

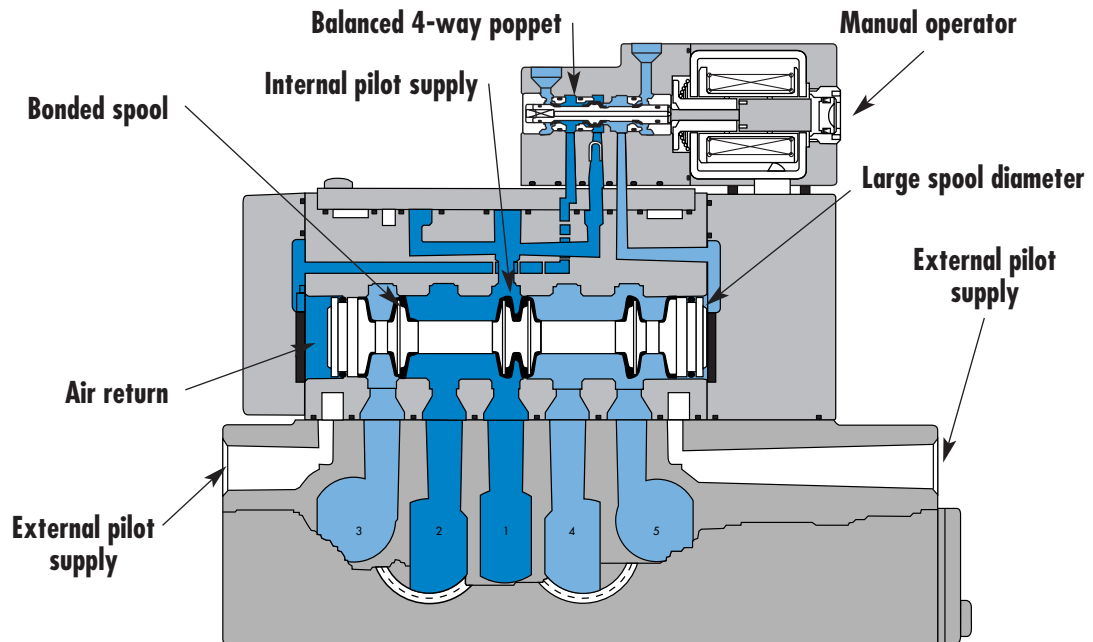
Individual mounting

Valve only - No base non "plug-in" Conform to ISO 5599/1	Valve only - No base "plug-in" Conform to ISO 5599/2
--	--

Series

Manifold mounting

Valve only - No base non "plug-in" Conform to ISO 5599/1	Valve only - No base "plug-in" Conform to ISO 5599/2
--	--



SERIES FEATURES

- Plug-in (5599/2) and non plug-in (5599/1) models.
- 2-position, single or double operator. (Solenoid or Remote Air)
- 3-position, double solenoid, open center, closed center, and pressure center.
- Extended or recessed manual operators.
- Single pressure and dual pressure.
- Individual base or add-a-unit manifold base.
- Plug-in, sandwich, single and dual pressure regulators for both individual and manifold valves.

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48P

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400

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ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

Function	Port size	Flow [Max]	Individual/Manifold mounting	Series
5/2, 5/3	1/4" - 3/8"	1.8 C_v	Valve only - No base non "plug-in" Conform to ISO 5599/1	

OPERATIONAL BENEFITS

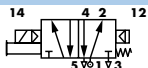
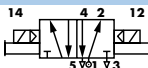
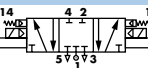

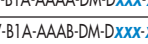
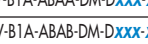
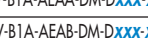
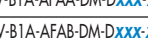
1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof AC solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. MAC spool and bore combination wipes away contamination, eliminates sticking and allows for use on non-lube service.
4. Large spool area for maximum shifting forces even at minimum operating pressure.
5. Very high flow in a compact package.
6. Plug-in design of valves, bases and regulators for modular assembly and ease of maintenance.
7. Internal or external pilot operation. Manifolds supplied with common external pilot.
8. Air only return. Optional memory spring is also available.
9. Optional low wattage DC solenoid down to 1.0 watt.



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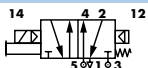
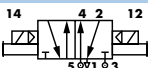
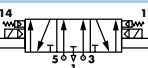
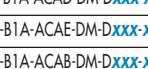
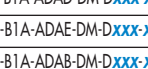
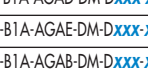



HOW TO ORDER

SINGLE PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
Internal	 MV-B1A-AAAA-DM-Dxxx-xxx	 MV-B1A-ABAA-DM-Dxxx-xxx	 MV-B1A-AEAA-DM-Dxxx-xxx	 MV-B1A-AFAA-DM-Dxxx-xxx
External "12" end	 MV-B1A-AAAB-DM-Dxxx-xxx	 MV-B1A-ABAB-DM-Dxxx-xxx	 MV-B1A-AEAB-DM-Dxxx-xxx	 MV-B1A-AFAB-DM-Dxxx-xxx

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42

DUAL PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal pilot From port #3	 MV-B1A-ACAD-DM-Dxxx-xxx	 MV-B1A-ADAD-DM-Dxxx-xxx	 MV-B1A-AGAD-DM-Dxxx-xxx
Internal pilot From port #5	 MV-B1A-ACAE-DM-Dxxx-xxx	 MV-B1A-ADAE-DM-Dxxx-xxx	 MV-B1A-AGAE-DM-Dxxx-xxx
External pilot From "12" end	 MV-B1A-ACAB-DM-Dxxx-xxx	 MV-B1A-ADAB-DM-Dxxx-xxx	 MV-B1A-AGAB-DM-Dxxx-xxx

47
48P
48
400
92

SOLENOID OPERATOR ➤

DM-D **xxx-xxx***

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

* Other options available, see page 309.
Note: ISO series, valve and base are ordered separately, see page 231 for base code.

OPTIONS

Valve function :

MV-B1A-**AXX**-XX-Dxxx-xxx

- J** for single operator universal spool (ext. pilot only)
- K** for double operator universal spool (ext. pilot only)

Pilot style :

MV-B1A-AXX-**DM**-Dxxx-xxx

- DM** Pilot exhaust muffled
- DP** Pilot exhaust piped (#10-32)

Spool return :

MV-B1A-AXX-**AX**-XX-Dxxx-xxx

- A** Standard return
- B** Memory spring return

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ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

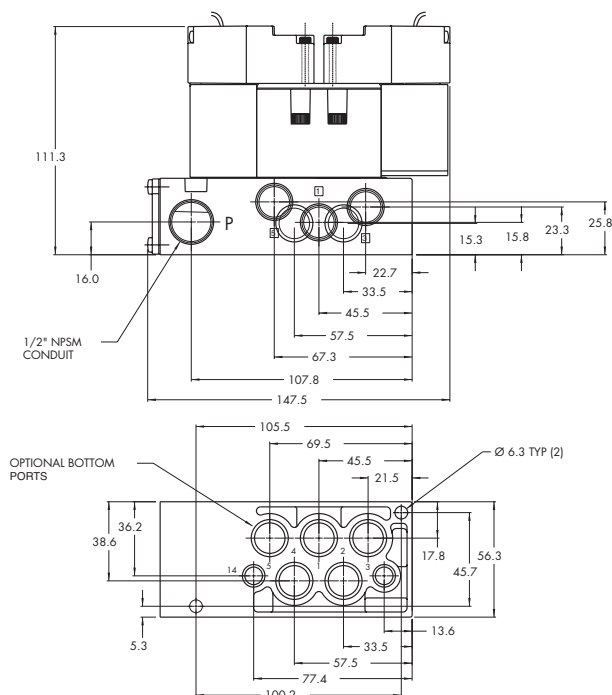
TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Internal pilot: 20 to 120 PSI External pilot : vacuum to 120 PSI
Pilot pressure :	Single/double operator : 20 to 120 PSI, 3 positions : 30 to 120 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
Filtration :	40 µ
Temperature range :	0°F to 120°F (-18°C to +50°C)
Flow :	3/8": (1.8 C _v) – 1/4": (1.6 C _v)
Coil :	Class A continuous duty, #22 AWG x 18 leads
Voltage range :	-15% to +10% of nominal voltage
Protection :	Consult factory
Power :	~ Inrush 7.6 VA Holding: 4.8 VA = 1 to 12.7 W
Response times : (with 5,4 W coil)	Energize : 11.3 ms De-energize : 7.8 ms

- Options :
- Sandwich flow controls: FCP1A-BA (screwdriver slot adjustment)
FCP1A-BB (locking knob adjustment)
 - Sandwich regulator, see „Regulators’ section
- Spare parts :
- Pilot valve: DMB-Dxxx-xxx • Valve to base pressure seal: 16661

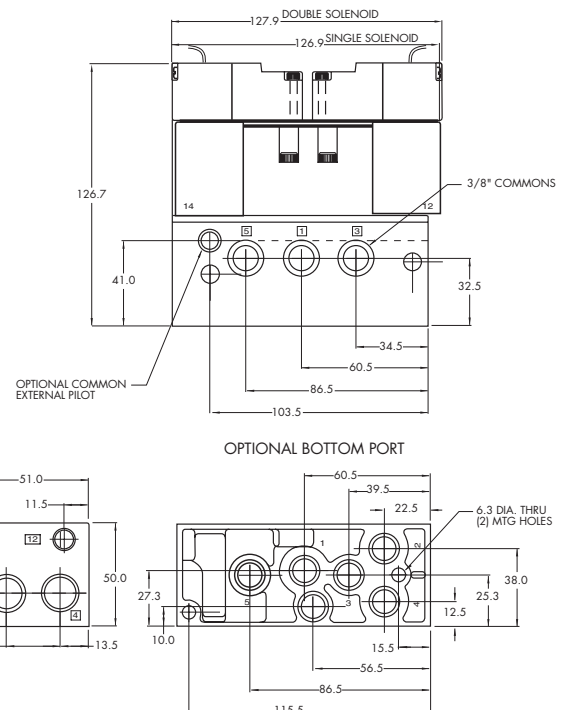
DIMENSIONS

Individual base



Dimensions shown are metric (mm)

Manifold base



Function	Port size	Flow [Max]	Individual/Manifold mounting	Series
5/2, 5/3	1/4" - 3/8"	1.8 C_v	Valve only - No base "plug-in" Conform to ISO 5599/2	

OPERATIONAL BENEFITS

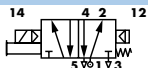
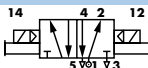
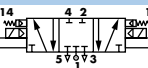

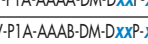
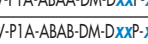
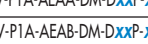
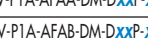
1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof AC solenoid operation.
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4. Large spool area for maximum shifting forces even at minimum operating pressure.
5. Very high flow in a compact package.
6. Plug-in design of valves, bases and regulators for modular assembly and ease of maintenance.
7. Internal or external pilot operation. Manifolds supplied with common external pilot.
8. Air only return. Optional memory spring is also available.
9. Optional low wattage DC solenoid down to 1.0 watt.



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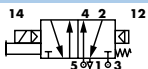
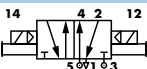
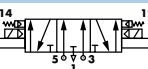
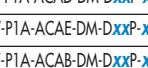
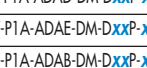
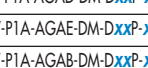



HOW TO ORDER

SINGLE PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
Internal	 MV-P1A-AAAA-DM-DxxP-xxx	 MV-P1A-ABAA-DM-DxxP-xxx	 MV-P1A-AEAA-DM-DxxP-xxx	 MV-P1A-AFAA-DM-DxxP-xxx
External "12" end	 MV-P1A-AAAB-DM-DxxP-xxx	 MV-P1A-ABAB-DM-DxxP-xxx	 MV-P1A-AEAB-DM-DxxP-xxx	 MV-P1A-AFAB-DM-DxxP-xxx

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42

DUAL PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal pilot From port #3	 MV-P1A-ACAD-DM-DxxP-xxx	 MV-P1A-ADAD-DM-DxxP-xxx	 MV-P1A-AGAD-DM-DxxP-xxx
Internal pilot From port #5	 MV-P1A-ACAE-DM-DxxP-xxx	 MV-P1A-ADAE-DM-DxxP-xxx	 MV-P1A-AGAE-DM-DxxP-xxx
External pilot From "12" end	 MV-P1A-ACAB-DM-DxxP-xxx	 MV-P1A-ADAB-DM-DxxP-xxx	 MV-P1A-AGAB-DM-DxxP-xxx

47
48P
48
400
92

SOLENOID OPERATOR ►

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

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

* Other options available, see page 309.

Note: - ISO series, valve and base are ordered separately, see page 233 for base codes.
- Ground wire required for 30 volts or higher.

OPTIONS

Valve function :

MV-P1A-**AXXX**-XX-DxxP-xxx

- J** for single operator universal spool (ext. pilot only)
K for double operator universal spool (ext. pilot only)

Pilot style :

MV-P1A-AXXX-**DM**-DxxP-xxx

- DM** Pilot exhaust muffled
DP Pilot exhaust piped (#10-32)

Spool return :

MV-P1A-AX**AX**-XX-DxxP-xxx

- A** Standard return
B Memory spring return
D Standard return with light
E Memory spring return with light

93

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

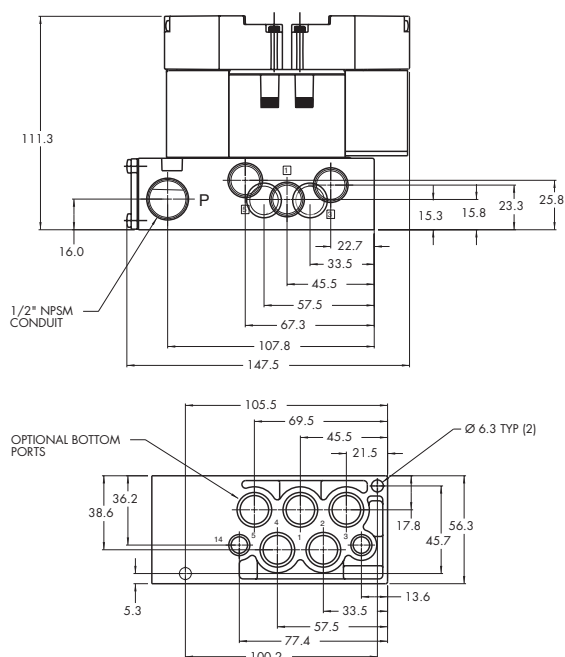
TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Internal pilot: 20 to 120 PSI External pilot : vacuum to 120 PSI
Pilot pressure :	Single/double operator : 20 to 120 PSI, 3 positions : 30 to 120 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
Filtration :	40 µ
Temperature range :	0°F to 120°F (-18°C to +50°C)
Flow :	3/8": (1.8 C _v) – 1/4": (1.6 C _v)
Coil :	Class A continuous duty, #22 AWG x 12 base leads
Voltage range :	-15% to +10% of nominal voltage
Protection :	Consult factory
Power :	~ Inrush 7.6 VA Holding: 4.8 VA = 1 to 12.7 W
Response times : (with 5,4 W coil)	Energize : 10 ms De-energize : 9 ms

- Options :
- Sandwich flow controls: FCP1A-AA (screwdriver slot adjustment)
FCP1A-AB (locking knob adjustment)
 - Sandwich regulator, see „Regulators’ section
- Spare parts :
- Pilot valve: DMB-DxxP-xxx • Valve to base pressure seal: 16661

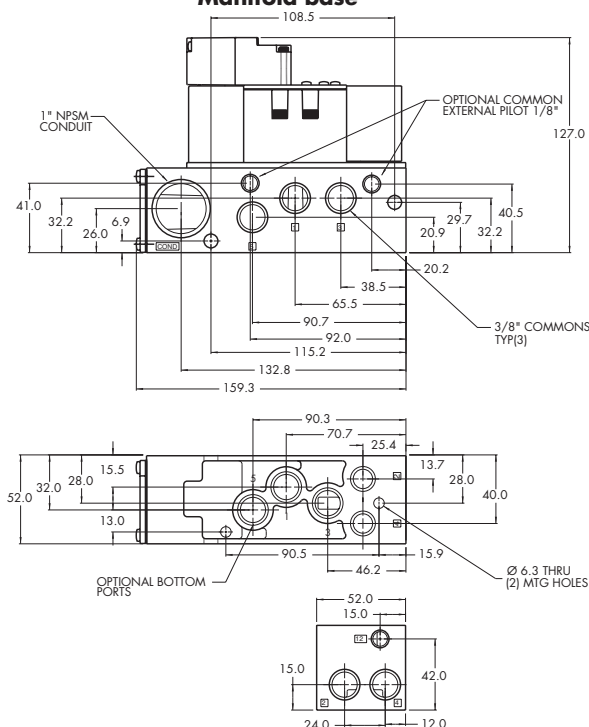
DIMENSIONS

Individual base



Dimensions shown are metric (mm)

Manifold base



Non plug-in base / manifold

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



HOW TO ORDER

INDIVIDUAL BASE

Port size	Side ports	Side & bottom ports	Bottom cylinder ports 2 and 4.	Bottom inlet port 1
1/4" NPTF	MB-A1C-221	MB-A1C-223	MB-A1C-222	MB-A1C-224
3/8" NPTF	MB-A1C-231	MB-A1C-233	MB-A1C-232	MB-A1C-234

MANIFOLD BASE

Port size	Side ports	Side & bottom ports	Bottom cylinder ports 2 and 4.	Bottom inlet port 1
1/4" NPTF	MM-A1C-221	MM-A1C-223	MM-A1C-222	MM-A1C-224
3/8" NPTF	MM-A1C-231	MM-A1C-233	MM-A1C-232	MM-A1C-234

Manifold fastening kit : N-63002-01.

Valve blanking plate: MA1003.

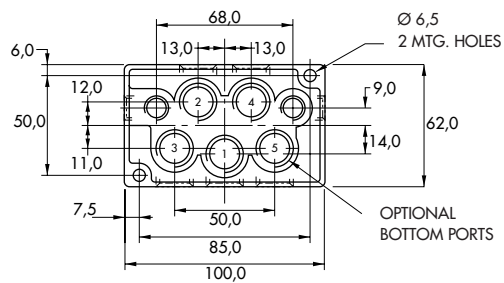
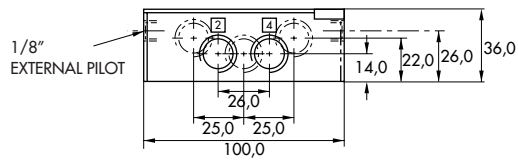
Inlet/exhaust isolator plug: 32835.

DIMENSIONS

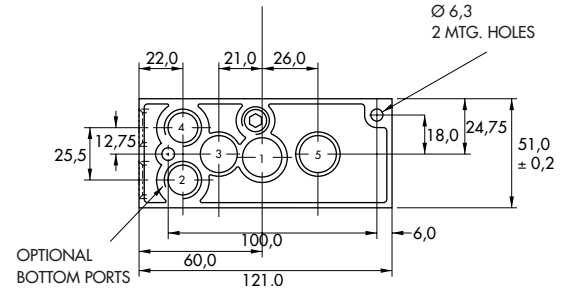
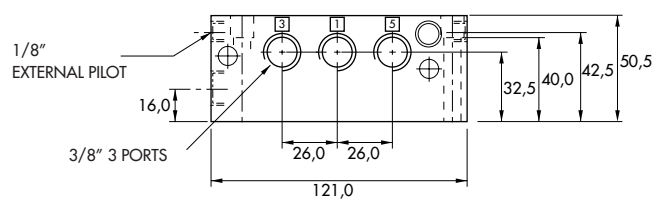
Dimensions shown are metric (mm)

Individual

DIN 5599/1



Manifold



Plug-in base / manifold



ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

HOW TO ORDER

INDIVIDUAL BASE

Port size	Wired for	Side ports	Side ports w/ bottom 2 & 4 ports	All side & bottom ports
1/4" NPTF	Single solenoid	MB-P1A-221-A	MB-P1A-222-A	MB-P1A-223-A
	Double solenoid	MB-P1A-221-B	MB-P1A-222-B	MB-P1A-223-B
3/8" NPTF	Single solenoid	MB-P1A-231-A	MB-P1A-232-A	MB-P1A-233-A
	Double solenoid	MB-P1A-231-B	MB-P1A-232-B	MB-P1A-233-B

MANIFOLD BASE

Port size	Wired for	Side ports	Side ports w/ bottom 2 & 4 ports	All side & bottom ports (see note)
1/4" NPTF	Single solenoid	MM-P1A-221-A	MM-P1A-222-A	MM-P1A-223-A
	Double solenoid	MM-P1A-221-B	MM-P1A-222-B	MM-P1A-223-B
3/8" NPTF	Single solenoid	MM-P1A-231-A	MM-P1A-232-A	MM-P1A-233-A
	Double solenoid	MM-P1A-231-B	MM-P1A-232-B	MM-P1A-233-B

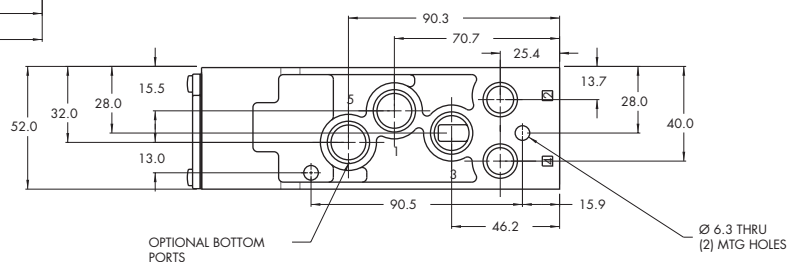
Note : Ports 1, 3 & 5 are always 3/8"

OPTIONS

Manifold options :	External pilot	MM-P1A-22-x-x	25 for 1/4" port – common external pilot 26 for 3/8" port – common external pilot
	Terminal strip	MM-P1A-xxx-A (N/A with light)	J wired for sgl solenoid K wired for double solenoid
Base / Manifold option: light(s)		MX-P1A-xxx-xJA	JA 110/120 volt JB 220/240 volt DA 24 volt

Accessories: M-P1001 Valve blanking plate.
N-P1007-01 Manifold fastening kit.
32835 Inlet/exhaust isolator plug.

Dimensions shown are metric (mm)

[illegible]

Individual mounting

valve only

Series

Manifold mounting

valve only

35

100

200

55

56

57

58

59

45

700

900

82

6300

6500

6600

1300

800

ISO 1

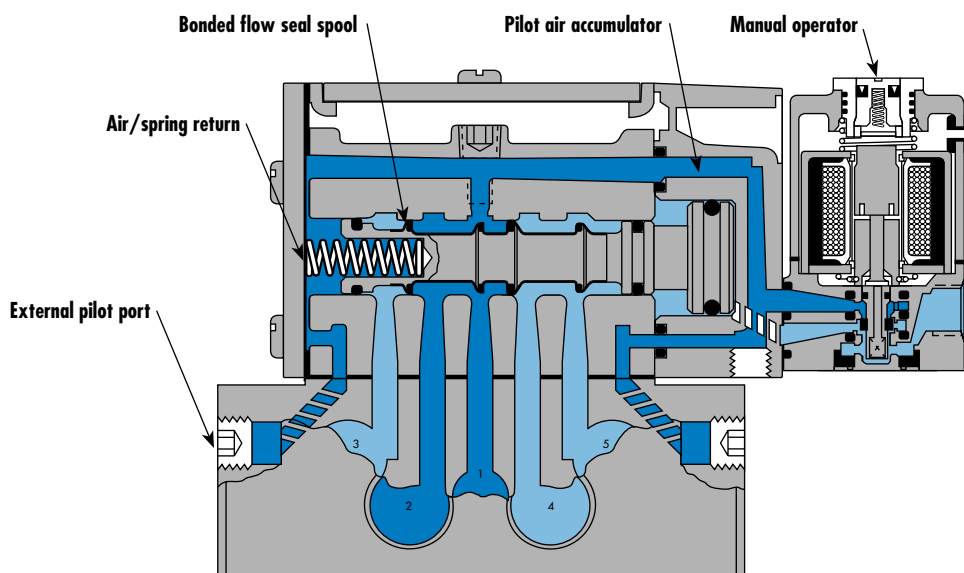
ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A



SERIES FEATURES

- Fastest available response time with patented MACSOLENOID®.
- No-stick operation is ensured by wiping action of unique MAC spool/bore combination.
- Balanced poppet pilot valve for high flow, precise repeatability, and consistent operation.
- Large spool piston for high shifting force even at minimum operating pressure.
- Air/spring return for consistent shifting on single solenoid models.
- Patented virtually burn-out proof AC solenoid.
- Optional low wattage DC solenoids down to 1.0 watt.
- Various manual operators & electrical connectors are available.
- Muffled or threaded pilot exhaust ports.
- Internal or external pilot models available.

VALVE CONFIGURATIONS AVAILABLE

- 2-Pos., single or double operators (solenoid or remote air).
- Single or dual pressure.
- 3-Pos., double operator-closed center, open center or pressure center (solenoid or remote air).
- Individual base or add-a-unit manifold base.
- Internal pilot or external pilot (including a common external pilot or manifold models).
- Side porting and bottom porting options.

*International Standards Organization ISO Common Base Interface (ISO Std. 5599/1)

SPECIAL APPLICATION INSTRUCTIONS :

On all models, energizing the "14" operator (solenoid or remote air) connects Port #1 to Cylinder Port #4 and energizing the "12" operator connects Port #1 to Cylinder Port #2. For the following special applications, additional piping considerations are required.

EXTERNAL PILOT APPLICATIONS* - An External Pilot Supply is only required when the main valve pressure is less than 1.8 BARS on single operators (solenoid or remote air) or 0.7 BARS on double solenoid valves only. In these cases, use an External Pilot

model and supply a minimum of 1.8 BARS for single operators or a minimum of 0.7 BARS for double solenoid valves to either the "14" or "12" External Pilot Port of the valve base.

VACUUM APPLICATIONS - Use an External Pilot model as described above and also connect the vacuum source to Port #3 & 5 and leave Port#1 open to atmosphere on single pressure models. On two pressure models, reverse the single pressure piping.

SELECTOR APPLICATIONS - Use an External Pilot Model as described above if both pressures are below the minimum, otherwise use an Internal Pilot model and connect the higher pressure to Port #1 and the lower pressure to either Port #3 or 5 depending on which Cylinder Port is to be active.

TWO PRESSURE APPLICATIONS - For Internal Pilot models specify the model number for connecting either port #3 or 5, whichever is to be the higher pressure, to the Internal Pilot supply. For external Pilot models, pipe as described above for "External Pilot Application."

*Note: 1Bar = 14.5 PSIG

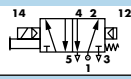
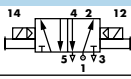
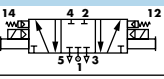
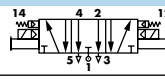
Function	Port size	Flow [Max]	Individual mounting & Manifold mounting	Series
5/2 - 5/3	1/4" - 3/8"	1.6 C_v	valve only	

OPERATIONAL BENEFITS

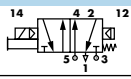
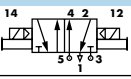
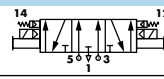
1. Balanced spool, immune to variations of pressure.
2. Short stroke with high flow.
3. The piston (booster) provides maximum shifting forces.
4. Powerful return force thanks to the combination of mechanical and air springs.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Wiping effect eliminates sticking.
7. Pilot valve with balanced poppet, high flow, short and consistent response times.
8. Long service life.

HOW TO ORDER

SINGLE PRESSURE VALVES

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
				
Internal	MV-A1C-A111-PM- XXYZZ	MV-A1C-A211-PM- XXYZZ	MV-A1C-A312-PM- XXYZZ	MV-A1C-A311-PM- XXYZZ
External	MV-A1C-A121-PM- XXYZZ	MV-A1C-A221-PM- XXYZZ	MV-A1C-A322-PM- XXYZZ	MV-A1C-A321-PM- XXYZZ

DUAL PRESSURE VALVES

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
			
Internal port 3	MV-A1C-A131-PM- XXYZZ	MV-A1C-A231-PM- XXYZZ	MV-A1C-A331-PM- XXYZZ
Internal port 5	MV-A1C-A135-PM- XXYZZ	MV-A1C-A232-PM- XXYZZ	MV-A1C-A332-PM- XXYZZ
External	MV-A1C-A141-PM- XXYZZ	MV-A1C-A241-PM- XXYZZ	MV-A1C-A341-PM- XXYZZ

SOLENOID OPERATOR ►

XX Y ZZ*

XX	Voltage	Y	Manual operator	ZZ	Electrical connection
11	120/60, 110/50	1	Non-locking	JB	Rectangular connector
12	240/60, 220/50	2	Locking	JD	Rectangular connector with light
22	24/60, 24/50			JA	Square connector
59	24 VDC (2.5 W)			JC	Square connector with light
87	24 VDC (17.1 W)			BA	Flying leads (18")
61	24 VDC (8.5 W)				

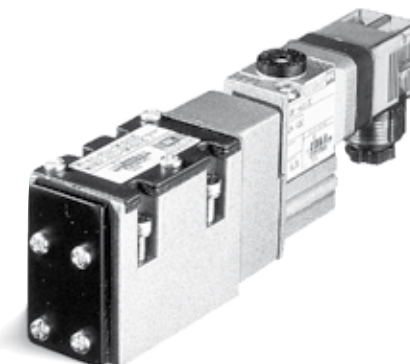
* Other options available, see page 357.

Note : ISO valves are delivered w/o base. See page 281 for base code.

OPTIONS

MV-A1C-A111-PM-**XXYZZ**

- For CNOMO pilot, consult factory.
- For universal spool replace by 6 (2 position, sgl. pressure valves only)
- For use with single pressure sandwich regulator, replace by 5.



Note : Photo shown with JC connector.

35

100

200

55

56

57

58

59

45

700

900

82

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Internal pilot : single operator and 3 positions : 25-150 PSI double operator : 10-150 PSI External pilot : vacuum to 150 PSI		
Pilot pressure :	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 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)		
Flow (at 6 bar, ΔP=1bar) :	1/4" : (1.6 C _v), 3/8" : (1.6 C _v)		
Coil :	Epoxy encapsulated - class A wires - Continuous duty		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 14.8 VA Holding : 10.9 VA = 1 to 17.1 W		
Response times :	24 VDC (8.5 W) Energize : 10 ms De-energize : 11 ms 120/60 Energize : 7-13 ms De-energize : 10-17 ms		

Spare parts :

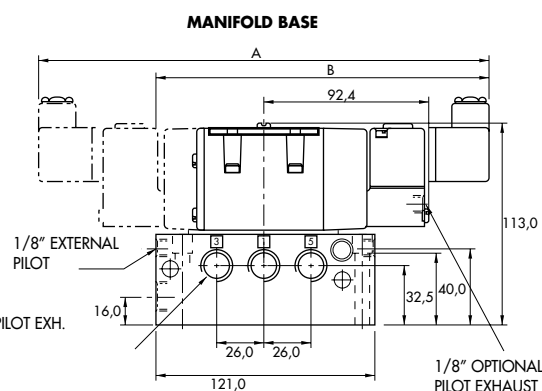
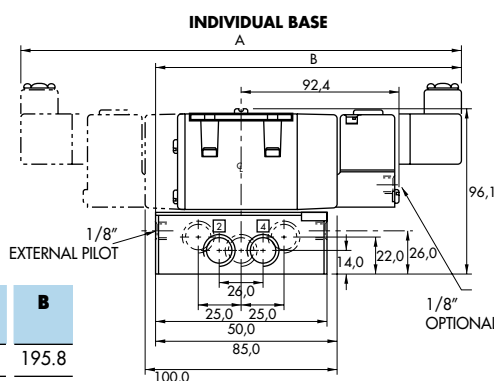
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XYZZ, including seal 16337. • Pressure seal between valve and base : 16344.
- Mounting screw valve to base (x4) : 35304.

DIMENSIONS

Dimensions shown are metric (mm)

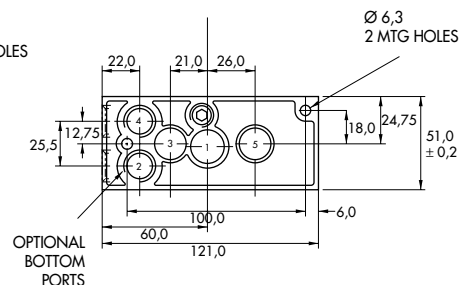
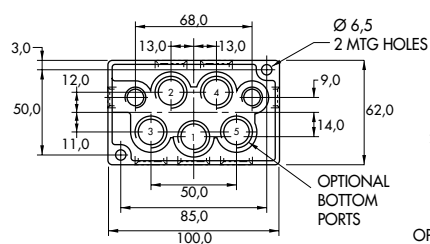
ISO 1 Manifold mounting

TYPE	A	B
JA & JC	271.6	195.8
JB & JD	294.6	207.3



ISO 1 Individual mounting

TYPE	A	B
JA & JC	271.6	185.8
JB & JD	294.6	197.3



ISO 1

ISO 2

ISO 3



HOW TO ORDER

INDIVIDUAL BASE

Port size	Side ports	Side & bottom ports	Bottom cylinder ports 2 and 4.	Bottom inlet port 1
1/4" NPTF	MB-A1C-221	MB-A1C-223	MB-A1C-222	MB-A1C-224
3/8" NPTF	MB-A1C-231	MB-A1C-233	MB-A1C-232	MB-A1C-234

MANIFOLD BASE

Port size	Side ports	Bottom ports	Bottom cylinder ports 2 and 4.	Bottom inlet port 1
1/4" NPTF	MM-A1C-221	MM-A1C-223	MM-A1C-222	MM-A1C-224
3/8" NPTF	MM-A1C-231	MM-A1C-233	MM-A1C-232	MM-A1C-234

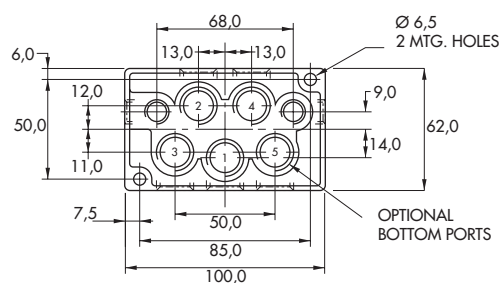
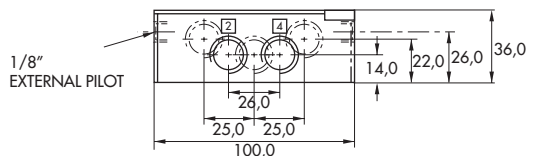
Manifold fastening kit : N-63002-01.

DIMENSIONS

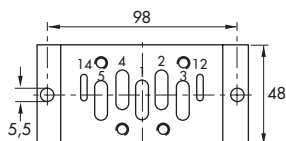
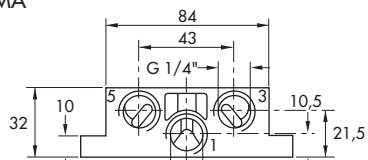
Dimensions shown are metric (mm)

Individual

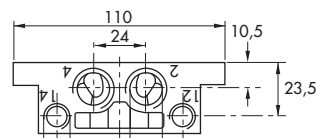
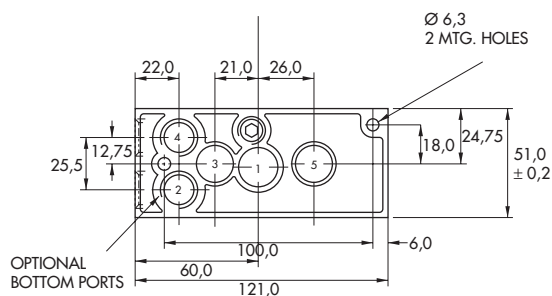
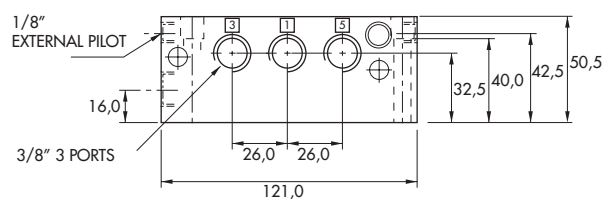
DIN 5599/1



VDMA



Manifold



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

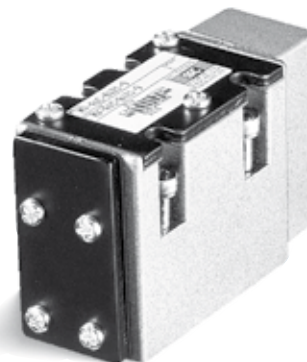
VALVE CODE ► **- XX Y ZZ (-VV)**
1 2 3 4

OPTIONS AVAILABLE FOR	OPTIONS AVAILABLE FOR
<ul style="list-style-type: none"> - valves type 100 Series - pilot valves "CNOMO" 	<ul style="list-style-type: none"> - valves type 200 Series
<ul style="list-style-type: none"> - Pilot operated valves with pilots type 100 Series Series : 55 - 56 - 700 - 800 - 900 - 6300 - 6500 - 6600 - 1300 - ISO 1 - ISO 2 - ISO 3. - MAC 125 - MAC 250 - MAC 500 	<ul style="list-style-type: none"> - pilot operated valves with pilots type 200 Series Series : 200 - 57 - 58 - 59.
<ul style="list-style-type: none"> - Pilot operated valves with pilots "CNOMO" Series : ISO1 - ISO2 - ISO3 	

Function	Port size	Flow [Max]	Individual mounting & Manifold mounting	Series
5/2 - 5/3	1/4" - 3/8"	1.6 C_v	valve only	

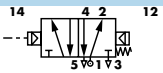
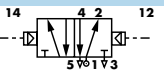
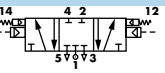
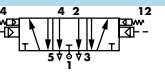
OPERATIONAL BENEFITS

1. Balanced spool, immune to variations of pressure.
2. Short stroke with high flow.
3. The piston (booster) provides maximum shifting forces.
4. Powerful return thanks to the combination of mechanical and air springs.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6. Wiping effect eliminates sticking.
7. Low leakage rate.

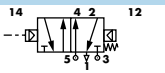
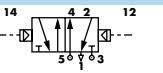
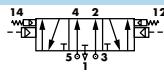


HOW TO ORDER

SINGLE PRESSURE VALVES

Air spring	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
				
Internal	MV-A1C-B111	-----	-----	-----
External	MV-A1C-B121	MV-A1C-B221	MV-A1C-B322	MV-A1C-B321

DUAL PRESSURE VALVES

Air spring	5/2 Single operator	5/2 Double operator	5/3 Pressure center
			
Internal port 3	MV-A1C-B131	-----	-----
Internal port 5	MV-A1C-B135	-----	-----
External	MV-A1C-B141	MV-A1C-B241	MV-A1C-B341

Note : ISO valves are delivered w/o base. See page 281 for base code

1100

55

56

57

58

59

700

900

82

6300

6500

6600

2700

1800

ISO 1

ISO 2

ISO 3

TECHNICAL DATA

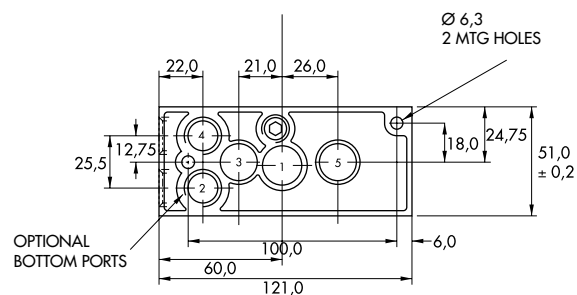
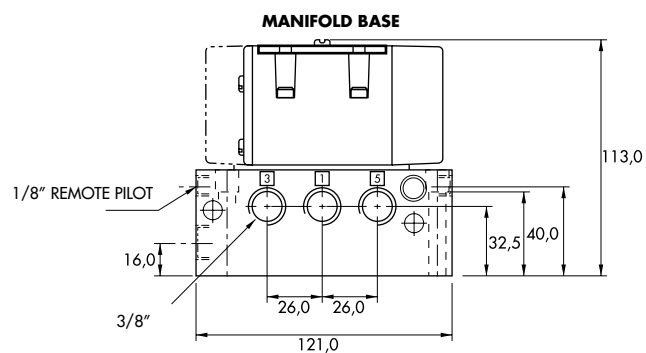
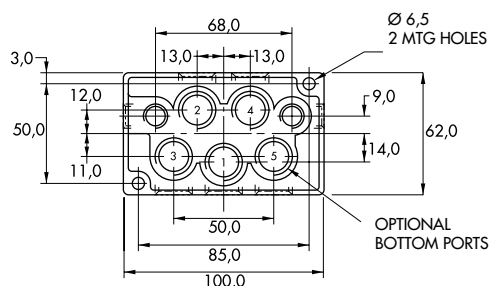
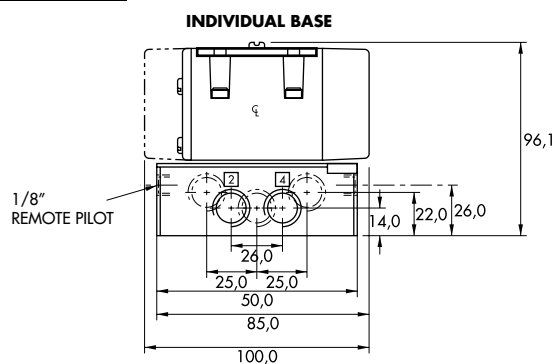
Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Vacuum to 150 PSI
Air signal pressure :	Single operator and 3 positions : 20 to 150 PSI \geq main valve pressure Double operator : 10 to 150 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
Filtration :	40 μ
Temperature range :	0°F to 120°F (-18°C to 50°C)
Flow (at 6 bar, $\Delta P=1$ bar) :	1/4" - 3/8" : (1.6 C _v)

Spare parts :

- Remote air operator 2 positions : R-A1010. • Remote air operator 3 positions : R-A1005B.
- Pressure seal between valve and base : 16344. • Mounting screw body to base (x4) : 35304.

DIMENSIONS

Dimensions shown are metric (mm)



Sandwich pressure regulator with manual adjust knob.

OPERATIONAL BENEFITS

1. Easy mounting : saves on installation costs in comparison with inline regulators.
2. Allows to have compact, all-included units.
3. Large orifice provides high flow.
4. Various functions available.
5. Simple, reliable and solid design.



PR82A
PR63D
PR65C

HOW TO ORDER

INTERNAL PILOT

Gauges	Single pressure Regulator 14 end Same regulated pressure to ports 2 and 4	Single pressure Regulator 12 end Same regulated pressure to ports 2 and 4	Dual pressure [*] Regulator 14 end Regulated pressure to port 4	Dual pressure [*] Regulator 12 end Regulated pressure to port 2	Dual pressure [*] Dual regulator Two regulated pressures to ports 2 and 4
No gauge	PRA1A-GAAA	PRA1A-GCAA	PRA1A-GBAA	PRA1A-GDAA	PRA1A-GEAA
Gauge parallel to regulator(s)	PRA1A-GADA	PRA1A-GCDA	PRA1A-GBDA	PRA1A-GDDA	PRA1A-GEEA
Gauge perpendicular to regulator(s)	PRA1A-GABA	PRA1A-GCBA	PRA1A-GBBA	PRA1A-GDBA	PRA1A-GECA

EXTERNAL PILOT AND REMOTE AIR

Gauges	Single pressure Regulator 14 end Same regulated pressure to ports 2 and 4	Single pressure Regulator 12 end Same regulated pressure to ports 2 and 4	Dual pressure [*] Regulator 14 end Regulated pressure to port 4	Dual pressure [*] Regulator 12 end Regulated pressure to port 2	Dual pressure [*] Dual regulator Two regulated pressures to ports 2 and 4
No gauge	PRA1A-HAAA	PRA1A-HCAA	PRA1A-HBAA	PRA1A-HDAA	PRA1A-HEAA
Gauge parallel to regulator(s)	PRA1A-HADA	PRA1A-HCDA	PRA1A-HBDA	PRA1A-HDDA	PRA1A-HEEA
Gauge perpendicular to regulator(s)	PRA1A-HABA	PRA1A-HCBA	PRA1A-HBBA	PRA1A-HDBA	PRA1A-HECA

* - To be used with dual pressure valves.

Valve code is : MV-A1C-AX5X-PM-XYZZ (sgl. pressure ext. pilot)

Valve code is : MV-A1C-AX4X-PM-XYZZ (dual pressure ext. pilot)

Note : regulating range for above models is 0-120 PSI. For other ranges see technical data page.

Main valve body assembly must be external pilot model. Pilots are supplied internally from primary pressure in regulator block. Cannot field convert regulator block from Single Pressure to dual pressure. Body/Block to base mounting screw #35336.

PRA1A
PRA2D
PRA3C

PR125A
PR250B

ADJUSTMENT OPTIONS

PRA1A-XXXX

- Replace by A for slotted stem adjustment (internal pilot)
- Replace by B for slotted stem adjustment (external/remote air)
- Replace by K for slotted stem with locknut (internal pilot)
- Replace by L for slotted stem with locknut (external/remote air)

TECHNICAL DATA

Fluid :	Compressed air, inert gases
Pressure range :	0 to 150 PSI
Regulating range :	0 to 120 PSI (other ranges see below)
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)
Flow :	(1.0 C _v)

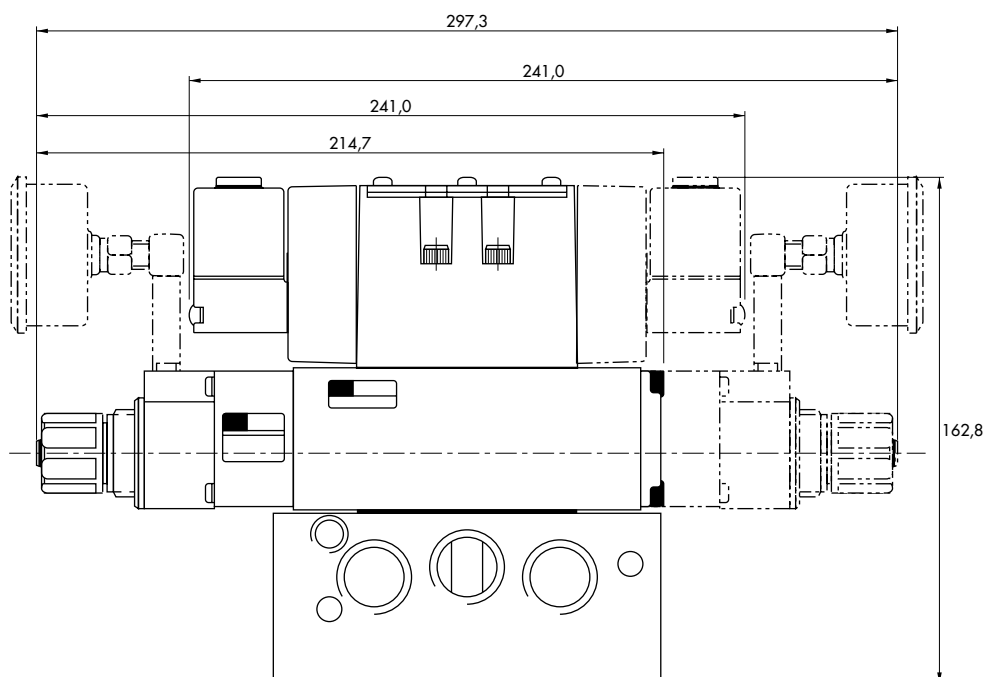
- Spare parts :
- Pressure regulator (less sandwich block) : PRA1A-J0AA (KNOB), PRA1A-C0AA (SLOTTED STEM), PRA1A-M0AA (SLOTTED STEM WITH LOCKNUT).
 - Gauges : N-82016-01 (0-120 PSI perpendicular)
N-82016-02 (0-120 PSI parallel)
N-82016-03 (0-80 PSI perpendicular)
N-82016-04 (0-80 PSI parallel)
N-82016-05 (0-30 PSI perpendicular)
N-82016-06 (0-30 PSI parallel)

Regulating range options : PRA1A-XXXX

- | | |
|--------------|----------------------------|
| Replace by B | - 0 to 80 PSI |
| Replace by C | - 0 to 30 PSI |
| Replace by D | - 0 to 120 PSI on "14" end |
| | - 0 to 80 PSI on "12" end |
| Replace by E | - 0 to 120 PSI on "12" end |
| | - 0 to 80 PSI on "14" end |
| Replace by F | - 0 to 120 PSI on "14" end |
| | - 0 to 30 PSI on "12" end |
| Replace by G | - 0 to 120 PSI on "12" end |
| | - 0 to 30 PSI on "14" end |
| Replace by H | - 0 to 80 PSI on "14" end |
| | - 0 to 30 PSI on "12" end |
| Replace by J | - 0 to 80 PSI on "12" end |
| | - 0 to 30 PSI on "14" end |

DIMENSIONS

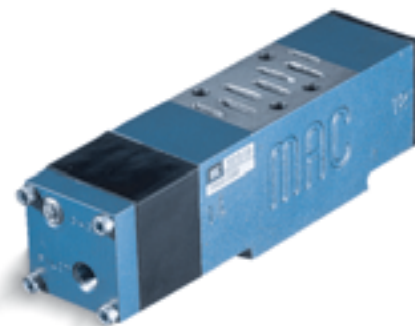
Dimensions shown are metric (mm)



Sandwich pressure regulator with air pilot adjust.

OPERATIONAL BENEFITS

1. Easy mounting : saves on installation costs in comparison with inline regulators.
2. Allows to have compact, all-included units.
3. Large orifice provides high flow.
4. Various functions available.
5. Simple, reliable and solid design.



PR82A
PR63D
PR65C

HOW TO ORDER

INTERNAL PILOT

Gauges	Single pressure Regulator 14 end Same regulated pressure to ports 2 and 4	Single pressure Regulator 12 end Same regulated pressure to ports 2 and 4	Dual pressure Regulator 14 end Regulated pressure to port 4 *	Dual pressure Regulator 12 end Regulated pressure to port 2 *	Dual pressure Dual regulator Two regulated pressures to ports 2 and 4 *
No gauge	PRA1A-DAAA	PRA1A-DCAA	PRA1A-DBAA	PRA1A-DDAA	PRA1A-DEAA
Gauge parallel to regulator(s)	PRA1A-DADA	PRA1A-DCDA	PRA1A-DBDA	PRA1A-DDDA	PRA1A-DEEA
Gauge perpendicular to regulator(s)	PRA1A-DABA	PRA1A-DCBA	PRA1A-DBBA	PRA1A-DDBA	PRA1A-DECA

EXTERNAL PILOT AND REMOTE AIR

Gauges	Single pressure Regulator 14 end Same regulated pressure to ports 2 and 4	Single pressure Regulator 12 end Same regulated pressure to ports 2 and 4	Dual pressure Regulator 14 end Regulated pressure to port 4 *	Dual pressure Regulator 12 end Regulated pressure to port 2 *	Dual pressure Dual regulator Two regulated pressures to ports 2 and 4 *
No gauge	PRA1A-EAAA	PRA1A-ECAA	PRA1A-EBAA	PRA1A-EDAA	PRA1A-EEAA
Gauge parallel to regulator(s)	PRA1A-EADA	PRA1A-ECDA	PRA1A-EBDA	PRA1A-EDDA	PRA1A-EEEA
Gauge perpendicular to regulator(s)	PRA1A-EABA	PRA1A-ECBA	PRA1A-EBBA	PRA1A-EDBA	PRA1A-EECA

* - To be used with dual pressure valves.

Valve code is : MV-A1C-AX5X-PM-XXYZZ (sgl. pressure ext. pilot)

Valve code is : MV-A1C-AX4X-PM-XXYZZ (dual pressure ext. pilot)

Main valve body assembly must be external pilot model. Pilots are supplied internally from primary pressure in regulator block. Cannot field convert regulator block from Single Pressure to dual pressure. Body/Block to base mounting screw #35336.

PRA1A
PRA2D
PRA3C

PR125A
PR250B

TECHNICAL DATA

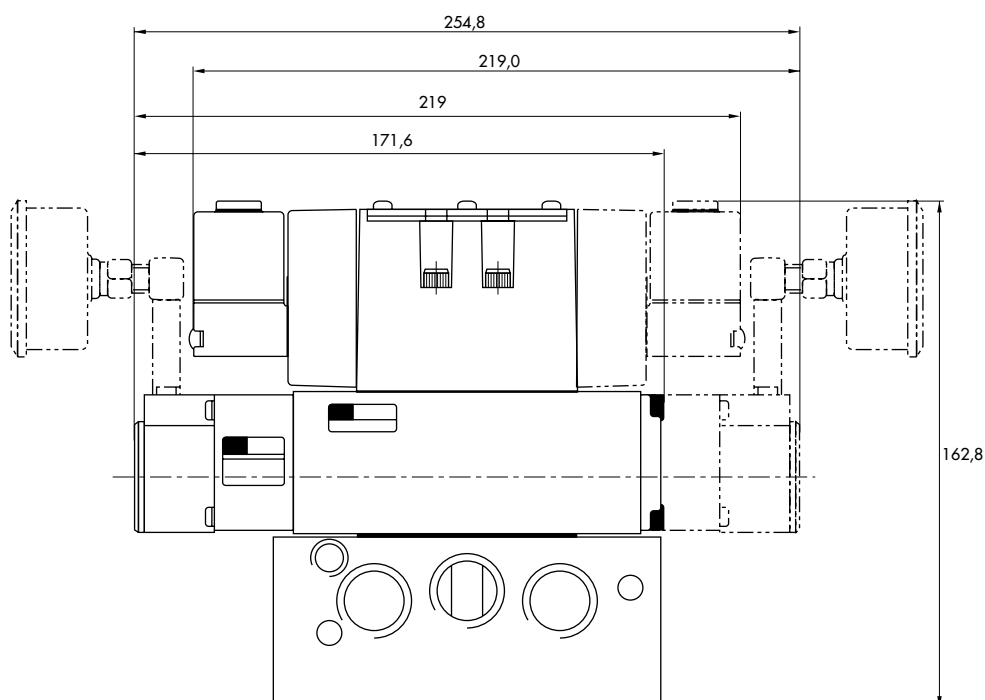
Fluid :	Compressed air, inert gases
Pressure range :	0 to 150 PSI
Regulating range :	0 to 120 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
Filtration :	40 µ
Temperature range :	0°F to 120°F (-18°C to 50°C)
Flow :	(1.0 C _v)

Spare parts :

- Pressure regulator (less sandwich block) : PRA1A-FOAA.
- Gauges : N-82016-01 (0-120 PSI perpendicular)
N-82016-02 (0-120 PSI parallel)

DIMENSIONS

Dimensions shown are metric (mm)



Non plug-in sandwich pressure regulator with air pilot adjust

OPERATIONAL BENEFITS

1. Easy mounting : saves on installation costs in comparison with inline regulators.
2. Allows to have compact, all-included units.
3. Large orifice provides high flow.
4. Various functions available.
5. Simple, reliable and solid design.



PR37A
PR42B
PR46A
PR47A
PR48B

PR92C

HOW TO ORDER

INTERNAL PILOT

Gage	Single pressure Regulator 14 end Same regulated pressure to ports 2 and 4	Single pressure Regulator 12 end Same regulated pressure to ports 2 and 4	Dual pressure Regulator 14 end Regulated pressure to port 4 *	Dual pressure Regulator 12 end Regulated pressure to port 2 *	Dual pressure Dual regulator Two regulated pressures to ports 2 and 4 *
No gage	PRA1A-DAAA	PRA1A-DCAA	PRA1A-DBAA	PRA1A-DDAA	PRA1A-DEAA
Gage perpendicular to regulator(s)	PRA1A-DABA	PRA1A-DCBA	PRA1A-DBBA	PRA1A-DDBA	PRA1A-DECA
Gage parallel to regulator(s)	PRA1A-DADA	PRA1A-DCDA	PRA1A-DBDA	PRA1A-DDDA	PRA1A-DEEA

PR93A

PRA01A

PRA02A

EXTERNAL PILOT AND REMOTE AIR

Gage	Single pressure Regulator 14 end Same regulated pressure to ports 2 and 4	Single pressure Regulator 12 end Same regulated pressure to ports 2 and 4	Dual pressure Regulator 14 end Regulated pressure to port 4 *	Dual pressure Regulator 12 end Regulated pressure to port 2 *	Dual pressure Dual regulator Two regulated pressures to ports 2 and 4 *
No gage	PRA1A-EAAA	PRA1A-ECAA	PRA1A-EBAA	PRA1A-EDAA	PRA1A-EEAA
Gage perpendicular to regulator(s)	PRA1A-EABA	PRA1A-ECBA	PRA1A-EBBA	PRA1A-EDBA	PRA1A-EECA
Gage parallel to regulator(s)	PRA1A-EADA	PRA1A-ECDA	PRA1A-EBDA	PRA1A-EDDA	PRA1A-EEEA

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C

PRP3B

* - To be used with dual pressure valves.

Main valve body assembly must be external pilot model. Pilots are supplied internally from primary pressure in regulator block. Cannot field convert regulator block from Single Pressure to dual pressure. Body/Block to base mounting screw #35336.

TECHNICAL DATA

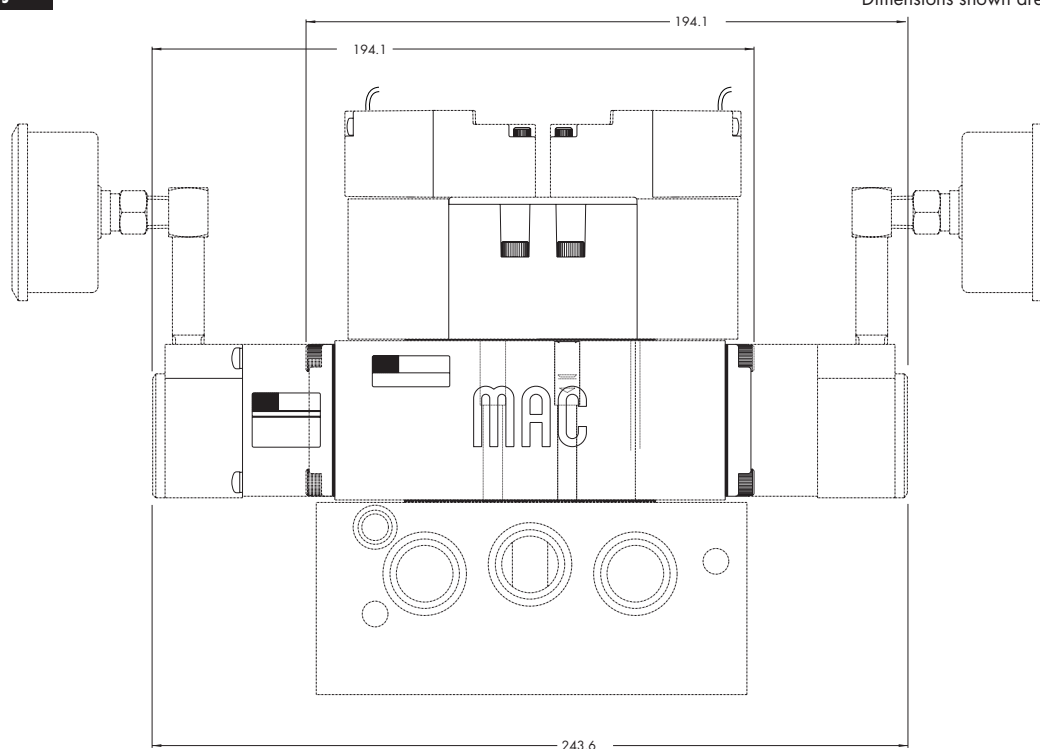
Fluid :	Compressed air, inert gases
Pressure range :	0 to 150 PSI
Regulating range :	0 to 120 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
Filtration :	40 µ
Temperature range :	0°F to 120°F (-18°C to +50°C)
Flow :	1.0 C _v

Spare parts :

- Pressure regulator (less sandwich block) : PRA1A-FOAA.
- Gage : N-82016-01 (0-120 PSI perpendicular)
N-82016-02 (0-120 PSI parallel)

DIMENSIONS

Dimensions shown are metric (mm)



Plug-in sandwich pressure regulator with manual adjust knob

OPERATIONAL BENEFITS

1. Easy mounting; saves on installation costs in comparison with inline regulators.
2. Compact all-included units.
3. Large orifice provides high flow.
4. Various functions available.
5. Simple, reliable and solid design.



PR37A

PR42B

PR46A

PR47A

PR48B

PR92C

HOW TO ORDER

REGULATORS FOR INTERNAL PILOT (CODED FOR KNOB ADJUSTMENT)

Gage	Single pressure Regulator 14 end Same regulated pressure to ports 2 and 4	Single pressure Regulator 12 end Same regulated pressure to ports 2 and 4	Dual pressure Regulator 14 end Regulated pressure to port 4 *	Dual pressure Regulator 12 end Regulated pressure to port 2 *	Dual pressure Dual regulator Two regulated pressures to ports 2 and 4 *
Gage port only	PRP1A-GAKA	PRP1A-GCKA	PRP1A-GBKA	PRP1A-GDKA	PRP1A-GEKA
Gage perpendicular to manual operator	PRP1A-GABA	PRP1A-GCBA	PRP1A-GBBA	PRP1A-GDBA	PRP1A-GECA
Gage parallel to manual operator	PRP1A-GADA	PRP1A-GCDA	PRP1A-GBDA	PRP1A-GDDA	PRP1A-GEEA

PR93A

PRA01A

PRA02A

REGULATORS FOR EXTERNAL PILOT AND REMOTE AIR (CODED FOR KNOB ADJUSTMENT)

Gage	Single pressure Regulator 14 end Same regulated pressure to ports 2 and 4	Single pressure Regulator 12 end Same regulated pressure to ports 2 and 4	Dual pressure Regulator 14 end Regulated pressure to port 4 *	Dual pressure Regulator 12 end Regulated pressure to port 2 *	Dual pressure Dual regulator Two regulated pressures to ports 2 and 4 *
No gage	PRP1A-HAKA	PRP1A-HCKA	PRP1A-HBKA	PRP1A-HDKA	PRP1A-HEKA
Gage perpendicular to manual operator	PRP1A-HABA	PRP1A-HCBA	PRP1A-HBBA	PRP1A-HDBA	PRP1A-HECA
Gage parallel to manual operator	PRP1A-HADA	PRP1A-HCDA	PRP1A-HBDA	PRP1A-HDDA	PRP1A-HEEA

PRA1A

PRP1A

PRA2D

PRP2B

* For use with dual pressure valves.

Note: Regulating range for above models is 0 - 120 PSI. For other ranges see technical data page.

ADJUSTMENT OPTIONS

PRP1A-xxxx

- A** for slotted stem adjustment (internal pilot)
- B** for slotted stem adjustment (external/remote air)
- K** for slotted stem with locknut (internal pilot)
- L** for slotted stem with locknut (external/remote air)

Notes:

1. Valves used with above models must be external pilot models.
2. Cannot field convert regulator block from single pressure to dual pressure.
3. Cannot field convert from internal pilot to external pilot.
4. Wired for double solenoid valves.

TECHNICAL DATA

Fluid :	Compressed air, inert gases
Pressure range :	0 to 150 PSI
Regulating range :	0 to 120 PSI (other ranges see below)
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)
Flow :	1.1 C _v

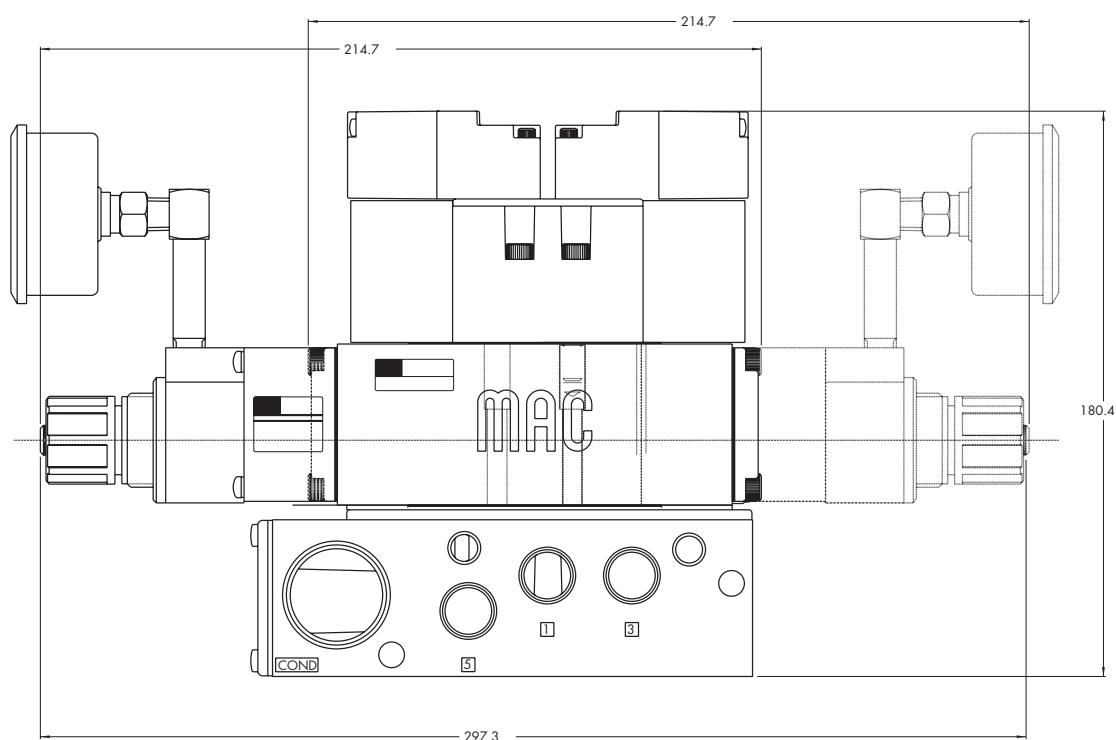
Spare parts : • Pressure regulator (less sandwich block) : PRP1A-JOKA (knob), PRP1A-COKA (slotted stem)
PRP1A-MOKA (slotted stem with locknut)

Regulating range options : PRP1A-XXXA

Replace by B	- 0 to 80 PSI
Replace by C	- 0 to 30 PSI
Replace by D	- 0 to 120 PSI on "14" end - 0 to 80 PSI on "12" end
Replace by E	- 0 to 120 PSI on "12" end - 0 to 80 PSI on "14" end
Replace by F	- 0 to 120 PSI on "14" end - 0 to 30 PSI on "12" end
Replace by G	- 0 to 120 PSI on "12" end - 0 to 30 PSI on "14" end
Replace by H	- 0 to 80 PSI on "14" end - 0 to 30 PSI on "12" end
Replace by J	- 0 to 80 PSI on "12" end - 0 to 30 PSI on "14" end

DIMENSIONS

Dimensions shown are metric (mm)



Plug-in sandwich pressure regulator with air pilot adjust

OPERATIONAL BENEFITS

1. Easy mounting: saves on installation costs in comparison with inline regulators.
2. Compact all-included units.
3. Large orifice provides high flow.
4. Various functions available.
5. Simple, reliable and solid design.



PR37A

PR42B

PR46A

PR47A

PR48B

PR92C

HOW TO ORDER

REGULATORS FOR INTERNAL PILOT

Gage	Single pressure Regulator 14 end Same regulated pressure to ports 2 and 4	Single pressure Regulator 12 end Same regulated pressure to ports 2 and 4	Dual pressure Regulator 14 end Regulated pressure to port 4 *	Dual pressure Regulator 12 end Regulated pressure to port 2 *	Dual pressure Dual regulator Two regulated pressures to ports 2 and 4 *
Gage port only	PRP1A-DAKA	PRP1A-DCKA	PRP1A-DBKA	PRP1A-DDKA	PRP1A-DEKA
Gage perpendicular to manual operator	PRP1A-DABA	PRP1A-DCBA	PRP1A-DBBA	PRP1A-DDBA	PRP1A-DECA
Gage parallel to manual operator	PRP1A-DADA	PRP1A-DCDA	PRP1A-DBDA	PRP1A-DDDA	PRP1A-DEEA

PR93A

PRA01A

PRA02A

REGULATORS FOR EXTERNAL PILOT AND REMOTE AIR

Gage	Single pressure Regulator 14 end Same regulated pressure to ports 2 and 4	Single pressure Regulator 12 end Same regulated pressure to ports 2 and 4	Dual pressure Regulator 14 end Regulated pressure to port 4 *	Dual pressure Regulator 12 end Regulated pressure to port 2 *	Dual pressure Dual regulator Two regulated pressures to ports 2 and 4 *
Gage port only	PRP1A-EAKA	PRP1A-ECKA	PRP1A-EBKA	PRP1A-EDKA	PRP1A-EEKA
Gage perpendicular to manual operator	PRP1A-EABA	PRP1A-ECBA	PRP1A-EBBA	PRP1A-EDBA	PRP1A-EECA
Gage parallel to manual operator	PRP1A-EADA	PRP1A-ECDA	PRP1A-EBDA	PRP1A-EDDA	PRP1A-EEEA

PRA1A

PRP1A

PRA2D

PRP2B

* - To be used with dual pressure valves.

Notes:

1. Valves used with above models must be external pilot models.
2. Cannot field convert regulator block from single pressure to dual pressure.
3. Cannot field convert from internal pilot to external pilot.
4. Wired for double solenoid valves.

PRA3C

PRP3B

TECHNICAL DATA

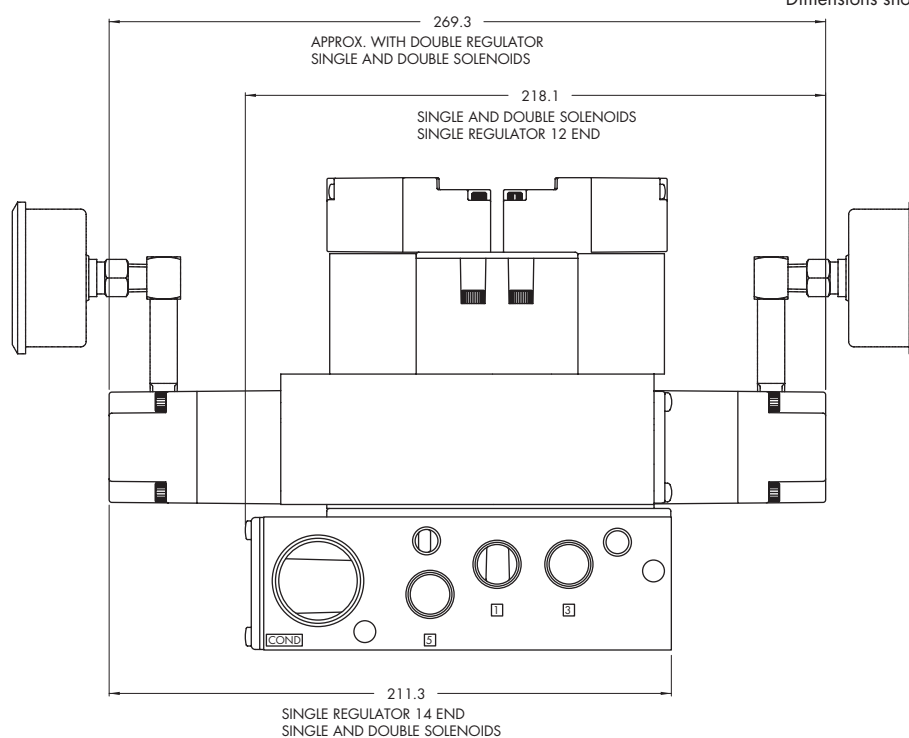
Fluid :	Compressed air, inert gases
Pressure range :	0 to 150 PSI
Regulating range :	0 to 120 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
Filtration :	40 µ
Temperature range :	0°F to 120°F (-18°C to +50°C)
Flow :	1.1 C _v

Spare parts :

- Pressure regulator (less sandwich block): PRP1A-FOKA
- Regulator block to base mounting tie rod: 19496

DIMENSIONS

Dimensions shown are metric (mm)





Codification table for voltages / Manual operator / Electrical connection

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

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.

PRECAUTIONS AND WARNINGS CONCERNING THE APPLICATION, INSTALLATION AND SERVICE OF MAC VALVES AND OTHER MAC VALVES PRODUCTS

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

WARNING :

Under no circumstances are MAC Valves products to be used in any application or in any manner where failure of the MAC Valves product to operate as intended could in any way jeopardize the safety of the operator or any other person or property.

- Do not operate outside of pressure range listed on a valve label or outside of the designated temperature range.
- Air supply must be clean and dry. Moisture or contamination can affect proper operation of the valve.
- Before attempting to repair, adjust or clean a MAC Valves product, 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 the valve.
- If air line lubrication is used do not use any lubrication other than those recommended in the catalog, parts & operation sheet or by the factory.

APPLICATION PRECAUTIONS :

INDUSTRIAL USE -

- MAC Valve products are intended for general use in industrial pneumatic and/or vacuum systems. They are general purpose industrial products with 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 Valve products 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 on 2-position, 4-way valves. 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 or this type valve should not be used.

OPERATING SPECIFICATIONS -

MAC Valves products are to be installed only on applications that meet all operating specifications described in the MAC catalog for the MAC Valves product.

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 pilot operator 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. If intentional or accidental operation of a valve by a manual operator could cause personal injury or property damage, a manual operator should not 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 PRECAUTIONS :

- Do not install any MAC Valves product without first turning off air (bleed system completely) and electricity to the machine.
- MAC Valves products should only be installed 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 graphic symbols. Do not install unless these symbols and the valve functions and operations are thoroughly understood.
- If air line lubrication is used do not use any lubrication other than those recommended in the catalog, parts & operation sheet or by the factory.

SERVICE PRECAUTIONS :

- Do not service or remove from service any MAC Valves product without first shutting off both the air and electricity to the valve and making certain no pressurized air which could present a hazard is retained in the system.
- MAC Valves products should only be serviced or removed from service by qualified, knowledgeable personnel who understand how the specific product is used and/or how the specific valve is piped and used and whether there is air retained in the connecting lines to the valve or electric power still connected to the valve.
- Before attempting to repair, adjust or clean a MAC Valves product, 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 the valve.
- MAC Valves products are never to be stepped on while working on a machine. Damage to a MAC valve, or other product or lines to the product (either air or electrical lines) or accidental activation of a manual operator on the valve could result in personal injury or property damage.



MAC Valves Product Warranty Information

MAC VALVES Warranty, Warranty Limitations, Flat Rate Rebuild Program

The MAC Valves organization has established a reputation over many years for fulfilling the needs and requirements of the users of its products. All MAC Valves are quality products specifically designed and built for long and rugged service. For this reason, MAC Valves is able to provide the Buyer a limited warranty.

WARRANTY:

MAC Valves, Inc. hereby warrants to Buyer that, for a period of 18 months from the original date of shipment of each valve from our factory ("Warranty Period"), such valve will be free from significant defects in material and workmanship and will conform to all specifications agreed to by MAC Valves, Inc.. In addition, MAC Valves, Inc. warrants that the electrical coils on such valves will be free from significant defects in material and workmanship for their normal useful life. EXCEPT FOR THESE LIMITED WARRANTIES, MAC VALVES, INC. EXPRESSLY DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES OF ANY KIND (WHETHER EXPRESS, IMPLIED OR ARISING BY OPERATION OF LAW) WITH RESPECT TO THE VALVES, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OR REPRESENTATIONS AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER MATTER. THIS SECTION SURVIVES THE EXPIRATION, TERMINATION OR CANCELLATION OF ANY AGREEMENTS BETWEEN THE PARTIES RELATING TO THE PURCHASE OF THE VALVES.

WARRANTY LIMITATIONS:

This Warranty does not apply where the valves have been (i) subjected to abuse, misuse, damage, neglect, negligence, accident, improper testing, improper installation, improper storage, improper handling, abnormal physical stress, abnormal environmental condition, or use contrary to any instructions issued by MAC Valves, Inc.; (ii) modified, reconstructed, repaired, or altered by persons other than MAC Valves, Inc. or its authorized representative; or (iii) used with any third-party product, hardware, software or other product that has not been previously approved in writing by MAC Valves, Inc. Additionally, this Warranty does not cover claims for labor, material, time or transportation, and 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.

EXCLUSIVE REMEDY:

The Buyer's sole remedy under this Warranty is limited to the replacement or rebuilding of any valve which does not conform to the warranties provided herein or, in MAC Valves, Inc.'s sole discretion, refund of the purchase price for the non-conforming valve. Buyer's remedy is conditioned on Buyer's compliance with its obligations under this Warranty. Valves that Buyer believes do not conform to this Warranty must be returned (with or without bases) transportation prepaid and received at our factory within the Warranty Period. If MAC Valves, Inc. determines that the valve is non-conforming and is otherwise covered by this Warranty, the rebuilt or replaced valve will be returned to the customer at the expense of MAC Valves, Inc., and will carry the same warranties as provided under the Flat Rate Rebuild Program described below. MAC VALVES, INC. WILL NOT BE RESPONSIBLE FOR ANY INCIDENTAL, SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION DIRECT AND INDIRECT LOST PROFITS, REGARDLESS OF WHETHER THOSE DAMAGES WERE FORESEEABLE.

THE FLAT REBUILD PROGRAM:

Valves no longer covered by the MAC Warranty may be eligible for a one-time rebuild under the MAC Valves, Inc. Flat Rate Rebuild Program. Our constant research and testing program is dedicated to extending the life of our valves and maximizing their reliability under the most adverse conditions. Valves returned under this limited program are completely disassembled, inspected, rebuilt to current operating standards whenever possible, tested and returned within a few weeks for a nominal flat rate charge. All rebuilt valves carry the same warranty described (in our MAC Warranty) for new valves for a warranty period of 90 days from the date of shipment from our factory.

Valves that have gone through the one-time rebuild will have been marked with a letter "R" as part of the date stamp (This is an example of a rebuild date stamp from this month E(May)17(Year)Tester Symbol R(Indicates Rebuild)).



Please note that any valves sent back for subsequent rebuild that have already been through the program previously (indicated by the "R") will not be eligible for additional rebuild.