

Алматы (7273)495-231  
Ангарск (3955)60-70-56  
Архангельск (8182)63-90-72  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Благовещенск (4162)22-76-07  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
Владикавказ (8672)28-90-48  
Владимир (4922)49-43-18  
Волгоград (844)278-03-48  
Волгодга (8172)26-41-59  
Воронеж (473)204-51-73  
Екатеринбург (343)384-55-89

Иваново (4932)77-34-06  
Ижевск (3412)26-03-58  
Иркутск (395)279-98-46  
Казань (843)206-01-48  
Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
Коломна (4966)23-41-49  
Кострома (4942)77-07-48  
Краснодар (861)203-40-90  
Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Курган (3522)50-90-47  
Липецк (4742)52-20-81

Магнитогорск (3519)55-03-13  
Москва (495)268-04-70  
Мурманск (8152)59-64-93  
Набережные Челны (8552)20-53-41  
Нижний Новгород (831)429-08-12  
Новокузнецк (3843)20-46-81  
Новыйбурск (3496)41-32-12  
Новосибирск (383)227-86-73  
Омск (3812)21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
Пенза (8412)22-31-16  
Петрозаводск (8142)55-98-37  
Псков (8112)59-10-37  
Пермь (342)205-81-47

Ростов-на-Дону (863)308-18-15  
Рязань (4912)46-61-64  
Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78  
Севастополь (8692)22-31-93  
Саранск (8342)22-96-24  
Симферополь (3652)67-13-56  
Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Сургут (3462)77-98-35  
Сыктывкар (8212)25-95-17  
Тамбов (4752)50-40-97  
Тверь (4822)63-31-35

Тольятти (8482)63-91-07  
Томск (3822)98-41-53  
Тула (4872)33-79-87  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Улан-Удэ (3012)59-97-51  
Уфа (347)229-48-12  
Хабаровск (4212)92-98-04  
Чебоксары (8352)28-53-07  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Чита (3022)38-34-83  
Якутск (4112)23-90-97  
Ярославль (4852)69-52-93

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Киргизия +996(312)96-26-47

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V A L V E S

NEW Technology





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MAC VALVES INC. has earned a reputation as an innovator in solenoid air valve technology as is evidenced by our numerous global patents.

MAC's designs focus on offering customers the best performing products available on the market. Some of the key features MAC's products offer are:

- reliability
- speed
- repeatability
- non lube service
- ease of maintenance
- compact packaging
- modularity
- specific application modifications
- low wattage
- broad electrical options

Many of these performance advantages are based on MAC's high shifting forces. MAC's patented oval shaped armature solenoid and 4-way pilot technologies are two new concepts which result in extremely high shifting forces in small packages.

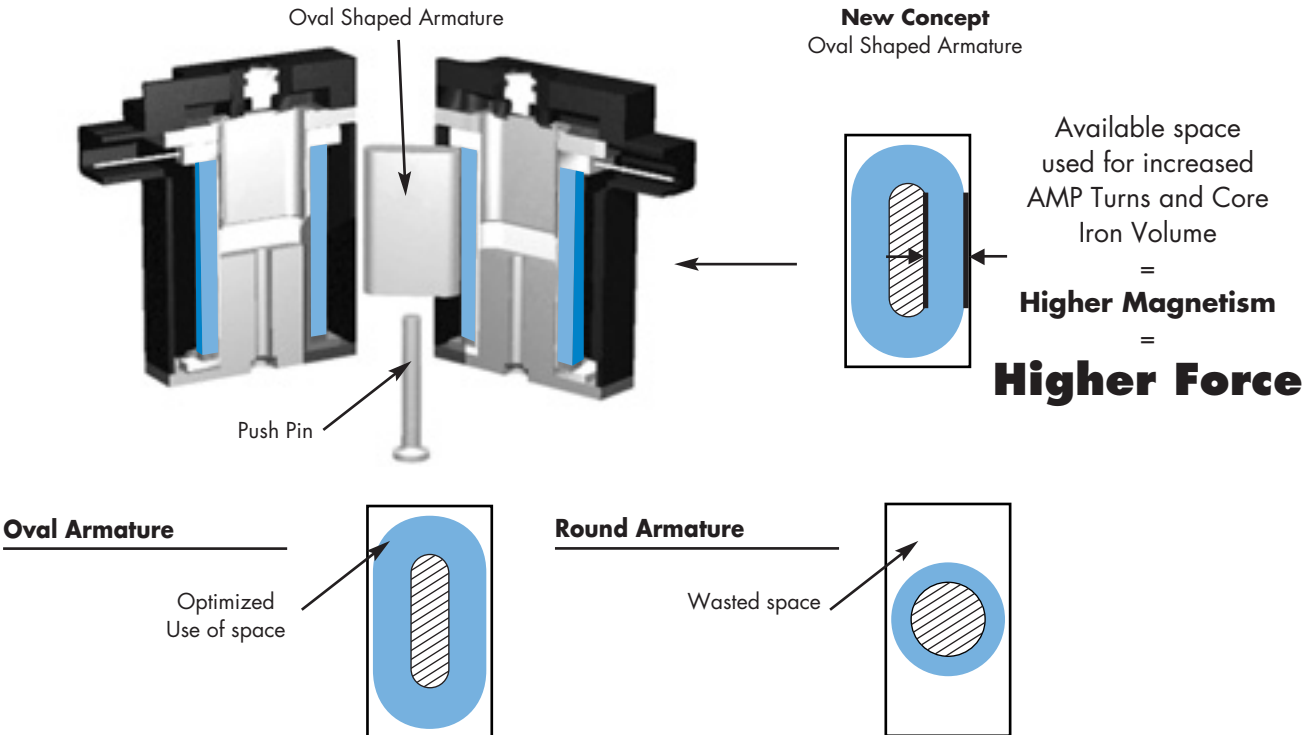
The patented Latching Solenoid is another new offering to the MAC product line. The latching solenoid provides the function of a double solenoid operated valve utilizing only one solenoid.

## I. OVAL SHAPED ARMATURE SOLENOID – Maximized Shifting Forces

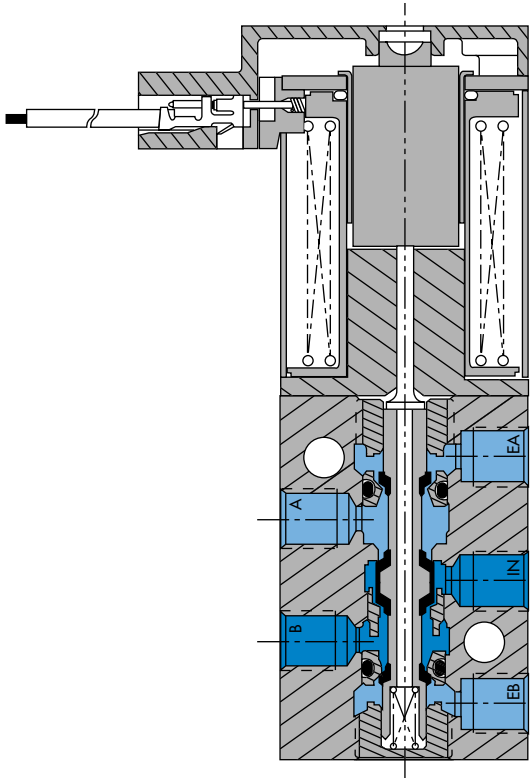
Compared with typical round armature solenoids, the oval shaped armature design results in much higher shifting forces due to the following:

- Increased coil windings (amp turns)
- Increased core iron volume

With more amp turns and core iron than conventional round armature designs, more shifting force is available to shift through contaminated air resulting in reliable shifting valves.



## DIRECT SOLENOID POPPET VALVE



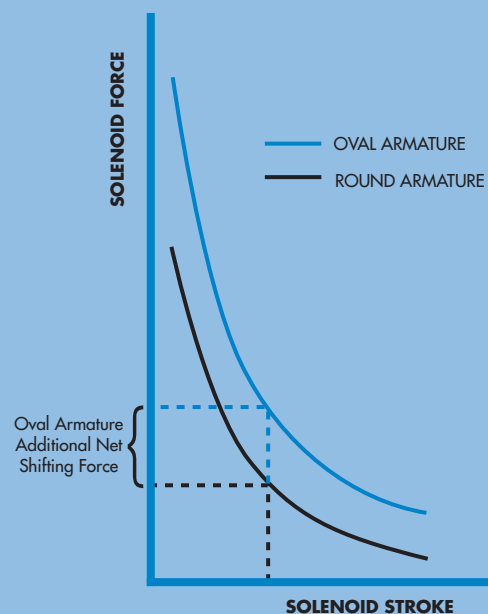
## SHORT STROKE

- Short Stroke = High solenoid force
- Short Stroke = High return spring force
- Short Stroke = Low current to shift solenoid

## DIRECT OPERATED 10 MM DESIGN WITH OVAL SHAPED ARMATURE

- Balanced poppet, with no seals of any kind in a bore - **no friction**
- New patented MAC solenoid® with "oval" shaped armature - provides **high shifting force** through more core iron and magnet wire
- Balanced poppet - **high shifting forces** - unaffected by fluctuations in air pressure
- Short stroke direct operated poppet valve (patented adjustable inlet seat controls stroke) - **high shifting force** - without small piston and no minimum operating pressure
- Large orifice "0.0024 in<sup>2</sup>" minimum - **resists clogging**
- Strong return spring - **high shifting force** - even at low pressure
- Few parts - **simple design**
- Patented conical shaped exhaust seats act as cushions - **eliminates cutting - long life**
- Every valve calibrated for flow for a given coil wattage - **consistent flow**

## solenoid force curve

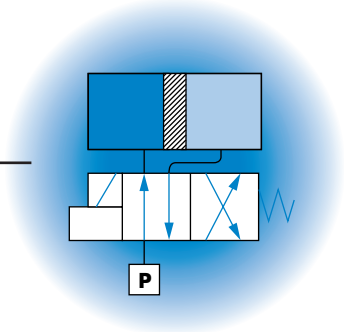
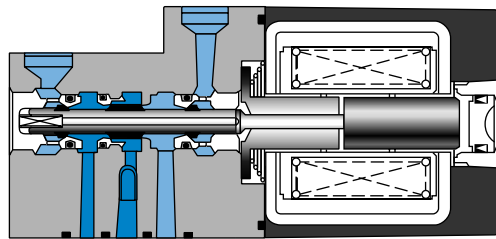




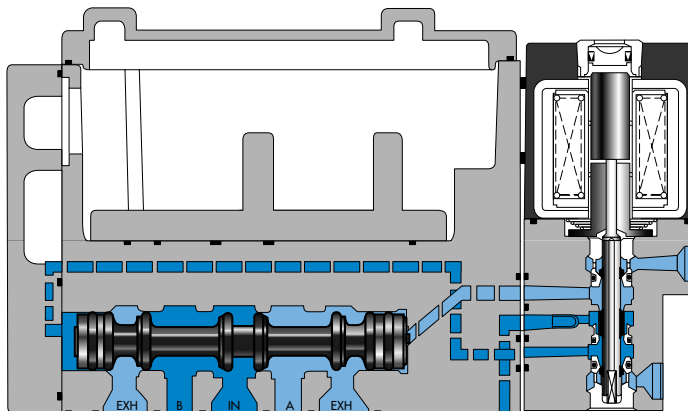
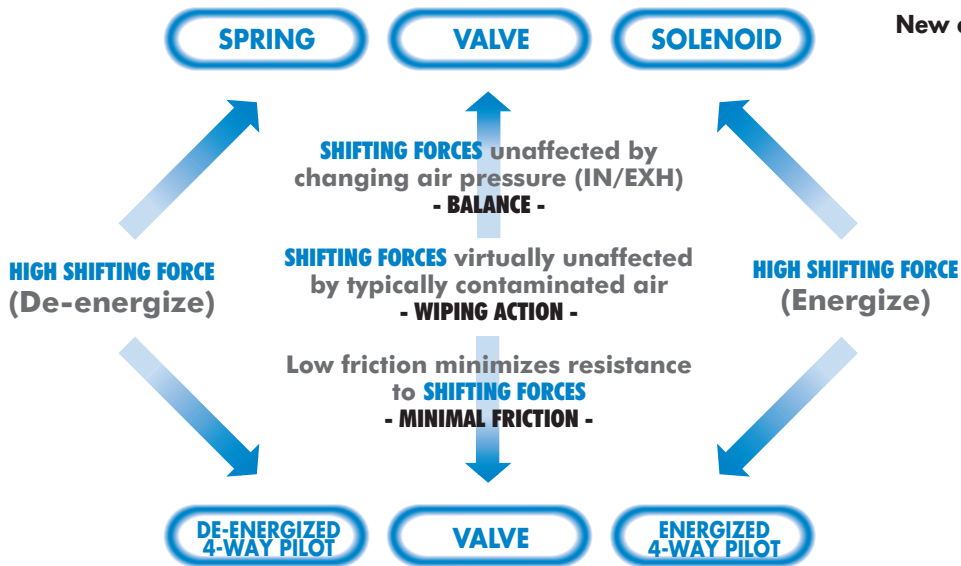
## II. MAC's 4-WAY PILOT SYSTEM – Maximized Shifting Forces

The balanced 4-way pilot valve provides maximum shifting forces in both directions by supplying air alternately to each end section of the spool, similar to double acting rodless cylinder. This system provides maximized shifting forces, equal forces at energization and de-energization, with no resistance to shifting at either end. The result is increased shifting reliability and faster, more consistent response times.

Small direct 4-way solenoid operated valve



New concept : 4-way pilot



Solenoid pilot operated large valve

*Valves that don't stick*



ACT LOCAL

## MAC DISTRIBUTORS NETWORK

- 30 years experience
- Local support
- Globally linked network
- Special solutions
- Global customer partnership



○ **45 countries**

○ **3500 employees**

○ **200 service centers**

○ **\$ 50 million inventory**

○ **1000 factory certified application specialists**

KEEPING YOUR MACHINES RUNNING AROUND THE CLOCK AROUND THE WORLD

Let us show you via high performance demonstration kits and animated software,  
**HOW MAC'S PERFORMANCE ADVANTAGES HELP MAKE YOUR EQUIPMENT MORE RELIABLE - FASTER - MORE REPEATABLE.**



### TLD

Traveling Lab Demonstration measures critical valve performance characteristics - *Shifting forces, Response Time, Speed, Repeatability and Flow.*



### PLD

Proportional Lab Demonstration measures critical proportional regulation characteristics - *Response Time, Accuracy, Hysteresis, Repeatability and Flow.*



### Animation

Animated Software shows inner workings of various Air Valves Designs - *Powerful educational tool for learning about how air valves function.*

#### Other MAC VALVE literature:

DESCRIPTION	CATALOG NUMBER
CURRENT TECHNOLOGY	999CTCB
BUILDING BLOCKS BROCHURE	999ADVB
CIRCUIT BAR CATALOG	999CBCA
PROPORTIONAL VALVE CATALOG	999PPCB
CATALOG CD	999CCDB
SERIAL INTERFACE PRODUCTS	9999SI
MACONNECT SYSTEM	CONSULT FACTORY



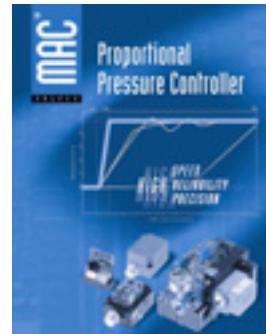
999CTCB



999ADVB



999CBCA



999PPCB



**Pneumatic functions**

All valves inside the MAC product range allow for multiple pneumatic functions.  
 Direct solenoid and solenoid pilot operated valves could be used as 2 ways, 3 ways (NO, NC) or 4 ways.  
 When plugging one orifice to achieve a 2 way function (or 3 way), it will not affect the valve operation.

- Direct solenoid valves 3 ways : universal  
 The following functions are available

- 3 ways NC
- 3 ways NO
- 2 ways NC
- 2 ways NO
- Selector
- Divertor

- Direct solenoid valves 4 ways :
- The following functions are available

- 4 ways
- 3 ways NC
- 3 ways NO
- 2 ways NC
- 2 ways NO
- Divertor

- Pilot operated valves 3 ways :
- The following functions are available

- 3 ways NC
- 3 ways NO
- 2 ways NC
- 2 ways NO
- Selector : the highest pressure is connected to the IN port; the lowest pressure is connected to the EXH port. (Use external pilot when the highest pressure is less than 25 PSI)
- Divertor (consult factory)

- Pilot operated valves 4 & 5 ways :
- The following functions are available

- 4 or 5 ways
- 3 ways NC
- 3 ways NO
- 2 ways NC
- 2 ways NO
- Selector (except 3 positions)
- Divertor (consult factory).

**EVERY VALVE FULLY TESTED PRIOR TO SHIPMENT**



## Section 1

# Direct solenoid and solenoid pilot operated valves

---



Function	Port size	Flow (Max) Cv	Individual mounting							
			Inline	Sub-base non "plug-in"	Sub-base "plug-in"	Sub-base/manifold base non "plug-in" with latching solenoid	Sub-base/manifold base "plug-in" with latching solenoid	Valve only - No base non "plug-in" Conform to ISO 5599/1	Valve only - No base "plug-in" Conform to ISO 5599/2	Valve only - No base non "plug-in" Conform to ISO 15407/1
<b>3/2</b>	<b>M3</b>	<b>0.082</b>	P. 15							
<b>3/2 - 2/2</b>	<b>M5 - #10-32</b>	<b>0.12</b>	P. 19							
<b>3/2</b>	<b>1/8"</b>	<b>0.3</b>	P. 23							
<b>3/2</b>	<b>1/8" - #10-32</b>	<b>0.3</b>								
<b>3/2</b>	<b>1/8" - 5/32</b> <small>O.D. pressed-in tube receptacle</small>	<b>0.3</b>								
<b>3/2</b>	<b>1/8"</b>	<b>0.4</b>		P. 33						
<b>3/2</b>	<b>#10-32 - 1/4"</b> <small>O.D. tube receptacle</small>	<b>0.4</b>			P. 35	P. 41	P. 43			
<b>3/2</b>	<b>1/8" - 1/4"</b>	<b>0.5</b>	P. 47	P. 49						
<b>3/2</b>	<b>1/8" - 1/4"</b> <small>O.D. tube receptacle</small>	<b>1.2</b>		P. 53	P. 55	P. 59	P. 61			
<b>3/2 - 2/2</b>	<b>1/8" - 1/4"</b>	<b>1.5</b>	P. 65							
<b>3/2 - 2/2</b>	<b>3/4" - 1"</b>	<b>20.0</b>	P. 69							
<b>3/2 - 2/2</b>	<b>1 1/2" - 2" - 2 1/2"</b>	<b>60.0</b>	P. 73							
<b>5/2</b>	<b>M5 - #10-32</b>	<b>0.1</b>	P. 77							
<b>4/2</b>	<b>1/8" - #10-32</b>	<b>0.3</b>	P. 81							
<b>4/2</b>	<b>1/8" - 5/32</b> <small>O.D. pressed-in tube receptacle</small>	<b>0.3</b>								
<b>5/2 - 5/3</b>	<b>#10-32 - 1/4"</b> <small>O.D. tube receptacle</small>	<b>0.4</b>		P. 95	P. 97					
<b>5/2</b>	<b>#10-32 - 1/4"</b> <small>O.D. tube receptacle</small>	<b>0.4</b>				P. 103	P. 105			
<b>5/2</b>	<b>1/8" - 1/4"</b>	<b>0.5</b>	P. 111	P. 113						
<b>5/2</b>	<b>1/8"</b>	<b>1.0</b>	P. 121							
<b>5/2 - 5/3</b>	<b>1/8"</b>	<b>1.1</b>		P. 125	P. 127					
<b>5/2</b>	<b>1/8"</b>	<b>1.1</b>				P. 133	P. 135			
<b>5/2 - 5/3</b>	<b>1/8" - 1/4"</b>	<b>1.0</b>	P. 141	P. 143						
<b>5/2 - 5/3</b>	<b>1/8" - 1/4" - 3/8"</b>	<b>1.2</b>		P. 147	P. 149					
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.2</b>								
<b>5/2 - 5/3</b>	<b>3/8" - 1/2"</b>	<b>3.8</b>	P. 159							
<b>5/2 - 5/3</b>	<b>1/4" - 3/8" - 1/2"</b>	<b>3.4</b>		P. 161	P. 163					
<b>5/2 - 5/3</b>	<b>1/4"</b>	<b>1.0</b>								P. 173
<b>5/2 - 5/3</b>	<b>1/8"</b>	<b>0.43</b>								P. 177
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.8</b>						P. 181	P. 165	
<b>5/2 - 5/3</b>	<b>3/8" - 1/2"</b>	<b>3.0</b>						P. 187	P. 189	
<b>5/2 - 5/3</b>	<b>1/2" - 3/4"</b>	<b>6.1</b>						P. 193	P. 195	



Manifold mounting

Series

stacking	Manifold base non "plug-in"	Manifold base "plug-in"	Manifold base "plug-in" with pressure regulators	Manifold base "plug-in" with flow controls	Manifold base "plug-in" with PR & FC	Sub-base/ manifold base non "plug-in" with latching solenoid	Sub-base/ manifold base "plug-in" with latching solenoid	Valve only - No base non "plug-in" Conform to ISO 5599/1	Valve only - No base "plug-in" Conform to ISO 5599/2	Valve only - No base non "plug-in" Conform to ISO 15407/1
P. 25		P. 27	P. 29							
	P. 37	P. 39				P. 41	P. 43			
	P. 57	P. 55				P. 59	P. 61			
P. 83		P. 85	P. 87	P. 89	P. 91					
	P. 99	P. 101								
						P. 103	P. 105			
P. 115		P. 117								
	P. 129	P. 131								
						P. 133	P. 135			
	P. 151	P. 153								
	P. 165	P. 167								
										P.173
										P.177
								P. 181	P. 183	
								P. 187	P. 189	
								P. 193	P. 195	

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48P
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400
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ISO 01
ISO 02
ISO 1
ISO 2
ISO 3

Direct solenoid and solenoid pilot operated valves  
8 mm valve

Individual mounting

Series

Inline

**33**

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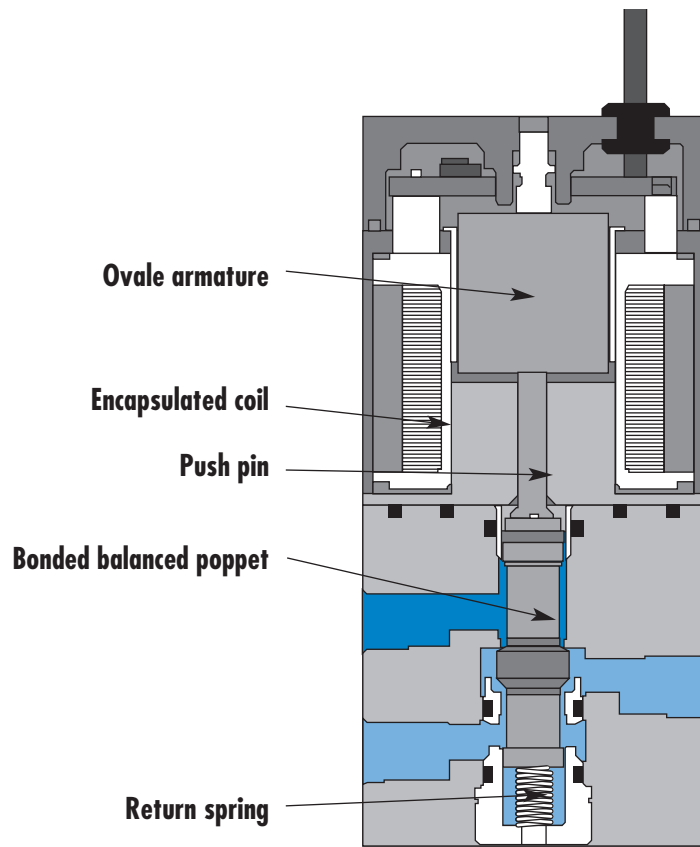
48P

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**SERIES FEATURES**

- Patented high force MACSOLENOID® for fastest possible response times.
- Bonded balanced poppet for high flow, precise repeatability, and consistent operation.
- Extremely high cycle rate capability.
- Use on lube or non-lube service.
- Low wattage DC solenoids-down to 0.5 W.
- 8 mm direct operated valve.
- Very fast response times.

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



# Direct solenoid and solenoid pilot operated valves

## 8 mm valve

Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NC</b>	<b>M3</b>	<b>0.082 C<sub>v</sub></b>	Inline	

### OPERATIONAL BENEFITS

1. 8mm valve direct solenoid operated.
2. Balanced poppet, immune to pressure variations.
3. Short stroke with high flow.
4. Patented solenoid develops high shifting forces.
5. Low wattage solenoids.
6. Powerful return spring.
7. Extremely fast response times.

Patents and patents pending



### HOW TO ORDER

Port size	N.C. Only	N.C. Only **
<b>M3</b>	33A-AAB-Rxxx-xxx	33A-BAB-Rxxx-xxx

\*\* For use with solenoids above 4.0 W - MOD number required. (Consult factory)

### SOLENOID OPERATOR >

R **XXX-XXX**

XX	Voltage	X	Lead wire length	X	Manual operator	XX	Electrical connection
DA	24 VDC (0.5W)	0	No Lead wire*	0	No manual operator	BA	Flying leads
DB	24 VDC (1.0W)	A	18"	1	Non-locking recessed	BB	Flying leads w/LED
DC	24 VDC (1.8W)	B	24"	3	Non-locking extended	BC	Flying leads w/MOV
DF	24 VDC (4.0W)	C	36"			BD	Flying leads w/LED & MOV
DG	12 VDC (0.5W)	D	48"				
DH	12 VDC (1.0W)	E	72"			RA	Mini JAC Solenoid plug-in
DJ	12 VDC (1.8W)					RB	Mini JAC Solenoid plug-in w/LED
DM	12 VDC (4.0W)					RC	Mini JAC Solenoid plug-in w/MOV
						RD	Mini JAC Solenoid plug-in w/LED & MOV
						TA	JST Solenoid plug-in
						TB	JST Solenoid plug-in w/LED
						TC	JST Solenoid plug-in w/MOV
						TD	JST Solenoid plug-in w/LED & MOV

\* Other options available, see page 321.

Washdown capability is possible for the "B" and "R" type electrical connectors. Consult factory for ordering information.

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- 400
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- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

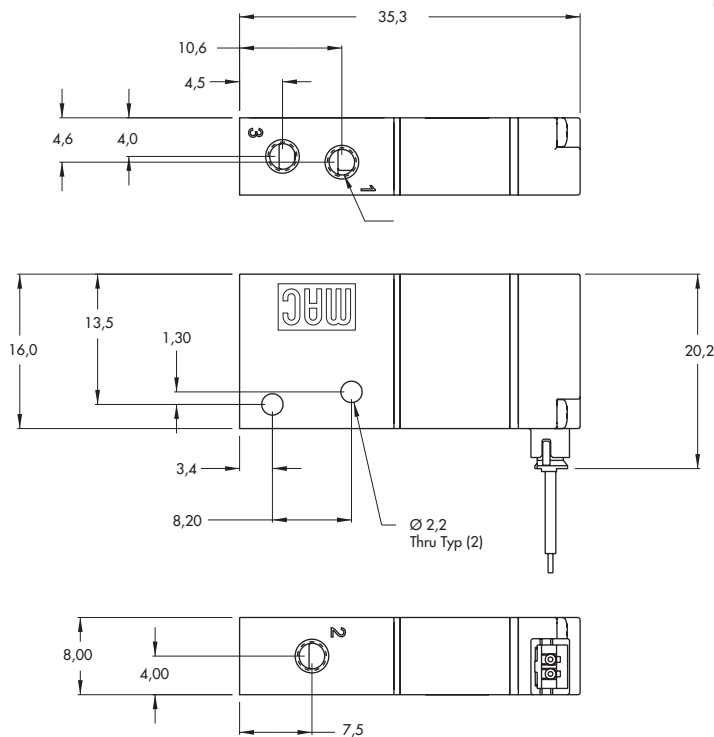
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	4W: (Cv .082) - 3W: (Cv .062) - 2.5W: (Cv .062) - 1.8W: (Cv .055) - 1.0W: (Cv .030) - 0.5W: (Cv .020)
<b>Coil :</b>	Class A wire (#26 AWG x18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	4.0W - 3.0W - 2.5W - 1.8W - 1.0W - 0.5W

**DIMENSIONS**

Dimensions shown are metric (mm)

Shown with JST Connector



Individual mounting

Series

Inline

33

**34**

36

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48P

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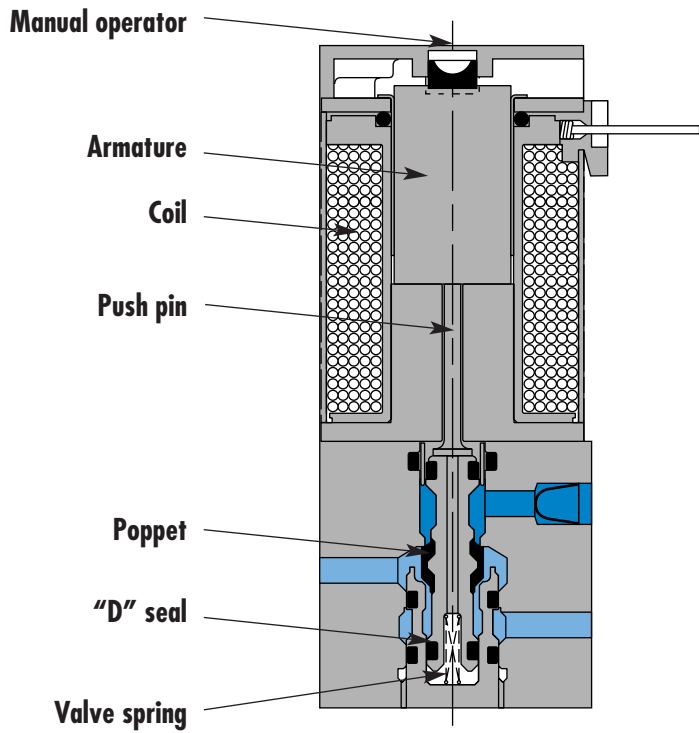
ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



**SERIES FEATURES**

- High force MACSOLENOID®.
- Universal porting.
- # 10-32 or M5 ports.
- Rated for lubricated or non-lubricated service.
- 10 mm direct operated.



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>M5, # 10-32</b>	<b>0.12 C<sub>v</sub></b>	Inline	

### OPERATIONAL BENEFITS

1. 10 mm valve, direct solenoid operated.
2. Balanced poppet, immune to variations of pressure.
3. Short stroke with high flow.
4. Patented solenoid develops high shifting forces.
5. Powerful return spring.
6. Manual operator standard on all valves.



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ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

### HOW TO ORDER

Port size	Universal valve	NC only valve
<b>M5</b>	34C-ABA-G <b>XXX-XXX</b>	34C-ABB-G <b>XXX-XXX</b>
<b># 10-32</b>	34C-AAA-G <b>XXX-XXX</b>	34C-AAB-G <b>XXX-XXX</b>

### SOLENOID OPERATOR >

G **XXX-XXX**\*

XX	Voltage	X	Wire length	X	Manual operator	XX	Electrical connection
AA	120 VAC (2.5W)	A	18"	1	Non-locking recessed	BA	Flying leads
DC	24 VDC (1.8W)	B	24"	3	Non-locking extended	BT	Flying leads with light
DD	24 VDC (2.5W)	C	36"			GA	MAC JAC Solenoid plug-in w/Diode
DF	24 VDC (4.0W)					GB	MAC JAC Solenoid plug-in w/Diode
						GC	MAC JAC Solenoid plug-in w/MOV
						GD	MAC JAC Solenoid plug-in w/LED
						GE	MAC JAC Solenoid plug-in w/Diode & LED
						GF	MAC JAC Solenoid plug-in w/MOV & LED
						GG	MAC JAC Solenoid plug-in w/Rectifier
						GH	MAC JAC Solenoid plug-in w/Rectifier & LED
						KA	Plug-in wire assembly
						KC	Plug-in wire assembly with rectifier and light
						KT	Plug-in wire assembly with light

Note : AC voltage requires connector with rectifier.

\* Other options available, see page 311.

Washdown capability is possible for the "G" type electrical connectors. Consult factory for ordering information.

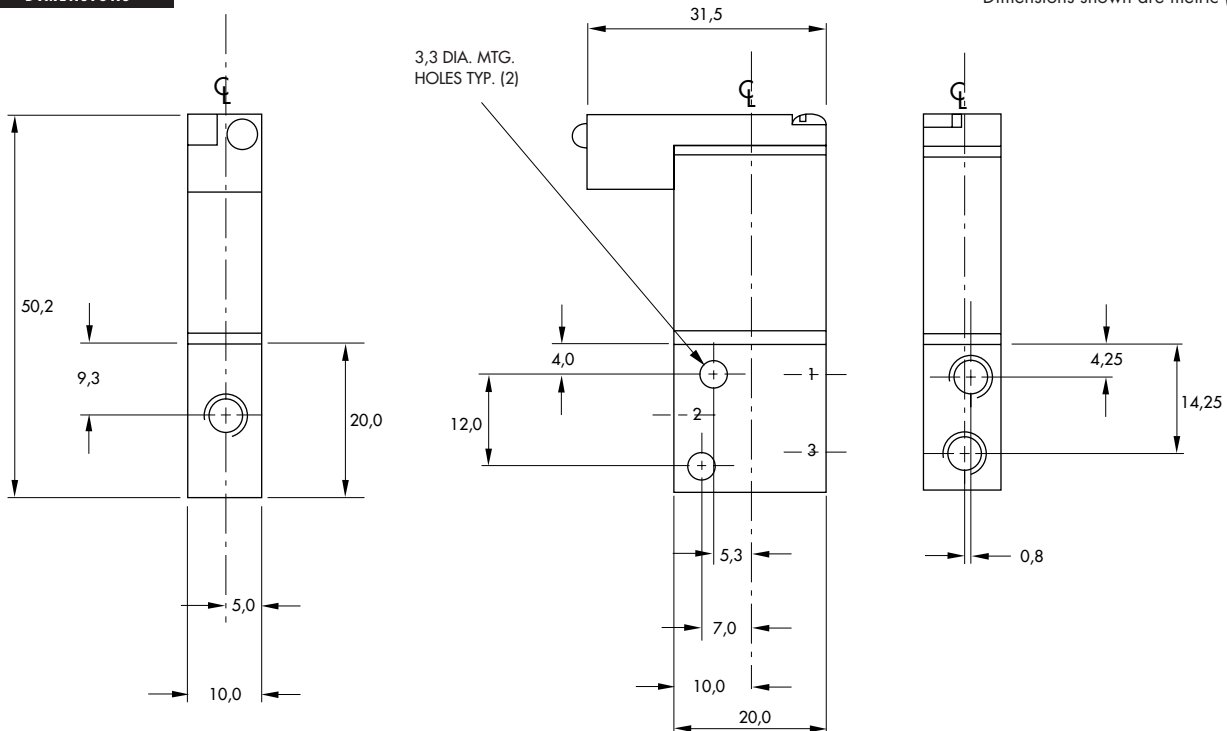


**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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>	4 W : (0.12 C <sub>v</sub> ) – 2.5 W : (0.10 C <sub>v</sub> ) – 1.8 W : (0.06 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	4 W – 2.5 W – 1.8 W
<b>Response times :</b> (with 4 W coil)	Energize : 3.4 ms De-energize : 1.5 ms

**DIMENSIONS**

Dimensions shown are metric (mm)



Individual mounting

Inline
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Manifold mounting

Stacking	Manifold base "plug-in"	Manifold base "plug-in" with pressure regulators
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Series

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**36**

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48P

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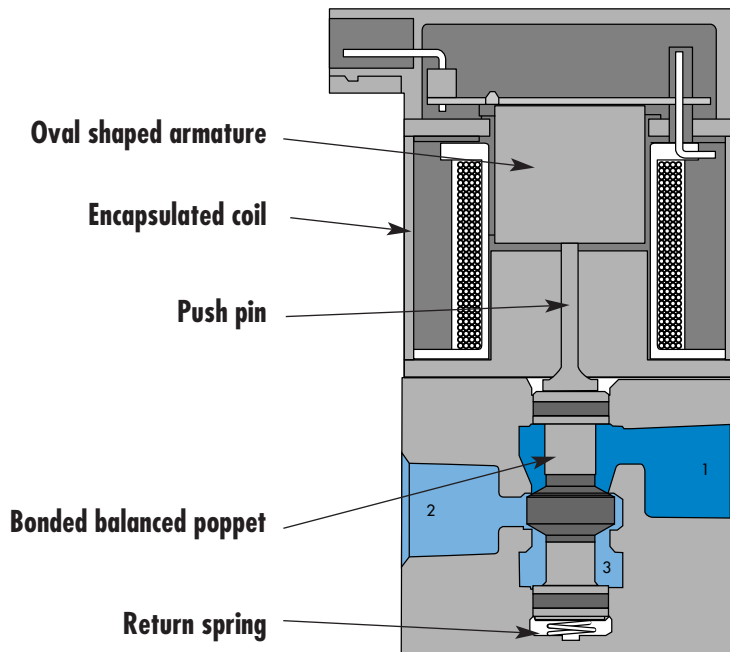
ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



**SERIES FEATURES**

- Patented high force MACSOLENOID® for fastest possible response times.
- Bonded balanced poppet for high flow, precise repeatability, and consistent operation.
- Balanced poppet permits versatility in function — may be used as 3-way or 2-way normally open or normally closed and may be used for vacuum, divertor, or selector applications.
- Extremely high cycle rate capability.
- Use on lube or non-lube service.
- Manual overrides as standard.
- Various solenoid enclosures and plug-in connectors.
- Optional surge suppression available.
- Low wattage DC solenoids — down to 1.8 watts.
- Rectified AC voltage.

Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2</b>	<b>1/8"</b>	<b>0.3 C<sub>v</sub></b>	Inline	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Patented solenoid develops high shifting forces.
3. Short stroke with high flow.
4. Higher forces result in lower wattages for given flow.
5. Powerful return spring.



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ISO 01

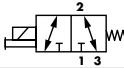
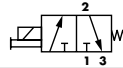
ISO 02

ISO 1

ISO 2

ISO 3

**HOW TO ORDER**

Port size	Universal valve	NC only valve
		
<b>1/8" NPTF</b>	36A-AAA-J <b>XXX-XXX</b>	36A-AAB-J <b>XXX-XXX</b>

SOLENOID OPERATOR ▶

J **XXX-XXX\*** (-G) Add "G" for ground

XX	Voltage	X	Lead wire length	X	Manual operator	XX	Electrical connection
AA	120 VAC (5.4W)	A	18"	1	Non-locking recessed	BA	Flying leads
DA	24 VDC (5.4W)	B	24"	2	Locking recessed	GA	MAC JAC solenoid plug-in
DB	12 VDC (5.4W)	C	36"			GB	MAC JAC solenoid plug-in with diode
DC	24 VDC (2.4W)					GD	MAC JAC solenoid plug-in with light
DD	12 VDC (2.4W)					GG	MAC JAC solenoid plug-in with rectifier

\* Other options available, see page 317.

Note : - AC voltage requires connector with rectifier.

- With the MAC JAC, washdown capability is possible. Consult factory for washdown modification number.

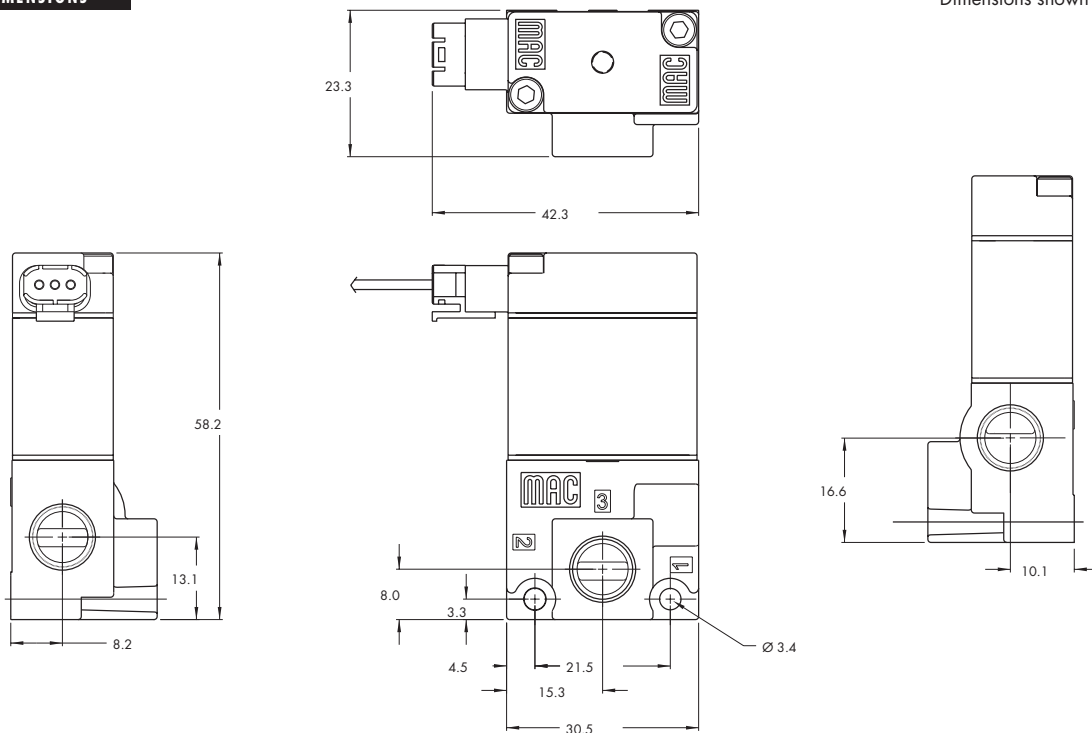
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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>	1.8 Watt: (0.15 C <sub>v</sub> ), 2.4 Watt: (0.15 C <sub>v</sub> ), 5.4 Watt: (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 12), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	5.4 W – 2.4 W – 1.8 W

Option : • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)





# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2</b>	<b>1/8" - # 10-32</b>	<b>0.3 C<sub>v</sub></b>	Stacking	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Patented solenoid develops high shifting forces.
3. Short stroke with high flow.
4. Higher forces result in lower wattages for given flow.
5. Powerful return spring.



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### HOW TO ORDER

Port size	NC only stacking	NC stacking Universal poppet	NO stacking Universal poppet
<b>1/8" NPTF</b>	36A-SAB-J <b>XXX-XXX</b>	36A-SAC-J <b>XXX-XXX</b>	36A-SAD-J <b>XXX-XXX</b>
<b># 10-32</b>	36A-SBB-J <b>XXX-XXX</b>	36A-SBC-J <b>XXX-XXX</b>	36A-SBD-J <b>XXX-XXX</b>

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### SOLENOID OPERATOR >

J **XXX-XXX\*** (-G) Add "G" for ground

XX	Voltage	X	Lead wire length	X	Manual operator	XX	Electrical connection
AA	120 VAC (5.4W)	A	18"	1	Non-locking recessed	BA	Flying leads
DA	24 VDC (5.4W)	B	24"	2	Locking recessed	GA	MAC JAC solenoid plug-in
DB	12 VDC (5.4W)	C	36"			GB	MAC JAC solenoid plug-in with diode
DC	24 VDC (2.4W)					GD	MAC JAC solenoid plug-in with light
DD	12 VDC (2.4W)					GG	MAC JAC solenoid plug-in with rectifier

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\* Other options available, see page 317.

Note : - AC voltage requires connector with rectifier.

- With the MAC JAC, washdown capability is possible. Consult factory for washdown modification number.

End plate kit required (port size 1/4") : M-36001-01.

93

### BODY TYPE OPTIONS

36A-SAB-J**xxx-xxx**

- S Stacking body
- T Stacking body with bottom inlet

ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

**TECHNICAL DATA**

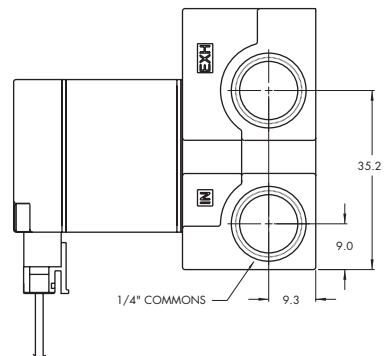
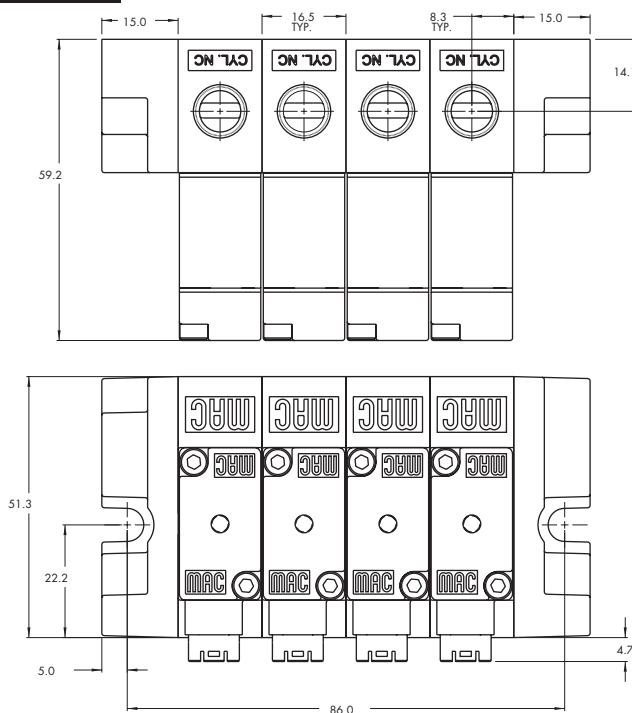
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	1.8 Watt: (0.15 C <sub>v</sub> ), 2.4 Watt: (0.15 C <sub>v</sub> ), 5.4 Watt: (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 12), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	5.4 W – 2.4 W – 1.8 W

- Option : • BSPP threads
- Spare parts : • Inlet & exhaust isolator plate : N-36001 • Inlet isolator : N-36002  
• Exhaust isolator : N-36003 • Tie rod (x2) : 79411

**DIMENSIONS**

Dimensions shown are metric (mm)

Note: Isolator adds 2.5 mm to length of stack.

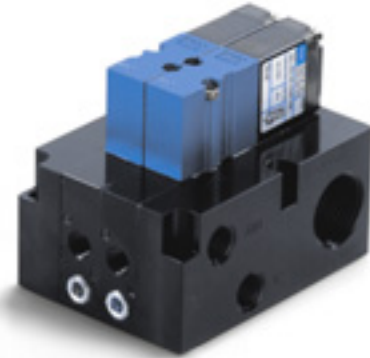




Function	Port size	Flow [Max]	Individual mounting	Series
3/2	1/8" - 5/32 Pressed-in tube receptacle	0.3 C <sub>v</sub>	Manifold base "plug-in"	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Patented solenoid develops high shifting forces.
3. Short stroke with high flow.
4. Higher forces result in lower wattages for given flow.
5. Powerful return spring.



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ISO 01

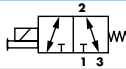
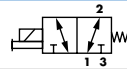
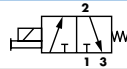
ISO 02

ISO 1

ISO 2

ISO 3

**HOW TO ORDER**

Port size	Universal Valve Normally Closed	Universal Valve Normally Open	Normally Closed Only
			
<b>Valve less base</b>	36A-J00-00-J <b>XX</b> P- <b>XXX</b>	36A-K00-00-J <b>XX</b> P- <b>XXX</b>	36A-L00-00-J <b>XX</b> P- <b>XXX</b>
<b>1/8" NPTF</b>	36A-JSA-AE-J <b>XX</b> P- <b>XXX</b>	36A-KSA-AF-J <b>XX</b> P- <b>XXX</b>	36A-LSA-AE-J <b>XX</b> P- <b>XXX</b>
<b>5/32 tube receptacle</b>	36A-JSF-AE-J <b>XX</b> P- <b>XXX</b>	36A-KSF-AF-J <b>XX</b> P- <b>XXX</b>	36A-LSF-AE-J <b>XX</b> P- <b>XXX</b>

SOLENOID OPERATOR >

J **XX** P-**XXX**\* (-G) Add "G" for ground

XX Voltage	X Manual operator	XX Electrical connection
<b>AA</b> 120 VAC (5.4W)	<b>1</b> Non-locking recessed	<b>FA</b> Base plug-in
<b>DA</b> 24 VDC (5.4W)	<b>2</b> Locking recessed	<b>FB</b> Base plug-in with diode
<b>DB</b> 12 VDC (5.4W)		<b>FG</b> Base plug-in with rectifier
<b>DC</b> 24 VDC (2.4W)		
<b>DD</b> 12 VDC (2.4W)		

\* Other options available, see page 317.

Note : AC voltage requires connector with rectifier.

Example : Manifold base only : 36A-0SA-AE (Normally closed manifold base).

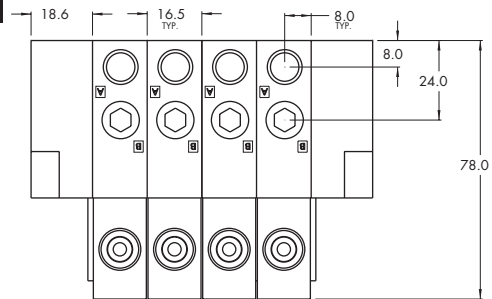
End plate kit required (port size 1/4") : M-46003-01.

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	1.8W : (0.20 C <sub>v</sub> ) – 2.4W : (0.20 C <sub>v</sub> ) – 5.4W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult Factory
<b>Power :</b>	5.4 W – 2.4 W – 1.8 W

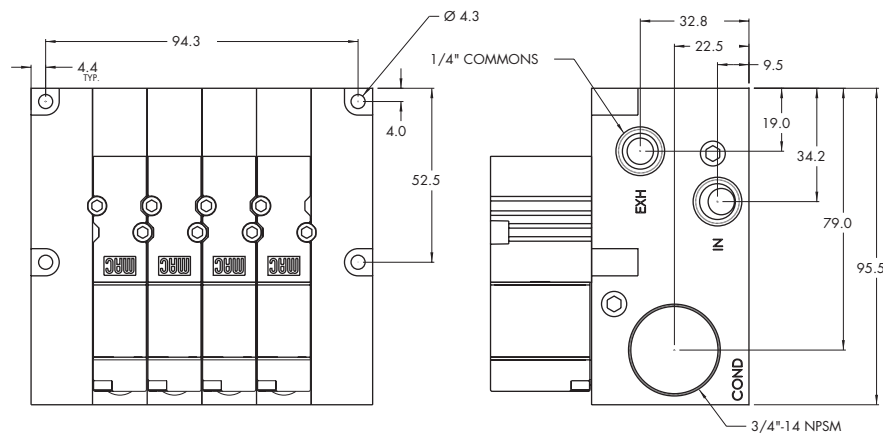
- Option :
  - BSPP threads
- Spare parts :
  - Inlet isolator : 28501 • Exhaust isolator : 28502 • Valve cover plate : M-46002
  - Tie rod (x2) : 79443

**DIMENSIONS**



Dimensions shown are metric (mm)

Note: For Normally closed manifold the "A" port is plugged.  
For Normally open manifold the "B" port is plugged.



Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2</b>	<b>1/8" - 5/32 Pressed-in tube receptacle</b>	<b>0.3 C<sub>v</sub></b>	Manifold base "plug-in" with pressure regulators	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Patented solenoid develops high shifting forces.
3. Short stroke with high flow.
4. Higher forces result in lower wattages for given flow.
5. Powerful return spring.



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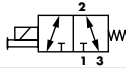
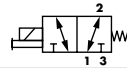
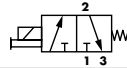
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ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

### HOW TO ORDER

Port size	Universal Valve Normally Closed	Universal Valve Normally Open	Normally Closed Only
			
<b>Valve less base</b>	36A-J00-00-J <b>XX</b> P- <b>XXX</b>	36A-K00-00-J <b>XX</b> P- <b>XXX</b>	36A-L00-00-J <b>XX</b> P- <b>XXX</b>
<b>1/8" NPTF</b>	36A-JSA-AG-J <b>XX</b> P- <b>XXX</b>	36A-KSA-AH-J <b>XX</b> P- <b>XXX</b>	36A-LSA-AG-J <b>XX</b> P- <b>XXX</b>
<b>5/32 tube receptacle</b>	36A-JSF-AG-J <b>XX</b> P- <b>XXX</b>	36A-KSF-AH-J <b>XX</b> P- <b>XXX</b>	36A-LSF-AG-J <b>XX</b> P- <b>XXX</b>

### SOLENOID OPERATOR >

J **XX** P-**XXX**\* (-G) Add "G" for ground

XX Voltage	X Manual operator	XX Electrical connection
<b>AA</b> 120 VAC (5.4W)	<b>1</b> Non-locking recessed	<b>FA</b> Base plug-in
<b>DA</b> 24 VDC (5.4W)	<b>2</b> Locking recessed	<b>FB</b> Base plug-in with diode
<b>DB</b> 12 VDC (5.4W)		<b>FG</b> Base plug-in with rectifier
<b>DC</b> 24 VDC (2.4W)		
<b>DD</b> 12 VDC (2.4W)		

\* Other options available, see page 317.  
Note : AC voltage requires connector with rectifier.

### OPTIONS

36A-JSA-AG-J <b>XX</b> P- <b>XXX</b>	<p><b>G</b> NC manifold &amp; regulator with slotted stem adjustment</p> <p><b>S</b> NC manifold &amp; regulator with locking slotted stem adjustment</p> <p><b>J</b> NC manifold &amp; regulator with knob adjustment</p>	36A-KSA-AH-J <b>XX</b> P- <b>XXX</b>	<p><b>H</b> NO manifold &amp; regulator with slotted stem adjustment</p> <p><b>T</b> NO manifold &amp; regulator with locking slotted stem adjustment</p> <p><b>K</b> NO manifold &amp; regulator with knob adjustment</p>
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Note : All manifold bases are only available with a bottom cylinder port.  
Example : Manifold base only : 36A-OSA-AJ (Normally closed manifold base & regulator with knob).  
End plate kit required (port size 1/4") : M-46003-01.

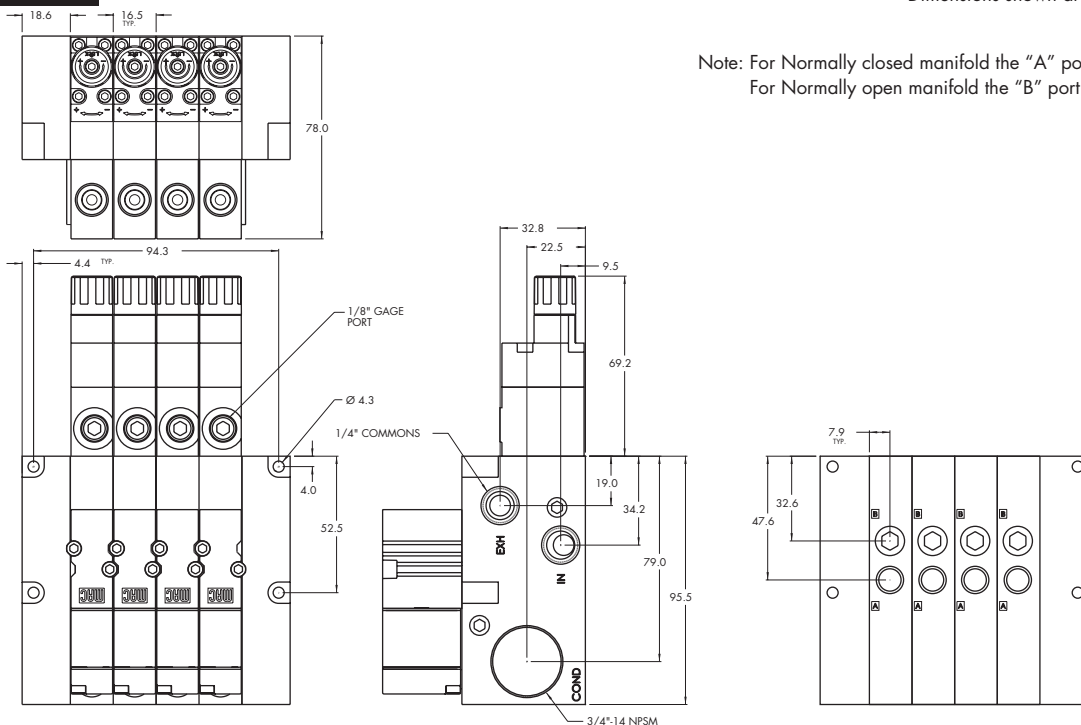
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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>	1.8W : (0.20 C <sub>v</sub> ) – 2.4W : (0.20 C <sub>v</sub> ) – 5.4W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult Factory
<b>Power :</b>	5.4 W – 2.4 W – 1.8 W

- Option : • BSPP threads
- Spare parts : • Inlet isolator : 28501 • Exhaust isolator : 28502 • Valve cover plate : M-46002  
• Tie rod (x2) : 79443

**DIMENSIONS**

Dimensions shown are metric (mm)



Note: For Normally closed manifold the "A" port is plugged.  
For Normally open manifold the "B" port is plugged.

Individual mounting

Sub-base non "plug-in"	Sub-base "plug-in"	Sub-base/manifold base non "plug-in" with latching solenoid	Sub-base/manifold base "plug-in" with latching solenoid
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Manifold mounting

Manifold base non "plug-in"	Manifold base "plug-in"	Sub-base/manifold base non "plug-in" with latching solenoid	Sub-base/manifold base "plug-in" with latching solenoid
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Series

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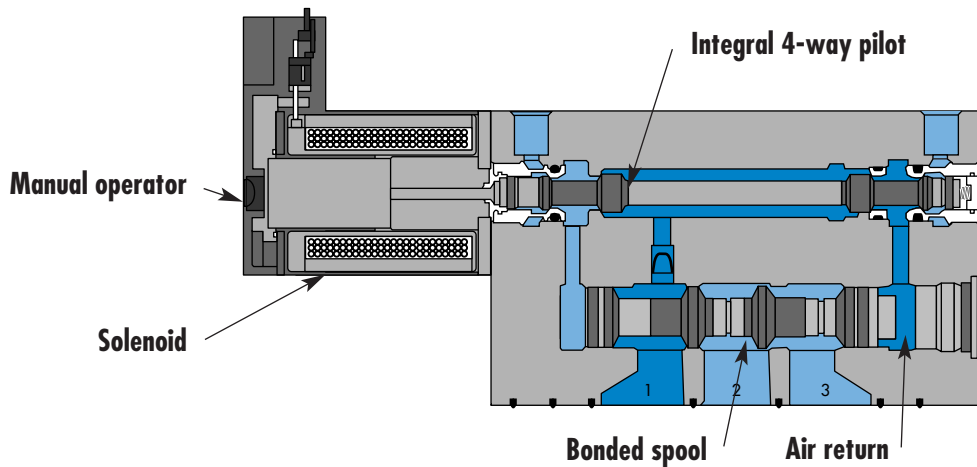
ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



**SERIES FEATURES**

- High force MACSOLENOID®.
- Integral 4-way pilot design.
- Internal or external pilot.
- Normally open or normally closed function.
- Universal function (external pilot).
- Rectified AC voltage.
- Latching solenoid technology.



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC</b>	<b>1/8"</b>	<b>0.4 C<sub>v</sub></b>	Sub-base non "plug-in"	

### OPERATIONAL BENEFITS

1. 3-way valve with 4-way integral pilot.
2. 10 mm valve (stacks on 10.5 mm centers).
3. High flow (up to 0.4 C<sub>v</sub>).
4. Fast, repeatable response times.
5. Maximum shifting forces in both directions.



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ISO 02

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ISO 2

ISO 3

### HOW TO ORDER

Port size	Pilot air	NO valve	NC valve	Universal valve
<b>Valve less base</b>	Internal	32B-BMA-000-G <b>XXX-XXX</b>	32B-AMA-000-G <b>XXX-XXX</b>	32B-GMB-000-G <b>XXX-XXX</b>
	External	32B-BMB-000-G <b>XXX-XXX</b>	32B-AMB-000-G <b>XXX-XXX</b>	
<b>1/8" NPTF</b>	Internal	32B-BMA-CAL-G <b>XXX-XXX</b>	32B-AMA-CAL-G <b>XXX-XXX</b>	32B-GMB-CAM-G <b>XXX-XXX</b>
	External	32B-BMB-CAM-G <b>XXX-XXX</b>	32B-AMB-CAM-G <b>XXX-XXX</b>	

Note : Above codes are for side port.

### STANDARD SOLENOID OPERATOR >

G **XXX-XXX**\*

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>BA</b> Flying leads
<b>DA</b> 24 VDC (1.0W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>BT</b> Flying leads with light
<b>DC</b> 24 VDC (1.8W)	<b>C</b> 36"		<b>GA</b> MAC JAC Solenoid plug-in
<b>DD</b> 24 VDC (2.5W)			<b>GB</b> MAC JAC Solenoid plug-in w/Diode
<b>DF</b> 24 VDC (4.0W)			<b>GC</b> MAC JAC Solenoid plug-in w/MOV
			<b>GD</b> MAC JAC Solenoid plug-in w/LED
			<b>GE</b> MAC JAC Solenoid plug-in w/Diode & LED
			<b>GF</b> MAC JAC Solenoid plug-in w/MOV & LED
			<b>GG</b> MAC JAC Solenoid plug-in w/Rectifier
			<b>GH</b> MAC JAC Solenoid plug-in w/Rectifier & LED
			<b>KA</b> Plug-in wire assy.
			<b>KT</b> Plug-in wire assy. with light
			<b>KD</b> Plug-in wire assy. with rectifier & light & ground

Note : AC voltage requires connector with rectifier.

\* Other options available, see page 311.

Latching solenoid also available, see page 41.

With MAC JAC electrical connector washdown capability is possible.

Consult factory for modification number.

### OPTIONS

Pilot/Base Configuration :

32B-**xM-x-Ax-Gxxx-xxx**

- A** Individual base – Side port
- B** Individual base – Bottom port
- M** Pilot exhaust muffled
- P** Pilot exhaust piped (# 10-32)
- U** Pilot exhaust to main exhaust (not available with external pilot)



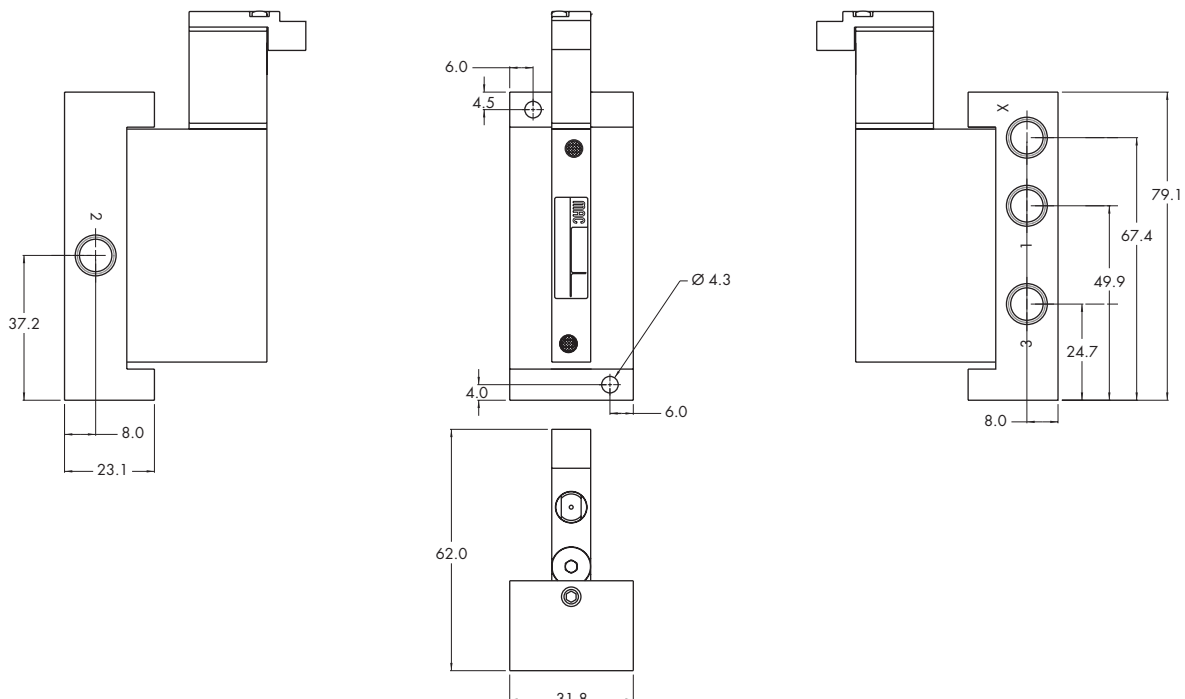
**TECHNICAL DATA**

<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>Pilot pressure :</b>	20 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>	1/8" : (0.40 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times : (with 4 W coil)</b>	Energize : 5 ms De-energize : 5 ms

Options : • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC</b>	<b># 10-32 - 1/4" O.D. tube receptacle</b>	<b>0.4 C<sub>v</sub></b>	Sub-base "plug-in"	

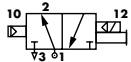
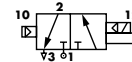
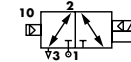
**OPERATIONAL BENEFITS**

1. 3-way valve with 4-way integral pilot.
2. 10 mm valve (stacks on 10.5 mm centers).
3. High flow (up to 0.4 C<sub>v</sub>).
4. Fast, repeatable response times.
5. Maximum shifting forces in both directions.



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**32**  
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48P

**HOW TO ORDER**

Port size	Pilot air	NO valve	NC valve	Universal valve
				
<b>Valve less base</b>	Internal	32B-BMA-000-G <b>XX</b> P- <b>XXX</b>	32B-AMA-000-G <b>XX</b> P- <b>XXX</b>	
	External	32B-BMB-000-G <b>XX</b> P- <b>XXX</b>	32B-AMB-000-G <b>XX</b> P- <b>XXX</b>	32B-GMB-000-G <b>XX</b> P- <b>XXX</b>
<b># 10-32</b>	Internal	32B-BMA-AAA-G <b>XX</b> P- <b>XXX</b>	32B-AMA-AAA-G <b>XX</b> P- <b>XXX</b>	
	External	32B-BMB-AAB-G <b>XX</b> P- <b>XXX</b>	32B-AMB-AAB-G <b>XX</b> P- <b>XXX</b>	32B-GMB-AAB-G <b>XX</b> P- <b>XXX</b>
<b>1/4" O.D. Tube receptacle</b>	Internal	32B-BMA-EAA-G <b>XX</b> P- <b>XXX</b>	32B-AMA-EAA-G <b>XX</b> P- <b>XXX</b>	
	External	32B-BMB-EAB-G <b>XX</b> P- <b>XXX</b>	32B-AMB-EAB-G <b>XX</b> P- <b>XXX</b>	32B-GMB-EAB-G <b>XX</b> P- <b>XXX</b>

Note : Above codes are for side port.

STANDARD SOLENOID OPERATOR >

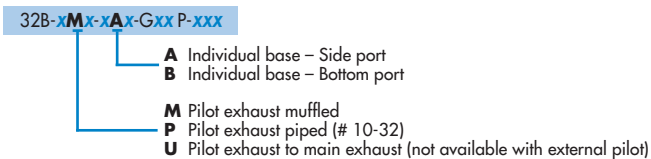
G **XX** P-**XXX**\*

<b>XX</b> Voltage	<b>X</b> Manual operator	<b>XX</b> Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>1</b> Non-locking recessed	<b>SA</b> Base plug-in
<b>DA</b> 24 VDC (1.0W)	<b>2</b> Locking recessed	<b>SJ</b> Base plug-in with light
<b>DC</b> 24 VDC (1.8W)		<b>SS</b> Base plug-in with rectifier & light & ground
<b>DD</b> 24 VDC (2.5W)		
<b>DF</b> 24 VDC (4.0W)		

Note : AC voltage requires connector with rectifier.  
 \* Other options available, see page 311.  
 Latching solenoid also available, see page 43.  
 Washdown capability is possible, consult factory for modification number.

**OPTIONS**

Pilot/Base Configuration :



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ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

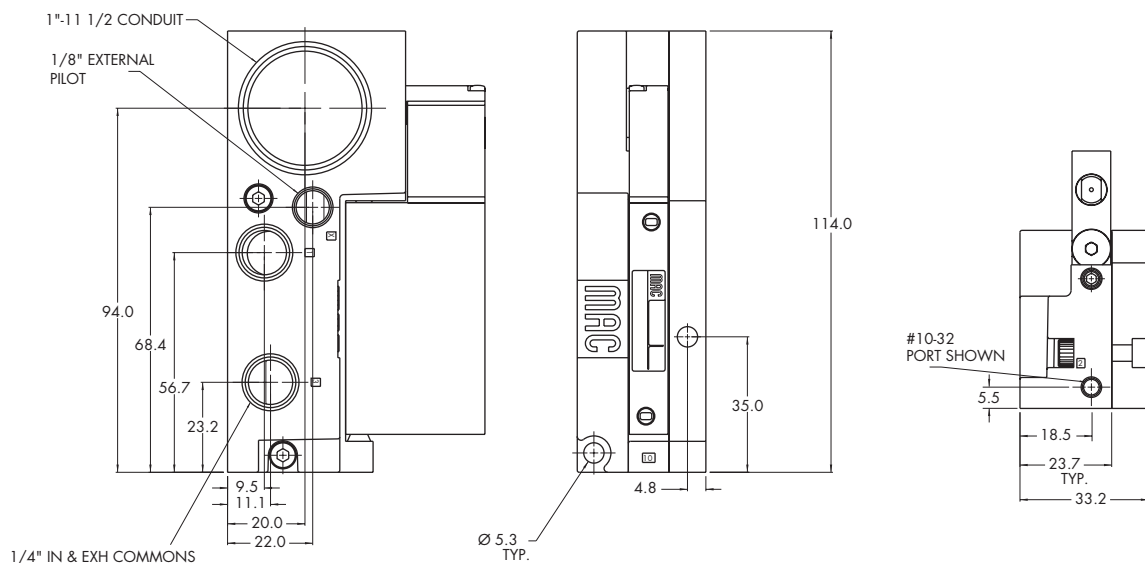
**TECHNICAL DATA**

<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>Pilot pressure :</b>	20 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>	# 10-32 : (0.35 C <sub>v</sub> ) - 1/4 tube receptacle : (0.40 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times : (with 4 W coil)</b>	Energize : 5 ms De-energize : 5 ms

Options :                   • M5 port • M7 port • 6 mm O.D. tube receptacle

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC</b>	<b># 10-32 - 1/4" O.D. tube receptacle</b>	<b>0.4 C<sub>v</sub></b>	Manifold base non "plug-in"	

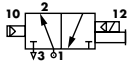
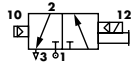
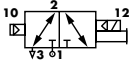
### OPERATIONAL BENEFITS

1. 3-way valve with 4-way integral pilot.
2. 10 mm valve (stacks on 10.5 mm centers).
3. High flow (up to 0.4 C<sub>v</sub>).
4. Fast, repeatable response times.
5. Maximum shifting forces in both directions.



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48P

### HOW TO ORDER

Port size	Pilot air	NO valve	NC valve	Universal valve
				
<b>Valve less base</b>	Internal	32B-BMA-000-G <b>XXX-XXX</b>	32B-AMA-000-G <b>XXX-XXX</b>	
	External	32B-BMB-000-G <b>XXX-XXX</b>	32B-AMB-000-G <b>XXX-XXX</b>	32B-GMB-000-G <b>XXX-XXX</b>
<b># 10-32</b>	Internal	32B-BMA-AJL-G <b>XXX-XXX</b>	32B-AMA-AJL-G <b>XXX-XXX</b>	
	External	32B-BMB-AJM-G <b>XXX-XXX</b>	32B-AMB-AJM-G <b>XXX-XXX</b>	32B-GMB-AJM-G <b>XXX-XXX</b>
<b>1/4" O.D. Tube receptacle</b>	Internal	32B-BMA-EJL-G <b>XXX-XXX</b>	32B-AMA-EJL-G <b>XXX-XXX</b>	
	External	32B-BMB-EJM-G <b>XXX-XXX</b>	32B-AMB-EJM-G <b>XXX-XXX</b>	32B-FMB-EJM-G <b>XXX-XXX</b>

Note : Above codes are for side port.

### STANDARD SOLENOID OPERATOR >

G **XXX-XXX**\*

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>BA</b> Flying leads
<b>DA</b> 24 VDC (1.0W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>BT</b> Flying leads with light
<b>DC</b> 24 VDC (1.8W)	<b>C</b> 36"		<b>GA</b> MAC JAC Solenoid plug-in
<b>DD</b> 24 VDC (2.5W)			<b>GB</b> MAC JAC Solenoid plug-in w/Diode
<b>DF</b> 24 VDC (4.0W)			<b>GC</b> MAC JAC Solenoid plug-in w/MOV
			<b>GD</b> MAC JAC Solenoid plug-in w/LED
			<b>GE</b> MAC JAC Solenoid plug-in w/Diode & LED
			<b>GF</b> MAC JAC Solenoid plug-in w/MOV & LED
			<b>GG</b> MAC JAC Solenoid plug-in w/Rectifier
			<b>GH</b> MAC JAC Solenoid plug-in w/Rectifier & LED
			<b>KA</b> Plug-in wire Assy.
			<b>KT</b> Plug-in wire Assy. with light
			<b>KD</b> Plug-in wire Assy. with rectifier & light & ground

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ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

Note : AC voltage requires connector with rectifier.

\* Other options available, see page 311.

Latching solenoid also available, see page 41.

With MAC JAC electrical connector washdown capability is possible.

Consult factory for modification number.

### OPTIONS

Base only :

32B-000-**XXX**  
(i.e. 32B-000-AJL)

Base/Pilot Configuration :

32B-**XMx-JX-GXXX-XXX**

- J** Manifold base – Side port
- K** Manifold base – Bottom port
- M** Pilot exhaust muffled
- P** Pilot exhaust piped (# 10-32)
- U** Pilot exhaust to main exhaust (not available with external pilot)

Note : Manifold assemblies require an end plate kit :  
M-32003-01-01 (Internal pilot)  
M-32003-02-01 (External pilot)

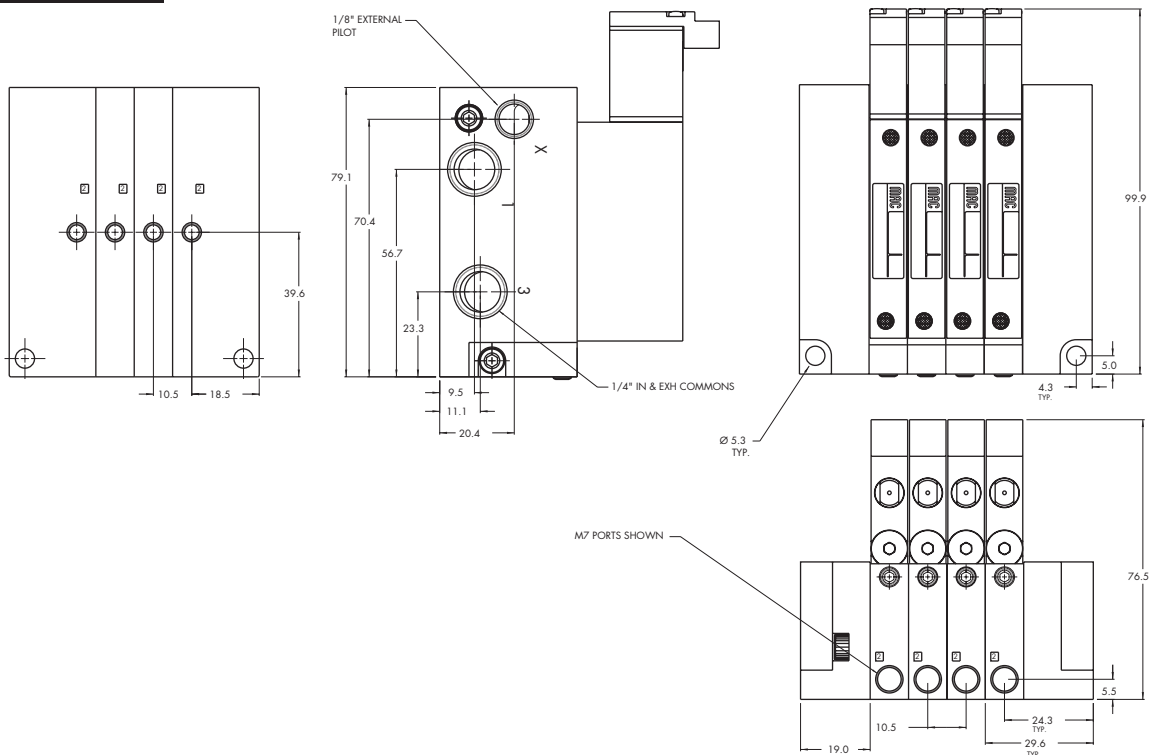
**TECHNICAL DATA**

<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>Pilot pressure :</b>	20 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>	# 10-32 : (0.35 C <sub>v</sub> ) - 1/4 tube receptacle : (0.40 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times : (with 4 W coil)</b>	Energize : 5 ms De-energize : 5 ms

- Options :
- M5 port • M7 port • 6 mm O.D. tube receptacle
  - Inlet/Exhaust Isolator : 28454

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC</b>	<b># 10-32 - 1/4" O.D. tube receptacle</b>	<b>0.4 C<sub>v</sub></b>	Manifold base "plug-in"	

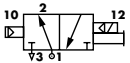
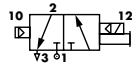
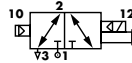
### OPERATIONAL BENEFITS

1. 3-way valve with 4-way integral pilot.
2. 10 mm valve (stacks on 10.5 mm centers).
3. High flow (up to 0.4 C<sub>v</sub>).
4. Fast, repeatable response times.
5. Maximum shifting forces in both directions.



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### HOW TO ORDER

Port size	Pilot air	NO valve	NC valve	Universal valve
				
<b>Valve less base</b>	Internal	32B-BMA-000-G <b>XX</b> P- <b>XXX</b>	32B-AMA-000-G <b>XX</b> P- <b>XXX</b>	
	External	32B-BMB-000-G <b>XX</b> P- <b>XXX</b>	32B-AMB-000-G <b>XX</b> P- <b>XXX</b>	32B-GMB-000-G <b>XX</b> P- <b>XXX</b>
<b># 10-32</b>	Internal	32B-BMA-AJA-G <b>XX</b> P- <b>XXX</b>	32B-AMA-AJA-G <b>XX</b> P- <b>XXX</b>	
	External	32B-BMB-AJB-G <b>XX</b> P- <b>XXX</b>	32B-AMB-AJB-G <b>XX</b> P- <b>XXX</b>	32B-GMB-AJB-G <b>XX</b> P- <b>XXX</b>
<b>1/4" O.D. Tube receptacle</b>	Internal	32B-BMA-EJA-G <b>XX</b> P- <b>XXX</b>	32B-AMA-EJA-G <b>XX</b> P- <b>XXX</b>	
	External	32B-BMB-EJB-G <b>XX</b> P- <b>XXX</b>	32B-AMB-EJB-G <b>XX</b> P- <b>XXX</b>	32B-GMB-EJB-G <b>XX</b> P- <b>XXX</b>

Note : Above codes are for side port.

### STANDARD SOLENOID OPERATOR >

G **XX** P-**XXX**\*

<b>XX</b> Voltage	<b>X</b> Manual operator	<b>XX</b> Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>1</b> Non-locking recessed	<b>SA</b> Base plug-in
<b>DA</b> 24 VDC (1.0W)	<b>2</b> Locking recessed	<b>SJ</b> Base plug-in with light
<b>DC</b> 24 VDC (1.8W)		<b>SS</b> Base plug-in with rectifier & light & ground
<b>DD</b> 24 VDC (2.5W)		
<b>DF</b> 24 VDC (4.0W)		

Note : AC voltage requires connector with rectifier.

\* Other options available, see page 311.

Latching solenoid also available, see page 43.

Washdown capability is possible, consult factory for modification number.

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### OPTIONS

Base only :

32B-000-**XXX**  
(i.e. 32B-000-AJA)

Base Configuration :

32B-**XXX**-**XJ**X-G**XX**P-**XXX**

- J** Manifold base – Side port
- K** Manifold base – Bottom port
- L** Left end manifold base – Side port
- M** Left end manifold base – Bottom port
- N** Right end manifold base – Side port
- P** Right end manifold base – Bottom port

Note : Manifold assemblies consist of (1) left end manifold, (1) right end manifold and middle station manifolds (options "J" or "K").

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ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

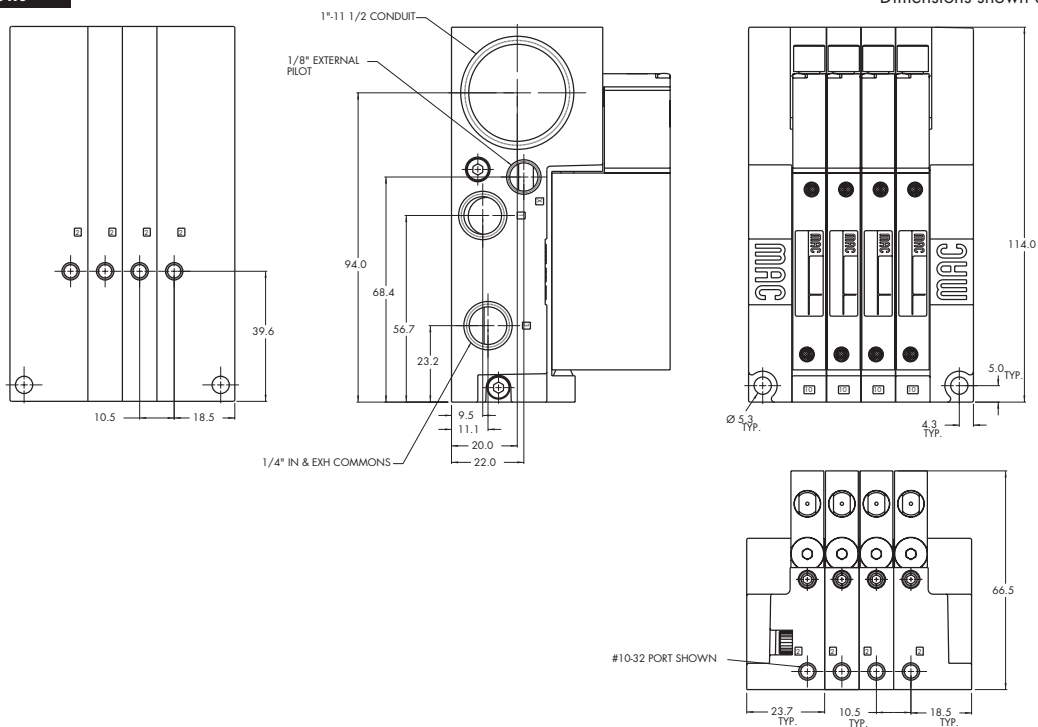
**TECHNICAL DATA**

<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>Pilot pressure :</b>	20 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>	# 10-32 : (0.35 C <sub>v</sub> ) - 1/4 tube receptacle : (0.40 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times : (with 4 W coil)</b>	Energize : 5 ms De-energize : 5 ms

- Options :
- M5 port • M7 port • 6 mm O.D. tube receptacle
  - Inlet/Exhaust Isolator : 28454

**DIMENSIONS**

Dimensions shown are metric (mm)



Individual mounting

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

Series

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**37**

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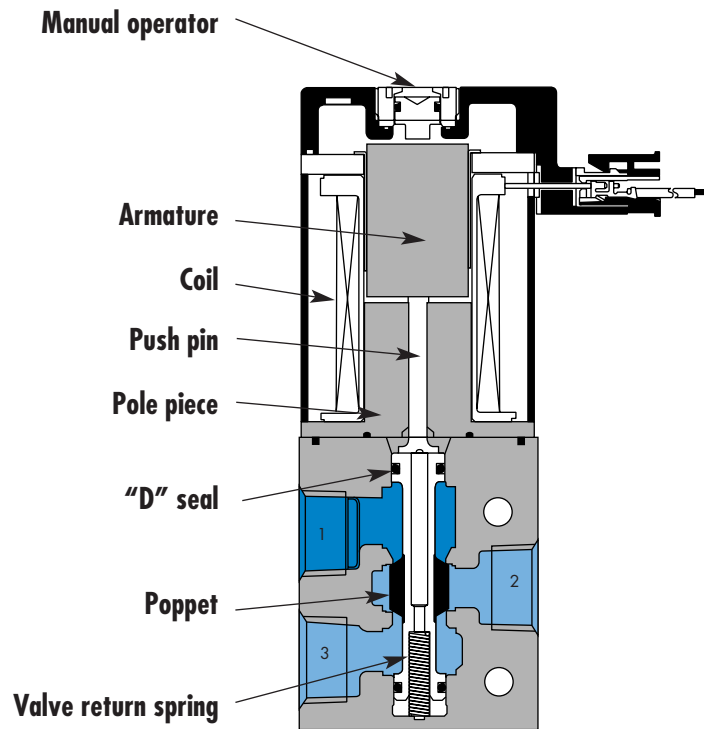
ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



**SERIES FEATURES**

- Balanced poppet equals consistent high shifting forces.
- Valve shifting forces are consistent and independent of pressure fluctuations.
- High solenoid and return spring forces ensure high speed and precise repeatability.
- Built-in wear compensation - valve stroke is shorter than solenoid stroke.
- Constant high flow maintained throughout the pressure range.
- Exhaust contaminants are isolated from the solenoid.
- Full flow exhaust.
- Universal porting - 6 functions in one valve.

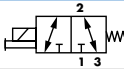
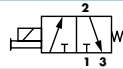


Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC</b>	<b>1/8" - 1/4"</b>	<b>0.5 C<sub>v</sub></b>	Inline	

**OPERATIONAL BENEFITS**

- Balanced poppet equals consistent high shifting forces.
- Valve shifting forces are consistent and independent of pressure fluctuations.
- High solenoid and return spring forces ensure high speed and precise repeatability.
- Built-in wear compensation – valve stroke is shorter than solenoid stroke.
- Constant high flow maintained throughout the pressure range.
- Exhaust contaminants are isolated from the solenoid.
- Full flow exhaust.
- Universal porting – 6 functions in one valve.

**HOW TO ORDER**

Port size	Universal valve	NC only valve
		
<b>1/8" NPTF</b>	37A-AA0-H <b>XXX-XXX</b>	37A-BA0-H <b>XXX-XXX</b>
<b>1/4" NPTF</b>	37A-AB0-H <b>XXX-XXX</b>	37A-BB0-H <b>XXX-XXX</b>



SOLENOID OPERATOR ►

H **XXX-XXX\***

XX	Voltage	X	Wire length	X	Manual operator	XX	Electrical connection**
AA	120 VAC (6.7W)	A	18"	1	Non-locking recessed	MA	Plug-in wire assembly
DA	24 VDC (5.2W)	B	24"	2	Locking recessed	MC	Plug-in wire assembly with light
DB	24 VDC (2.4W)					BA	Flying leads
DC	24 VDC (1.8W)					BC	Flying leads with light
						MT	Plug-in wire assembly with rectifier & light

Note : AC voltage requires connector with rectifier.

\* Other options available, see page 315.

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48P

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ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

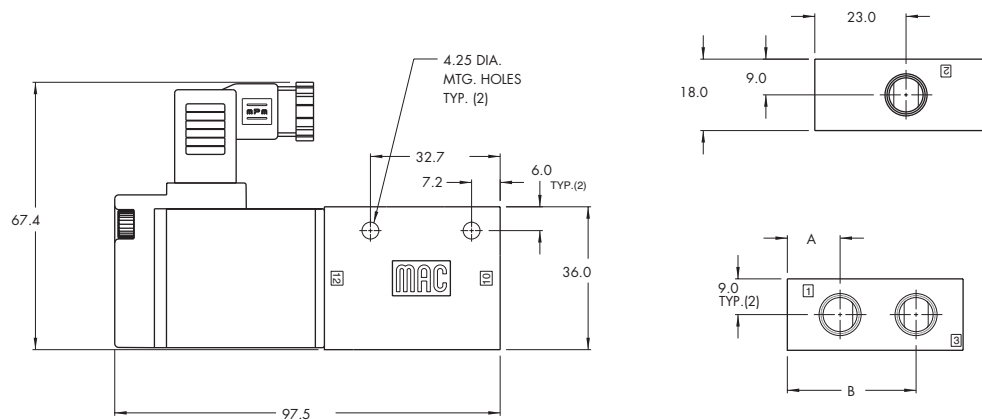
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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>	5.2 W : (0.5 C <sub>v</sub> ) – 2.4 W : (0.35 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	5.2 W – 2.4 W
<b>Response times :</b> (with 5.2 W coil)	Energize : 16.9 ms De-energize : 6.7 ms

Options : • BSPP ports

**DIMENSIONS**

Dimensions shown are metric (mm)



Shown with Mini Square Connector ("K" Type)

Dim	A	B
1/8"	13.3	32.45
1/4"	14.7	33.7

Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC</b>	<b>1/8" - 1/4"</b>	<b>0.5 C<sub>v</sub></b>	Sub-base non plug-in	

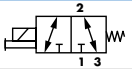
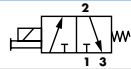
**OPERATIONAL BENEFITS**

1. Balanced poppet equals consistent high shifting forces.
2. Valve shifting forces are consistent and independent of pressure fluctuations.
3. High solenoid and return spring forces ensure high speed and precise repeatability.
4. Built-in wear compensation – valve stroke is shorter than solenoid stroke.
5. Constant high flow maintained throughout the pressure range.
6. Exhaust contaminants are isolated from the solenoid.
7. Full flow exhaust.
8. Universal porting – 6 functions in one valve.



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ISO 02  
ISO 1  
ISO 2  
ISO 3

**HOW TO ORDER**

Port size	Universal valve	NC only valve
		
<b>Valve less base</b>	37A-C10-H <b>XXX-XXX</b>	37A-D10-H <b>XXX-XXX</b>
<b>1/8" NPTF</b>	37A-CAA-H <b>XXX-XXX</b>	37A-DAA-H <b>XXX-XXX</b>
<b>1/4" NPTF</b>	37A-CBA-H <b>XXX-XXX</b>	37A-DBA-H <b>XXX-XXX</b>

SOLENOID OPERATOR >

H **XXX-XXX\***

XX	Voltage	X	Wire length	X	Manual operator	XX	Electrical connection
AA	120 VAC (6.7W)	A	18"	1	Non-locking recessed	MA	Plug-in wire assembly
DA	24 VDC (5.2W)	B	24"	2	Locking recessed	MC	Plug-in wire assembly with light
DB	24 VDC (2.4W)					BA	Flying leads
DC	24 VDC (1.8W)					BC	Flying leads with light
						MT	Plug-in wire assembly with rectifier & light

Note : AC voltage requires connector with rectifier.  
\* Other options available, see page 315.

**OPTIONS**

Base only :

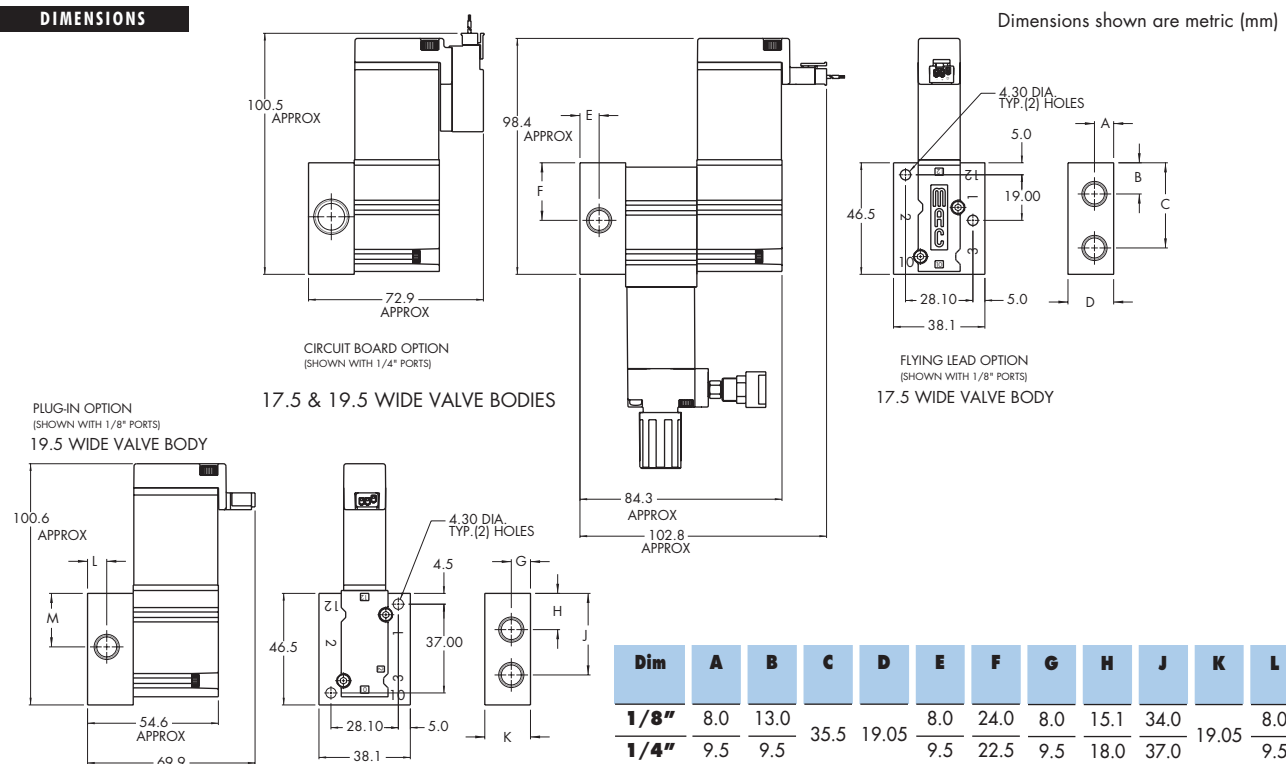
37A-OAA (1/8")
37A-OBA (1/4")

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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>	5.2 W : (0.5 C <sub>v</sub> ) – 2.4 W : (0.35 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	5.2 W – 2.4 W
<b>Response times :</b> (with 5.2 W coil)	Energize : 16.9 ms De-energize : 6.7 ms

Options : • BSPP ports • Sandwich regulator - see "Regulator" Section

**DIMENSIONS**



Individual mounting

Sub-base non "plug-in"	Sub-base "plug-in"	Sub-base/manifold base non "plug-in" with latching solenoid	Sub-base/manifold base "plug-in" with latching solenoid
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Manifold mounting

Manifold base "plug-in"	Sub-base/manifold base non "plug-in" with latching solenoid	Sub-base/manifold base "plug-in" with latching solenoid
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Series

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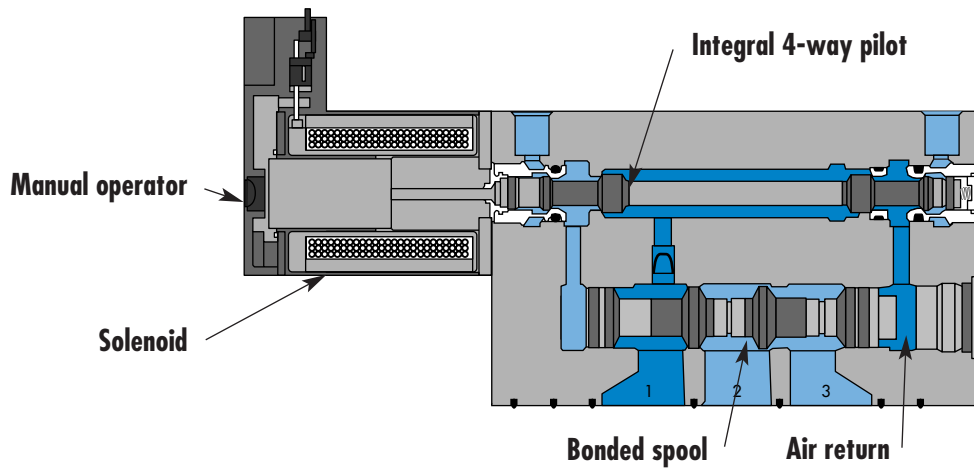
48P

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**SERIES FEATURES**

- High force MACSOLENOID®.
- Integral 4-way pilot design.
- Internal or external pilot.
- Normally open or normally closed function.
- Universal function (external pilot).
- Rectified AC voltage.
- Latching solenoid technology.

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC</b>	<b>1/8"</b>	<b>1.2 C<sub>v</sub></b>	Sub-base non "plug-in"	

### OPERATIONAL BENEFITS

1. 3-way valve with 4-way integral pilot.
2. 10 mm valve (stacks on 16.5 mm centers).
3. High flow (up to 1.2 Cv).
4. Fast, repeatable response times.
5. Maximum shifting forces in both directions.



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### HOW TO ORDER

Port size	Pilot air	NO valve	NC valve	Universal valve
<b>Valve less base</b>	Internal	38B-BMA-000-G <b>XXX-XXX</b>	38B-AMA-000-G <b>XXX-XXX</b>	38B-GMB-000-G <b>XXX-XXX</b>
	External	38B-BMB-000-G <b>XXX-XXX</b>	38B-AMB-000-G <b>XXX-XXX</b>	
<b>1/8" NPTF</b>	Internal	38B-BMA-AAL-G <b>XXX-XXX</b>	38B-AMA-AAL-G <b>XXX-XXX</b>	
	External	38B-BMB-AAM-G <b>XXX-XXX</b>	38B-AMB-AAM-G <b>XXX-XXX</b>	38B-GMB-AAM-G <b>XXX-XXX</b>

Note : Above codes are for side port.

### STANDARD SOLENOID OPERATOR >

G **XXX-XXX\***

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>BA</b> Flying leads
<b>DA</b> 24 VDC (1.0W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>BT</b> Flying leads with light
<b>DC</b> 24 VDC (1.8W)	<b>C</b> 36"		<b>GA</b> MAC JAC Solenoid plug-in w/Diode
<b>DD</b> 24 VDC (2.5W)			<b>GB</b> MAC JAC Solenoid plug-in w/Rectifier
<b>DF</b> 24 VDC (4.0W)			<b>GC</b> MAC JAC Solenoid plug-in w/MOV
			<b>GD</b> MAC JAC Solenoid plug-in w/LED
			<b>GE</b> MAC JAC Solenoid plug-in w/Diode & LED
			<b>GF</b> MAC JAC Solenoid plug-in w/MOV & LED
			<b>GG</b> MAC JAC Solenoid plug-in w/Rectifier
			<b>GH</b> MAC JAC Solenoid plug-in w/Rectifier & LED
			<b>KA</b> Plug-in wire assembly
			<b>KT</b> Plug-in wire assembly with light
			<b>KD</b> Plug-in wire assembly with rectifier & light & ground

Note : AC voltage requires connector with rectifier.

\* Other options available, see page 311.

Latching solenoid also available, see page 59.

With MAC JAC electrical connector washdown capability is possible. Consult factory for modification number.

### OPTIONS

Pilot/Base Configuration :

38B-**M**-**X**-**A**-G**XXX-XXX**

- A** Individual base – Side port
- B** Individual base – Bottom port
- M** Pilot exhaust muffled
- P** Pilot exhaust piped (# 10-32)
- U** Pilot exhaust to main exhaust

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ISO 01

ISO 02

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ISO 2

ISO 3

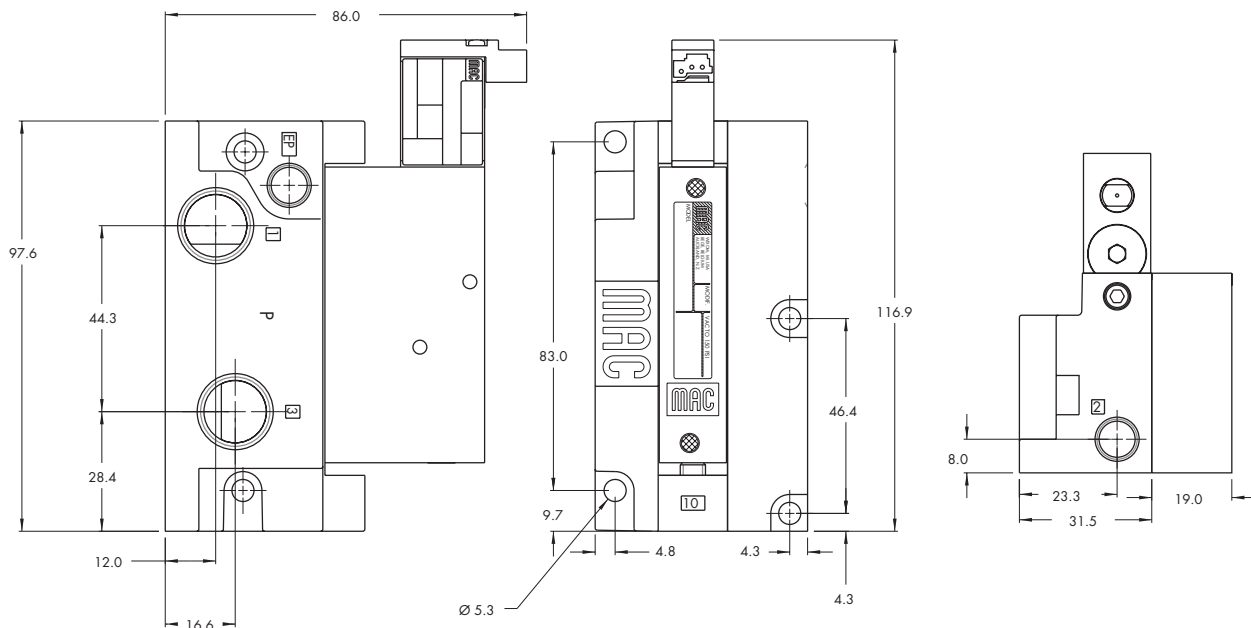
**TECHNICAL DATA**

<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>Pilot pressure :</b>	20 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 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	1/8" bottom port: (1.2 C <sub>v</sub> ) - 1/8" side port: (1.0 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times : (with 4 W coil)</b>	Energize : 6 ms De-energize : 6 ms

Options : • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)





# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC</b>	<b>1/8" - 1/4" O.D. tube receptacle</b>	<b>1.2 C<sub>v</sub></b>	Sub-base "plug-in"	

### OPERATIONAL BENEFITS

1. 3-way valve with 4-way integral pilot.
2. 10 mm valve (stacks on 16.5 mm centers).
3. High flow (up to 1.2 C<sub>v</sub>).
4. Fast, repeatable response times.
5. Maximum shifting forces in both directions.



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- 48P

### HOW TO ORDER

Port size	Pilot air	NO valve	NC valve	Universal valve
<b>Valve less base</b>	Internal	38B-BMA-000-G <b>XX</b> P- <b>XXX</b>	38B-AMA-000-G <b>XX</b> P- <b>XXX</b>	
	External	38B-BMB-000-G <b>XX</b> P- <b>XXX</b>	38B-AMB-000-G <b>XX</b> P- <b>XXX</b>	38B-GMB-000-G <b>XX</b> P- <b>XXX</b>
<b>1/8" NPTF</b>	Internal	38B-BMA-AAA-G <b>XX</b> P- <b>XXX</b>	38B-AMA-AAA-G <b>XX</b> P- <b>XXX</b>	
	External	38B-BMB-AAB-G <b>XX</b> P- <b>XXX</b>	38B-AMB-AAB-G <b>XX</b> P- <b>XXX</b>	38B-GMB-BAB-G <b>XX</b> P- <b>XXX</b>
<b>1/4" O.D. Tube receptacle</b>	Internal	38B-BMA-EAA-G <b>XX</b> P- <b>XXX</b>	38B-AMA-EAA-G <b>XX</b> P- <b>XXX</b>	
	External	38B-BMB-EAB-G <b>XX</b> P- <b>XXX</b>	38B-AMB-EAB-G <b>XX</b> P- <b>XXX</b>	38B-GMB-EAB-G <b>XX</b> P- <b>XXX</b>

Note : Above codes are for side port.

### STANDARD SOLENOID OPERATOR >

G **XX** P-**XXX**\*

<b>XX</b> Voltage	<b>X</b> Manual operator	<b>XX</b> Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>1</b> Non-locking recessed	<b>SA</b> Base plug-in
<b>DA</b> 24 VDC (1.0W)	<b>2</b> Locking recessed	<b>SJ</b> Base plug-in with light
<b>DC</b> 24 VDC (1.8W)		<b>SS</b> Base plug-in with rectifier & light & ground
<b>DD</b> 24 VDC (2.5W)		
<b>DF</b> 24 VDC (4.0W)		

Note : AC voltage requires connector with rectifier.  
 \* Other options available, see page 311.  
 Latching solenoid also available, see page 61.

- 48
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- 93
- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

### OPTIONS

Pilot/Base Configuration :

38B-**M**X-**A**X-G**XX**P-**XXX**

- A** Individual base – Side port
- B** Individual base – Bottom port
- M** Pilot exhaust muffled
- P** Pilot exhaust piped (# 10-32)
- U** Pilot exhaust to main exhaust

Washdown capability is possible, consult factory for modification number.



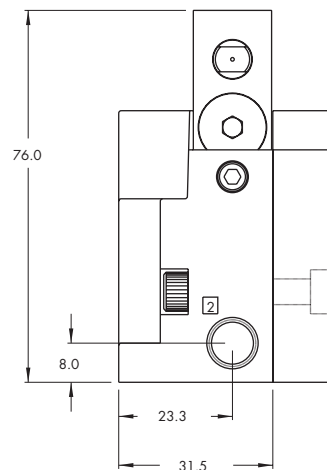
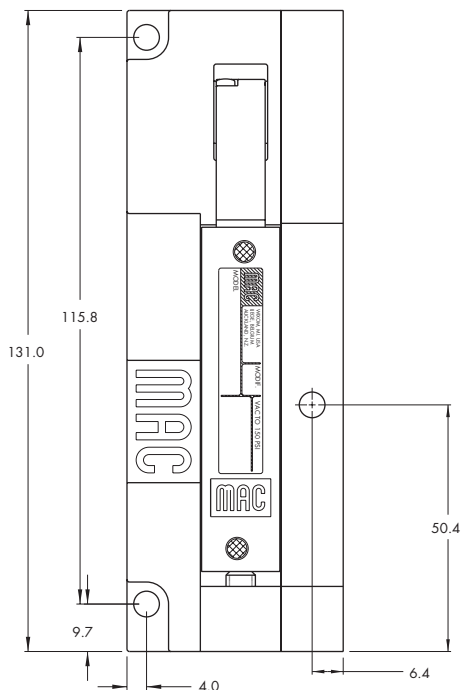
**TECHNICAL DATA**

<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>Pilot pressure :</b>	20 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>	1/8" bottom port: (1.2 C <sub>v</sub> ) - 1/8" side port: (1.0 C <sub>v</sub> ) - 1/4" tube receptacle: (0.85 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times : (with 4 W coil)</b>	Energize : 6 ms De-energize : 6 ms

Options : • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Manifold mounting	Series
<b>3/2 NO-NC</b>	<b>1/8" - 1/4" O.D. tube receptacle</b>	<b>1.2 C<sub>v</sub></b>	Manifold base "plug-in"	

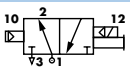
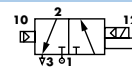
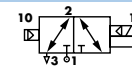
### OPERATIONAL BENEFITS

1. 3-way valve with 4-way integral pilot.
2. 10 mm valve (stacks on 16.5 mm centers).
3. High flow (up to 1.2 C<sub>v</sub>).
4. Fast, repeatable response times.
5. Maximum shifting forces in both directions.



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### HOW TO ORDER

Port size	Pilot air	NO valve	NC valve	Universal valve
				
<b>Valve less base</b>	Internal	38B-BMA-000-G <b>XX</b> P- <b>XXX</b>	38B-AMA-000-G <b>XX</b> P- <b>XXX</b>	
	External	38B-BMB-000-G <b>XX</b> P- <b>XXX</b>	38B-AMB-000-G <b>XX</b> P- <b>XXX</b>	38B-GMB-000-G <b>XX</b> P- <b>XXX</b>
<b>1/8" NPTF</b>	Internal	38B-BMA-AJA-G <b>XX</b> P- <b>XXX</b>	38B-AMA-AJA-G <b>XX</b> P- <b>XXX</b>	
	External	38B-BMB-AJB-G <b>XX</b> P- <b>XXX</b>	38B-AMB-AJB-G <b>XX</b> P- <b>XXX</b>	38B-GMB-BJB-G <b>XX</b> P- <b>XXX</b>
<b>1/4" O.D. Tube receptacle</b>	Internal	38B-BMA-EJA-G <b>XX</b> P- <b>XXX</b>	38B-AMA-EJA-G <b>XX</b> P- <b>XXX</b>	
	External	38B-BMB-EJB-G <b>XX</b> P- <b>XXX</b>	38B-AMB-EJB-G <b>XX</b> P- <b>XXX</b>	38B-GMB-EJB-G <b>XX</b> P- <b>XXX</b>

Note : Above codes are for side port.

### STANDARD SOLENOID OPERATOR >

G **XX** P-**XXX**\*

<b>XX</b> Voltage	<b>X</b> Manual operator	<b>XX</b> Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>1</b> Non-locking recessed	<b>SA</b> Base plug-in
<b>DA</b> 24 VDC (1.0W)	<b>2</b> Locking recessed	<b>SJ</b> Base plug-in with light
<b>DC</b> 24 VDC (1.8W)		<b>SS</b> Base plug-in with rectifier & light & ground
<b>DD</b> 24 VDC (2.5W)		
<b>DF</b> 24 VDC (4.0W)		

Note : AC voltage requires connector with rectifier.

\* Other options available, see page 311.

Latching solenoid also available, see page 61.

Washdown capability is possible, consult factory for modification number.

### OPTIONS

Base only :

38B-000-**xxx**  
(i.e. 38B-000-AJA)

Base Configuration :

38B-**xxx-xJx-Gxx** P-**xxx**

- J** Manifold base – Side port
- K** Manifold base – Bottom port
- L** Left end manifold base – Side port
- M** Left end manifold base – Bottom port
- N** Right end manifold base – Side port
- P** Right end manifold base – Bottom port

Note : Manifold assemblies consist of (1) left end manifold, (1) right end manifold and middle station manifolds (options "J" or "K").

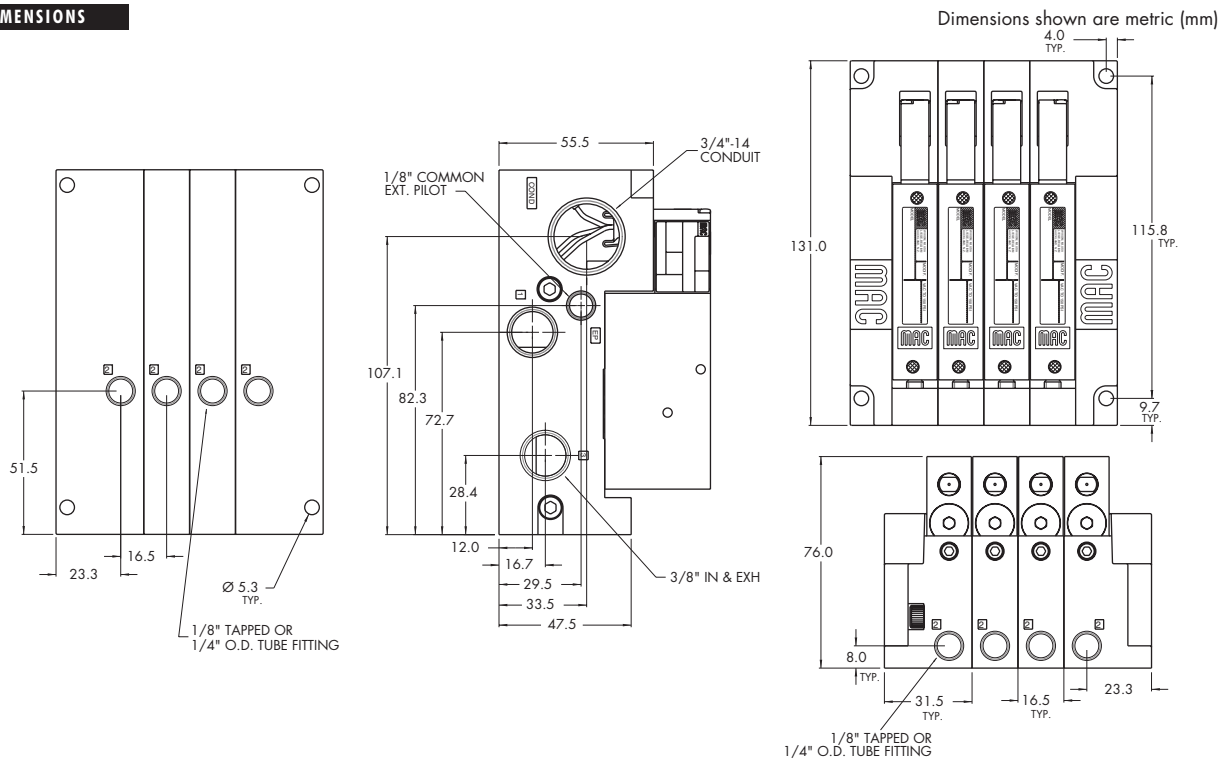
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**TECHNICAL DATA**

<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>Pilot pressure :</b>	20 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>	1/8" bottom port: (1.2 C <sub>v</sub> ) - 1/8" side port: (1.0 C <sub>v</sub> ) - 1/4" tube receptacle: (0.85 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times : (with 4 W coil)</b>	Energize : 6 ms De-energize : 6 ms

Options : • BSPP threads

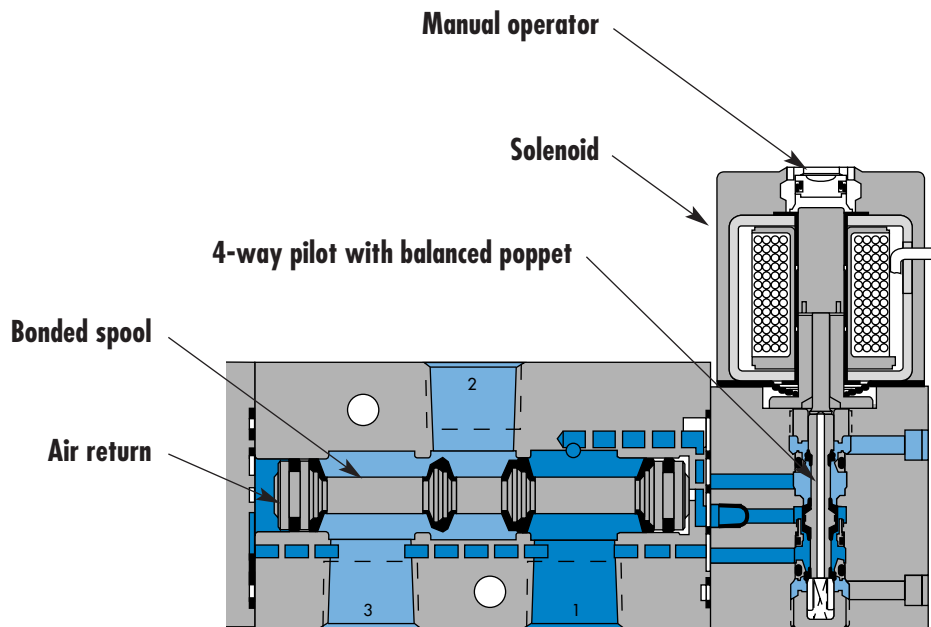
**DIMENSIONS**



Individual mounting

Series

Inline



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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.
- Various manual operators.
- Optional memory spring.
- Normally closed or normally open valve function.
- May be plugged for 2-way operation.
- Internal or external pilot.

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ISO 01

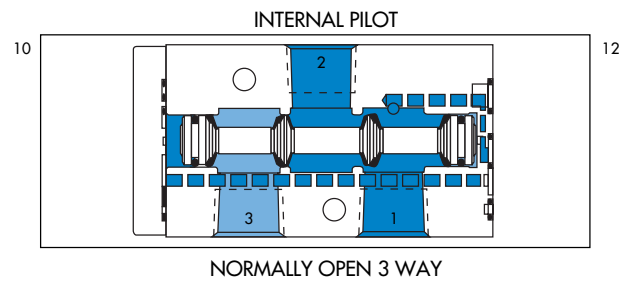
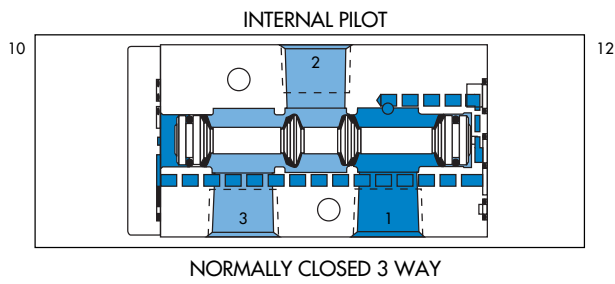
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**SPOOL CONFIGURATIONS**



Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8" - 1/4"</b>	<b>1.5 C<sub>v</sub></b>	Inline	

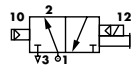
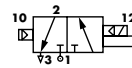
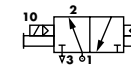
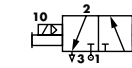
**OPERATIONAL BENEFITS**

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



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**HOW TO ORDER**

Port size	Pilot air	Single Operator		Double Operator	
		NO Valve	NC Valve	NO Valve	NC Valve
					
<b>1/8" NPTF</b>	Internal	52A-31-A0A-XX-X-XXX-XXX	52A-11-A0A-XX-X-XXX-XXX	52A-41-A0A-XX-X-XXX-XXX	52A-21-A0A-XX-X-XXX-XXX
<b>1/4" NPTF</b>	Internal	52A-31-B0A-XX-X-XXX-XXX	52A-11-B0A-XX-X-XXX-XXX	52A-41-B0A-XX-X-XXX-XXX	52A-21-B0A-XX-X-XXX-XXX
<b>1/8" NPTF</b>	External	52A-31-A0B-XX-X-XXX-XXX	52A-11-A0B-XX-X-XXX-XXX	52A-41-A0B-XX-X-XXX-XXX	52A-21-A0B-XX-X-XXX-XXX
<b>1/4" NPTF</b>	External	52A-31-B0B-XX-X-XXX-XXX	52A-11-B0B-XX-X-XXX-XXX	52A-41-B0B-XX-X-XXX-XXX	52A-21-B0B-XX-X-XXX-XXX

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48P

SOLENOID OPERATOR >

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

XX	Voltage	X	Wire length	X	Manual operator	XX	Electrical connection
JA	110/50, 120/60 (2.9W)	A	18" (Flying leads)	1	Non-locking recessed	KA	Square connector
JB	220/50, 240/60 (2.9W)	B	24" (Flying leads)	2	Locking recessed	KD	Square connector with light
JC	24/60 (2.9W)	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)						

48  
400  
92

SOLENOID OPERATOR >

GM-G **XXX-XXX\*\***

XX	Voltage	X	Wire length	X	Manual operator	XX	Electrical connection
DC	24 VDC (1.8W)	A	18"	1	Non-locking recessed	BA	Flying leads
DD	24 VDC (2.5W)	B	24"	2	Locking recessed	BT	Flying leads with light
DF	24 VDC (4.0W)	C	36"			KA	Plug-in wire Assy.
						KT	Plug-in wire Assy. with light

93

\* Other options available, see page 309.  
\*\* Other options available, see page 313.

**OPTIONS**

52A-31-A0A-XX-X-XXX-XXX

For memory spring, replace by **4** (single solenoid only)

ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

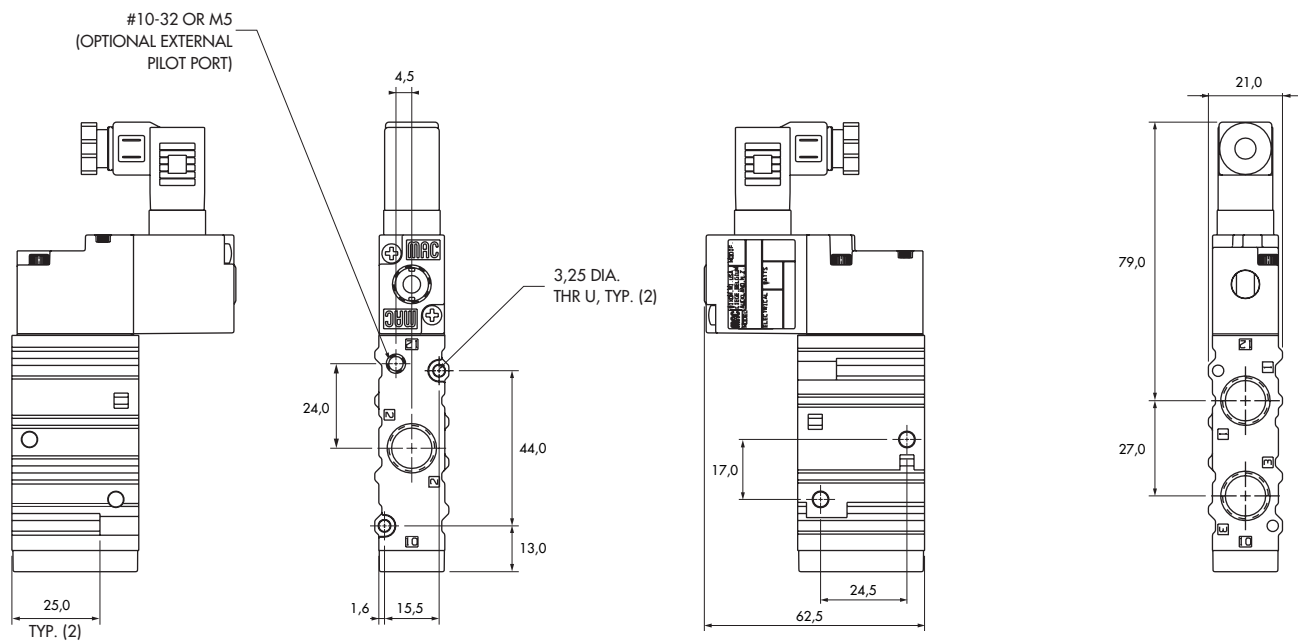
**TECHNICAL DATA**

<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>	1/8" : (1.2 C <sub>v</sub> ) – 1/4" : (1.5 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 18 lead wires
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~Inrush: 10.9 VA    Holding: 7.7 VA = 1.8 to 12.7 W
<b>Response times :</b>	24V=5.4W    Energize: 7.3 ms    De-energize: 5.3 ms 120/60    Energize: 8-12 ms    De-energize: 7-11 ms

Options :                    • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)

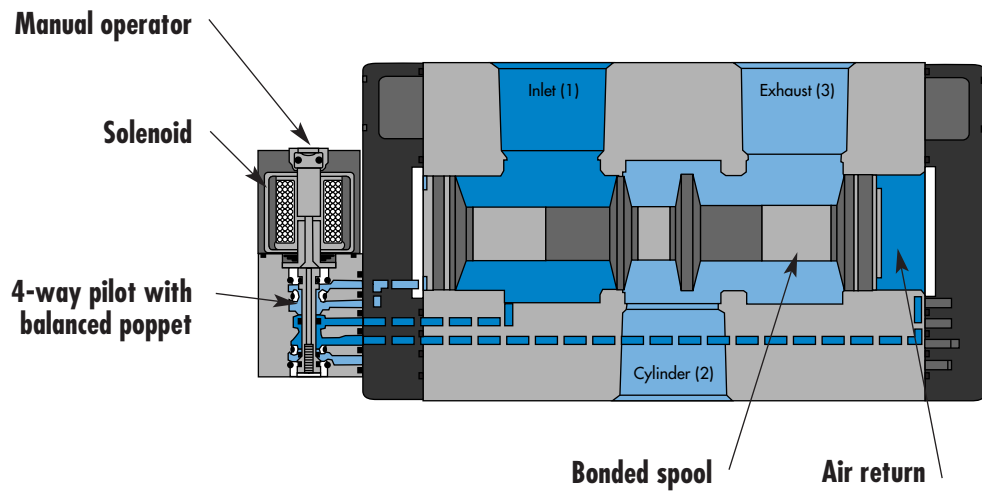


Individual mounting

Inline
--------

Series

- 33
- 34
- 36
- 32
- 37
- 38
- 52
- 67



- 69
- 44
- 46
- 42
- 47
- 48P
- 48
- 400
- 92

**SERIES FEATURES**

- Patented MACSOLENOID® for fastest possible response times and virtually burn-out proof AC solenoid operation.
- Optional low watt DC solenoids.
- Normally closed or normally open valve function.
- Optional universal spool.
- Internal or external pilot.
- Optional memory spring.
- Checked accumulator.
- Optional pilot exhaust to main valve exhaust.
- May be plugged for 2-way operation.

- 93
- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3



Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>3/4" - 1"</b>	<b>20.0 C<sub>v</sub></b>	Inline	

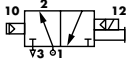
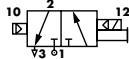
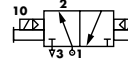
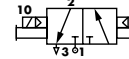
### OPERATIONAL BENEFITS

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



33  
34  
36  
32  
37  
38  
52  
**67**

### HOW TO ORDER

Port size	Pilot air	Single Operator		Double Operator	
		NO Valve	NC Valve	NO Valve	NC Valve
					
<b>3/4" NPTF</b>	Internal	67A-Cx-AAA-DM-Dxxx-xxx	67A-Ax-AAA-DM-Dxxx-xxx	67A-Dx-AAA-DM-Dxxx-xxx	67A-Bx-AAA-DM-Dxxx-xxx
<b>1" NPTF</b>		67A-Cx-BAA-DM-Dxxx-xxx	67A-Ax-BAA-DM-Dxxx-xxx	67A-Dx-BAA-DM-Dxxx-xxx	67A-Bx-BAA-DM-Dxxx-xxx
<b>3/4" NPTF</b>	External	67A-Cx-AAB-DM-Dxxx-xxx	67A-Ax-AAB-DM-Dxxx-xxx	67A-Dx-AAB-DM-Dxxx-xxx	67A-Bx-AAB-DM-Dxxx-xxx
<b>1" NPTF</b>		67A-Cx-BAB-DM-Dxxx-xxx	67A-Ax-BAB-DM-Dxxx-xxx	67A-Dx-BAB-DM-Dxxx-xxx	67A-Bx-BAB-DM-Dxxx-xxx

69  
44  
46  
42  
47  
48P

### SOLENOID OPERATOR >

### DM-D xxx-xxx\*

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>JA</b> 110/50, 120/60 (2.9W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>KA</b> Square connector
<b>JB</b> 220/50, 240/60 (2.9W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>KD</b> Square connector with light
<b>JC</b> 24/60 (2.9W)	<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.

48  
400  
92

### OPTIONS

Spool type :

67A-**XX**-AAA-DM-Dxxx-xxx

- G** Single operator universal spool
- H** Double operator universal spool

Port configuration :

67A-XX-**AXA**-DM-Dxxx-xxx

- A** Standard pilot exhaust
- B** Pilot exhaust to main exhaust\*
- C** Pilot exhaust out adapter\*
- \* Must use DU pilot. Replace DM with DU

Mounting style :

67A-XX-**XAA**-DM-Dxxx-xxx

- G** O-Ring mount

Spool return :

67A-**XX**-AAA-DM-Dxxx-xxx

- 1** Standard return
- 2** Standard return with memory spring (for use with single operator only)

Pilot style :

67A-XX-AAA-**DM**-Dxxx-xxx

- M** Pilot exhaust muffled
- P** Pilot exhaust piped (#10-32)
- U** Pilot exhaust to main exhaust

93  
ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

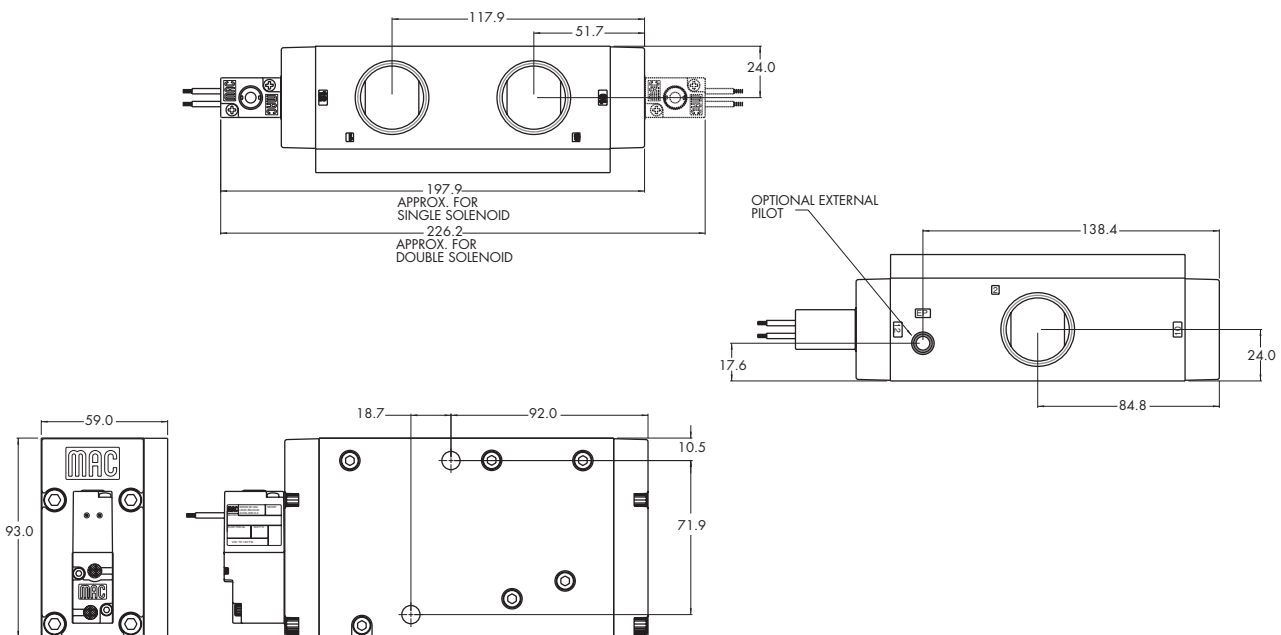
**TECHNICAL DATA**

<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>	3/4" : (14.5 C <sub>v</sub> ) – 1" : (20.0 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 18 lead wires
<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 = 12.7 to 1.0 W
<b>Response times : (with 5.4 W coil)</b>	Energize : 29 ms De-energize : 21 ms

Options :                    • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)



Individual mounting

Inline

Series

33

34

36

32

37

38

52

67

**69**

44

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48P

48

400

92

93

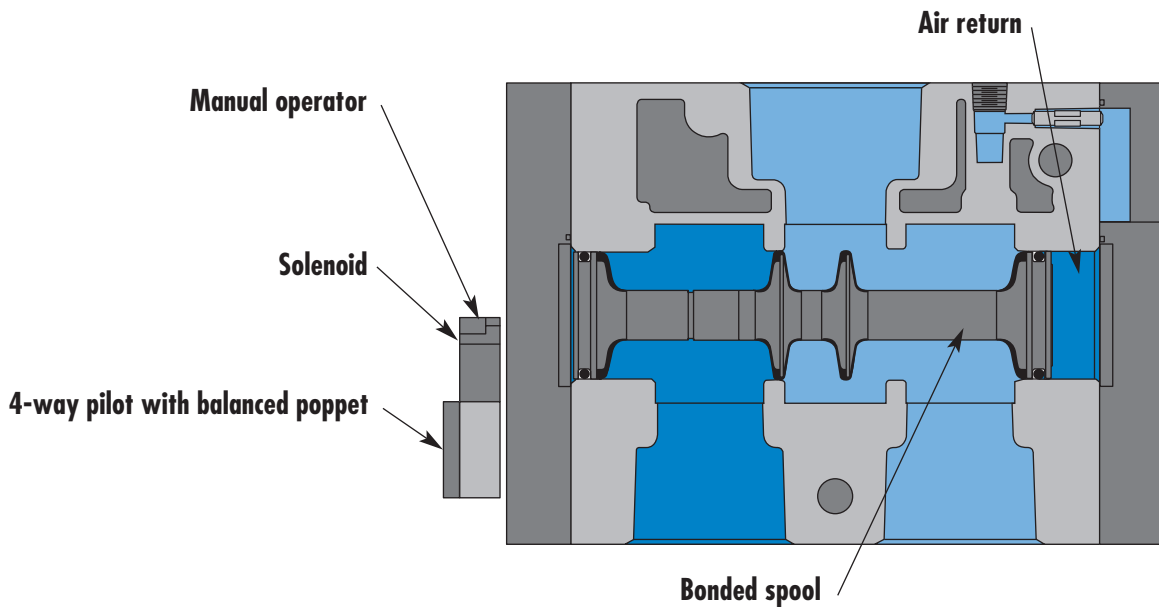
ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



**SERIES FEATURES**

- High force MACSOLENOID®.
- Optional low watt DC solenoids.
- Internal or external pilot.
- Normally open or normally closed function.
- Checked accumulator.
- May be plugged for 2-way operation.

Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1 1/2" - 2" - 2 1/2"</b>	<b>60.0 C<sub>v</sub></b>	Inline	

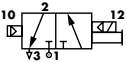
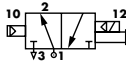
### OPERATIONAL BENEFITS

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



33  
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### HOW TO ORDER

Port size	Pilot air	Single Operator NC valve	Single Operator NO valve
			
<b>1 1/2"</b>	Internal	69A-A1-AAA-JXXX-XXX	69A-C1-AAA-JXXX-XXX
<b>2"</b>		69A-A1-BAA-JXXX-XXX	69A-C1-BAA-JXXX-XXX
<b>2 1/2"</b>		69A-A1-CAA-JXXX-XXX	69A-C1-CAA-JXXX-XXX
<b>1 1/2"</b>	External	69A-A1-AAB-JXXX-XXX	69A-C1-AAB-JXXX-XXX
<b>2"</b>		69A-A1-BAB-JXXX-XXX	69A-C1-BAB-JXXX-XXX
<b>2 1/2"</b>		69A-A1-CAB-JXXX-XXX	69A-C1-CAB-JXXX-XXX

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44  
46  
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47  
48P

### SOLENOID OPERATOR >

J **XXX-XXX\*** (-G) Add "G" for ground

XX Voltage	X Lead wire length	X Manual operator	XX Electrical connection*
<b>AA</b> 120 VAC (5,4W)	<b>0</b> No lead wire	<b>1</b> Non-locking	<b>BA</b> Flying leads
<b>DA</b> 24 VDC (5,4W)	<b>A</b> 18"	<b>2</b> Locking	<b>GA</b> MAC JAC Solenoid Plug-in
<b>DB</b> 12 VDC (5,4W)	<b>B</b> 24"		<b>GG</b> MAC JAC Solenoid Plug-in with rectifier
<b>DC</b> 24 VDC (2,4W)	<b>C</b> 36"		<b>JB</b> Rectangular connector
<b>DD</b> 12 VDC (2,4W)			<b>JD</b> Rectangular connector with light
			<b>KA</b> Mini square connector
			<b>KD</b> Mini square connector with light

48  
400  
92  
93

\* Other options available, see page 317.  
Note : use "0" No lead wire for "J", "K" and "L" type electrical connectors.  
AC voltage requires connector with rectifier.

### OPTIONS

Pilot exhaust configuration:

69A-xx-xx X-JXXX-XXX
<b>A</b> Standard pilot exhaust
<b>B</b> Pilot exhaust out main exhaust
<b>M</b> Manifold O'Ring Mount

ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

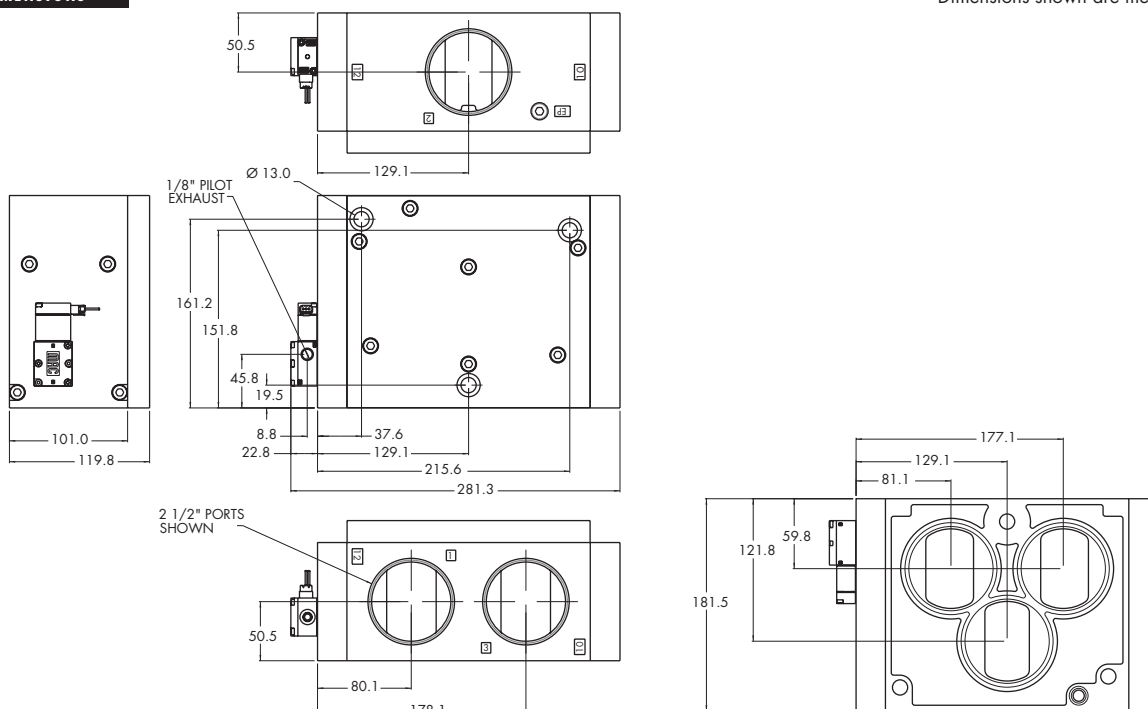
**TECHNICAL DATA**

<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>Pilot Pressure:</b>	20 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>	Cv 60.0
<b>Coil :</b>	Class A wire, #22 AWG x 18, continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	5.4W – 2.4W – 1.8W

Options : • BSPP threads

**DIMENSIONS**

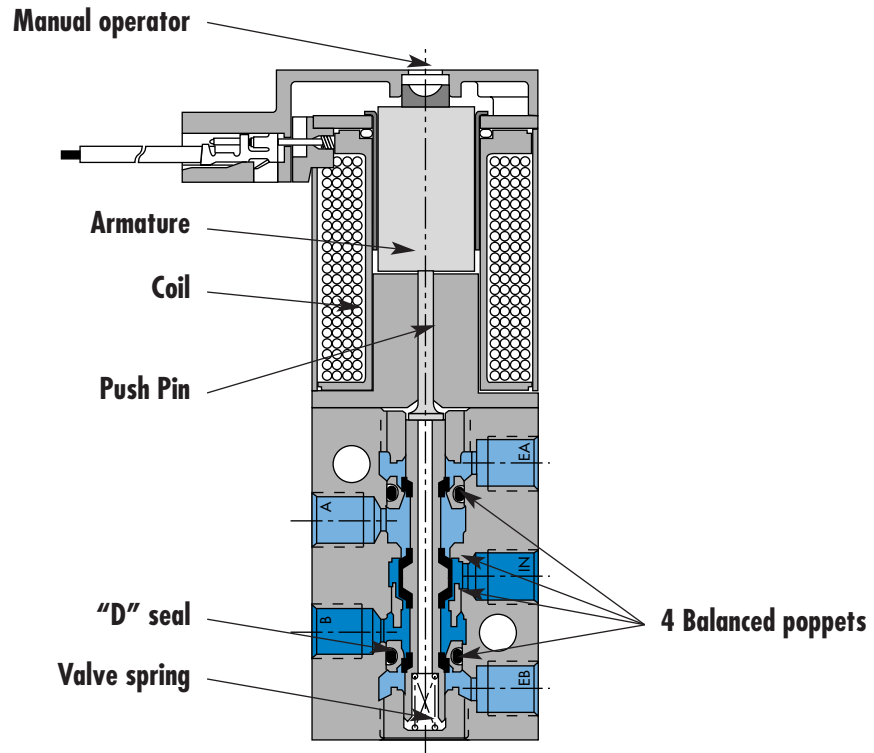
Dimensions shown are metric (mm)



Individual mounting

Series

Inline



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**44**

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47

48P

48

400

92

**SERIES FEATURES**

- High force MACSOLENOID®.
- 10mm direct operated.
- # 10-32 or M5 ports.
- Rated for lubricated or non-lubricated service.

93

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual Mounting	Series
<b>5/2</b>	<b>M5, # 10-32</b>	<b>0.1 C<sub>v</sub></b>	Inline	

### OPERATIONAL BENEFITS

1. 10 mm valve, direct solenoid operated.
2. Balanced poppet, immune to variations of pressure.
3. Short stroke with high flow.
4. The patented solenoid develops high shifting forces.
5. Powerful return spring.
6. Flow is specifically adjusted on each valve.
7. Manual operator standard on all valves.



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### HOW TO ORDER

#### SOLENOID OPERATOR

Port size	Universal valve	For use with external flow controls
<b>M5</b>	44C-ABA-G xxx-xxx	44C-BBA-G xxx-xxx
<b># 10-32</b>	44C-AAA-G xxx-xxx	44C-BAA-G xxx-xxx

44  
46  
42  
47  
48P

#### SOLENOID OPERATOR >

G **xxx-xxx\***

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>BA</b> Flying leads
<b>DC</b> 24 VDC (1.8W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>BT</b> Flying leads with light
<b>DD</b> 24 VDC (2.5W)			<b>GA</b> MAC JAC Solenoid Plug-in
<b>DF</b> 24 VDC (4.0W)			<b>KA</b> Plug-in wire assembly.
			<b>KC</b> Plug-in wire assembly with rectifier & light
			<b>KT</b> Plug-in wire assembly with light

\* Other options available, see page 311.  
Note : AC voltage requires connector with rectifier

92  
93  
ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

\* Other options available, see page 319.

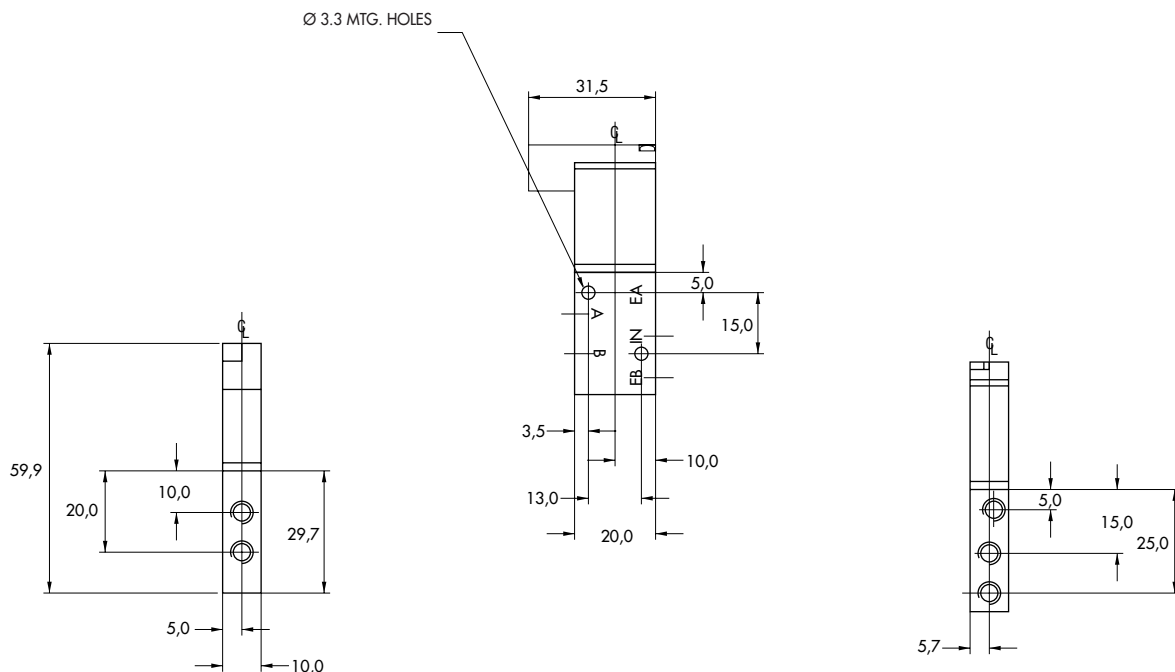
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	4 W : (0.10 C <sub>v</sub> ) – 2.5 W : (0.08 C <sub>v</sub> ) – 1.8 W : (0.06 C <sub>v</sub> ) – 1.0W : (0.05 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	4 W – 2.5 W – 1.8 W – 1.0 W
<b>Response times :</b> (with 4 W coil)	Energize : 3.4 ms De-energize : 1.5 ms

Note : • Valve and coil are not interchangeable.

**DIMENSIONS**

Dimensions shown are metric (mm)



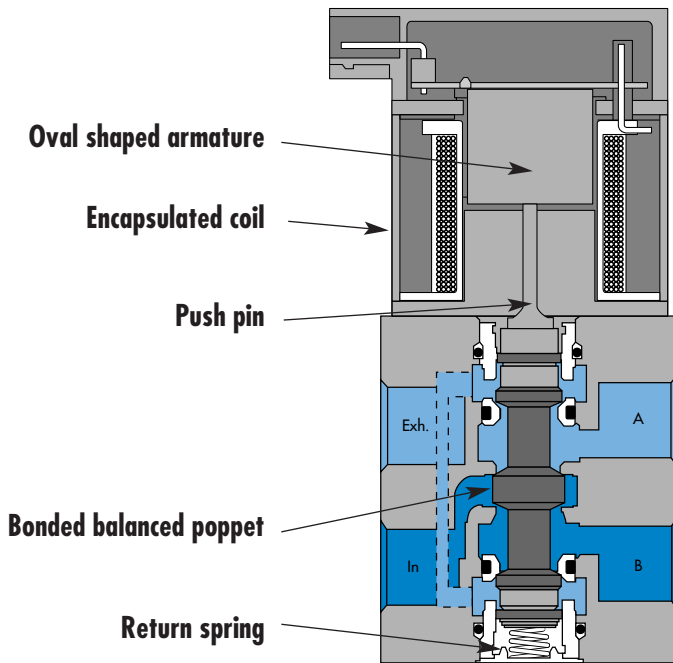


Individual mounting

Inline
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Manifold mounting

Stacking	Manifold base "plug-in"	Manifold base "plug-in" with pressure regulators	Manifold base "plug-in" with flow controls	Manifold base "plug-in" with PR & FC
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**SERIES FEATURES**

- Patented high force MACSOLENOID® for fastest possible response times.
- Bonded balanced poppet for high flow, precise repeatability, and consistent operation.
- Balanced poppet permits versatility in function — may be used as 3-way or 2-way normally open or normally closed and may be used for vacuum, divertor, or selector applications.
- Extremely high cycle rate capability.
- Use on lube or non-lube service.
- Manual overrides as standard.
- Various solenoid enclosures and plug-in connectors.
- Optional surge suppression available.
- Low wattage DC solenoids — down to 1.3 watts.
- Rectified AC voltage.

Series

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**46**

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48P

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400

92

93

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

Function	Port size	Flow [Max]	Individual mounting	Series
<b>4/2</b>	<b>1/8" - # 10-32</b>	<b>0.3 C<sub>v</sub></b>	Inline	

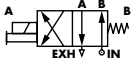
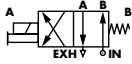
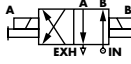
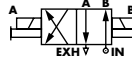
### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Patented solenoid develops high shifting forces.
3. Short stroke with high flow.
4. Higher forces result in lower wattages for given flow.
5. Powerful return spring.



33  
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69  
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### HOW TO ORDER

Port size	Single Operator		Double Operator	
	Without flow controls	With flow controls	Without flow controls	With flow controls
				
<b>1/8" NPTF</b>	46A-AA1-J XXX-XXX	46A-AA2-J XXX-XXX	46A-GA1-J XXX-XXX	46A-GA2-J XXX-XXX
<b># 10-32</b>	46A-AB1-J XXX-XXX	46A-AB2-J XXX-XXX	46A-GB1-J XXX-XXX	46A-GB2-J XXX-XXX

46  
42  
47  
48P

### SOLENOID OPERATOR >

J **XXX-XXX**\* (-G) Add "G" for ground

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>Single &amp; double solenoid</b>	<b>** O</b> No leads	<b>1</b> Non-locking recessed	<b>BA</b> Flying leads
<b>AA</b> 120 VAC (5.4W)	<b>A</b> 18"	<b>2</b> Locking recessed	<b>GA</b> MAC JAC solenoid plug-in
<b>DA</b> 24 VDC (5.4W)	<b>B</b> 24"		<b>GG</b> MAC JAC solenoid plug-in with rectifier
<b>DB</b> 12 VDC (5.4W)	<b>C</b> 36"		<b>JB</b> Rectangular connector
<b>Single solenoid only</b>			<b>JD</b> Rectangular connector with light
<b>DC</b> 24 VDC (2.4W)			<b>KA</b> Mini square connector
<b>DD</b> 12 VDC (2.4W)			<b>KD</b> Mini square connector with light

48  
400  
92  
93

\* Other options available, see page 317.

\*\* Use with rectangular and mini connectors

Note: - AC voltage requires connector with rectifier.

- With the MAC JAC, washdown capability is possible. Consult factory for washdown modification number.  
- Double solenoid requires minimum 5.4 watts.

### OPTIONS

46A-AA1-Jxxx-xxx

**G** Use with O ring mount (body option 'D' & 'H')

- A** Single operator - 4 port body with side ports
- C** Single operator - 4 port body with bottom ports (No side ports - M5 or #10-32 ONLY)
- D** Single operator - Bottom O ring mount - All ports (No side ports)
- F** Single operator - Bottom O ring mount - Cylinder ports only - Side inlet & exhaust
- G** Double operator - 4 Port body - With side ports
- H** Double operator - Bottom O ring mount - All ports (No side ports)

Examples: 46A-DG1-Jxxx-xxx (Bottom O ring mount - all ports)  
46A-CB1-Jxxx-xxx (4 port body with bottom ports - no side ports)

ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

**TECHNICAL DATA**

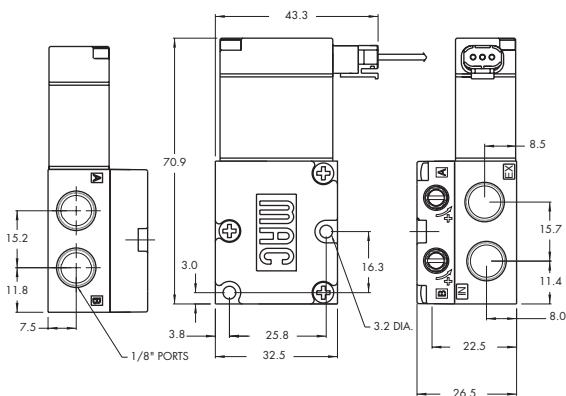
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Orifice :</b>	3,3 mm
<b>Flow :</b>	1.8W : (0.20 C <sub>v</sub> ) – 2.4W : (0.20 C <sub>v</sub> ) – 5.4W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	5.4W – 2.4W – 1.8W

Options :                   • BSPP threads

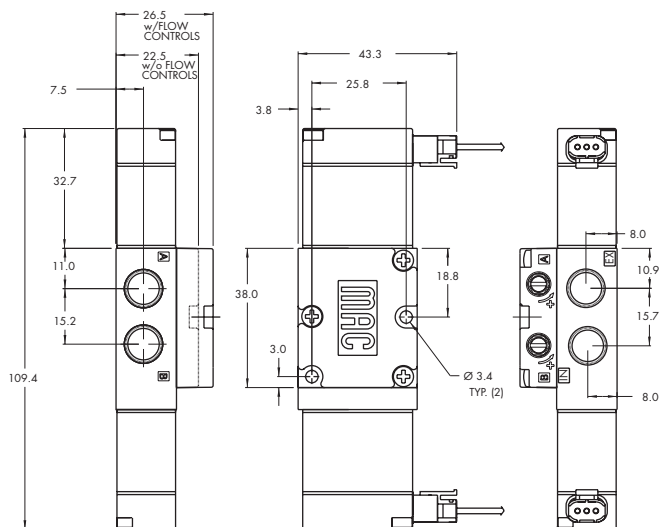
**DIMENSIONS**

Dimensions shown are metric (mm)

**Single solenoid**



**Double solenoid**





# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Manifold Mounting	Series
<b>4/2</b>	<b>1/8" - # 10-32</b>	<b>0.3 C<sub>v</sub></b>	Stacking	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Patented solenoid develops high shifting forces.
3. Short stroke with high flow.
4. Higher forces result in lower wattages for given flow.
5. Powerful return spring.



33  
34  
36  
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38  
52  
67  
69  
44

### HOW TO ORDER

Port size	Without flow controls	With flow controls
<b>1/8" NPTF</b>	46A-SA1-J <b>XXX-XXX</b>	46A-SA2-J <b>XXX-XXX</b>
<b># 10-32</b>	46A-SB1-J <b>XXX-XXX</b>	46A-SB2-J <b>XXX-XXX</b>

46  
42

### SOLENOID OPERATOR >

J **XXX-XXX\*** (-G) Add "G" for ground

XX	Voltage	X	Wire length	X	Manual operator	XX	Electrical connection
AA	120 VAC (5.4W)	A	18"	1	Non-locking recessed	BA	Flying leads
DA	24 VDC (5.4W)	B	24"	2	Locking recessed	GA	MAC JAC solenoid plug-in
DB	12 VDC (5.4W)	C	36"			GB	MAC JAC solenoid plug-in with diode
DC	24 VDC (2.4W)					GG	MAC JAC solenoid plug-in with rectifier
DD	12 VDC (2.4W)						

47  
48P  
48  
400

\* Other options available, see page 317.

Note : - AC voltage requires connector with rectifier.

- With the MAC JAC, washdown capability is possible. Consult factory for washdown modification number.

End plate kit required (port size 1/4") : M-46001-01.

92

93  
ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

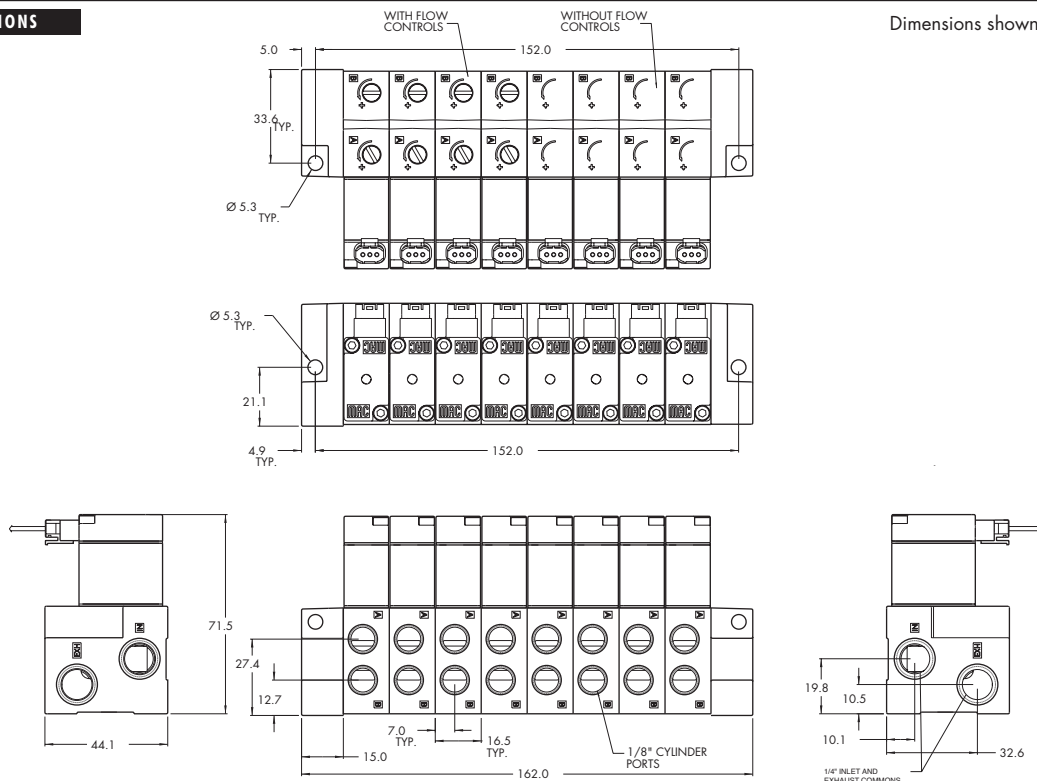
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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>	1.8W : (0.20 C <sub>v</sub> ) – 2.4W : (0.20 C <sub>v</sub> ) – 5.4W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	5.4W – 2.4W – 1.8W
<b>Response times :</b>	Energize : 7.20 ms
<b>(with 5.4 W coil)</b>	De-energize : 4.20ms

- Options : • BSPP threads
- Spare parts : • Inlet isolator : 28494 • Exhaust isolator : 28493 • Tie rod (x2) : 79411

**DIMENSIONS**

Dimensions shown are metric (mm)



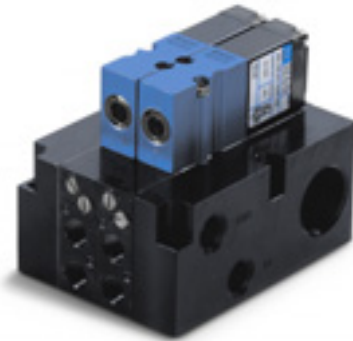


# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Manifold mounting	Series
4/2	1/8" - 5/32 O.D. Pressed-in tube receptacles	0.3 C <sub>v</sub>	Manifold base "plug-in"	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Patented solenoid develops high shifting forces.
3. Short stroke with high flow.
4. Higher forces result in lower wattages for given flow.
5. Powerful return spring.



- 33
- 34
- 36
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- 38
- 52
- 67
- 69
- 44
- 46**
- 42
- 47
- 48P

### HOW TO ORDER

Port size	Single solenoid	Double solenoid
<b>Valve less base</b>	46A-L00-00-J <b>XX</b> P- <b>XXX</b>	46A-N00-00-J <b>XX</b> P- <b>XXX</b>
<b>1/8" NPTF</b>	46A-LSA-AC-J <b>XX</b> P- <b>XXX</b>	46A-NSA-BL-J <b>XX</b> P- <b>XXX</b>
<b>5/32 O.D. Pressed-in tube receptacles</b>	46A-LSF-AC-J <b>XX</b> P- <b>XXX</b>	46A-NSF-BL-J <b>XX</b> P- <b>XXX</b>

### SOLENOID OPERATOR >

J **XX** P-**XXX**\* (-G) Add "G" for ground

XX Voltage	X Manual operator	XX Electrical connection
<b>Single &amp; double solenoid</b>		
<b>AA</b> 120 VAC (5,4W)	<b>1</b> Non-locking	<b>FA</b> Base plug-in
<b>AC</b> 24 VAC (5,4W)	<b>2</b> Locking	<b>FB</b> Base plug-in with diode
<b>DA</b> 24 VDC (5,4W)		<b>FG</b> Base plug-in with rectifier
<b>DB</b> 12 VDC (5,4W)		
<b>Single solenoid only</b>		
<b>DC</b> 24 VDC (2,4W)		
<b>DD</b> 12 VDC (2,4W)		

- 48
- 400
- 92
- 93
- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

\* Other options available, see page 317.  
 Note : AC voltage requires connector with rectifier. Double solenoid requires minimum 5.4 watts.

### OPTIONS

46A-LSB-AC-J**XX**P-**XXX**

- C** Single solenoid - Side cylinder ports
- L** Single & double solenoid - Bottom cylinder ports
- O** Base only - no valve
- L** Single solenoid - Base mount body
- M** Single solenoid - Base mount body with gage port
- N** Double solenoid - Base mount body
- P** Double solenoid - Base mount body with gage port

Example : base only : 46A-OSA-AC.  
 End plate kit required (port size 1/4") : M-46003-01.

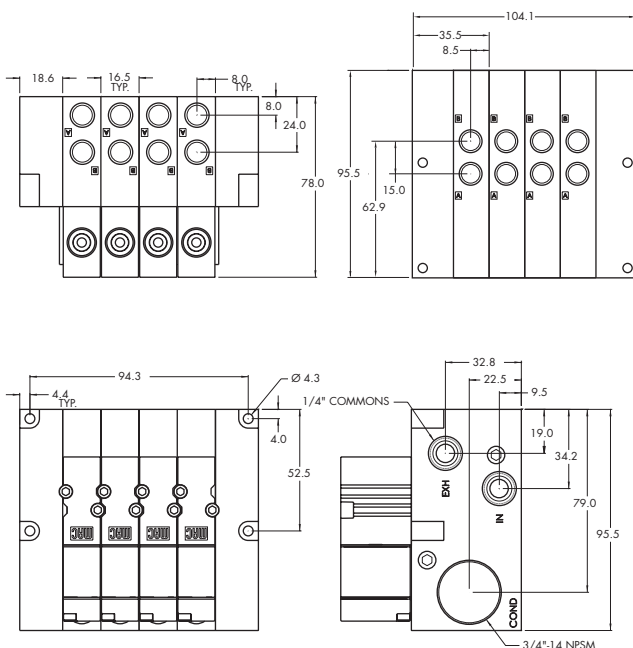
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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>Orific e</b>	3.3 mm
<b>Flow :</b>	1.8W : (0.20 C <sub>v</sub> ) – 2.4W : (0.20 C <sub>v</sub> ) – 5.4W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Epoxy encapsulated – Class A wires – 100% ED
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	IP54 (electrical connection)
<b>Power :</b>	5.4W – 2.4W – 1.8W
<b>Response times :</b>	Energize : 7.20 ms De-energize : 4.20ms

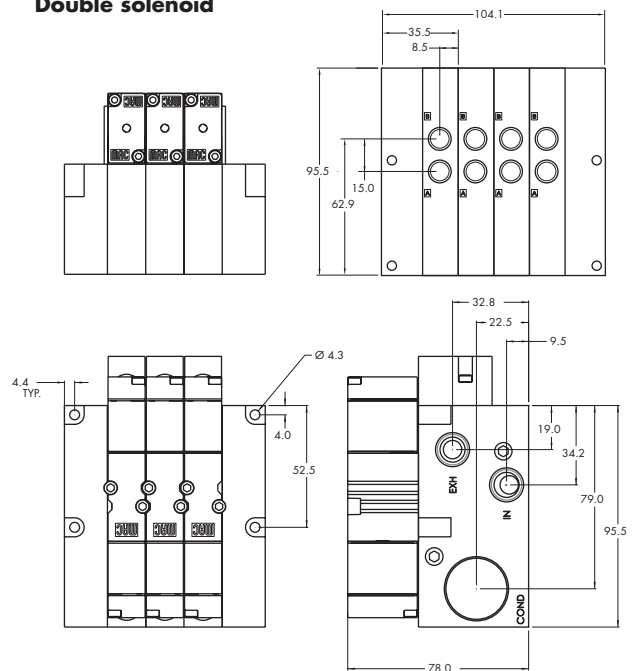
- Options :
- BSPP threads
- Spare parts :
- Inlet isolator : 28501 • Exhaust isolator : 28502 • Valve cover plate : M-46002
  - Tie rod (x2) : 79443

**DIMENSIONS**

Dimensions shown are metric (mm)



**Double solenoid**





# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Manifold mounting	Series
<b>4/2</b>	<b>1/8" - 5/32 O.D. Pressed-in tube receptacles</b>	<b>0.3 C<sub>v</sub></b>	Manifold base "plug-in" with pressure regulators	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Patented solenoid develops high shifting forces.
3. Short stroke with high flow.
4. Higher forces result in lower wattages for given flow.
5. Powerful return spring.



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67  
69  
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### HOW TO ORDER

Port size (Bottom ports only)	Model number
<b>Valve less base</b>	46A-L00-00-J <b>XXP-XXX</b>
<b>1/8" NPTF</b>	46A-LSA-AJ-J <b>XXP-XXX</b>
<b>5/32 O.D. Pressed-in tube receptacles</b>	46A-LSF-AJ-J <b>XXP-XXX</b>



46  
42

### SOLENOID OPERATOR >

J **XX** P-**XXX**\* (-G) Add "G" for ground

XX Voltage	X Manual operator	XX Electrical connection
<b>AA</b> 120 VAC (5.4W)	<b>1</b> Non-locking recessed	<b>FA</b> Base plug-in
<b>DA</b> 24 VDC (5.4W)	<b>2</b> Locking recessed	<b>FB</b> Base plug-in with diode
<b>DB</b> 12 VDC (5.4W)		<b>FG</b> Base plug-in with rectifier
<b>DC</b> 24 VDC (2.4W)		

47  
48P  
48

\* Other options available, see page 317.  
Note : AC voltage requires connector with rectifier.

### OPTIONS

46A-LSA-AJ-J**XX**P-**XXX**

J	Regulator with adjusting knob
E	Regulator with slotted stem
G	Regulator with slotted stem with locknut
O	Base only – no valve
L	Base mount body
M	Base mount body with gage port

Example : base only with regulator : 46A-0SA-AJ.  
End plate kit required (port size 1/4") : M-46003-01.

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>	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>	1.8W : (0.20 C <sub>v</sub> ) – 2.4W : (0.20 C <sub>v</sub> ) – 5.4W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	5.4W – 2.4W – 1.8W
<b>Response times :</b>	Energize : 7.20 ms
<b>(with 5.4 W coil)</b>	De-energize : 4.20ms

Options :

Spare parts :

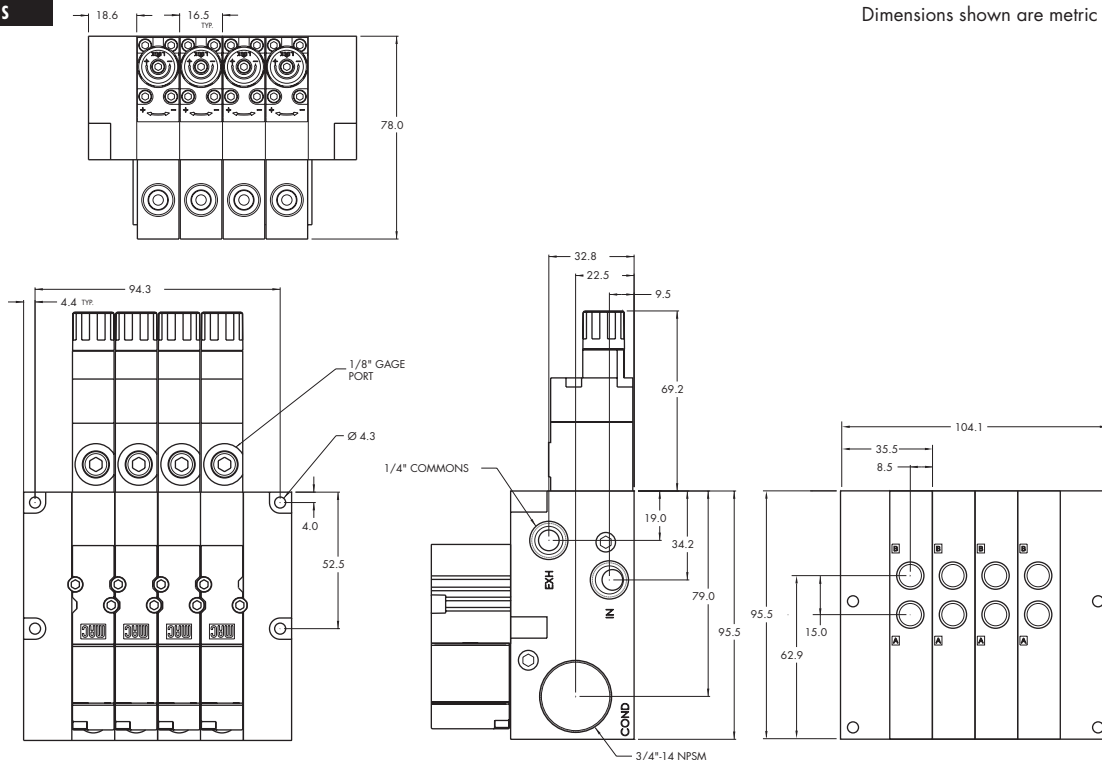
- BSPP threads
- Inlet isolator : 28501 • Exhaust isolator : 28502 • Valve cover plate : M-46002 • Tie rod (x2) : 79443
- Replacement regulators : PR46A-OAAA (slotted stem)  
PR46A-OBAA (adjusting knob)  
PR46A-OCAA (slotted stem with locknut)

Regulating range options :

- PR46A-xxx**A**
  - A** 0 to 120 PSI
  - B** 0 to 80 PSI
  - C** 0 to 30 PSI

**DIMENSIONS**

Dimensions shown are metric (mm)



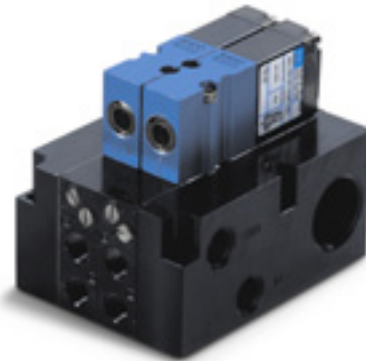


# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Manifold mounting	Series
4/2	1/8" - 5/32 O.D. Pressed-in tube receptacles	0.3 C <sub>v</sub>	Manifold base "plug-in" with flow controls	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Patented solenoid develops high shifting forces.
3. Short stroke with high flow.
4. Higher forces result in lower wattages for given flow.
5. Powerful return spring.



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48P

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ISO 01

ISO 02

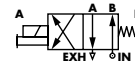
ISO 1

ISO 2

ISO 3

### HOW TO ORDER

Port size	Model number
Valve less base	46A-L00-00-J <b>XX</b> P- <b>XXX</b>
1/8" NPTF	46A-LSA-AD-J <b>XX</b> P- <b>XXX</b>
5/32 O.D. Pressed-in tube receptacles	46A-LSF-AD-J <b>XX</b> P- <b>XXX</b>



### SOLENOID OPERATOR ▶

J **XX** P-**XXX**\* (-G) Add "G" for ground

XX Voltage	X Manual operator	XX Electrical connection
AA 120 VAC (5.4W)	1 Non-locking recessed	FA Base plug-in
DA 24 VDC (5.4W)	2 Locking recessed	FB Base plug-in with diode
DB 12 VDC (5.4W)		FG Base plug-in with rectifier
DC 24 VDC (2.4W)		

\* Other options available, see page 317.  
Note: AC voltage requires connector with rectifier.

### OPTIONS

46A-LSA-AD-J**XX**P-**XXX**

- D** Side cylinder ports
- M** Bottom cylinder ports
- O** Base only – no valve
- L** Base mount body
- M** Base mount body with gage port

Example: base only with flow controls: 46A-OSA-AD.  
End plate kit required (port size 1/4"): M-46003-01.

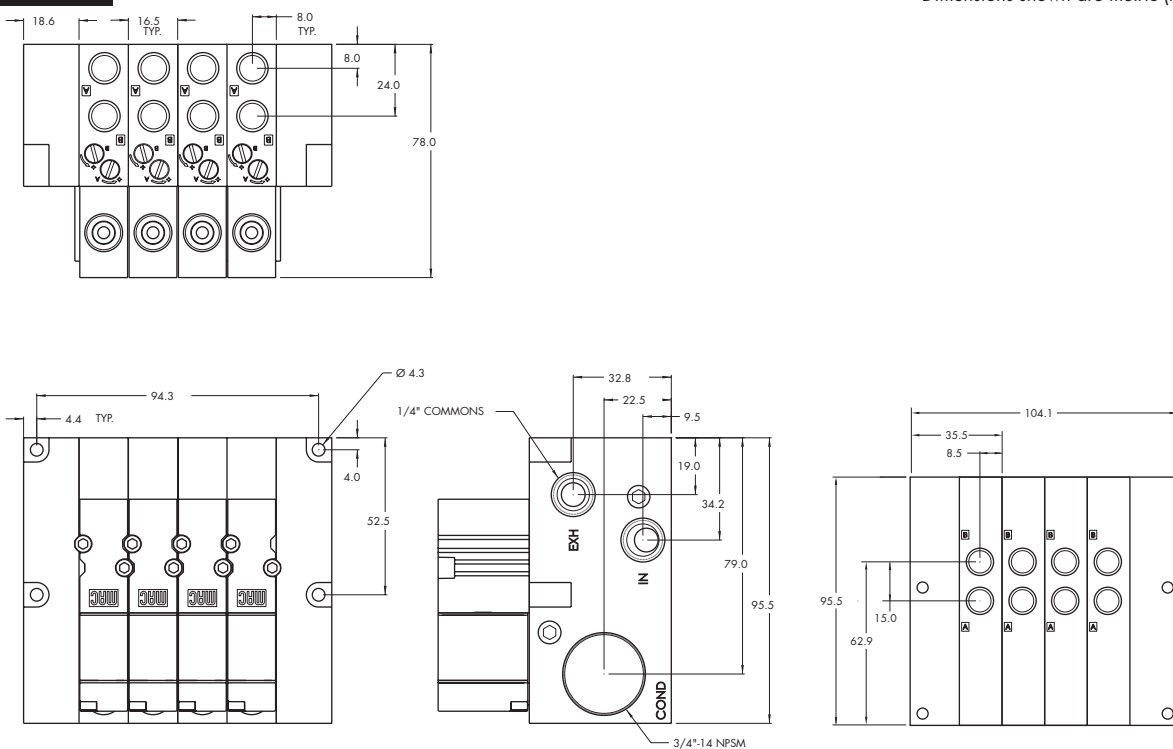
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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>	1.8W : (0.20 C <sub>v</sub> ) – 2.4W : (0.20 C <sub>v</sub> ) – 5.4W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	5.4W – 2.4W – 1.8W
<b>Response times :</b>	Energize : 7.20 ms De-energize : 4.20ms

- Options :
- BSPP threads
- Spare parts :
- Inlet isolator : 28501 • Exhaust isolator : 28502 • Valve cover plate : M-46002
  - Tie rod (x2) : 79443

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Manifold mounting	Series
<b>4/2</b>	<b>1/8" - 5/32 O.D. Pressed-in tube receptacles</b>	<b>0.3 C<sub>v</sub></b>	Manifold base "plug-in" with PR & FC	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Patented solenoid develops high shifting forces.
3. Short stroke with high flow.
4. Higher forces result in lower wattages for given flow.
5. Powerful return spring.



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67  
69  
44

### HOW TO ORDER

Port size (Bottom ports only)	Model number
Valve less base	46A-L00-00-J <b>XX</b> P- <b>XXX</b>
1/8" NPTF	46A-LSA-AK-J <b>XX</b> P- <b>XXX</b>
5/32 O.D. Pressed-in tube receptacles	46A-LSF-AK-J <b>XX</b> P- <b>XXX</b>



46  
42  
47  
48P

### SOLENOID OPERATOR >

J **XX** P-**XXX**\* (-G) Add "G" for ground

<b>XX</b> Voltage	<b>X</b> Manual operator	<b>XX</b> Electrical connection
<b>AA</b> 120 VAC (5.4W)	<b>1</b> Non-locking recessed	<b>FA</b> Base plug-in
<b>DA</b> 24 VDC (5.4W)	<b>2</b> Locking recessed	<b>FB</b> Base plug-in with diode
<b>DB</b> 12 VDC (5.4W)		<b>FG</b> Base plug-in with rectifier
<b>DC</b> 24 VDC (2.4W)		

\* Other options available, see page 317.  
Note : AC voltage requires connector with rectifier.

### OPTIONS

46A-LSA-AK-J <b>XX</b> P- <b>XXX</b>	
<b>K</b>	Regulator with adjusting knob & flow controls
<b>F</b>	Regulator with slotted stem & flow controls
<b>H</b>	Regulator with slotted stem with locknut & flow controls
<b>O</b>	Base only - no valve
<b>L</b>	Base mount body
<b>M</b>	Base mount body with gage port

Example : base only with regulator : 46A-OSA-AK.  
End plate kit required (port size 1/4") : M-46003-01.

400  
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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>	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>	1.8W : (0.20 C <sub>v</sub> ) – 2.4W : (0.20 C <sub>v</sub> ) – 5.4W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	5.4W – 2.4W – 1.8W
<b>Response times :</b>	Energize : 7.20 ms De-energize : 4.20ms

Options :

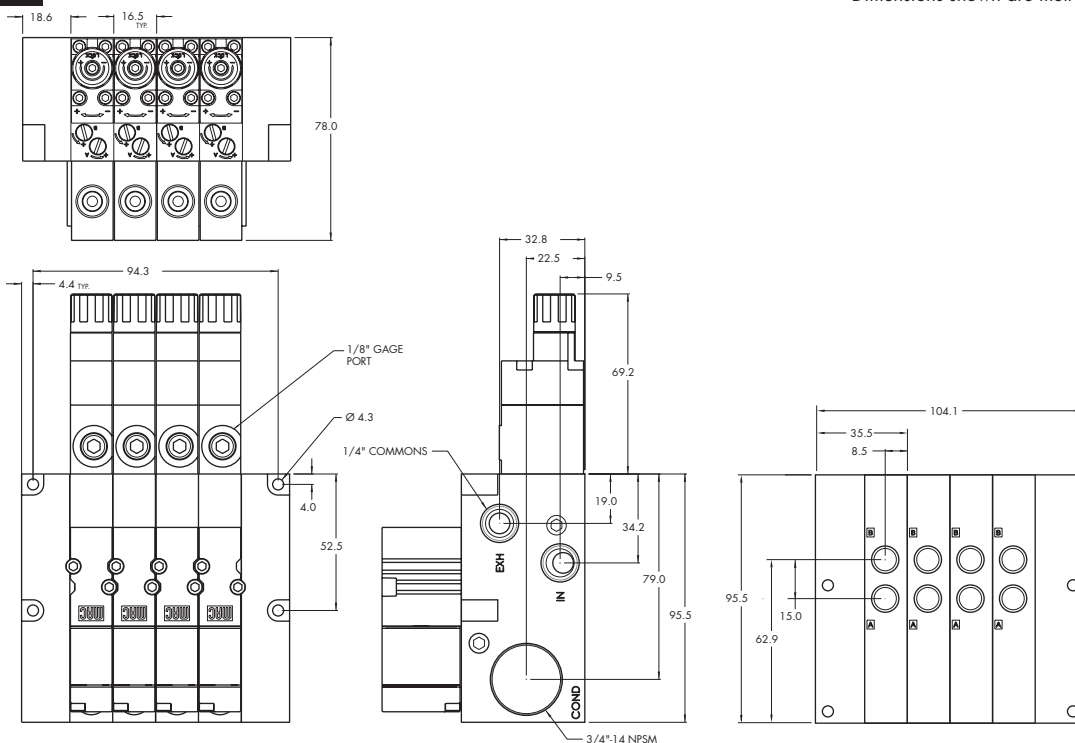
- BSPP threads
- Inlet isolator : 28501 • Exhaust isolator : 28502 • Valve cover plate : M-46002 • Tie rod (x2) : 79443
- Replacement regulators : PR46A-OAAA (slotted stem)  
PR46A-OBAA (adjusting knob)  
PR46A-OCAA (slotted stem with locknut)

Regulating range options :

- PR46A-xxx**A**
  - A** 0 to 120 PSI
  - B** 0 to 80 PSI
  - C** 0 to 30 PSI

**DIMENSIONS**

Dimensions shown are metric (mm)



Individual mounting

Sub-base non "plug-in"	Sub-base "plug-in"	Sub-base/manifold base non "plug-in" with latching solenoid	Sub-base/manifold base "plug-in" with latching solenoid
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Manifold mounting

Manifold base non "plug-in"	Manifold base "plug-in"	Sub-base/manifold base non "plug-in" with latching solenoid	Sub-base/manifold base "plug-in" with latching solenoid
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Series

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48P

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400

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92

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93

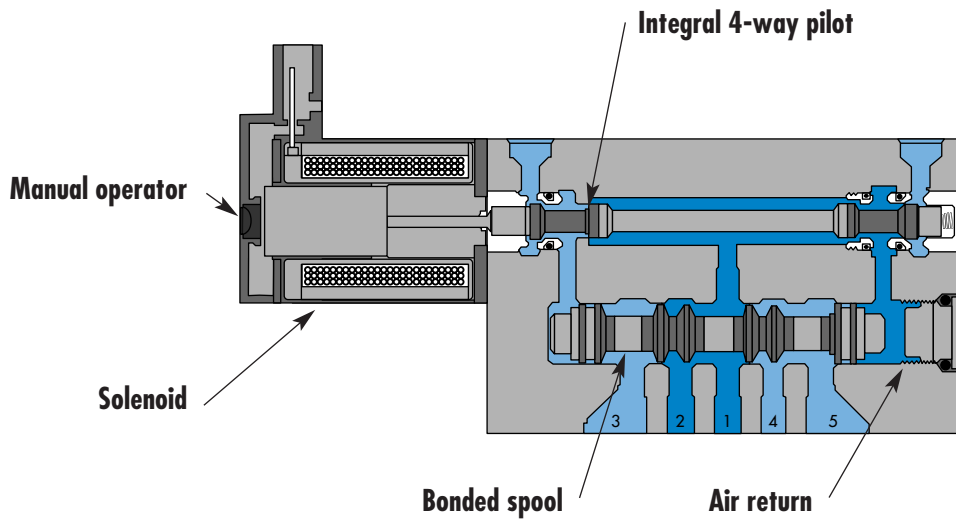
ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



**SERIES FEATURES**

- High force MACSOLENOID®.
- Integral 4-way pilot design.
- Single or dual pressure.
- Internal or external pilot.
- Single or double solenoid.
- 2 or 3 position.
- Rectified AC voltage.
- Latching solenoid technology.



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
5/2, 5/3	# 10-32 - 1/4" O.D. tube receptacle	0.4 C <sub>v</sub>	Sub-base non "plug-in"	

### OPERATIONAL BENEFITS

1. 4-way valve with 4-way integral pilot.
2. 10 mm valve (stacks on 10.5 mm centers).
3. High flow (up to 0.4 C<sub>v</sub>).
4. Fast repeatable response times.
5. Maximum shifting forces in both directions.
6. Long life.



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48P

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93

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

### HOW TO ORDER

#### SINGLE PRESSURE MODELS (VALVE WITH BASE CODED FOR SIDE PORTS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Closed center	5/3 Open center
Valve less base	Internal	42B-AMA-000-Gxxx-xxx	42B-BMA-000-Gxxx-xxx	42B-EMA-000-Gxxx-xxx	42B-FMA-000-Gxxx-xxx
	External	42B-AMD-000-Gxxx-xxx	42B-BMD-000-Gxxx-xxx	42B-EMD-000-Gxxx-xxx	42B-FMD-000-Gxxx-xxx
# 10-32	Internal	42B-AMA-AAL-Gxxx-xxx	42B-BMA-AAL-Gxxx-xxx	42B-EMA-AAL-Gxxx-xxx	42B-FMA-AAL-Gxxx-xxx
	External	42B-AMD-AAM-Gxxx-xxx	42B-BMD-AAM-Gxxx-xxx	42B-EMD-AAM-Gxxx-xxx	42B-FMD-AAM-Gxxx-xxx
1/4" O.D. tube receptacles	Internal	42B-AMA-EAL-Gxxx-xxx	42B-BMA-EAL-Gxxx-xxx	42B-EMA-EAL-Gxxx-xxx	42B-FMA-EAL-Gxxx-xxx
	External	42B-AMD-EAM-Gxxx-xxx	42B-BMD-EAM-Gxxx-xxx	42B-EMD-EAM-Gxxx-xxx	42B-FMD-EAM-Gxxx-xxx

#### DUAL PRESSURE MODELS (VALVE WITH BASE CODED FOR SIDE PORTS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Pressure center
Valve less base	Internal	Supply #3 port 42B-CMB-000-Gxxx-xxx	42B-DMB-000-Gxxx-xxx	42B-HMB-000-Gxxx-xxx
	External	Supply #5 port 42B-CMC-000-Gxxx-xxx	42B-DMC-000-Gxxx-xxx	42B-HMC-000-Gxxx-xxx
# 10-32	Internal	Supply #3 port 42B-CMB-AAL-Gxxx-xxx	42B-DMB-AAL-Gxxx-xxx	42B-HMB-AAL-Gxxx-xxx
	External	Supply #5 port 42B-CMC-AAL-Gxxx-xxx	42B-DMC-AAL-Gxxx-xxx	42B-HMC-AAL-Gxxx-xxx
1/4" O.D. tube receptacles	Internal	Supply #3 port 42B-CMB-EAL-Gxxx-xxx	42B-DMB-EAL-Gxxx-xxx	42B-HMB-EAL-Gxxx-xxx
	External	Supply #5 port 42B-CMC-EAL-Gxxx-xxx	42B-DMC-EAL-Gxxx-xxx	42B-HMC-EAL-Gxxx-xxx
		42B-CMD-AAM-Gxxx-xxx	42B-DMD-AAM-Gxxx-xxx	42B-HMD-AAM-Gxxx-xxx
		42B-CMD-EAM-Gxxx-xxx	42B-DMD-EAM-Gxxx-xxx	42B-HMD-EAM-Gxxx-xxx

#### STANDARD SOLENOID OPERATOR >

G **XXX-XXX**\*

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
AA 120 VAC (2.5W)	A 18"	1 Non-locking recessed	BA Flying leads
DC 24 VDC (1.8W)	B 24"	2 Locking recessed	BT Flying leads with light
DD 24 VDC (2.5W)	C 36"		GA MAC JAC solenoid Plug-in
DF 24 VDC (4.0W)			KA Plug-in wire assy.
			KT Plug-in wire assy. with light
			KD Plug-in wire assy. with rectifier & light & ground

Note : AC voltage requires connector with rectifier.

\* Other options available, see page 311.

Latching solenoid available for 5/2 valves.

Other options available for the 42 series valves, see page 107.

**TECHNICAL DATA**

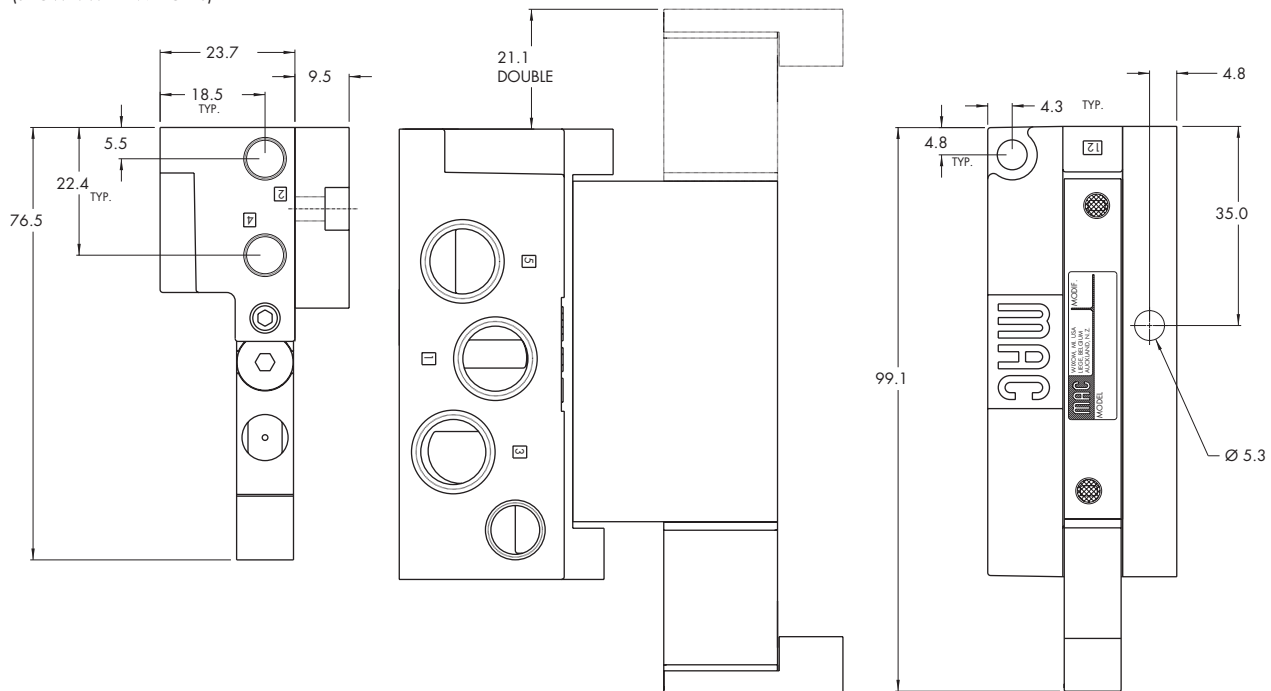
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot - 2 pos. : 20 to 120 PSI      3 pos. : 40 to 120 PSI External Pilot : vacuum to 120 PSI
<b>Pilot pressure :</b>	2 position : 20 to 120 PSI      3 position : 40 to 120 PSI
<b>Lubrication :</b>	Not required, if used 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>	# 10-32 : (0.35 C <sub>v</sub> ) – 1/4" O.D. tube receptacle : (0.4 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times :</b> (with 24V 4 W coil)	Energize : 5 ms De-energize : 5 ms

- Options :
- M5 ports, M7 ports, 6 mm O.D. tube receptacles
  - Sandwich flow controls : FC42B-BB
  - Sandwich regulator : see 'Regulator' section

**DIMENSIONS**

Dimensions shown are metric (mm)

(SHOWN WITH M7 PORTS)





Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2, 5/3</b>	<b># 10-32 - 1/4" O.D. tube receptacle</b>	<b>0.4 C<sub>v</sub></b>	Sub-base "plug-in"	

### OPERATIONAL BENEFITS

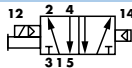
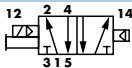
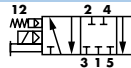
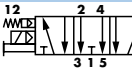
1. 4-way valve with 4-way integral pilot.
2. 10 mm valve (stacks on 10.5 mm centers).
3. High flow (up to 0.4 C<sub>v</sub>).
4. Fast repeatable response times.
5. Maximum shifting forces in both directions.
6. Long life.



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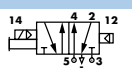
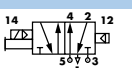
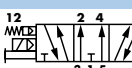
### HOW TO ORDER

SINGLE PRESSURE MODELS (LED STANDARD EXCEPT FOR SINGLE SOLENOIDS) - MODELS CODED FOR SIDE PORTS

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Closed center	5/3 Open center
					
<b>Valve less base</b>	Internal	42B-AMA-000-GxxP-xxx	42B-BME-000-GxxP-xST	42B-EME-000-GxxP-xST	42B-FME-000-GxxP-xST
	External	42B-AMD-000-GxxP-xxx	42B-BMH-000-GxxP-xST	42B-EMH-000-GxxP-xST	42B-FMH-000-GxxP-xST
<b># 10-32</b>	Internal	42B-AMA-AAA-GxxP-xxx	42B-BME-AAC-GxxP-xST	42B-EME-AAC-GxxP-xST	42B-FME-AAC-GxxP-xST
	External	42B-AMD-AAB-GxxP-xxx	42B-BMH-AAD-GxxP-xST	42B-EMH-AAD-GxxP-xST	42B-FMH-AAD-GxxP-xST
<b>1/4" O.D. tube receptacles</b>	Internal	42B-AMA-EAA-GxxP-xxx	42B-BME-EAC-GxxP-xST	42B-EME-EAC-GxxP-xST	42B-FME-EAC-GxxP-xST
	External	42B-AMD-EAB-GxxP-xxx	42B-BMH-EAD-GxxP-xST	42B-EMH-EAD-GxxP-xST	42B-FMH-EAD-GxxP-xST

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48P

DUAL PRESSURE MODELS (LED STANDARD EXCEPT FOR SINGLE SOLENOIDS) - MODELS CODED FOR SIDE PORTS

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Pressure center
				
<b>Valve less base</b>	Internal	Supply #3 port 42B-CMB-000-GxxP-xxx	42B-DMF-000-GxxP-xST	42B-HMF-000-GxxP-xST
	Internal	Supply #5 port 42B-CMC-000-GxxP-xxx	42B-DMG-000-GxxP-xST	42B-HMG-000-GxxP-xST
	External	42B-CMD-000-GxxP-xxx	42B-DMH-000-GxxP-xST	42B-HMH-000-GxxP-xST
<b># 10-32</b>	Internal	Supply #3 port 42B-CMB-AAA-GxxP-xxx	42B-DMF-AAC-GxxP-xST	42B-HMF-AAC-GxxP-xST
	Internal	Supply #5 port 42B-CMC-AAA-GxxP-xxx	42B-DMG-AAC-GxxP-xST	42B-HMG-AAC-GxxP-xST
	External	42B-CMD-AAB-GxxP-xxx	42B-DMH-AAD-GxxP-xST	42B-HMH-AAD-GxxP-xST
<b>1/4" O.D. tube receptacles</b>	Internal	Supply #3 port 42B-CMB-EAA-GxxP-xxx	42B-DMF-EAC-GxxP-xST	42B-HMF-EAC-GxxP-xST
	Internal	Supply #5 port 42B-CMC-EAA-GxxP-xxx	42B-DMG-EAC-GxxP-xST	42B-HMG-EAC-GxxP-xST
	External	42B-CMD-EAB-GxxP-xxx	42B-DMH-EAD-GxxP-xST	42B-HMH-EAD-GxxP-xST

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STANDARD SOLENOID OPERATOR >

G **XX** P-**XXX**\*

XX	Voltage	X	Manual operator	XX	Electrical connection
AA	120 VAC (2.5W)	1	Non-locking recessed	ST	Base plug-in
DC	24 VDC (1.8W)	2	Locking recessed	SA	Base plug-in
DD	24 VDC (2.5W)			SJ	Base plug-in with light
DF	24 VDC (4.0W)			SS	Base plug-in with rectifier & light & ground

Note : AC voltage requires connector with rectifier (for double solenoid consult factory).

\* Other options available, see page 311.

Other options available for the 42 series valves, see page 108.

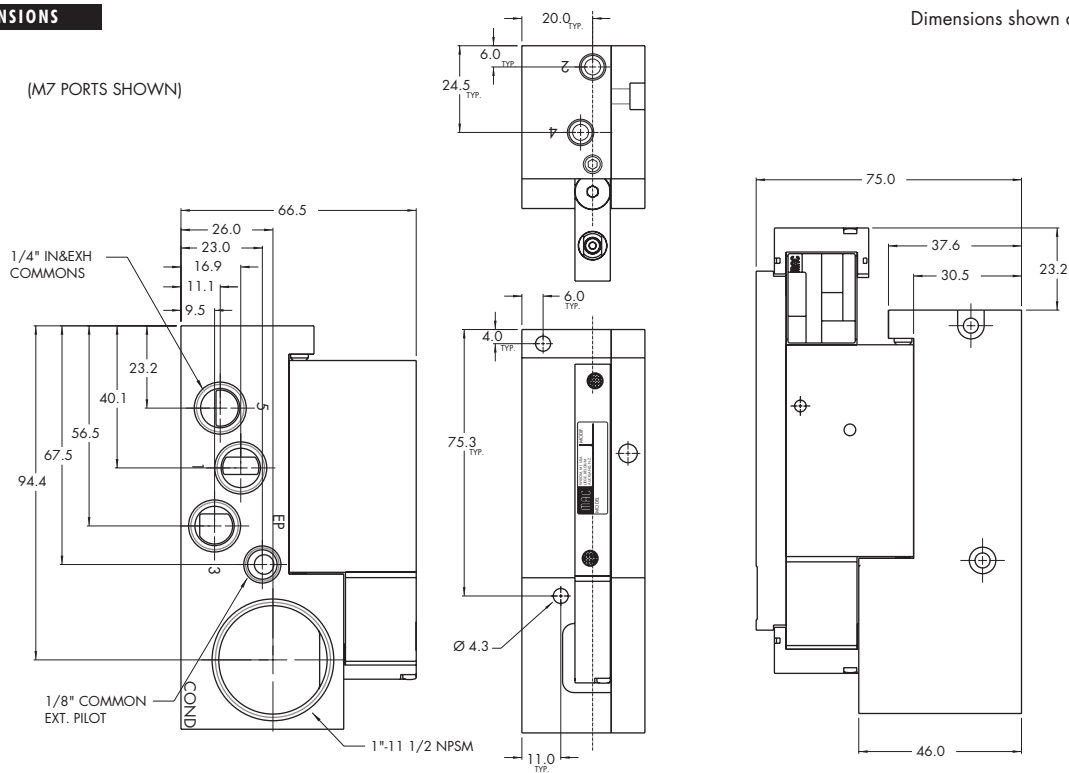
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot - 2 pos. : 20 to 120 PSI      3 pos. : 40 to 120 PSI External Pilot : vacuum to 120 PSI
<b>Pilot pressure :</b>	2 position : 20 to 120 PSI      3 position : 40 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>	# 10-32 : (0.35 C <sub>v</sub> ) – 1/4" O.D. tube receptacle : (0.4 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times :</b> (with 24V 4 W coil)	Energize : 5 ms De-energize : 5 ms

- Options :
- M5 ports, M7 ports, 6 mm O.D. tube receptacles
  - Sandwich flow controls : FC42B-AB
  - Sandwich regulator : see 'Regulator' section

**DIMENSIONS**

Dimensions shown are metric (mm)





# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Manifold mounting	Series
5/2, 5/3	# 10-32 - 1/4" O.D. tube receptacle	0.4 C <sub>v</sub>	Manifold base non "plug-in"	

### OPERATIONAL BENEFITS

1. 4-way valve with 4-way integral pilot.
2. 10 mm valve (stacks on 10.5 mm centers).
3. High flow (up to 0.4 C<sub>v</sub>).
4. Fast repeatable response times.
5. Maximum shifting forces in both directions.
6. Long life.



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### HOW TO ORDER

#### SINGLE PRESSURE MODELS (MIDDLE STATION MANIFOLDS WITH SIDE PORTS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Closed center	5/3 Open center
Valve less base	Internal	42B-AMA-000-Gxxx-xxx	42B-BMA-000-Gxxx-xxx	42B-EMA-000-Gxxx-xxx	42B-FMA-000-Gxxx-xxx
	External	42B-AMD-000-Gxxx-xxx	42B-BMD-000-Gxxx-xxx	42B-EMD-000-Gxxx-xxx	42B-FMD-000-Gxxx-xxx
# 10-32	Internal	42B-AMA-AJL-Gxxx-xxx	42B-BMA-AJL-Gxxx-xxx	42B-EMA-AJL-Gxxx-xxx	42B-FMA-AJL-Gxxx-xxx
	External	42B-AMD-AJM-Gxxx-xxx	42B-BMD-AJM-Gxxx-xxx	42B-EMD-AJM-Gxxx-xxx	42B-FMD-AJM-Gxxx-xxx
1/4" O.D. tube receptacles	Internal	42B-AMA-EJL-Gxxx-xxx	42B-BMA-EJL-Gxxx-xxx	42B-EMA-EJL-Gxxx-xxx	42B-FMA-EJL-Gxxx-xxx
	External	42B-AMD-EJM-Gxxx-xxx	42B-BMD-EJM-Gxxx-xxx	42B-EMD-EJM-Gxxx-xxx	42B-FMD-EJM-Gxxx-xxx

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#### DUAL PRESSURE MODELS (MIDDLE STATION MANIFOLDS WITH SIDE PORTS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Pressure center
Valve less base	Internal	Supply #3 port	42B-CMB-000-Gxxx-xxx	42B-DMB-000-Gxxx-xxx
		Supply #5 port	42B-CMC-000-Gxxx-xxx	42B-DMC-000-Gxxx-xxx
	External		42B-CMD-000-Gxxx-xxx	42B-DMD-000-Gxxx-xxx
# 10-32	Internal	Supply #3 port	42B-CMB-AJL-Gxxx-xxx	42B-DMB-AJL-Gxxx-xxx
		Supply #5 port	42B-CMC-AJL-Gxxx-xxx	42B-DMC-AJL-Gxxx-xxx
	External		42B-CMD-AJM-Gxxx-xxx	42B-DMD-AJM-Gxxx-xxx
1/4" O.D. tube receptacles	Internal	Supply #3 port	42B-CMB-EJL-Gxxx-xxx	42B-DMB-EJL-Gxxx-xxx
		Supply #5 port	42B-CMC-EJL-Gxxx-xxx	42B-DMC-EJL-Gxxx-xxx
	External		42B-CMD-EJM-Gxxx-xxx	42B-DMD-EJM-Gxxx-xxx

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#### STANDARD SOLENOID OPERATOR >

G **XXX-XXX\***

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
AA 120 VAC (2.5W)	A 18"	1 Non-locking recessed	BA Flying leads
DC 24 VDC (1.8W)	B 24"	2 Locking recessed	BT Flying leads with light
DD 24 VDC (2.5W)	C 36"		GA MAC JAC solenoid plug-in
DF 24 VDC (4.0W)			KA Plug-in wire assy.
			KT Plug-in wire assy. with light
			KD Plug-in wire assy. with rectifier & light & ground

Note : - AC voltage requires connector with rectifier.

\* Other options available, see page 311.

Latching solenoid available for 5/2 valves.

Manifold assemblies consist of (1) left end manifold, (1) right end manifold, and middle station manifolds (options "J" or "K").

Other options available for the 42 series valves, see page 107.

**TECHNICAL DATA**

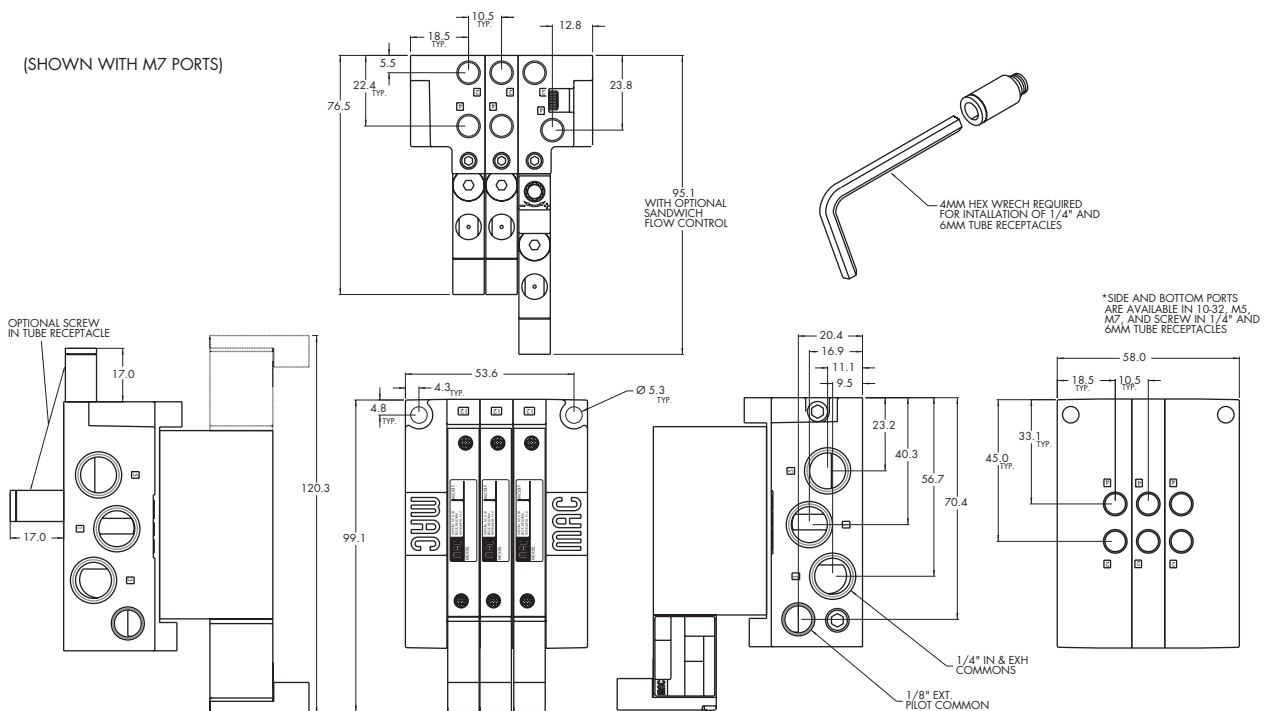
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot - 2 pos. : 20 to 120 PSI      3 pos. : 40 to 120 PSI External Pilot : vacuum to 120 PSI
<b>Pilot pressure :</b>	2 position : 20 to 120 PSI      3 position : 40 to 120 PSI
<b>Lubrication :</b>	Not required, if used 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>	# 10-32 : (0.35 C <sub>v</sub> ) – 1/4" O.D. tube receptacle : (0.4 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times :</b> (with 24V 4 W coil)	Energize : 5 ms De-energize : 5 ms

Options :

- M5 ports, M7 ports, 6 mm O.D. tube receptacles
- Sandwich flow controls : FC42B-BB
- Sandwich regulator : see "regulators" section
- Isolator disk for inlet or exhaust: 28454
- Valve blanking plate : M-42004

**DIMENSIONS**

Dimensions shown are metric (mm)





# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Manifold mounting	Series
5/2, 5/3	# 10-32 - 1/4" O.D. tube receptacle	0.4 C <sub>v</sub>	Manifold base "plug-in"	

### OPERATIONAL BENEFITS

1. 4-way valve with 4-way integral pilot.
2. 10 mm valve (stacks on 10.5 mm centers).
3. High flow (up to 0.4 C<sub>v</sub>).
4. Fast repeatable response times.
5. Maximum shifting forces in both directions.
6. Long life.



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ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

### HOW TO ORDER

SINGLE PRESSURE MODELS (LED STANDARD EXCEPT FOR SINGLE SOLENOIDS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Closed center	5/3 Open center
Valve less base	Internal	42B-AMA-000-GxxP-xxx	42B-BME-000-GxxP-xST	42B-EME-000-GxxP-xST	42B-FME-000-GxxP-xST
	External	42B-AMD-000-GxxP-xxx	42B-BMH-000-GxxP-xST	42B-EMH-000-GxxP-xST	42B-FMH-000-GxxP-xST
# 10-32	Internal	42B-AMA-AJA-GxxP-xxx	42B-BME-AJC-GxxP-xST	42B-EME-AJC-GxxP-xST	42B-FME-AJC-GxxP-xST
	External	42B-AMD-AJB-GxxP-xxx	42B-BMH-AJD-GxxP-xST	42B-EMH-AJD-GxxP-xST	42B-FMH-AJD-GxxP-xST
1/4" O.D. tube receptacles	Internal	42B-AMA-EJA-GxxP-xxx	42B-BME-EJC-GxxP-xST	42B-EME-EJC-GxxP-xST	42B-FME-EJC-GxxP-xST
	External	42B-AMD-EJB-GxxP-xxx	42B-BMH-EJD-GxxP-xST	42B-EMH-EJD-GxxP-xST	42B-FMH-EJD-GxxP-xST

DUAL PRESSURE MODELS (LED STANDARD EXCEPT FOR SINGLE SOLENOIDS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Pressure center
Valve less base	Internal	Supply #3 port 42B-CMB-000-GxxP-xxx	42B-DMF-000-GxxP-xST	42B-HMF-000-GxxP-xST
	External	Supply #5 port 42B-CMC-000-GxxP-xxx	42B-DMG-000-GxxP-xST	42B-HMG-000-GxxP-xST
# 10-32	Internal	Supply #3 port 42B-CMB-AJA-GxxP-xxx	42B-DMF-AJC-GxxP-xST	42B-HMF-AJC-GxxP-xST
	External	Supply #5 port 42B-CMC-AJA-GxxP-xxx	42B-DMG-AJC-GxxP-xST	42B-HMG-AJC-GxxP-xST
1/4" O.D. tube receptacles	Internal	Supply #3 port 42B-CMB-EJA-GxxP-xxx	42B-DMF-EJC-GxxP-xST	42B-HMF-EJC-GxxP-xST
	External	Supply #5 port 42B-CMC-EJA-GxxP-xxx	42B-DMG-EJC-GxxP-xST	42B-HMG-EJC-GxxP-xST

STANDARD SOLENOID OPERATOR >

G **XX** P-**XXX**\*

Above numbers are middle station manifolds with side ports

XX Voltage	X Manual operator	XX Electrical connection
AA 120 VAC (2.5W)	1 Non-locking recessed	Double solenoid & 3 position models
DC 24 VDC (1.8W)	2 Locking recessed	ST Base plug-in
DD 24 VDC (2.5W)		Single solenoid models
DF 24 VDC (4.0W)		SA Base plug-in
		SJ Base plug-in with light
		SS Base plug-in with rectifier & light & ground

\* Other options available, see page 311.

\*\* Latching solenoid available for 5/2 valves.

Note : - AC voltage requires connector with rectifier (for double solenoid consult factory).

- Manifold assemblies consist of (1) left end manifold, (1) right end manifold, and middle station manifolds (options "J" or "K").

Other options available for the 42 series valves, see page 108.

**TECHNICAL DATA**

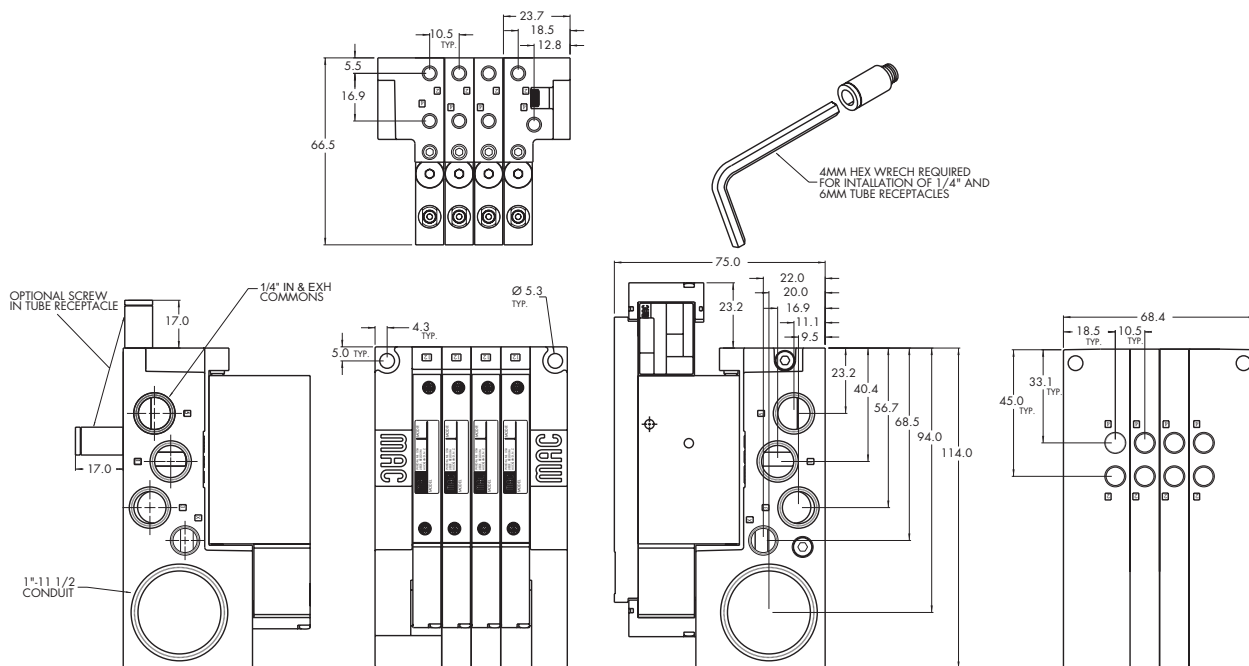
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot - 2 pos. : 20 to 120 PSI      3 pos. : 40 to 120 PSI External Pilot : vacuum to 120 PSI
<b>Pilot pressure :</b>	2 position : 20 to 120 PSI      3 position : 40 to 120 PSI
<b>Lubrication :</b>	Not required, if used 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>	# 10-32 : (0.35 C <sub>v</sub> ) – 1/4" O.D. tube receptacle : (0.4 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times :</b> (with 24V 4 W coil)	Energize : 5 ms De-energize : 5 ms

Options :

- M5 ports, M7 ports, 6 mm O.D. tube receptacles
- Sandwich flow controls : FC42B-AB
- Sandwich regulator : see "regulators" section
- Isolator disk for inlet or exhaust: 28454
- Valve blanking plate : M-42004
- Plug-in wire protector : 24180

**DIMENSIONS**

Dimensions shown are metric (mm)



<b>OPTIONS FOR NON PLUG-IN VALVES</b>	<b>33</b>
<b>Base type :</b>	<b>34</b>
<b>Individual base</b>	<b>36</b>
42B-XXX- <b>AX</b> -Gxxx-xxx	
<b>A</b> Individual base – Side ports	
<b>B</b> Individual base – Bottom ports	
<b>Manifold base</b>	<b>32</b>
42B-XXX- <b>XJX</b> -Gxxx-xxx	
<b>J</b> Manifold base – Side ports	
<b>K</b> Manifold base – Bottom ports	
<b>L</b> Left end manifold base – Side ports	<b>37</b>
<b>M</b> Left end manifold base – Bottom ports	<b>38</b>
<b>N</b> Right end manifold base – Side ports	<b>52</b>
<b>P</b> Right end manifold base – Bottom ports	<b>67</b>
<b>Universal spool</b>	<b>69</b>
42B- <b>RXX</b> -XXX-Gxxx-xxx	
<b>R</b> 2 position single solenoid universal spool	
<b>S</b> 2 position double solenoid universal spool	<b>44</b>
<b>Base only :</b>	<b>46</b>
42B-000-XXX (i.e. 42B-000-AAL) - Individual base	
42B-000-XXX (i.e. 42B-000-AJL) - Manifold base	
<b>Pilot style :</b>	<b>42</b>
42B- <b>XM</b> X-XXX-Gxxx-xxx	
<b>M</b> Pilot exhaust muffled	<b>47</b>
<b>P</b> Pilot exhaust piped (# 10-32)	<b>48P</b>
<b>U</b> Pilot exhaust to main exhaust	
	<b>48</b>
	<b>400</b>
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	<b>93</b>
	<b>ISO 01</b>
	<b>ISO 02</b>
	<b>ISO 1</b>
	<b>ISO 2</b>
	<b>ISO 3</b>

**OPTIONS FOR  
PLUG-IN VALVES**

**Base type :**

**Individual base**

42B-XXX-**XAX**-GxxP-xxx

- A** Individual base – Side ports
- B** Individual base – Bottom ports

**Manifold base**

42B-XXX-**XJX**-GxxP-xxx

- J** Manifold base – Side ports
- K** Manifold base – Bottom ports
- L** Left end manifold base – Side ports
- M** Left end manifold base – Bottom ports
- N** Right end manifold base – Side ports
- P** Right end manifold base – Bottom ports

**Universal spool**

42B-**RXX**-XXX-GxxP-xxx

- R** 2 position single solenoid universal spool
- S** 2 position double solenoid universal spool

**Base only :**

42B-000-XXX (i.e. 42B-000-AAC)

- Individual base wired for a double solenoid

42B-000-XXX (i.e. 42B-000-AJA)

- Manifold base wired for a single solenoid

**For LED with diode (2 & 3 position double solenoid valves)**

42B-XX**J**-XXX-GxxP-xST

- J** Internal pilot single pressure
- K** Internal pilot dual pressure supply from #3 port
- L** Internal pilot dual pressure supply from #5 port
- M** External pilot

**Pilot style :**

42B-**XM**X-XXX-GxxP-xxx

- M** Pilot exhaust muffled
- P** Pilot exhaust piped (# 10-32)
- U** Pilot exhaust to main exhaust



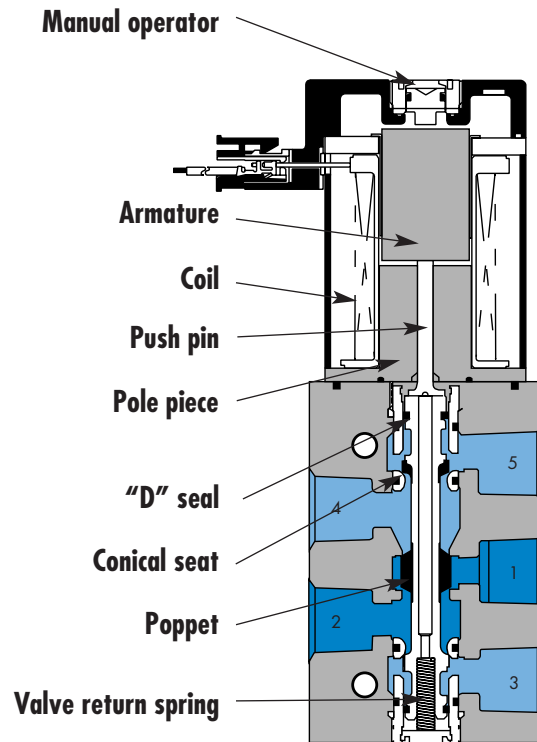
Individual mounting

Inline	Sub-base non "plug-in"
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Series

Manifold mounting

Stacking	Manifold base "plug-in"
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**47**

48P

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400

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92

**SERIES FEATURES**

- Short stroke solenoid produces high energization shifting force.
- High force return spring due to high force solenoid maximizes both energization and de-energization shifting forces.
- Built-in wear compensation - valve stroke is shorter than solenoid stroke.
- Four (4) bonded balanced poppets on a one-piece valve stem.
- End poppets seal first on conical seats and cushion inlet poppet, eliminating cutting.
- Exhaust seals are not under inlet pressure thus reducing friction.
- Short stroking balanced poppet allows for direct solenoid operation with high shifting forces, minimized friction, fast response and high flow in a small package.

93

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow (Max)	Individual Mounting	Series
<b>5/2</b>	<b>1/8" - 1/4"</b>	<b>0.5 C<sub>v</sub></b>	Inline	

### OPERATIONAL BENEFITS

- Short stroke solenoid produces high energization shifting force.
- High force return spring due to high force solenoid maximizes both energization and de-energization shifting forces.
- Built-in wear compensation – valve stroke is shorter than solenoid stroke.
- Four bonded balanced poppets on a one-piece valve stem.
- End poppets seal first on conical seats and cushion inlet poppet, eliminating cutting.
- Exhaust seals are not under inlet pressure thus reducing friction.
- Integral non-rising flow controls available on inline models.
- Short stroking balanced poppet allows for direct solenoid operation with high shifting forces, minimized friction, fast response and high flow in a small package.



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- 46
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### HOW TO ORDER

Port size	Without flow controls	With flow controls
<b>1/8" NPTF</b>	47A-AA0-H <b>XXX-XXX</b>	47A-BA0-H <b>XXX-XXX</b>
<b>1/4" NPTF</b>	47A-AB0-H <b>XXX-XXX</b>	47A-BB0-H <b>XXX-XXX</b>

### SOLENOID OPERATOR >

H **XXX-XXX\***

XX Voltage	X Lead Wire length	X Manual operator	XX Electrical connection
<b>DA</b> 24 VDC (5.2W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>MA</b> Plug-in wire assembly
<b>DB</b> 24 VDC (2.4W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>MC</b> Plug-in wire assembly with light
<b>DC</b> 24 VDC (1.8W)	<b>C</b> 36"		<b>BA</b> Flying leads
<b>DD</b> 24 VDC (1.0W)			<b>BC</b> Flying leads with light
<b>AA</b> 120 VAC (6.7W)			<b>MT</b> Plug-in wire assembly with rectifier & light

\* Other options available, see page 315.  
Note: AC voltage requires connector with rectifier.

\* Other options available, see page 319.

### OPTIONS

#### Namur Mount Option (w/o flow controls)

47A-CXO-H**XXX-XXX**

- A** 1/8" NPTF
- B** 1/4" NPTF

- 47
- 48P
- 48
- 400
- 92
- 93
- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

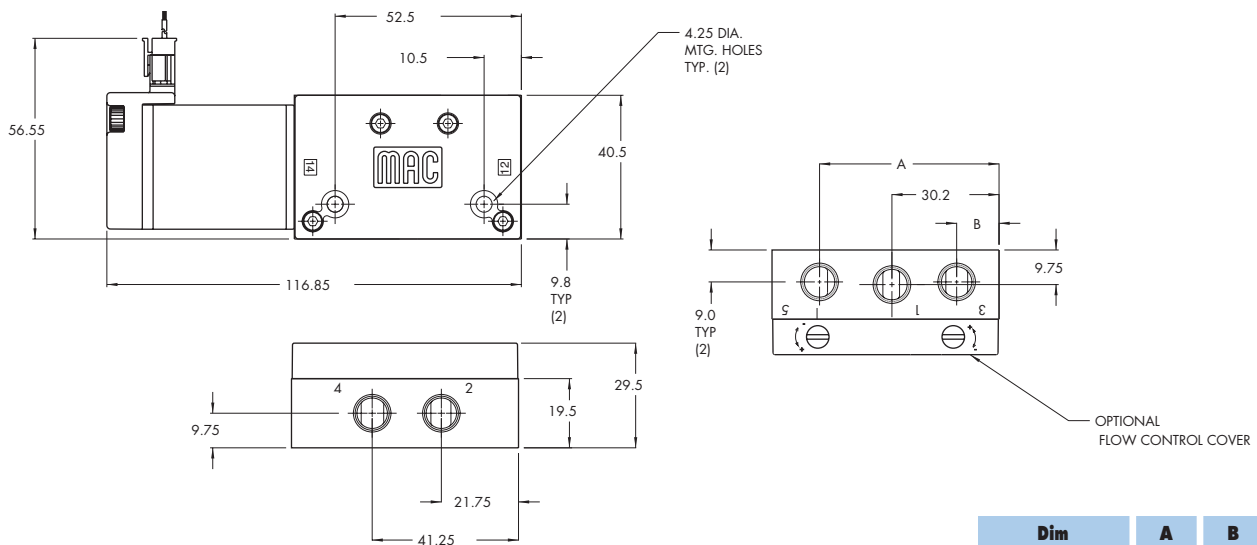
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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>	5.2W : (0.50 C <sub>v</sub> ) – 2.4W : (0.35 C <sub>v</sub> ) – 1.0W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	5.2W – 2.4W – 1.0W
<b>Response times :</b> (with 5.2 W coil)	Energize : 17.4 ms De-energize : 3.8 ms

- Options :                   • BSPP threads
- Spare parts :             • Flow control assembly : N-47004

**DIMENSIONS**

Dimensions shown are metric (mm)



Dim	A	B
1/8"	50.6	11.95
1/4"	49.2	11.2

Function	Port size	Flow [Max]	Individual Mounting	Series
<b>5/2</b>	<b>1/8" - 1/4"</b>	<b>0.5 C<sub>v</sub></b>	Sub-base non "plug-in"	



**OPERATIONAL BENEFITS**

- Short stroke solenoid produces high energization shifting force.
- High force return spring due to high force solenoid maximizes both energization and de-energization shifting forces.
- Built-in wear compensation – valve stroke is shorter than solenoid stroke.
- Four bonded balanced poppets on a one-piece valve stem.
- End poppets seal first on conical seats and cushion inlet poppet, eliminating cutting.
- Exhaust seals are not under inlet pressure thus reducing friction.
- Integral non-rising flow controls available on inline models.
- Short stroking balanced poppet allows for direct solenoid operation with high shifting forces, minimized friction, fast response and high flow in a small package.



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**HOW TO ORDER**

Port size	Without flow controls	With flow controls
		
<b>Valve less base</b>	47A-L10-H <b>XXX-XXX</b>	47A-L10-H <b>XXX-XXX</b>
<b>1/8" NPTF</b>	47A-LAA-H <b>XXX-XXX</b>	47A-LAB-H <b>XXX-XXX</b>
<b>1/4" NPTF</b>	47A-LBA-H <b>XXX-XXX</b>	47A-LBB-H <b>XXX-XXX</b>

**SOLENOID OPERATOR >**

H **XXX-XXX\***

XX Voltage	X Lead Wire length	X Manual operator	XX Electrical connection
<b>DA</b> 24 VDC (5.2W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>MA</b> Plug-in wire assembly
<b>DB</b> 24 VDC (2.4W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>MC</b> Plug-in wire assembly with light
<b>DC</b> 24 VDC (1.8W)	<b>C</b> 36"		<b>BA</b> Flying leads
<b>DD</b> 24 VDC (1.0W)			<b>BC</b> Flying leads with light
<b>AA</b> 120 VAC (6.7W)			<b>MT</b> Plug-in wire assembly with rectifier & light

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48P  
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ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

\* Other options available, see page 315.  
Note: AC voltage requires connector with rectifier.

\* Other options available, see page 319.

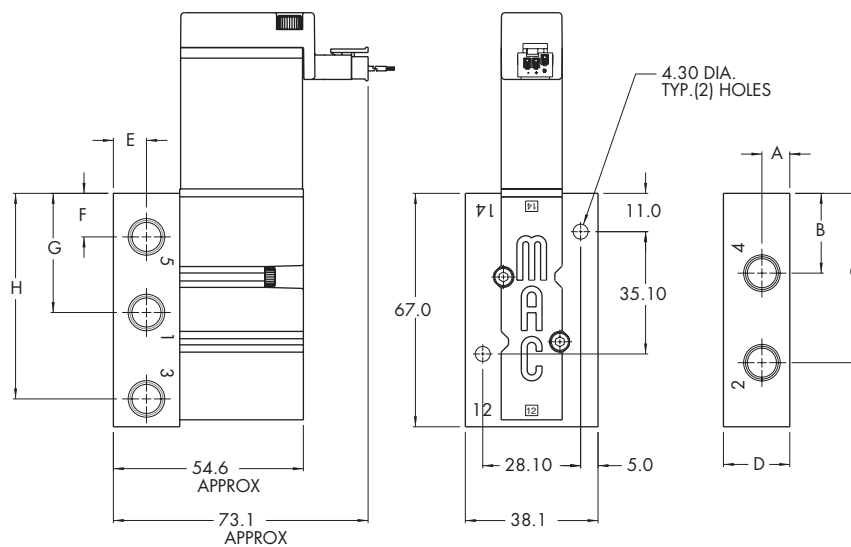
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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>	5.2W : (0.50 C <sub>v</sub> ) – 2.4W : (0.35 C <sub>v</sub> ) – 1.0W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	5.2W – 2.4W – 1.0W
<b>Response times :</b> (with 5.2 W coil)	Energize : 17.4 ms De-energize : 3.8 ms

- Options :                   • BSPP threads
- Spare parts :             • Pressure seal body to base: 16628 • Mounting screw (x2): 35043  
                                  • Flow control assembly (x2): N-04001

**DIMENSIONS**

Dimensions shown are metric (mm)



DIM.	A	B	C	D	E	F	G	H
1/8"	8.0	22.9	48.6	19.05	9.5	12.5	34.2	59.0
1/4"	9.5	24.0	48.8	23.0	12.5	12.8	34.2	57.2

Function	Port size	Flow [Max]	Manifold Mounting	Series
<b>5/2</b>	<b>1/8" - 1/4"</b>	<b>0.5 C<sub>v</sub></b>	Stacking	

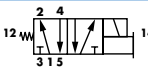
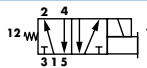
### OPERATIONAL BENEFITS

- Short stroke solenoid produces high energization shifting force.
- High force return spring due to high force solenoid maximizes both energization and de-energization shifting forces.
- Built-in wear compensation – valve stroke is shorter than solenoid stroke.
- Four bonded balanced poppets on a one-piece valve stem.
- End poppets seal first on conical seats and cushion inlet poppet, eliminating cutting.
- Exhaust seals are not under inlet pressure thus reducing friction.
- Integral non-rising flow controls available on inline models.
- Short stroking balanced poppet allows for direct solenoid operation with high shifting forces, minimized friction, fast response and high flow in a small package.



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### HOW TO ORDER

Port size	Without flow controls	With flow controls
		
<b>1/8" NPTF</b>	47A-SA0-H <b>XXX-XXX</b>	47A-TA0-H <b>XXX-XXX</b>
<b>1/4" NPTF</b>	47A-SB0-H <b>XXX-XXX</b>	47A-TB0-H <b>XXX-XXX</b>

### SOLENOID OPERATOR >

H **XXX-XXX\***

XX Voltage	X Lead Wire length	X Manual operator	XX Electrical connection
<b>DA</b> 24 VDC (5.2W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>MA</b> Plug-in wire assembly
<b>DB</b> 24 VDC (2.4W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>MC</b> Plug-in wire assembly with light
<b>DC</b> 24 VDC (1.8W)	<b>C</b> 36"		<b>BA</b> Flying leads
<b>DD</b> 24 VDC (1.0W)			<b>BC</b> Flying leads with light
<b>AA</b> 120 VAC (6.7W)			<b>MT</b> Plug-in wire assembly with rectifier & light

\* Other options available, see page 315.  
Note: AC voltage requires connector with rectifier.

### LATCHING OPERATOR >

L **XXX-XXX\***

XX Voltage	X Lead Wire length	X Manual operator	XX Electrical connection
<b>DA</b> 24 VDC (5.2W)	<b>A</b> 18"	<b>0</b> No operator	<b>BA</b> 2 Wire Flying leads
<b>DF</b> 12 VDC (5.2W)	<b>B</b> 24"		<b>BJ</b> 4 Wire Flying leads
	<b>C</b> 36"		<b>LA</b> 3 Wire Plug-in (Polarity switching cover)
			<b>MA</b> 2 Wire Plug-in
			<b>ME</b> 4 Wire Plug-in

\* Other options available, see page 319.  
End plate kit required: M-47013-01 (1/4" NPTF).

47  
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ISO 01  
ISO 02  
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ISO 3

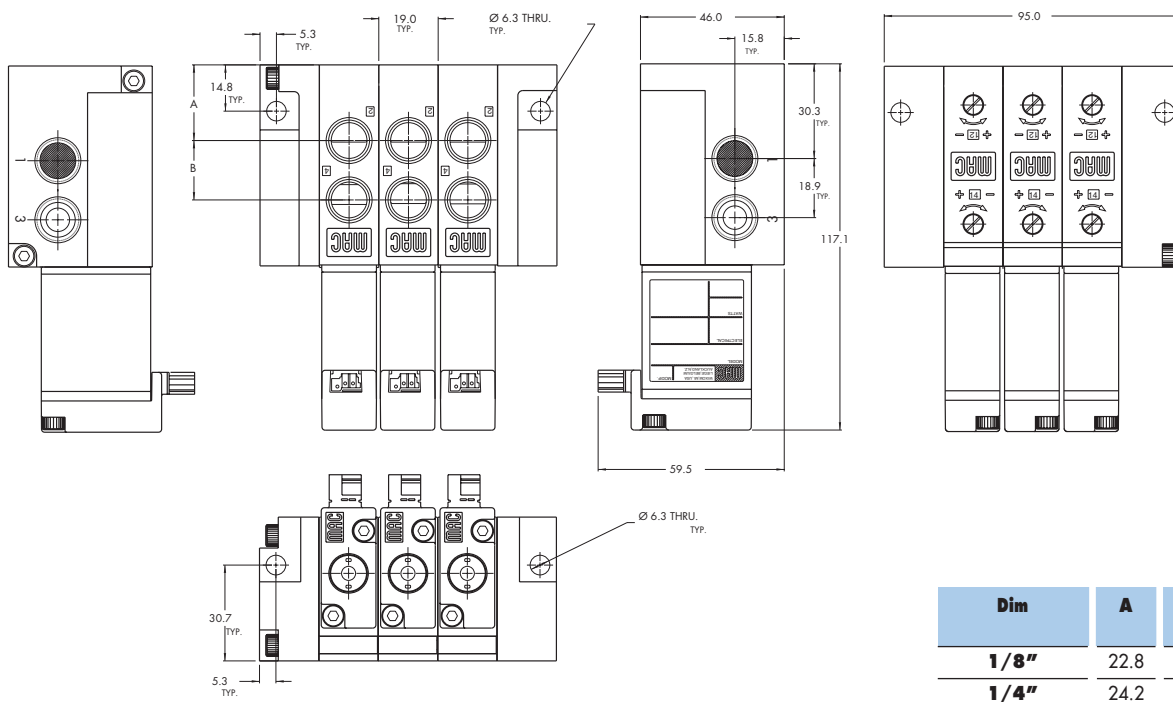
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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>	5.2W : (0.50 C <sub>v</sub> ) – 2.4W : (0.35 C <sub>v</sub> ) – 1.0W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A wires (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	5.2W – 2.4W – 1.0W
<b>Response times :</b> (with 5.2 W coil)	Energize : 17.4 ms De-energize : 3.8 ms

- Options : • BSPP threads
- Spare parts : • Inlet isolator: 28451 • Exhaust isolator: N-47009 • Tie Rod (x2): 79057

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Manifold Mounting	Series
<b>5/2</b>	<b>1/8" - 1/4"</b>	<b>0.5 C<sub>v</sub></b>	Manifold base "plug-in"	

**OPERATIONAL BENEFITS**

- Short stroke solenoid produces high energization shifting force.
- High force return spring due to high force solenoid maximizes both energization and de-energization shifting forces.
- Built-in wear compensation – valve stroke is shorter than solenoid stroke.
- Four bonded balanced poppets on a one-piece valve stem.
- End poppets seal first on conical seats and cushion inlet poppet, eliminating cutting.
- Exhaust seals are not under inlet pressure thus reducing friction.
- Integral non-rising flow controls available on inline models.
- Short stroking balanced poppet allows for direct solenoid operation with high shifting forces, minimized friction, fast response and high flow in a small package.

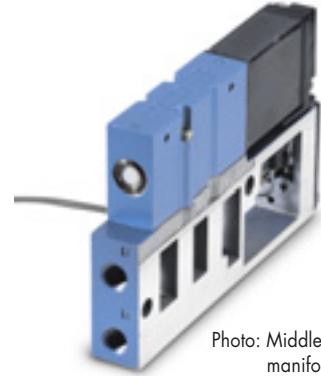


Photo: Middle station manifold base

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**HOW TO ORDER**

Port size	Model number
<b>Valve less base</b>	
<b>1/8" NPTF</b>	47A-L10-H <b>XX</b> P- <b>XXX</b>
<b>1/4" NPTF</b>	47A-LAJ-H <b>XX</b> P- <b>XXX</b>
	47A-LBJ-H <b>XX</b> P- <b>XXX</b>



**SOLENOID OPERATOR >**

H **XX** P-**XXX**\*

<b>XX Voltage</b>	<b>X Manual operator</b>	<b>XX Electrical connection</b>
<b>DA</b> 24 VDC (5.2W)	<b>1</b> Non-locking recessed	<b>FA</b> Base plug-in
<b>DB</b> 24 VDC (2.4W)	<b>2</b> Locking recessed	<b>FB</b> Base plug-in w/ ground
<b>DC</b> 24 VDC (1.8W)		<b>FC</b> Base plug-in w/ LED light
<b>DD</b> 24 VDC (1.0W)		<b>FD</b> Base plug-in w/ LED light w/ ground
<b>AA</b> 120 VAC (6.7W)		<b>FT</b> Base plug-in w/ rectifier and light

\* Other options available, see page 315.  
Note : AC voltage requires connector with rectifier.

**LATCHING SOLENOID >**

L **XX** P-**XXX**\*

<b>XX Voltage</b>	<b>X Manual operator</b>	<b>XX Electrical connection</b>
<b>DA</b> 24 VDC (5.2W)	<b>0</b> No operator	<b>FA</b> Base plug-in w/ ground
<b>DF</b> 12 VDC (5.2W)		<b>FB</b> Base plug-in w/ ground & LED
		<b>FC</b> Base plug-in 4 wire w/ ground
		<b>FD</b> Base Plug-in 4 wire w/ LED & ground

\* Other options available, see page 319.

**OPTIONS**

47A-**xxJ**-**xxx**P-**xxx**

- J** Manifold base, side cylinders (middle station)
- K** Manifold base, bottom cylinders (middle station)
- L** Right end manifold base, side cylinders
- M** Right end manifold base, bottom cylinders
- N** Left end manifold base, side cylinders
- P** Left end manifold base, bottom cylinders

Note: Manifold assemblies consist of (1) left end manifold, (1) right end manifold, and middle station manifolds.

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ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3



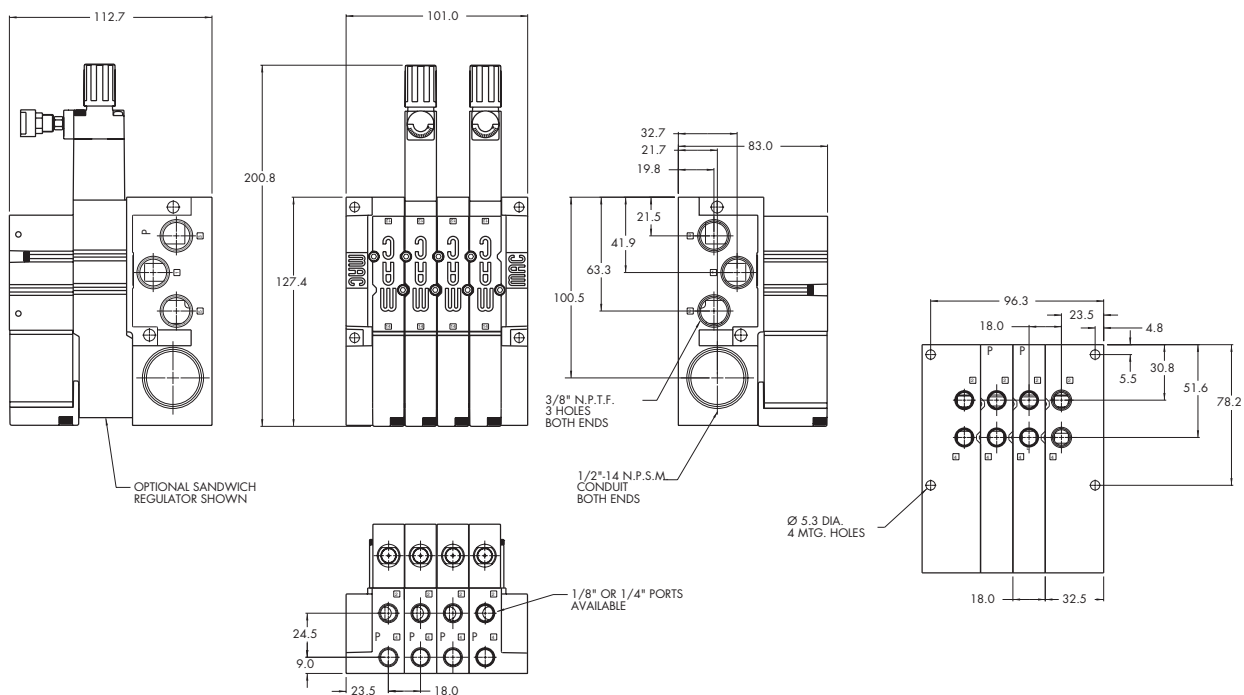
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	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 (at 6 bar, ΔP=1bar) :</b>	5.2W : (0.50 C <sub>v</sub> ) – 2.4W : (0.35 C <sub>v</sub> ) – 1.0W : (0.30 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	5.2W – 2.4W – 1.0W
<b>Response times :</b> (with 5,2 W coil)	Energize : 17.4 ms De-energize : 3.8 ms

- Options : • BSPP threads • Sandwich flow control: FC47A-AA • Sandwich regulator: see "Regulator" section
- Spare parts : • Inlet/exhaust isolator: 28447 • Valve cover plate: M-47001

**DIMENSIONS**

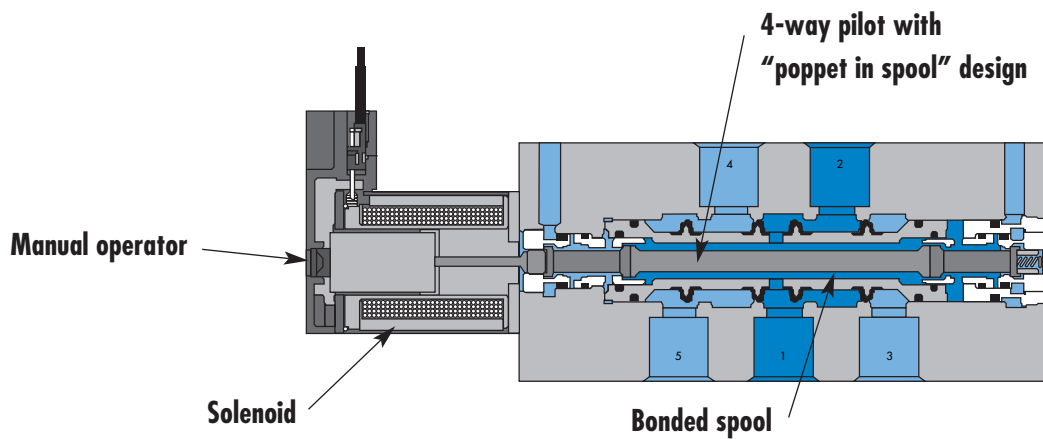
Dimensions shown are metric (mm)



Individual mounting

Series

Inline



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**48P**

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**SERIES FEATURES**

- High force MACSOLENOID®.
- Integral 4-way pilot with poppet inside the spool.
- Large flow in compact package.
- Single or dual pressure.
- Rectified AC voltage.

93

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2</b>	<b>1/8"</b>	<b>1.0 Cv</b>	Inline	

### OPERATIONAL BENEFITS

1. 4-way valve with 4-way pilot.
2. Poppet in spool design
3. 16 mm valve (stacks on 16.5 mm centers).
4. High flow (up to 1.0 Cv).
5. Fast repeatable response times.
6. Maximum shifting forces in both directions.
7. Long life.
8. Compact design.



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**48P**

### HOW TO ORDER

Port size	Pilot	5/2 Single operator Single pressure	5/2 Single operator Dual pressure
	Internal	48PB-AAA-A00-G-XXX-XXX	
<b>1/8"</b>	Internal from port 3	-	48PB-CAB-A00-G-XXX-XXX
	Internal from port 5	-	48PB-CAC-A00-G-XXX-XXX

### STANDARD SOLENOID OPERATOR >

G **XXX-XXX\***

XX	Voltage	X	Wire length	X	Manual operator	XX	Electrical connection
AA	120 VAC (2.5W)	A	18"	1	Non-locking	BA	Flying leads
DC	24 VDC (1.8W)	B	24"	2	Locking	BT	Flying leads with light
DD	24 VDC (2.5W)	C	36"			GA	MAC JAC solenoid plug-in
DF	24 VDC (4.0W)					KA	Plug-in wire assy.
						KT	Plug-in wire assy. with light
						KD	Plug-in wire assy. with rectifier & light & ground

\* Other options available, see page 311.  
Note : AC voltage requires connector with rectifier.

### OPTIONS

48PB-X X X-X00-G-XX-XXX

- A Pilot exhaust muffled
- C Pilot exhaust piped M5
- D Pilot exhaust out main exhaust

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ISO 01  
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ISO 1  
ISO 2  
ISO 3

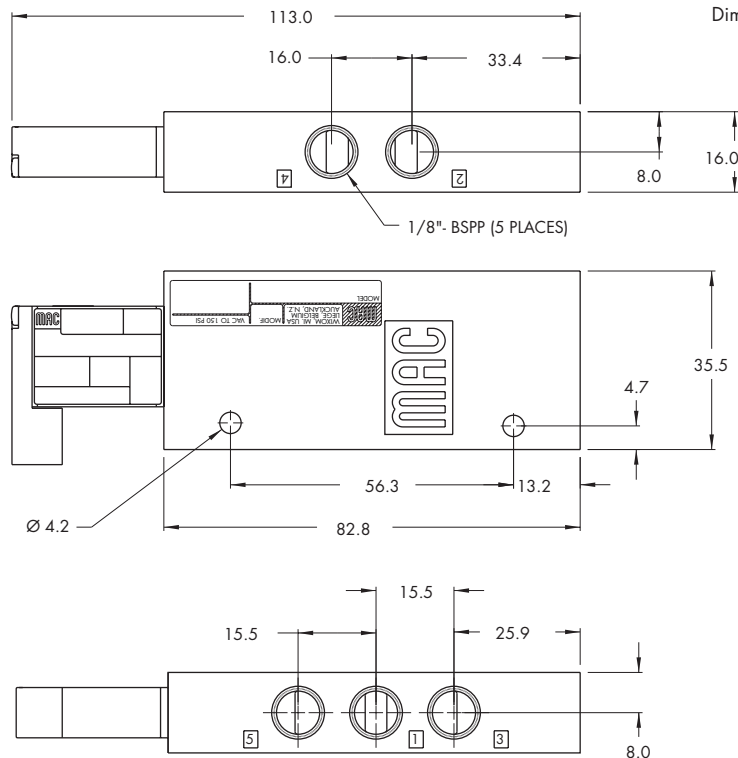
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	25 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 $\mu$
<b>Temperature range :</b>	0°F to 120°F (18°C to +50°C)
<b>Flow :</b>	Cv 1,0
<b>Coil :</b>	Class A wire continuous duty, #22 AWG x 18 leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W

Options : • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)



Individual mounting

Sub-base non "plug-in"	Sub-base "plug-in"	Sub-base/manifold base non "plug-in" with latching solenoid	Sub-base/manifold base "plug-in" with latching solenoid
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Manifold mounting

Manifold base non "plug-in"	Manifold base "plug-in"	Sub-base/manifold base non "plug-in" with latching solenoid	Sub-base/manifold base "plug-in" with latching solenoid
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Series

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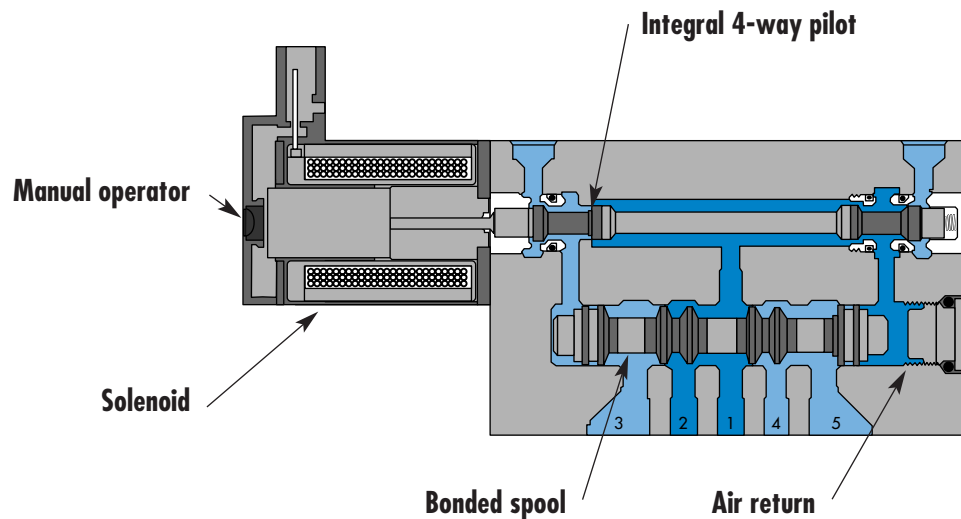
ISO 01

ISO 02

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**SERIES FEATURES**

- High force MACSOLENOID®.
- Integral 4-way pilot design.
- Single or dual pressure.
- Internal or external pilot.
- Single or double solenoid.
- 2 or 3 position.
- Rectified AC voltage.
- Latching solenoid technology.



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2, 5/3</b>	<b>1/8"</b>	<b>1.1 C<sub>v</sub></b>	Sub-base non "plug-in"	

### OPERATIONAL BENEFITS

1. 4-way valve with 4-way integral pilot.
2. 16 mm valve (stacks on 16.5 mm centers).
3. High flow (up to 1.1 C<sub>v</sub>).
4. Fast repeatable response times.
5. Maximum shifting forces in both directions.
6. Long life.



- 33
- 34
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- 69
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- 47
- 48P

### HOW TO ORDER

SINGLE PRESSURE MODELS (VALVE WITH BASE CODED FOR SIDE PORTS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Closed center	5/3 Open center
<b>Valve less base</b>	Internal	48B-AMA-000-Gxxx-xxx	48B-BMA-000-Gxxx-xxx	48B-EMA-000-Gxxx-xxx	48B-FMA-000-Gxxx-xxx
	External	48B-AMD-000-Gxxx-xxx	48B-BMD-000-Gxxx-xxx	48B-EMD-000-Gxxx-xxx	48B-FMD-000-Gxxx-xxx
<b>1/8" NPTF</b>	Internal	48B-AMA-AAL-Gxxx-xxx	48B-BMA-AAL-Gxxx-xxx	48B-EMA-AAL-Gxxx-xxx	48B-FMA-AAL-Gxxx-xxx
	External	48B-AMD-AAM-Gxxx-xxx	48B-BMD-AAM-Gxxx-xxx	48B-EMD-AAM-Gxxx-xxx	48B-FMD-AAM-Gxxx-xxx

DUAL PRESSURE MODELS (VALVE WITH BASE CODED FOR SIDE PORTS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Pressure center
<b>Valve less base</b>	Internal	Supply #3 port	48B-CMB-000-Gxxx-xxx	48B-DMB-000-Gxxx-xxx
		Supply #5 port	48B-CMC-000-Gxxx-xxx	48B-DMC-000-Gxxx-xxx
	External		48B-CMD-000-Gxxx-xxx	48B-DMD-000-Gxxx-xxx
	<b>1/8" NPTF</b>	Internal	Supply #3 port	48B-CMB-AAL-Gxxx-xxx
Supply #5 port			48B-CMC-AAL-Gxxx-xxx	48B-DMC-AAL-Gxxx-xxx
External		48B-CMD-AAM-Gxxx-xxx	48B-DMD-AAM-Gxxx-xxx	

- 48
- 400
- 92
- 93

STANDARD SOLENOID OPERATOR >

G **xxx-xxx\***

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>BA</b> Flying leads
<b>DC</b> 24 VDC (1.8W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>BT</b> Flying leads with light
<b>DD</b> 24 VDC (2.5W)	<b>C</b> 36"		<b>GA</b> MAC JAC solenoid plug-in
<b>DF</b> 24 VDC (4.0W)			<b>KA</b> Plug-in wire Assy.
			<b>KT</b> Plug-in wire Assy. with light
			<b>KD</b> Plug-in wire Assy. with rectifier & light & ground

- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

\* Other options available, see page 311.  
 Latching solenoid also available, see page 133.  
 Note : AC voltage requires connector with rectifier.  
**Other options available for the 48 series valves, see page 137.**

**TECHNICAL DATA**

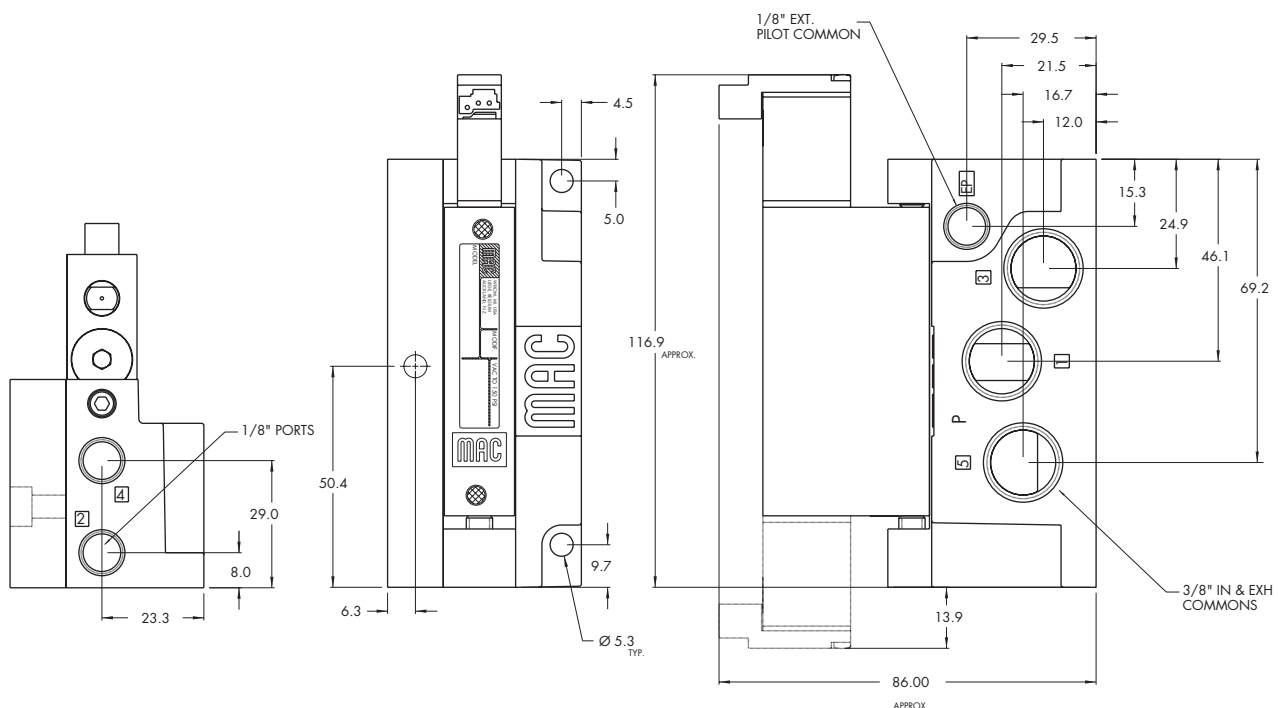
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot: 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External pilot: vacuum to 120 PSI
<b>Pilot pressure :</b>	2 position : 20 to 120 PSI - 3 position : 35 to 120 PSI
<b>Lubrication :</b>	Not required, if used select 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>	1/8" side ports: (1.0 C <sub>v</sub> ) – 1/8" bottom ports : (1.1 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times :</b> (with 4 W coil)	Energize : 6 ms De-energize : 6 ms

Options :

- BSPP threads • 1/4" O.D. pressed in tube receptacles • Sandwich Flow controls: FC48B-BB
- Sandwich regulator: see "regulators" section

**DIMENSIONS**

Dimensions shown are metric (mm)





# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2, 5/3</b>	<b>1/8"</b>	<b>1.1 C<sub>v</sub></b>	Sub-base "plug-in"	

### OPERATIONAL BENEFITS

1. 4-way valve with 4-way integral pilot.
2. 16 mm valve (stacks on 16.5 mm centers).
3. High flow (up to 1.1 C<sub>v</sub>).
4. Fast repeatable response times.
5. Maximum shifting forces in both directions.
6. Long life.



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48P

### HOW TO ORDER

SINGLE PRESSURE MODELS (LED STANDARD EXCEPT FOR SINGLE SOLENOIDS) - VALVE WITH BASE CODED FOR SIDE PORTS

Port size	Pilot air	5/2 Single solenoid	5/3 Double solenoid	5/3 Closed center	5/3 Open center
<b>Valve less base</b>	Internal	48B-AMA-000-GxxP-xxx	48B-BME-000-GxxP-xST	48B-EME-000-GxxP-xST	48B-FME-000-GxxP-xST
	External	48B-AMD-000-GxxP-xxx	48B-BMH-000-GxxP-xST	48B-EMH-000-GxxP-xST	48B-FMH-000-GxxP-xST
<b>1/8" NPTF</b>	Internal	48B-AMA-AAA-GxxP-xxx	48B-BME-AAC-GxxP-xST	48B-EME-AAC-GxxP-xST	48B-FME-AAC-GxxP-xST
	External	48B-AMD-AAB-GxxP-xxx	48B-BMH-AAD-GxxP-xST	48B-EMH-AAD-GxxP-xST	48B-FMH-AAD-GxxP-xST

DUAL PRESSURE MODELS (LED STANDARD EXCEPT FOR SINGLE SOLENOIDS) - VALVE WITH BASE CODED FOR SIDE PORTS

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Pressure center
<b>Valve less base</b>	Internal	Supply #3 port	48B-CMB-000-GxxP-xxx	48B-DMF-000-GxxP-xST
		Supply #5 port	48B-CMC-000-GxxP-xxx	48B-DMG-000-GxxP-xST
	External		48B-CMD-000-GxxP-xxx	48B-DMH-000-GxxP-xST
<b>1/8" NPTF</b>	Internal	Supply #3 port	48B-CMB-AAA-GxxP-xxx	48B-DMF-AAC-GxxP-xST
		Supply #5 port	48B-CMC-AAA-GxxP-xxx	48B-DMG-AAC-GxxP-xST
	External		48B-CMD-AAB-GxxP-xxx	48B-DMH-AAD-GxxP-xST

48  
400  
92  
93

STANDARD SOLENOID OPERATOR >

G **XX P-XXX**\*

XX Voltage	X Manual operator	XX Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>1</b> Non-locking recessed	<b>Double solenoid &amp; 3 position models</b>
<b>DC</b> 24 VDC (1.8W)	<b>2</b> Locking recessed	<b>ST</b> Base plug-in
<b>DD</b> 24 VDC (2.5W)		<b>Single solenoid models</b>
<b>DF</b> 24 VDC (4.0W)		<b>SA</b> Base plug-in
		<b>SJ</b> Base plug-in with LED light
		<b>SS</b> Base plug-in with rectifier & light & ground

ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

\* Other options available, see page 311.  
Latching solenoid also available, see page 135.  
Note : AC voltage requires connector with rectifier (For double solenoid consult factory).  
**Other options available for the 48 series valves, see page 138.**



**TECHNICAL DATA**

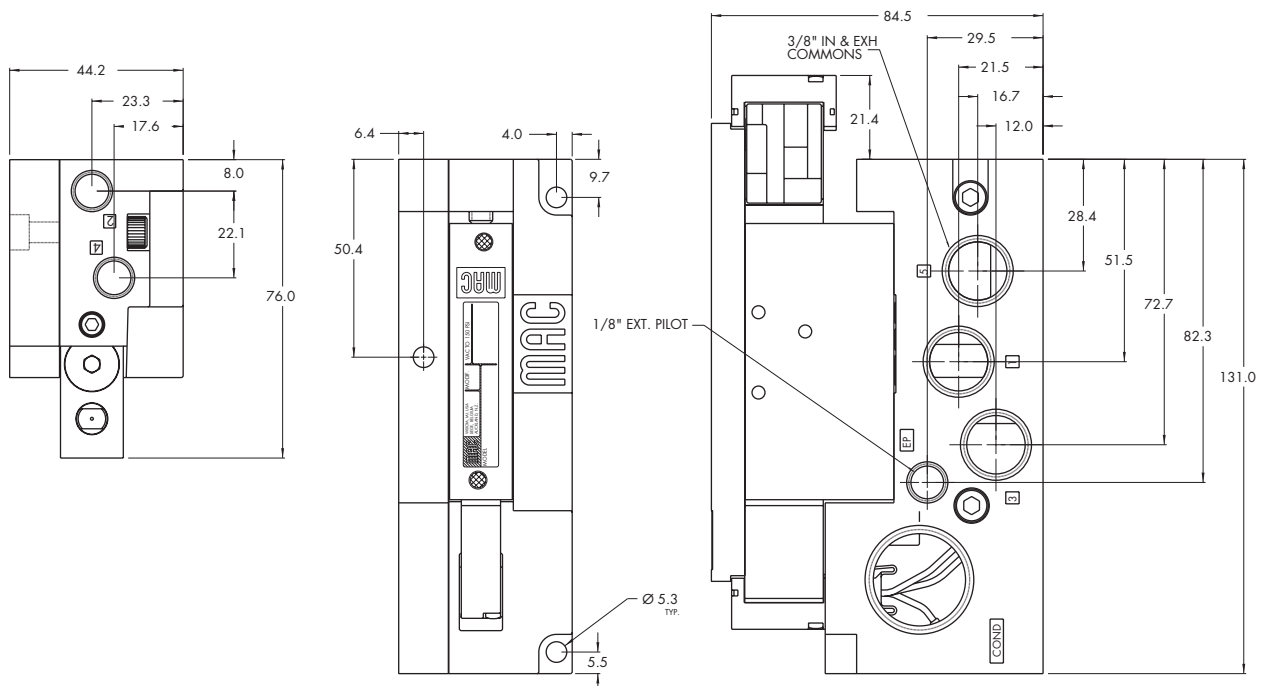
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot: 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External pilot: vacuum to 120 PSI
<b>Pilot pressure :</b>	2 position : 20 to 120 PSI - 3 position : 35 to 120 PSI
<b>Lubrication :</b>	Not required, if used select 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>	1/8" side ports: (1.0 C <sub>v</sub> ) – 1/8" bottom ports: (1.1 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times :</b> (with 4 W coil)	Energize : 6 ms De-energize : 6 ms

Options :

- BSPP threads • 1/4" O.D. pressed in tube receptacles • Sandwich Flow controls: FC48B-AB
- Sandwich regulator: see "regulators" section

**DIMENSIONS**

Dimensions shown are metric (mm)





# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Manifold mounting	Series
<b>5/2, 5/3</b>	<b>1/8"</b>	<b>1.1 C<sub>v</sub></b>	Manifold base non "plug-in"	

### OPERATIONAL BENEFITS

1. 4-way valve with 4-way integral pilot.
2. 16 mm valve (stacks on 16.5 mm centers).
3. High flow (up to 1.1 C<sub>v</sub>).
4. Fast repeatable response times.
5. Maximum shifting forces in both directions.
6. Long life.



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- 69
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- 48P

### HOW TO ORDER

#### SINGLE PRESSURE MODELS (MIDDLE STATION MANIFOLDS WITH SIDE PORTS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Closed center	5/3 Open center
<b>Valve less base</b>	Internal	48B-AMA-000-Gxxx-xxx	48B-BMA-000-Gxxx-xxx	48B-EMA-000-Gxxx-xxx	48B-FMA-000-Gxxx-xxx
	External	48B-AMD-000-Gxxx-xxx	48B-BMD-000-Gxxx-xxx	48B-EMD-000-Gxxx-xxx	48B-FMD-000-Gxxx-xxx
<b>1/8" NPTF</b>	Internal	48B-AMA-AJL-Gxxx-xxx	48B-BMA-AJL-Gxxx-xxx	48B-EMA-AJL-Gxxx-xxx	48B-FMA-AJL-Gxxx-xxx
	External	48B-AMD-AJM-Gxxx-xxx	48B-BMD-AJM-Gxxx-xxx	48B-EMD-AJM-Gxxx-xxx	48B-FMD-AJM-Gxxx-xxx

#### DUAL PRESSURE MODELS (MIDDLE STATION MANIFOLDS WITH SIDE PORTS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Pressure center
<b>Valve less base</b>	Internal	Supply #3 port	48B-CMB-000-Gxxx-xxx	48B-DMB-000-Gxxx-xxx
		Supply #5 port	48B-CMC-000-Gxxx-xxx	48B-DMC-000-Gxxx-xxx
	External		48B-CMD-000-Gxxx-xxx	48B-DMD-000-Gxxx-xxx
			48B-HMD-000-Gxxx-xxx	
<b>1/8" NPTF</b>	Internal	Supply #3 port	48B-CMB-AJL-Gxxx-xxx	48B-DMB-AJL-Gxxx-xxx
		Supply #5 port	48B-CMC-AJL-Gxxx-xxx	48B-DMC-AJL-Gxxx-xxx
	External		48B-CMD-AJM-Gxxx-xxx	48B-DMD-AJM-Gxxx-xxx
			48B-HMD-AJM-Gxxx-xxx	

- 48
- 400
- 92
- 93

#### STANDARD SOLENOID OPERATOR >

G **XXX-XXX\***

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>BA</b> Flying leads
<b>DC</b> 24 VDC (1.8W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>BT</b> Flying leads with light
<b>DD</b> 24 VDC (2.5W)	<b>C</b> 36"		<b>GA</b> MAC JAC solenoid plug-in
<b>DF</b> 24 VDC (4.0W)			<b>KA</b> Plug-in wire assy.
			<b>KT</b> Plug-in wire assy. with light
			<b>KD</b> Plug-in wire assy. with rectifier & light & ground

\* Other options available, see page 311.  
 Latching solenoid also available, see page 133.  
 Note : - AC voltage requires connector with rectifier.  
 - Manifold assemblies consist of (1) left end manifold, (1) right end manifold, and middle station manifolds (options "J" or "K").  
**Other options available for the 48 series valves, see page 137.**

- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

**TECHNICAL DATA**

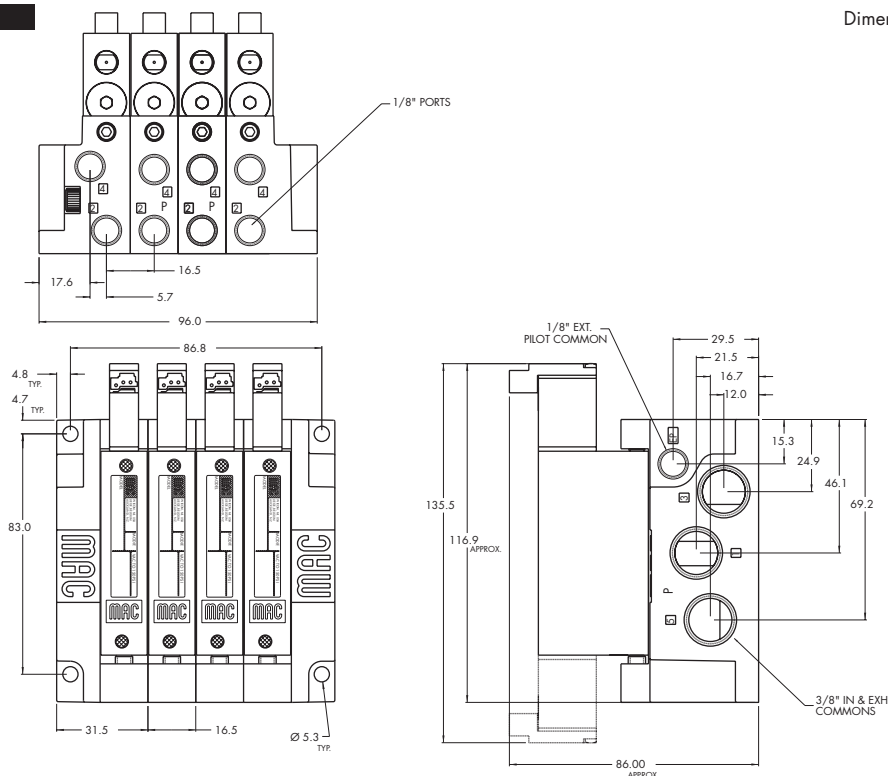
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot: 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External pilot: vacuum to 120 PSI
<b>Pilot pressure :</b>	2 position : 20 to 120 PSI - 3 position : 35 to 120 PSI
<b>Lubrication :</b>	Not required, if used select 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>	1/8" side ports: (1.0 C <sub>v</sub> ) – 1/8" bottom ports : (1.1 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times : (with 4 W coil)</b>	Energize : 6 ms De-energize : 6 ms

Options :

- BSPP threads • 1/4" O.D. pressed in tube receptacles • Sandwich flow controls: FC48B-BB
- Sandwich regulator: see "regulators" section
- Valve blanking plate: M-48004 • Isolator disk for inlet/exhaust: 28471

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>5/2, 5/3</b>	<b>1/8"</b>	<b>1.1 C<sub>v</sub></b>	Manifold base "plug-in"	

### OPERATIONAL BENEFITS

1. 4-way valve with 4-way integral pilot.
2. 16 mm valve (stacks on 16.5 mm centers).
3. High flow (up to 1.1 C<sub>v</sub>).
4. Fast repeatable response times.
5. Maximum shifting forces in both directions.
6. Long life.



33  
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69  
44  
46  
42  
47  
48P

### HOW TO ORDER

SINGLE PRESSURE MODELS (LED STANDARD EXCEPT FOR SINGLE SOLENOIDS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Closed center	5/3 Open center
<b>Valve less base</b>	Internal	48B-AMA-000-GxxP-xxx	48B-BME-000-GxxP-xST	48B-EME-000-GxxP-xST	48B-FME-000-GxxP-xST
	External	48B-AMD-000-GxxP-xxx	48B-BMH-000-GxxP-xST	48B-EMH-000-GxxP-xST	48B-FMH-000-GxxP-xST
<b>1/8" NPTF</b>	Internal	48B-AMA-AJA-GxxP-xxx	48B-BME-AJC-GxxP-xST	48B-EME-AJC-GxxP-xST	48B-FME-AJC-GxxP-xST
	External	48B-AMD-AJB-GxxP-xxx	48B-BMH-AJD-GxxP-xST	48B-EMH-AJD-GxxP-xST	48B-FMH-AJD-GxxP-xST

DUAL PRESSURE MODELS (LED STANDARD EXCEPT FOR SINGLE SOLENOIDS)

Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Pressure center
<b>Valve less base</b>	Internal	Supply #3 port	48B-CMB-000-GxxP-xxx	48B-DMF-000-GxxP-xST
		Supply #5 port	48B-CMC-000-GxxP-xxx	48B-DMG-000-GxxP-xST
	External		48B-CMD-000-GxxP-xxx	48B-DMH-000-GxxP-xST
<b>1/8" NPTF</b>	Internal	Supply #3 port	48B-CMB-AJA-GxxP-xxx	48B-DMF-AJC-GxxP-xST
		Supply #5 port	48B-CMC-AJA-GxxP-xxx	48B-DMG-AJC-GxxP-xST
	External		48B-CMD-AJB-GxxP-xxx	48B-DMH-AJD-GxxP-xST

48  
400  
92  
93

STANDARD SOLENOID OPERATOR >

G **XX P-XXX\***

Above numbers are middle station manifolds with side ports

XX Voltage	X Manual operator	XX Electrical connection
<b>AA</b> 120 VAC (2.5W)	<b>1</b> Non-locking recessed	<b>Double solenoid &amp; 3 position models</b>
<b>DC</b> 24 VDC (1.8W)	<b>2</b> Locking recessed	<b>ST</b> Base plug-in
<b>DD</b> 24 VDC (2.5W)		<b>Single solenoid models</b>
<b>DF</b> 24 VDC (4.0W)		<b>SA</b> Base plug-in
		<b>SJ</b> Base plug-in with LED light
		<b>SS</b> Base plug-in with rectifier & light & ground

ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

\* Other options available, see page 311.

Note : - AC voltage requires connector with rectifier. (For double solenoid consult factory).  
- Manifold assemblies consist of (1) left end manifold, (1) right end manifold, and middle station manifolds (options "J" or "K").

Other options available for the 48 series valves, see page 138.

**TECHNICAL DATA**

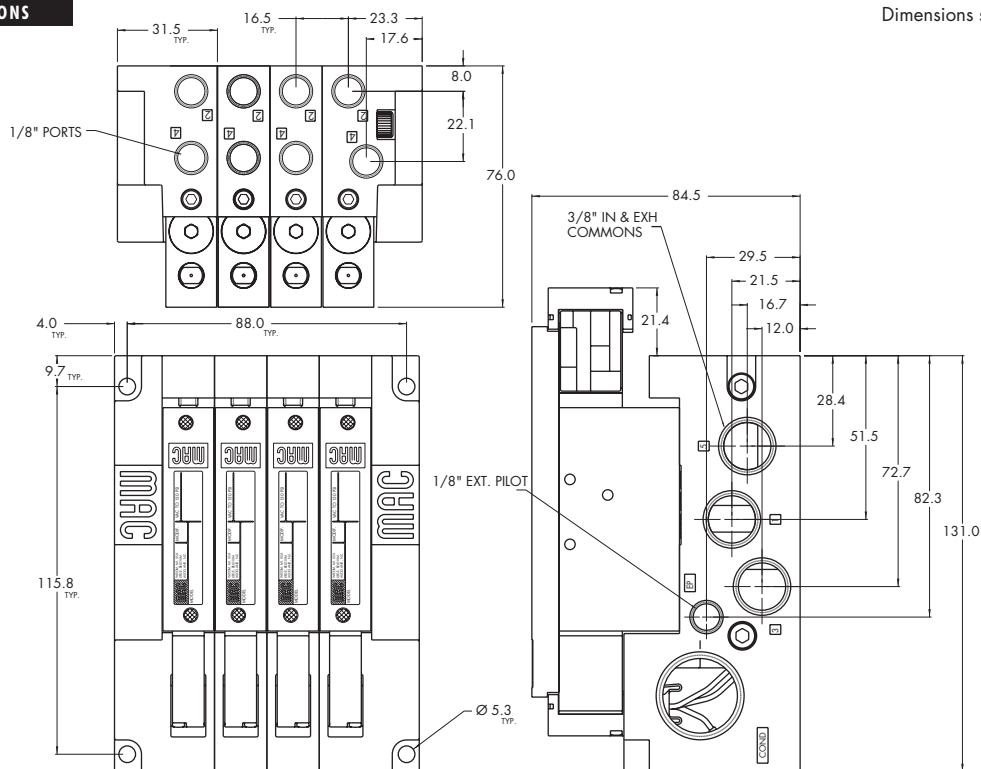
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot: 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External pilot: vacuum to 120 PSI
<b>Pilot pressure :</b>	2 position : 20 to 120 PSI - 3 position : 35 to 120 PSI
<b>Lubrication :</b>	Not required, if used select 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>	1/8" side ports: (1.0 C <sub>v</sub> ) – 1/8" bottom ports : (1.1 C <sub>v</sub> )
<b>Coil :</b>	Class A wire (#22 AWG x 18), continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1.0 to 4.0 W
<b>Response times :</b> (with 4 W coil)	Energize : 6 ms De-energize : 6 ms

Options :

- BSPP threads • 1/4" O.D. pressed in tube receptacles • Sandwich flow controls: FC48B-AB
- Sandwich regulator: see "regulators" section
- Valve blanking plate: M-48004 • Isolator disk for inlet/exhaust: 28471
- Plug-in wire protector: 24180

**DIMENSIONS**

Dimensions shown are metric (mm)



<b>OPTIONS FOR NON PLUG-IN VALVES</b>		<b>33</b>
<b>Base type :</b>		<b>34</b>
<b>Individual base</b>		<b>36</b>
48B-XXX- <b>XAX</b> -Gxxx-xxx		
<b>A</b> Individual base – Side ports		
<b>B</b> Individual base – Bottom ports		
<b>Manifold base</b>		<b>32</b>
48B-XXX- <b>XJX</b> -Gxxx-xxx		
<b>J</b> Manifold base – Side ports		
<b>K</b> Manifold base – Bottom ports		
<b>L</b> Left end manifold base – Side ports		
<b>M</b> Left end manifold base – Bottom ports		
<b>N</b> Right end manifold base – Side ports		
<b>P</b> Right end manifold base – Bottom ports		
<b>Universal spool</b>		<b>37</b>
48B- <b>RXX</b> -XXX-Gxxx-xxx		<b>38</b>
<b>R</b> 2 position single solenoid universal spool		<b>52</b>
<b>S</b> 2 position double solenoid universal spool		<b>67</b>
<b>Base only :</b>		<b>69</b>
48B-000-XXX (i.e. 48B-000-AAL) - Individual base	48B-000-XXX (i.e. 48B-000-AJL) - Manifold base	<b>44</b>
		<b>46</b>
<b>Pilot style :</b>		<b>42</b>
48B- <b>XM</b> X-XXX-Gxxx-xxx		<b>47</b>
<b>M</b> Pilot exhaust muffled		<b>48P</b>
<b>P</b> Pilot exhaust piped (# 10-32)		
<b>U</b> Pilot exhaust to main exhaust		
		<b>48</b>
		<b>400</b>
		<b>92</b>
		<b>93</b>
		<b>ISO 01</b>
		<b>ISO 02</b>
		<b>ISO 1</b>
		<b>ISO 2</b>
		<b>ISO 3</b>

**OPTIONS FOR  
PLUG-IN VALVES**

**Base type :**

**Individual base**

48B-XXX-**XAX**-GxxP-xxx

- A** Individual base – Side ports
- B** Individual base – Bottom ports

**Manifold base**

48B-XXX-**XJX**-GxxP-xxx

- J** Manifold base – Side ports
- K** Manifold base – Bottom ports
- L** Left end manifold base – Side ports
- M** Left end manifold base – Bottom ports
- N** Right end manifold base – Side ports
- P** Right end manifold base – Bottom ports

**Universal spool**

48B-**RXX**-XXX-GxxP-xxx

- R** 2 position single solenoid universal spool
- S** 2 position double solenoid universal spool

**Base only :**

48B-000-XXX (i.e. 48B-000-AAA)

- Individual base wired for a single solenoid valve

48B-000-XXX (i.e. 48B-000-AJC)

- Manifold base wired for a double solenoid valve

**For LED with diode (2 & 3 position double solenoid valves)**

48B-**XXJ**-XXX-GxxP-**xST**

- J** Internal pilot single pressure
- K** Internal pilot dual pressure supply from #3 port
- L** Internal pilot dual pressure supply from #5 port
- M** External pilot

**Pilot style :**

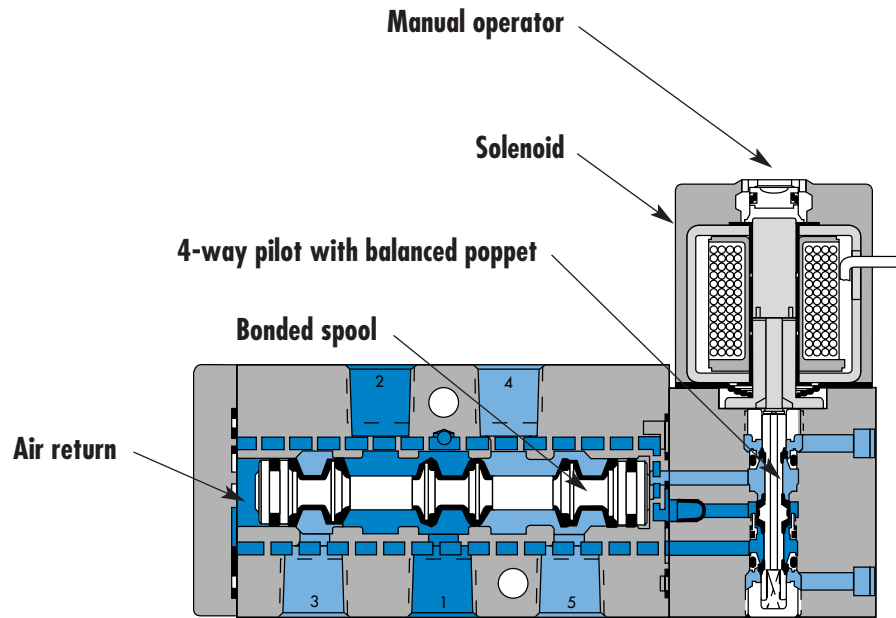
48B-**XXM**-XXX-GxxP-xxx

- M** Pilot exhaust muffled
- P** Pilot exhaust piped (# 10-32)
- U** Pilot exhaust to main exhaust

Individual mounting

Inline	Sub-base non "plug-in"
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Series



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48P

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**400**

92

**SERIES FEATURES**

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

93

ISO 01

ISO 02

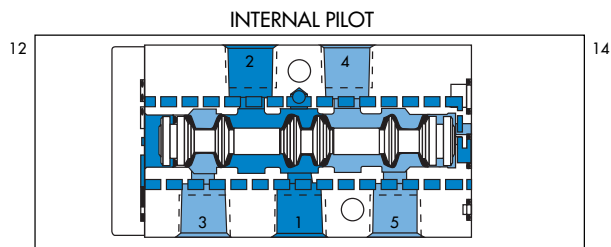
ISO 1

ISO 2

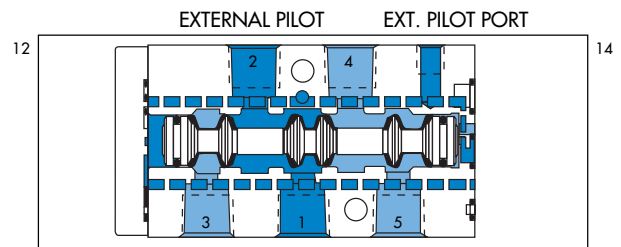
ISO 3



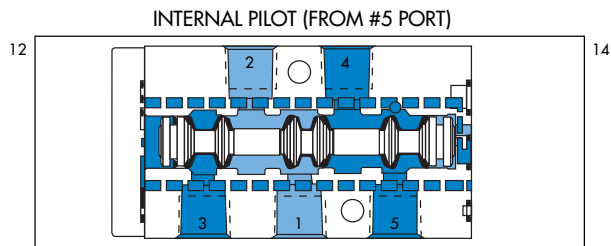
**SPOOL CONFIGURATIONS**



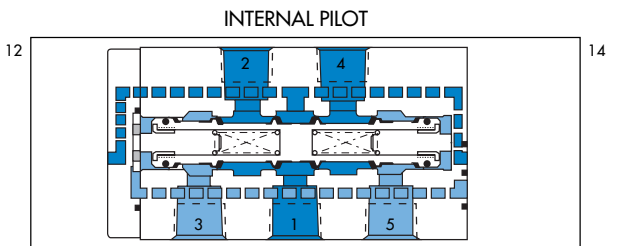
SINGLE OPERATOR - SINGLE INLET  
 SHOWN WITH 12 OPERATOR ENERGIZED



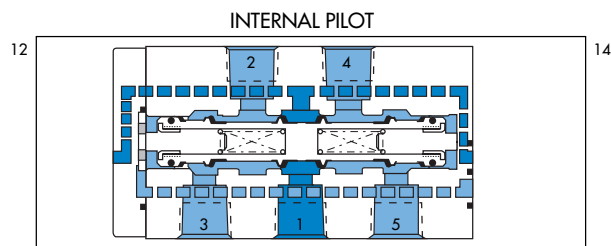
SINGLE OPERATOR - SINGLE INLET  
 SHOWN WITH 12 OPERATOR ENERGIZED



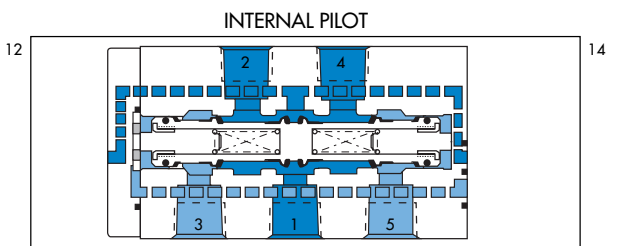
SINGLE OPERATOR - DUAL INLET  
 SHOWN WITH 12 OPERATOR ENERGIZED



3 POSITION CLOSED CENTER



3 POSITION OPEN CENTER



3 POSITION PRESSURE CENTER



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2, 5/3</b>	<b>1/8" - 1/4"</b>	<b>1.0 C<sub>v</sub></b>	Inline	

### OPERATIONAL BENEFITS

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



- 33
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- 69
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- 46
- 42
- 47
- 48P

### 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	5/3 Pressure center
<b>1/8" NPTF</b>	Internal	411A-A0A-XX-XXXX-XXX	421A-A0A-XX-XXXX-XXX	451A-A0A-XX-XXXX-XXX	461A-A0A-XX-XXXX-XXX	471A-A0A-XX-XXXX-XXX
<b>1/4" NPTF</b>	Internal	411A-B0A-XX-XXXX-XXX	421A-B0A-XX-XXXX-XXX	451A-B0A-XX-XXXX-XXX	461A-B0A-XX-XXXX-XXX	471A-B0A-XX-XXXX-XXX
<b>1/8" NPTF</b>	External	411A-A0B-XX-XXXX-XXX	421A-A0B-XX-XXXX-XXX	451A-A0B-XX-XXXX-XXX	461A-A0B-XX-XXXX-XXX	471A-A0B-XX-XXXX-XXX
<b>1/4" NPTF</b>	External	411A-B0B-XX-XXXX-XXX	421A-B0B-XX-XXXX-XXX	451A-B0B-XX-XXXX-XXX	461A-B0B-XX-XXXX-XXX	471A-B0B-XX-XXXX-XXX

#### DUAL PRESSURE MODELS (INTERNAL PILOT – PILOT PRESSURE SUPPLY FROM #5 PORT)

Port size	Pilot air	5/2 Single operator	5/2 Double operator
<b>1/8" NPTF</b>	Internal	431A-A0A-XX-XXXX-XXX	441A-A0A-XX-XXXX-XXX
<b>1/4" NPTF</b>	Internal	431A-B0A-XX-XXXX-XXX	441A-B0A-XX-XXXX-XXX
<b>1/8" NPTF</b>	External	431A-A0B-XX-XXXX-XXX	441A-A0B-XX-XXXX-XXX
<b>1/4" NPTF</b>	External	431A-B0B-XX-XXXX-XXX	441A-B0B-XX-XXXX-XXX

- 48
- 400
- 92
- 93

#### SOLENOID OPERATOR >

### DM-D XXX-XXX\*

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>JA</b> 110/50, 120/60 (2.9W)	<b>A</b> 18" (Flying leads)	<b>1</b> Non-locking recessed	<b>KA</b> Square connector
<b>JB</b> 220/50, 240/60 (2.9W)	<b>B</b> 24" (Flying leads)	<b>2</b> Locking recessed	<b>KD</b> Square connector with light
<b>JC</b> 24/60 (2.9W)	<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)			

- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

#### SOLENOID OPERATOR >

### GM-G XXX-XXX\*\*

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>DC</b> 24VDC (1.8W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>BA</b> Flying leads
<b>DD</b> 24VDC (2.5W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>BT</b> Flying leads with light
<b>DF</b> 24VDC (4.0W)	<b>C</b> 36"		<b>KA</b> Plug-in wire assy.
			<b>KT</b> Plug-in wire assy. with light

\* Other options available, see page 309.  
 \*\* Other options available, see page 313.

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot – 2 pos. : 20 to 120 PSI (with memory spring: 30 to 120 PSI) 3 pos.: 35 to 120 PSI External pilot : vacuum to 120 PSI
<b>Pilot pressure :</b>	2 position: 20 to 120 PSI (with memory spring: 30 to 120 PSI) 3 position: 35 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>	1.0 C <sub>v</sub>
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 leads wires
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W
<b>Response times :</b>	24 V= /5.4W      Energize : 7.3 ms      De-energize : 5.3 ms 120/60      Energize : 8-12 ms      De-energize : 7-11 ms

Options :

- BSPP threads • Namur interface (specify mod. 1080 after model)

**411A-A0A-XX-XXX-XXX**

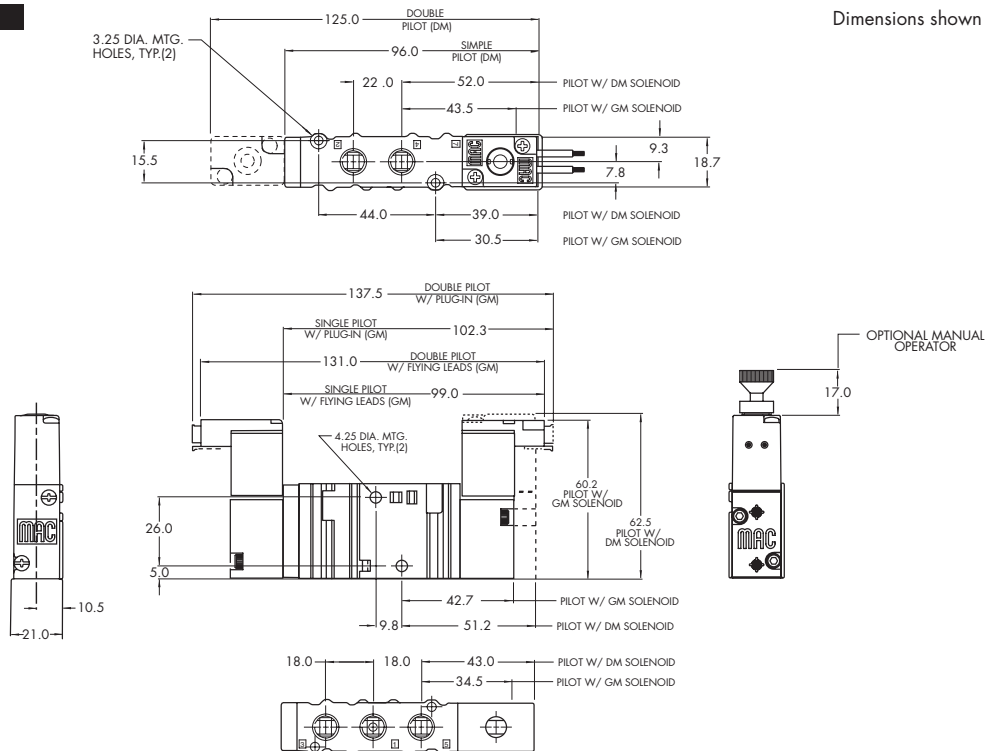
- Dual pressure models, replace by **C** for pilot supply from #3 port
- For memory spring, replace by **4** (single operator models only)
- Replace by **8** for 3 position dual pressure, pressure center

Spare parts :

- DM pilot body pressure seal: 16542 • DM pilot spacer plate: 24168-01.

**DIMENSIONS**

Dimensions shown are metric (mm)





# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2, 5/3</b>	<b>1/8" - 1/4"</b>	<b>1.0 C<sub>v</sub></b>	Sub-base non "plug-in"	

### OPERATIONAL BENEFITS

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



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48P

### 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	5/3 Pressure center
<b>Valve only</b>	Internal	413A-00A-XX-XXXX-XXX	423A-00A-XX-XXXX-XXX	453A-00A-XX-XXXX-XXX	463A-00A-XX-XXXX-XXX	473A-00A-XX-XXXX-XXX
	External	413A-00D-XX-XXXX-XXX	423A-00D-XX-XXXX-XXX	453A-00D-XX-XXXX-XXX	463A-00D-XX-XXXX-XXX	473A-00D-XX-XXXX-XXX
<b>1/8" NPTF</b>	Internal	413A-AAA-XX-XXXX-XXX	423A-AAA-XX-XXXX-XXX	453A-AAA-XX-XXXX-XXX	463A-AAA-XX-XXXX-XXX	473A-AAA-XX-XXXX-XXX
<b>1/4" NPTF</b>		413A-BAA-XX-XXXX-XXX	423A-BAA-XX-XXXX-XXX	453A-BAA-XX-XXXX-XXX	463A-BAA-XX-XXXX-XXX	473A-BAA-XX-XXXX-XXX
<b>1/8" NPTF</b>	External	413A-AAD-XX-XXXX-XXX	423A-AAD-XX-XXXX-XXX	453A-AAD-XX-XXXX-XXX	463A-AAD-XX-XXXX-XXX	473A-AAD-XX-XXXX-XXX
<b>1/4" NPTF</b>		413A-BAD-XX-XXXX-XXX	423A-BAD-XX-XXXX-XXX	453A-BAD-XX-XXXX-XXX	463A-BAD-XX-XXXX-XXX	473A-BAD-XX-XXXX-XXX

#### DUAL PRESSURE MODELS (INTERNAL PILOT – PILOT PRESSURE SUPPLY FROM #5 PORT)

Port size	Pilot air	5/2 Single operator	5/2 Double operator
<b>Valve only</b>	Internal	433A-00A-XX-XXXX-XXX	443A-00A-XX-XXXX-XXX
	External	433A-00D-XX-XXXX-XXX	443A-00D-XX-XXXX-XXX
<b>1/8" NPTF</b>	Internal	433A-AAA-XX-XXXX-XXX	443A-AAA-XX-XXXX-XXX
<b>1/4" NPTF</b>		433A-BAA-XX-XXXX-XXX	443A-BAA-XX-XXXX-XXX
<b>1/8" NPTF</b>	External	433A-AAD-XX-XXXX-XXX	443A-AAD-XX-XXXX-XXX
<b>1/4" NPTF</b>		433A-BAD-XX-XXXX-XXX	443A-BAD-XX-XXXX-XXX

48  
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92  
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#### SOLENOID OPERATOR >

### DM-D XXX-XXX\*

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>JA</b> 110/50, 120/60 (2.9W)	<b>A</b> 18" (Flying leads)	<b>1</b> Non-locking recessed	<b>KA</b> Square connector
<b>JB</b> 220/50, 240/60 (2.9W)	<b>B</b> 24" (Flying leads)	<b>2</b> Locking recessed	<b>KD</b> Square connector with light
<b>JC</b> 24/60 (2.9W)	<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)			

ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

#### SOLENOID OPERATOR >

### GM-G XXX-XXX\*\*

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>DC</b> 24VDC (1.8W)	<b>A</b> 18"	<b>1</b> Non-locking recessed	<b>BA</b> Flying leads
<b>DD</b> 24VDC (2.5W)	<b>B</b> 24"	<b>2</b> Locking recessed	<b>BT</b> Flying leads with light
<b>DF</b> 24VDC (4.0W)	<b>C</b> 36"		<b>KA</b> Plug-in wire assy.
			<b>KT</b> Plug-in wire assy. with light

\* Other options available, see page 309.  
\*\* Other options available, see page 313.

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot – 2 pos. : 20 to 120 PSI (with memory spring: 30 to 120 PSI) 3 pos.: 35 to 120 PSI External pilot : vacuum to 120 PSI
<b>Pilot pressure :</b>	2 position: 20 to 120 PSI (with memory spring: 30 to 120 PSI) 3 position: 35 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>	1.0 C <sub>v</sub>
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 leads wires
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~Inrush : 10.9 VA Holding : 7.7 VA = 1.8 to 12.7 W
<b>Response times :</b>	24 V= /5.4W Energize : 7.3 ms De-energize : 5.3 ms 120/60 Energize : 8-12 ms De-energize : 7-11 ms

Options :

- BSPP threads

413A-AAA-XX-XXXX-XXX

- Dual pressure models, replace by **C** for pilot supply from #3 port
- For flow control, replace by **B**
- For memory spring, replace by **6**

Base only :

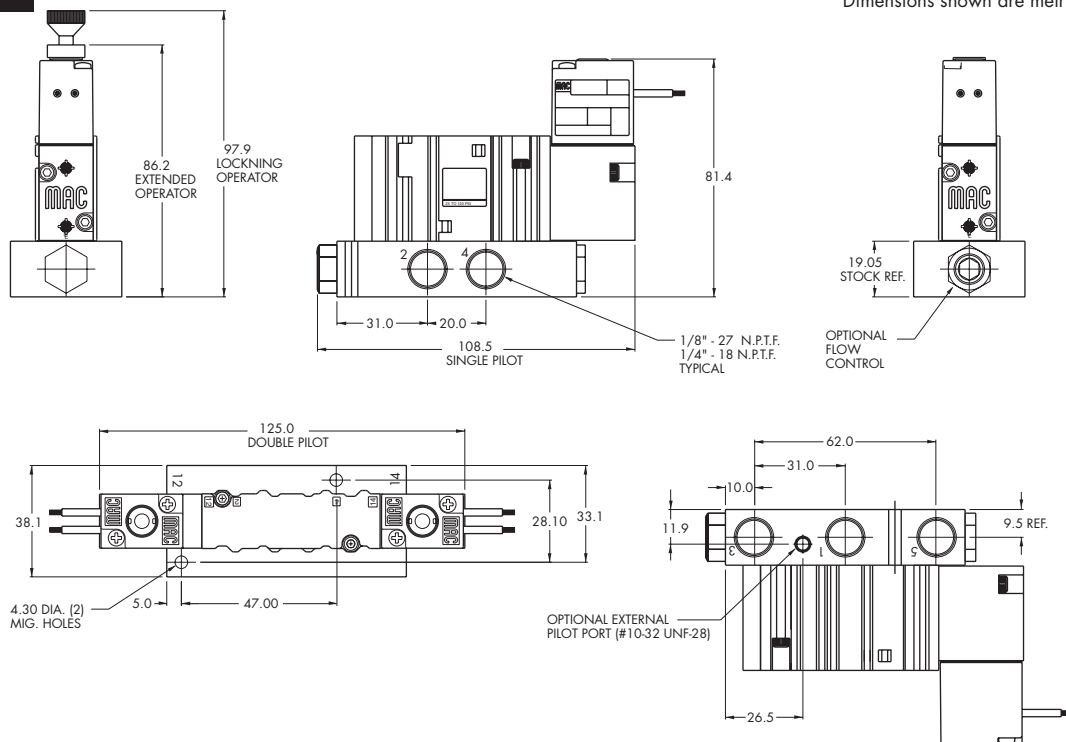
400A-XXX  
(i.e. 400A-AAA)

Spare parts :

- Body to base seal: 16525 • Flow control assembly: N-04001 • Body mounting screws (x2): 35043.

**DIMENSIONS**

Dimensions shown are metric (mm)



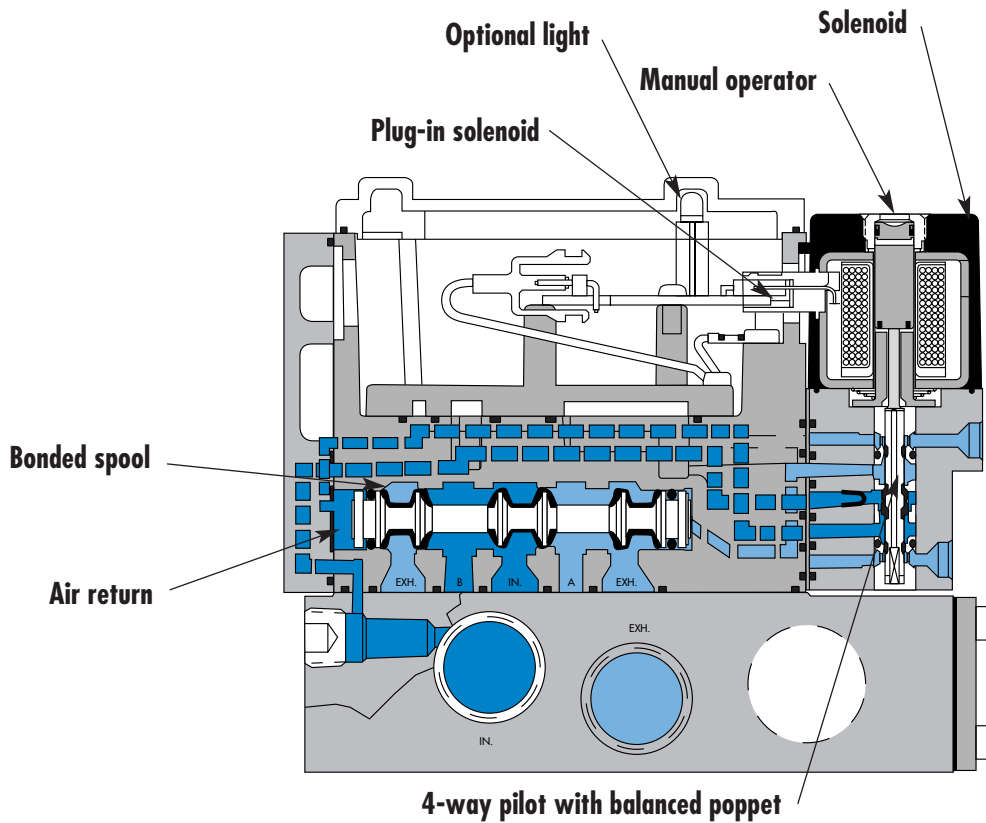
Individual mounting

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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48P

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400

**92**

**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

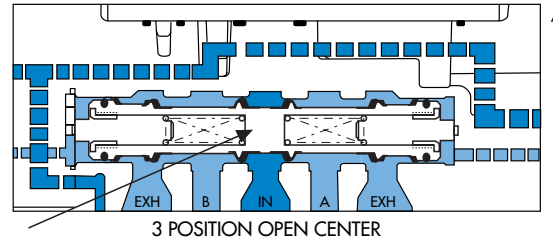
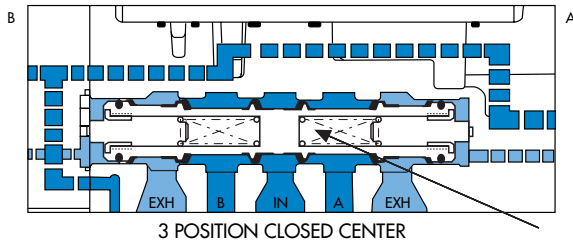
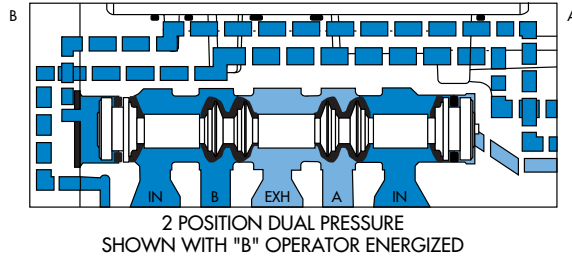
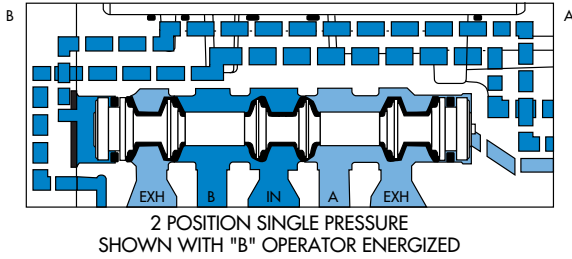
ISO 02

ISO 1

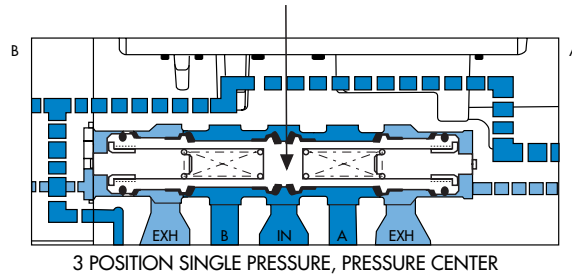
ISO 2

ISO 3

**SPOOL CONFIGURATIONS**



**SPRING CENTERING**



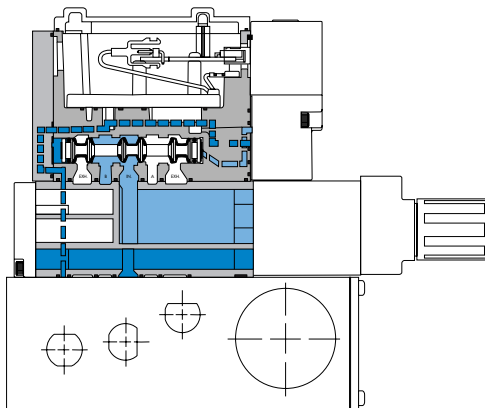
**REGULATOR CONFIGURATIONS**

**SINGLE REGULATOR - SINGLE PRESSURE**

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

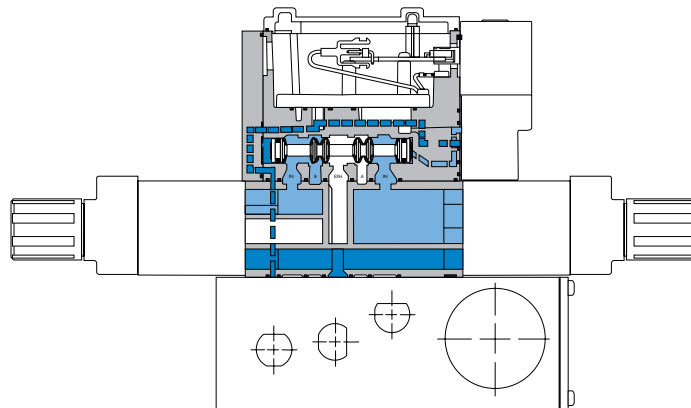
**DUAL REGULATOR - DUAL PRESSURE**

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



**MANIFOLD WITH REGULATOR - SINGLE PRESSURE**

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



**MANIFOLD WITH REGULATOR - DUAL PRESSURE**



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2, 5/3</b>	<b>1/8" - 1/4" - 3/8"</b>	<b>1.2 C<sub>v</sub></b>	Sub-base non "plug-in"	

### OPERATIONAL BENEFITS

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



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- 69
- 44
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- 42
- 47
- 48P
- 48

### 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	5/3 Pressure center
<b>Valve less base</b>		92B-ABA-000-DM-Dxxx-xxx	92B-BBA-000-DM-Dxxx-xxx	92B-EBA-000-DM-Dxxx-xxx	92B-FBA-000-DM-Dxxx-xxx	92B-GBA-000-DM-Dxxx-xxx
<b>1/8" NPTF</b>		92B-ABA-AAG-DM-Dxxx-xxx	92B-BBA-AAG-DM-Dxxx-xxx	92B-EBA-AAG-DM-Dxxx-xxx	92B-FBA-AAG-DM-Dxxx-xxx	92B-GBA-AAG-DM-Dxxx-xxx
<b>1/4" NPTF</b>	Internal	92B-ABA-BAG-DM-Dxxx-xxx	92B-BBA-BAG-DM-Dxxx-xxx	92B-EBA-BAG-DM-Dxxx-xxx	92B-FBA-BAG-DM-Dxxx-xxx	92B-GBA-BAG-DM-Dxxx-xxx
<b>3/8" NPTF</b>		92B-ABA-CAG-DM-Dxxx-xxx	92B-BBA-CAG-DM-Dxxx-xxx	92B-EBA-CAG-DM-Dxxx-xxx	92B-FBA-CAG-DM-Dxxx-xxx	92B-GBA-CAG-DM-Dxxx-xxx
<b>1/8" NPTF</b>		92B-ABA-AAH-DM-Dxxx-xxx	92B-BBA-AAH-DM-Dxxx-xxx	92B-EBA-AAH-DM-Dxxx-xxx	92B-FBA-AAH-DM-Dxxx-xxx	92B-GBA-AAH-DM-Dxxx-xxx
<b>1/4" NPTF</b>	External	92B-ABA-BAH-DM-Dxxx-xxx	92B-BBA-BAH-DM-Dxxx-xxx	92B-EBA-BAH-DM-Dxxx-xxx	92B-FBA-BAH-DM-Dxxx-xxx	92B-GBA-BAH-DM-Dxxx-xxx
<b>3/8" NPTF</b>		92B-ABA-CAH-DM-Dxxx-xxx	92B-BBA-CAH-DM-Dxxx-xxx	92B-EBA-CAH-DM-Dxxx-xxx	92B-FBA-CAH-DM-Dxxx-xxx	92B-GBA-CAH-DM-Dxxx-xxx

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

Port size	Pilot air	5/2 Single operator	5/2 Double operator
<b>Valve less base</b>		92B-CBA-000-DM-Dxxx-xxx	92B-DBA-000-DM-Dxxx-xxx
<b>1/8" NPTF</b>		92B-CBA-AAG-DM-Dxxx-xxx	92B-DBA-AAG-DM-Dxxx-xxx
<b>1/4" NPTF</b>	Internal	92B-CBA-BAG-DM-Dxxx-xxx	92B-DBA-BAG-DM-Dxxx-xxx
<b>3/8" NPTF</b>		92B-CBA-CAG-DM-Dxxx-xxx	92B-DBA-CAG-DM-Dxxx-xxx
<b>1/8" NPTF</b>		92B-CBA-AAH-DM-Dxxx-xxx	92B-DBA-AAH-DM-Dxxx-xxx
<b>1/4" NPTF</b>	External	92B-CBA-BAH-DM-Dxxx-xxx	92B-DBA-BAH-DM-Dxxx-xxx
<b>3/8" NPTF</b>		92B-CBA-CAH-DM-Dxxx-xxx	92B-DBA-CAH-DM-Dxxx-xxx

- 400
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- 93
- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

#### 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 (2.9W)	<b>A</b> 18" (Flying leads)	<b>1</b> Non-locking recessed	<b>BM</b> Flying leads
<b>JB</b> 220/50, 240/60 (2.9W)	<b>B</b> 24" (Flying leads)	<b>2</b> Locking recessed	<b>BN</b> Flying leads with diode
<b>JC</b> 24/60 (2.9W)	<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
			<b>KA</b> Square connector

\* Other options available, see page 309.

Other options available for the 92 series valves, see page 155.



**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot : 20 to 120 PSI      3 position : 35 to 120 PSI External pilot : vacuum to 120 PSI      3 position : 35 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>	1/8": (1.0 C <sub>v</sub> ) – 1/4": (1.1 C <sub>v</sub> ) – 3/8": (1.2 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 18 lead wire
<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 :</b>	24V=5.4W      Energize : 8 ms      De-energize : 7 ms 120/60      Energize : 7-13 ms      De-energize : 12-20 ms

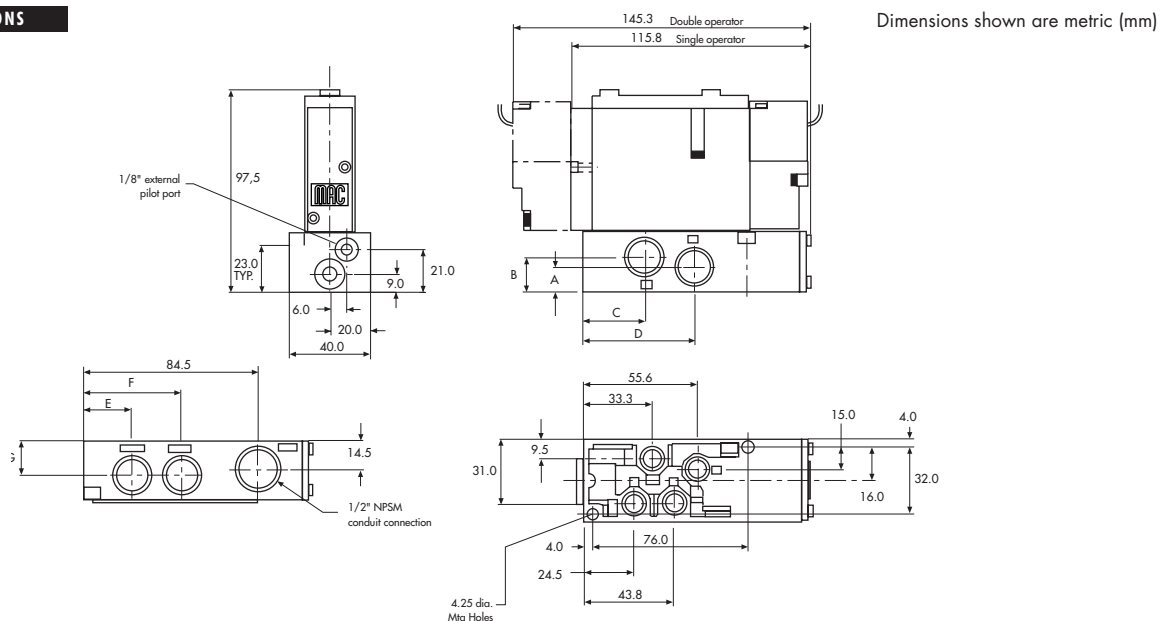
Options :

- BSPP threads • Sandwich flow control: FC92B-CA

Spare parts :

- Pilot valve DM-Dxxx-xxx • Valve blanking plate: M-92002
- Pressure seal between valve and base : 16543. • Mounting screws valve to base (X2) : 35050.

**DIMENSIONS**



DIM.	A	B	C	D	E	F	G
1/8"	12.5	18.0	31.0	54.0	23.5	46.5	18.0
1/4"	12.5	18.0	31.0	54.0	23.5	46.5	18.0
3/8"	12.0	17.0	30.0	54.0	23.5	47.5	17.0



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2, 5/3</b>	<b>1/8" - 1/4" - 3/8"</b>	<b>1.2 C<sub>v</sub></b>	Sub-base "plug-in"	

### OPERATIONAL BENEFITS

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



- 33
- 34
- 36
- 32
- 37
- 38
- 52
- 67
- 69
- 44
- 46
- 42
- 47
- 48P
- 48

### 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	5/3 Pressure center
<b>Valve less base</b>		92B-AAA-000-DM-DxxP-xxx	92B-BAA-000-DM-DxxP-xxx	92B-EAA-000-DM-DxxP-xxx	92B-FAA-000-DM-DxxP-xxx	92B-GAA-000-DM-DxxP-xxx
<b>1/8"</b>		92B-AAA-AAA-DM-DxxP-xxx	92B-BAA-AAA-DM-DxxP-xxx	92B-EAA-AAA-DM-DxxP-xxx	92B-FAA-AAA-DM-DxxP-xxx	92B-GAA-AAA-DM-DxxP-xxx
<b>1/4"</b>	Internal	92B-AAA-BAA-DM-DxxP-xxx	92B-BAA-BAA-DM-DxxP-xxx	92B-EAA-BAA-DM-DxxP-xxx	92B-FAA-BAA-DM-DxxP-xxx	92B-GAA-BAA-DM-DxxP-xxx
<b>3/8"</b>		92B-AAA-CAA-DM-DxxP-xxx	92B-BAA-CAA-DM-DxxP-xxx	92B-EAA-CAA-DM-DxxP-xxx	92B-FAA-CAA-DM-DxxP-xxx	92B-GAA-CAA-DM-DxxP-xxx
<b>1/8"</b>		92B-AAA-AAD-DM-DxxP-xxx	92B-BAA-AAD-DM-DxxP-xxx	92B-EAA-AAD-DM-DxxP-xxx	92B-FAA-AAD-DM-DxxP-xxx	92B-GAA-AAD-DM-DxxP-xxx
<b>1/4"</b>	External	92B-AAA-BAD-DM-DxxP-xxx	92B-BAA-BAD-DM-DxxP-xxx	92B-EAA-BAD-DM-DxxP-xxx	92B-FAA-BAD-DM-DxxP-xxx	92B-GAA-BAD-DM-DxxP-xxx
<b>3/8"</b>		92B-AAA-CAD-DM-DxxP-xxx	92B-BAA-CAD-DM-DxxP-xxx	92B-EAA-CAD-DM-DxxP-xxx	92B-FAA-CAD-DM-DxxP-xxx	92B-GAA-CAD-DM-DxxP-xxx

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

Port size	Pilot air	5/2 Single operator	5/2 Double operator
<b>Valve less base</b>		92B-CAA-000-DM-DxxP-xxx	92B-DAA-000-DM-DxxP-xxx
<b>1/8"</b>		92B-CAA-AAA-DM-DxxP-xxx	92B-DAA-AAA-DM-DxxP-xxx
<b>1/4"</b>	Internal	92B-CAA-BAA-DM-DxxP-xxx	92B-DAA-BAA-DM-DxxP-xxx
<b>3/8"</b>		92B-CAA-CAA-DM-DxxP-xxx	92B-DAA-CAA-DM-DxxP-xxx
<b>1/8"</b>		92B-CAA-AAD-DM-DxxP-xxx	92B-DAA-AAD-DM-DxxP-xxx
<b>1/4"</b>	External	92B-CAA-BAD-DM-DxxP-xxx	92B-DAA-BAD-DM-DxxP-xxx
<b>3/8"</b>		92B-CAA-CAD-DM-DxxP-xxx	92B-DAA-CAD-DM-DxxP-xxx

- 400
- 92
- 93
- ISO 01
- ISO 02
- ISO 1
- ISO 2
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#### SOLENOID OPERATOR >

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

Above models are shown with side ports.

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 / 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>DJ</b> Plug-in with M.O.V. & ground
<b>DF</b> 24 VDC (12.7W)		<b>DH</b> Plug-in with diode & ground

\* Other options available, see page 309.  
 Note: Ground required for 30 Volts or higher.  
 Other options available for the 92 series valves, see page 156.

**TECHNICAL DATA**

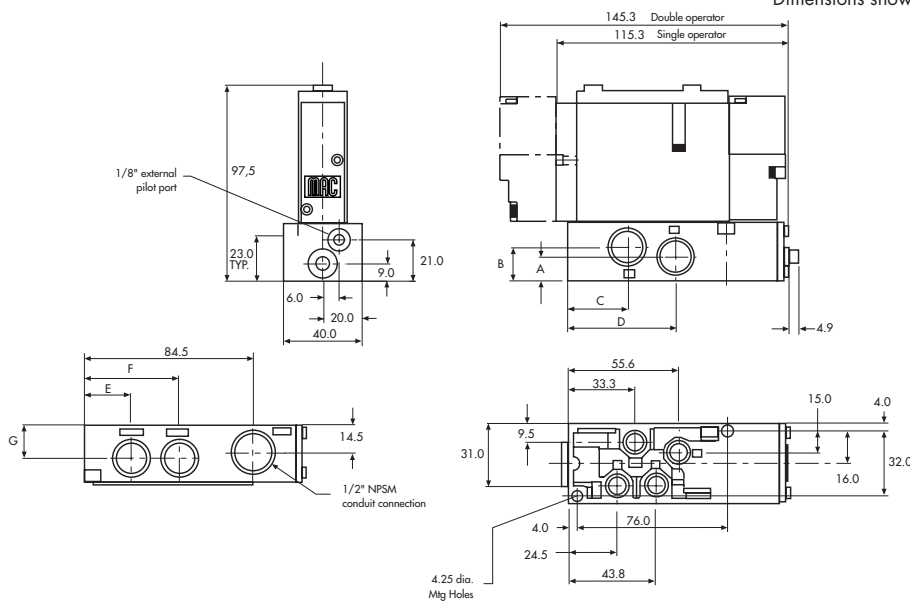
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot : 20 to 120 PSI      3 position : 35 to 120 PSI External pilot : vacuum to 120 PSI      3 position : 35 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F 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>	1/8": (1.0 C <sub>v</sub> ) – 1/4": (1.1 C <sub>v</sub> ) – 3/8": (1.2 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 18 lead wire
<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 :</b>	24V=5.4W      Energize : 8 ms      De-energize : 7 ms 120/60      Energize : 7-13 ms      De-energize : 12-20 ms

Options : • BSPB threads • Sandwich flow control: FC92B-AA (sgl. operator), FC92B-BA (dbl. operator)

Spare parts : • Pilot valve DM-DxxP-xxx • Valve blanking plate: M-92002  
• Pressure seal between valve and base : 16543. • Mounting screws valve to base (X2) : 35050.

**DIMENSIONS**

Dimensions shown are metric (mm)



DIM.	A	B	C	D	E	F	G
1/8"	12.5	18.0	31.0	54.0	23.5	46.5	18.0
1/4"	12.5	18.0	31.0	54.0	23.5	46.5	18.0
3/8"	12.0	17.0	30.0	54.0	23.5	47.5	17.0



# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Manifold mounting	Series
<b>5/2, 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.2 C<sub>v</sub></b>	Sub-base non "plug-in"	

### OPERATIONAL BENEFITS

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



33  
34  
36  
32  
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38  
52  
67  
69  
44

### 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	5/3 Pressure center
<b>Valve less base</b>		92B-ABA-000-DM-DXXX-XXX	92B-BBA-000-DM-DXXX-XXX	92B-EBA-000-DM-DXXX-XXX	92B-FBA-000-DM-DXXX-XXX	92B-GBA-000-DM-DXXX-XXX
<b>1/4" NPTF</b>	Internal	92B-ABA-BJG-DM-DXXX-XXX	92B-BBA-BJG-DM-DXXX-XXX	92B-EBA-BJG-DM-DXXX-XXX	92B-FBA-BJG-DM-DXXX-XXX	92B-GBA-BJG-DM-DXXX-XXX
<b>3/8" NPTF</b>		92B-ABA-CJG-DM-DXXX-XXX	92B-BBA-CJG-DM-DXXX-XXX	92B-EBA-CJG-DM-DXXX-XXX	92B-FBA-CJG-DM-DXXX-XXX	92B-GBA-CJG-DM-DXXX-XXX

46  
42  
47  
48P

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

Port size	Pilot air	5/2 Single operator	5/2 Double operator
<b>Valve less base</b>		92B-CBA-000-DM-DXXX-XXX	92B-DBA-000-DM-DXXX-XXX
<b>1/4" NPTF</b>	Internal	92B-CBA-BJG-DM-DXXX-XXX	92B-DBA-BJG-DM-DXXX-XXX
<b>3/8" NPTF</b>		92B-CBA-CJG-DM-DXXX-XXX	92B-DBA-CJG-DM-DXXX-XXX

48  
400

Above models are shown with side ports.

92  
93

#### SOLENOID OPERATOR >

### DM-D XXX-XXX\*

XX Voltage	X Wire length	X Manual operator	XX Electrical connection
<b>JA</b> 110 /50, 120/60 (2.9W)	<b>A</b> 18" (flying leads)	<b>1</b> Non-locking recessed	<b>KA</b> Square connector
<b>JB</b> 220/50, 240/60 (2.9W)	<b>J</b> Connector	<b>2</b> Locking recessed	<b>KD</b> Square connector with light
<b>JC</b> 24/60 (2.9W)			<b>JB</b> Rectangular connector
<b>FB</b> 24 VDC (1.8W)			<b>JD</b> Rect. connector with light
<b>DA</b> 24 VDC (5.4W)			<b>BA</b> Flying leads
<b>DF</b> 24 VDC (12.7W)			<b>BK</b> Flying leads with diode

\* Other options available, see page 309.  
End plate kit required (port size 3/8"): M-92004-01-01 (internal pilot)  
M-92004-02-01 (External pilot)

Other options available for the 92 series valves, see page 155.

ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

**TECHNICAL DATA**

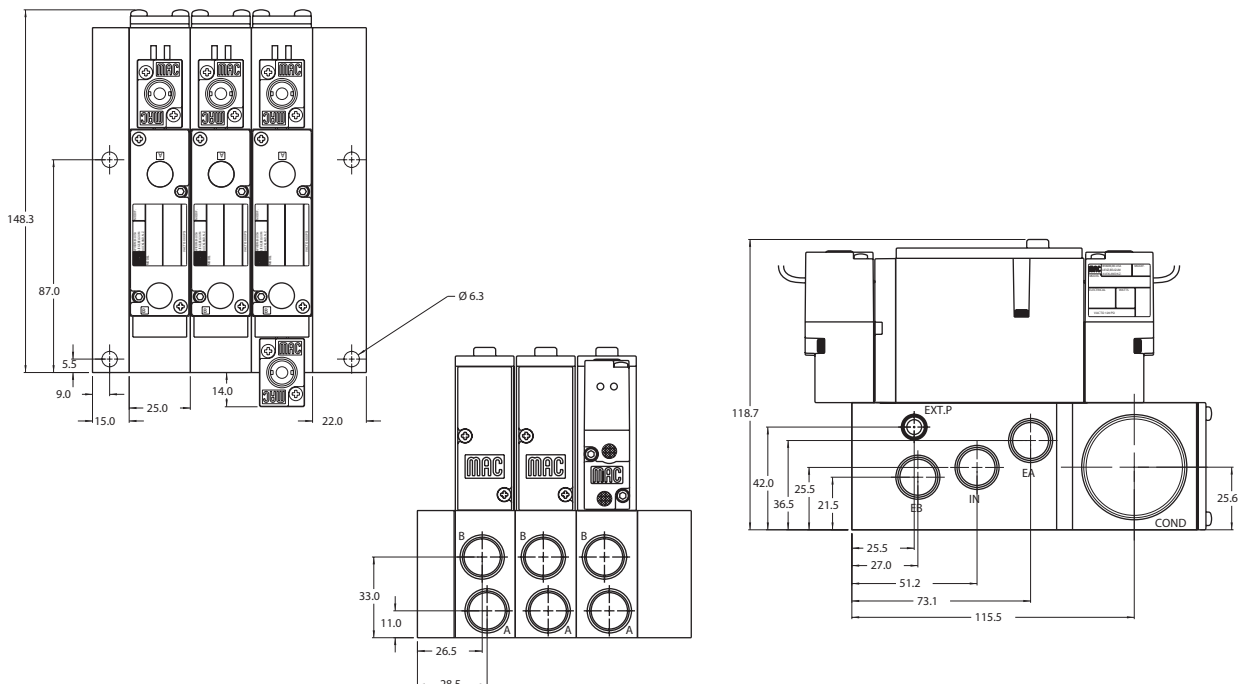
Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Internal pilot : 20 to 120 PSI      3 position : 35 to 120 PSI External pilot : vacuum to 120 PSI      3 position : 35 to 120 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
Filtration :	40 μ
Temperature range :	0°F to 120°F (-18°C to +50°C)
Flow :	1/4": (1.1 C <sub>v</sub> ) – 3/8": (1.2 C <sub>v</sub> )
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 = 1.8 to 12.7 W
Response times :	24V=/5.4W      Energize : 8 ms      De-energize : 7 ms 120/60      Energize : 7-13 ms      De-energize : 12-20 ms

Options : • BSPP threads • Sandwich flow controls: FC92B-CA

Spare parts : • Pilot valve: DM-Dxxx-xxx • Valve blanking plate: M-92002 • Pressure seal, valve to base 16543  
• Inlet/Exhaust isolator disc: N-92018.

**DIMENSIONS**

Dimensions shown are metric (mm)





# Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow [Max]	Manifold mounting	Series
<b>5/2, 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.2 C<sub>v</sub></b>	Sub-base "plug-in"	

### OPERATIONAL BENEFITS

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



33  
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38  
52  
67  
69  
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### 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	5/3 Pressure center
<b>Valve less base</b>		92B-AAA-000-DM-DxxP-xxx	92B-BAA-000-DM-DxxP-xxx	92B-EAA-000-DM-DxxP-xxx	92B-FAA-000-DM-DxxP-xxx	92B-GAA-000-DM-DxxP-xxx
<b>1/4" NPTF</b>	Internal	92B-AAA-BJA-DM-DxxP-xxx	92B-BAA-BJA-DM-DxxP-xxx	92B-EAA-BJA-DM-DxxP-xxx	92B-FAA-BJA-DM-DxxP-xxx	92B-GAA-BJA-DM-DxxP-xxx
<b>3/8" NPTF</b>		92B-AAA-CJA-DM-DxxP-xxx	92B-BAA-CJA-DM-DxxP-xxx	92B-EAA-CJA-DM-DxxP-xxx	92B-FAA-CJA-DM-DxxP-xxx	92B-GAA-CJA-DM-DxxP-xxx

46  
42  
47  
48P

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

Port size	Pilot air	5/2 Single operator	5/2 Double operator
<b>Valve less base</b>		92B-CAA-000-DM-DxxP-xxx	92B-DAA-000-DM-DxxP-xxx
<b>1/4" NPTF</b>	Internal	92B-CAA-BJA-DM-DxxP-xxx	92B-DAA-BJA-DM-DxxP-xxx
<b>3/8" NPTF</b>		92B-CAA-CJA-DM-DxxP-xxx	92B-DAA-CJA-DM-DxxP-xxx

48  
400

#### SOLENOID OPERATOR >

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

Above models are shown with side ports and no lights.

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> 24/60 (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>DJ</b> Plug-in with M.O.V. & ground
<b>DF</b> 24 VDC (12.7W)		<b>DH</b> Plug-in with diode & ground

92

\* Other options available, see page 309.  
 Note: Ground required for 30 Volts or higher.  
 End plate kit required (port size 3/8"): M-92004-01-01 (internal pilot)  
 M-92004-02-01 (external pilot)

Other options available for the 92 series valves, see page 156.

93  
ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

**TECHNICAL DATA**

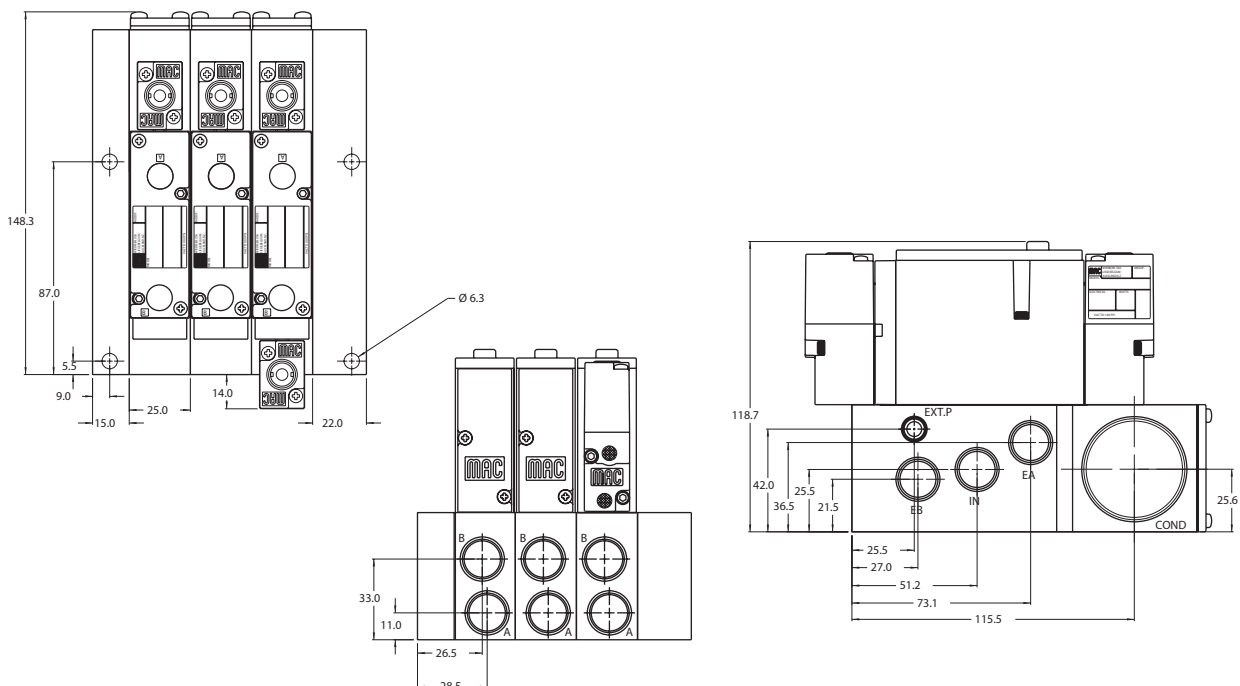
Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Internal pilot : 20 to 120 PSI      3 position : 35 to 120 PSI External pilot : vacuum to 120 PSI      3 position : 35 to 120 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
Filtration :	40 μ
Temperature range :	0°F to 120°F (-18°C to +50°C)
Flow :	1/4": (1.1 C <sub>v</sub> ) – 3/8": (1.2 C <sub>v</sub> )
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 = 1.8 to 12.7 W
Response times :	24V=/5.4W      Energize : 8 ms      De-energize : 7 ms 120/60      Energize : 7-13 ms      De-energize : 12-20 ms

Options : • BSPP threads • Sandwich flow controls: FC92B-AA (sgl. operator), FC92B-BA (dbl. operator)

Spare parts : • Pilot valve: DM-DxxP-xxx • Valve blanking plate: M-92002 • Pressure seal, valve to base: 16543  
• Mounting screws valve to base (x2): 35050 • Inlet/Exhaust isolator disc: N-92018.

**DIMENSIONS**

Dimensions shown are metric (mm)



<b>OPTIONS FOR NON PLUG-IN VALVES</b>	<b>33</b>
<b>Valve function</b>	<b>34</b>
92B- <b>HXX-XXX-XX-Dxxx-xxx</b>	<b>36</b>
<ul style="list-style-type: none"> <li><b>H</b> for 3 position dual pressure, pressure center*</li> <li><b>J</b> for 3 position dual pressure, closed center*</li> <li><b>K</b> for 3 position dual pressure, open center*</li> <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> </ul>	<b>32</b>
<b>Pilot exhaust</b>	<b>37</b>
92B- <b>XBX-XXX-XX-Dxxx-xxx</b>	<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>
92B- <b>XXX-<b>AX</b>-XX-Dxxx-xxx</b>	<b>44</b>
<ul style="list-style-type: none"> <li><b>A</b> side ports</li> <li><b>B</b> bottom ports (1/8" only)</li> <li><b>C</b> side &amp; bottom ports (1/8" only)</li> <li><b>D</b> side inlet &amp; exhaust with bottom cylinder ports (1/8")</li> </ul>	<b>46</b>
<b>Manifold sub-base</b>	<b>42</b>
92B- <b>XXX-<b>XJX</b>-XX-Dxxx-xxx</b>	<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>
92B- <b>XXX-XXX-<b>DM</b>-Dxxx-xxx</b>	<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>	
92B-000-XXX (i.e. 92B-000-AAG) - Individual base	
92B-000-XXX (i.e. 92B-000-BJG) - Manifold base	

\* Requires sandwich regulator.

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





# Direct solenoid and solenoid pilot operated valves

## OPTIONS FOR PLUG-IN VALVES

### Valve function

92B-**HXX**-XXX-XX-D**xxP**-XXX

- H** for 3 position dual pressure, pressure center\*
- J** for 3 position dual pressure, closed center\*
- K** for 3 position dual pressure, open center\*
- L** for single operator, single pressure with memory spring
- N** for single operator, dual pressure with memory spring\*

### Pilot exhaust

92B-**XA**X-XXX-XX-D**xxP**-XXX

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

### Body electrical

92B-**XA**-XXX-XX-D**xxP**-XXX

- A** no light
- B** light(s)
- F** suppression and blocking diode with light(s)
- H** M.O.V. with light(s)

### Port configuration :

#### Individual sub-base

92B-XXX-**XA**X-XX-D**xxP**-XXX

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

#### Manifold sub-base

92B-XXX-**XJ**X-XX-D**xxP**-XXX

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

#### Individual & Manifold sub-base Int. pilot

92B-XXX-**XA**-XX-D**xxP**-XXX

- A** internal pilot no light
- B** internal pilot single light
- C** internal pilot double light

#### Individual sub-base Ext. pilot

92B-XXX-**XD**-XX-D**xxP**-XXX

- D** external pilot no light
- E** external pilot single light
- F** external pilot double light

### Pilot style :

92B-XXX-XXX-**DM**-D**xxP**-XXX

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

### Lead Wire Lengths : (manifold sub-base only)

92B-XXX-XXX-**DM**-D**xxP**-XXX

- P** 12" leads
- 1** 18" leads
- 2** 24" leads
- 3** 36" leads
- 4** 48" leads
- 5** 72" leads

### Base only :

92B-000-XXX (i.e. 92B-000-AAA) - Individual base

(Note: bases are wired for double solenoid valves)

92B-000-XXX (i.e. 92B-000-BJA) - Manifold base

\* Requires sandwich regulator.

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

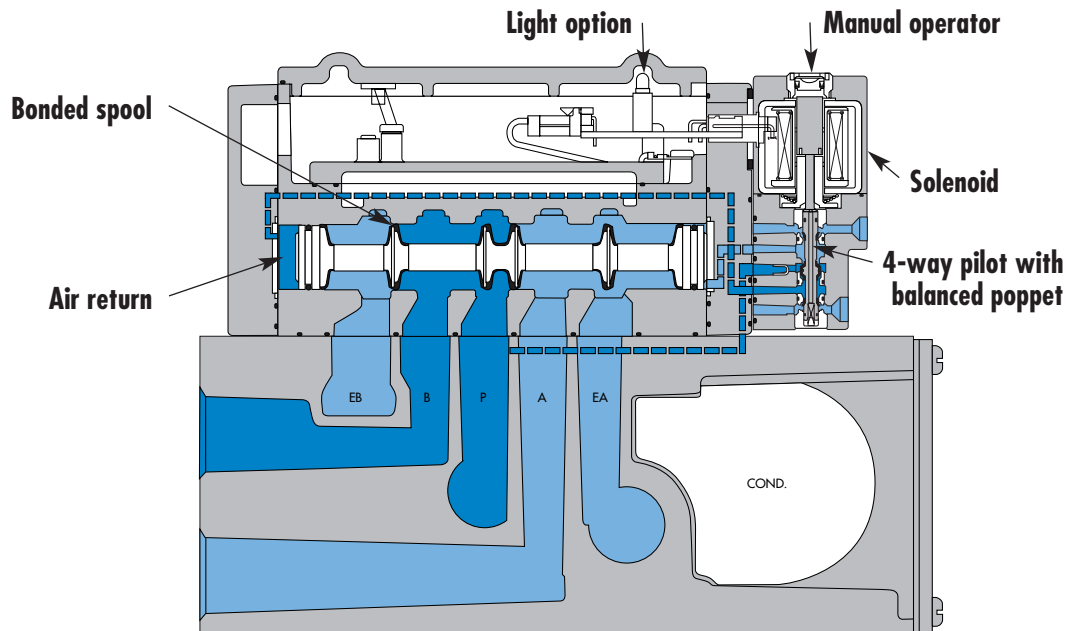
Individual mounting

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

Manifold mounting

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



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48P

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48

48

400

92

**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

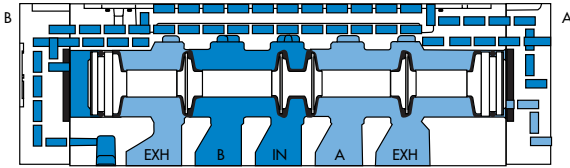
ISO 02

ISO 1

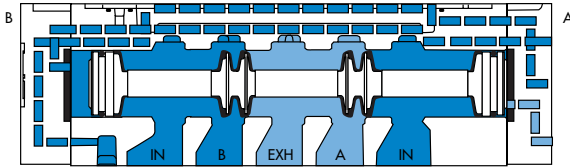
ISO 2

ISO 3

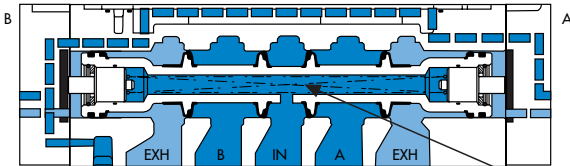
**SPOOL CONFIGURATIONS**



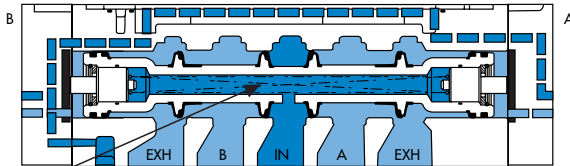
2 POSITION SINGLE PRESSURE  
SHOWN WITH "B" OPERATOR ENERGIZED



2 POSITION DUAL PRESSURE  
SHOWN WITH "B" OPERATOR ENERGIZED

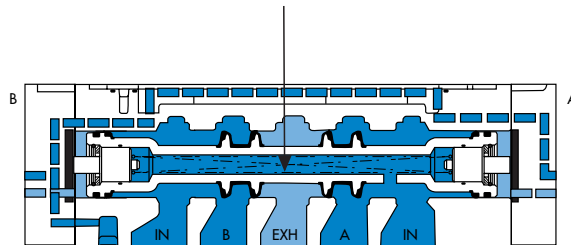


3 POSITION CLOSED CENTER



3 POSITION OPEN CENTER

**SPRING CENTERING**

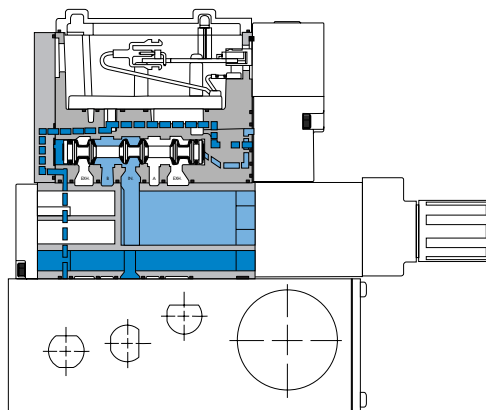


3 POSITION DUAL PRESSURE, PRESSURE CENTER

**REGULATOR CONFIGURATIONS**

**SINGLE REGULATOR - SINGLE PRESSURE**

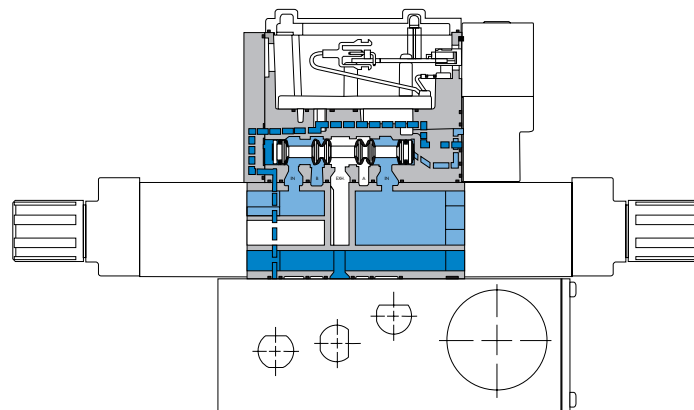
Pressure supplied to the individual or manifold base passes through the regulator. Regulated pressure is supplied to the pressure path of the valve.



**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.



- 33
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- 67
- 69
- 44
- 46
- 42
- 47
- 48P
- 48
- 400
- 92
- 93
- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

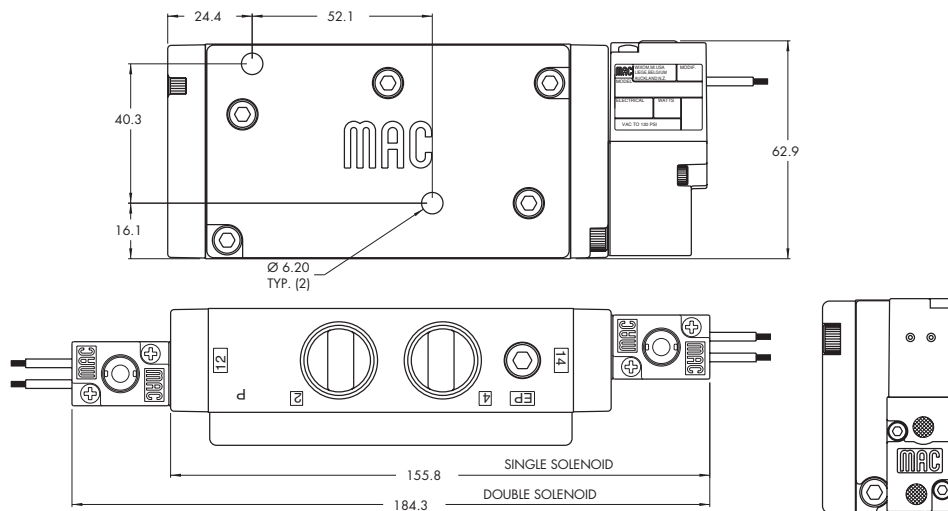
**TECHNICAL DATA**

<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 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)






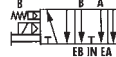
Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2, 5/3</b>	<b>1/4" - 3/8" - 1/2"</b>	<b>3.4 C<sub>v</sub></b>	Sub-base non "plug-in"	

### 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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93  
ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3



**TECHNICAL DATA**

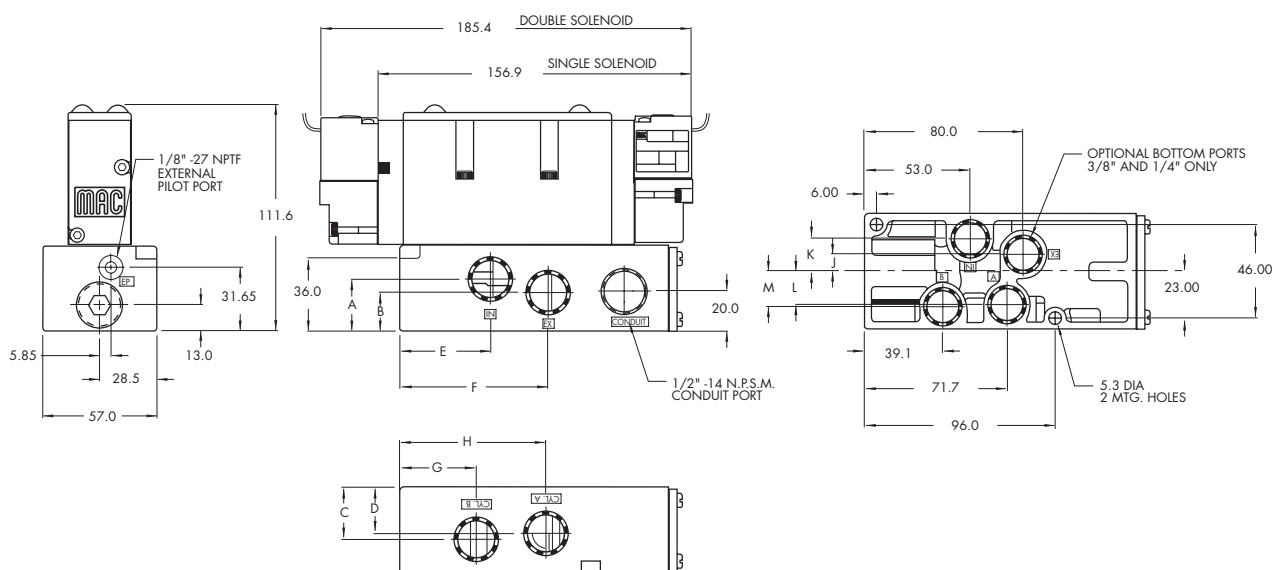
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 µ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	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 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
  - 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

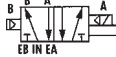


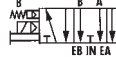
Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2, 5/3</b>	<b>1/4" - 3/8" - 1/2"</b>	<b>3.4 C<sub>v</sub></b>	Sub-base "plug-in"	

### OPERATIONAL BENEFITS



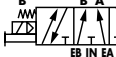
1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. Air only return. Optional memory spring is also available.
4. 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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42  
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48P  
48  
400  
92  
93  
ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3





**TECHNICAL DATA**

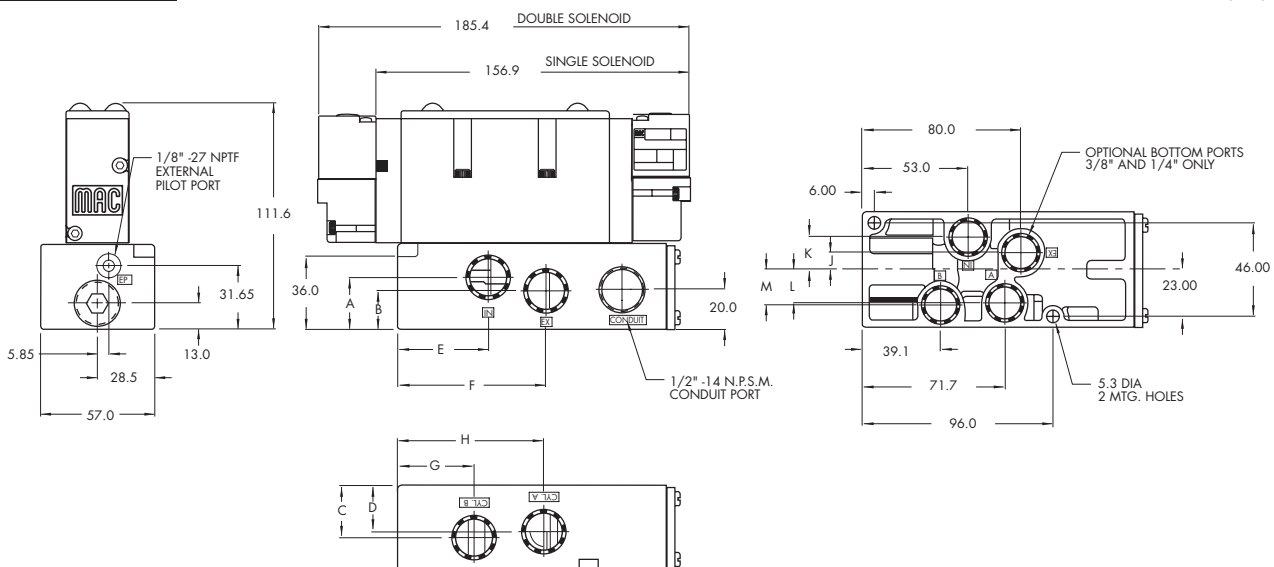
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	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.

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- 48P
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- 400
- 92
- 93
- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

**TECHNICAL DATA**

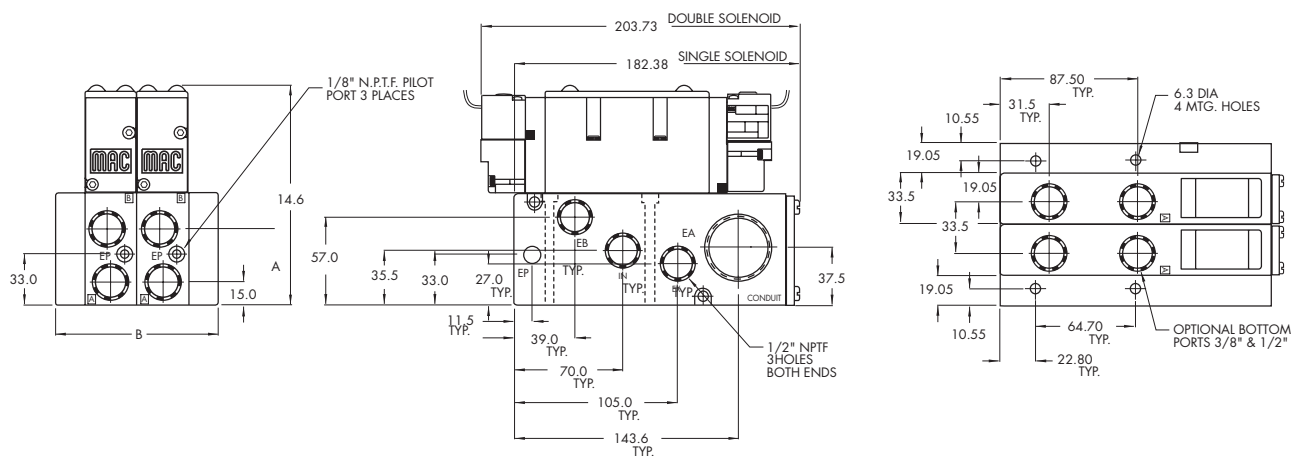
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 µ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	3/8" : (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.



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- 48P
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- 400
- 92
- 93
- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3

**TECHNICAL DATA**

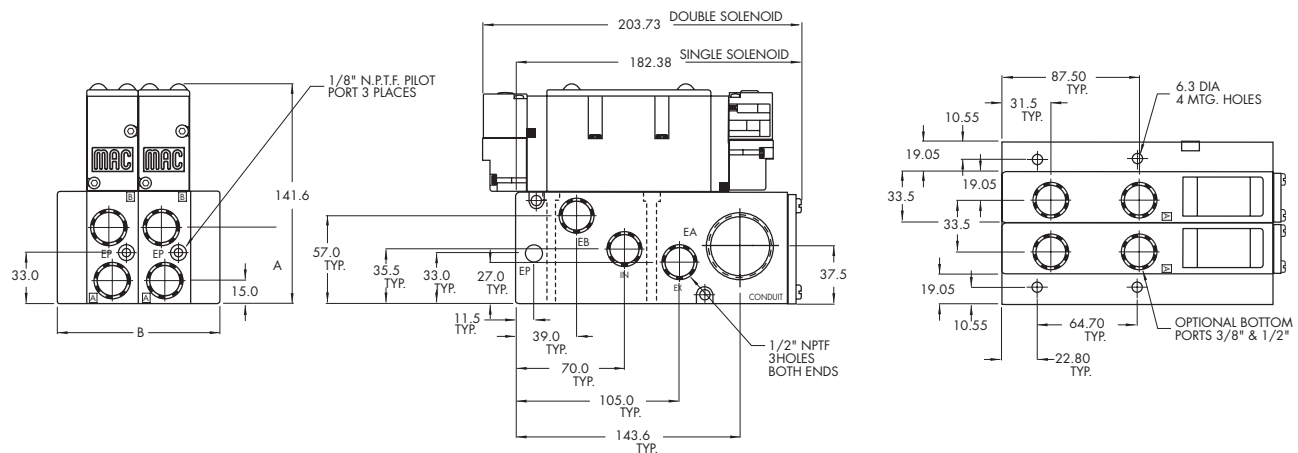
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	3/8" : (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-XX-AX-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.

Individual mounting

Valve only -  
 No base  
 non "plug-in"  
 Conform to  
 ISO 15407/1

Series

Manifold mounting

Valve only -  
 No base  
 non "plug-in"  
 Conform to  
 ISO 15407/1

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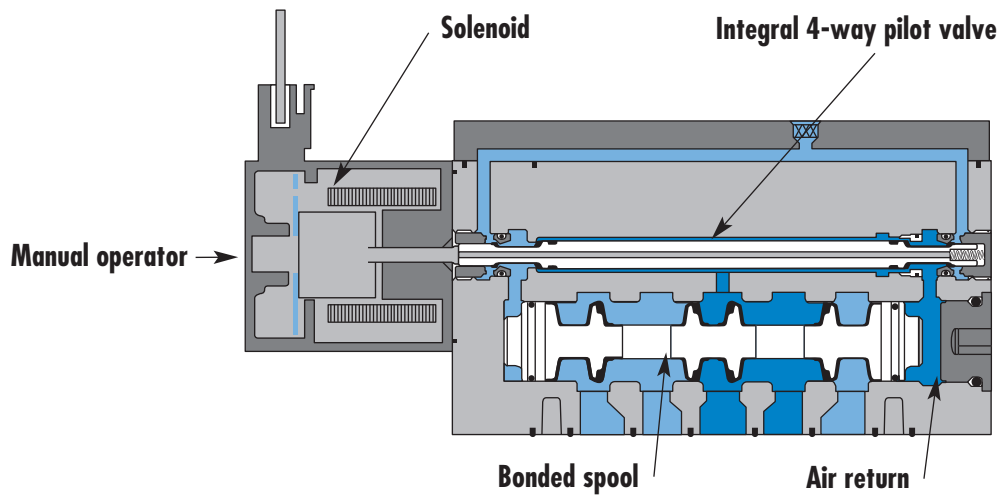
48P

48

400

92

93



**SERIES FEATURES**

- High force MACSOLENOID®.
- Integral 4-way pilot design.
- 2-position, single or double operator.
- 3-position, double solenoid, open center, closed center and pressure center.
- Internal or external pilot.
- Single or dual pressure.

**ISO 01**

**ISO 02**

**ISO 1**

**ISO 2**

**ISO 3**



Function	Port size	Flow [Max]	Individual/Manifold mounting	Series
<b>5/2, 5/3</b>	<b>1/4"</b>	<b>1.0 C<sub>v</sub></b>	Valve only - No base non "plug-in" Conform to ISO 15407/1	

### OPERATIONAL BENEFITS

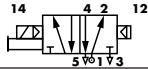
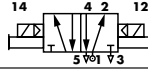
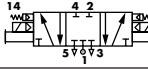
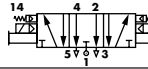
1. Unique patented MACsolenoid® with oval shaped armature for fastest possible response times.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. MAC spool and bore combination wipes away contamination, eliminates sticking and allows 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. Pilot valve and main valve in the same body.
6. Internal or external pilot operation.
7. Air only return
8. Optional low wattage DC solenoid down to 1.0 Watt.



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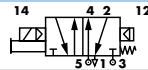
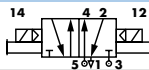
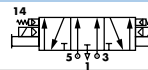
### HOW TO ORDER

#### SINGLE PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
Internal	 MV-A01A-AAMA-Jxxx-xxx	 MV-A01A-ABMA-Jxxx-xxx	 MV-A01A-AEMA-Jxxx-xxx	 MV-A01A-AFMA-Jxxx-xxx
External "12" end	MV-A01A-AAMD-Jxxx-xxx	MV-A01A-ABMD-Jxxx-xxx	MV-A01A-AEMD-Jxxx-xxx	MV-A01A-AFMD-Jxxx-xxx
External "14" end	MV-A01A-AAME-Jxxx-xxx	MV-A01A-ABME-Jxxx-xxx	MV-A01A-AEME-Jxxx-xxx	MV-A01A-AFME-Jxxx-xxx

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42  
47

#### DUAL PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal from port #3	 MV-A01A-ACMB-Jxxx-xxx	 MV-A01A-ADMB-Jxxx-xxx	 MV-A01A-AHMB-Jxxx-xxx
Internal from port #5	MV-A01A-ACMC-Jxxx-xxx	MV-A01A-ADMC-Jxxx-xxx	MV-A01A-AHMC-Jxxx-xxx
External from "12" end	MV-A01A-ACMD-Jxxx-xxx	MV-A01A-ADMD-Jxxx-xxx	MV-A01A-AHMD-Jxxx-xxx
External from "14" end	MV-A01A-ACME-Jxxx-xxx	MV-A01A-ADME-Jxxx-xxx	MV-A01A-AHME-Jxxx-xxx

48P  
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#### SOLENOID OPERATOR >

J **xxx-xxx**\*

XX Voltage	X Lead wire length	X Manual operator	XX Electrical connection
DA 24 VDC (5.4W)	O No lead wire/ connector	1 Non-locking	BA Flying leads
DB 12 VDC (5.4W)	A 18"	2 Locking	JA Square connector
DC 24 VDC (2.4W)	B 24"		JC Square connector with light
DD 12 VDC (2.4W)	C 36"		JB Rectangular connector
DE 24 VDC (1.8W)			JD Rectangular connector with light
DU 24 VDC (1.0W)			KA Mini square connector
			KD Mini square connector with light

ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

\* Other options available, see page 317.

Note: - ISO series, valve and base are ordered separately, see page 227 for base codes.  
- If sandwich regulator is required, valve must be ordered as external pilot. For internal pilot regulator use valve with external pilot 12 end, - for external pilot regulator, use valve with external pilot 12 or 14 end.

### OPTIONS

Pilot exhaust: MV-A01A-XX X X-Jxxx-xxx

- M Pilot exhaust muffled
- P Pilot exhaust piped #10-32
- U Pilot exhaust out main exhaust

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot - 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External Pilot: Vacuum to 120 PSI
<b>Pilot pressure :</b>	2 pos.: 20 to 120 PSI - 3 pos.: 35 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>	2 pos.: Cv 1.0 – 3 pos.: Cv 0.8
<b>Coil :</b>	Class A wires continuous duty, #22 AWG x 18
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1,0 to 5,4 W

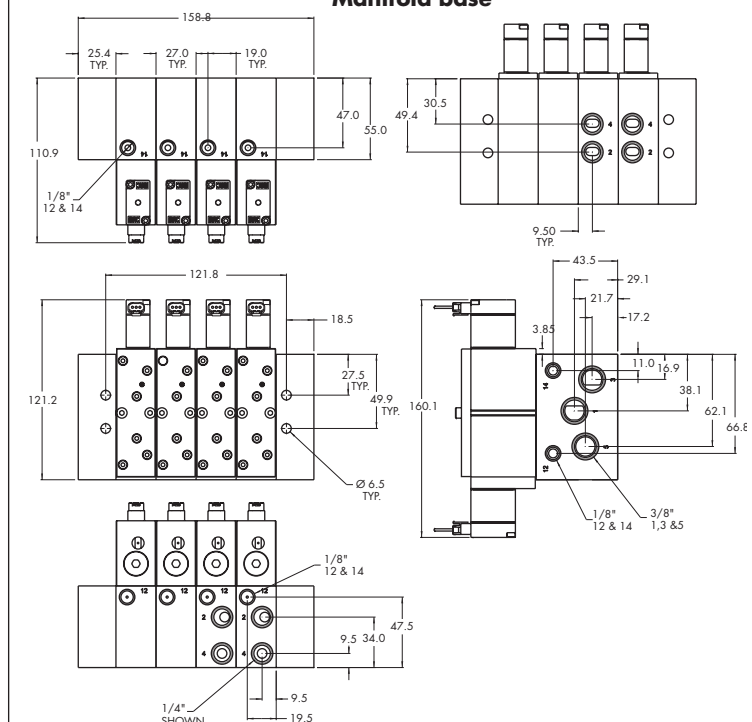
- Options :
- Sandwich flow controls: FCA01A-AA (screwdriver slot adjustment).
  - Sandwich pressure regulator, see ,Regulators' section

**DIMENSIONS**

**Individual base**

Dimensions shown are metric (mm)

**Manifold base**



Individual mounting

Valve only -  
 No base  
 non "plug-in"  
 Conform to  
 ISO 15407/1

Series

Manifold mounting

Valve only -  
 No base  
 non "plug-in"  
 Conform to  
 ISO 15407/1

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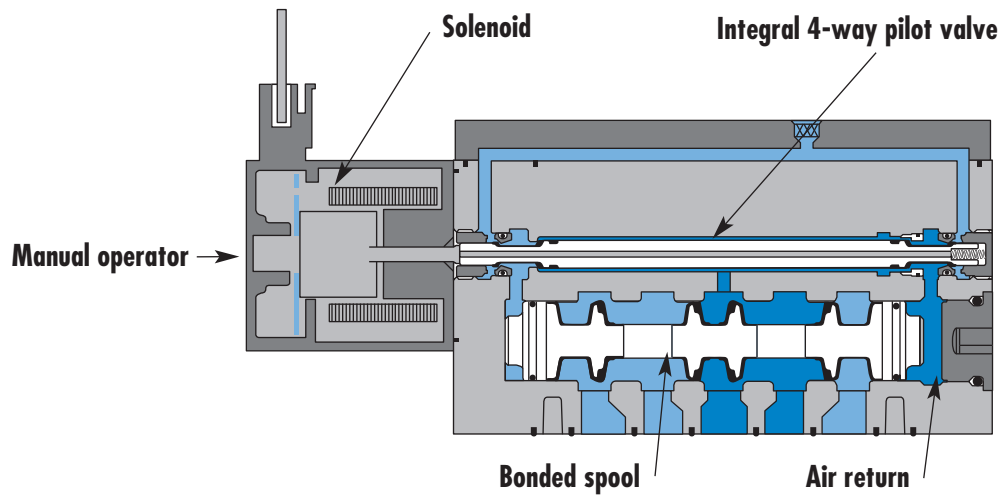
ISO 01

**ISO 02**

ISO 1

ISO 2

ISO 3



**SERIES FEATURES**

- High force MACSOLENOID®.
- Integral 4-way pilot design.
- 2-position, single or double operator.
- 3-position, double solenoid, open center, closed center and pressure center.
- Internal or external pilot.
- Single or dual pressure.

Function	Port size	Flow [Max]	Individual/Manifold mounting	Series
<b>5/2, 5/3</b>	<b>1/8"</b>	<b>0.43 C<sub>v</sub></b>	Valve only - No base non "plug-in" Conform to ISO 15407/1	

### OPERATIONAL BENEFITS

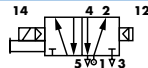
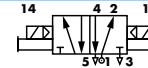
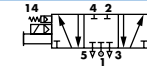
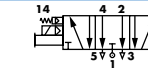
1. Unique patented MACsolenoid® with oval shaped armature for fastest possible response times.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. MAC spool and bore combination wipes away contamination, eliminates sticking and allows 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. Pilot valve and main valve in the same body.
6. Internal or external pilot operation.
7. Air only return
8. Optional low wattage DC solenoid down to 1.0 Watt.



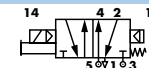
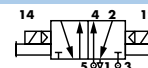
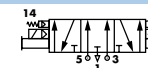
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48P

### 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-A02A-AAMA-Jxxx-xxx	 MV-A02A-ABMA-Jxxx-xxx	 MV-A02A-AEMA-Jxxx-xxx	 MV-A02A-AFMA-Jxxx-xxx
External "12" end	MV-A02A-AAMD-Jxxx-xxx	MV-A02A-ABMD-Jxxx-xxx	MV-A02A-AEMD-Jxxx-xxx	MV-A02A-AFMD-Jxxx-xxx
External "14" end	MV-A02A-AAME-Jxxx-xxx	MV-A02A-ABME-Jxxx-xxx	MV-A02A-AEME-Jxxx-xxx	MV-A02A-AFME-Jxxx-xxx

#### DUAL PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal from port #3	 MV-A02A-ACMB-Jxxx-xxx	 MV-A02A-ADMB-Jxxx-xxx	 MV-A02A-AHMB-Jxxx-xxx
Internal from port #5	MV-A02A-ACMC-Jxxx-xxx	MV-A02A-ADMC-Jxxx-xxx	MV-A02A-AHMC-Jxxx-xxx
External from "12" end	MV-A02A-ACMD-Jxxx-xxx	MV-A02A-ADMD-Jxxx-xxx	MV-A02A-AHMD-Jxxx-xxx
External from "14" end	MV-A02A-ACME-Jxxx-xxx	MV-A02A-ADME-Jxxx-xxx	MV-A02A-AHME-Jxxx-xxx

#### SOLENOID OPERATOR >

**J XXX-XXX\***

XX Voltage	X Lead wire length	X Manual operator	XX Electrical connection
DA 24V=/5,4W	0 No lead wire/ connector	1 Non-locking	BA Flying leads
DB 12V=/5,4W	A 45 cm	2 Locking	JA Square connector
DC 24V=/2,4W	B 60 cm		JC Square connector with light
DD 12V=/2,4W	C 90 cm		JB Rectangular connector
DE 24V=/1,8W			JD Rectangular connector with light
DU 24V=/1,0W			KA Mini square connector
			KD Mini square connector with light

\* Other options available, see page 317.

Note: - ISO series, valve and base are ordered separately, see page 229 for base codes.

- If sandwich regulator is required, valve must be ordered as external pilot. For internal pilot regulator use valve with external pilot 12 end, - for external pilot regulator, use valve with external pilot 12 or 14 end.

### OPTIONS

Pilot exhaust: **MV-A02A-XX X X-Jxxx-xxx**

- M** Pilot exhaust muffled
- P** Pilot exhaust piped #10-32
- U** Pilot exhaust out main exhaust

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ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

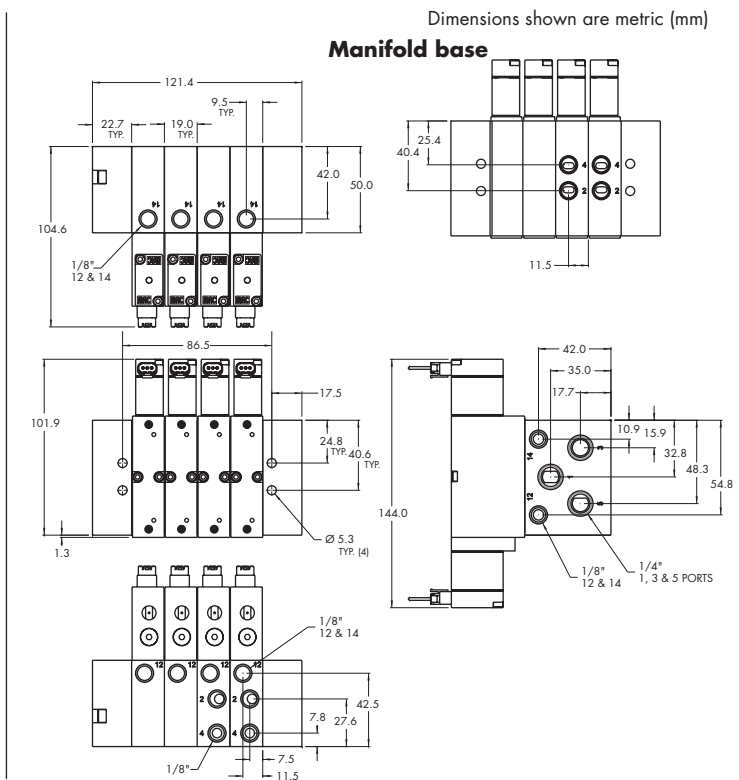
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal Pilot - 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External Pilot: Vacuum to 120 PSI
<b>Pilot pressure :</b>	2 pos.: 20 to 120 PSI - 3 pos.: 35 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>	2 pos.: Cv 0.43 – 3 pos.: Cv 0.28
<b>Coil :</b>	Class A wires continuous duty, #22 AWG x 18
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Power :</b>	1,0 to 5,4 W

- Options :
- Sandwich flow controls: FCA02A-AA (screwdriver slot adjustment).
  - Sandwich pressure regulator, see 'Regulators' section

**DIMENSIONS**

**Individual base**



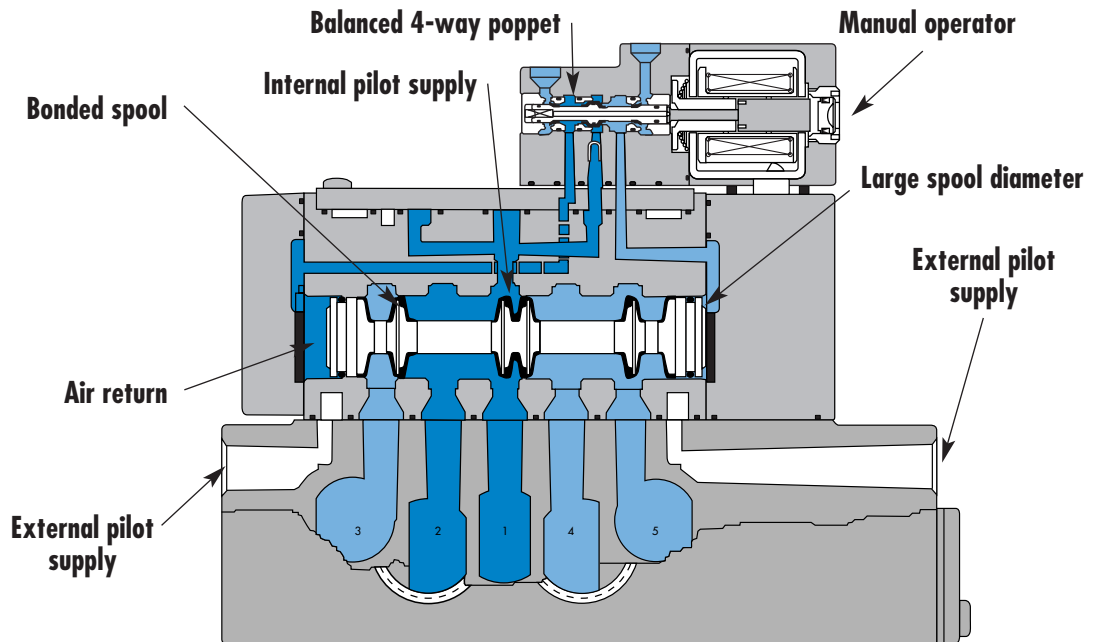
Individual mounting

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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ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

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

### OPERATIONAL BENEFITS

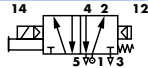
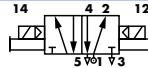
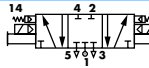
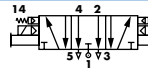
1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof AC solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. MAC spool and bore combination wipes away contamination, eliminates 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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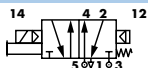
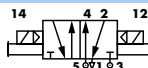

### HOW TO ORDER

#### 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

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48P  
48  
400

#### SOLENOID OPERATOR ▶

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

XX Voltage	X Lead 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)			

92

93  
ISO 01  
ISO 02

ISO 1

ISO 2

ISO 3

\* 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-AX**A**X-XX-Dxxx-xxx

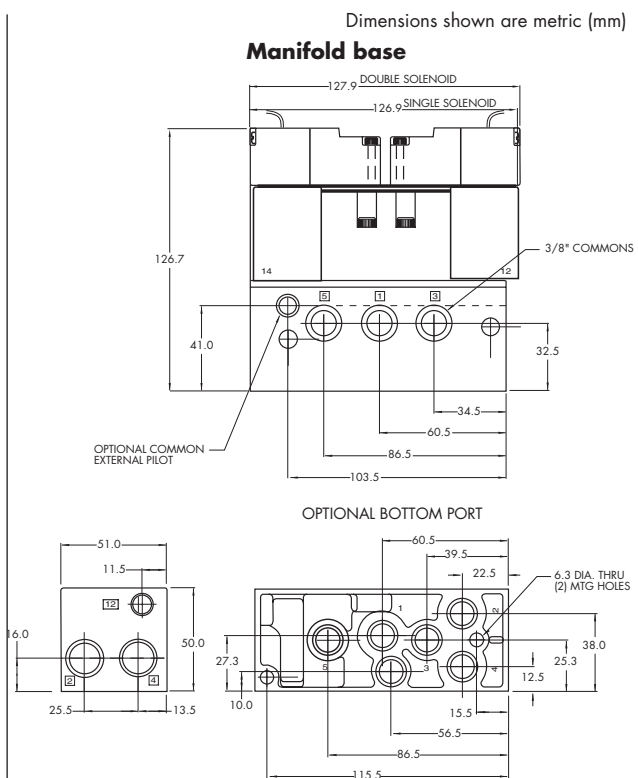
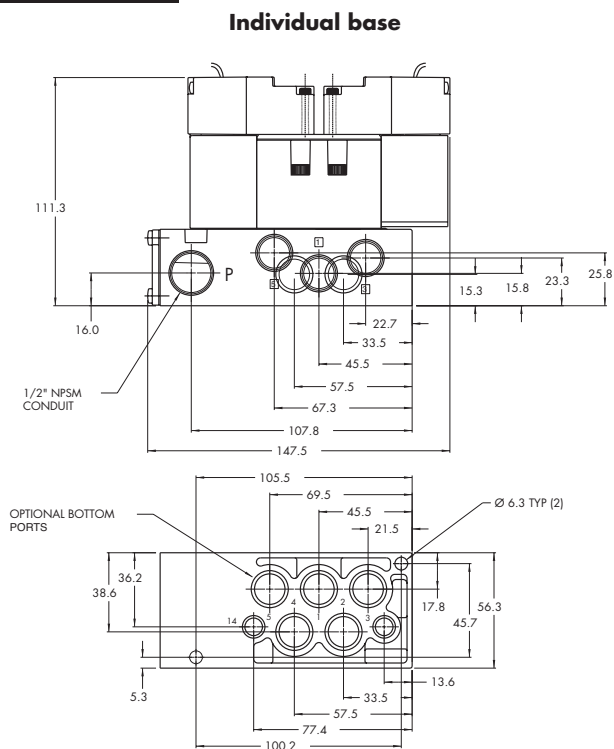
- A** Standard return
- B** Memory spring return

**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>Pilot pressure :</b>	Single/double operator : 20 to 120 PSI, 3 positions : 30 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": (1.8 C <sub>v</sub> ) – 1/4": (1.6 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 : 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**





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

### OPERATIONAL BENEFITS

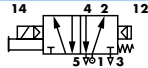
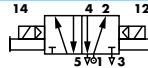
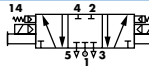
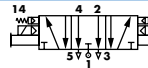
1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof AC solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. MAC spool and bore combination wipes away contamination, eliminates 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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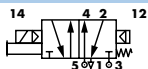
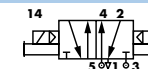
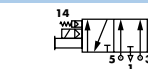
### HOW TO ORDER

#### SINGLE PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
Internal	 MV-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

46  
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

#### 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)		

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93

\* 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-AXX-AX-XX-DxxP-xxx  
**A** Standard return  
**B** Memory spring return  
**D** Standard return with light  
**E** Memory spring return with light

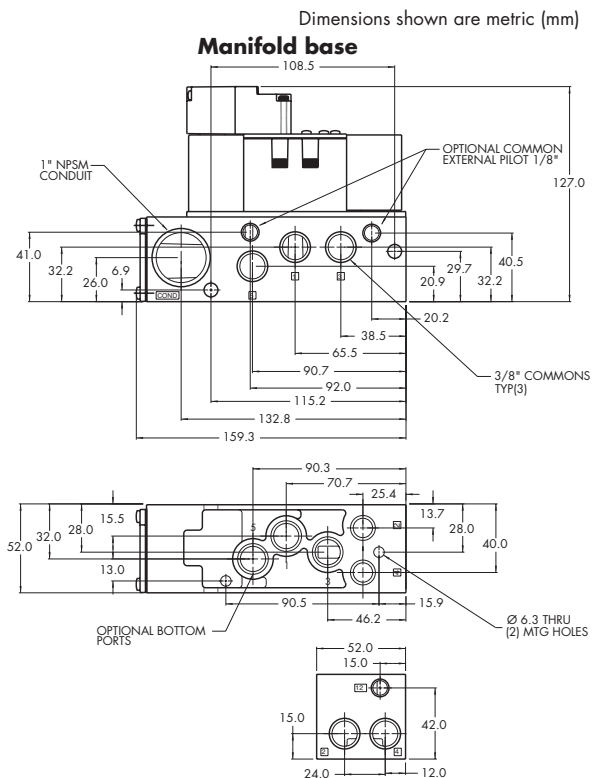
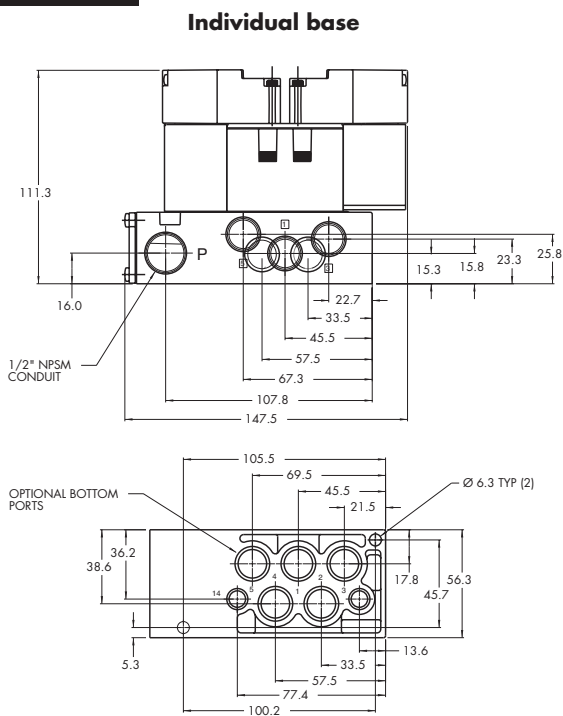
ISO 01  
ISO 02  
**ISO 1**  
ISO 2  
ISO 3

**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>Pilot pressure :</b>	Single/double operator : 20 to 120 PSI, 3 positions : 30 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": (1.8 C <sub>v</sub> ) – 1/4": (1.6 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG x 12 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 : 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**



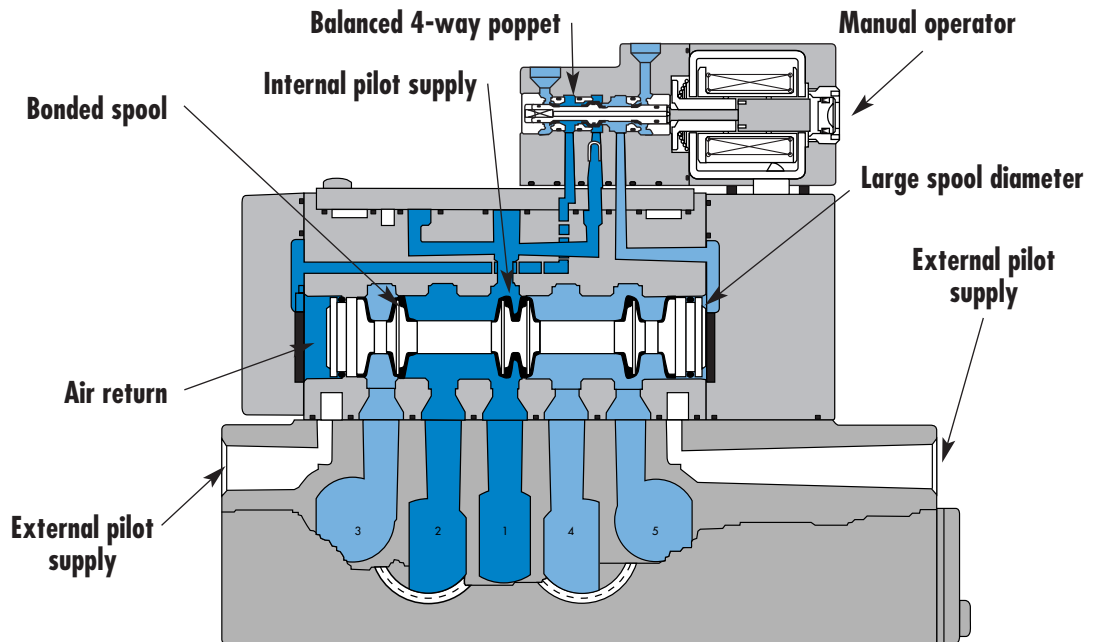
Individual mounting

Valve only - No base non "plug-in" Conform to ISO 5599/1	Valve only - No base "plug-in" Conform to ISO 5599/2
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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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ISO 02  
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**ISO 2**  
ISO 3

Function	Port size	Flow [Max]	Individual/Manifold mounting	Series
<b>5/2, 5/3</b>	<b>3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>	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-B2A-AAAA-DM-Dxxx-xxx	MV-B2A-ABAA-DM-Dxxx-xxx	MV-B2A-AEAA-DM-Dxxx-xxx	MV-B2A-AFAA-DM-Dxxx-xxx
External "12" end	MV-B2A-AAAB-DM-Dxxx-xxx	MV-B2A-ABAB-DM-Dxxx-xxx	MV-B2A-AEAB-DM-Dxxx-xxx	MV-B2A-AFAB-DM-Dxxx-xxx

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#### DUAL PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal pilot From port #3	MV-B2A-ACAD-DM-Dxxx-xxx	MV-B2A-ADAD-DM-Dxxx-xxx	MV-B2A-AGAD-DM-Dxxx-xxx
Internal pilot From port #5	MV-B2A-ACAE-DM-Dxxx-xxx	MV-B2A-ADAE-DM-Dxxx-xxx	MV-B2A-AGAE-DM-Dxxx-xxx
External pilot From "12" end	MV-B2A-ACAB-DM-Dxxx-xxx	MV-B2A-ADAB-DM-Dxxx-xxx	MV-B2A-AGAB-DM-Dxxx-xxx

47  
48P  
48  
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#### 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)			

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93  
ISO 01  
ISO 02  
ISO 1  
ISO 2  
ISO 3

\* Other options available, see page 309.  
Note: ISO series, valve and base are ordered separately, see page 235 for base code.

### OPTIONS

Valve function :

MV-B2A-AXXX-XX-Dxxx-xxx

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

Pilot style :

MV-B2A-AXXX-DM-Dxxx-xxx

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

Spool return :

MV-B2A-AXXX-XX-Dxxx-xxx

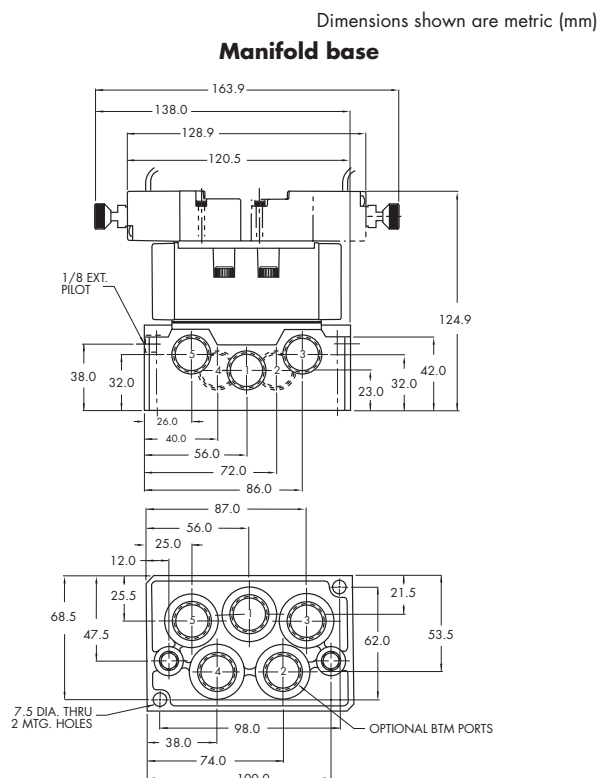
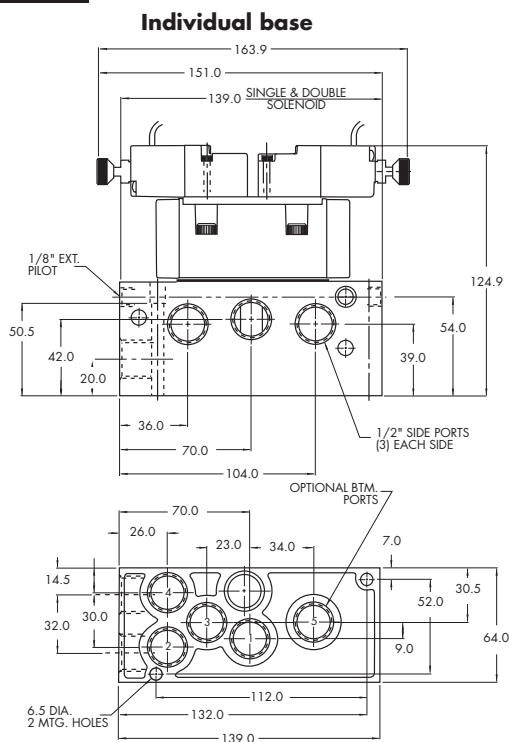
- A Standard return
- B Memory spring return

**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>Pilot pressure :</b>	Single/double operator : 20 to 120 PSI, 3 positions : 30 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": (2.8 C <sub>v</sub> ) - 1/2": (3.0 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 = 12.7 to 1.0 W
<b>Response times :</b>	24 VDC 5.4w    Energize : 10 ms    De-energize : 9.6 ms 120/60    Energize : 6-15 ms    De-energize : 10-17 ms

- Options :
- Sandwich flow controls: FCP2A-BA (screwdriver slot adjustment)  
FCP2A-BB (locking knob adjustment)
  - Sandwich regulator, see „Regulators’ section
- Spare parts :
- Pilot valve: DMB-Dxxx-xxx
  - Valve to base pressure seal: 16576
  - Valve mounting screws (x4): 35413

**DIMENSIONS**



Function	Port size	Flow [Max]	Individual/Manifold mounting	Series
<b>5/2, 5/3</b>	<b>3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>	Valve only - No base "plug-in" Conform to ISO 5599/2	

**OPERATIONAL BENEFITS**

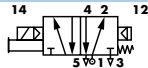
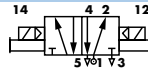
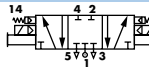

1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof AC solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. MAC spool and bore combination wipes away contamination, eliminates 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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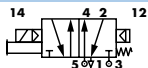
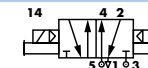
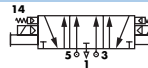
**HOW TO ORDER**

**SINGLE PRESSURE MODELS**

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
Internal	 MV-P2A-AAAA-DM-DxxP-xxx	 MV-P2A-ABAA-DM-DxxP-xxx	 MV-P2A-AEAA-DM-DxxP-xxx	 MV-P2A-AFAA-DM-DxxP-xxx
External "12" end	MV-P2A-AAAB-DM-DxxP-xxx	MV-P2A-ABAB-DM-DxxP-xxx	MV-P2A-AEAB-DM-DxxP-xxx	MV-P2A-AFAB-DM-DxxP-xxx

46  
42

**DUAL PRESSURE MODELS**

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal pilot From port #3	 MV-P2A-ACAD-DM-DxxP-xxx	 MV-P2A-ADAD-DM-DxxP-xxx	 MV-P2A-AGAD-DM-DxxP-xxx
Internal pilot From port #5	MV-P2A-ACAE-DM-DxxP-xxx	MV-P2A-ADAE-DM-DxxP-xxx	MV-P2A-AGAE-DM-DxxP-xxx
External pilot From "12" end	MV-P2A-ACAB-DM-DxxP-xxx	MV-P2A-ADAB-DM-DxxP-xxx	MV-P2A-AGAB-DM-DxxP-xxx

47  
48P  
48  
400

**SOLENOID OPERATOR ▶**

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

XX Voltage	X Manual operator	XX Electrical connection
<b>JA</b> 110/50, 120/60	<b>1</b> Non-locking recessed	<b>DM</b> Plug-in
<b>JB</b> 220/50, 240/60	<b>2</b> Locking recessed	<b>DN</b> Plug-in with diode
<b>JC</b> 24/50, 24/60		<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)		

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\* Other options available, see page 309.  
Note: - ISO series, valve and base are ordered separately, see page 237 for base codes.  
- Ground wire required for 30 volts or higher.

**OPTIONS**

Valve function :

MV-P2A-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-P2A-AXXX-DM-DxxP-xxx  
**DM** Pilot exhaust muffled  
**DP** Pilot exhaust piped (#10-32)

Spool return :

MV-P2A-AXXX-XX-DxxP-xxx  
**A** Standard return  
**B** Memory spring return  
**D** Standard return with light  
**E** Memory spring return with light

ISO 01  
ISO 02  
ISO 1  
**ISO 2**  
ISO 3

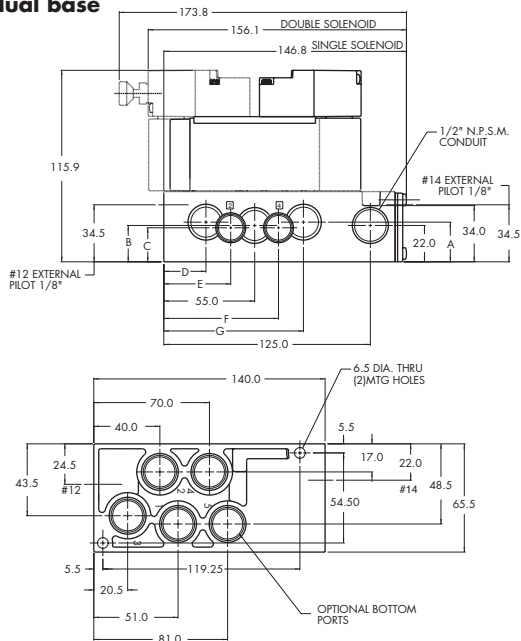
**TECHNICAL DATA**

<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>Pilot pressure :</b>	Single/double operator : 20 to 120 PSI, 3 positions : 30 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": (2.8 C <sub>v</sub> ) - 1/2": (3.0 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #18 AWG x 12 base leads
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~ Inrush 14.8 VA    Holding: 10.9 VA = 12.7 to 1.0 W
<b>Response times :</b>	24 VDC 5.4w    Energize : 10 ms    De-energize : 9.6 ms 120/60    Energize : 6-15 ms    De-energize : 10-17 ms

- Options :
- Sandwich flow controls: FCP2A-AA (screwdriver slot adjustment)  
FCP2A-AB (locking knob adjustment)
  - Sandwich regulator, see „Regulators’ section
- Spare parts :
- Pilot valve: DMB-DxxP-xxx
  - Valve to base pressure seal: 16576
  - Valve mounting screws (x4): 35413

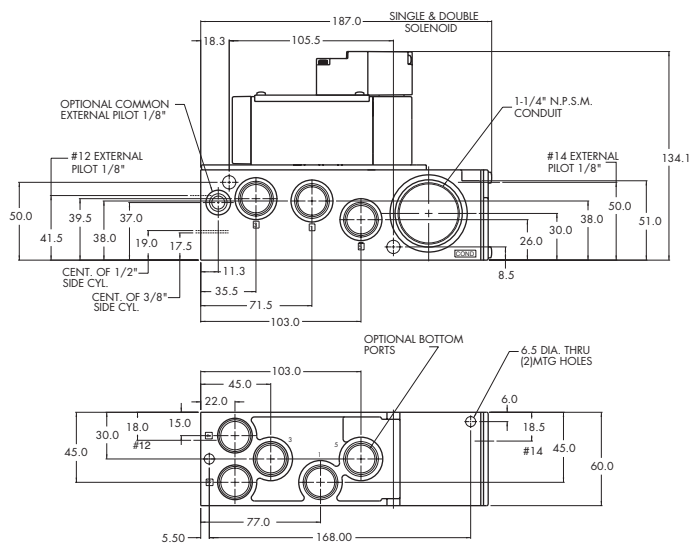
**DIMENSIONS**

**Individual base**



DIM.	A	B	C	D	E	F	G
3/8"	25.2	22.7	20.6	26.7	40.5	69.4	83.3
1/2"	24.0	21.0	19.0	25.5	40.0	70.0	84.5

**Manifold base**



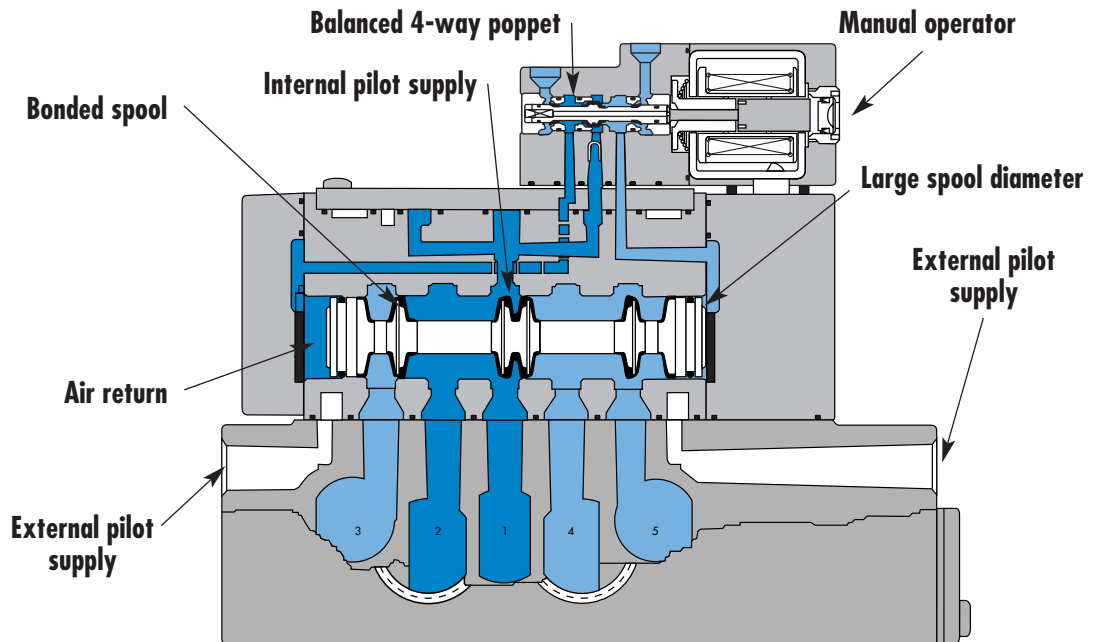
Individual mounting

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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ISO 01  
ISO 02  
ISO 1  
ISO 2  
**ISO 3**



Function	Port size	Flow [Max]	Individual/Manifold mounting	Series
<b>5/2, 5/3</b>	<b>1/2" - 3/4"</b>	<b>6.1 C<sub>v</sub></b>	Valve only - No base "non plug-in" Conform to ISO 5599/1	

### OPERATIONAL BENEFITS

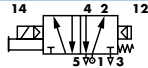
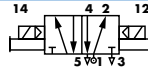
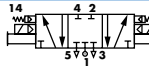
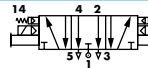
1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof AC solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. MAC spool and bore combination wipes away contamination, eliminates 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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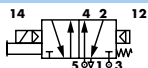
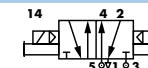
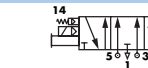
### HOW TO ORDER

#### SINGLE PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
Internal	 MV-B3A-AAAA-DM-DXXX-XXX	 MV-B3A-ABAA-DM-DXXX-XXX	 MV-B3A-AEAA-DM-DXXX-XXX	 MV-B3A-AFAA-DM-DXXX-XXX
External "12" end	MV-B3A-AAAB-DM-DXXX-XXX	MV-B3A-ABAB-DM-DXXX-XXX	MV-B3A-AEAB-DM-DXXX-XXX	MV-B3A-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-B3A-ACAD-DM-DXXX-XXX	 MV-B3A-ADAD-DM-DXXX-XXX	 MV-B3A-AGAD-DM-DXXX-XXX
Internal pilot From port #5	MV-B3A-ACAE-DM-DXXX-XXX	MV-B3A-ADAE-DM-DXXX-XXX	MV-B3A-AGAE-DM-DXXX-XXX
External pilot From "12" end	MV-B3A-ACAB-DM-DXXX-XXX	MV-B3A-ADAB-DM-DXXX-XXX	MV-B3A-AGAB-DM-DXXX-XXX

47  
48P  
48  
400

#### SOLENOID OPERATOR ▶

### DM-D XXX-XXX\*

XX Voltage	X Lead 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)			

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ISO 01  
ISO 02  
ISO 1  
ISO 2  
**ISO 3**

\* Other options available, see page 309.  
Note: ISO series, valve and base are ordered separately, see page 239 for base code.

### OPTIONS

Valve function :

MV-B3A-**AXXX**-XX-DXXX-XXX

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

Pilot style :

MV-B3A-**AXXX-DM**-DXXX-XXX

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

Spool return :

MV-B3A-**AXAX**-XX-DXXX-XXX

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

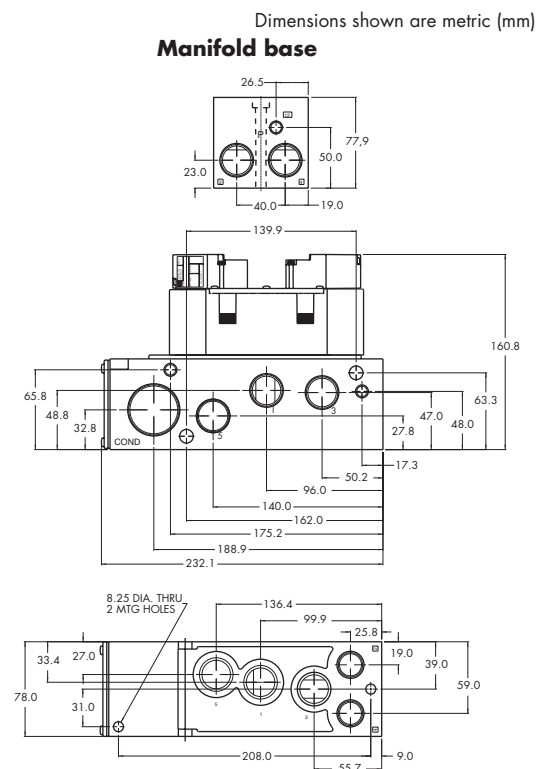
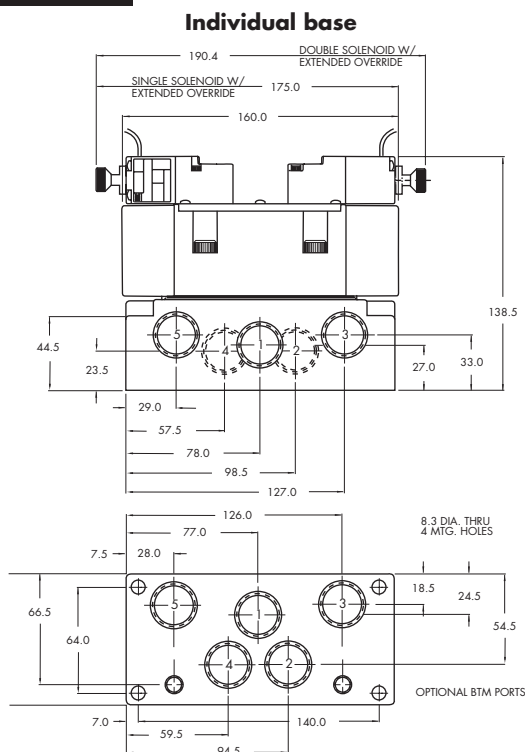
**TECHNICAL DATA**

<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>Pilot pressure :</b>	Single/double operator : 20 to 120 PSI, 3 positions : 30 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>	1/2": (5.4 C <sub>v</sub> ) – 3/4": (6.1 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG 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 = 12.7 to 1.0 W
<b>Response times : (5.4 W coil)</b>	Energize : 16.2 ms De-energize : 13.6 ms

Options :                      • Sandwich regulator, see „Regulators’ section

Spare parts :                • Pilot valve: DMB-Dxxx-xxx • Valve to base pressure seal: 16614  
                                      • Valve mounting screws (x4): 35451

**DIMENSIONS**



Function	Port size	Flow [Max]	Individual/Manifold mounting	Series
<b>5/2, 5/3</b>	<b>1/2" - 3/4"</b>	<b>6.1 C<sub>v</sub></b>	Valve only - No base "plug-in" Conform to ISO 5599/2	

### OPERATIONAL BENEFITS

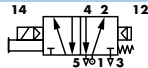
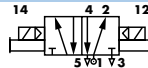
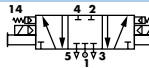

1. Unique patented Macsolenoid® for fastest possible response times and virtually burn-out proof AC solenoid operation.
2. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability and consistent operation.
3. MAC spool and bore combination wipes away contamination, eliminates 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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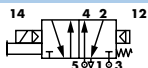
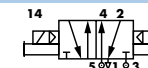
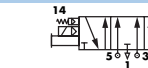
### HOW TO ORDER

#### SINGLE PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
Internal	 MV-P3A-AAAA-DM-DxxP-xxx	 MV-P3A-ABAA-DM-DxxP-xxx	 MV-P3A-AEAA-DM-DxxP-xxx	 MV-P3A-AFAA-DM-DxxP-xxx
External "12" end	MV-P3A-AAAB-DM-DxxP-xxx	MV-P3A-ABAB-DM-DxxP-xxx	MV-P3A-AEAB-DM-DxxP-xxx	MV-P3A-AFAB-DM-DxxP-xxx

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#### DUAL PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal pilot From port #3	 MV-P3A-ACAD-DM-DxxP-xxx	 MV-P3A-ADAD-DM-DxxP-xxx	 MV-P3A-AGAD-DM-DxxP-xxx
Internal pilot From port #5	MV-P3A-ACAE-DM-DxxP-xxx	MV-P3A-ADAE-DM-DxxP-xxx	MV-P3A-AGAE-DM-DxxP-xxx
External pilot From "12" end	MV-P3A-ACAB-DM-DxxP-xxx	MV-P3A-ADAB-DM-DxxP-xxx	MV-P3A-AGAB-DM-DxxP-xxx

47  
48P  
48  
400

#### 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.  
Note: - ISO series, valve and base are ordered separately, see page 241 for base codes.  
- Ground wire required for 30 volts or higher.

92  
93

ISO 01  
ISO 02  
ISO 1  
ISO 2  
**ISO 3**

### OPTIONS

Valve function :

MV-P3A-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-P3A-AXXX-DM-DxxP-xxx

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

Spool return :

MV-P3A-AXXX-XX-DxxP-xxx

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

**TECHNICAL DATA**

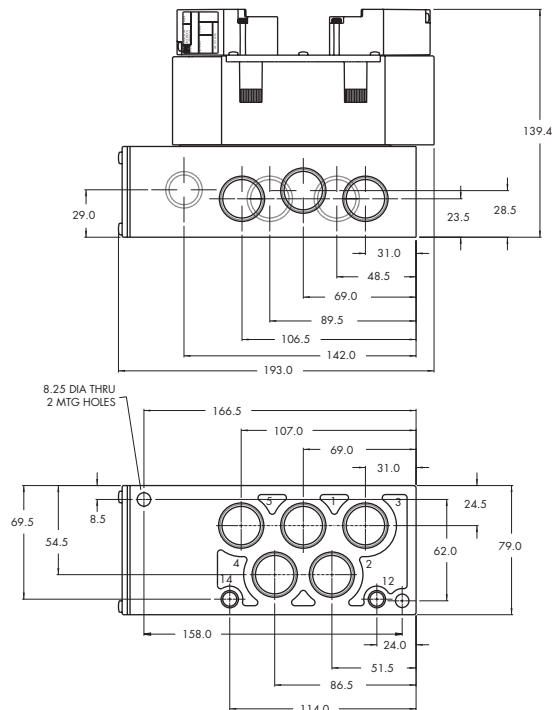
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot: 20 to 120 PSI External pilot : vacuum to 120 PSI
<b>Pilot pressure :</b>	Single/double operator : 20 to 120 PSI, 3 positions : 30 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point 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>	1/2": (5.4 C <sub>v</sub> ) – 3/4": (6.1 C <sub>v</sub> )
<b>Coil :</b>	Class A continuous duty, #22 AWG 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 = 12.7 to 1.0 W
<b>Response times :</b> <b>(5.4 W coil)</b>	Energize : 16.2 ms De-energize : 13.6 ms

Options :                    • Sandwich regulator, see „Regulators’ section

Spare parts :             • Pilot valve: DMB-DxxP-xxx • Valve to base pressure seal: 16614  
                                  • Valve mounting screws (x4): 35451

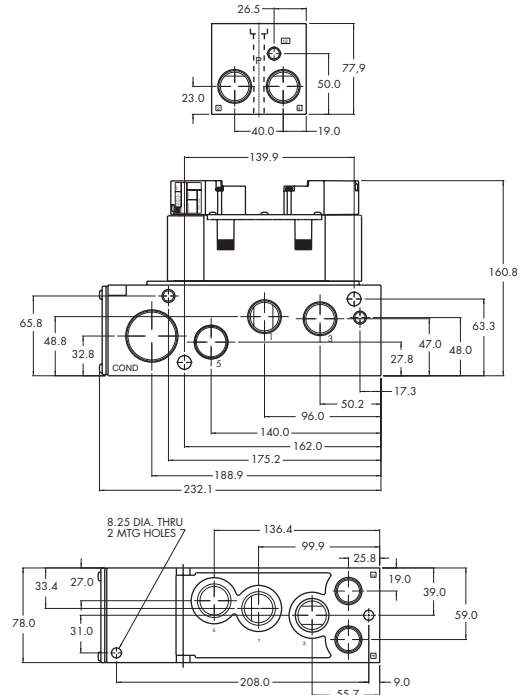
**DIMENSIONS**

**Individual base**



Dimensions shown are metric (mm)

**Manifold base**





# R e m o t e a i r v a l v e s

Function	Port size	Flow [Max] Cv	Individual mounting			Manifold mounting	Series
			Inline	Sub-base non "plug-in"	Valve only - no base	Valve only - no base	
<b>5/2 - 5/3</b>	<b>1/8" - 1/4"</b>	<b>1.0</b>	P. 203	P. 205			<b>400</b>
<b>3/2</b>	<b>3/4" - 1"</b>	<b>20.0</b>	P. 209				<b>67</b>
<b>3/2 - 2/2</b>	<b>1 1/2" - 2" - 2 1/2"</b>	<b>60.0</b>	P. 213				<b>69</b>
<b>5/2 - 5/3</b>	<b>3/8" - 1/2"</b>	<b>3.1</b>			P. 217	P. 217	<b>ISO 2</b>
<b>5/2 - 5/3</b>	<b>1/2" - 3/4"</b>	<b>6.2</b>			P. 221	P. 221	<b>ISO 3</b>



R e m o t e a i r v a l v e s

Individual mounting

Series

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

**400**

**67**

**69**

**ISO 2**

**ISO 3**



# R e m o t e a i r v a l v e s

Function	Port size	Flow (Max)	Individual mounting	Series
<b>5/2 - 5/3</b>	<b>1/8" - 1/4"</b>	<b>1.0 C<sub>v</sub></b>	Inline	

### OPERATIONAL BENEFITS

1. Balanced spool, immune to variations of pressure, also provides high flow.
2. Bonded spool with minimum friction, shifting in a glass-like finished bore.
3. Wiping effect eliminates sticking.
4. Long service life.
5. Short stroke with high flow.



**400**

**67**

**69**

**ISO 2**

**ISO 3**

### HOW TO ORDER

#### SINGLE PRESSURE VALVES

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
<b>1/8" NPTF</b>	411A-AOH-RA Mod 1493	421A-AOH-RA	451A-AOH-RA	461A-AOH-RA	471A-AOH-RA
<b>1/4" NPTF</b>	411A-BOH-RA Mod 1493	421A-BOH-RA	451A-BOH-RA	461A-BOH-RA	471A-BOH-RA

#### DUAL PRESSURE VALVES

Port size	5/2 Double operator
<b>1/8" NPTF</b>	441A-AOH-RA
<b>1/4" NPTF</b>	441A-BOH-RA

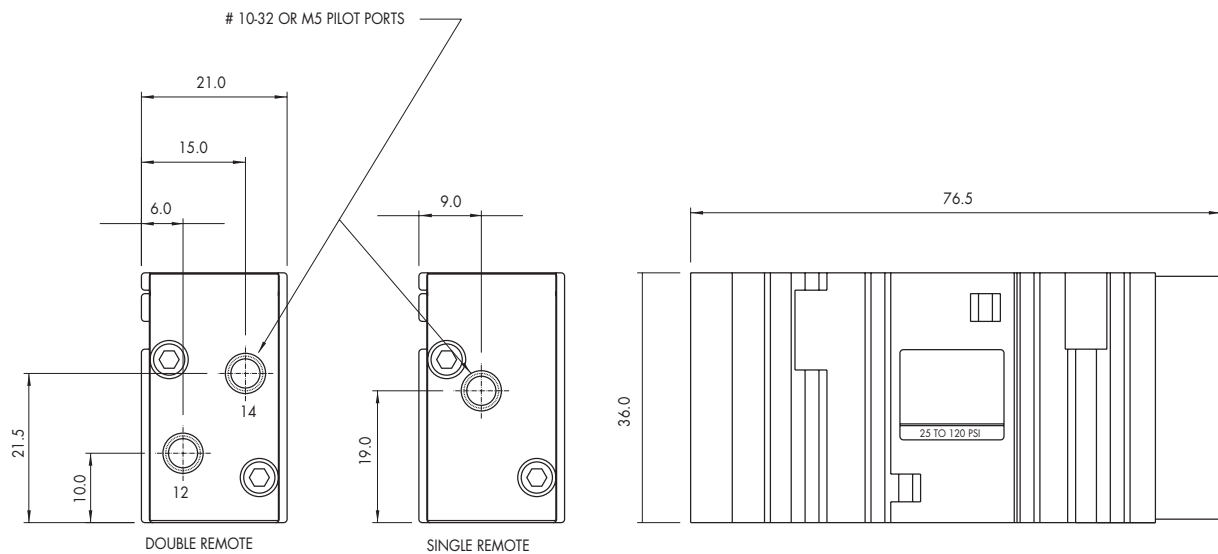
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Single operator: vacuum to 100 PSI Double operator: vacuum to 150 PSI
<b>Air signal pressure :</b>	Single oper.: 40 to 150 PSI Double oper., 2 pos.: 20 to 150 PSI, 3 pos.: 35 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	1.0 C <sub>v</sub>
<b>Note :</b>	Air signal must be $\geq$ main valve pressure

Option : • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)







# R e m o t e a i r v a l v e s

Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2 - 5/3</b>	<b>1/8" - 1/4"</b>	<b>1.0 C<sub>v</sub></b>	Sub-base non "plug-in"	

### OPERATIONAL BENEFITS

1. Balanced spool, immune to variations of pressure, also provides high flow.
2. Bonded spool with minimum friction, shifting in a glass-like finished bore.
3. Wiping effect eliminates sticking.
4. Long service life.
5. Short stroke with high flow.



**400**

**67**

**69**

**ISO 2**

**ISO 3**

### HOW TO ORDER

#### SINGLE PRESSURE VALVES

Port size	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
<b>Valve less base</b>	413A-00H-RA	423A-00H-RA	453A-00H-RA	463A-00H-RA	473A-00H-RA
<b>1/8" NPTF</b>	413A-AAH-RA Mod 1493	423A-AAH-RA	453A-AAH-RA	463A-AAH-RA	473A-AAH-RA
<b>1/4" NPTF</b>	413A-BAH-RA Mod 1493	423A-BAH-RA	453A-BAH-RA	463A-BAH-RA	473A-BAH-RA

#### DUAL PRESSURE VALVES

Port size	5/2 Double operator
<b>1/8" NPTF</b>	443A-AAH-RA
<b>1/4" NPTF</b>	443A-BAH-RA

### OPTIONS

423A-AAH-RA

↳ **B** for base with flow controls

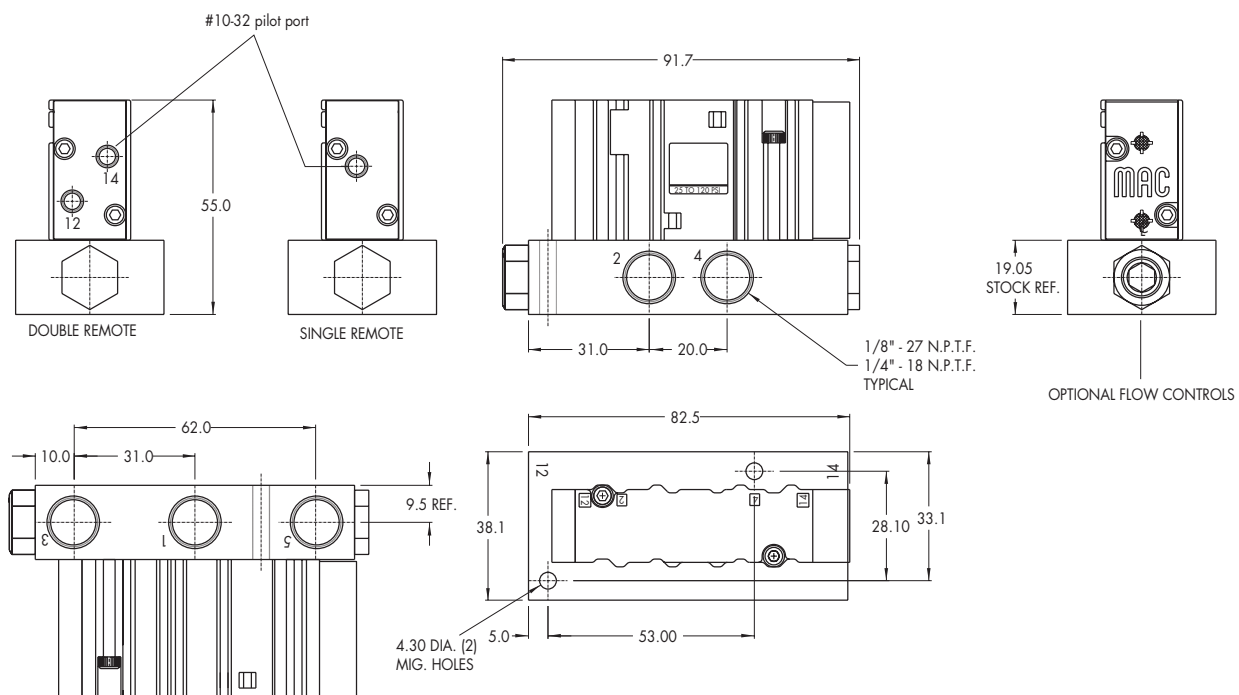
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Single operator: vacuum to 100 PSI Double operator: vacuum to 150 PSI
<b>Air signal pressure :</b>	Single oper.: 40 to 150 PSI Double oper., 2 pos.: 20 to 150 PSI, 3 pos.: 35 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	1.0 C <sub>v</sub>
<b>Note :</b>	Air signal must be $\geq$ main valve pressure

- Options :
- BSPP threads
- Spare parts :
- Valve to base pressure seal: 16525
  - Valve mounting screw (x2): 35043
  - Flow control assembly (x2): N-04001

**DIMENSIONS**

Dimensions shown are metric (mm)





R e m o t e a i r v a l v e s

Individual mounting

Series

Inline

400

**67**

69

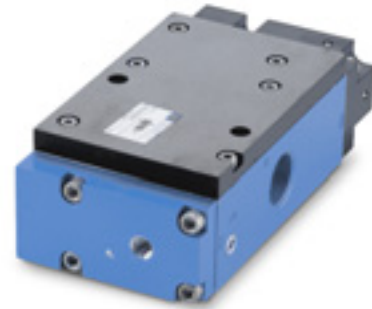
ISO 2

ISO 3

Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2</b>	<b>3/4" - 1"</b>	<b>20.0 C<sub>v</sub></b>	Inline	

**OPERATIONAL BENEFITS**

1. Balanced spool, immune to variations of pressure.
2. Powerful return forces thanks to the combination of mechanical and air springs.
3. Bonded spool with minimum friction, shifting in a glass like finished bore.
4. Wiping effect eliminates sticking.
5. Long service life.



400

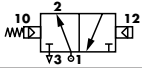
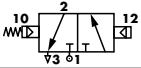
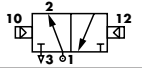
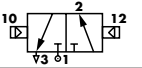
67

69

ISO 2

ISO 3

**HOW TO ORDER**

Port size	Pilot air	Single Operator		Double Operator	
		NO Valve	NC Valve	NO Valve	NC Valve
					
<b>3/4" NPTF</b>	Internal	67A-C3-ARA-RA	67A-A3-ARA-RA	67A-D4-ARA-RA	67A-B4-ARA-RA
<b>1" NPTF</b>		67A-C3-BRA-RA	67A-A3-BRA-RA	67A-D4-BRA-RA	67A-B4-BRA-RA
<b>3/4" NPTF</b>	External	67A-C3-ARB-RE	67A-A3-ARB-RE	-	-
<b>1" NPTF</b>		67A-C3-BRB-RE	67A-A3-BRB-RE	-	-

Note : Designation 'RE' required on remote air models with main valve pressures of vacuum to 20 PSI.

'RE' provides an external pilot and should have a pressure range of 20 - 75 PSI. Since the external pilot supplies the air spring, it must not exceed the remote air pilot pressure.

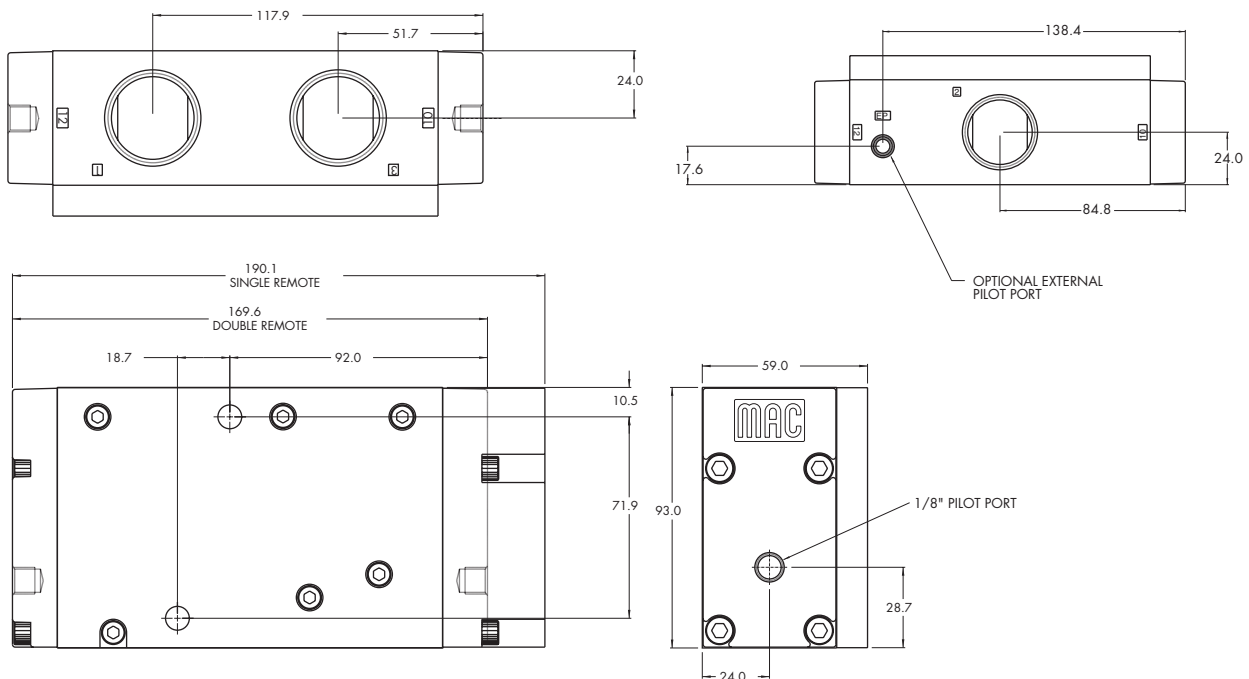
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	20 to 150 PSI (must be $\geq$ main valve pressure)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	3/4" : (14.5 C <sub>v</sub> ) - 1" : (20.0 C <sub>v</sub> )

Options : • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)





R e m o t e   a i r   v a l v e s

Individual mounting

Series

Inline

400

67

**69**

ISO 2

ISO 3

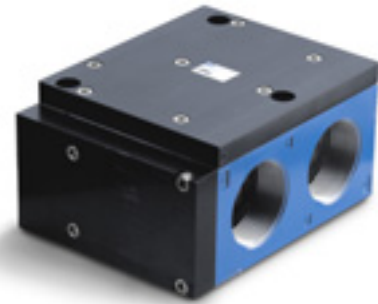


# R e m o t e a i r v a l v e s

Function	Port size	Flow [Max]	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1 1/2" - 2" - 2 1/2"</b>	<b>60.0 C<sub>v</sub></b>	Inline	

### OPERATIONAL BENEFITS

1. Balanced spool, immune to variations of pressure
2. Bonded spool with minimum friction, shifting in a glass like finished bore
3. Wiping effect eliminates sticking and contamination
4. Long service life



400

67

69

ISO 2

ISO 3

### HOW TO ORDER

#### SINGLE OPERATOR

Port size	Air Spring	Single Operator NO valve	Single Operator NC valve
<b>1 1/2"</b>	Internal	69A-C3-ARA-RA	69A-A3-ARA-RA
<b>2"</b>		69A-C3-BRA-RA	69A-A3-BRA-RA
<b>2 1/2"</b>		69A-C3-CRA-RA	69A-A3-CRA-RA
<b>1 1/2"</b>	External	69A-C3-ARB-RE	69A-A3-ARB-RE
<b>2"</b>		69A-C3-BRB-RE	69A-A3-BRB-RE
<b>2 1/2"</b>		69A-C3-CRB-RE	69A-A3-CRB-RE

#### DOUBLE OPERATOR

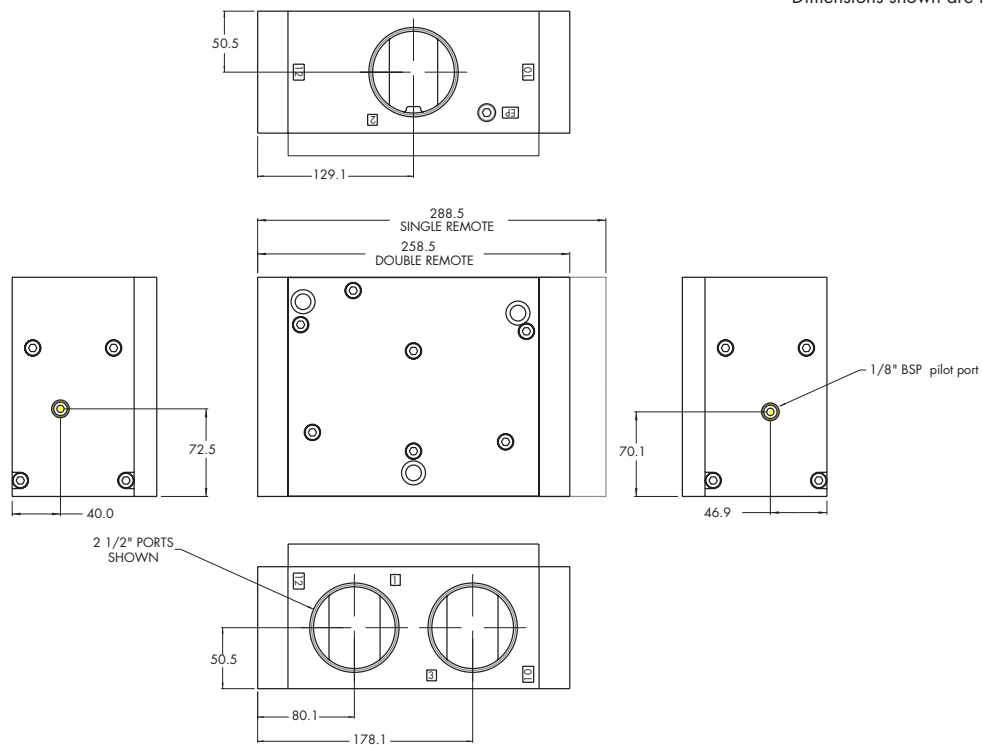
Port size	Double Operator NO valve	Double Operator NC valve
<b>1 1/2"</b>	69A-D4-ARB-RA	69A-B4-ARB-RA
<b>2"</b>	69A-D4-BRB-RA	69A-B4-BRB-RA
<b>2 1/2"</b>	69A-D4-CRB-RA	69A-B4-CRB-RA

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	20 to 150 PSI (must be $\geq$ main valve pressure)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	Cv 60.0

**DIMENSIONS**

Dimensions shown are metric (mm)







R e m o t e a i r v a l v e s

Individual mounting

Valve only -  
no base

Series

400

67

69

**ISO 2**

ISO 3

Manifold mounting

Valve only -  
no base

Function	Port size	Flow [Max]	Individual/Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>3/8" - 1/2"</b>	<b>3.1 C<sub>v</sub></b>	Valve only - no base	

**OPERATIONAL BENEFITS**

1. Balanced spool, immune to variations of pressure.
2. Powerful return forces thanks to the combination of mechanical and air springs.
3. Bonded spool with minimum friction, shifting in a glass-like finished bore.
4. Wiping effect eliminates sticking.
5. Long service life.



**400**

**67**

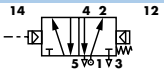
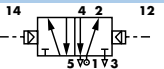
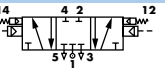
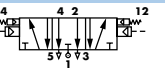
**69**

**ISO 2**

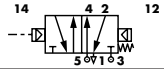
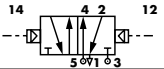
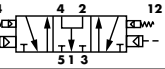
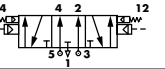
**ISO 3**

**HOW TO ORDER**

**SINGLE PRESSURE MODELS**

Air spring	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
Internal	 MV-R2A-BACF	 MV-R2A-BBAK	 MV-R2A-BEAK	 MV-R2A-BFAK
External	MV-R2A-BACG			

**DUAL PRESSURE MODELS**

Air spring	5/2 Single operator	5/2 Double operator	5/3 Open center	5/3 Pressure center
Internal port #3	 MV-R2A-BCCH	 MV-R2A-BDAK	 MV-R2A-BHAK	 MV-R2A-BGAK
Internal port #5	MV-R2A-BCCJ			
External	MV-R2A-BCCG			

Note: ISO series, valve and base are ordered separately, see page 235 for base code.

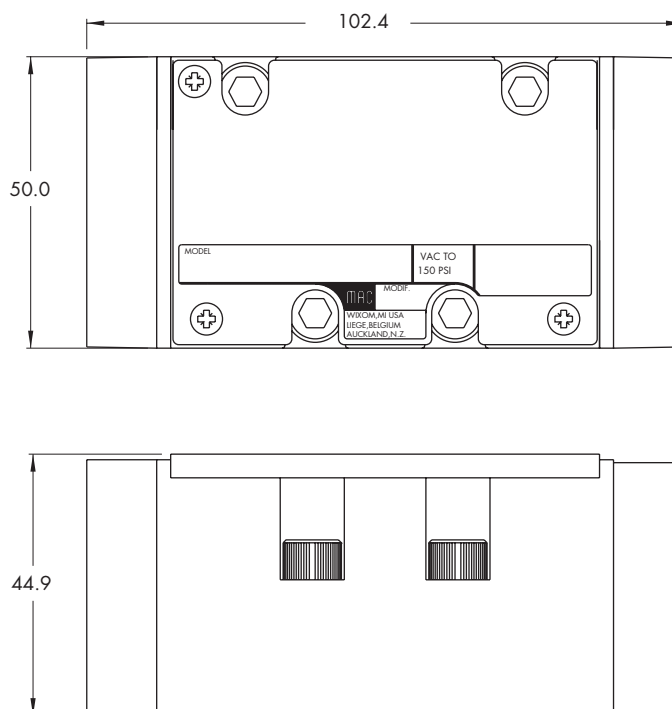
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single/double operator: 20 to 150 PSI 3 position: 30 to 150 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" : (2.8 Cv) - 1/2" : (3.1 Cv)

Spare parts : • Valve to base pressure seal: 16576 • Valve mounting screws (x4): 35413

**DIMENSIONS**

Dimensions shown are metric (mm)





R e m o t e a i r v a l v e s

Individual mounting

Valve only -  
no base

Series

400

67

69

ISO 2

**ISO 3**

Manifold mounting

Valve only -  
no base

Function	Port size	Flow [Max]	Individual/Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>1/2" - 3/4"</b>	<b>6.2 C<sub>v</sub></b>	Valve only - no base	

**OPERATIONAL BENEFITS**

1. Balanced spool, immune to variations of pressure.
2. Powerful return forces thanks to the combination of mechanical and air springs.
3. Bonded spool with minimum friction, shifting in a glass-like finished bore.
4. Wiping effect eliminates sticking.
5. Long service life.



**400**  
**67**  
**69**  
**ISO 2**  
**ISO 3**

**HOW TO ORDER**

**SINGLE PRESSURE MODELS**

Air spring	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
Internal	MV-R3A-BACF	MV-R3A-BBAK	MV-R3A-BEAK	MV-R3A-BFAK
External	MV-R3A-BACG			

**DUAL PRESSURE MODELS**

Air spring	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal port #3	MV-R3A-BCCH	MV-R3A-BDAK	MV-R3A-BGAK
Internal port #5	MV-R3A-BCCJ		
External	MV-R3A-BCCG		

Note: ISO series, valve and base are ordered separately, see page 239 for base code.

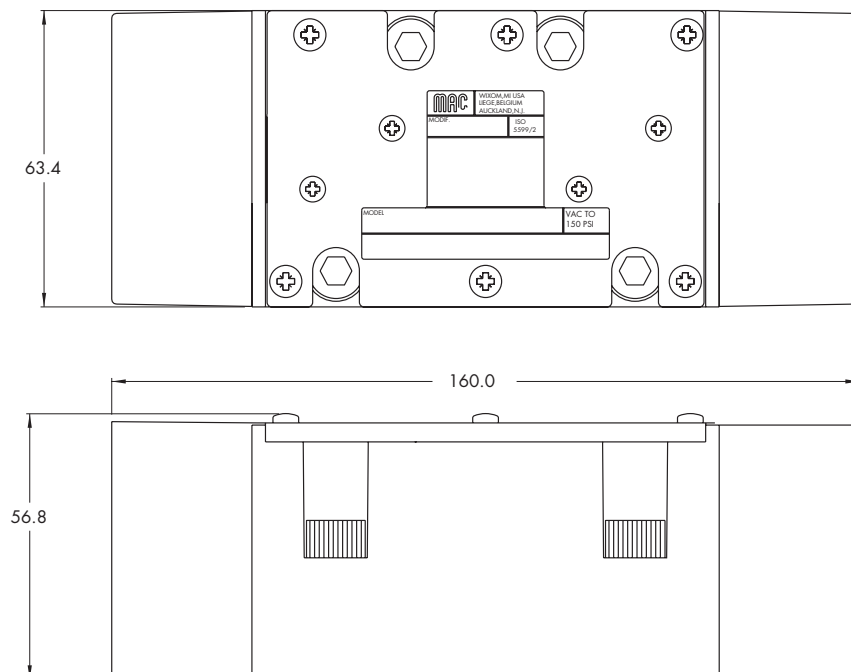
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single/double operator: 20 to 150 PSI 3 position: 30 to 150 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>	1/2" : (5.4 C <sub>v</sub> ) - 3/4" : (6.2 C <sub>v</sub> )

Spare parts : • Valve to base pressure seal: 16614 • Valve mounting screws (x4): 35451

**DIMENSIONS**

Dimensions shown are metric (mm)





## Section 3

## Bases according to ISO standards

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# Bases according to ISO STANDARDS

			Series
Non plug-in individual / manifold base	Non plug-in base / manifold	Plug-in base / manifold	
P. 227			<b>ISO 01</b>
P. 229			<b>ISO 02</b>
	P. 231	P. 233	<b>ISO 1</b>
	P. 235	P. 237	<b>ISO 2</b>
	P. 239	P. 241	<b>ISO 3</b>



**Non plug-in individual / manifold base**



ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

**HOW TO ORDER**

INDIVIDUAL BASE

Port size	Pilot air	Side ports	Bottom 2 & 4 ports With all side ports
1/4" NPTF	Internal	MB-A01A-121	MB-A01A-122

MANIFOLD BASE

Port size	Pilot air	Side ports	Bottom 2 & 4 ports With side 1, 3 & 5 ports
1/4" NPTF	Internal	MM-A01A-121	MM-A01A-122

Notes:

- For manifold bases external pilot is common
- A base is ordered as internal pilot and can be changed into external pilot by removing pipe plugs from the external pilot ports (individual base).
- Manifold base: same base for internal and external pilot, different end plate kits.

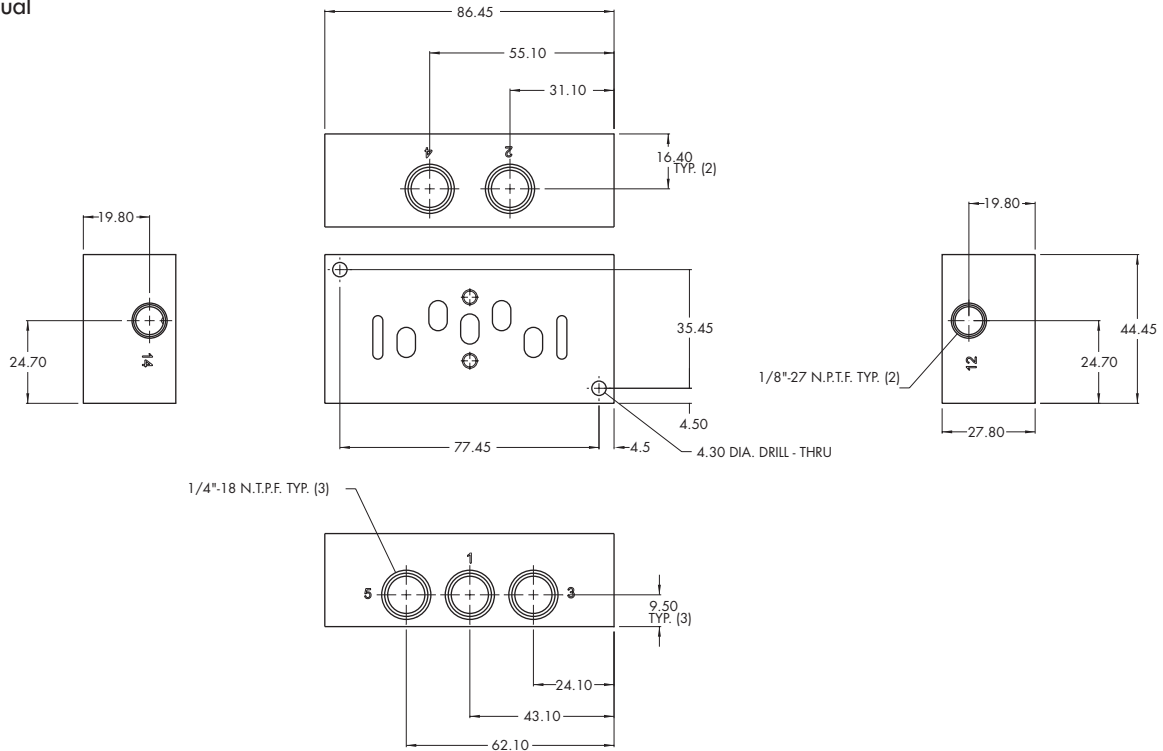
End plate kit: Internal pilot M-00017-01-01  
External pilot M-00017-02-01

Inlet/exhaust isolator: 28413

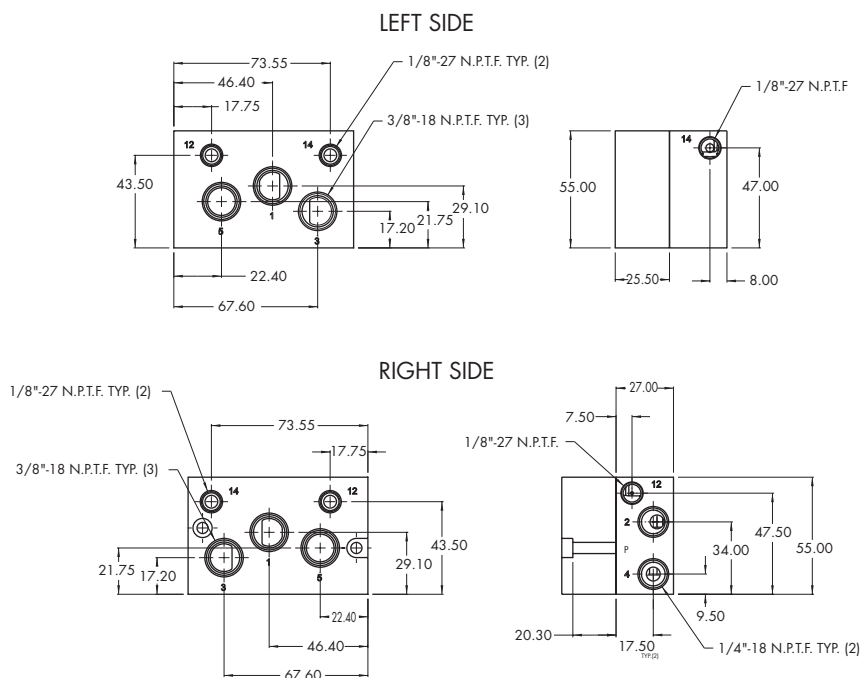
**DIMENSIONS**

Dimensions shown are metric (mm)

Individual



Manifold



**Non plug-in individual / manifold base**



ISO 01  
**ISO 02**  
 ISO 1  
 ISO 2  
 ISO 3

**HOW TO ORDER**

INDIVIDUAL BASE

Port size	Pilot air	Side ports	Bottom 2 & 4 ports With all side ports
1/8" NPTF	Internal	MB-A02A-111	MB-A02A-112

MANIFOLD BASE

Port size	Pilot air	Side ports	Bottom 2 & 4 ports With side 1, 3 & 5 ports
1/8" NPTF	Internal	MM-A02A-111	MM-A02A-112

Notes:

- For manifold bases external pilot is common
- A base is ordered as internal pilot and can be changed into external pilot by removing pipe plugs from the external pilot ports (individual base).
- Manifold base: same base for internal and external pilot, different end plate kits.

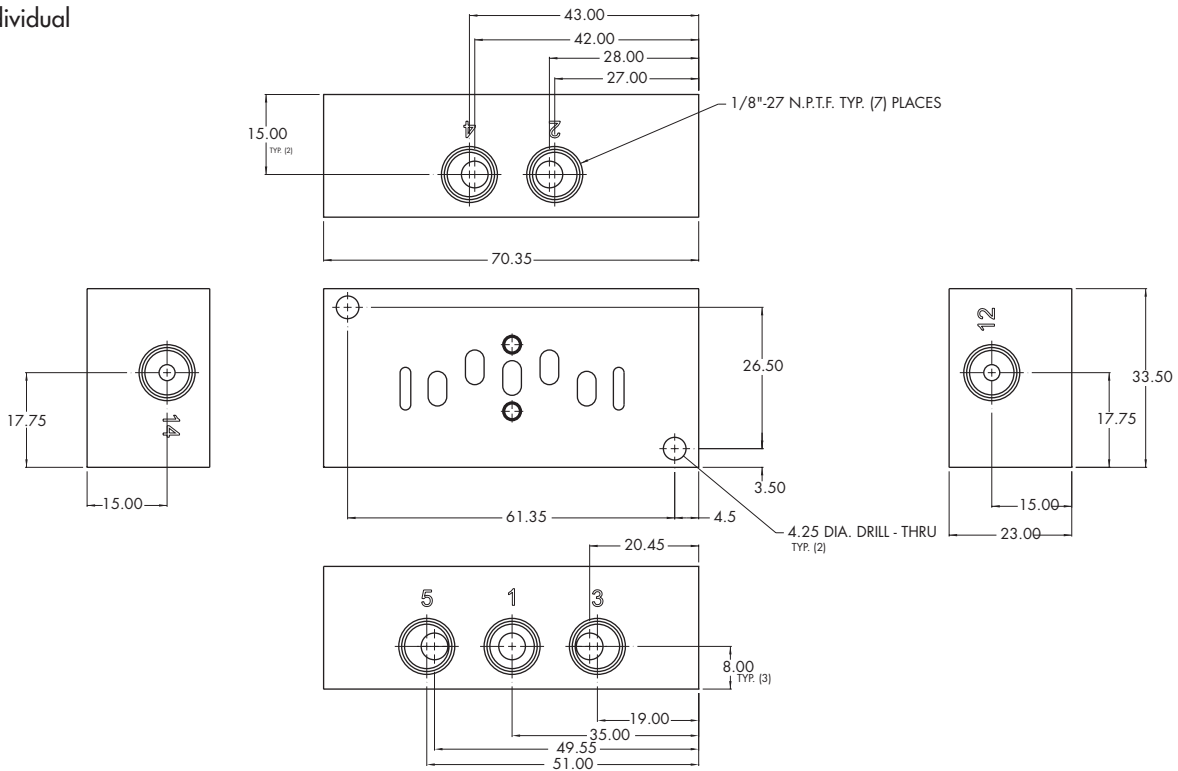
End plate kit: Internal pilot M-00018-01-01  
 External pilot M-00018-02-01

Inlet/exhaust isolator: 28499

**DIMENSIONS**

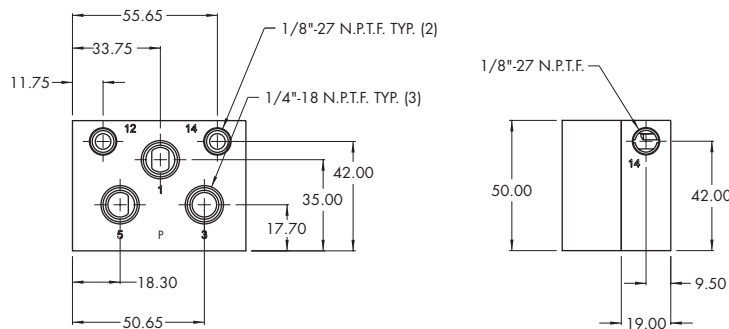
Dimensions shown are metric (mm)

Individual

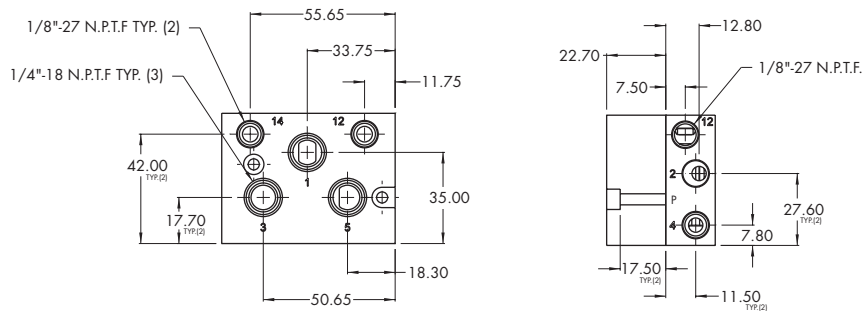


Manifold

LEFT SIDE



RIGHT SIDE



**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
<b>1/4" NPTF</b>	MB-A1C-221	MB-A1C-223	MB-A1C-222	MB-A1C-224
<b>3/8" NPTF</b>	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
<b>1/4" NPTF</b>	MM-A1C-221	MM-A1C-223	MM-A1C-222	MM-A1C-224
<b>3/8" NPTF</b>	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.



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

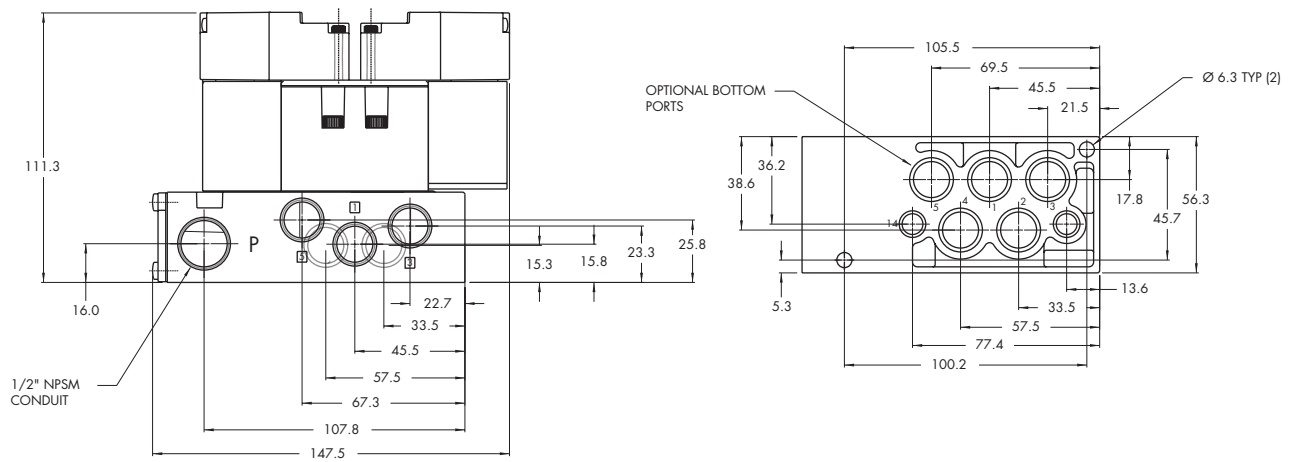
- Manifold options :
- External pilot **MM-P1A-22-x-x**
    - 25** for 1/4" port – common external pilot
    - 26** for 3/8" port – common external pilot
  - Terminal strip **MM-P1A-xxx-A** (N/A with light)
    - J** wired for sgl solenoid
    - K** wired for double solenoid
  - Base / Manifold option: 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.

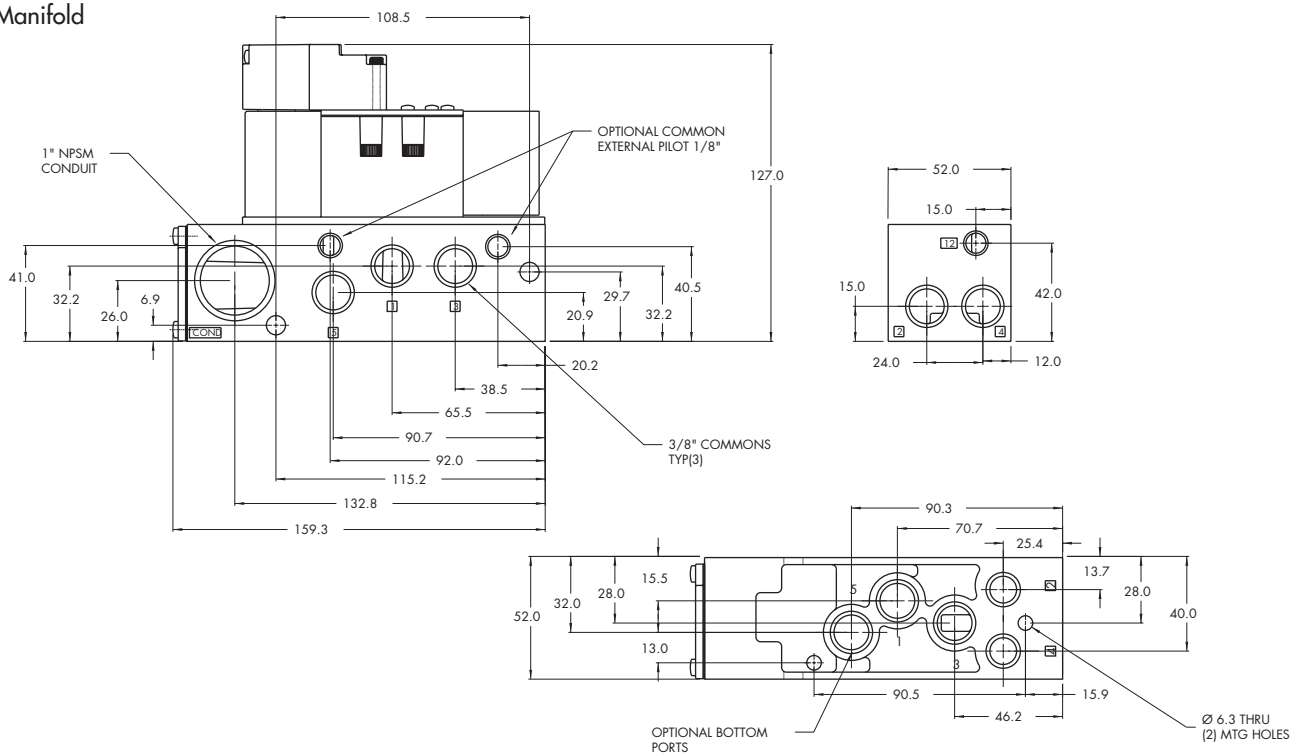
**DIMENSIONS**

Dimensions shown are metric (mm)

Individual



Manifold





**Non plug-in base / manifold**

- ISO 01
- ISO 02
- ISO 1
- ISO 2**
- ISO 3



**HOW TO ORDER**

INDIVIDUAL BASE

Port size	Side ports	Bottom ports	Bottom cylinder ports 2 and 4.	Bottom inlet port 1
<b>3/8" NPTF</b>	MB-A2B-221	MB-A2B-223	MB-A2B-222	MB-A2B-224
<b>1/2" NPTF</b>	MB-A2B-231	MB-A2B-233	MB-A2B-232	MB-A2B-234

MANIFOLD BASE

Port size	Side ports	Bottom ports	Bottom cylinder ports 2 and 4.	Bottom inlet port 1
<b>3/8" NPTF</b>	MM-A2B-221	MM-A2B-223	MM-A2B-222	MM-A2B-224
<b>1/2" NPTF</b>	MM-A2B-231	MM-A2B-233	MM-A2B-232	MM-A2B-234

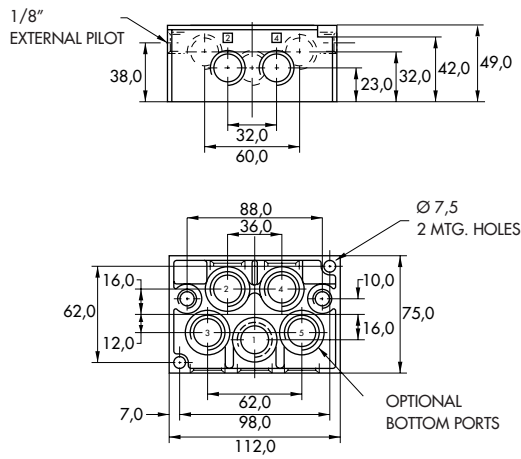
Manifold fastening kit : N-63002-01.  
 Valve blanking plate: MA2003.  
 Inlet/exhaust isolator plug: 32839.

**DIMENSIONS**

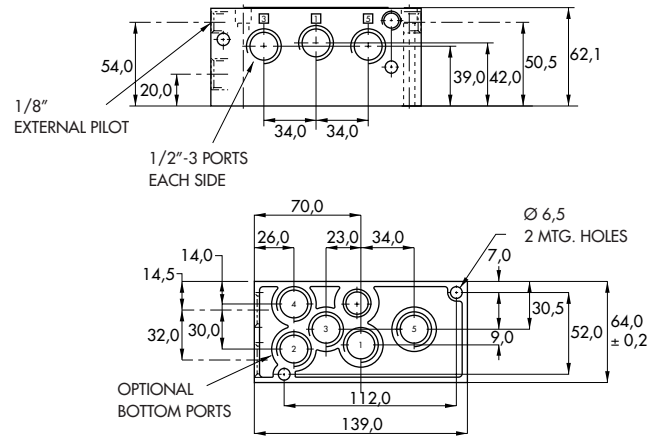
Dimensions shown are metric (mm)

**Individual**

**DIN 5599/1**



**Manifold**



Plug-in base / manifold



ISO 01  
 ISO 02  
 ISO 1  
**ISO 2**  
 ISO 3

HOW TO ORDER

INDIVIDUAL BASE

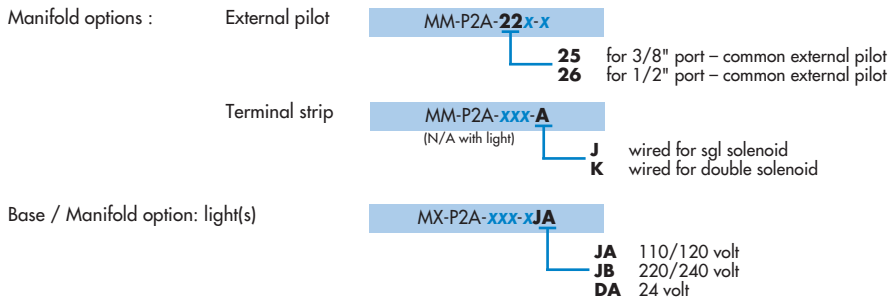
Port size	Wired for	Side ports	Side ports w/ bottom 2 & 4 ports	All side & bottom ports
<b>3/8" NPTF</b>	Single solenoid	MB-P2A-221-A	MB-P2A-222-A	MB-P2A-223-A
	Double solenoid	MB-P2A-221-B	MB-P2A-222-B	MB-P2A-223-B
<b>1/2" NPTF</b>	Single solenoid	MB-P2A-231-A	MB-P2A-232-A	MB-P2A-233-A
	Double solenoid	MB-P2A-231-B	MB-P2A-232-B	MB-P2A-233-B

MANIFOLD BASE

Port size	Wired for	Side ports	Side ports w/ bottom 2 & 4 ports	All side & bottom ports (see note)
<b>3/8" NPTF</b>	Single solenoid	MM-P2A-221-A	MM-P2A-222-A	MM-P2A-223-A
	Double solenoid	MM-P2A-221-B	MM-P2A-222-B	MM-P2A-223-B
<b>1/2" NPTF</b>	Single solenoid	MM-P2A-231-A	MM-P2A-232-A	MM-P2A-233-A
	Double solenoid	MM-P2A-231-B	MM-P2A-232-B	MM-P2A-233-B

Note : Ports 1, 3 & 5 are always 1/2"

OPTIONS

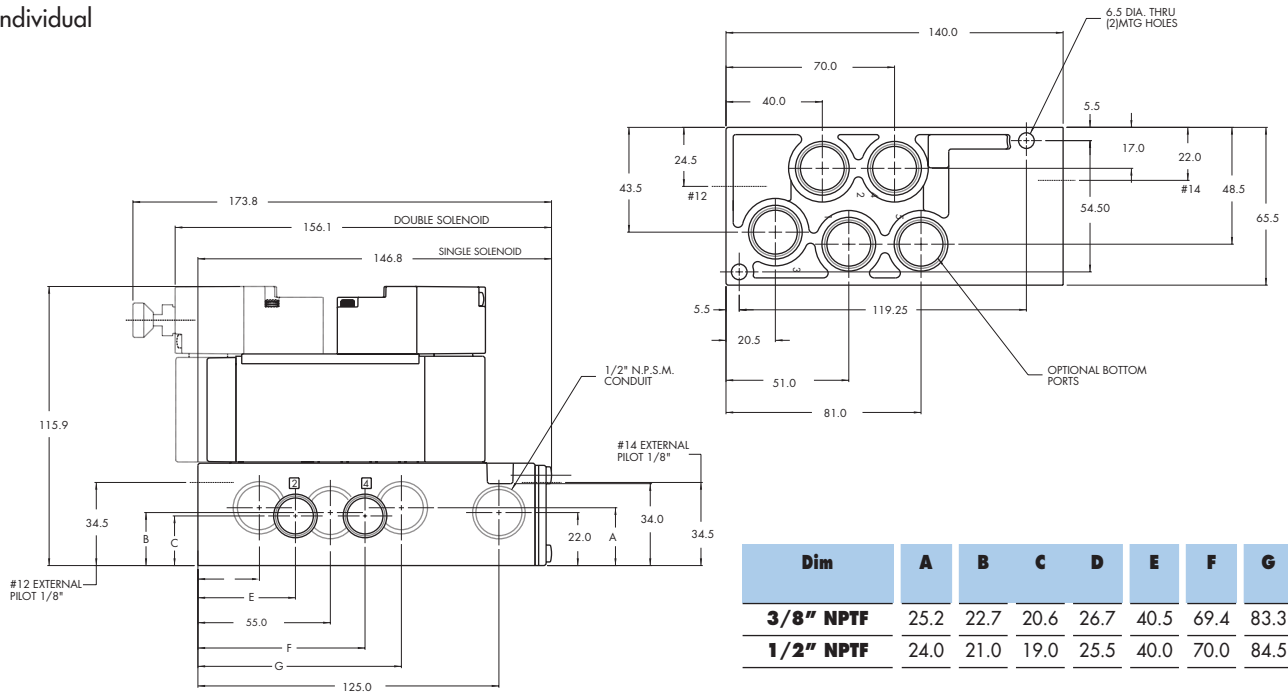


Accessories: M-P2001 Valve blanking plate.  
 N-P2004-01 Manifold fastening kit.  
 32839 Inlet/exhaust isolator plug.

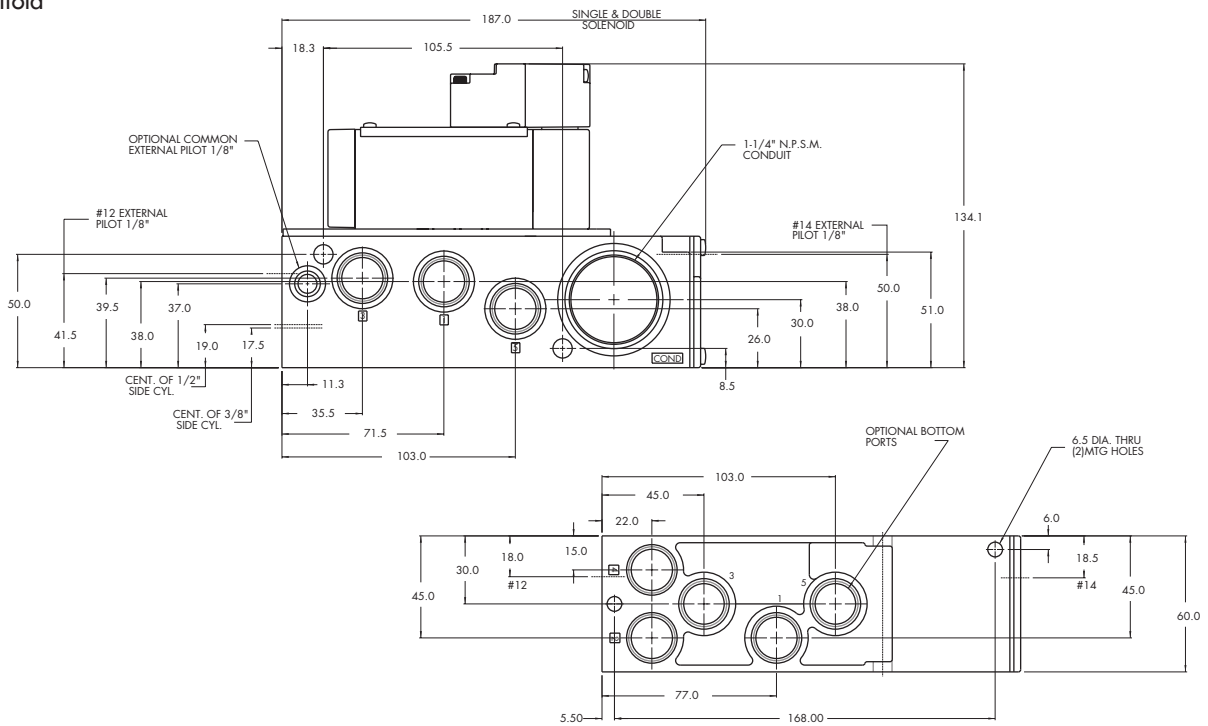
**DIMENSIONS**

Dimensions shown are metric (mm)

**Individual**



**Manifold**



Non plug-in base / manifold

- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3**



HOW TO ORDER

INDIVIDUAL BASE

Port size	Side ports	Bottom ports	Bottom cylinder ports 2 and 4.	Bottom inlet port 1
1/2" NPTF	MB-A3B-221	MB-A3B-223	MB-A3B-222	MB-A3B-224
3/4" NPTF	MB-A3B-231	MB-A3B-233	MB-A3B-232	MB-A3B-234

MANIFOLD BASE

Port size	Side ports	Bottom ports	Bottom cylinder ports 2 and 4.	Bottom inlet port 1
1/2" NPTF	MM-B3A-221-A	MM-B3A-223-A	MM-B3A-222-A	MM-B3A-224-A
3/4" NPTF	MM-B3A-231-A	MM-B3A-233-A	MM-B3A-232-A	MM-B3A-234-A

Manifold fastening kit: N-P3003-01.  
 Valve blanking plate: M-P3001.  
 Inlet/exhaust isolator plug: 32845.

Individual Base Options:

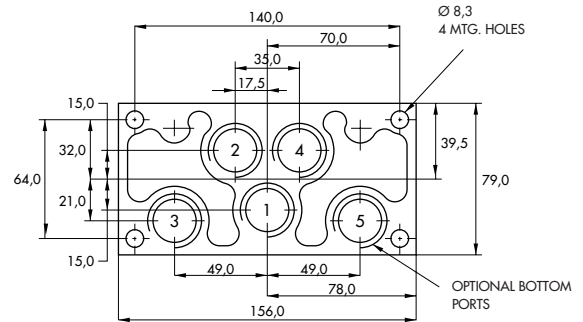
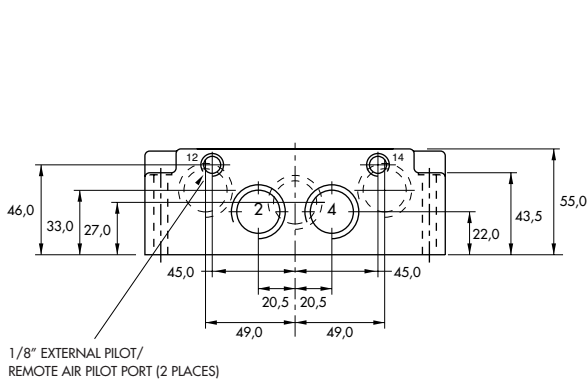
MB-A3B-XXXF  Optional Integral Flow Controls

**DIMENSIONS**

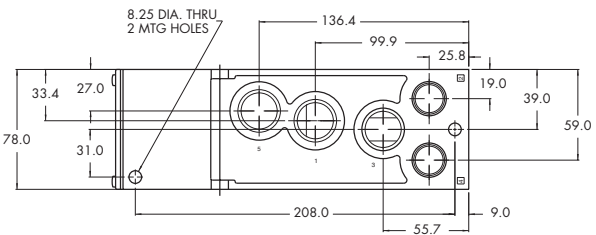
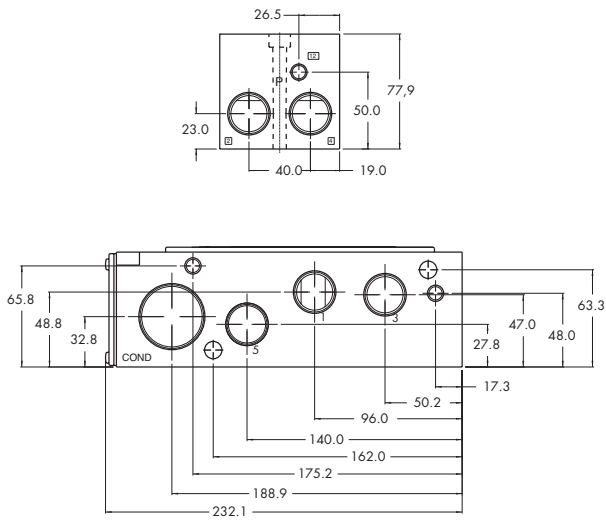
Dimensions shown are metric (mm)

Individual

ISO DIN 5599/1



Manifold



**Plug-in manifold**



- ISO 01
- ISO 02
- ISO 1
- ISO 2
- ISO 3**

**HOW TO ORDER**

MANIFOLD BASE

Port size	Wired for	Side ports	Side ports w/ bottom 2 & 4 ports	All side & bottom ports (see note)
<b>1/2" NPTF</b>	Single solenoid	MM-P3A-221-A	MM-P3A-222-A	MM-P3A-223-A
	Double solenoid	MM-P3A-221-B	MM-P3A-222-B	MM-P3A-223-B
<b>3/4" NPTF</b>	Single solenoid	MM-P3A-231-A	MM-P3A-232-A	MM-P3A-233-A
	Double solenoid	MM-P3A-231-B	MM-P3A-232-B	MM-P3A-233-B

Note : Ports 1, 3 & 5 are always 3/4"

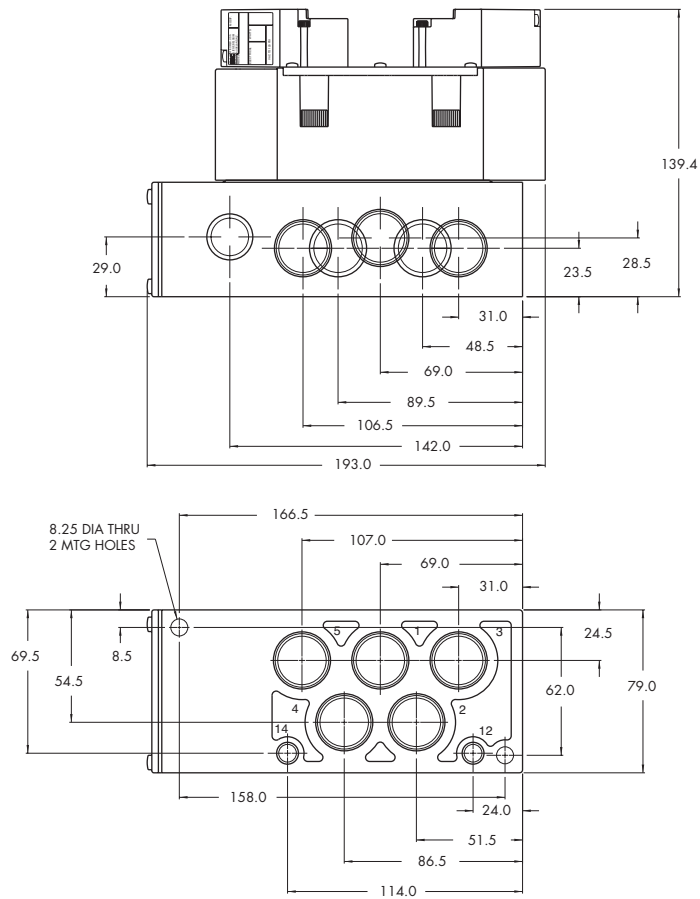
**OPTIONS**

- Manifold options :
- External pilot **MM-P3A-22-x-x**
    - 25** for 1/2" port – common external pilot
    - 26** for 3/4" port – common external pilot
  - Terminal strip **MM-P3A-xxx-A**
    - J** wired for sgl solenoid
    - K** wired for double solenoid
  - light(s) **MM-P3A-xxx-xJA**
    - JA** 110/120 volt
    - JB** 220/240 volt
    - DA** 24 volt

- Accessories:
- M-P3001 Valve blanking plate.
  - N-P3003-01 Manifold fastening kit.
  - 32845 Inlet/exhaust isolator plug.

**DIMENSIONS**

Dimensions shown are metric (mm)







## Section 4

## Pressure regulators

---

<b>Sandwich pressure regulator with manual adjust knob</b>	P. 247
<b>Sandwich pressure regulator with manual adjust knob</b>	P. 249
<b>Sandwich pressure regulator</b>	P. 251
<b>Sandwich pressure regulator with manual adjust knob</b>	P. 253
<b>Sandwich pressure regulator with manual adjust knob</b>	P. 255
<b>Sandwich pressure regulator with air pilot adjust</b>	P. 257
<b>Sandwich pressure regulator with manual adjust knob</b>	P. 259
<b>Sandwich pressure regulator with manual adjust knob</b>	P. 261
<b>Sandwich pressure regulator with air pilot adjust</b>	P. 263
<b>Sandwich pressure regulator with manual adjust knob</b>	P. 265
<b>Sandwich pressure regulator with manual adjust knob</b>	P. 267
<b>Non plug-in sandwich pressure regulator with manual adjust</b>	P. 269
<b>Plug-in sandwich pressure regulator with air pilot adjust</b>	P. 271
<b>Non plug-in sandwich pressure regulator with manual adjust</b>	P. 273
<b>Non plug-in sandwich pressure regulator with manual adjust knob</b>	P. 275
<b>Non plug-in sandwich pressure regulator with air pilot adjust</b>	P. 277
<b>Plug-in sandwich pressure regulator with manual adjust knob</b>	P. 279
<b>Plug-in sandwich pressure regulator with air pilot adjust</b>	P. 281
<b>Non plug-in sandwich pressure regulator with manual adjust knob</b>	P. 283
<b>Non plug-in sandwich pressure regulator with air pilot adjust</b>	P. 285
<b>Plug-in sandwich pressure regulator with manual adjust knob</b>	P. 287
<b>Plug-in sandwich pressure regulator with air pilot adjust</b>	P. 289
<b>Non plug-in sandwich pressure regulator with manual adjust knob</b>	P. 291
<b>Non plug-in sandwich pressure regulator with air pilot adjust</b>	P. 293
<b>Plug-in sandwich pressure regulator with manual adjust knob</b>	P. 295
<b>Plug-in sandwich pressure regulator with air pilot adjust</b>	P. 297

**PR37A**

**PR42B**

**PR46A**

**PR47A**

**PR48B**

**PR92C**

**PR93A**

**PRA01A**

**PRA02A**

**PRA1A**

**PRP1A**

**PRA2D**

**PRP2B**

**PRA3C**

**PRP3B**

**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 "NON PLUG-IN" VALVES (CODED FOR KNOB ADJUSTMENT)

Gage	Single pressure
<b>No gage port</b>	PR37A-FAAA
<b>With gage Port (plugged)</b>	PR37A-FABA

Note: Regulating pressure range for above models is 0 to 120 PSI  
For other ranges, see below.

**OPTIONS**

Adjustment :

PR37A-**Fxxx**

- B** for slotted stem
- K** for slotted stem with locknut

Pressure range :

PR37A-**xxxA**

- B** for 0 to 80 PSI
- C** for 0 to 30 PSI

**PR93A**

**PRA01A**

**PRA02A**

**PRA1A**

**PRP1A**

**PRA2D**

**PRP2B**

**PRA3C**

**PRP3B**

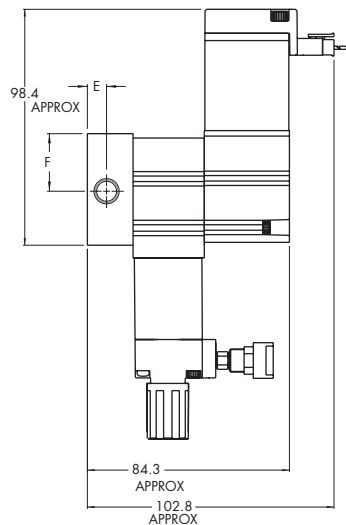
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 120 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	0.4 C <sub>v</sub>

- Spare parts :
- Pressure regulator (less sandwich block) : PR37A-G0AA (knob), PR37A-C0AA (slotted stem), PR37A-L0AA (slotted stem with locknut)
  - Gages : 24177-160 (0 to 160 PSI, 23 mm)  
24177-100 (0 to 100 PSI, 23 mm)  
24177-060 (0 to 60 PSI, 23 mm)

**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. 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**

NON PLUG-IN SANDWICH REGULATORS

Gage	Regulator "1/2" end Internal pilot	Regulator "1/2" end External pilot
No gage port	PR42B-BAAA	PR42B-BBAA
With gage Port	PR42B-BABA	PR42B-BBBA

PR93A

PLUG-IN SANDWICH REGULATORS

Gage	Regulator "1/2" end Internal pilot	Regulator "1/2" end External pilot
No gage port	PR42B-AAAA	PR42B-ABAA
With gage Port	PR42B-AABA	PR42B-ABBA

PRA01A  
 PRA02A

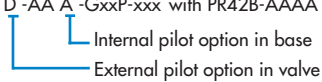
Notes:

- External pilot regulator required only when supply pressure (primary) to the valve is below the minimum operating pressure of the 42 series valve.
- When an internal pilot regulator is used with the 42 series valve, the valve should be ordered as external pilot and the base should be ordered as internal pilot. This ensures that the pilot supply is not regulated. If an internal pilot valve and base are used with an internal pilot regulator, the pilot supply is regulated.

PRA1A

PRP1A

Example: Valve 42B-AM D-AA A -GxxP-xxx with PR42B-AAAA



PRA2D

**OPTIONS**

Pressure range :

PR42B-AAAA
<b>A</b> 0 to 120 PSI
<b>B</b> 0 to 80 PSI
<b>C</b> 0 to 40 PSI

PRP2B

PRA3C

PRP3B

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 120 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	0.25 C <sub>v</sub>

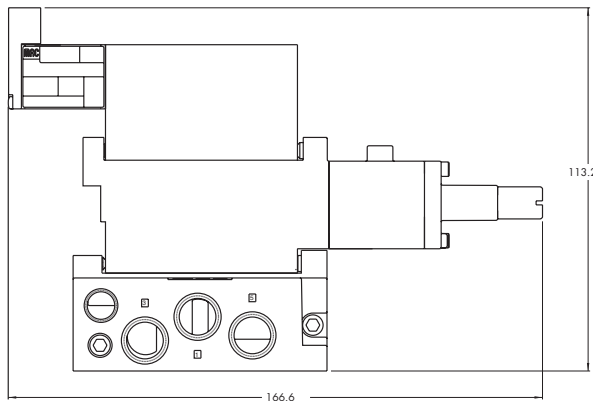
Spare parts :

- Pressure regulator (less sandwich block) : PR42B-C0xx • Gage port plug: N-PE003
- #10 -32 to 1/8" adapter : N-35005 • Gage: 24177-160 (0 to 160 PSI, 23 mm)  
24177-100 (0 to 100 PSI, 23 mm)  
24177-060 (0 to 60 PSI, 23 mm)

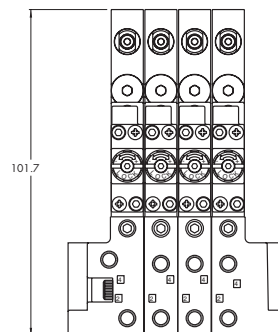
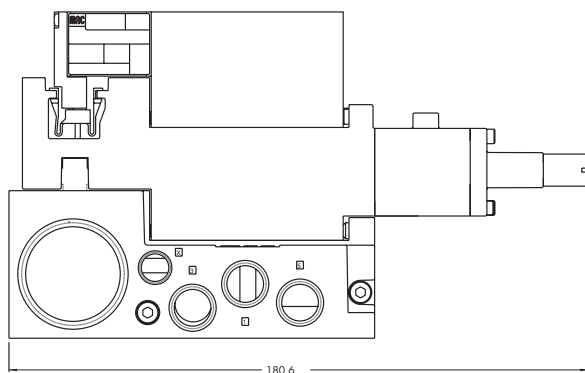
**DIMENSIONS**

Dimensions shown are metric (mm)

NON PLUG-IN



PLUG-IN



**Sandwich-pressure regulator**

**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.
6. Single pressure regulator.



PR37A  
PR42B  
**PR46A**  
PR47A  
PR48B  
  
PR92C

**HOW TO ORDER**

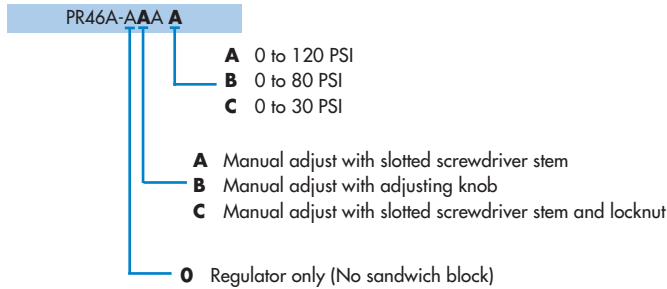
REGULATORS FOR "PLUG-IN" AND "NON PLUG-IN" VALVES

Gauge	For plug-in valves	For non plug-in valves
Gauge port (plugged)	PR46A-AAAA	PR46A-BAAA

PR93A

**OPTIONS**

Pressure range :



PRA01A  
PRA02A  
PRA1A  
  
PRP1A  
  
PRA2D  
  
PRP2B  
  
PRA3C  
  
PRP3B

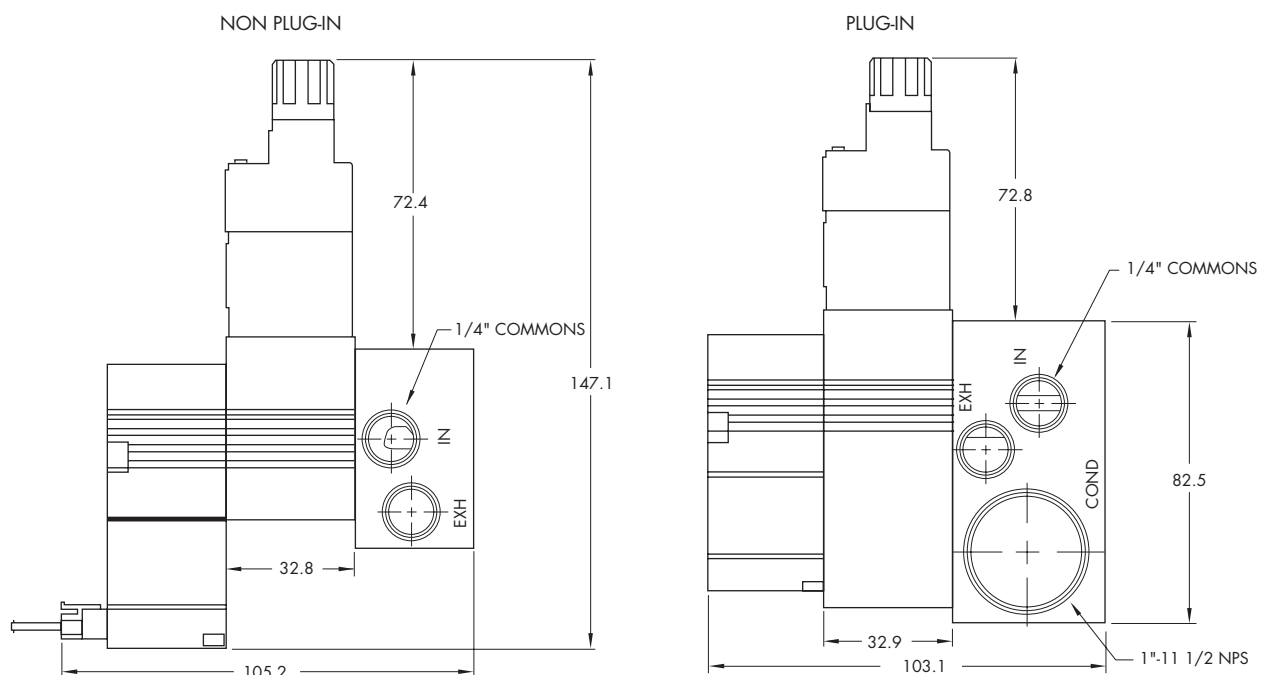
Notes : gages must be ordered separately, not included with regulator.  
Recommended gage : 241 65-150 (15 mm)

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 120 PSI
<b>Regulating range :</b>	0 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 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	Cv 0,21

**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. 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 "PLUG-IN" VALVES (KNOB ADJUSTMENT)

Gage	Single pressure
No gage port	PR47A-EAAA
With gage Port	PR47A-EABA

PR93A

REGULATORS FOR "NON PLUG-IN" VALVES (KNOB ADJUSTMENT)

Gage	Single pressure
No Gage port	PR47A-FAAA
With Gage Port	PR47A-FABA

PRA01A  
PRA02A

**OPTIONS**

Pressure range :

PR47A-xxx**A**

- A** 0 to 120 PSI
- B** 0 to 80 PSI
- C** 0 to 30 PSI

Adjustment for : Plug-in regulator

PR47A-**E**xxx

- E** Knob
- A** Screwdriver slot
- J** Screwdriver slot with locknut

Non plug-in regulator

PR47A-**F**xxx

- F** Knob
- B** Screwdriver slot
- K** Screwdriver slot with locknut

PRA1A  
PRP1A  
  
PRA2D  
PRP2B  
  
PRA3C  
PRP3B

**TECHNICAL DATA**

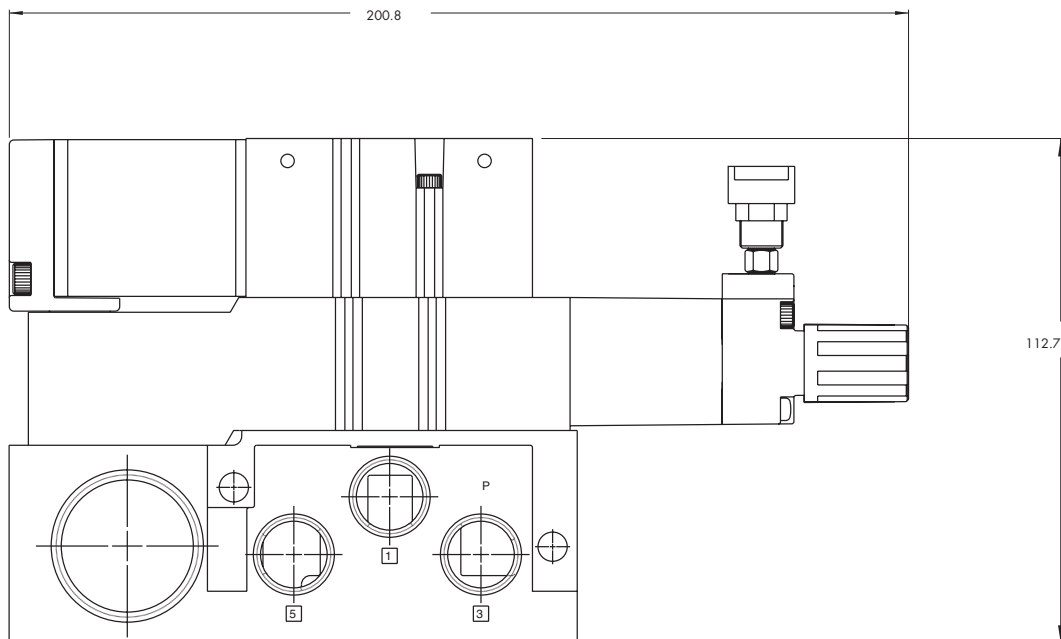
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 120 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	0.4 C <sub>v</sub>

Spare parts :

- Pressure regulator (less sandwich block) : PR47A-G0AA (knob), PR47A-C0AA (screwdriver slot), PR47A-L0AA (screwdriver slot with locknut)
- Gage: 24177-160 (0 to 160 PSI, 23 mm)  
24177-100 (0 to 100 PSI, 23 mm)  
24177-060 (0 to 60 PSI, 23 mm)

**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. 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

PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C

PRP3B

**HOW TO ORDER**

NON PLUG-IN SANDWICH REGULATORS (KNOB ADJUSTMENT)

Gage	Regulator "12" end Internal pilot	Regulator "12" end External pilot
Gage port	PR48B-BAAA	PR48B-BBAA

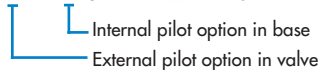
PLUG-IN SANDWICH REGULATORS (KNOB ADJUSTMENT)

Gage	Regulator "12" end Internal pilot	Regulator "12" end External pilot
Gage port	PR48B-AAAA	PR48B-ABAA

Notes:

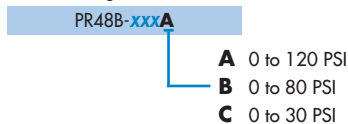
- External pilot regulator required only when supply pressure (primary) to the valve is below the minimum operating pressure of the 48 series valve.
- When an internal pilot regulator is used with the 48 series valve, the valve should be ordered as external pilot and the base should be ordered as internal pilot. This ensures that the pilot supply is not regulated. If an internal pilot valve and base are used with an internal pilot regulator, the pilot supply is regulated.

Example: Valve 48B-AM D-AA A -GxxP-xxx with PR48B-AAAA

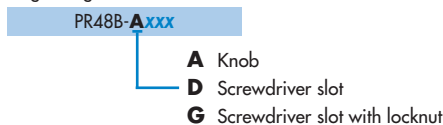


**OPTIONS**

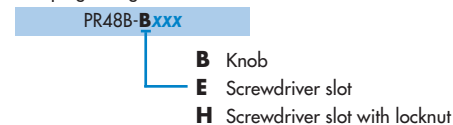
Pressure range :



Adjustment for : Plug-in regulator



Non plug-in regulator



**TECHNICAL DATA**

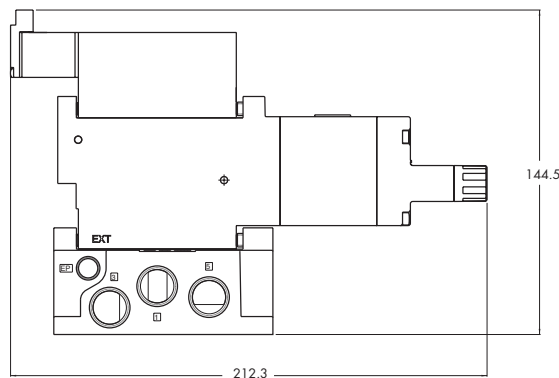
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 120 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	0.8 C <sub>v</sub>

- Spare parts :
- Pressure regulator (less sandwich block) : PR48B-C0AA (knob), PR48B-F0AA (screwdriver slot), PR48B-J0AA (screwdriver slot with locknut)
  - Gage: 24177-160 (0 to 160 PSI, 23 mm)  
 24177-100 (0 to 100 PSI, 23 mm)  
 24177-060 (0 to 60 PSI, 23 mm)

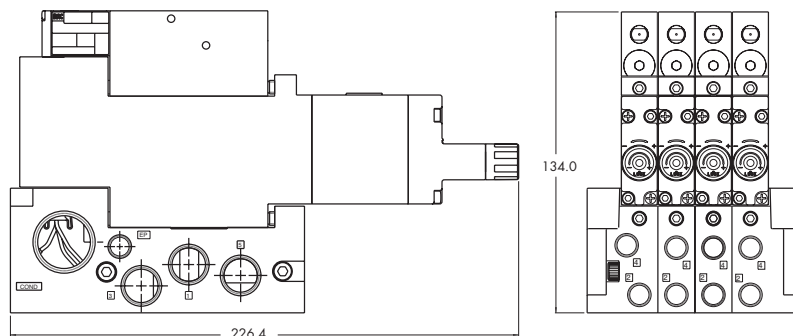
**DIMENSIONS**

Dimensions shown are metric (mm)

NON PLUG-IN



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**

PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C

PRP3B

**HOW TO ORDER**

REGULATORS FOR "PLUG-IN" VALVES

Gage	Regulator A end Single pressure	Regulator B end Single pressure	Regulator A * end with by-pass end plate B end	Regulator B * end with by-pass end plate A end	Regulator * both ends
<b>Gage port only (plugged)</b>	PR92C-EAAA	PR92C-EBAA	PR92C-ECAA	PR92C-EDAA	PR92C-EEAA
<b>Gage with face perpendicular to manual operator</b>	PR92C-EABA	PR92C-EBBA	PR92C-ECBA	PR92C-EDBA	PR92C-EEBA
<b>Gage with face parallel to manual operator</b>	PR92C-EACA	PR92C-EBCA	PR92C-ECCA	PR92C-EDCA	PR92C-EECA

Note: above models are coded for use with single solenoid valves

REGULATORS FOR "NON PLUG-IN" VALVES

Gage	Regulator A end Single pressure	Regulator B end Single pressure	Regulator A * end with by-pass end plate B end	Regulator B * end with by-pass end plate A end	Regulator * both ends
<b>Gage port only (plugged)</b>	PR92C-GAAA	PR92C-GBAA	PR92C-GCAA	PR92C-GDAA	PR92C-GEAA
<b>Gage with face perpendicular to manual operator</b>	PR92C-GABA	PR92C-GBBA	PR92C-GCBA	PR92C-GDBA	PR92C-GEBA
<b>Gage with face parallel to manual operator</b>	PR92C-GACA	PR92C-GBCA	PR92C-GCCA	PR92C-GDCA	PR92C-GECA

\* For use with dual pressure valves.

**PLUG-IN OPTIONS**

PR92C-Exxx

F for double solenoid valve

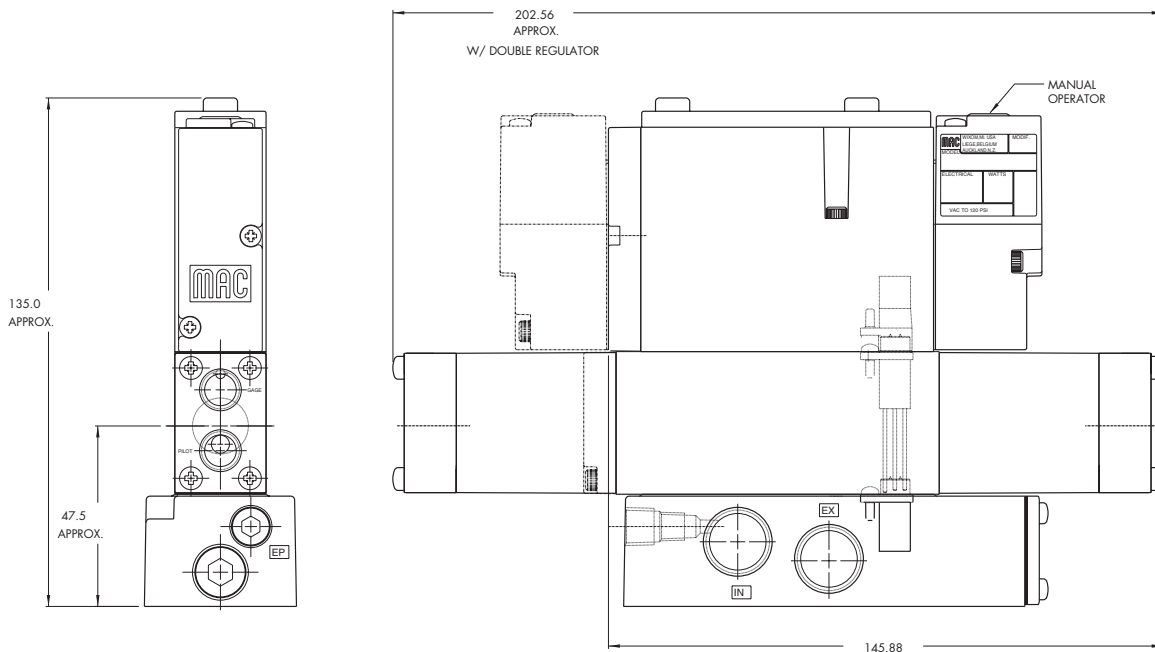
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 120 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	0.8 C <sub>v</sub>

- Spare parts :
- R-92003 : regulator end plate kit • Gage kit 0 - 160 PSI: N-92006-01
  - R-92003-01 : regulator by-pass end plate kit
  - Pressure regulator (less sandwich block) : PR92C-H0AA

**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. 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 "PLUG-IN" VALVES (CODED FOR KNOB ADJUSTMENT)

Gage	Regulator A end Single pressure	Regulator B end Single pressure	Regulator A * end with by-pass end plate B end	Regulator B * end with by-pass end plate A end	Regulator * both ends
<b>No Gage</b>	PR92C-JAAA	PR92C-JBAA	PR92C-JCAA	PR92C-JDAA	PR92C-JEAA
<b>Gage with face perpendicular to manual operator</b>	PR92C-JABA	PR92C-JBBA	PR92C-JCBA	PR92C-JDBA	PR92C-JEBA
<b>Gage with face parallel to manual operator</b>	PR92C-JACA	PR92C-JBCA	PR92C-JCCA	PR92C-JDCA	PR92C-JECA

PR93A

PRA01A

PRA02A

Note: above models are coded for use with single solenoid valves

REGULATORS FOR "NON PLUG-IN" VALVES (CODED FOR KNOB ADJUSTMENT)

Gage	Regulator A end Single pressure	Regulator B end Single pressure	Regulator A * end with by-pass end plate B end	Regulator B * end with by-pass end plate A end	Regulator * both ends
<b>No Gage</b>	PR92C-LAAA	PR92C-LBAA	PR92C-LCAA	PR92C-LDAA	PR92C-LEAA
<b>Gage with face perpendicular to manual operator</b>	PR92C-LABA	PR92C-LBBA	PR92C-LCBA	PR92C-LDBA	PR92C-LEBA
<b>Gage with face parallel to manual operator</b>	PR92C-LACA	PR92C-LBCA	PR92C-LCCA	PR92C-LDCA	PR92C-LECA

PRA1A

PRP1A

PRA2D

\* For use with dual pressure valves.

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

PRP2B

**OPTIONS**

Regulator less sandwich block

- PR92C-**x0xx**
- M** Knob
  - D** Slotted stem
  - S** Slotted stem with locknut

Other adjustment

- PR92C-**xxxx**
- A** Slotted stem, single solenoid
  - B** Slotted stem, double solenoid
  - C** Slotted stem, non plug-in
  - K** Knob, double solenoid
  - N** Slotted stem w/ locknut, single solenoid
  - P** Slotted stem w/ locknut, double solenoid
  - R** Slotted stem w/ locknut, non plug-in

PRA3C

PRP3B

**TECHNICAL DATA**

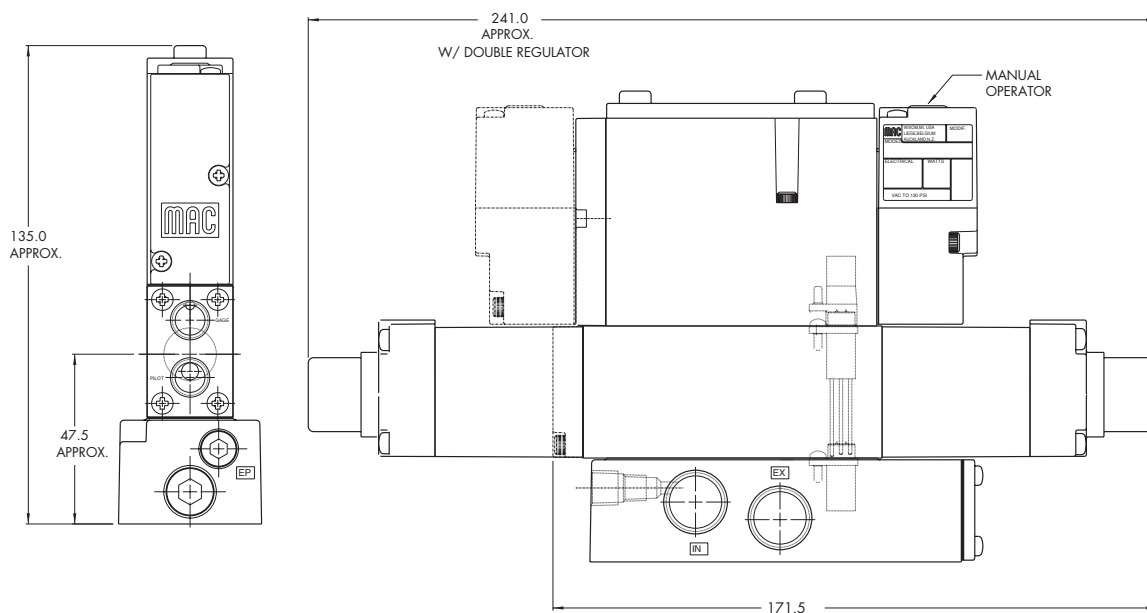
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 120 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	0.8 C <sub>v</sub>

- Spare parts :
- R-92003 : end plate kit • R-92003-01 : by-pass end plate kit
  - Gage kit 0 – 160 PSI : N-92006-01 • Gage kit 0 – 100 PSI : N-92006-02
  - Gage kit 0 – 60 PSI : N-92006-03

- Options:
- Pressure range: PR92C-xxxA (A 0 to 120 PSI)
    - B 0 to 80 PSI
    - C 0 to 30 PSI
    - D 0 to 120 PSI "A" end, 0 to 80 PSI "B" end
    - E 0 to 120 PSI "B" end, 0 to 80 PSI "A" end
    - F 0 to 120 PSI "A" end, 0 to 30 PSI "B" end
    - G 0 to 120 PSI "B" end, 0 to 30 PSI "A" end
    - H 0 to 80 PSI "A" end, 0 to 30 PSI "B" end
    - J 0 to 80 PSI "B" end, 0 to 30 PSI "A" end

**DIMENSIONS**

Dimensions shown are metric (mm)





**Sandwich selector 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 "PLUG-IN" VALVES (CODED FOR KNOB ADJUSTMENT)

Gage	Select to A port Regulator A end By-pass plate B end	Select to B port Regulator B end By-pass plate A end	Select to A port Reg. both ends A end low press. B end high press.	Select to B port Reg. both ends A end high press. B end low press.
No Gage	PR92C-JPAA	PR92C-JRAA	PR92C-JSAA	PR92C-JTAA
Gage with face perpendicular to manual operator	PR92C-JPBA	PR92C-JRBA	PR92C-JSBA	PR92C-JTBA
Gage with face parallel to manual operator	PR92C-JPCA	PR92C-JRCA	PR92C-JSCA	PR92C-JTCA

PR93A  
PRA01A  
PRA02A

Note: above models are coded for use with single solenoid valves

REGULATORS FOR "NON PLUG-IN" VALVES (CODED FOR KNOB ADJUSTMENT)

Gage	Select to A port Regulator A end By-pass plate B end	Select to B port Regulator B end By-pass plate A end	Select to A port Reg. both ends A end low press. B end high press.	Select to B port Reg. both ends A end high press. B end low press.
No Gage	PR92C-LPAA	PR92C-LRAA	PR92C-LSAA	PR92C-LTAA
Gage with face perpendicular to manual operator	PR92C-LPBA	PR92C-LRBA	PR92C-LSBA	PR92C-LTBA
Gage with face parallel to manual operator	PR92C-LPCA	PR92C-LRCA	PR92C-LSCA	PR92C-LTCA

PRA1A  
PRP1A  
PRA2D  
PRP2B

Notes: - Regulating range for above models is 0 to 120 PSI. For other ranges, see technical data page  
- Use single pressure valve for all above models.

**OPTIONS**

Regulator less sandwich block

PR92C-x0xx

- M** Knob
- D** Slotted stem
- S** Slotted stem with locknut

Other adjustment

PR92C-xxxx

- A** Slotted stem, single solenoid
- B** Slotted stem, double solenoid
- C** Slotted stem, non plug-in
- K** Knob, double solenoid
- N** Slotted stem w/ locknut, single solenoid
- P** Slotted stem w/ locknut, double solenoid
- R** Slotted stem w/ locknut, non plug-in

PRA3C  
PRP3B

**TECHNICAL DATA**

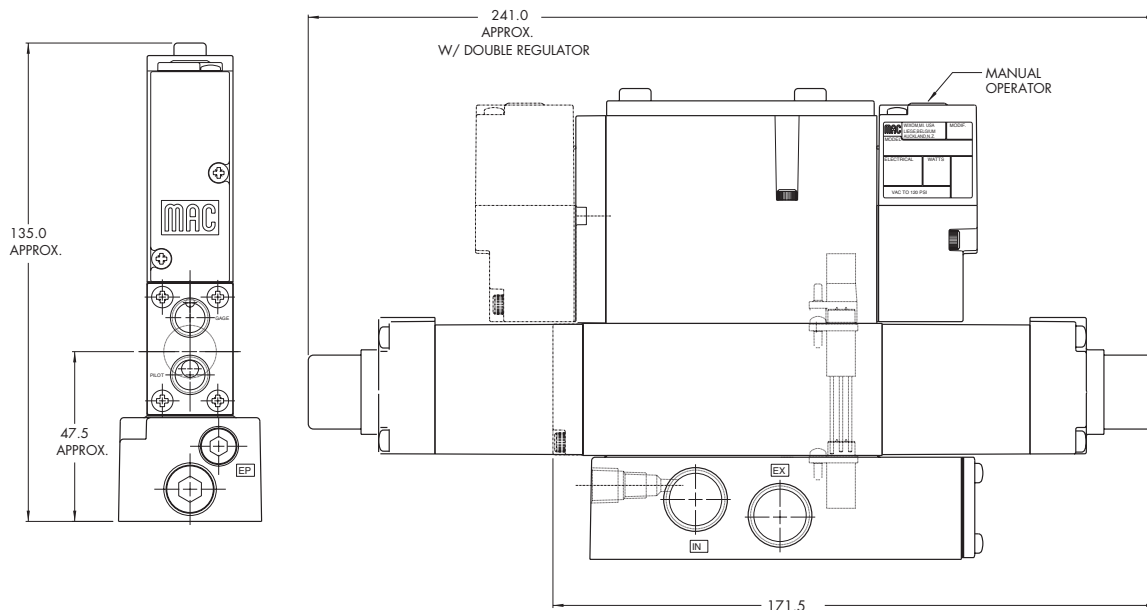
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 120 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	0.8 C <sub>v</sub>

- Spare parts :
- R-92003 : end plate kit • R-92003-01 : by-pass end plate kit
  - Gage kit 0 – 160 PSI : N-92006-01 • Gage kit 0 – 100 PSI : N-92006-02
  - Gage kit 0 – 60 PSI : N-92006-03

- Options :
- Pressure range: PR92C-xxxA (A 0 to 120 PSI)
    - B 0 to 80 PSI
    - C 0 to 30 PSI
    - D 0 to 120 PSI "A" end, 0 to 80 PSI "B" end
    - E 0 to 120 PSI "B" end, 0 to 80 PSI "A" end
    - F 0 to 120 PSI "A" end, 0 to 30 PSI "B" end
    - G 0 to 120 PSI "B" end, 0 to 30 PSI "A" end
    - H 0 to 80 PSI "A" end, 0 to 30 PSI "B" end
    - J 0 to 80 PSI "B" end, 0 to 30 PSI "A" 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. 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 "PLUG-IN" VALVES

Gage	Regulator A end Single pressure	Regulator B end Single pressure	Regulator A * end with by-pass end plate B end	Regulator B * end with by-pass end plate A end	Regulator * both ends
<b>Gage port only (plugged)</b>	PR93A-DAAA	PR93A-DBAA	PR93A-DCAA	PR93A-DDAA	PR93A-DEAA
<b>Gage with face perpendicular to manual operator</b>	PR93A-DABA	PR93A-DBBA	PR93A-DCBA	PR93A-DDBA	PR93A-DEBA
<b>Gage with face parallel to manual operator</b>	PR93A-DACA	PR93A-DBCA	PR93A-DCCA	PR93A-DDCA	PR93A-DECA

PR93A  
  
PRA01A  
PRA02A

REGULATORS FOR "NON PLUG-IN" VALVES

Gage	Regulator A end Single pressure	Regulator B end Single pressure	Regulator A * end with by-pass end plate B end	Regulator B * end with by-pass end plate A end	Regulator * both ends
<b>Gage port only (plugged)</b>	PR93A-EAAA	PR93A-EBAA	PR93A-ECAA	PR93A-EDAA	PR93A-EEAA
<b>Gage with face perpendicular to manual operator</b>	PR93A-EABA	PR93A-EBBA	PR93A-ECBA	PR93A-EDBA	PR93A-EEBA
<b>Gage with face parallel to manual operator</b>	PR93A-EACA	PR93A-EBCA	PR93A-ECCA	PR93A-EDCA	PR93A-EECA

PRA1A  
PRP1A  
PRA2D  
PRP2B  
PRA3C  
PRP3B

Note: Above models may be used with either single or double solenoid valves.  
\* For use with dual pressure valves.

**TECHNICAL DATA**

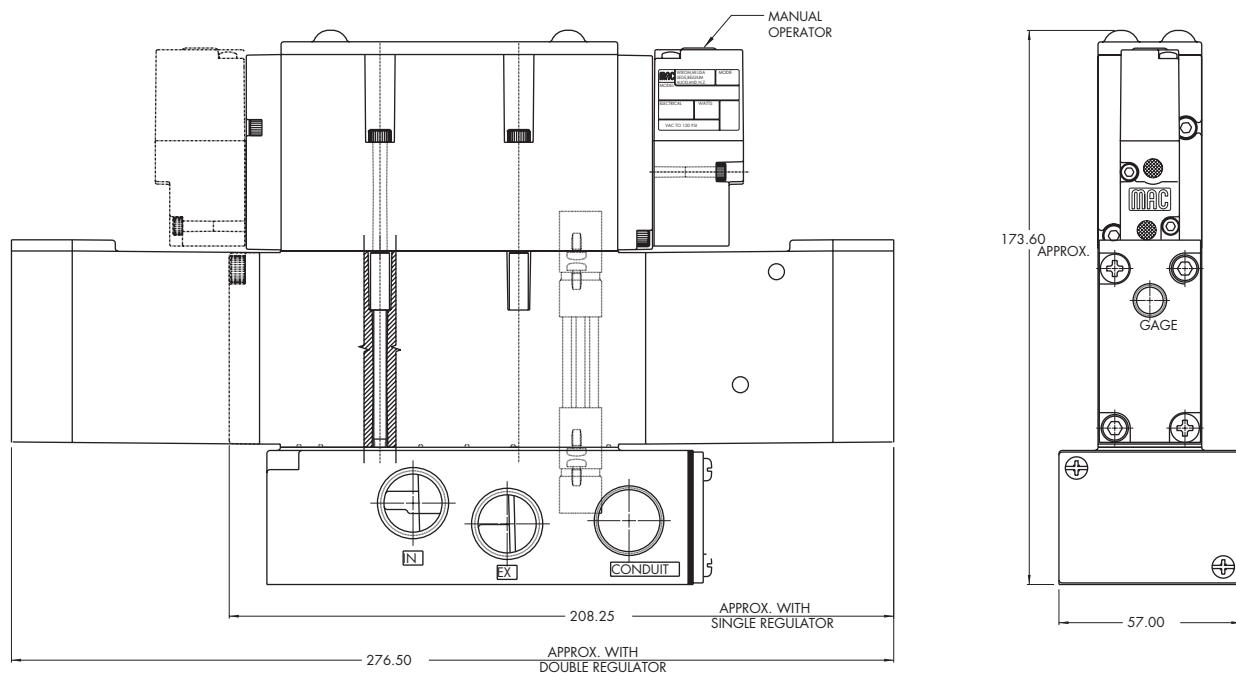
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 120 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	2.4 C <sub>v</sub>

Spare parts :

- Regulator end plate kit: R-93004 • Regulator by-pass end plate kit: R-93004-01
- Gage kit: N-92006-01 (0 to 160 PSI)
- Pressure regulator (less sandwich block): PR93A-F0AA

**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. 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 "PLUG-IN" VALVES (CODED FOR KNOB ADJUSTMENT)

Gage	Regulator A end Single pressure	Regulator B end Single pressure	Regulator A * end with by-pass end plate B end	Regulator B * end with by-pass end plate A end	Regulator * both ends
<b>Gage port only (plugged)</b>	PR93A-GAAA	PR93A-GBAA	PR93A-GCAA	PR93A-GDAA	PR93A-GEAA
<b>Gage with face perpendicular to manual operator</b>	PR93A-GABA	PR93A-GBBA	PR93A-GCBA	PR93A-GDBA	PR93A-GEBA
<b>Gage with face parallel to manual operator</b>	PR93A-GACA	PR93A-GBCA	PR93A-GCCA	PR93A-GDCA	PR93A-GECA

PR93A  
  
PRA01A  
PRA02A

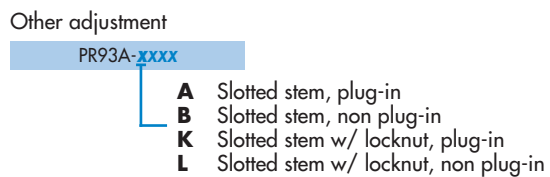
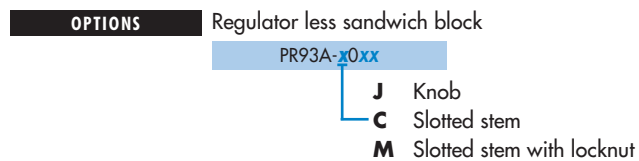
REGULATORS FOR "NON PLUG-IN" VALVES (CODED FOR KNOB ADJUSTMENT)

Gage	Regulator A end Single pressure	Regulator B end Single pressure	Regulator A * end with by-pass end plate B end	Regulator B * end with by-pass end plate A end	Regulator * both ends
<b>Gage port only (plugged)</b>	PR93A-HAAA	PR93A-HBAA	PR93A-HCAA	PR93A-HDAA	PR93A-HEAA
<b>Gage with face perpendicular to manual operator</b>	PR93A-HABA	PR93A-HBBA	PR93A-HCBA	PR93A-HDBA	PR93A-HEBA
<b>Gage with face parallel to manual operator</b>	PR93A-HACA	PR93A-HBCA	PR93A-HCCA	PR93A-HDCA	PR93A-HECA

PRA1A  
PRP1A  
PRA2D

\* For use with dual pressure valves.

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



PRP2B  
PRA3C  
PRP3B

Note: Above models may be used with either single or double solenoid valves.

**TECHNICAL DATA**

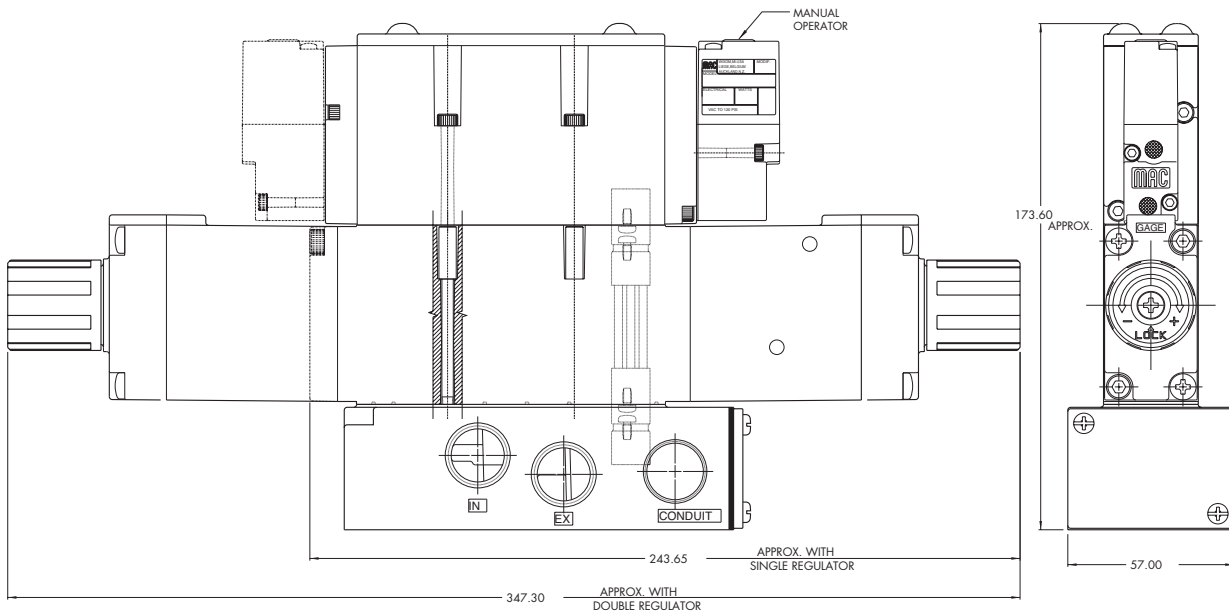
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 120 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	2.4 C <sub>v</sub>

Spare parts :  
 • Regulator end plate kit :R-93004 • Regulator by-pass end plate kit : R-93004-01.  
 • Gage kit 0 – 160 PSI : N-92006-01 • Gage kit 0 – 100 PSI : N-92006-02  
 • Gage kit 60 PSI : N-92006-03

Option:  
 • Pressure range: PR93A-xxxA (A 0 to 120 PSI)  
     B 0 to 80 PSI  
     C 0 to 30 PSI  
     D 0 to 120 PSI "A" end, 0 to 80 PSI "B" end  
     E 0 to 120 PSI "B" end, 0 to 80 PSI "A" end  
     F 0 to 120 PSI "A" end, 0 to 30 PSI "B" end  
     G 0 to 120 PSI "B" end, 0 to 30 PSI "A" end  
     H 0 to 80 PSI "A" end, 0 to 30 PSI "B" end  
     J 0 to 80 PSI "B" end, 0 to 30 PSI "A" end

**DIMENSIONS**

Dimensions shown are metric (mm)



**Sandwich selector 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 "PLUG-IN" VALVES (CODED FOR KNOB ADJUSTMENT)

Gage	Select to A port Regulator A end By-pass plate B end	Select to B port Regulator B end By-pass plate A end	Select to A port Reg. both ends A end low press. B end high press.	Select to B port Reg. both ends A end high press. B end low press.
<b>Gage port only (plugged)</b>	PR93A-GPAA	PR93A-GRAA	PR93A-GSAA	PR93A-GTAA
<b>Gage with face perpendicular to manual operator</b>	PR93A-GPBA	PR93A-GRBA	PR93A-GSBA	PR93A-GTBA
<b>Gage with face parallel to manual operator</b>	PR93A-GPCA	PR93A-GRCA	PR93A-GSCA	PR93A-GTCA

PR93A

PRA01A

PRA02A

REGULATORS FOR "NON PLUG-IN" VALVES

Gage	Select to A port Regulator A end By-pass plate B end	Select to B port Regulator B end By-pass plate A end	Select to A port Reg. both ends A end low press. B end high press.	Select to B port Reg. both ends A end high press. B end low press.
<b>Gage port only (plugged)</b>	PR93A-HPAA	PR93A-HRAA	PR93A-HSAA	PR93A-HTAA
<b>Gage with face perpendicular to manual operator</b>	PR93A-HPBA	PR93A-HRBA	PR93A-HSBA	PR93A-HTBA
<b>Gage with face parallel to manual operator</b>	PR93A-HPCA	PR93A-HRCA	PR93A-HSCA	PR93A-HTCA

PRA1A

PRP1A

PRA2D

Notes: - Regulating range for above models is 0 to 120 PSI. For other ranges, see technical data page  
- Use single pressure valve for all above models.

PRP2B

**OPTIONS**

Regulator less sandwich block

- PR93A-x0xx
- J** Knob
  - C** Slotted stem
  - M** Slotted stem with locknut

Other adjustment

- PR93A-xxxx
- A** Slotted stem, plug-in
  - B** Slotted stem, non plug-in
  - K** Slotted stem w/ locknut, plug-in
  - L** Slotted stem w/ locknut, non plug-in

PRA3C

PRP3B

Note: Above models may be used with either single or double solenoid valves.

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 120 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	2.4 C <sub>v</sub>

Spare parts :

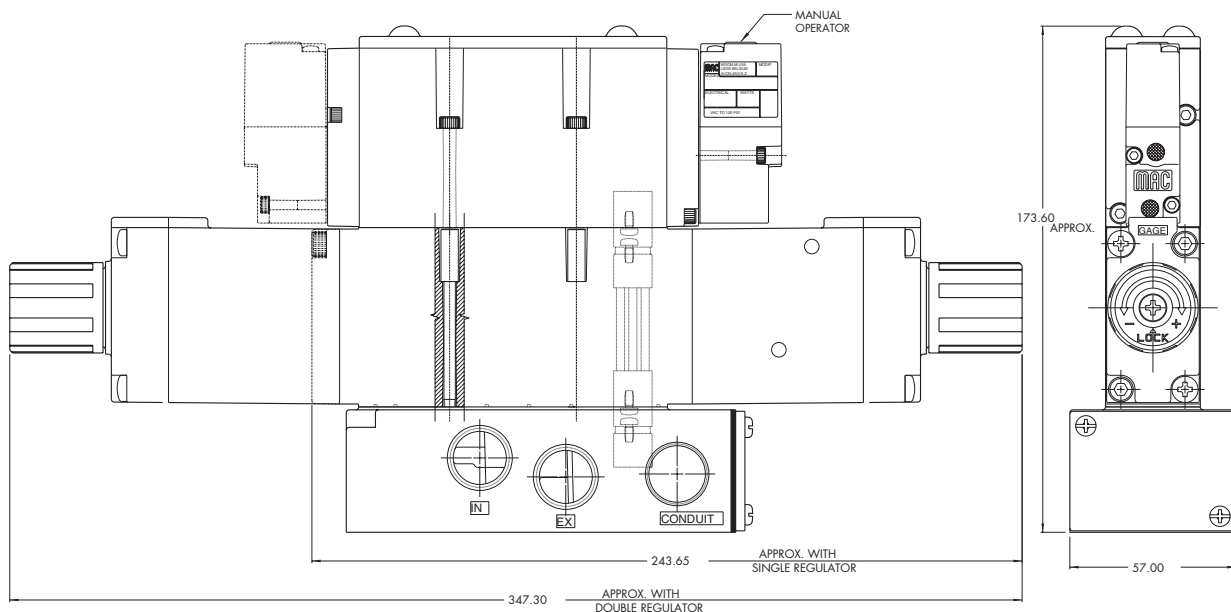
- Regulator end plate kit :R-93004 • Regulator by-pass end plate kit : R-93004-01.
- Gage kit 0 – 160 PSI : N-92006-01 • Gage kit 0 – 100 PSI : N-92006-02
- Gage kit 0 – 60 PSI : N-92006-03

Option:

- Pressure range: PR93A-xxxA (A 0 to 120 PSI)
  - B 0 to 80 PSI
  - C 0 to 30 PSI
  - D 0 to 120 PSI "A" end, 0 to 80 PSI "B" end
  - E 0 to 120 PSI "B" end, 0 to 80 PSI "A" end
  - F 0 to 120 PSI "A" end, 0 to 30 PSI "B" end
  - G 0 to 120 PSI "B" end, 0 to 30 PSI "A" end
  - H 0 to 80 PSI "A" end, 0 to 30 PSI "B" end
  - J 0 to 80 PSI "B" end, 0 to 30 PSI "A" end

**DIMENSIONS**

Dimensions shown are metric (mm)





**Non plug-in sandwich pressure regulator with manual adjust**

**OPERATIONAL BENEFITS**

1. Easy mounting: saves on installation costs and space 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**

Pilot	Single pressure Regulator 12 end	Dual pressure Regulator 12 end with by-pass 14 end *	Dual pressure Regulator 14 end with by-pass 12 end *	Dual pressure Regulator both ends *
<b>Internal</b>	PRA01A-AAAA	PRA01A-ABAA	PRA01A-ADAA	PRA01A-AEAA
<b>External</b>	PRA01A-BAAA	PRA01A-BBAA	PRA01A-BDAA	PRA01A-BEAA

PR93A

Above models are for manual adjust with knob  
For other manual adjustments and pressure ranges, see Options.

Note: Add -9 after part number for regulator block assembled to valve.  
\* To be used with dual pressure valves.

**PRA01A**  
PRA02A

**OPTIONS**

Adjustments :

PRA01A - **XXXX**

- A** Manual adjust with knob – Internal pilot
- B** Manual adjust with knob – External pilot
- G** Manual adjust with screwdriver slot – Internal pilot
- H** Manual adjust with screwdriver slot – External pilot
- K** Manual adjust with screwdriver slot with locknut– Internal pilot
- L** Manual adjust with screwdriver slot with locknut – External pilot

PRA1A  
PRP1A

Regulated Pressure range :

PRA01A - **xxxx**

- A** 0 to 120 PSI
- B** 0 to 80 PSI
- C** 0 to 30 PSI
- D** 0 to 120 PSI "14" end - 0 to 80 PSI "12" end
- E** 0 to 120 PSI "12" end - 0 to 80 PSI "14" end
- F** 0 to 120 PSI "14" end - 0 to 30 PSI "12" end
- G** 0 to 120 PSI "12" end - 0 to 30 PSI "14" end
- H** 0 to 80 PSI "14" end - 0 to 30 PSI "12" end
- J** 0 to 80 PSI "12" end - 0 to 30 PSI "14" end

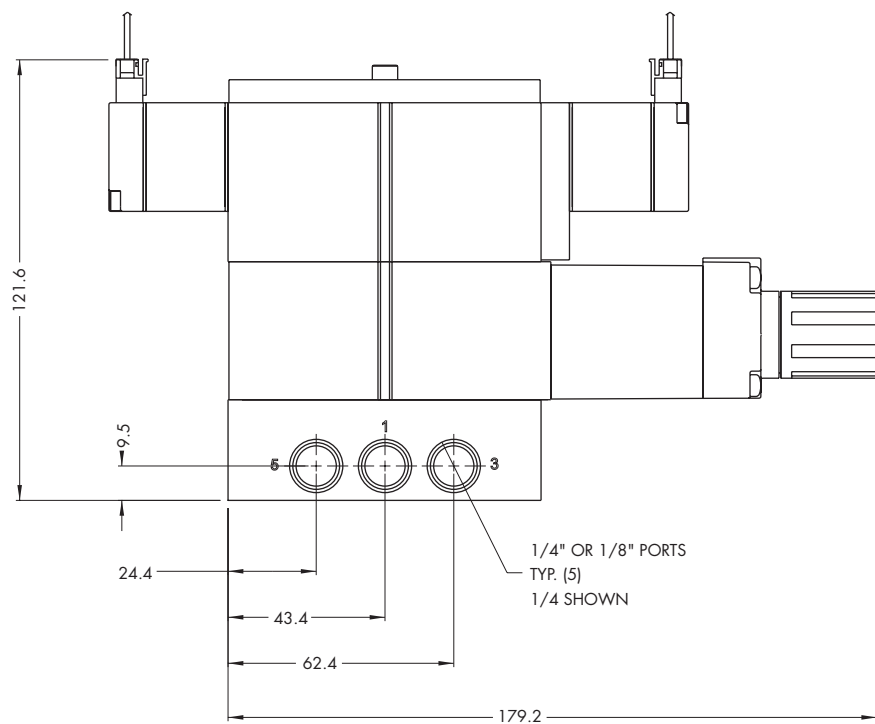
PRA2D  
PRP2B  
  
PRA3C  
PRP3B

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure supply :</b>	Higher than maximum regulated pressure (max. 8,5 bar)
<b>Regulating range :</b>	0 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)

**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. 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**

Pilot	Single pressure Regulator 12 end	Dual pressure Regulator 12 end with by-pass 14 end *	Dual pressure Regulator 14 end with by-pass 12 end *	Dual pressure Regulator both ends *
<b>Internal</b>	PRA01A-DAAA	PRA01A-DBAA	PRA01A-DDAA	PRA01A-DEAA
<b>External</b>	PRA01A-EAAA	PRA01A-EBAA	PRA01A-EDAA	PRA01A-EEAA

**PR93A**

Note : Only pressure range available for air adjust regulator is 0-120 PSI.  
 \* To be used with dual pressure valves.

**PRA01A**

**PRA02A**

**PRA1A**

**PRP1A**

**PRA2D**

**PRP2B**

**PRA3C**

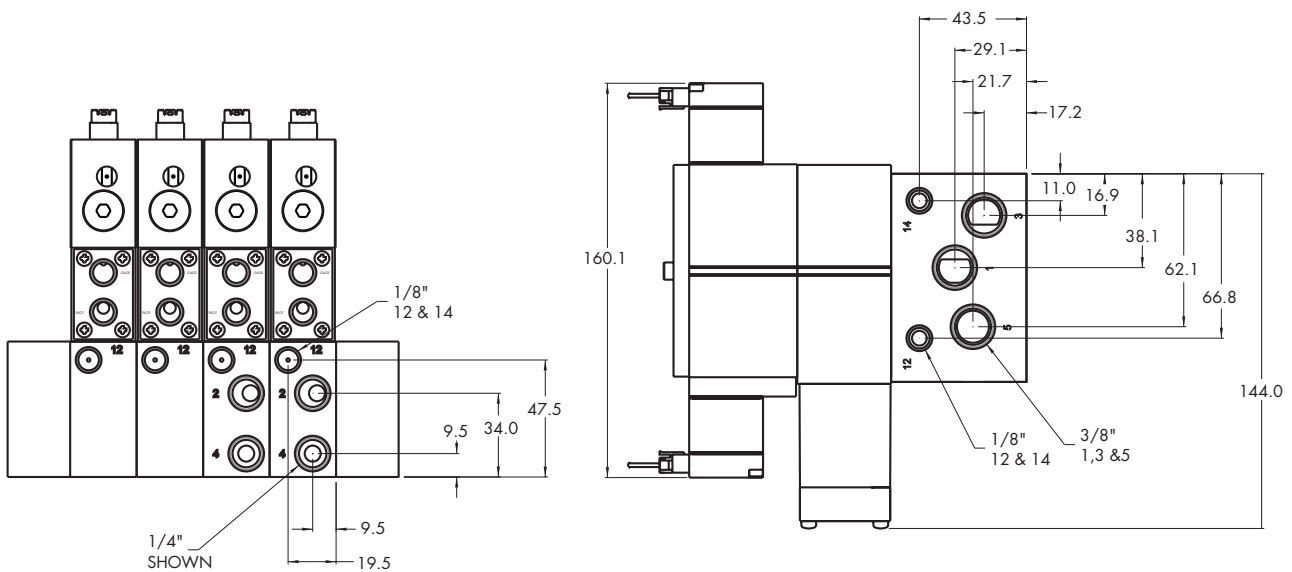
**PRP3B**

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	Higher than maximum regulated pressure
<b>Regulating range :</b>	0 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)

**DIMENSIONS**

Dimensions shown are metric (mm)



**Non plug-in sandwich pressure regulator with manual adjust**

**OPERATIONAL BENEFITS**

1. Easy mounting: saves on installation costs and space 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**

Pilot	Single pressure Regulator 12 end	Dual pressure Regulator 12 end with by-pass 14 end *	Dual pressure Regulator 14 end with by-pass 12 end *	Dual pressure Regulator both ends *
<b>Internal</b>	PRA02A-AAAA	PRA02A-ABAA	PRA02A-ADAA	PRA02A-AEAA
<b>External</b>	PRA02A-BAAA	PRA02A-BBAA	PRA02A-BDAA	PRA02A-BEAA

Above models are for manual adjust with knob  
 For other manual adjustments and pressure ranges, see Options.

Note: Add -9 after part number for regulator block assembled to valve.  
 \* To be used with dual pressure valves.

**PR93A**

**PRA01A**

**PRA02A**

**OPTIONS**

Adjustments :

PRA02A - **XXXX**

- A** Manual adjust with knob – Internal pilot
- B** Manual adjust with knob – External pilot
- G** Manual adjust with screwdriver slot – Internal pilot
- H** Manual adjust with screwdriver slot – External pilot
- K** Manual adjust with screwdriver slot with locknut– Internal pilot
- L** Manual adjust with screwdriver slot with locknut – External pilot

Regulated Pressure range :

PRA02A - **xxxx**

- A** 0 to 120 PSI
- B** 0 to 80 PSI
- C** 0 to 30 PSI
- D** 0 to 120 PSI "14" end - 0 to 80 PSI "12" end
- E** 0 to 120 PSI "12" end - 0 to 80 PSI "14" end
- F** 0 to 120 PSI "14" end - 0 to 30 PSI "12" end
- G** 0 to 120 PSI "12" end - 0 to 30 PSI "14" end
- H** 0 to 80 PSI "14" end - 0 to 30 PSI "12" end
- J** 0 to 80 PSI "12" end - 0 to 30 PSI "14" end

**PRA1A**

**PRP1A**

**PRA2D**

**PRP2B**

**PRA3C**

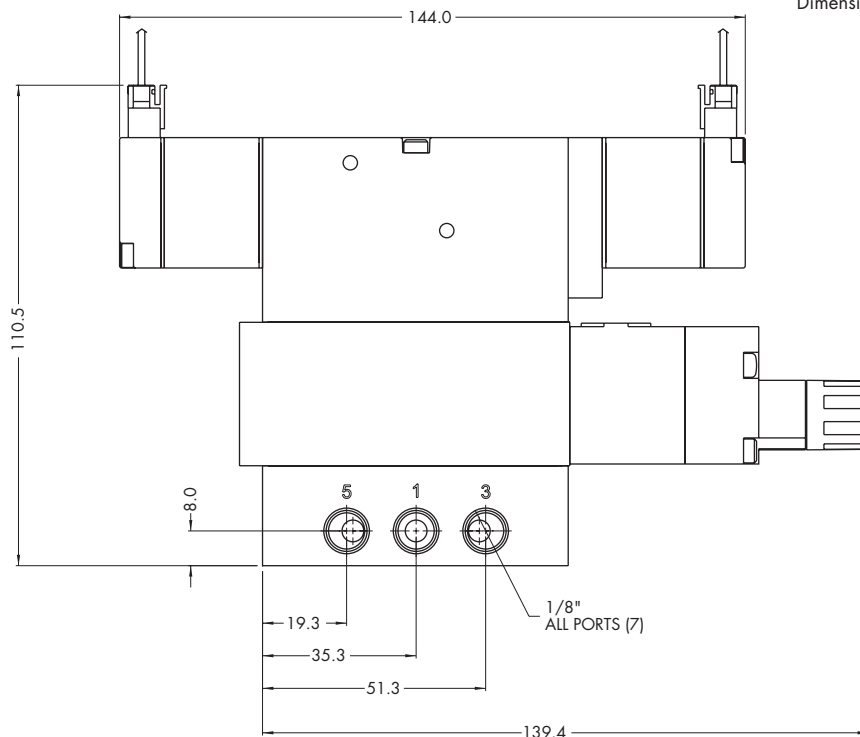
**PRP3B**

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure supply :</b>	Higher than maximum regulated pressure
<b>Regulating range :</b>	0 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)

**DIMENSIONS**

Dimensions shown are metric (mm)



**Non plug-in 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.



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-GAAA	PRA1A-GCAA	PRA1A-GBAA	PRA1A-GDAA	PRA1A-GEAA
Gage perpendicular to regulator(s)	PRA1A-GABA	PRA1A-GCBA	PRA1A-GBBA	PRA1A-GDBA	PRA1A-GECA
Gage parallel to regulator(s)	PRA1A-GADA	PRA1A-GCDA	PRA1A-GBDA	PRA1A-GDDA	PRA1A-GEEA

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-HAAA	PRA1A-HCAA	PRA1A-HBAA	PRA1A-HDAA	PRA1A-HEAA
Gage perpendicular to regulator(s)	PRA1A-HABA	PRA1A-HCBA	PRA1A-HBBA	PRA1A-HDBA	PRA1A-HECA
Gage parallel to regulator(s)	PRA1A-HADA	PRA1A-HCDA	PRA1A-HBDA	PRA1A-HDDA	PRA1A-HEEA

PRA1A  
  
PRP1A  
  
PRA2D  
  
PRP2B

\* - To be used with dual pressure valves.  
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.

**ADJUSTMENT OPTIONS**

PRA1A-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)

PRA3C  
  
PRP3B

**TECHNICAL DATA**

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

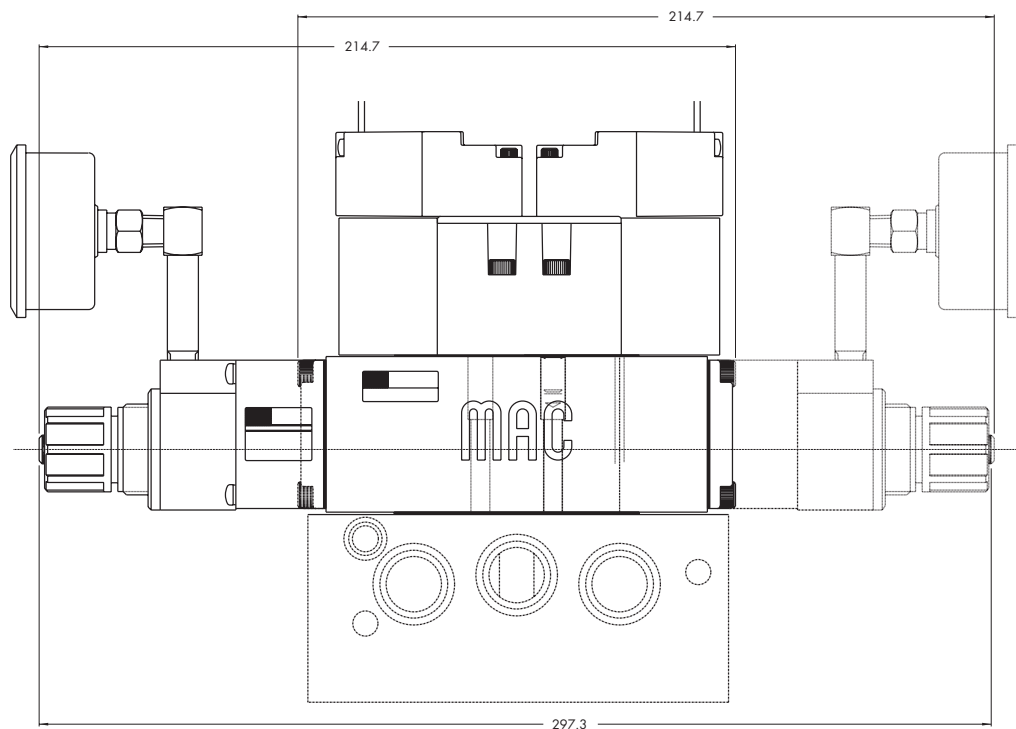
- Spare parts :
- Pressure regulator (less sandwich block) : PRA1A-JOAA (KNOB), PRA1A-COAA (SLOTTED STEM), PRA1A-M0AA (SLOTTED STEM WITH LOCKNUT).
  - Gage : N-82016-01 (0-120 PSI perpendicular)  
 N-82016-02 (0-120 PSI parallel)  
 N-82016-03 (0-80 PSI perpendicular)  
 N-82016-04 (0-80 PSI parallel)  
 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)





**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**

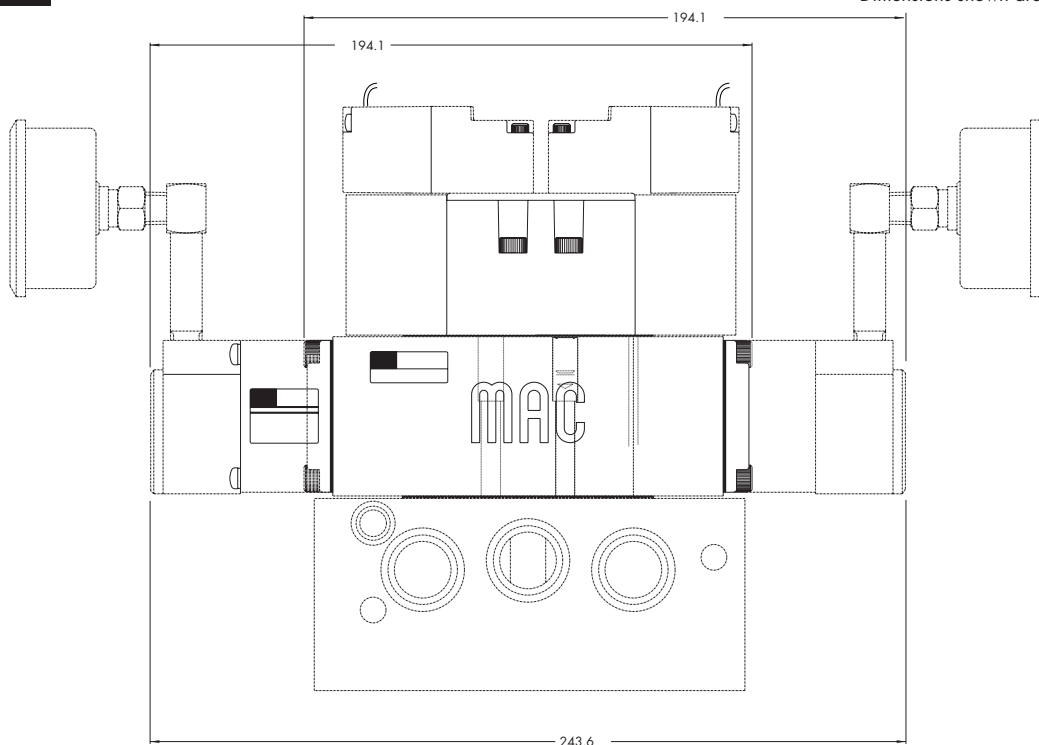
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 µ
<b>Temperature range :</b>	0°F to 120°F (-18°C to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

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 *
<b>Gage port only</b>	PRP1A-GAKA	PRP1A-GCKA	PRP1A-GBKA	PRP1A-GDKA	PRP1A-GEKA
<b>Gage perpendicular to manual operator</b>	PRP1A-GABA	PRP1A-GCBA	PRP1A-GBBA	PRP1A-GDBA	PRP1A-GECA
<b>Gage parallel to manual operator</b>	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 *
<b>No gage</b>	PRP1A-HAKA	PRP1A-HCKA	PRP1A-HBKA	PRP1A-HDKA	PRP1A-HEKA
<b>Gage perpendicular to manual operator</b>	PRP1A-HABA	PRP1A-HCBA	PRP1A-HBBA	PRP1A-HDBA	PRP1A-HECA
<b>Gage parallel to manual operator</b>	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**

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

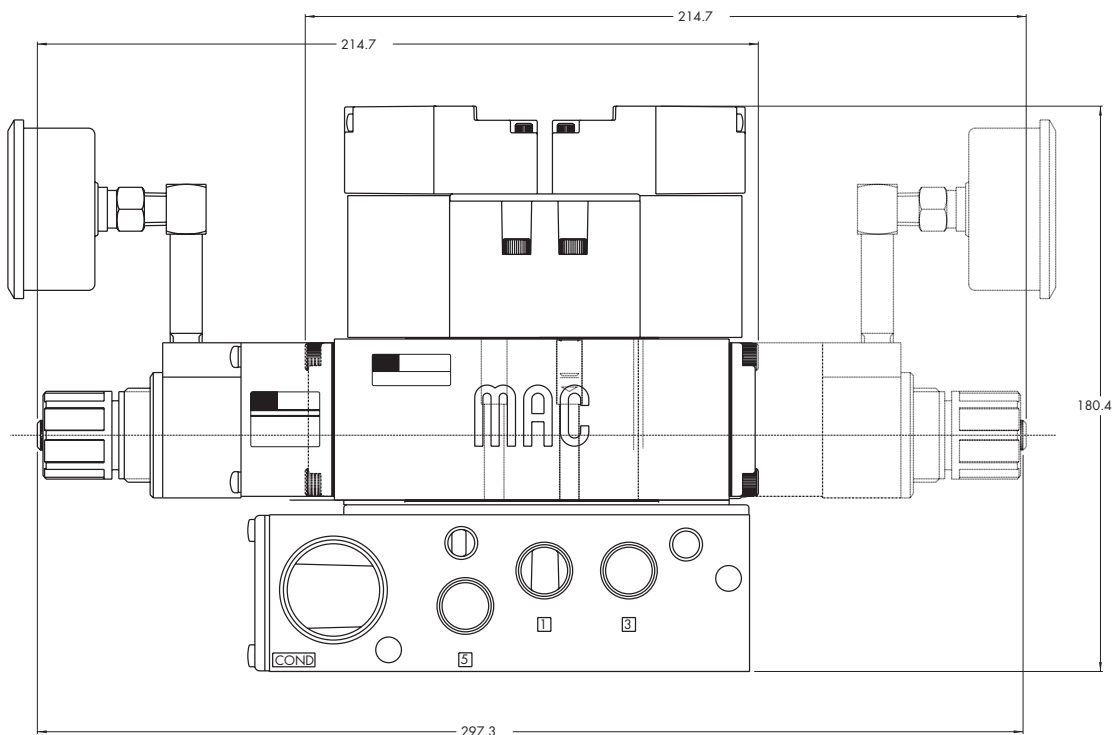
Spare parts :                   • Pressure regulator (less sandwich block) : PRP1A-JOKA (knob), PRP1A-COKA (slotted stem)  
PRP1A-MOKA (slotted stem with locknut)

Regulating range options : PRP1A-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)



**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

PR93A

PRA01A

PRA02A

PRA1A

**PRP1A**

PRA2D

PRP2B

PRA3C

PRP3B

**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

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

\* - To be used with dual pressure valves.

Notes:

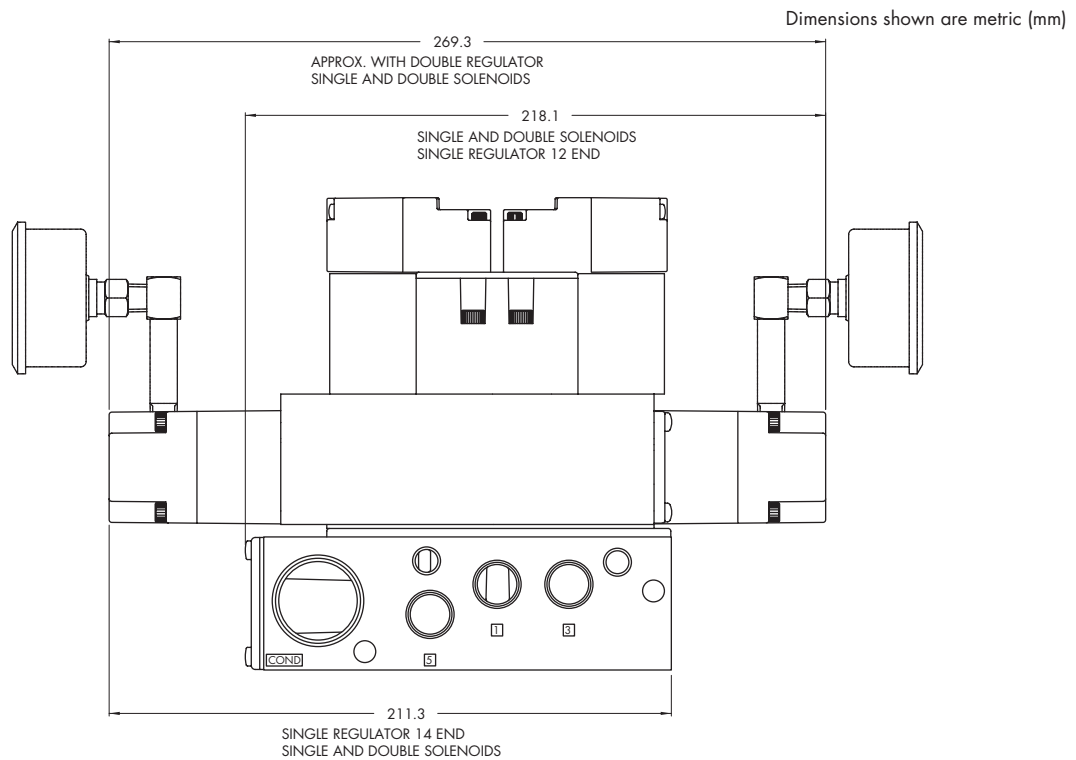
1. Valves used with above models must be external pilot models.
2. Cannot field convert regulator block from single pressure to dual pressure.
3. Cannot field convert from internal pilot to external pilot.
4. Wired for double solenoid valves.

**TECHNICAL DATA**

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

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

**DIMENSIONS**



**Non plug-in 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.



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	PRA2D-1AAA	PRA2D-1EAA	PRA2D-1BAA	PRA2D-1FAA	PRA2D-1JAA
Non-filled gage on regulator(s)	PRA2D-1ADA	PRA2D-1EDA	PRA2D-1BDA	PRA2D-1FDA	PRA2D-1JEA
Non-filled gage opposite to regulator	PRA2D-1CDA	PRA2D-1GDA	PRA2D-1DDA	PRA2D-1HDA	-----
Glycerine filled gage on regulator(s)	PRA2D-1ABA	PRA2D-1EBA	PRA2D-1BBA	PRA2D-1FBA	PRA2D-1JCA
Glycerine filled gage opposite to regulator	PRA2D-1CBA	PRA2D-1GBA	PRA2D-1DBA	PRA2D-1HBA	-----

PR93A  
  
PRA01A  
PRA02A  
  
PRA1A

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	PRA2D-2AAA	PRA2D-2EAA	PRA2D-2BAA	PRA2D-2FAA	PRA2D-2JAA
Non-filled gage on regulator(s)	PRA2D-2ADA	PRA2D-2EDA	PRA2D-2BDA	PRA2D-2FDA	PRA2D-2JEA
Non-filled gage opposite to regulator	PRA2D-2CDA	PRA2D-2GDA	PRA2D-2DDA	PRA2D-2HDA	-----
Glycerine filled gage on regulator(s)	PRA2D-2ABA	PRA2D-2EBA	PRA2D-2BBA	PRA2D-2FBA	PRA2D-2JCA
Glycerine filled gage opposite to regulator	PRA2D-2CBA	PRA2D-2GBA	PRA2D-2DBA	PRA2D-2HBA	-----

PRP1A  
  
PRA2D  
  
PRP2B  
  
PRA3C  
  
PRP3B

\* - To be used with dual pressure valves.  
Note : regulating range for above models is 0-150 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 #19177.

**ADJUSTMENT OPTIONS**

PRA2D-xxxx

- A** for slotted stem adjustment (internal pilot)
- B** for slotted stem adjustment (external pilot)
- D** for slotted stem with locknut (internal pilot)
- E** for slotted stem with locknut (external pilot)

**TECHNICAL DATA**

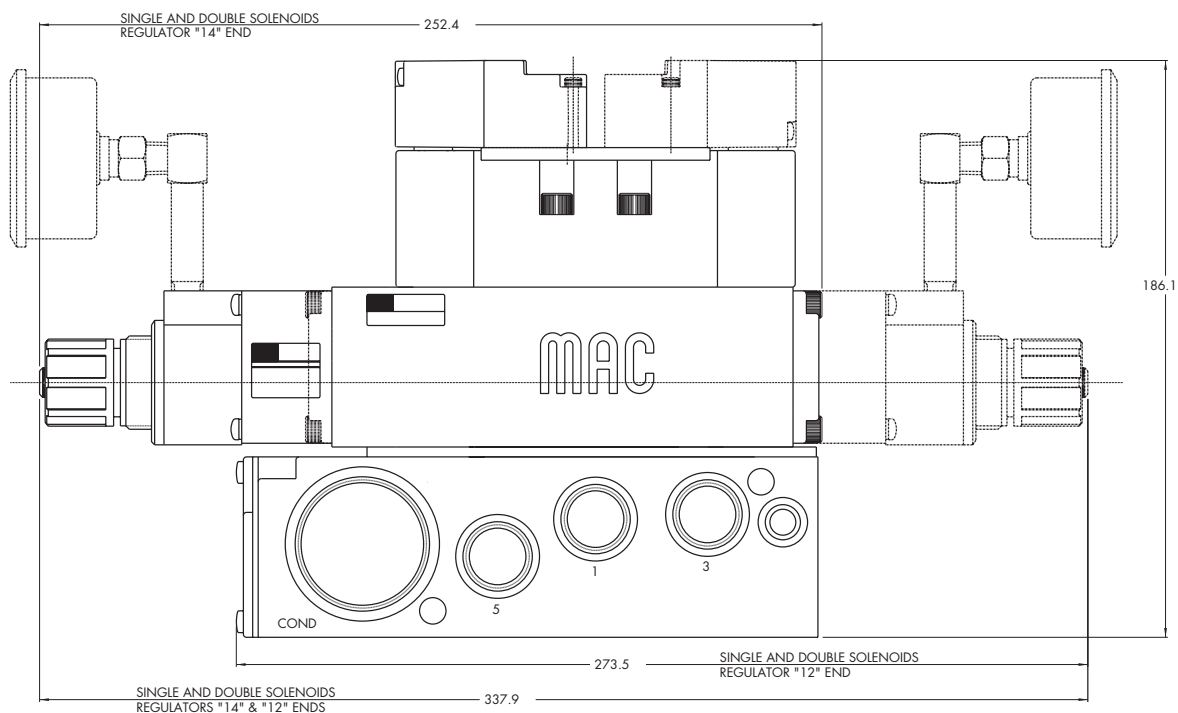
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	2.3 C <sub>v</sub>

Spare parts :   
 • Pressure regulator (less sandwich block) : PRA2D-30AA (KNOB), PRA2D-C0AA (SLOTTED STEM), PRA2D-F0AA (SLOTTED STEM WITH LOCKNUT).  
 • Gage : • Glycerine filled : N-62015-01  
 • Non filled : N-62016-01

Regulating range options : PRA2D-XXXX  
 Replace by B - 0 to 100 PSI  
 Replace by C - 0 to 45 PSI

**DIMENSIONS**

Dimensions shown are metric (mm)

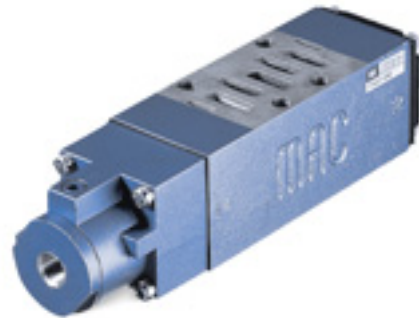




**Non plug-in sandwich pressure regulator with air pilot adjust**

**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	PRA2D-4AAA	PRA2D-4EAA	PRA2D-4BAA	PRA2D-4FAA	PRA2D-4JAA
Non-filled gage on regulator(s)	PRA2D-4ADA	PRA2D-4EDA	PRA2D-4BDA	PRA2D-4FDA	PRA2D-4JEA
Non-filled gage opposite to regulator	PRA2D-4CDA	PRA2D-4GDA	PRA2D-4DDA	PRA2D-4HDA	----
Glycerine filled gage on regulator(s)	PRA2D-4ABA	PRA2D-4EBA	PRA2D-4BBA	PRA2D-4FBA	PRA2D-4JCA
Glycerine filled gage opposite to regulator	PRA2D-4CBA	PRA2D-4GBA	PRA2D-4DBA	PRA2D-4HBA	----

PR93A  
  
PRA01A  
PRA02A  
  
PRA1A

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	PRA2D-5AAA	PRA2D-5EAA	PRA2D-5BAA	PRA2D-5FAA	PRA2D-5JAA
Non-filled gage on regulator(s)	PRA2D-5ADA	PRA2D-5EDA	PRA2D-5BDA	PRA2D-5FDA	PRA2D-5JEA
Non-filled gage opposite to regulator	PRA2D-5CDA	PRA2D-5GDA	PRA2D-5DDA	PRA2D-5HDA	----
Glycerine filled gage on regulator(s)	PRA2D-5ABA	PRA2D-5EBA	PRA2D-5BBA	PRA2D-5FBA	PRA2D-5JCA
Glycerine filled gage opposite to regulator	PRA2D-5CBA	PRA2D-5GBA	PRA2D-5DBA	PRA2D-5HBA	----

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 #19177.

**TECHNICAL DATA**

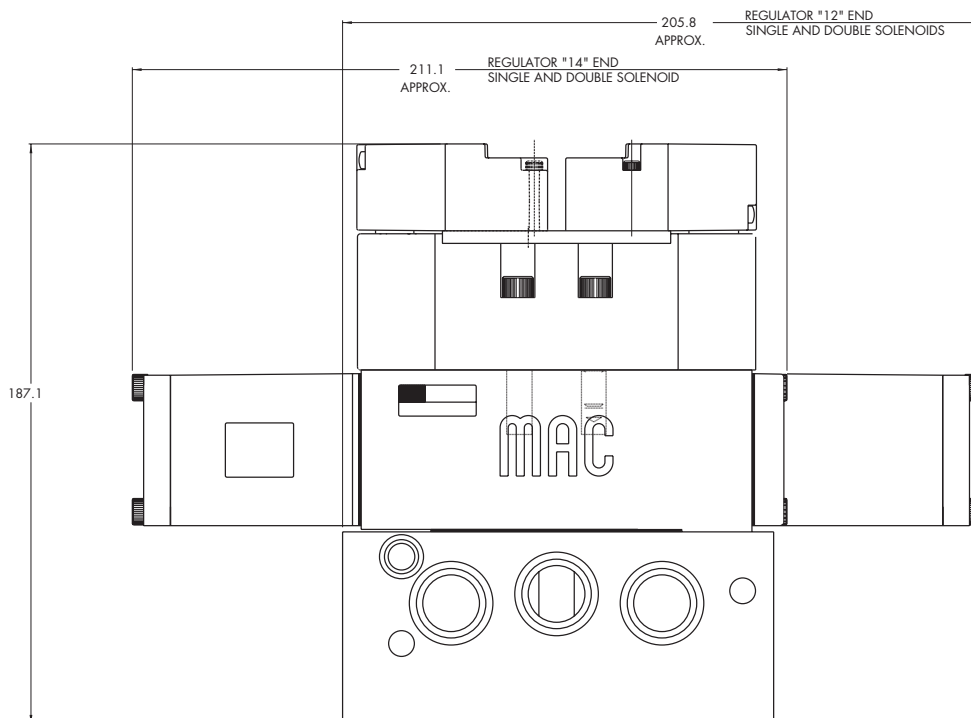
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	2.3 C <sub>v</sub>

Spare parts :

- Pressure regulator (less sandwich block) : PRA2D-60AA.
- Gage : • Glycerine filled : N-62015-01  
• Non filled : N-62016-01

**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 *
No gage	PRP2B-AAAA	PRP2B-AEAA	PRP2B-ABAA	PRP2B-AFAA	PRP2B-AJAA
Glycerine gage	PRP2B-AABA	PRP2B-AEBA	PRP2B-ABBA	PRP2B-AFBA	PRP2B-AJCA
Non-filled gage	PRP2B-AADA	PRP2B-AEDA	PRP2B-ABDA	PRP2B-AFDA	PRP2B-AJEA

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	PRP2B-BAAA	PRP2B-BEAA	PRP2B-BBAA	PRP2B-BFAA	PRP2B-BJAA
Glycerine gage	PRP2B-BABA	PRP2B-BEBA	PRP2B-BBBA	PRP2B-BFBA	PRP2B-BJCA
Non-filled gage	PRP2B-BADA	PRP2B-BEDA	PRP2B-BBDA	PRP2B-BFDA	PRP2B-BJEA

PRA1A  
PRP1A  
PRA2D

**PRP2B**

\* For use with dual pressure valves.

Note: Regulating range for above models is 0-150 PSI. For other ranges, see technical data page.

**ADJUSTMENT OPTIONS**

PRP2B-XXXX

- G** for slotted stem (internal pilot)
- H** for slotted stem (external pilot)
- K** for slotted stem with locknut (internal pilot)
- L** for slotted stem with locknut (external pilot)

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**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	3.1 C <sub>v</sub>

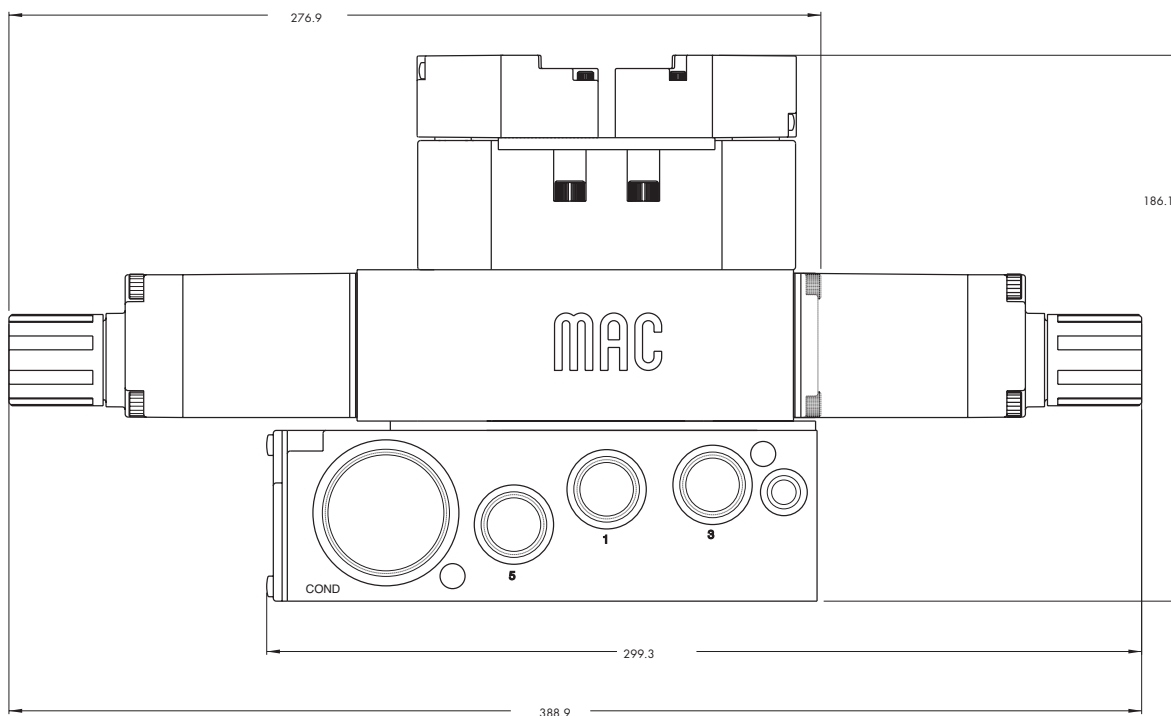
Spare parts :

- Pressure regulator (less sandwich block) : PRP2B-COAA (knob), PRP2B-JOAA (slotted stem), PRP2B-MOAA (slotted stem with locknut)
- Regulator block to base mounting screw: 19177
- Regulating range option: PRP2B-xxxA

Replace by B for 0 to 100 PSI  
Replace by C for 0 to 45 PSI

**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 *
No gage	PRP2B-DAAA	PRP2B-DEAA	PRP2B-DBAA	PRP2B-DFAA	PRP2B-DJAA
Glycerine gage	PRP2B-DABA	PRP2B-DEBA	PRP2B-DBBA	PRP2B-DFBA	PRP2B-DJCA
Non-filled gage	PRP2B-DADA	PRP2B-DEDA	PRP2B-DBDA	PRP2B-DFDA	PRP2B-DJEA

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 *
No gage	PRP2B-EAAA	PRP2B-EEAA	PRP2B-EBAA	PRP2B-EFAA	PRP2B-EJAA
Glycerine gage	PRP2B-EABA	PRP2B-EEBA	PRP2B-EBBA	PRP2B-EFBA	PRP2B-EJCA
Non-filled gage	PRP2B-EADA	PRP2B-EEDA	PRP2B-EBDA	PRP2B-EFDA	PRP2B-EJEA

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**

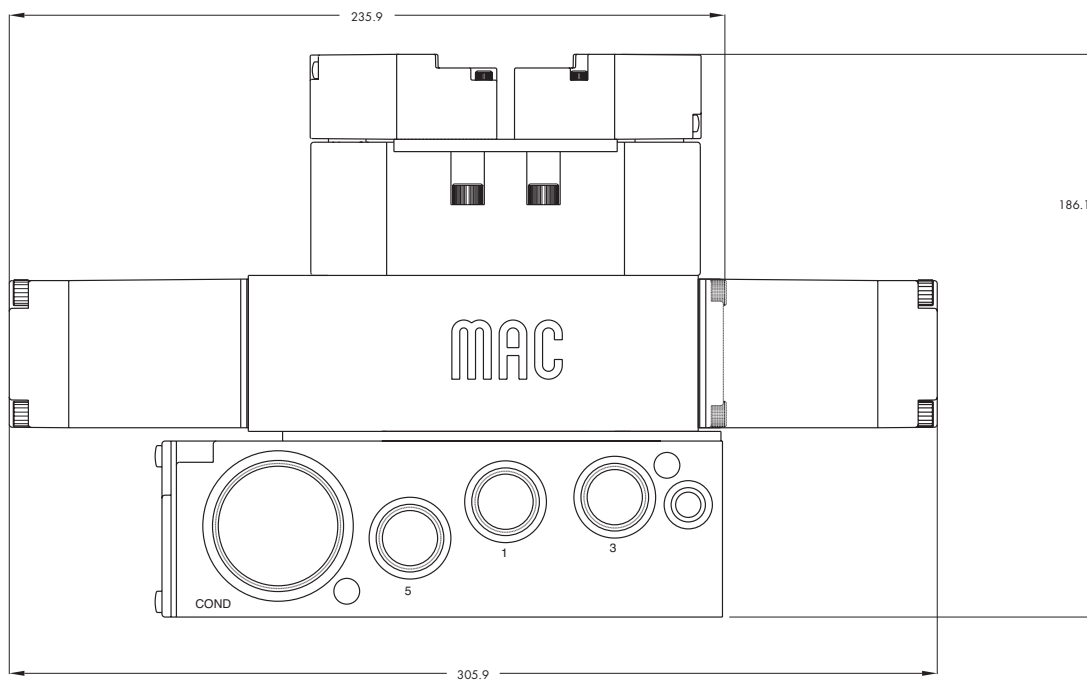
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	3.1 C <sub>v</sub>

Spare parts :

- Pressure regulator (less sandwich block): PRP2B-F0AA
- Body/block to base mounting screw: 19177

**DIMENSIONS**

Dimensions shown are metric (mm)



**Non plug-in 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.



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	PRA3C-1AAA	PRA3C-1EAA	PRA3C-1BAA	PRA3C-1FAA	PRA3C-1JAA
Non-filled gage on regulator(s)	PRA3C-1ADA	PRA3C-1EDA	PRA3C-1BDA	PRA3C-1FDA	PRA3C-1JEA
Non-filled gage opposite to regulator	PRA3C-1CDA	PRA3C-1GDA	PRA3C-1DDA	PRA3C-1HDA	-----
Glycerine filled gage on regulator(s)	PRA3C-1ABA	PRA3C-1EBA	PRA3C-1BBA	PRA3C-1FBA	PRA3C-1JCA
Glycerine filled gage opposite to regulator	PRA3C-1CBA	PRA3C-1GBA	PRA3C-1DBA	PRA3C-1HBA	-----

PR93A  
  
PRA01A  
PRA02A  
  
PRA1A

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	PRA3C-2AAA	PRA3C-2EAA	PRA3C-2BAA	PRA3C-2FAA	PRA3C-2JAA
Non-filled gage on regulator(s)	PRA3C-2ADA	PRA3C-2EDA	PRA3C-2BDA	PRA3C-2FDA	PRA3C-2JEA
Non-filled gage opposite to regulator	PRA3C-2CDA	PRA3C-2GDA	PRA3C-2DDA	PRA3C-2HDA	-----
Glycerine filled gage on regulator(s)	PRA3C-2ABA	PRA3C-2EBA	PRA3C-2BBA	PRA3C-2FBA	PRA3C-2JCA
Glycerine filled gage opposite to regulator	PRA3C-2CBA	PRA3C-2GBA	PRA3C-2DBA	PRA3C-2HBA	-----

PRP1A  
  
PRA2D  
  
PRP2B

\* - To be used with dual pressure valves.  
Note : regulating range for above models is 0-150 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 #35418.

**ADJUSTMENT OPTIONS**

PRA3C-xxxx

- A for slotted stem adjustment (internal pilot)
- B for slotted stem adjustment (external pilot)
- D for slotted stem with locknut (internal pilot)
- E for slotted stem with locknut (external pilot)

PRA3C  
  
PRP3B

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	5.4 C <sub>v</sub>

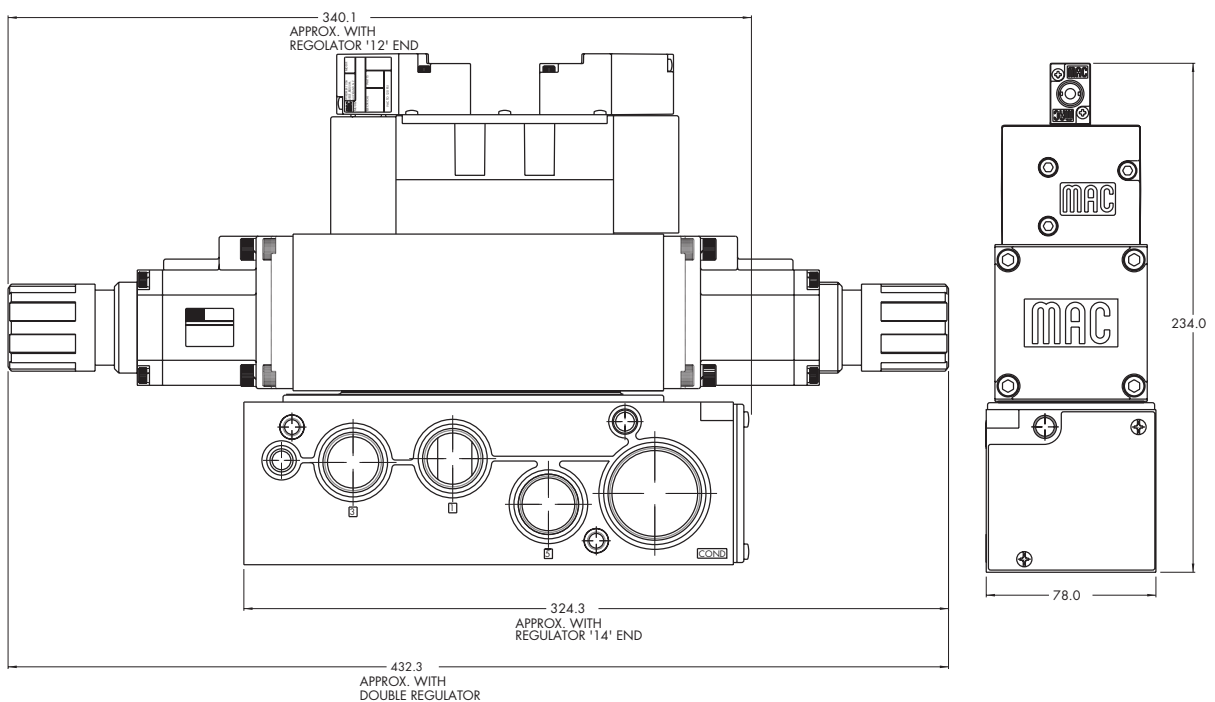
Spare parts :   
 • Pressure regulator (less sandwich block) : PRA3C-30AA (KNOB), PRA3C-C0AA (SLOTTED STEM), PRA3C-F0AA (SLOTTED STEM WITH LOCKNUT).  
 • Gage : • Glycerine filled : N-62015-01  
 • Non filled : N-62016-01

Regulating range options : PRA3C-XXXX

- Replace by B - 0 to 100 PSI
- Replace by C - 0 to 45 PSI

**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	PRA3C-4AAA	PRA3C-4EAA	PRA3C-4BAA	PRA3C-4FAA	PRA3C-4JAA
Non-filled gage on regulator(s)	PRA3C-4ADA	PRA3C-4EDA	PRA3C-4BDA	PRA3C-4FDA	PRA3C-4JEA
Non-filled gage opposite to regulator	PRA3C-4CDA	PRA3C-4GDA	PRA3C-4DDA	PRA3C-4HDA	-----
Glycerine filled gage on regulator(s)	PRA3C-4ABA	PRA3C-4EBA	PRA3C-4BBA	PRA3C-4FBA	PRA3C-4JCA
Glycerine filled gage opposite to regulator	PRA3C-4CBA	PRA3C-4GBA	PRA3C-4DBA	PRA3C-4HBA	-----

PR93A  
  
PRA01A  
PRA02A  
  
PRA1A

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	PRA3C-5AAA	PRA3C-5EAA	PRA3C-5BAA	PRA3C-5FAA	PRA3C-5JAA
Non-filled gage on regulator(s)	PRA3C-5ADA	PRA3C-5EDA	PRA3C-5BDA	PRA3C-5FDA	PRA3C-5JEA
Non-filled gage opposite to regulator	PRA3C-5CDA	PRA3C-5GDA	PRA3C-5DDA	PRA3C-5HDA	-----
Glycerine filled gage on regulator(s)	PRA3C-5ABA	PRA3C-5EBA	PRA3C-5BBA	PRA3C-5FBA	PRA3C-5JCA
Glycerine filled gage opposite to regulator	PRA3C-5CBA	PRA3C-5GBA	PRA3C-5DBA	PRA3C-5HBA	-----

PRP1A  
  
PRA2D  
  
PRP2B

\* - 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 #35418.

PRA3C  
  
PRP3B

**TECHNICAL DATA**

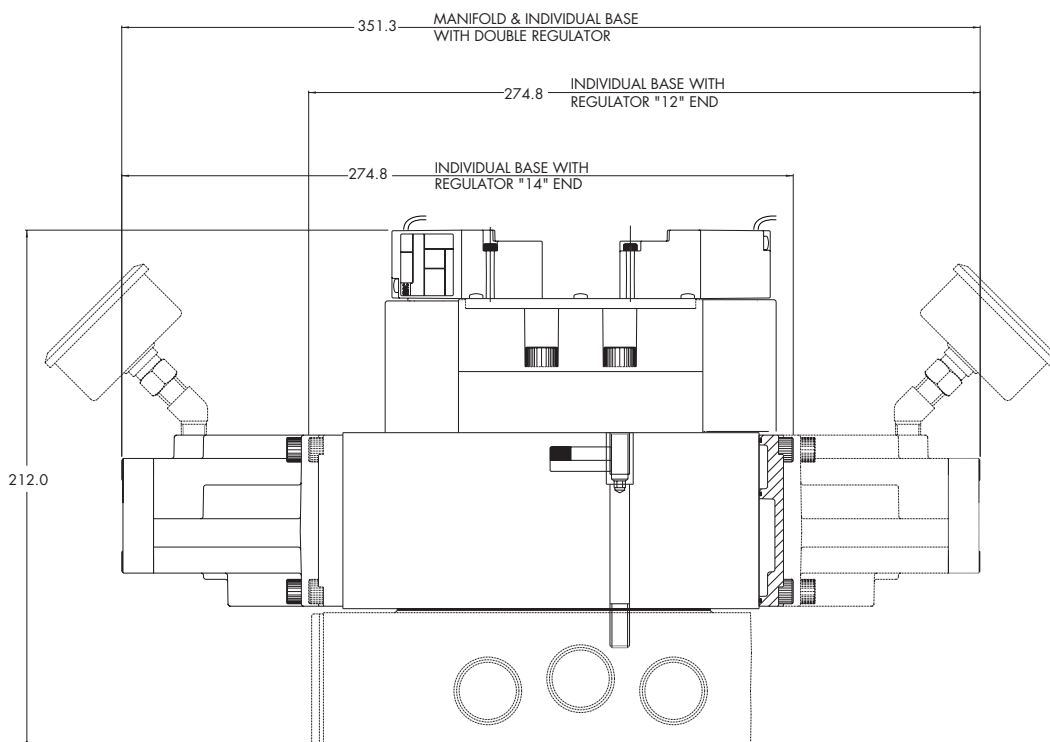
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	5.4 C <sub>v</sub>

Spare parts :

- Pressure regulator (less sandwich block) : PRA3C-60AA.
- Gage : • Glycerine filled : N-62015-01  
• Non filled : N-62016-01

**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 *
No gage	PRP3B-AAAA	PRP3B-AEAA	PRP3B-ABAA	PRP3B-AFAA	PRP3B-AJAA
Glycerine gage	PRP3B-AABA	PRP3B-AEBA	PRP3B-ABBA	PRP3B-AFBA	PRP3B-AJCA
Non-filled gage	PRP3B-AADA	PRP3B-AEDA	PRP3B-ABDA	PRP3B-AFDA	PRP3B-AJEA

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	PRP3B-BAAA	PRP3B-BEAA	PRP3B-BBAA	PRP3B-BFAA	PRP3B-BJAA
Glycerine gage	PRP3B-BABA	PRP3B-BEBA	PRP3B-BBBA	PRP3B-BFBA	PRP3B-BJCA
Non-filled gage	PRP3B-BADA	PRP3B-BEDA	PRP3B-BBDA	PRP3B-BFDA	PRP3B-BJEA

PRA1A  
PRP1A  
PRA2D  
PRP2B

\* For use with dual pressure valves.

**ADJUSTMENT OPTIONS**

PRP3B-xxxx

- G** for slotted stem (internal pilot)
- H** for slotted stem (external pilot)
- K** for slotted stem with locknut (internal pilot)
- L** for slotted stem with locknut (external pilot)

Notes:

1. Regulating range for above models is 0-150 PSI. For other ranges, see technical data page.
2. Valves used with above models must be external pilot models.
3. Cannot field convert regulator block from single pressure to dual pressure.
4. Cannot field convert from internal pilot to external pilot.
5. Wired for double solenoid valves.

PRA3C  
**PRP3B**

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	5.4 C <sub>v</sub>

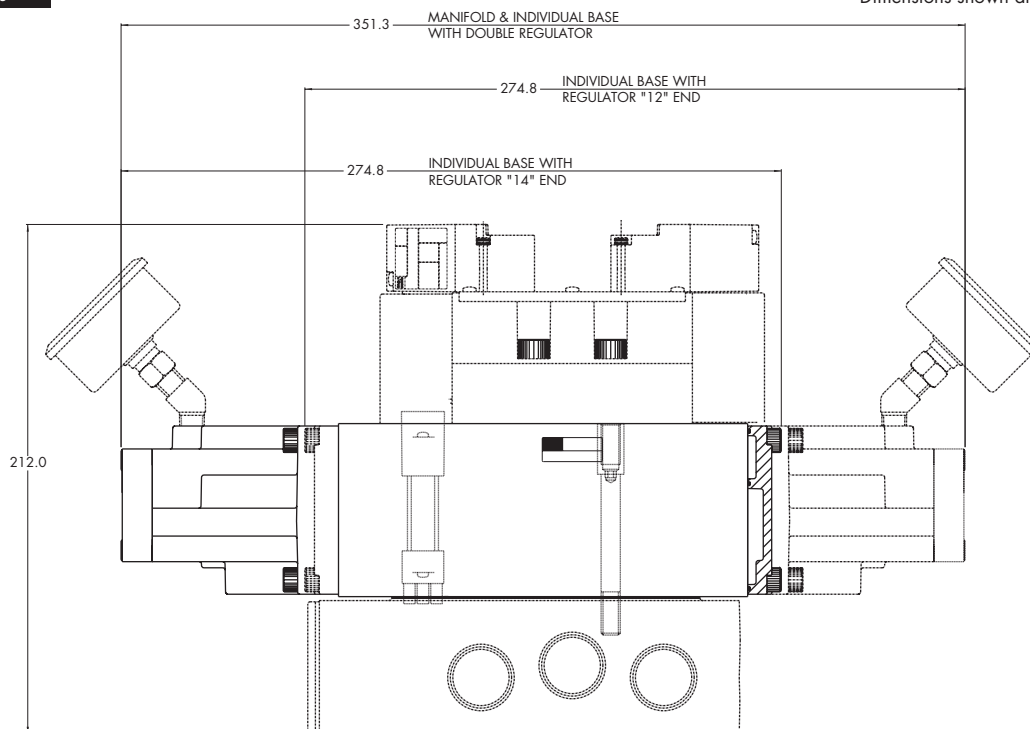
Spare parts :

- Pressure regulator (less sandwich block): PRP3B-C0AA (knob), PRP3B-J0AA (slotted stem), PRP3B-M0AA (slotted stem with locknut)
- Regulating block to base mounting screw: 19457
- Regulating range options: PRP3B-xxxA

— Replace by B for 0 to 100 PSI  
— Replace by C for 0 to 45 PSI

**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 *
No gage	PRP3B-DAAA	PRP3B-DEAA	PRP3B-DBAA	PRP3B-DFAA	PRP3B-DJAA
Glycerine gage	PRP3B-DABA	PRP3B-DEBA	PRP3B-DBBA	PRP3B-DFBA	PRP3B-DJCA
Non-filled gage	PRP3B-DADA	PRP3B-DEDA	PRP3B-DBDA	PRP3B-DFDA	PRP3B-DJEA

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 *
No gage	PRP3B-EAAA	PRP3B-EEAA	PRP3B-EBAA	PRP3B-EFAA	PRP3B-EJAA
Glycerine gage	PRP3B-EABA	PRP3B-EEBA	PRP3B-EBBA	PRP3B-EFBA	PRP3B-EJCA
Non-filled gage	PRP3B-EADA	PRP3B-EEDA	PRP3B-EBDA	PRP3B-EFDA	PRP3B-EJEA

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**

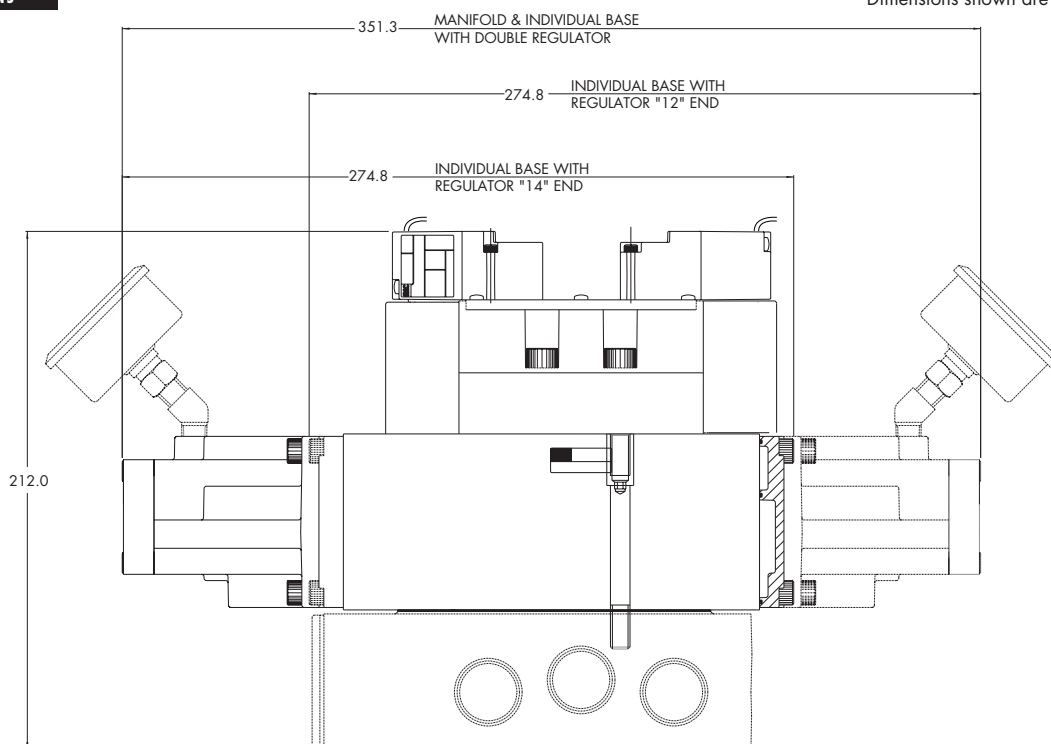
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to +50°C)
<b>Flow :</b>	5.4 C <sub>v</sub>

- Spare parts :
- Pressure regulator (less sandwich block): PRP3B-F0AA
  - Regulator block to base mounting screw: 19457

**DIMENSIONS**

Dimensions shown are metric (mm)





## Section 5

## Intrinsically Safe Valves

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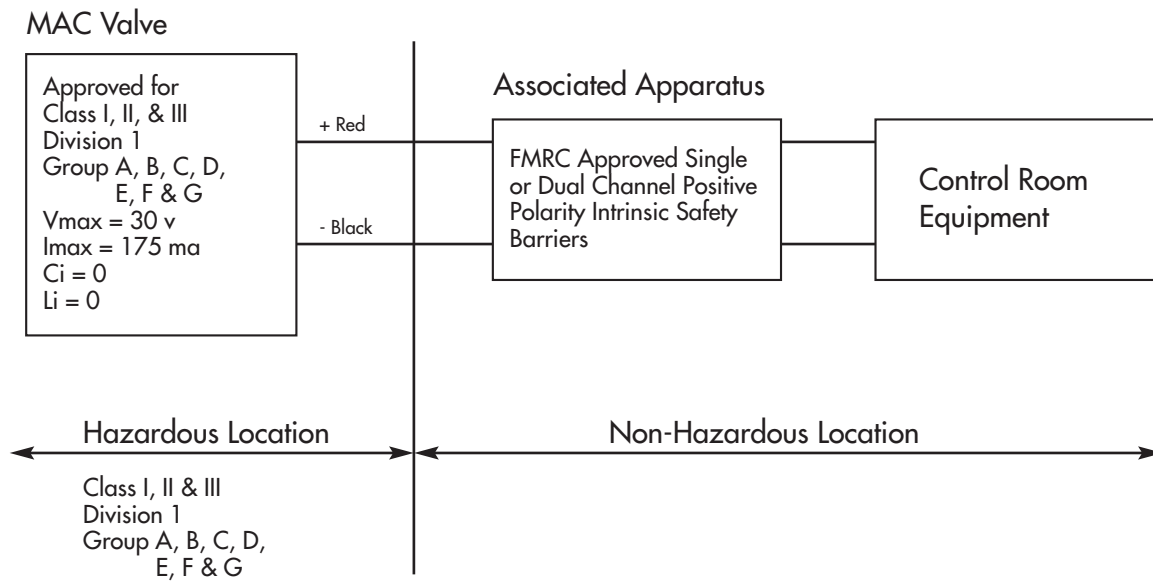


	Page
Specifications for Intrinsically Safe Valves	301
52 series	304
400 series	304
92 series	305



## INTRINSICALLY SAFE CIRCUIT

In order to use an intrinsically safe valve in a hazardous location, the installation must be in accordance with the following installation diagram :



There are 3 basic parts to an intrinsically safe circuit :

### 1. FIELD DEVICE

This is defined as the device that will be used in the hazardous location. In this case, the field device will be the intrinsically safe valve.

### 2. ASSOCIATED APPARATUS

This will be an energy limiting device also known as a barrier.

### 3. FIELD WIRING

Wiring used to connect the two above devices.

When the MAC intrinsically safe valves were tested for approval, they were tested and approved for the following atmospheres.

Class I, II, III  
Division 1  
Groups ; A, B, C, D, E, F, G

under the following parameters :

Vmax : 30 VDC  
Imax : 175 ma  
Ci : 0  
Li : 0



---

What this means is that the intrinsically safe valves were tested against each atmosphere with up to 30 VDC and 175 ma of current across the solenoid and found to still be safe. The other two parameters are values to indicate how much energy can be stored or created by the valve :

Ci : Internal capacitance of the solenoid.

This indicates how much energy the solenoid is capable of storing.

Li : Internal inductance of the solenoid.

This indicates the solenoid's ability to create or increase energy beyond what is supplied.

When applying an intrinsically safe valve in a hazardous location, a proper barrier must first be selected. The barrier selection process must first take into account the parameters the valve was approved for and compared in the following way :

- Vmax must be greater than or equal to Voc of the barrier.  
Voc = Voltage open circuit or maximum allowed out of the barrier
- Imax must be greater than or equal to Isc of the barrier.  
Isc = Current short circuit or the maximum current allowed out of the barrier
- Ci plus field wiring must be less than Ca of the barrier.  
Ca = Allowed capacitance
- Li plus field wiring must be less than La of the barrier.  
La = Allowed inductance

When properly combined, the barrier will never allow more energy to the intrinsically safe valve than what it was tested and approved for.

The following page can be used as your guide to help ask the right questions when working with an intrinsically safe circuit. Also included is a partial list of intrinsically safe barriers that have been tested with the MAC intrinsically safe valves.



**Approval :** Factory Mutual Research 2X7A8.AX (3610)

Approved as intrinsically safe apparatus and associated apparatus for use in Class I, II, III - Division 1, Group : A, B, C, D, E, F & G.

**Parameters :** Vmax : 30 VDC

I<sub>max</sub> : 175 ma

C<sub>i</sub> : 0

L<sub>i</sub> : 0

Operating voltage greater than 11.5 volts

Coil resistance : Approximately 250 ohms

Current draw : 50 ma

Wattage : 0.6 watts

**Circuit Check Lists :**

- Is V<sub>max</sub> greater than or equal to V<sub>oc</sub> ?
- Is I<sub>max</sub> greater than or equal to I<sub>sc</sub> ?
- Is C<sub>i</sub> less than C<sub>a</sub> ?
- Is L<sub>i</sub> less than L<sub>a</sub> ?
- Is the barrier capable of handing 50 ma draw ?
- Is the internal resistance of the barrier 250 ohms or less ?

If all answers to the above questions are “yes” the barrier may be a good choice in combination with the MAC intrinsically safe valve.

To calculate voltage across the solenoid, plug values into the following equations :

$$I_{TOTAL} = \frac{\text{SUPPLY VOLTAGE}}{250 + \text{BARRIER RESISTANCE}} = \text{_____} \leftarrow \text{Plug } I_{TOTAL} \text{ in below}$$

$$\text{Voltage at Solenoid} = I_{TOTAL} \times 250 \text{ ohms} = \text{_____} \text{ volts}$$

Manufacturer	Model #	Barrier Res.	Voltage w/o Light	Voltage w/Light	Groups	Type
Turck	MK72-S01-EX		11.2 v	10.2 v*	A-G	T.I.B.
Crouse-Hinds	SB19140-M2410		13.2 v	12.6 v	C-G	Zener
IMO Industries (Gems Sensors)	114072	234 OHMS	12.0 v	11.4 v	C-G	Zener
Pepperl & Fuchs	KHZ-922/EX-1	270 OHMS	11.6 v	11.06 v	A-G	Zener
	KHZ-922/EX-2	270 OHMS	11.6 v	11.06 v	A-G	Zener
	KHZ-922/EX-3	270 OHMS	11.6 v	11.06 v	A-G	Zener
Stahl	9001/01-280-165-10		13.5 v	12.9 v	C-G	Zener
	9351/10-14-10	80 OHMS	13.7 v	13.4 v	A-G	T.I.B.
Ronan	X57-229P	200 OHMS	12.7 v	12.05 v	C-G	Zener
Measurement Technology	MTL728P+	250 OHMS	11.9 v	11.4 v	A-G	Zener
	MTL3022		15.0 v	14.5 v	C-G	T.I.B.

Above data is based on a 24 v DC supply voltage to the input of the barrier. A 12 v DC, 243 OHM, .6 watt intrinsically safe solenoid is used. The measurement with light is an LED with a current limiting resistor.

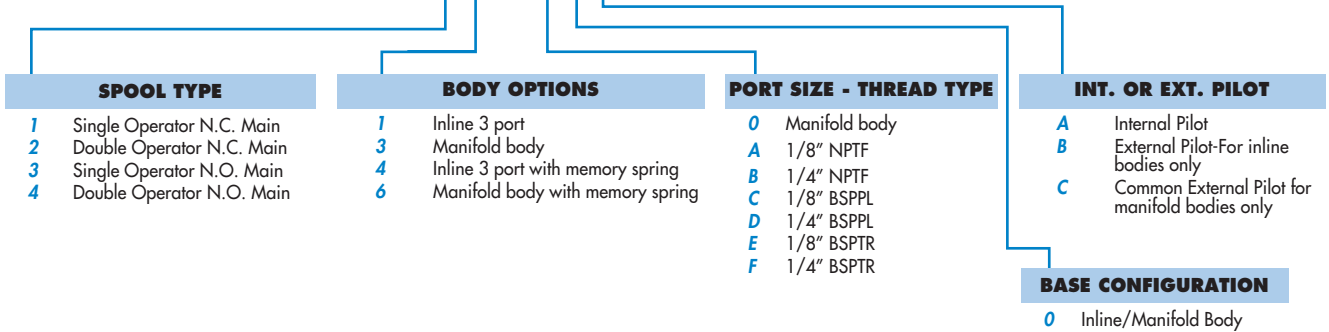
Groups indicate what atmosphere the barrier has been approved for. All MAC intrinsically safe valves have been approved for Class I, II and III, Division 1, Groups A, B, C, D, E, F and G indoor hazardous locations.

T.I.B. = Transformer Isolated Barrier

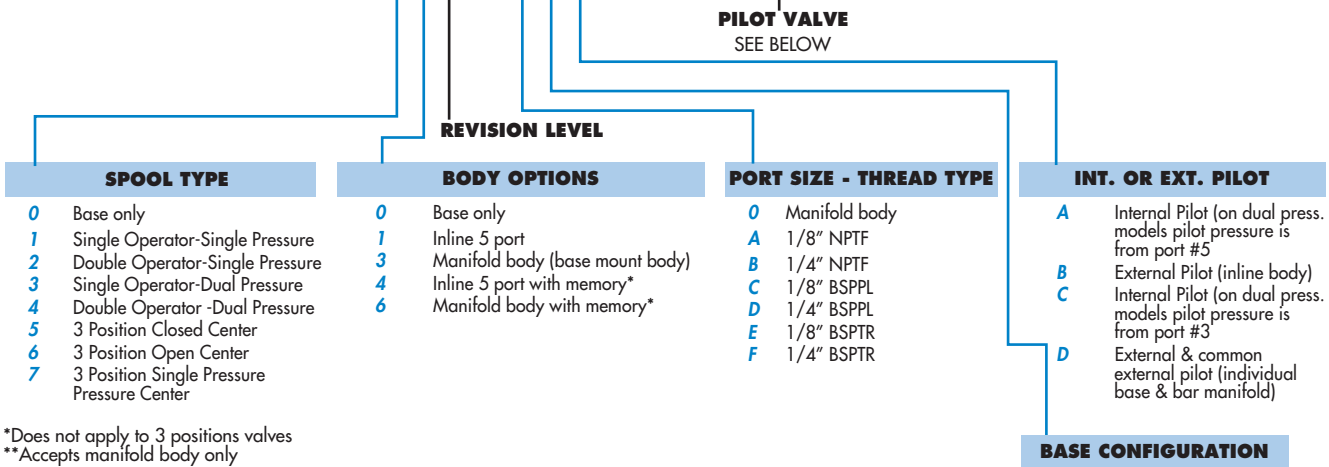
\* = Not a recommended combination

HOW TO ORDER

52A - XX - XXX - (XX - DXXX - XXX) SEE BELOW



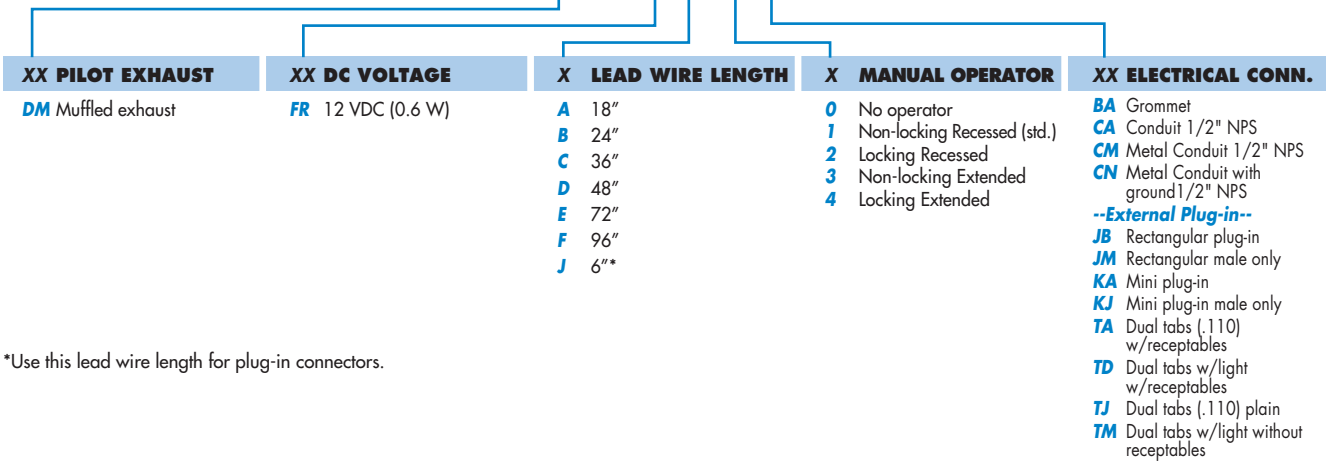
4XXA - XXX - XX - DXXX - XXX



\*Does not apply to 3 positions valves  
\*\*Accepts manifold body only

SOLENOID PILOT VALVE OPTIONS

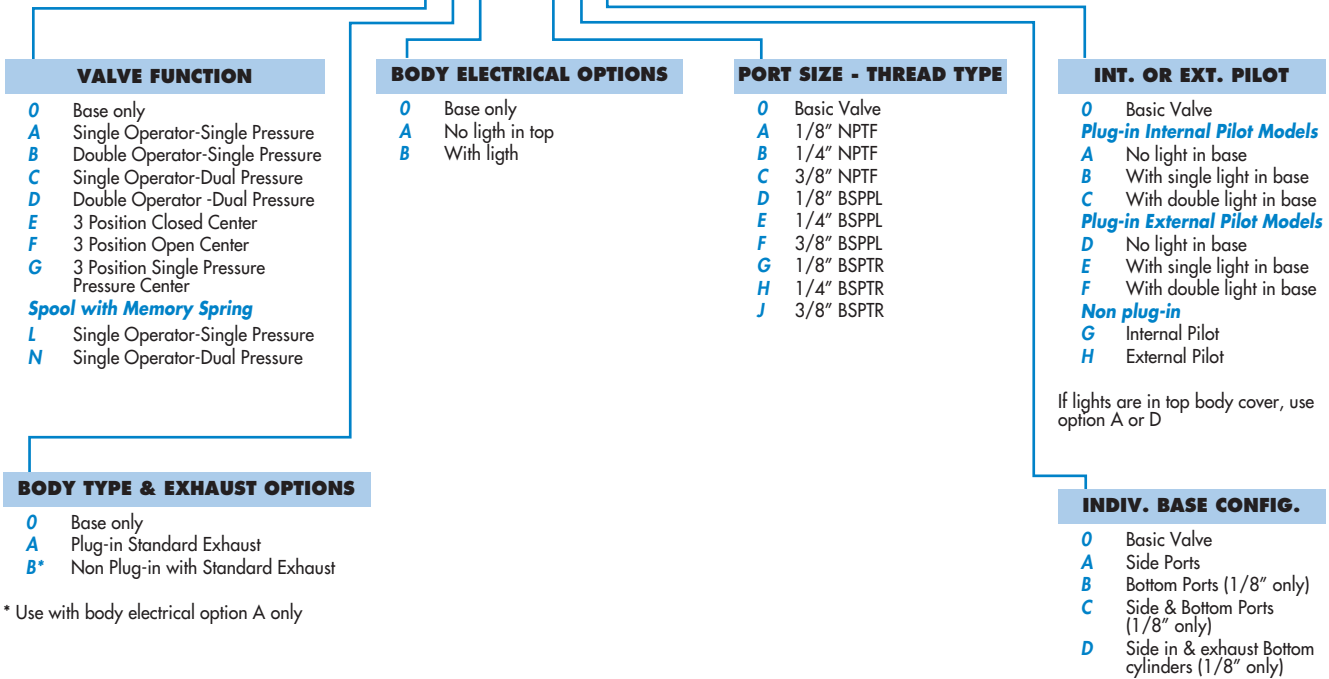
XX - DXXX - XXX



\*Use this lead wire length for plug-in connectors.

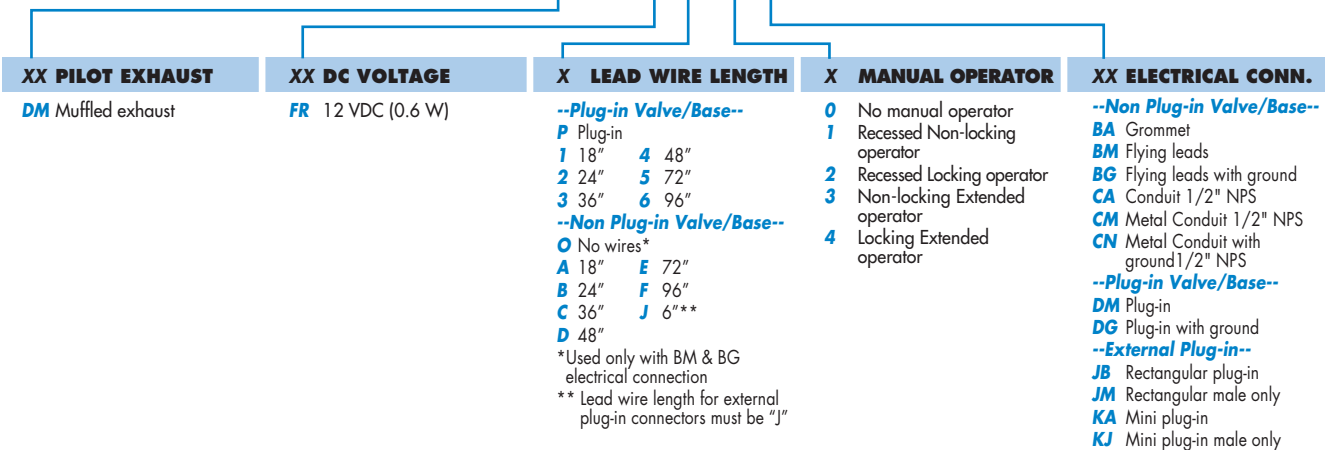
**HOW TO ORDER**

**92B - XXX - XXX - (XX - DXXX - XXX)** SEE BELOW



**PILOT VALVE OPTIONS**

**XX - DXXX - XXX**



**HOW TO ORDER 92 SERIES FLOW CONTROL MODULE\***

FC 92C-AA	Plug-in flow control assembly single solenoid
FC 92C-BA	Plug-in flow control assembly double solenoid
FC 92C-CA	Non plug-in flow control assembly

\*If flow control module is to be installed between valve and base or valve and manifold at the factory, add -9 after the flow control model number, i.e., FC92C-AA-9. The flow control model number should follow the valve model number on which it is to be installed.

NOTE: If a flow control assembly is used with the dual pressure regulator option, only the flow control on the "B" end is functional. (Controls both cylinder ports.)  
NOTE: Consult the general catalog for regulator and circuit bar ordering information.



## Section 6

## Options

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**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.



---

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

---

VALVE CODE > **G XX X-X XX**  
**1 2 3 4**

**OPTIONS AVAILABLE FOR**

- Solenoid valves 32, 34, 38, 42, 44 & 48 Series

---

### 1. VOLTAGE

G-XX X-X XX	VOLTAGE	
AA	120 VAC (2.5W)	Requires electrical connector with rectifier
AC	24 VAC (4.0W)	Requires electrical connector with rectifier
DA	24 VDC (1.0W)	
DC	24 VDC (1.8W)	
DD	24 VDC (2.5W)	
DE	24 VDC (3.0W)	
DF	24 VDC (4.0W)	
DG	12 VDC (1.0W)	
DJ	12 VDC (1.8W)	
DK	12 VDC (2.5W)	
DM	12 VDC (3.0W)	
DN	12 VDC (4.0W)	
DR	6 VDC (1.8W)	
DS	6 VDC (3.0W)	
EB	48 VDC (1.8W)	
EC	48 VDC (3.0W)	
ED	120 VDC (2.5W)	
GD	12 VDC (0.5W)	34 series only
GE	24 VDC (0.5W)	34 series only

### 2. WIRE LENGTH

G-XX X-X XX	WIRE LENGTH	
0	No lead wires	(used only with "KJ" & "KM" connectors)
A	18" coil leads	
B	24" coil leads	
C	36" coil leads	
D	48" coil leads	
E	72" coil leads	
F	96" coil leads	
G	120" coil leads	
H	144" coil leads	
I	18" base leads	
2	24" base leads	
3	36" base leads	
4	48" base leads	
5	72" base leads	
6	96" base leads	
7	120" base leads	

### 3. MANUAL OPERATOR

G-XX X-X XX	MANUAL OPERATOR
1	Non-locking recessed
2	Locking recessed
3	Non-locking extended
4	Locking extended

### 4. ELECTRICAL CONNECTION

G-XX X-X XX	ELECTRICAL CONNECTION
BA	Flying leads
BB	BA with ground wire
BC	BA with light
BD	BA with light and ground wire
BE	BA with suppression diode
BF	BA with suppression diode and ground wire
BG	BA with suppression diode and light
BH	BA with suppression diode, light and ground wire
BN	BA with suppression diode and blocking diode
BP	BA with suppression diode, blocking diode and ground wire
BR	BA with suppression diode, blocking diode and light
BS	BA with suppression diode, blocking diode, light and ground wire
GA	MAC JAC Solenoid plug-in
GB	MAC JAC Solenoid plug-in w/Diode
GC	MAC JAC Solenoid plug-in w/MOV
GD	MAC JAC Solenoid plug-in w/LED
GE	MAC JAC Solenoid plug-in w/Diode & LED
GF	MAC JAC Solenoid plug-in w/MOV & LED
GG	MAC JAC Solenoid plug-in w/Rectifier
GH	MAC JAC Solenoid plug-in w/Rectifier & LED
KA	Solenoid plug-in wire assembly
KB	KA with ground
KC	KA with rectifier and light
KD	KA with rectifier, light and ground
KE	KA with suppression diode
KF	KA with suppression diode and ground
KJ	Solenoid plug-in housing without wire assembly
KM	Solenoid plug-in housing with ground pin without wire assembly
KN	KA with suppression diode and blocking diode
KP	KA with suppression diode, blocking diode and ground
KT	KA with light
KU	KA with light and ground
KV	KA with suppression diode and light
KW	KA with suppression diode, light and ground
KX	KA with suppression diode, blocking diode and light
KY	KA with suppression diode, blocking diode, light & ground

### ELECTRICAL CONNECTION FOR PLUG-IN VALVES

G-XX X-X XX	PLUG-IN OPTIONS
SB	Base plug-in with ground
SC	Base plug-in with suppression and blocking diode
SD	Base plug-in with suppression and blocking diode and ground
SE	Base plug-in with MOV
SF	Base plug-in with MOV and ground
SG	Base plug-in with rectifier
SH	Base plug-in with rectifier and ground
SK	Base plug-in with light and ground
SL	Base plug-in with suppression and blocking diode and light
SM	Base plug-in with suppression and blocking diode with light and ground
SN	Base plug-in with MOV and light
SP	Base plug-in with MOV and light with ground
SR	Base plug-in with rectifier and light



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**Codification table for voltages / Manual operators / Electrical connections**

---

VALVE CODE > **-GM- G  $\frac{XX}{1}$   $\frac{X-X}{2}$   $\frac{XX}{3}$   $\frac{XX}{4}$**

**OPTIONS AVAILABLE FOR**

- Solenoid valves 52 & 400 Series

---

1. VOLTAGE		4. ELECTRICAL CONNECTION	
<b>G-XX X-X XX</b>	<b>VOLTAGE</b>	<b>G-XX X-X XX</b>	<b>ELECTRICAL CONNECTION</b>
<b>DC</b>	24 VDC (1.8 W)	<b>BA</b>	Flying leads
<b>DD</b>	24 VDC (2.5 W)	<b>BB</b>	BA with ground wire
<b>DE</b>	24 VDC (3.0 W)	<b>BC</b>	BA with light parallel to leads
<b>DF</b>	24 VDC (4.0 W)	<b>BD</b>	BA with light parallel to leads & ground wire
<b>DJ</b>	12 VDC (1.8 W)	<b>BE</b>	BA with suppression diode
<b>DK</b>	12 VDC (2.5 W)	<b>BF</b>	BA with suppression diode & ground wire
<b>DM</b>	12 VDC (3.0 W)	<b>BG</b>	BA with suppression diode plus light parallel to leads
<b>DN</b>	12 VDC (4.0 W)	<b>BH</b>	BA with suppression diode plus light parallel to leads & ground wire
2. WIRE LENGTH		<b>*BN</b>	BA with suppression diode plus blocking diode
<b>G-XX X-X XX</b>	<b>WIRE LENGTH</b>	<b>*BP</b>	BA with suppression diode plus blocking diode & ground wire
<b>0</b>	No lead wire (use only with "KJ" & "KM" electrical connectors)	<b>*BR</b>	BA with suppression diode plus blocking diode & light parallel to leads
<b>A</b>	18"	<b>*BS</b>	BA with suppression diode plus blocking diode & light parallel to leads & ground wire
<b>B</b>	24"	<b>BT</b>	BA with light on top
<b>C</b>	36"	<b>BU</b>	BA with light on top & ground wire
<b>D</b>	48"	<b>BV</b>	BA with suppression diode plus light on top
<b>E</b>	72"	<b>BW</b>	BA with suppression diode plus light on top & ground wire
<b>F</b>	96"	<b>*BX</b>	BA with suppression diode plus blocking diode & light on top
<b>G</b>	120"	<b>*BY</b>	BA with suppression diode plus blocking diode & light on top & ground wire
<b>H</b>	144"		
3. MANUAL OPERATOR		<b>G-XX X-X XX</b>	<b>SOLENOID PLUG-IN CONNECTOR WITH LEADS</b>
<b>G-XX X-X XX</b>	<b>MANUAL OPERATOR</b>	<b>GA</b>	MAC JAC Solenoid plug-in
<b>1</b>	Non-locking recessed	<b>GB</b>	MAC JAC Solenoid plug-in w/Diode
<b>2</b>	Locking recessed	<b>GC</b>	MAC JAC Solenoid plug-in w/MOV
<b>3</b>	Non-locking extended	<b>GD</b>	MAC JAC Solenoid plug-in w/LED
<b>4</b>	Locking extended	<b>GE</b>	MAC JAC Solenoid plug-in w/Diode & LED
		<b>GF</b>	MAC JAC Solenoid plug-in w/MOV & LED
		<b>GG</b>	MAC JAC Solenoid plug-in w/Rectifier
		<b>GH</b>	MAC JAC Solenoid plug-in w/Rectifier & LED
		<b>KA</b>	Plug-in wire assembly
		<b>KB</b>	KA with ground wire
		<b>KE</b>	KA with suppression diode
		<b>KF</b>	KA with suppression diode & ground wire
		<b>KJ</b>	Plug-in housing without wire assembly ('KA' without wire assembly)
		<b>KM</b>	Plug-in housing without wire assembly ('KB' without wire assembly)
		<b>*KN</b>	KA with suppression diode plus blocking diode
		<b>*KP</b>	KA with suppression diode plus blocking diode & ground wire
		<b>KT</b>	KA with light on top
		<b>KU</b>	KA with light on top & ground wire
		<b>KV</b>	KA with suppression diode plus light on top
		<b>KW</b>	KA with suppression diode plus light & ground wire
		<b>*KX</b>	KA with suppression diode plus blocking diode & light on top
		<b>*KY</b>	KA with suppression diode plus blocking diode & light on top & ground wire

Note: Blocking diode is located in the lead wire



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**Codification table for voltages / Manual operators / Electrical connections**

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VALVE CODE > **H XX X-X XX**  
**1 2 3 4**

**OPTIONS AVAILABLE FOR**

- Solenoid valves 37 & 47 Series

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### 1. VOLTAGE

H-XX X-X XX	VOLTAGE
<b>AA</b>	120/50, 120/60 (6.7 W) (use connector with rectifier)
<b>AB</b>	220/50, 220/60 (5.6 W) (use connector with rectifier)
<b>AC</b>	240/50, 240/60 (5.8 W) (use connector with rectifier)
<b>AD</b>	24/50, 24/60 (7.8 W) (use connector with rectifier)
<b>DA</b>	24 VDC (5.2 W)
<b>DB</b>	24 VDC (2.4 W)
<b>DC</b>	24 VDC (1.8 W)
<b>DD</b>	24 VDC (1.0 W)
<b>DF</b>	12 VDC (5.2 W)
<b>DG</b>	12 VDC (2.4 W)
<b>DH</b>	12 VDC (1.8 W)
<b>DJ</b>	12 VDC (1.0 W)
<b>DL</b>	120 VDC (6.3 W)

### 2. WIRE LENGTH

H-XX X-X XX	WIRE LENGTH
<b>0</b>	No lead wire (use with "MJ, MM & K Type connectors)
<b>A</b>	18"
<b>B</b>	24"
<b>C</b>	36"
<b>D</b>	48"
<b>E</b>	72"
<b>F</b>	96"
<b>G</b>	120"
<b>H</b>	144"

### 3. MANUAL OPERATOR

H-XX X-X XX	MANUAL OPERATOR
<b>0</b>	No operator
<b>1</b>	Non-locking recessed
<b>2</b>	Locking recessed
<b>3</b>	Non-locking extended
<b>4</b>	Locking extended

### 4. ELECTRICAL CONNECTION

H-XX X-X XX	ELECTRICAL CONNECTION
<b>BA</b>	Flying leads
<b>BB</b>	BA with ground wire
<b>BC</b>	BA with light
<b>BD</b>	BA with light & ground wire
<b>BE</b>	BA with suppression diode
<b>BF</b>	BA with suppression diode & ground wire
<b>BG</b>	BA with suppression diode plus light
<b>BH</b>	BA with suppression diode plus light & ground wire
<b>*BN</b>	BA with suppression diode plus blocking diode
<b>*BP</b>	BA with suppression diode plus blocking diode & ground wire
<b>*BR</b>	BA with suppression diode plus blocking diode & light
<b>*BS</b>	BBA with suppression diode plus blocking diode & light & ground wire
<b>BK</b>	BA with full wave rectifier

H-XX X-X XX	
<b>BL</b>	BA with full wave rectifier & ground wire
<b>BT</b>	BA with full wave rectifier plus light
<b>BU</b>	BA with full wave rectifier plus light & ground wire

H-XX X-X XX	PLUG-IN CONNECTOR
<b>FA</b>	Base plug-in
<b>FB</b>	FA with ground wire
<b>FC</b>	FA with light
<b>FD</b>	FA with light & ground wire
<b>FE</b>	FA with suppression diode
<b>FF</b>	FA with suppression diode & ground wire
<b>FG</b>	FA with suppression diode & light
<b>FH</b>	FA with suppression diode plus light & ground wire
<b>FK</b>	FA with full wave rectifier
<b>FL</b>	FA with full wave rectifier & ground wire
<b>*FN</b>	FA with suppression diode plus blocking diode
<b>*FP</b>	FA with suppression diode plus blocking diode & ground wire
<b>*FR</b>	FA with suppression diode plus blocking diode plus light
<b>*FS</b>	FA with suppression diode plus blocking diode & light & ground wire
<b>FT</b>	FA with full wave rectifier plus light
<b>FU</b>	FA with full wave rectifier plus light & ground wire
<b>MA</b>	Solenoid plug-in wire assembly
<b>MB</b>	MA with ground wire
<b>MC</b>	MA with light
<b>MD</b>	MA with light & ground wire
<b>ME</b>	MA with suppression diode
<b>MF</b>	MA with suppression diode & ground wire
<b>MG</b>	MA with suppression diode plus light
<b>MH</b>	MA with suppression diode plus light & ground wire
<b>MK</b>	MA with full wave rectifier
<b>ML</b>	MA with full wave rectifier & ground wire
<b>*MN</b>	MA with suppression diode plus blocking diode
<b>*MP</b>	MA with suppression diode plus blocking diode & ground wire
<b>*MR</b>	MA with suppression diode plus blocking diode & light
<b>*MS</b>	MA with suppression diode plus blocking diode & light & ground wire
<b>MT</b>	MA with full wave rectifier plus light
<b>MU</b>	MA with full wave rectifier plus light & ground wire
<b>MJ</b>	Plug-in housing without wire assembly ('MA' option without wire assembly)
<b>MM</b>	Plug-in housing without wire assembly ('MB' option without wire assembly)
<b>KA</b>	Mini square connector
<b>KB</b>	KA with suppression diode
<b>KC</b>	KA with M.O.V.
<b>KD</b>	KA with light
<b>KE</b>	KA with light & suppression diode
<b>KF</b>	KA with light & M.O.V.
<b>KJ</b>	Mini square connector – male only
<b>KK</b>	KJ with suppression diode
<b>KL</b>	KJ with M.O.V.
<b>KM</b>	KA with full wave rectifier
<b>KN</b>	KA with full wave rectifier & M.O.V.
<b>KP</b>	KA with full wave rectifier & light
<b>KR</b>	KA with full wave rectifier plus light & M.O.V.
<b>KS</b>	KJ with full wave rectifier

\* Blocking diode is located in the lead wire



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**Codification table for voltages / Manual operators / Electrical connections**

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VALVE CODE >

**J XX X-X XX**  
**1 2 3 4**

**OPTIONS AVAILABLE FOR**

- Solenoid valves 36, 46, ISO 01 and ISO 02 Series

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**1. VOLTAGE**

J-XX X-X XX	VOLTAGE
AA	120VAC (5.4W)
AC	24VAC (5.4W)
DE	24VDC (1.8W)
DF	12VDC (1.8W)
DJ	24VDC (1.3W)
DL	12VDC (1.3W)
DR	12VDC (1.0W)*
DU	24VDC (1.0W)*

\* Not available on 36 series universal valve

**2. WIRE LENGTH**

J-XX X-X XX	WIRE LENGTH
A	18" coil leads
B	24" coil leads
C	36" coil leads
D	48" coil leads
E	72" coil leads
F	96" coil leads
P	Base plug-in
O	No leads (use with J, K & L type connectors)

**3. MANUAL OPERATOR**

J-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**

J-XX X-X XX	CONNECTORS FOR NON PLUG-IN VALVES ELECTRICAL CONNECTION
BA	Flying leads
GA	MAC JAC solenoid plug-in
GB	MAC JAC solenoid plug-in with diode
GC	MAC JAC solenoid plug-in with MOV
GD	MAC JAC solenoid plug-in with light
GE	MAC JAC solenoid plug-in with diode and light
GF	MAC JAC solenoid plug-in with MOV and light
GG	MAC JAC solenoid plug-in with rectifier
GH	MAC JAC solenoid plug-in with rectifier and light
GJ	MAC JAC solenoid plug-in - Male only
GK	MAC JAC solenoid plug-in with diode - Male only
GL	MAC JAC solenoid plug-in with MOV - Male only
GM	MAC JAC solenoid plug-in with light - Male only
GN	MAC JAC solenoid plug-in with diode and light - Male only
GP	MAC JAC solenoid plug-in with MOV and light - Male only
GR	MAC JAC solenoid plug-in with rectifier - Male only
GS	MAC JAC solenoid plug-in with rectifier and light - Male only
*JA	Square Connector
*JC	Square Connector with light
*JE	Square Connector with diode
*JF	Square Connector with MOV
*JG	Square Connector with diode/light
*JH	Square Connector with MOV/light
*JK	Square Connector with Rectifier

**J-XX X-X XX**

*JL	Square Connector with Rectifier with light
*JJ	Square Connector Male only (Plain)
*JB	Rectangular Connector
*JD	Rectangular Connector with light
*JN	Rectangular Connector with diode
*JP	Rectangular Connector with MOV
*JR	Rectangular Connector with diode/light
*JS	Rectangular Connector with MOV/light
*JT	Rectangular Connector with Rectifier
*JU	Rectangular Connector with Rectifier with light
*JM	Rectangular Connector Male only (Plain)

\* Not available on manifold or stacking valves

**CONNECTORS FOR NON PLUG-IN VALVES**

J-XX X-X XX	MINI SQUARE PLUG-IN CONNECTORS 9.4 MM SPACING BETWEEN PINS
KA	Mini plug-in
KB	Mini plug-in with diode
KC	Mini plug-in with MOV
KD	Mini plug-in with light
KE	Mini plug-in with diode and light
KF	Mini plug-in with MOV and light
KG	Mini plug-in with rectifier
KH	Mini plug-in with rectifier and light
KJ	Mini plug-in - Male only
KK	Mini plug-in with diode - Male only
KL	Mini plug-in with MOV - Male only
KM	Mini plug-in with light - Male only
KN	Mini plug-in with diode and light - Male only
KP	Mini plug-in with MOV and light - Male only
KR	Mini plug-in with rectifier - Male only
KS	Mini plug-in with rectifier and light - Male only

**CONNECTORS FOR NON PLUG-IN VALVES**

J-XX X-X XX	MINI SQUARE PLUG-IN CONNECTORS 8.0 MM SPACING BETWEEN PINS ISO SPECIFICATION 15217
LA	Mini plug-in
LB	Mini plug-in with diode
LC	Mini plug-in with MOV
LD	Mini plug-in with light
LE	Mini plug-in with diode and light
LF	Mini plug-in with MOV and light
LG	Mini plug-in with rectifier
LH	Mini plug-in with rectifier and light
LJ	Mini plug-in - Male only
LK	Mini plug-in with diode - Male only
LL	Mini plug-in with MOV - Male only
LM	Mini plug-in with light - Male only
LN	Mini plug-in with diode and light - Male only
LP	Mini plug-in with MOV and light - Male only
LR	Mini plug-in with rectifier - Male only
LS	Mini plug-in with rectifier and light - Male only

**J-XX X-X XX**

FA	CONNECTORS FOR PLUG-IN VALVES Base plug-in
FB	Base plug-in with diode
FC	Base plug-in with MOV
FD	Base plug-in with light
FE	Base plug-in with diode and light
FF	Base plug-in with MOV and light
FG	Base plug-in with rectifier
FH	Base plug-in with rectifier and light





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**Codification table for voltages / Manual operators / Electrical connections**

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VALVE CODE >

**R XX X-X XX**  
**1 2 3 4**

**OPTIONS AVAILABLE FOR**

- Solenoid valves 33 Series

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### 1. VOLTAGE

R-XX X-X XX	VOLTAGE
DA	24 VDC (0.5W)
DB	24 VDC (1.0W)
DC	24 VDC (1.8W)
DD	24 VDC (2.5W)
DE	24 VDC (3.0W)
DF	24 VDC (4.0W)
DG	12 VDC (0.5W)
DH	12 VDC (1.0W)
DJ	12 VDC (1.8W)
DK	12 VDC (2.5W)
DL	12 VDC (3.0W)
DM	12 VDC (4.0W)
EA*	24 VDC (60W)
EB*	24 VDC (90W)
EC*	24 VDC (230W)

### 2. WIRE LENGTH (all series)

R-XX X-X XX	WIRE LENGTH
0**	No lead wire
A	18"
B	24"
C	36"
D	48"
E	72"
F	96"
G	120"
H	144"

### 3. MANUAL OPERATOR

R-XX X-X XX	MANUAL OPERATOR
0	No operator
1	Non-locking recessed
3	Non-locking extended

### 4. ELECTRICAL CONNECTOR

R-XX X-X XX	NON PLUG-IN
BA	Flying leads
BB	Flying leads with LED
BC	Flying leads with MOV
BD	Flying leads with LED and MOV
RA	Mini JAC solenoid plug-in
RB	Mini JAC solenoid plug-in with LED
RC	Mini JAC solenoid plug-in with MOV
RD	Mini JAC solenoid plug-in with LED and MOV
TA	JST solenoid plug-in
TB	JST solenoid plug-in with LED
TC	JST solenoid plug-in with MOV
TD	JST solenoid plug-in with LED and MOV

\*MOD numbers required for these voltages (consult factory) \*\* Not available for flying leads connector



## Section 7

## Supplemental technical information

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## MAC's PATENTED LATCHING SOLENOID – Eliminates one Solenoid, Simplifies Wiring, Reduces Package Size

MAC's latching solenoid technology provides the function of a double solenoid operated valve utilizing only one solenoid.

Typical 2 position direct operated double solenoid valves use two solenoids with spool/bore technology. When the power is removed from either solenoid, the spool position and valve function is maintained.

With direct acting solenoid valves, poppets with their inherent short strokes are not typically used as they cannot maintain sealing position when both solenoids are deenergized. As a consequence, longer stroking spool type solenoid valves are used which results in lower shifting forces. MAC's latching solenoid technology eliminates the sealing issue with poppets when no electrical signal is applied, by maintaining solenoid force, ensuring adequate sealing, while using short stroking poppets resulting in high shifting forces.

MAC's latching solenoid only requires one solenoid and correspondingly one plug-in and one conduit wireway versus two for conventional double solenoid valve, saving space, weight and cost. An added benefit of a latching solenoid valve when mounted on a circuit bar is the additional option of side cylinder ports.

### HOW IT WORKS

Unlike a spool and bore valve, a poppet valve requires that a force be continuously applied to either end of the poppet to ensure that proper sealing occurs. If another solenoid was simply added to the valve to create a double solenoid valve, power would need to be constantly applied to either solenoid for the valve to function properly (see Figure 1). If the poppet valve is converted to a spool and bore type valve design, the longer stroke of the spool and solenoid would result in lower net shifting forces (see Figure 2), compromising the valves shifting reliability.

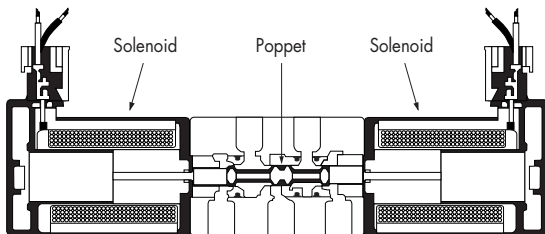


Figure 1 : Double Solenoid Poppet

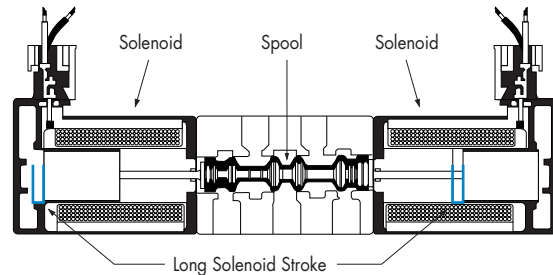


Figure 2 : Double Solenoid Spool Design

The latching solenoid overcomes these problems by introducing a powerful permanent magnet armature assembly which magnetically latches itself to the pole piece and in turn keeps the poppet sealed against the conical seats when the power is removed from the solenoid. To shift the poppet in the opposite direction, the polarity of the voltage applied to the solenoid leads is reversed and the attractive force between the permanent magnet armature assembly and the pole piece is reduced. The return spring in the valve then shifts the poppet to its other sealing position and the permanent magnet armature assembly is then magnetically attracted to the upper latch. The upper latch prevents the permanent magnet armature assembly from attracting itself back to the pole piece when the voltage is removed. Reversing the polarity again to the solenoid lead wires will create a powerful attractive force between the permanent magnet armature assembly and the pole piece and away from the upper latch which will correspondingly move the poppet to the other shifted position.

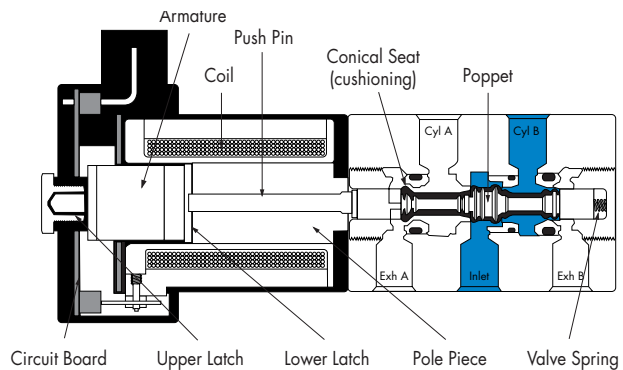


Figure 3 : Latching Solenoid Design

## WIRING INSTRUCTIONS AND OPTIONS

As shown in Figure 4, a conventional double solenoid valve requires that the pair of lead wires from each solenoid be wired to an appropriate voltage source, MAC's latching solenoid technology has the option of being wired in one of the three (3) currently available methods.

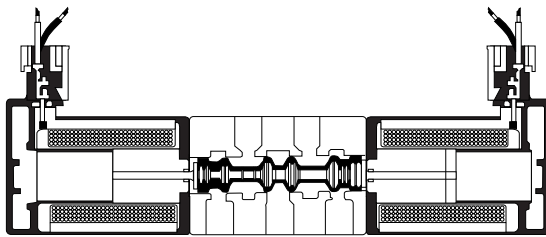
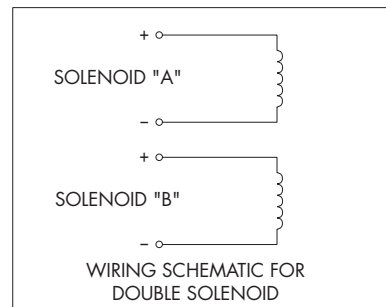


Figure 4 : Conventional Double Solenoid



### FOUR WIRE

As shown in Figure 5, the four wire method enables the coil to be wired as if it were a conventional double solenoid. By connecting the yellow lead wire to positive voltage and the yellow lead wire with black stripe to negative, the valve will be open to cylinder port "A". When positive voltage is supplied to the red lead wire and negative to the red lead with a black stripe, the valve will now be open to cylinder port "B". Since the negative red and yellow lead wires are internally connected together, the supply voltage for each pair of yellow and red lead wires must be isolated from the other pair (see diagram). Also, power must not be applied to all four leads simultaneously or a short circuit condition will occur possibly damaging the voltage source.

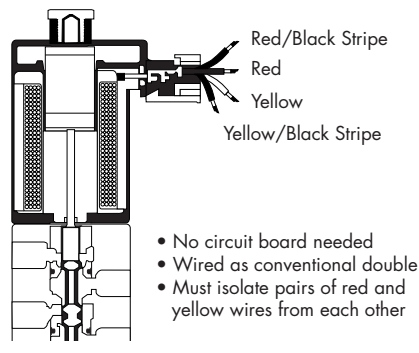
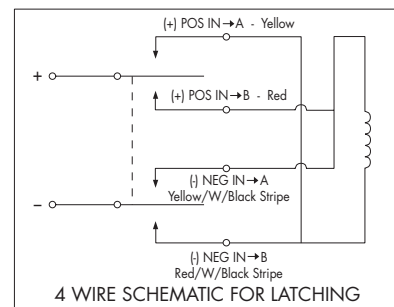


Figure 5 : Four Wire Latching



### THREE WIRE

Unlike the two wire method ( see Figure 7) which requires the user to provide the polarity switching circuitry, the three wire method incorporates the polarity switching circuitry within the solenoid enclosure ( see Figure 6). The black lead wire provided must be connected to positive and is used as a common. When negative voltage is supplied to the yellow lead wire with a black stripe the valve will be open to cylinder port "A". When the negative voltage is removed from the yellow lead wire with the black stripe and supplied to the red lead wire with a black stripe, the valve will now be open to cylinder port "B". Applying voltage to all three wires simultaneously or with the wrong polarity will cause permanent damage to the switching circuitry in the solenoid cover, and the valve won't work.

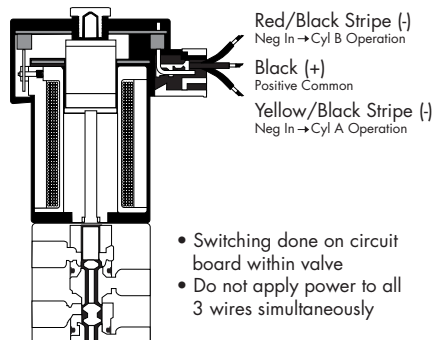
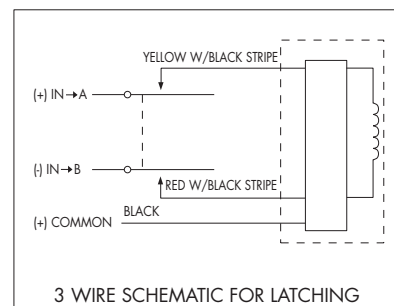


Figure 6 : Three Wire Latching



## TWO WIRE

The two wire method shown in Figure 7, provides a black and red lead wire connected to the solenoid. The user must provide the polarity switching circuitry to these leads in order to shift the valve to its two positions. By applying positive DC voltage to the red lead wire and negative to the black, the valve will be open to cylinder port "A". When the polarity of the voltage is externally reversed to the lead wires the valve will now become open to cylinder port "B".

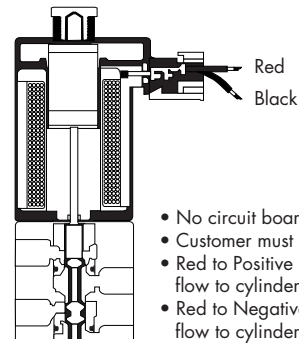


Figure 7 : Two Wire Latching

- No circuit board needed
- Customer must switch polarity of voltage
- Red to Positive and Black to Negative yields flow to cylinder port A
- Red to Negative and Black to Positive yields flow to cylinder port B

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## AVAILABLE OPTIONS

The 2 and 4 wire connections are available in both a flying lead and plug-in cover. The 3 wire connection is only available in the plug-in style cover. All 2 and 4 wire cover options are available with an LED indicator. The LED indicator on a 3 wire cover is standard. The LED will illuminate red for cylinder "A" operation and green for cylinder "B" operation.

The 3 wire connection must be used for valves connected to either a multi-pin connector or a serial manifold. Mixing single solenoids with latching solenoids on a circuit bar is possible since each station of the bar is wired for a latching coil. The circuit bar must be ordered with this wiring configuration. If required, a negative common 3 wire connection is also available, please consult factory.

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## HOW TO ORDER

The numbering system for a latching solenoid differs from the numbering system for a single solenoid valve. The letter "L" within the model number indicates a latching solenoid, while the letter "G" or "H" in the same position of the model number indicates a single solenoid valve.

## 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 :

- A. Do not install any MAC Valves product without first turning off air (bleed system completely) and electricity to the machine.
- B. 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.
- C. 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 :

- A. 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.
- B. 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.
- C. 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.
- D. 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

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## MAC VALVES Warranty, Warranty Limitations, Flat Rate Rebuild Program

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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.



MAC<sup>®</sup>  
MAC

V A L V E S

CURRENT

Technology





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## **Welcome to your brand new MAC VALVES catalog.**

Inside you will find more than 25 different valve series to meet the majority of industrial requirements.

They have been sorted and classified in such a way that you may easily find the required valve series.

For more than 50 years, MAC has based all new valve developments upon the specifications received from customers, both users and OEM's.

A lot of different modifications have been released for all fields of industry (automotive, aluminium, packaging, food, sorting, ...). Although they are not listed in this catalog, our technical sales staff will be pleased to provide all necessary information.

All our representatives have a "traveling lab demonstration" kit (TLD) to show you the specific design features of MAC Valves in terms of :

- speed
- reliability
- consistency
- repeatability

Feel free to ask for a personal demonstration, our team is at your disposal.

MAC Valves,  
Your Partner

## Pneumatic functions

All valves inside the MAC product range allow for multiple pneumatic functions.

Direct solenoid and solenoid pilot operated valves could be used as 2 ways, 3 ways (NO, NC) or 4 ways.

When plugging one orifice to achieve a 2 ways function (or 3 ways), it will not affect the valve operation.

- Direct solenoid valves 3 ways : universal

The following functions are available

- 3 ways NC
- 3 ways NO
- 2 ways NC
- 2 ways NO
- Selector
- Divertor

- Pilot operated valves 3 ways :

The following functions are available

- 3 ways NC
- 3 ways NO
- 2 ways NC
- 2 ways NO
- Selector : the highest pressure is connected to the IN port; the lowest pressure is connected to the EXH port. (Use external pilot when the highest pressure is less than 2 bar)
- Divertor (consult factory)

- Direct solenoid valves 4 ways :

The following functions are available

- 4 ways
- 3 ways NC
- 3 ways NO
- 2 ways NC
- 2 ways NO
- Divertor

- Pilot operated valves 4 & 5 ways :

The following functions are available

- 4 or 5 ways
- 3 ways NC
- 3 ways NO
- 2 ways NC
- 2 ways NO
- Selector (except 3 positions)
- Divertor (consult factory).

**EVERY VALVE FULLY TESTED PRIOR TO SHIPMENT**

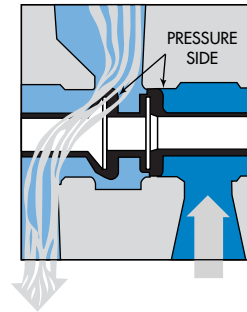
**SPOOLS/BODIES**

MAC flow seals are bonded to an aluminum spool, machine ground to a very close tolerance, and chemically surface hardened. The bore of the bodies is finished to a close tolerance, work hardened and polished. The result of these processes on the spool and bore keeps friction to a minimum and provides wiping action thus assuring long, stick-free consistent operation and making the spools relatively unaffected by air line contaminants.

MAC spools are of a balanced design; therefore they are not affected by back pressure or restrictions in the exhaust, permitting 3-ways to be plugged for 2-way operation and 4-ways to be plugged for 3-way or 2-way operation.

Further, the use of two seals, as illustrated, one for the exhaust and one for inlet, provides for a short stroke and high flow in a small envelope size.

All valves utilize one piece aluminum bodies. On almost all Series valves, the bodies are die cast. The die casting technique used provides large, smooth and direct flow paths for low pressure drop.

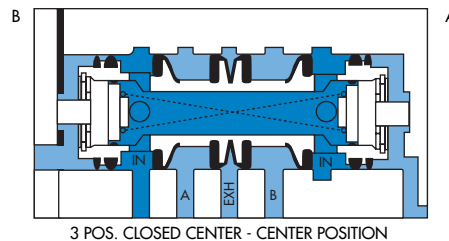


**PILOT SYSTEM**

On most pilot operated valves a large checked accumulator, housed in the main valve body, supplies both pilots on double solenoid valves as well as the air/spring return on single solenoid pilot or single remote air pilot valves. The checked accumulator assures positive, consistent shifting in both directions even with inlet pressure fluctuations and/or restrictions, and even at very low minimum pilot pressures. On internal pilot models the accumulator is supplied from the main valve inlet and protected from inlet pressure fluctuations by a check valve. The check valve is designed to bleed off the accumulator when the main supply pressure is removed. On external pilot models, the accumulator is supplied from an external pilot port. Pilot operation ensures maximum energization shifting force. An air spring ensures maximum deenergization shifting force.

**3-POSITION CENTERING**

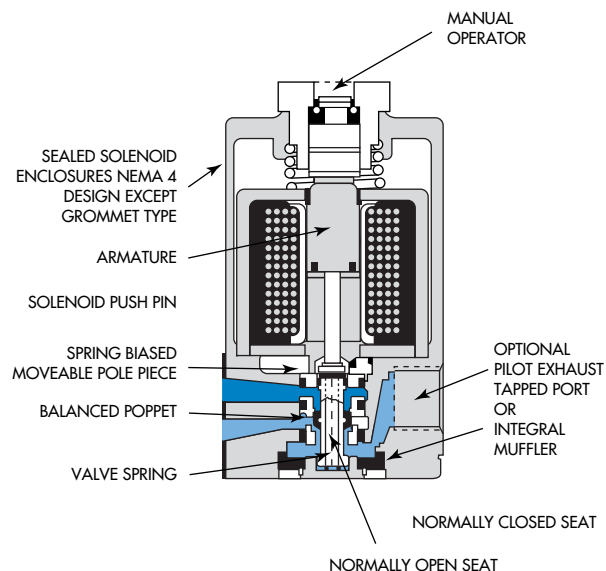
MAC 3-position solenoid and remote air pilot valves are centered by a patented spring centering device or patented combination spring and pressure assisted spool design which reduces side load potential and resultant wear, and assures fast, positive return of the main spool when the pilots are de-energized due to a high shifting force.



**SOLENOID PILOT VALVES**

Most MAC valves in this catalog are pilot operated by a patented high flow, fast response Normally Closed Only version of the compact MAC 100 Series solenoid valve (shown below). Similarly on solenoid pilot 3-way valves, another version of the 100 or 200 series is used as the pilot. These patented burnout proof solenoid pilots provide extremely fast response times to an extent not equaled in other valves.

Because air pressure does the work in shifting the main spool, minimal energy is consumed by the solenoid with no limitation in size of the main valve. On 120/60 AC service the inrush current is down to .12 Amps. On DC service wattages are available down to 1.0 Watts across almost the entire product line. (The 82 Series is piloted by a version of the 35 Series. On DC service, wattages are available down to 1.8 watts.). Intrinsically safe valves are available for most series listed in this catalog. This option is for DC service only at 0.6 Watts.

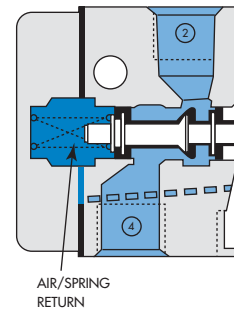


**VIRTUALLY—BURN-OUT PROOF MACSOLENOID®**

The patented spring biased floating pole piece MACSOLENOID® used on all 3-ways and 4-ways in this catalog is independent and isolated from the valve body (100 Series shown above). When voltage is applied to the coil, the pole piece is held down by the bias spring so that the magnetic attraction between the pole piece and armature results in the armature moving down against the push pin, moving the poppet from the Normally Closed (N.C.) seat to the Normally Open (N.O.) seat. After the poppet has shifted completely, the pole piece then moves upward, compressing the bias spring, until the pole piece magnetically seals with the armature. If the poppet sticks and fails to move initially, preventing the armature from moving down, the pole piece is magnetically drawn upward, compressing the bias spring, allowing the pole piece and armature to magnetically seal and subjecting the valve to maximum shifting forces. Thus the two most common causes of solenoid valve failure—failure to shift when energized, and coil burnout on AC service—are practically eliminated. The bias spring also reduces de-energized response time since it is exerting a separation force (downward force on the pole piece) between the armature and pole piece.

**AIR /SPRING RETURN**

Single solenoid pilot or single remote air pilot models contain a unique combination spring and air assisted differential return. Supplied from the accumulator, inlet or external pilot; it maximizes and balances the shifting forces for consistent operation and positive spool return.



**NON-LUBE SERVICE**

All valves in this catalog can be operated with or without air line lubrication. This is made possible through the use of the unique solenoid pilot operator, the pilot system, the spool and bore design, close tolerances and MAC’s prelubrication procedures. In either case, air line filters are recommended and will extend cycle life of the valves.

**COILS**

MAC makes its own coils permitting flexibility in voltage requirements. If the voltage required is not listed with the valve Series desired or in the “options” section, consult the factory, we may be able to produce it. Two types of special coils are described below.

**LOW WATTAGE DC**—MAC provides optional low wattage DC solenoids for all the valves of this catalog down to 1.0 watts, (except for the 1300 Series which is 6.0 watts, and the 35 & 45 Series which is 1.8 watts). These low wattage options can significantly reduce power consumption, power supply capacity, control amplifier capacity and cost of all the above.

**CLASS F**—High temperature AC and DC coil option. Available on all AC and DC coils. On some high wattage coils listed in the catalog, Class F is required and is so noted. These higher wattage coils are specified as MOD CLSF (Class F Option). Higher wattage coils will provide extremely fast response times.

**ADD-A-UNIT MANIFOLDS**

Pioneered by MAC, Add-A-Unit die cast manifold bodies and bases are available. The common inlet, exhaust, and on many models the electrical conduit channel, enables bodies and bases to be added as desired. A valve gang can contain both 2- and 3- position valves, as well as solenoid, remote air pilot and manual or mechanical valves. Sections of a gang or individual valves in a gang may be isolated permitting different pressures to be fed to either end of the gang.

**ELECTRICAL PLUG-IN CONNECTIONS**

4-way plug-in models incorporate recessed, shrouded connectors in both body and base with an integral ground pin that makes connection first and breaks last. Plug-ins permit easy and fast replacement of the valve without disturbing either the electrical wiring or air plumbing.

Let us show you via high performance demonstration kits and animated software,  
**HOW MAC'S PERFORMANCE ADVANTAGES HELP MAKE YOUR EQUIPMENT MORE RELIABLE - FASTER - MORE REPEATABLE.**



**TLD**

Traveling Lab Demonstration measures critical valve performance characteristics - *Shifting forces, Response Time, Speed, Repeatability and Flow.*



**PLD**

Proportional Lab Demonstration measures critical proportional regulation characteristics - *Response Time, Accuracy, Hysteresis, Repeatability and Flow.*



**Animation**

Animated Software shows inner workings of various Air Valves Designs - *Powerful educational tool for learning about how air valves function.*

**Other MAC VALVE literature:**

DESCRIPTION	CATALOG NUMBER
CIRCUIT BAR CATALOG	999CBCA
PROPORTIONAL VALVE CATALOG	999PPCB
SERIAL INTERFACE PRODUCTS	9999SI
MACONNECT SYSTEM	CONSULT FACTORY
NEW TECHNOLOGY	999NTCB



Section 1

Direct solenoid and solenoid pilot operated valves





Function	Port size	Flow [Max]	Individual mounting					
			inline	inline hazardous location	sub-base non "plug-in"	sub-base "plug-in"	valve only	
<b>3/2 - 2/2</b>	<b>1/8"</b>	<b>0.17 Cv</b>	P. 15					
<b>3/2 - 2/2</b>	<b># 10-32 - 1/8"</b>	<b>0.16 Cv</b>						
<b>3/2 - 2/2</b>	<b># 10-32 - 1/8"</b>	<b>0.10 Cv</b>						
<b>3/2 - 2/2</b>	<b>1/8" - 1/4"</b>	<b>0.18 Cv</b>	P. 25					
<b>3/2 - 2/2</b>	<b>1/8"</b>	<b>0.14 Cv</b>						
<b>3/2 - 2/2</b>	<b>1/8" - 1/4"</b>	<b>0.5 Cv</b>	P. 33	P. 35				
<b>3/2 - 2/2</b>	<b>1/4"</b>	<b>0.4 Cv</b>						
<b>3/2 - 2/2</b>	<b>1/4" - 3/8"</b>	<b>2.2 Cv</b>	P. 47					
<b>3/2 - 2/2</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>5.7 Cv</b>	P. 51					
<b>3/2 - 2/2</b>	<b>1/2" - 3/4" - 1"</b>	<b>17.4 Cv</b>	P. 55					
<b>3/2 - 2/2</b>	<b>1" - 1 1/4" - 1 1/2"</b>	<b>26.0 Cv</b>	P. 59					
<b>3/2 - 2/2</b>	<b>2" - 2 1/2"</b>	<b>60.0 Cv</b>	P. 63					
<b>4/2</b>	<b># 10-32 - 1/8"</b>	<b>0.15 Cv</b>	P. 67					
<b>4/2</b>	<b># 10-32 - 1/8"</b>	<b>0.13 Cv</b>			P. 69			
<b>4/2</b>	<b># 10-32 - 1/8"</b>	<b>0.20 Cv</b>						
<b>4/2</b>	<b># 10-32 - 1/8"</b>	<b>0.11 Cv</b>						
<b>4/2</b>	<b># 10-32 - 1/8" 5/32 Pressed-in tube receptacles</b>	<b>0.11 Cv</b>						
<b>4/2</b>	<b>1/8" - 1/4"</b>	<b>0.7 Cv</b>	P. 89					
<b>4/2</b>	<b>1/8" - 1/4"</b>	<b>0.8 Cv</b>						
<b>4/2</b>	<b>1/8" - 1/4"</b>	<b>1.2 Cv</b>	P. 95					
<b>4/2</b>	<b>1/8" - 1/4" - 3/8"</b>	<b>1.4 Cv</b>						
<b>4/2 - 4/3</b>	<b>1/8" - 1/4" - 3/8"</b>	<b>1.35 Cv</b>			P. 101	P. 103		
<b>4/2 - 4/3</b>	<b>1/4" - 3/8"</b>	<b>1.35 Cv</b>						
<b>4/2 - 4/3</b>	<b>1/4" - 3/8" - 1/2"</b>	<b>3.0 Cv</b>			P. 111	P. 113		
<b>4/2 - 4/3</b>	<b>3/8" - 1/2"</b>	<b>3.0 Cv</b>						
<b>4/2 - 4/3</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>5.1 Cv</b>			P. 121	P. 123		
<b>4/2 - 4/3</b>	<b>3/4" - 1"</b>	<b>9.6 Cv</b>			P. 131	P. 133		
<b>4/2 - 4/3</b>	<b>3/4" - 1" - 1 1/4"</b>	<b>9.6 Cv</b>						
<b>4/2 - 4/3</b>	<b>3/4" - 1" - 1 1/4" - 1 1/2"</b>	<b>15.9 Cv</b>					P. 141	
<b>5/2 - 5/3</b>	<b>1/4"</b>	<b>1.4 Cv</b>	P. 145					
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.4 Cv</b>						
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.6 Cv</b>						P. 159
<b>5/2 - 5/3</b>	<b>3/8" - 1/2"</b>	<b>3.0 Cv</b>						P. 163
<b>5/2 - 5/3</b>	<b>1/2" - 3/4"</b>	<b>6.3 Cv</b>						P. 167
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>2.5 Cv</b>						P. 171
<b>5/2 - 5/3</b>	<b>1/2" - 3/4" - 1"</b>	<b>7.0 Cv</b>						P. 175
<b>5/2 - 5/3</b>	<b>1" - 1 1/4"</b>	<b>11.2 Cv</b>						P. 179

Manifold mounting

Series

stacking	sub-base non "plug-in"	sub-base with pressure regulators	sub-base hazardous location	sub-base with pressure regulators and flow controls	sub-base "plug-in"	sub-base "plug-in" with pressure regulator	sub-base "plug-in" with flow controls	sub-base "plug-in" with regulator and flow controls	stacking body with 1 common port (inlet)	stacking body with 3 common ports (inlet & exhausts)	stacking body with 3 common parts and integral F.C.	stacking body with 3 common ports with common conduit	stacking body with 3 common ports with C. C. & integral exh. F. C.	valve only
P. 17														
	P. 19	P. 21												
P. 27														
	P. 29													
	P. 37		P. 43											
		P. 39-41												
P. 71														
	P. 73	P. 75		P. 77										
					P. 79	P. 81	P. 83	P. 85						
P. 91														
P. 97														
	P. 105					P. 107								
	P. 115					P. 117								
	P. 125					P. 127								
	P. 135					P. 137								
									P. 147					
										P. 149	P. 151	P. 153	P. 155	
														P. 159
														P. 163
														P. 167
														P. 171
														P. 175
														P. 179

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



### Individual mounting

inline

### Manifold mounting

stacking

sub-base  
non "plug-in"

sub-base  
with pressure  
regulators

Series

35

100

200

55

56

57

58

59

45

700

900

82

6300

6500

6600

1300

800

ISO 1

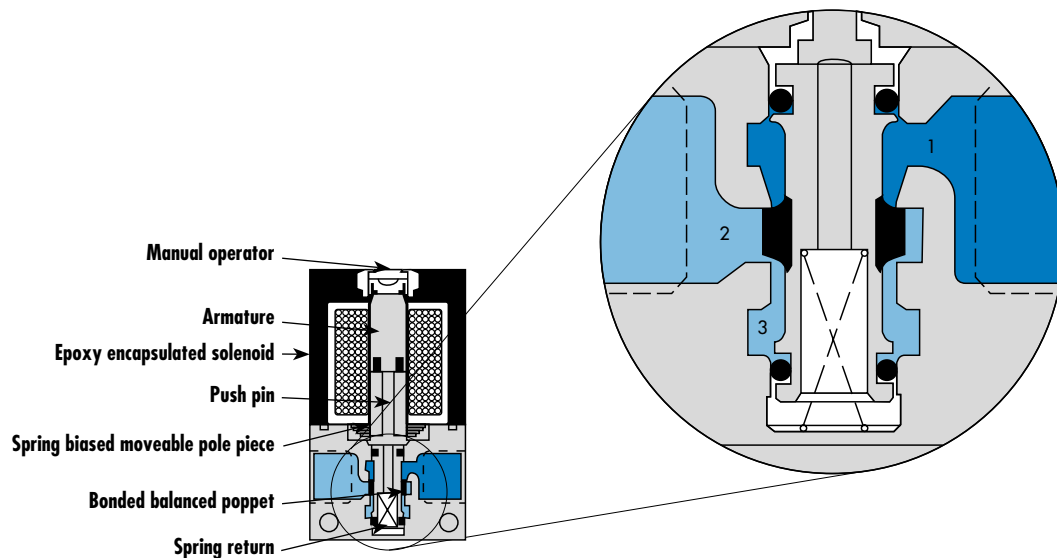
ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A



## SERIES FEATURES

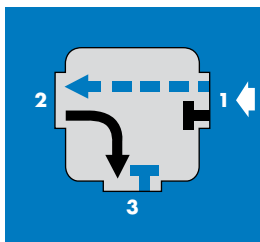
- Patented MACSOLENOID® for fastest possible response times.
- Bonded balanced poppet for high flow, precise repeatability, and consistent operation.
- Balanced poppet permits versatility in function — may be used as 3-way or 2-way normally open or normally closed and may be used for vacuum, divertor, or selector applications.
- Extremely high cycle rate capability.
- Use on lube or non-lube service.
- Manual overrides as standard.
- Various solenoid enclosures and plug-in connectors.
- Optional surge suppression (M.O.V. or Diode) available.
- Low wattage DC solenoids — down to 1.8 watts.
- Patented MACSOLENOID® — virtually burn-out proof on AC service.

### VALVE CONFIGURATIONS AVAILABLE :

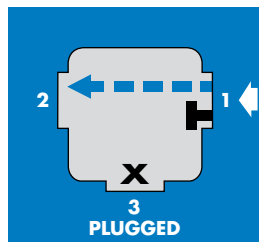
The 35 Series is a miniature 3 way or 2 way valve. This valve provides extremely fast response, long life and high flow in a surprisingly small package.

- Individual, stacking body or manifold base.
- 3 way—Normally Open or Normally Closed.
- 2 way—Normally Open or Normally Closed.
- Optional Normally Closed Only Models.
- Selectors & Divertors.

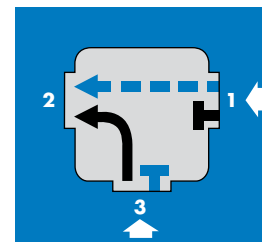
### PIPING CHART FOR INDIVIDUAL MODELS



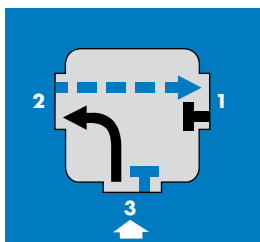
**3 Way  
Normally Closed**



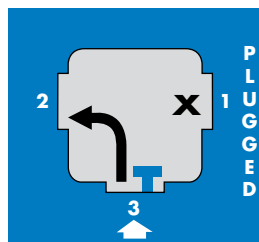
**2 Way  
Normally Closed**



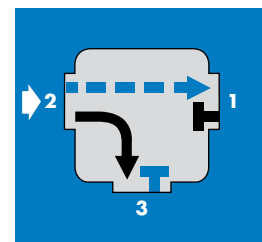
**Selector**



**3 Way  
Normally Open**



**2 Way  
Normally Open**



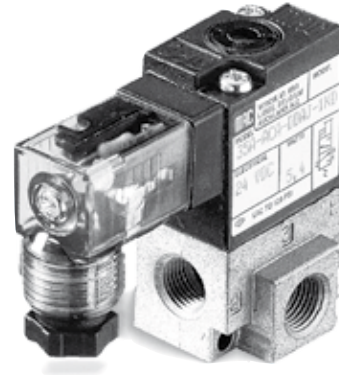
**Divertor**



Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8"</b>	<b>0.17 C<sub>v</sub></b>	inline	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35

100

200

55

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57

58

59

### HOW TO ORDER

Port size	Universal valve	NC only valve
<b>1/8" NPTF</b>	35A-AAA-Dxxx-xxx	35A-AAB-Dxxx-xxx

45

### SOLENOID OPERATOR >

D **XX X- X XX\***

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

700

900

\* Other options available, see page 361.

82

### OPTIONS

35A-CAX-Dxxx-xxx

- with (2) # 10-32 ports in backside of valve

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

**TECHNICAL DATA**

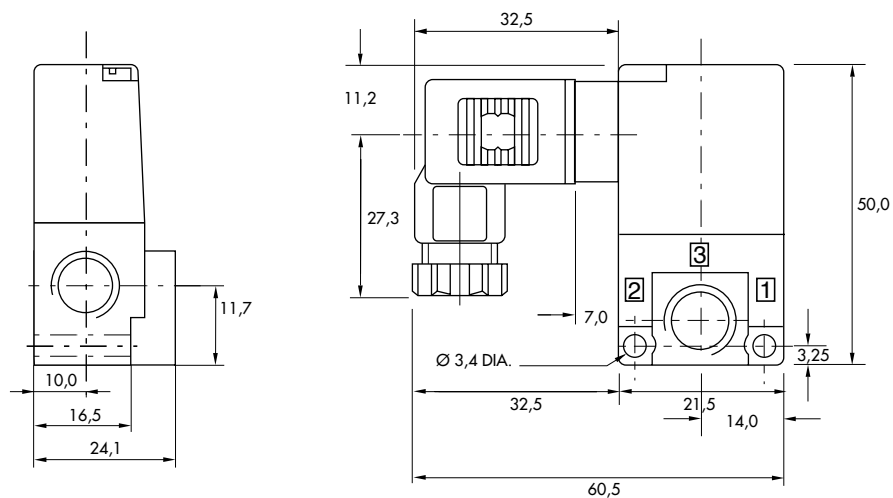
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Vacuum to 120 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1.8 W : 0.08 C <sub>v</sub> , 5.4 W : 0.15 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

- Spare parts :
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
  - Seal (between solenoid and valve body) : 16402.

- Options :
- BSPP threads. • High flow up to 0.25 C<sub>v</sub> according to wattage and high flow mod.

**DIMENSIONS**

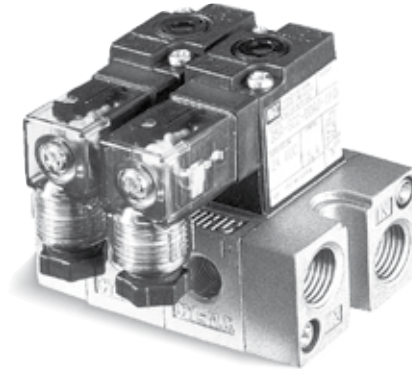
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b># 10-32, 1/8"</b>	<b>0.16 C<sub>v</sub></b>	stacking	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



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### HOW TO ORDER

Port size	NC only valve	NO only valve
<b>1/8" NPTF</b>	35A-SAC-Dxxx-xxx	35A-SAD-Dxxx-xxx
<b># 10-32 UNF</b>	35A-SBC-Dxxx-xxx	35A-SBD-Dxxx-xxx

45

### SOLENOID OPERATOR ▶

D **XX X- X XX**\*

XX Voltage	X Wire length	X Manual operator	XX
<b>AA</b> 120/60, 110/50	<b>A</b> 18" (Flying leads)	<b>1</b> Non-locking	<b>KA</b> Square connector
<b>AB</b> 240/60, 220/50	<b>J</b> Connector	<b>2</b> Locking	<b>KD</b> Square connector with light
<b>AC</b> 24/60, 24/50			<b>BA</b> Flying leads
<b>FB</b> 24 VDC (1.8 W)			
<b>DA</b> 24 VDC (5.4 W)			
<b>DF</b> 24 VDC (12.7 W)			

700

900

82

\* Other options available, see page 361.

End plate kit required (Port size : 1/4") : M-35001-01  
 Note : upon request, manifolds are mounted at the factory.

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

### OPTIONS

35A-TXX-Dxxx-xxx

— Bottom Inlet



### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	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 (at 6 bar, ΔP=1bar) :</b>	1.8 W : 0.12 C <sub>v</sub> , 5.4 to 12.7 W : 0.16 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	- Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

#### Spare parts :

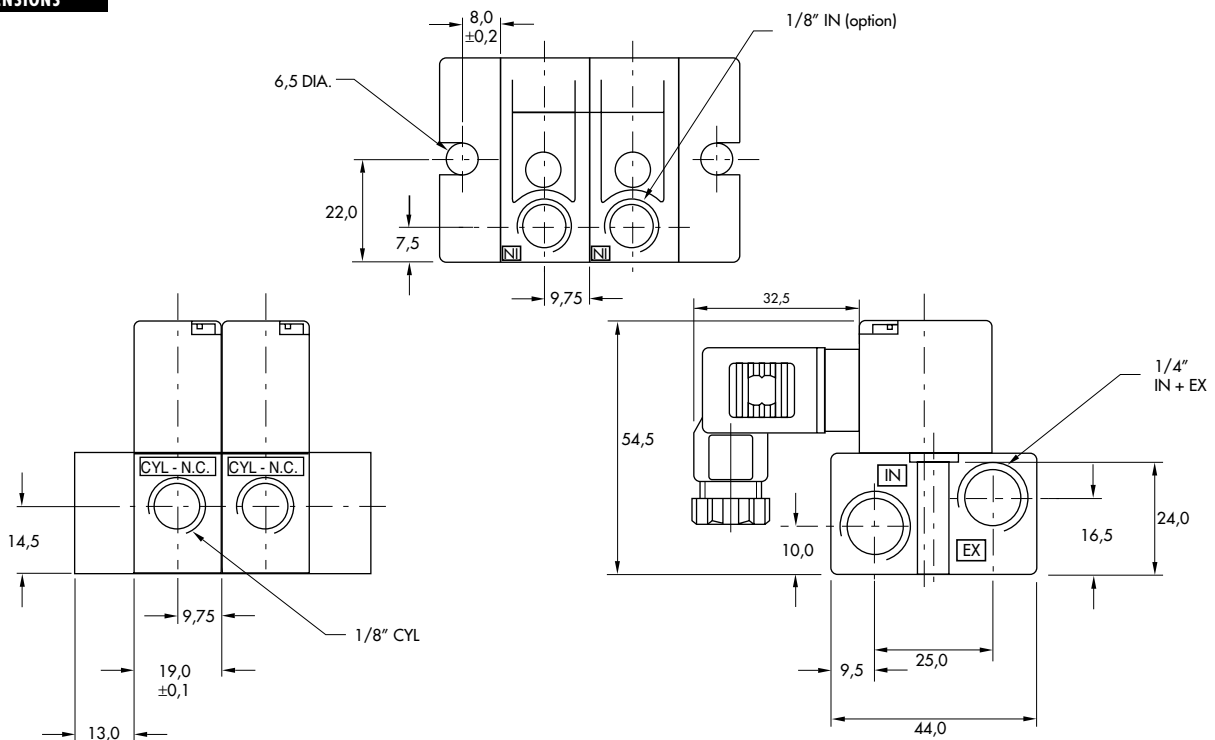
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402. • Pressure seal (between valves) : 16433.
- Tie-rod (x2) : 19813. • Inlet isolator : N-35002. • Exhaust isolator : N-35003. • Inlet & Exhaust isolator : N-35001.

#### Options :

- BSPP threads. • High flow up to 0.25 C<sub>v</sub>, according to wattage and high flow mod.

### DIMENSIONS

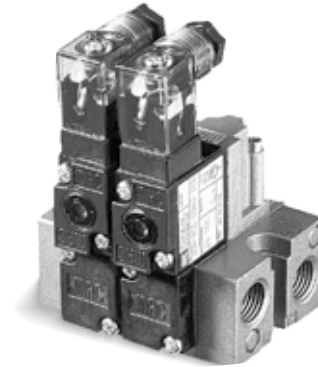
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b># 10-32, 1/8"</b>	<b>0.10 C<sub>v</sub></b>	sub-base non "plug-in"	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



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

### HOW TO ORDER

#### SIDE CYLINDER PORTS

Port size	Norm. closed Manifold base	Norm. open Manifold base
<b>Valve less base (universal)</b>	35A-B00-Dxxx-xxx	35A-B00-Dxxx-xxx
<b># 10-32 UNF base</b>	35A-BBE-Dxxx-xxx	35A-BBF-Dxxx-xxx
<b>1/8" NPTF base</b>	35A-BAE-Dxxx-xxx	35A-BAF-Dxxx-xxx

#### BOTTOM CYLINDER PORTS

Port size	Norm. closed Manifold base	Norm. open Manifold base
<b>Valve less base (universal)</b>	35A-B00-Dxxx-xxx	35A-B00-Dxxx-xxx
<b># 10-32 UNF base</b>	35A-BGE-Dxxx-xxx	35A-BGF-Dxxx-xxx
<b>1/8" NPTF base</b>	35A-BFE-Dxxx-xxx	35A-BFF-Dxxx-xxx

#### SOLENOID OPERATOR >

D **XX X- X XX**\*

XX Voltage	X Wire length	X Manual operator	XX
<b>AA</b> 120/60, 110/50	<b>A</b> 18" (Flying leads)	<b>1</b> Non-locking	<b>KA</b> Square connector
<b>AB</b> 240/60, 220/50	<b>J</b> Connector	<b>2</b> Locking	<b>KD</b> Square connector with light
<b>AC</b> 24/60, 24/50			<b>BA</b> Flying leads
<b>FB</b> 24 VDC (1.8 W)			
<b>DA</b> 24 VDC (5.4 W)			
<b>DF</b> 24 VDC (12.7 W)			

\* Other options available, see page 361.

End plate kit required (Port size : 1/4") : M-35003-01  
 Note : upon request, manifolds are mounted at the factory.

### OPTIONS

35A-EXX-Dxxx-xxx	35A-FXX-Dxxx-xxx	35A-OXX
- N.C. only valve	- universal w/gage port	- no valve body (base only)

### TECHNICAL DATA

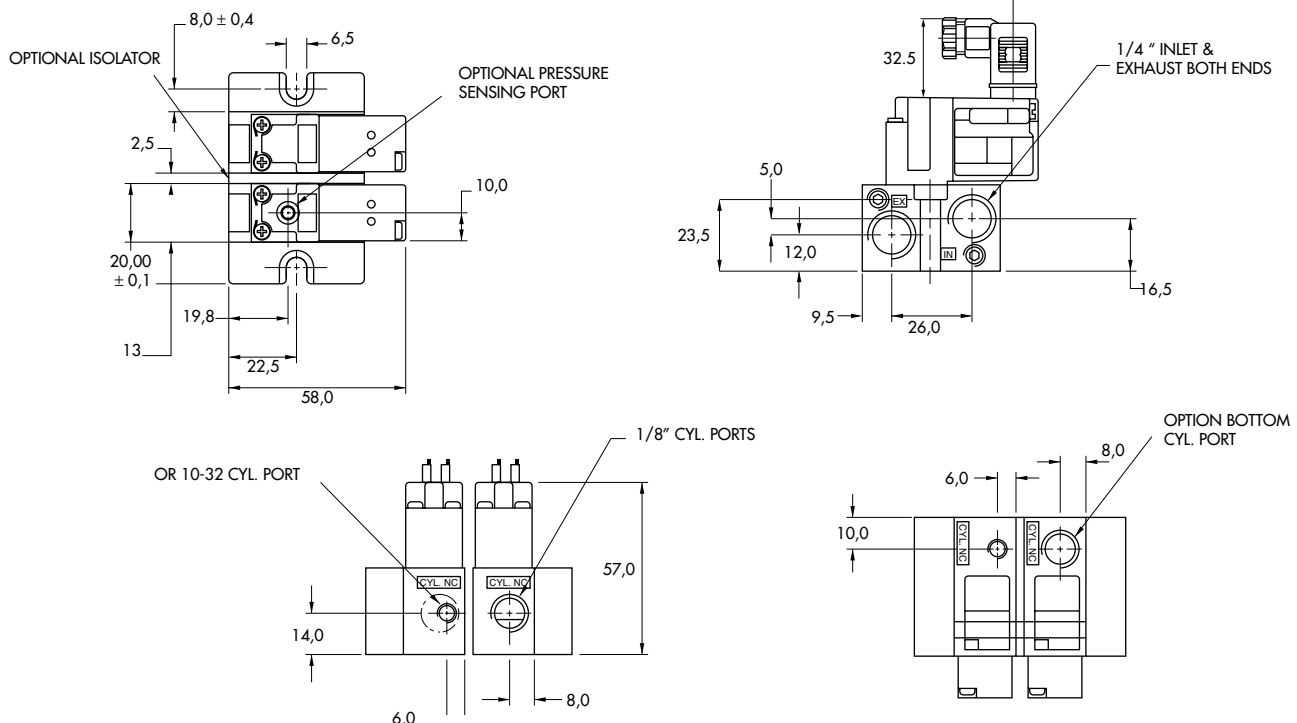
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Vacuum to 120 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1.8 W : 0.09 C <sub>v</sub> , 5.4 to 12.7 W : 0.1 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	- Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :      • Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.  
 • Seal (between solenoid and valve body) : 16402. • Pressure seal (between valve and base) : 16447.  
 • Pressure seal (between bases) : 16461. • Tie-rod (x2) : 19753. • Inlet isolator : N-35007. • Exhaust isolator : N-35008.  
 • Inlet & Exhaust isolator : N-35006.

Options :      • BSPP threads. • High flow up to 0.18 C<sub>v</sub>, according to wattage and high flow mod.

### DIMENSIONS

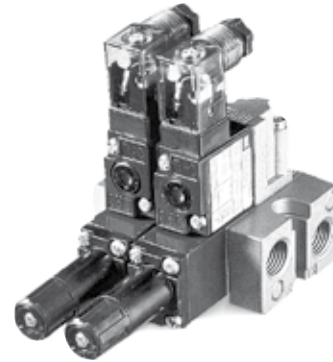
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b># 10-32, 1/8"</b>	<b>0.10 C<sub>v</sub></b>	sub-base with pressure regulators	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35

100

200

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700

900

82

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

### HOW TO ORDER

#### SIDE CYLINDER PORTS

Port size	Norm. closed Manifold base	Norm. open Manifold base
<b>Valve less base (universal)</b>	35A-B00-DXXX-XXX	35A-B00-DXXX-XXX
<b># 10-32 UNF base</b>	35A-BBJ-DXXX-XXX	35A-BBK-DXXX-XXX
<b>1/8" NPTF base</b>	35A-BAJ-DXXX-XXX	35A-BAK-DXXX-XXX

#### BOTTOM CYLINDER PORTS

Port size	Norm. closed Manifold base	Norm. open Manifold base
<b>Valve less base (universal)</b>	35A-B00-DXXX-XXX	35A-B00-DXXX-XXX
<b># 10-32 UNF base</b>	35A-BGJ-DXXX-XXX	35A-BGK-DXXX-XXX
<b>1/8" NPTF base</b>	35A-BFJ-DXXX-XXX	35A-BFK-DXXX-XXX

#### SOLENOID OPERATOR >

D **XX X- X XX**\*

XX Voltage	X Wire length	X Manual operator	XX
<b>AA</b> 120/60, 110/50	<b>A</b> 18" (Flying leads)	<b>1</b> Non-locking	<b>KA</b> Square connector
<b>AB</b> 240/60, 220/50	<b>J</b> Connector	<b>2</b> Locking	<b>KD</b> Square connector with light
<b>AC</b> 24/60, 24/50			<b>BA</b> Flying leads
<b>FB</b> 24 VDC (1.8 W)			
<b>DA</b> 24 VDC (5.4 W)			
<b>DF</b> 24 VDC (12.7 W)			

\* Other options available, see page 361.

End plate kit required (Port size : 1/4") : M-35003-01

Note : upon request, manifolds are mounted at the factory.

### OPTIONS

35A-EXX-DXXX-XXX

- N.C. only valve

35A-FXX-DXXX-XXX

- universal w/gage port

35A-QXX

- no valve body (base w/regulator)

### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	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 (at 6 bar, ΔP=1bar) :</b>	1.8 W : 0.09 C <sub>v</sub> , 5.4 to 12.7 W : 0.1 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :

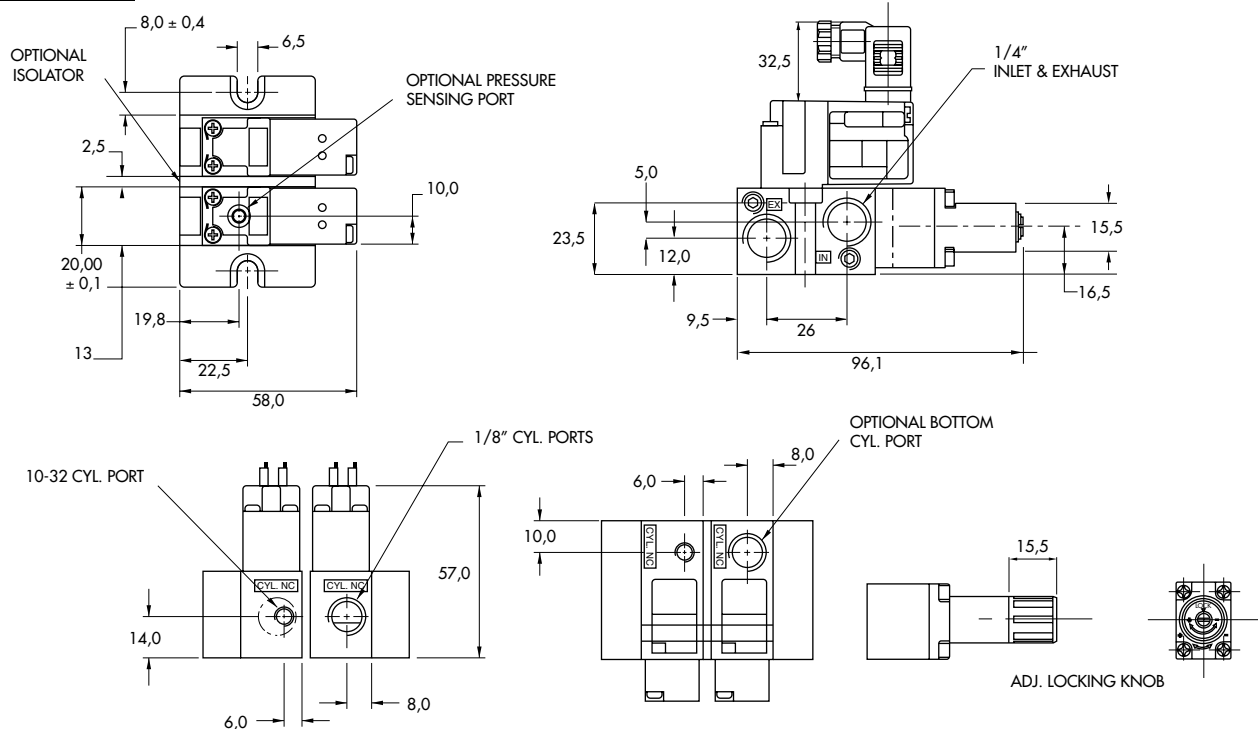
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402. • Pressure seal (between valve and base) : 16447.
- Pressure seal (between bases) : 16461. • Tie-rod (x2) : 19753. • Inlet isolator : N-35007. • Exhaust isolator : N-35008.
- Inlet & Exhaust isolator : N-35006. • Pressure regulator : 35A-00M (ADJ, KNOB) - 35A-00L (SLOTTED STEM).

Options :

- BSPP threads. • High flow up to 0.18 C<sub>v</sub>, according to wattage and high flow mod.

### DIMENSIONS

Dimensions shown are metric (mm)



### Individual mounting

inline

Series

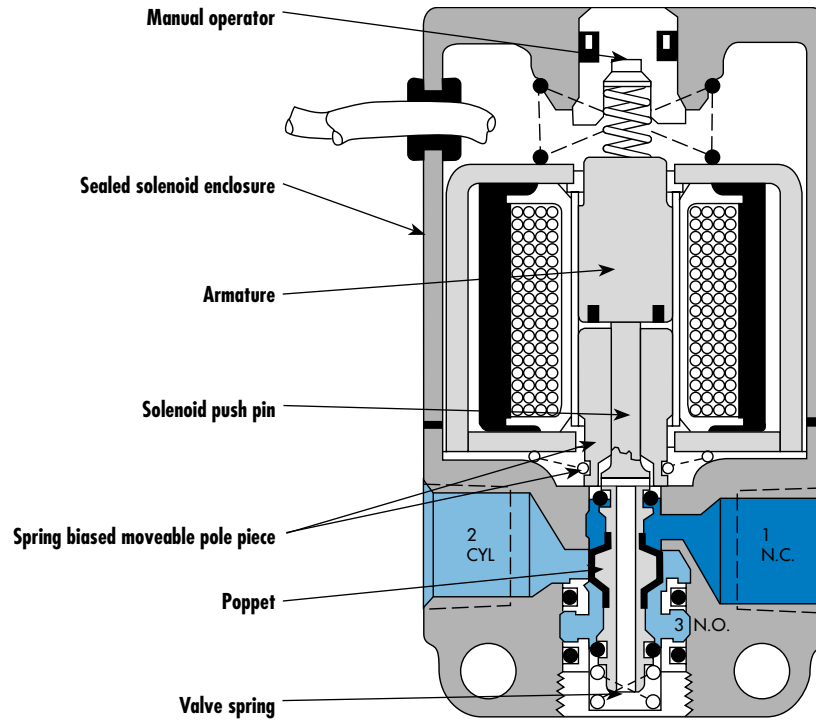
### Manifold mounting

stacking

sub-base  
non "plug-in"

35

100



200

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56

57

58

59

45

700

900

82

### SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Six valve functions with one individual valve.
- Individual, stacking body & add-a-unit manifold base capability.
- Use on lube or non-lube service.
- Extremely rapid response and cycle rate.
- Various types of manual operators and electrical enclosures.
- Extremely long service life.
- Optional low wattage DC solenoids down to 1 watt.

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

**APPLICATION CONVERSION PROCEDURE:**

**INDIVIDUAL MODELS**

The balanced poppet design facilitates using the same valve for 6 functions with any port being connected to vacuum, pressure or plugged. Piping is shown in the chart below.

**STACKING BODY MODELS**

The interchangeable function plate between the valve bodies permits selection of either 3-way Normally Closed or 3-way Normally Open operation.

**MANIFOLD BASE MODELS**

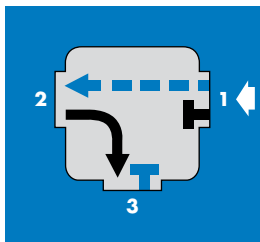
The interchangeable function plate between the valve bodies and base permits selection for 2- or 3-way, Normally Closed or Normally Open operation. On 3-way applications, one

function plate is used for both N.C. and N.O. When "3-NC" is visible on the plate, the function will be N.C. When "3-NO" is visible, the function is N.O. On 2-way applications, two separate plates are used—one for N.C., marked "2-NC"; the other for N.O., marked "2-NO". The 2-way plates block the exhaust at the valve, permitting the mixing in a stack of 3-ways and 2-ways. Changes within a stack from one function to another can be made without disturbing the plumbing.

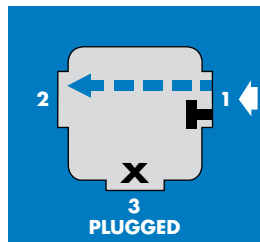
**N.C. ONLY MODELS**

A single purpose Normally Closed Only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired.

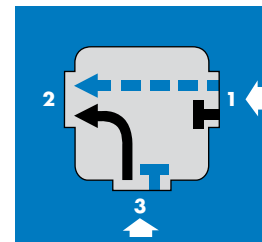
**PIPING CHART FOR INDIVIDUAL MODELS**



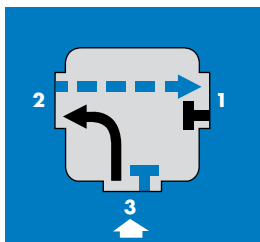
**3 Way  
Normally Closed**



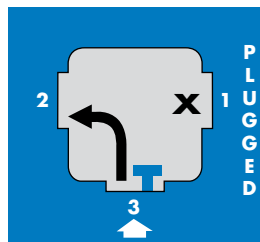
**2 Way  
Normally Closed**



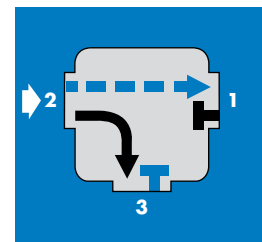
**Selector**



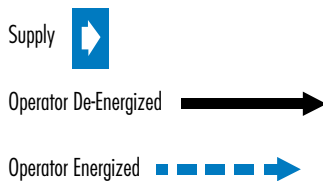
**3 Way  
Normally Open**



**2 Way  
Normally Open**



**Divertor**



Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8" - 1/4"</b>	<b>0.18 C<sub>v</sub></b>	inline	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35

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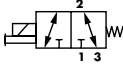
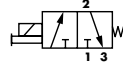
56

57

58

59

**HOW TO ORDER**

Port size	Universal valve	NC only valve
		
<b>1/8" NPTF</b>	111B- <b>XXYZZ</b>	161B- <b>XXYZZ</b>
<b>1/4" NPTF</b>	113B- <b>XXYZZ</b>	163B- <b>XXYZZ</b>

45

SOLENOID OPERATOR >

**XX Y ZZ\***

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

700

900

\* Other options available, see page 357.

82

Notes:

CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN

Individual inline valves can be changed from normally closed to normally open by connecting the inlet to port 3 instead of port 1.

NORMALLY CLOSED ONLY MODELS

A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

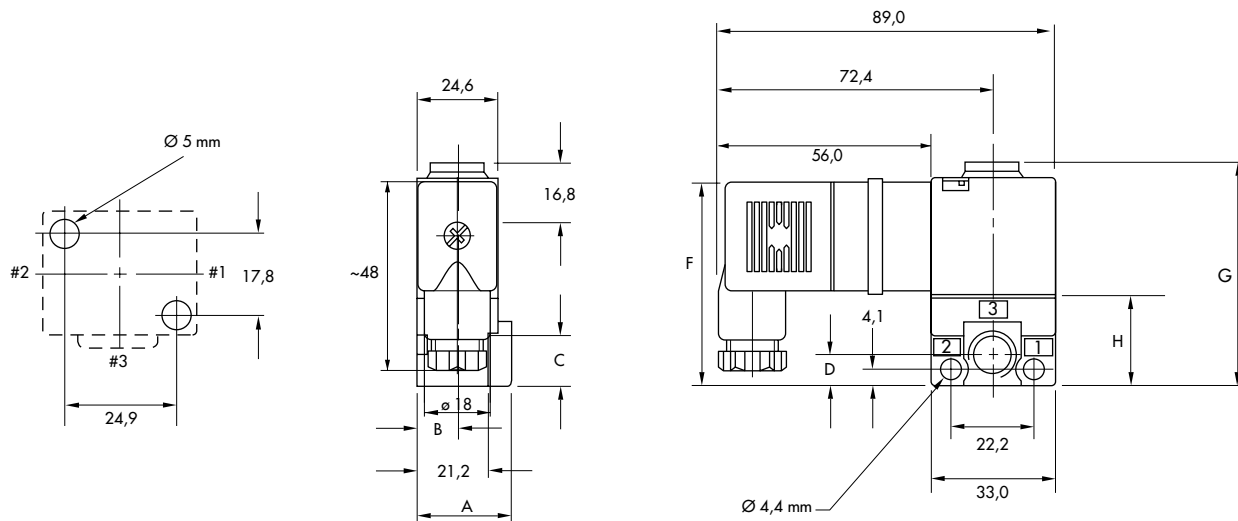


TECHNICAL DATA	
Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Vacuum to 150 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
Filtration :	40 μ
Temperature range :	0°F to 140°F (-18°C to 60°C)
Flow (at 6 bar, ΔP=1bar) :	0.18 C <sub>v</sub>
Coil :	General purpose class A, continuous duty, encapsulated
Voltage range :	-15% to +10% of nominal voltage
Protection :	Consult factory
Power :	~ Inrush : 14.8 VA      Holding : 10.9 VA = 1 to 17 W
Response times :	24 VDC (8.5 W)      Energize : 7 ms      De-energize : 2 ms 120/60              Energize : 3-8 ms      De-energize : 2-7 ms

Spare parts :      • Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 32184 and seal 16234.

Options :          • BSPP threads.

**DIMENSIONS** Dimensions shown are metric (mm)



<b>1/8"</b>	28.4	12.7	14.0	8.0	40.1	64.9	60.1	23.2
<b>1/4"</b>	29.8	13.3	12.7	9.9	40.9	65.8	60.9	24.1

Function	Port size	Flow (Max)	Manifold mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8" - 1/4"</b>	<b>0.18 C<sub>v</sub></b>	stacking	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35

100

200

55

56

57

58

59

**HOW TO ORDER**

Port size	Universal valve	NC only valve
<b>1/8" NPTF</b>	181B- <b>XXYZZ</b>	184B- <b>XXYZZ</b>
<b>1/4" NPTF</b>	183B- <b>XXYZZ</b>	185B- <b>XXYZZ</b>

45

**SOLENOID OPERATOR** ▶

**XX Y ZZ\***

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

700

900

\* Other options available, see page 357.

End plate kit required (Port size 1/4") : M-01001-01  
 "MB" option also requires end plate kit: M-01002-01

Notes:

**CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN**

In the case of stacking valves a reversible plate, complete with indicator, is placed between each valve body assembly. This determines whether the valve is N.C. or N.O.

**NORMALLY CLOSED ONLY MODELS**

A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

82

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

### TECHNICAL DATA

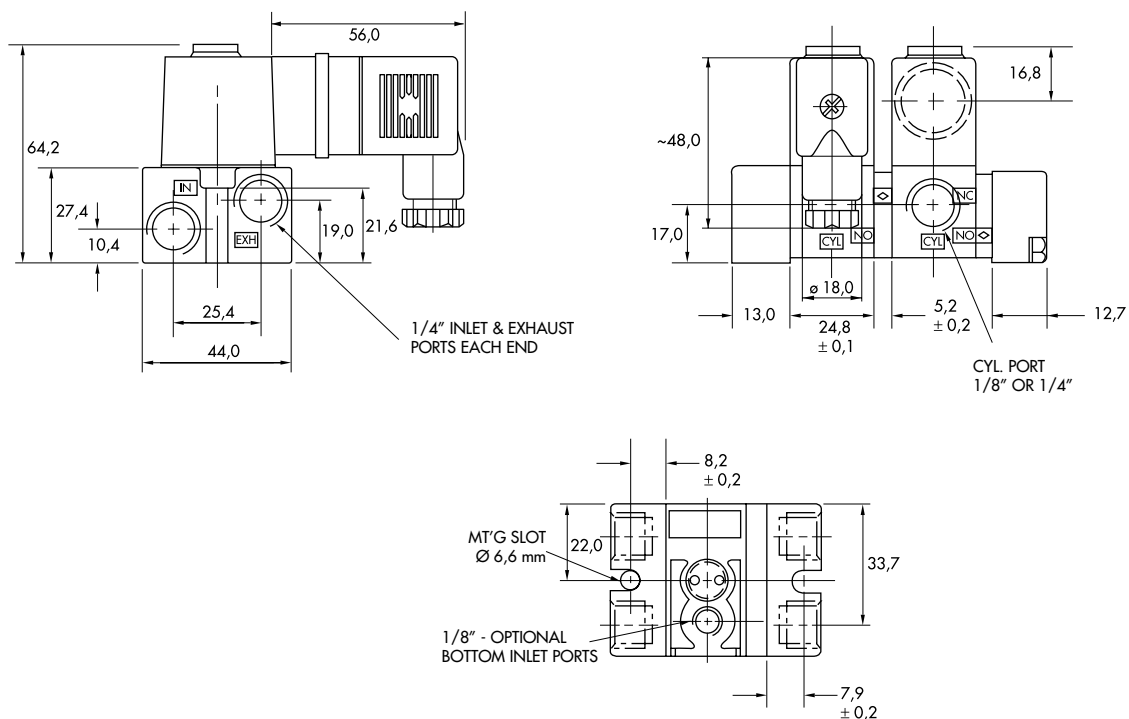
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Vacuum to 150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 140°F (-18°C to 60°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	0.18 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush 14.8 VA      Holding : 10.9 VA DC : 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 7 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :      • Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.  
 • Function plate : N-01002. • Tie-rod (x2) : 19674. • Inlet isolator plate : N01003. • Exhaust isolator plate : N01004.

Options :      • BSPP threads. • Bottom inlet (Mod. 0210).

### DIMENSIONS

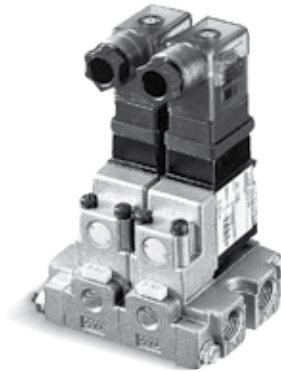
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8"</b>	<b>0.14 C<sub>v</sub></b>	sub-base non "plug-in"	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35

100

200

55

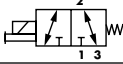
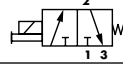
56

57

58

59

**HOW TO ORDER**

Port size	Universal valve	NC only valve
		
<b>Valve less base</b>	130B- <b>XXYZZ</b>	170B- <b>XXYZZ</b>
<b>1/8" base NPTF</b>	132B- <b>XXYZZ</b>	172B- <b>XXYZZ</b>

45

SOLENOID OPERATOR ➤

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking	<b>JB</b> Rectangular connector
<b>12</b> 240/60, 220/50	<b>2</b> Locking	<b>JD</b> Rectangular connector with light
<b>22</b> 24/60, 24/50		<b>BA</b> Flying leads (18")
<b>59</b> 24 VDC (2.5 W)		<b>MA</b> Common conduit 1" NPS
<b>87</b> 24 VDC (17.1 W)		<b>RA</b> Conduit 3/8" NPS
<b>61</b> 24 VDC (8.5 W)		

700

900

\* Other options available, see page 357.

End plate kit required (Port size : 1/4" ) : A2-5004-01  
"MA" option also requires end plate kit : M-01002-01

82

6300

**OPTIONS**

<b>12XB-XXYZZ</b>	2-way N.C.
<b>14XB-XXYZZ</b>	2-way N.O.
<b>102</b>	(Base only)

6500

6600

1300

800

Notes:

CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN

For manifold base mounted valves a plate is provided between the valve and the base. Three plates are available; a reversible plate for 3 Way valves (N.C. & N.O.), one plate for 2 Way N.C. and one for 2 Way N.O. Appropriate plates, determined by the valve model number, are supplied automatically with the valve.

NORMALLY CLOSED ONLY MODELS

A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Vacuum to 150 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 140°F (-18°C to 60°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	0.14 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	- Inrush : 14.8 VA      Holding : 10.9 VA = 1 to 17 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 7 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

**Spare parts :**

- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 32184 and seal 16234.
- Function plate : A2-7009. • Seal between manifold bases : 16226. • Tie-rod (x2) : 19546.

**Options :**

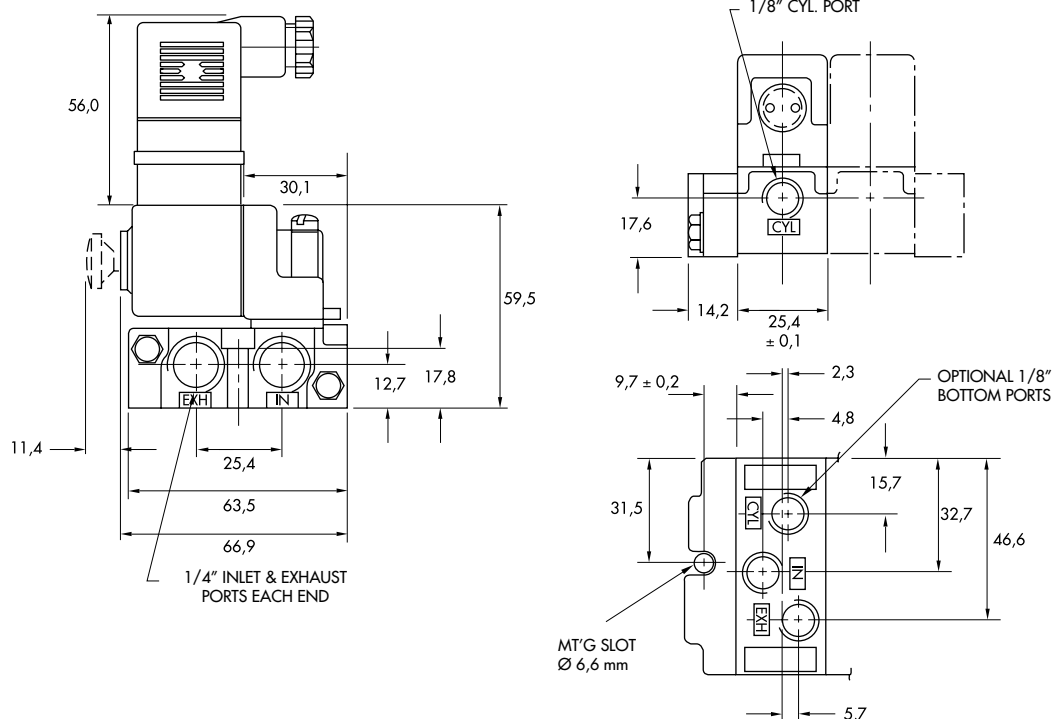
- BSPP threads. • Isolation of inlet : Mod. 313P. • Isolation of exhaust : Mod. 313E. • Additional bottom inlet : Mod. 0210.
- Bottom cyl. port : Mod. 0009. • All bottom & side ports : Mod. 0004.

**Note :**

- Specify mod. number after valve model number (i.e. 132B-111BA Mod. 0210)

### DIMENSIONS

Dimensions shown are metric (mm)



### Individual mounting

inline	inline hazardous location
--------	---------------------------

Series

### Manifold mounting

sub-base non "plug-in"	sub-base with pressure regulators	sub-base hazardous location
------------------------	-----------------------------------	-----------------------------

35

100

200

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59

45

700

900

82

6300

6500

6600

1300

800

ISO 1

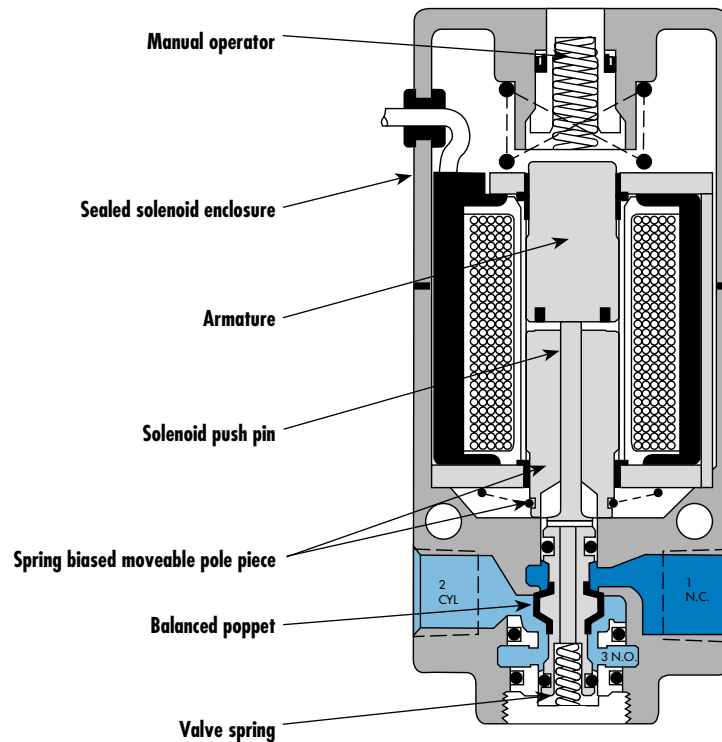
ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A



### SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Six valve functions with one Inline valve and four valve functions with one Manifold valve.
- A triple rated coil for 120/60, 110/50 or 24 VDC (6 Watt).
- Inline & add-a-unit manifold capability.
- Use on lube or non-lube service.
- Extremely rapid response and cycle rate.
- Various types of manual operators and electrical enclosures.
- Extremely long service life.
- Optional low wattage DC solenoids down to 1 watt.

**APPLICATION CONVERSION PROCEDURE:**

**INDIVIDUAL MODELS**

The balanced poppet design facilitates using the same valve for 6 functions with any port being connected to vacuum, pressure or plugged. Piping is shown in the chart below.

**MANIFOLD MODELS**

The interchangeable function plate between the valve body and base permits selection for 2- or 3-way, Normally Closed or Normally Open operation, instead of through piping as shown below in the Inlines. On 3-way applications, one function plate is used for both N.C. and N.O. When "3-C" is visible on the plate, the function will be N.C.

When "3-O" is visible, the function is N.O. On 2-way applications, a separate plate is used and like the 3-way plate is marked "2-C" for N.C. and "2-O" on the other side for N.O. The 2-way plates block the exhaust at the valve, permitting the mixing in a stack of

3-ways and 2-ways. Changes within a stack from one function to another can be made without disturbing the plumbing.

**SPECIAL APPLICATIONS:**

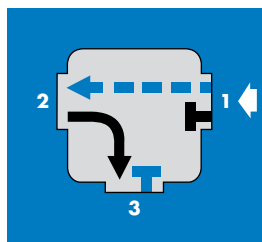
**N.C. ONLY MODELS**

A single purpose Normally Closed Only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired.

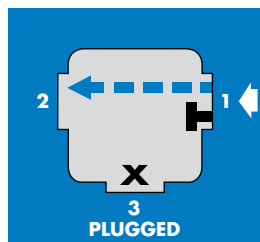
**EXPLOSION PROOF MODELS**

These models are designed to meet C.S.A. standards for Division 1, Class I, Groups B, C, D and Class II, Groups E, F and G (NEMA equivalent to Class I is NEMA 7; Class II is NEMA 9). Explosion proof models are available in either inline or manifold versions but only with the no operator ("O") manual operator.

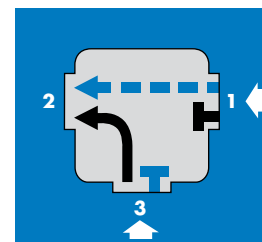
**PIPING CHART FOR INDIVIDUAL MODELS**



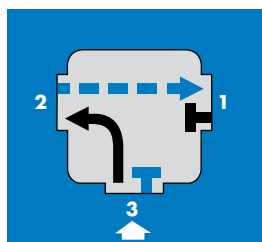
**3 Way  
Normally Closed**



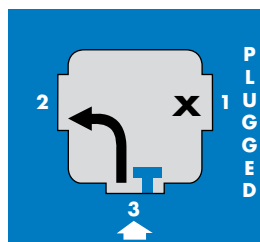
**2 Way  
Normally Closed**



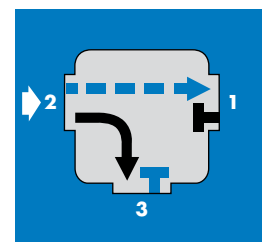
**Selector**



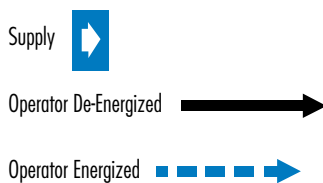
**3 Way  
Normally Open**



**2 Way  
Normally Open**



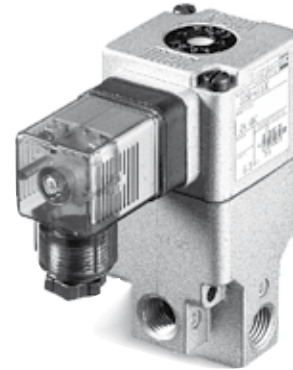
**Diverter**



Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8" - 1/4"</b>	<b>0.5 C<sub>v</sub></b>	inline	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35

100

200

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56

57

58

59

**HOW TO ORDER**

Port size	Universal valve	NC only valve
<b>1/8" NPTF</b>	224B- <b>XXYZZ</b>	274B- <b>XXYZZ</b>
<b>1/4" NPTF</b>	225B- <b>XXYZZ</b>	275B- <b>XXYZZ</b>

45

SOLENOID OPERATOR >

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50, 24 VDC (6.0 W)	<b>1</b> Non-locking	<b>JA</b> Square connector
<b>12</b> 240/60, 220/50	<b>2</b> Locking	<b>JC</b> Square connector with light
<b>22</b> 24/60, 24/50		<b>BA</b> Flying leads (18")
<b>52</b> 24 VDC (2.5 W)		<b>CA</b> Conduit 1/2" NPS
<b>78</b> 24 VDC (24.0 W)		
<b>61</b> 24 VDC (8.5 W)		

700

900

\* Other options available, see page 357.

Notes:

CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN

Individual inline valves can be changed from normally closed to normally open by connecting the inlet to port 3 instead of port 1.

NORMALLY CLOSED ONLY MODELS

A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

82

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A



**TECHNICAL DATA**

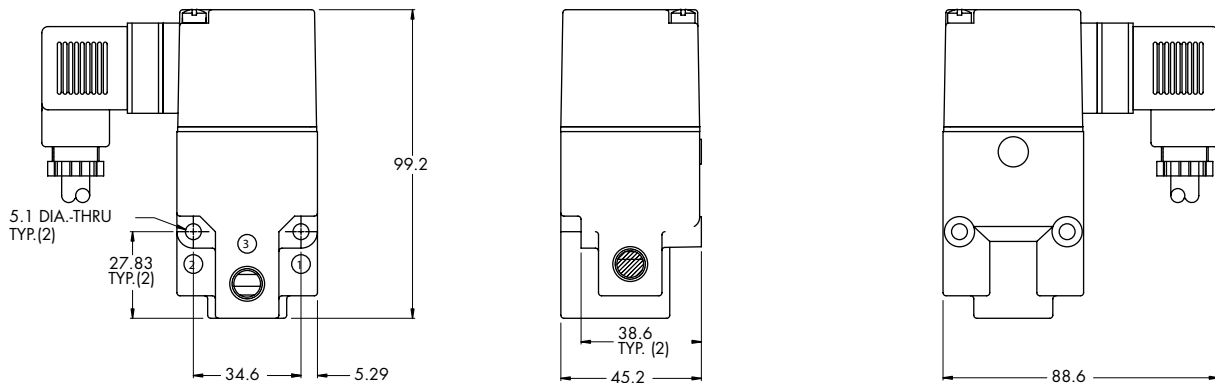
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Vacuum to 150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 140°F (-18°C to 60°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	0.5 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

Spare parts : •Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.

Options : • BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8" - 1/4"</b>	<b>0.5 C<sub>v</sub></b>	inline hazardous location	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Burn-out proof solenoid on AC service.



35

100

200

55

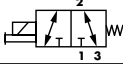
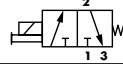
56

57

58

59

**HOW TO ORDER**

Port size	Universal valve	NC only valve
		
<b>1/8" NPTF</b>	224B-XX0EA	274B-XX0EA
<b>1/4" NPTF</b>	225B-XX0EA	275B-XX0EA

45

**SOLENOID OPERATOR** >

**XX**

XX	Voltage
11	120/60, 110/50, 24 VDC (6.0 W)
12	240/60, 220/50
22	24/60, 24/50
50	24 VDC (6.0 W)
55	12 VDC (6.0 W)
60	12 VDC (9.5 W)
61	24 VDC (8.5 W)

700

900

82

Notes:

The special version of the 200 Series designed for hazardous locations has been approved by CSA for Class I, Groups B, C & D; Class II, Groups E, F & G. Maximum rated fluid and ambient temperature is 40°C; maximum pressure is 150 p.s.i. Approval is limited to certain common AC & DC voltages which are those designated in the table above.

6300

These valves are supplied without manual operators. This version of the 200 Series can be supplied on the standard individual inline or the manifold valve body assemblies. It can also be supplied as a pilot for the 57, 58 and 59 Series (with special adapter plate # M-00012).

6500

6600

**CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN**

Individual inline valves can be changed from normally closed to normally open by connecting the inlet to port 3 instead of port 1.

1300

**NORMALLY CLOSED ONLY MODELS**

A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

**TECHNICAL DATA**

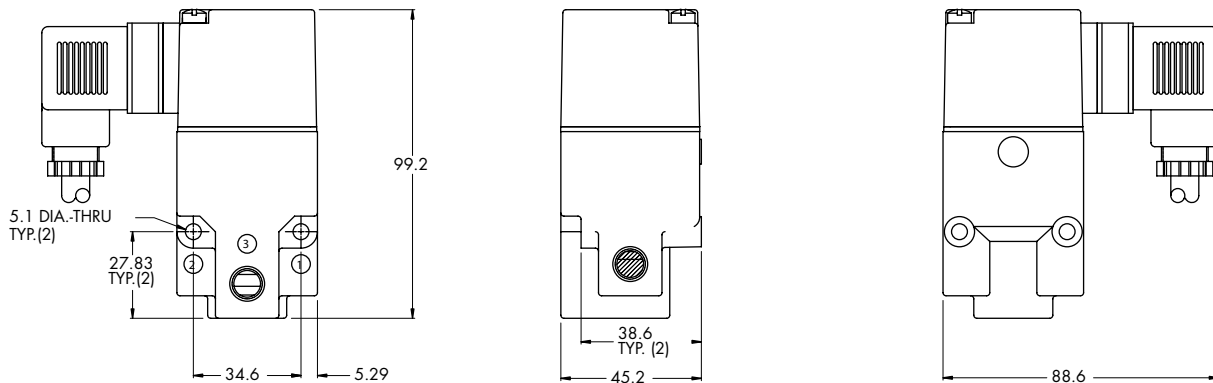
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Vacuum to 150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 140°F (-18°C to 60°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	0.5 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

Spare parts : •Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.

Options : • BSPP threads.

**DIMENSIONS**

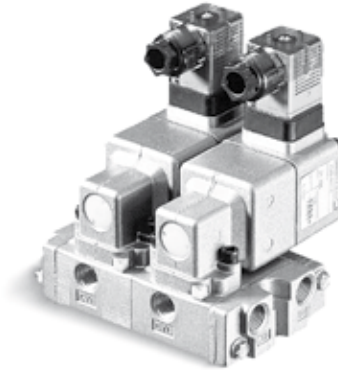
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8" - 1/4"</b>	<b>0.5 C<sub>v</sub></b>	sub-base non "plug-in"	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Universal valve	NC only valve
<b>Valve less base</b>	250B- <b>XXYZZ</b>	280B- <b>XXYZZ</b>
<b>1/8" base NPTF</b>	256B- <b>XXYZZ</b>	286B- <b>XXYZZ</b>
<b>1/4" base NPTF</b>	257B- <b>XXYZZ</b>	287B- <b>XXYZZ</b>

45

SOLENOID OPERATOR ▶

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50, 24 VDC (6.0 W)	<b>1</b> Non-locking	<b>JC</b> Square connector with light
<b>12</b> 240/60, 220/50	<b>2</b> Locking	<b>JA</b> Square connector
<b>22</b> 24/60, 24/50		<b>BA</b> Flying leads (18")
<b>52</b> 24 VDC (2.5 W)		<b>CA</b> Conduit 1/2" NPS
<b>78</b> 24 VDC (24.0 W)		
<b>61</b> 24 VDC (8.5 W)		

700  
900  
82

\* Other options available, see page 357.

End plate kit required (Port size : 1/4") : A2-5003-01.

**OPTIONS**

26XB- <b>XXYZZ</b>	206	207
- universal 2-way	(Base only - 1/8")	(Base only - 1/4")

6300  
6500  
6600  
1300  
800

CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN

For manifold base mounted valves a plate is provided between the valve and the base. Three plates are available; a reversible plate for 3 Way valves (N.C. & N.O.), one plate for 2 Way N.C. and one for 2 Way N.O. Appropriate plates, determined by the valve model number, are supplied automatically with the valve.

NORMALLY CLOSED ONLY MODELS

A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Vacuum to 150 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 140°F (-18°C to 60°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	0.5 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	- Inrush : 33 VA      Holding : 19.7 VA = 1 to 24 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

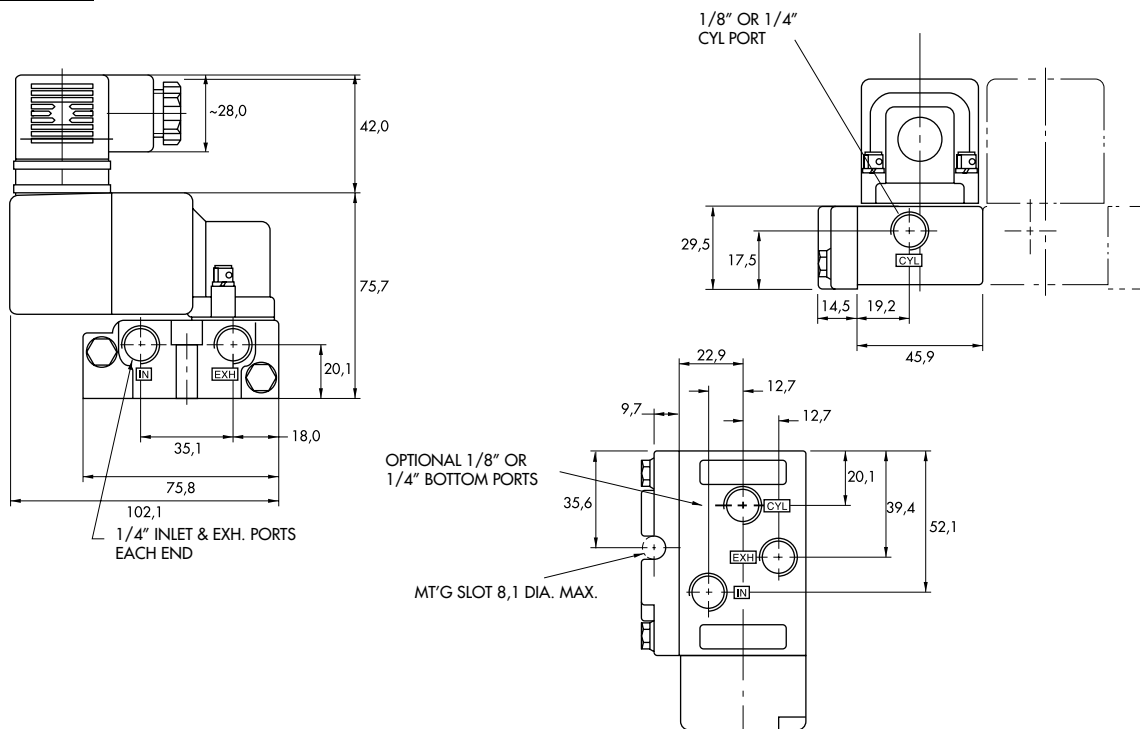
Spare parts : • Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.  
• Function plate : A2-7005. • Seal between bases : B5-5010. • Tie-rod (x2) : B4-9004.

Options : • BSPP threads. • Explosion-proof model. • Isolation of inlet : Mod. 313P. • Isolation of exhaust : Mod. 313E.  
• Additional bottom inlet : Mod. 0210. • Bottom cyl. port : Mod. 0009. • All bottom & side ports : Mod. 0004.

Note : • Specify Mod. number after valve model number (i.e. 257B-111BA Mod. 0210)

### DIMENSIONS

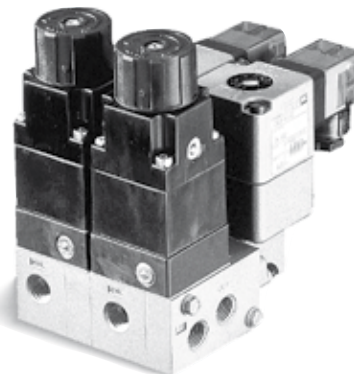
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/4"</b>	<b>0.4 C<sub>v</sub></b>	sub-base with pressure regulators	



**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.
7. Individual pressure control to each cylinder port.



35  
100  
**200**  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Universal valve	NC only valve	
			
<b>Valve less base</b>	250B- <b>XXYZZ</b>	280B- <b>XXYZZ</b>	
<b>1/4" base NPTF</b>	252B- <b>XXYZZ</b>	282B- <b>XXYZZ</b>	<b>45</b>

SOLENOID OPERATOR ►

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection	
<b>11</b> 120/60, 110/50, 24 VDC (6.0 W)	<b>1</b> Non-locking	<b>JA</b> Square connector	<b>700</b>
<b>12</b> 240/60, 220/50	<b>2</b> Locking	<b>JC</b> Square connector with light	
<b>22</b> 24/60, 24/50		<b>BA</b> Flying leads (18")	<b>900</b>
<b>52</b> 24 VDC (2.5 W)		<b>CA</b> Conduit 1/2" NPS	
<b>78</b> 24 VDC (24.0 W)			<b>82</b>
<b>61</b> 24 VDC (8.5 W)			<b>6300</b>

\* Other options available, see page 357.

Manifold fastening kit required : N-02003

**MODEL**

- 252B-** 3-Way N.C. or N.O.
- 262B-** 2-Way N.C. or N.O.
- 282B-** 3-Way N.C. only

**INDIVIDUAL PRESSURE CONTROL TO EACH CYLINDER PORT**

In this version the common inlet pressure supplies each individual valve in the stack. This common pressure passes through a relieving type regulator mounted on the same base as the valve and is supplied through the function plate to the Normally Closed or Normally Open poppet position. Through use of the appropriate function plate on the 200 Series basic valve, the operation can be Normally Closed Or Normally Open, 3-way or 2-way except for 282B models which are Normally Closed only. The exhaust ("out") port is common. Operation of the valves then opens or closes the cylinder port (See schematic diagram next page).

45  
**700**  
900  
82  
6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

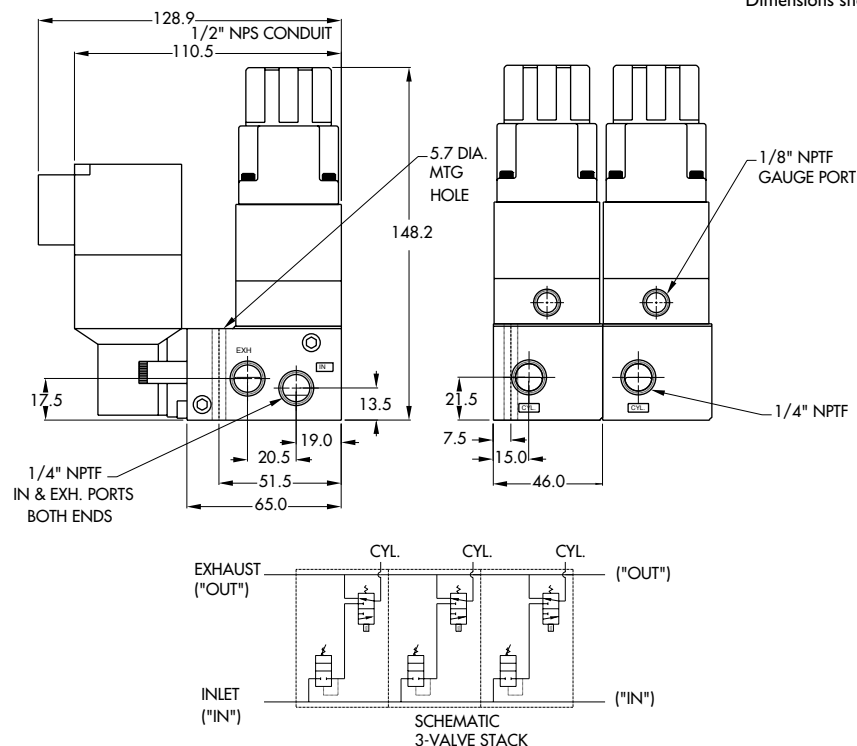
### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Vacuum to 150 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 140°F (-18°C to 60°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	0.4 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	- Inrush : 33 VA      Holding : 19.7 VA = 1 to 24 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

- Spare parts :
- Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.
  - Function plate : A2-7005. • Seal between bases (x2) : 17016-01. • Tie-rod (x2) : B4-9004. • Pressure regulator : PR02A-A0AA.
- Options :
- BSPP threads. • Explosion-proof model. • Isolation of inlet and/or exhaust.
  - Mod. PR80 (0-80 pressure range), Mod PR30 (0-30 pressure range)

### DIMENSIONS

Dimensions shown are metric (mm)



Function	Inlet & outlet port size	Flow (Max)	Manifold mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/4"</b>	<b>0.4 C<sub>v</sub></b>	sub-base with pressure regulators	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.
7. Selected pressure control to a single outlet.



35  
100  
**200**  
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57  
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59

**HOW TO ORDER**

Port size	NC only valve
	
Valve	251B- <b>XXYZZ</b>

SOLENOID OPERATOR ►

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50, 24 VDC (6.0 W)	<b>1</b> Non-locking	<b>JA</b> Square connector
<b>12</b> 240/60, 220/50	<b>2</b> Locking	<b>JC</b> Square connector with light
<b>22</b> 24/60, 24/50		<b>BA</b> Flying leads (18")
<b>52</b> 24 VDC (2.5 W)		<b>CA</b> Conduit 1/2" NPS
<b>78</b> 24 VDC (24.0 W)		
<b>61</b> 24 VDC (8.5 W)		

45  
700  
900  
82

\* Other options available, see page 357.

Manifold fastening kit required : N-02003

**MODEL**

**251B-**  
3-Way Normally Closed

**SELECTED PRESSURE CONTROL TO A SINGLE OUTLET**

This version permits the alternate selection of any of the regulated pressures in the stack to one common outlet. With all valves de-energized the regulated pressure supplied to the Normally Open pressure port passes through the valves and out the corresponding port at the other end of the stack (Common Outlet Port). Pressure supplied to the common inlet port is regulated at each valve and blocked by the poppet of each valve. When a valve is shifted in the stack the Normally Open pressure is blocked and the regulated normally closed pressure of that valve is open to the common outlet. If two valves are energized at the same time the pressure at the common outlet would be that of the energized valve nearest the outlet. If the normally open pressure port is not used it is open to exhaust from the common outlet. The individual cylinder port in each base is non-operative. (See schematic diagram next page).

6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A



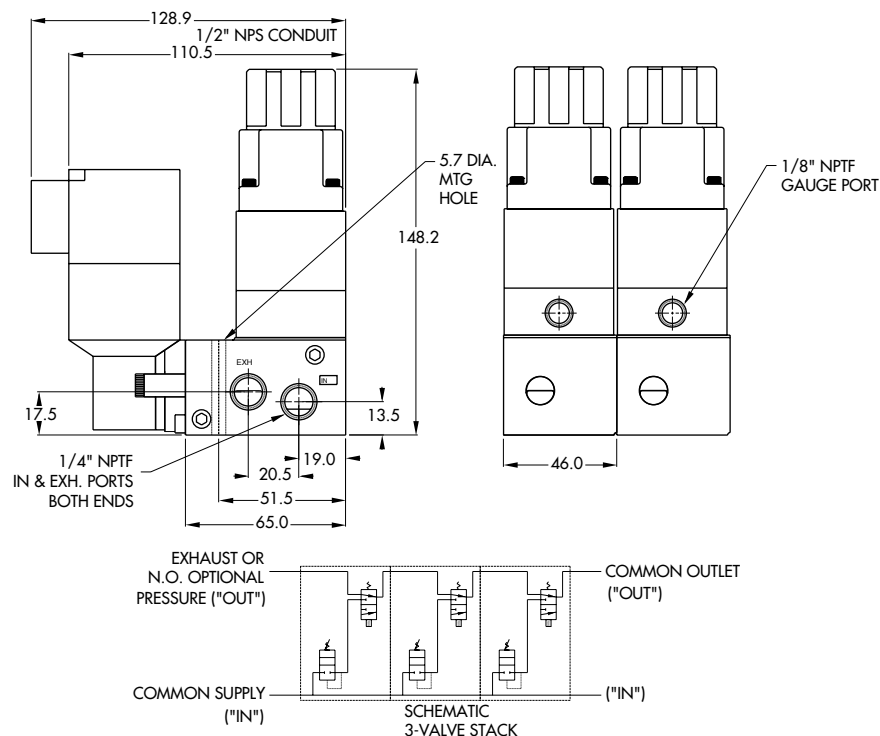
### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Vacuum to 150 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 140°F (-18°C to 60°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	0.4 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	- Inrush : 33 VA      Holding : 19.7 VA = 1 to 24 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

- Spare parts :
- Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.
  - Function plate : A2-7005. • Seal between bases (x2) : 17016-01. • Tie-rod (x2) : B4-9004. • Pressure regulator : PR02A-A0AA.
- Options :
- BSPP threads. • Explosion-proof model. • Isolation of inlet and/or exhaust.
  - Mod. PR80 (0-80 pressure range), Mod PR30 (0-30 pressure range)

### DIMENSIONS

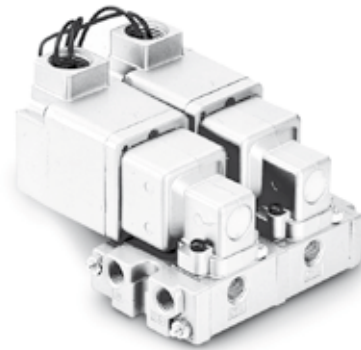
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8" - 1/4"</b>	<b>0.5 C<sub>v</sub></b>	sub-base hazardous location	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Universal valve	NC only valve	
<b>Valve less base</b>	250B-XXOEA	280B-XXOEA	
<b>1/8" base NPTF</b>	258B-XXOEA	288B-XXOEA	45
<b>1/4" base NPTF</b>	259B-XXOEA	289B-XXOEA	

SOLENOID OPERATOR >

**XX**

XX	Voltage
11	120/60, 110/50, 24 VDC (6.0 W)
12	240/60, 220/50
22	24/60, 24/50
50	24 VDC (6.0 W)
55	12 VDC (6.0 W)
60	12 VDC (9.5 W)
61	24 VDC (8.5 W)

End plate kit required (Port size : 1/4") : A2-5003-01.

**OPTIONS**

26XB-XXOEA	208	209
- universal 2-way	(Base only - 1/8")	(Base only - 1/4")

Notes:

The special version of the 200 Series designed for hazardous locations has been approved by CSA for Class I, Groups B, C & D; Class II, Groups E, F & G. Maximum rated fluid and ambient temperature is 40°C; maximum pressure is 150 p.s.i.

Approval is limited to certain common AC & DC voltages which are those designated in the table above.

These valves are supplied without manual operators. This version of the 200 Series can be supplied on the standard individual inline or the manifold valve body assemblies. It can also be supplied as a pilot for the 57, 58 and 59 Series (with special adapter plate # M-00012).

CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN

For manifold base mounted valves a plate is provided between the valve and the base. Three plates are available; a reversible plate for 3 Way valves (N.C. & N.O.), one plate for 2 Way N.C and one for 2 Way N.O. Appropriate plates, determined by the valve model number, are supplied automatically with the valve. NORMALLY CLOSED ONLY MODELS

A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

700  
900  
82  
6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

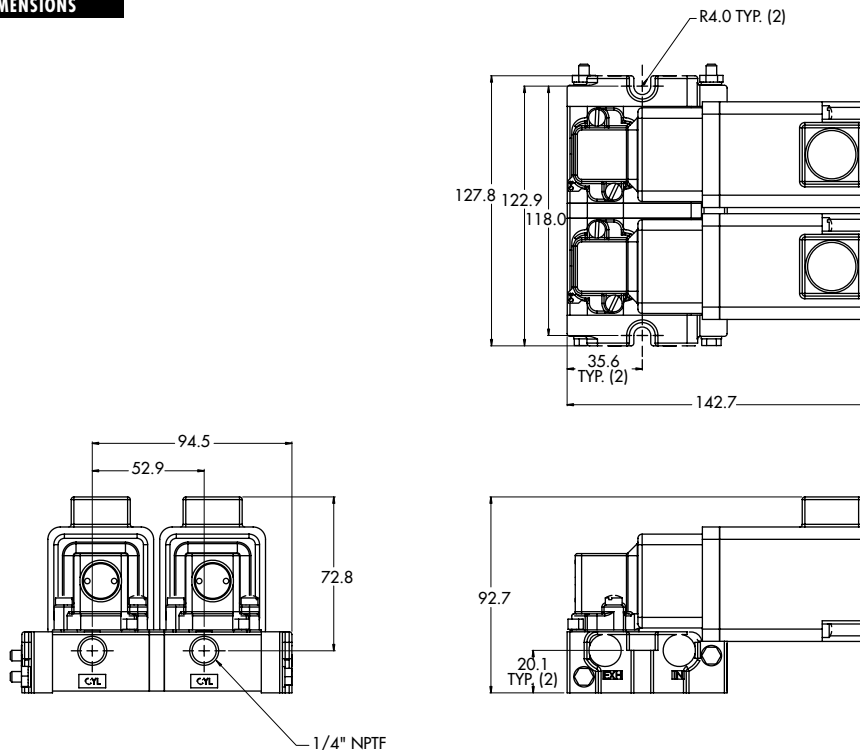
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Vacuum to 150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 140°F (-18°C to 60°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	0.5 C <sub>v</sub>		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

Spare parts : •Solenoid operator (power ≥ 6 W) : D4-XXAAC-0EA. • Function plate : A2-7005. • Seal between bases : B5-5010.  
• Tie-rod (x2) : 19598.

Options : • BSPP threads. • Isolation of inlet : Mod. 313P. • Isolation of exhaust : Mod. 313E.  
• Additional bottom inlet : Mod 0210.

**DIMENSIONS**

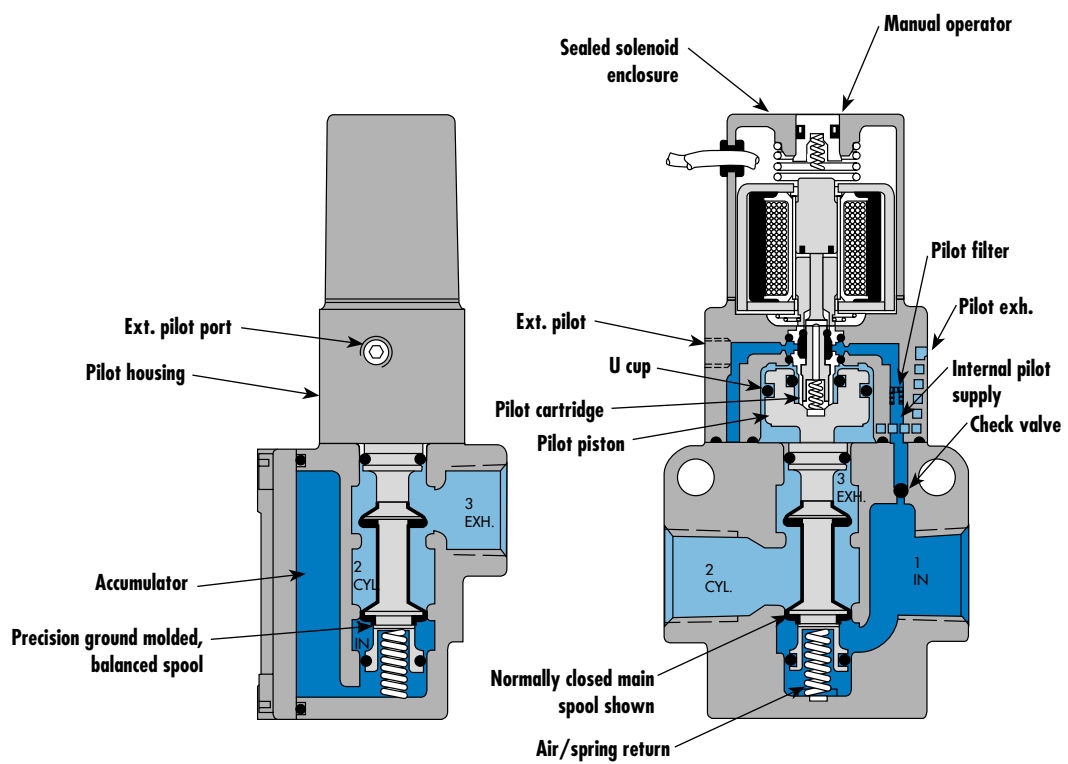
Dimensions shown are metric (mm)



### Individual mounting

inline

Series



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

- The patented MACSOLENOID<sup>®</sup> with its non-burn out feature on AC service.
- Balanced spool unaffected by back pressure in the exhaust or by inlet restrictions.  
May be plugged for 2-way operation.
- A large checked accumulator which supplies the pilot and air/spring return for consistent shifting.
- Use on lube or non-lube service.
- Extremely rapid response and cycle rate.
- Various types of manual operators and solenoid enclosures.
- Optional low wattage DC solenoids down to 1 watt.



### VALVE CONFIGURATIONS AVAILABLE

- 3-Way Normally Open or Normally Closed (solenoid or remote air).
- 2-Way (by plugging a port) Normally Open or Normally Closed (solenoid or remote air).
- Internal pilot or External pilot for vacuum to 30 PSI main valve pressures on solenoid or 25 on remote air operated models. Manual and mechanical operators available.

### SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

These air versions feature:

- A large checked accumulator for air/spring return.
- Balanced spool unaffected by back pressure in the exhaust or by inlet restrictions. May be plugged for 2-way operation.
- Use on lube or non-lube service.

### SERIES FEATURES-REMOTE AIR PILOT, PILOT OPERATED VALVES

These special air versions have the same features as the remote air pilot operated models, but additionally feature:

- Ability to use a pilot signal pressure different from the main valve pressure. Pilot signal can be from 30 to 150 PSI, regardless of main valve pressure.
- A manual operator and position indicator standard.

### SPECIAL APPLICATIONS:

- VACUUM APPLICATIONS: Connect the vacuum source to port #3 with port #1 open to atmosphere, and use external pilot on solenoid pilot operated models. On remote air pilot models, use **-RE**.
- SELECTOR APPLICATIONS: Pipe higher pressure to port #1 and lower pressure to port #3.
- INTERNAL PILOT: Use for main valve pressure of 30 to 150 PSI on all models. Includes ball check in the body and an M5x0.8 plug installed in the external pilot port.
- EXTERNAL PILOT: An external pilot supply is required when main valve pressures are lower than 30 psi on solenoid pilot or 25 psi on remote air pilot operated models. To convert from internal to external pilot on solenoid models simply rotate pilot housing 180 degrees and connect external pilot source. (Use either M5 or #10-32 fitting.) On remote air pilot models, specify **-RE**.

Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/4" - 3/8"</b>	<b>2.2 C<sub>v</sub></b>	inline	

**OPERATIONAL BENEFITS**

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- The piston (booster) provides maximum shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



35  
100  
200  
**55**  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Pilot air	NC valve	NO valve	
<b>1/4" NPTF</b>	Internal	55B-11-PI- <b>XXYYZZ</b>	55B-21-PI- <b>XXYYZZ</b>	
<b>3/8" NPTF</b>	Internal	55B-12-PI- <b>XXYYZZ</b>	55B-22-PI- <b>XXYYZZ</b>	45
<b>1/4" NPTF</b>	External	55B-11-PE- <b>XXYYZZ</b>	55B-21-PE- <b>XXYYZZ</b>	
<b>3/8" NPTF</b>	External	55B-12-PE- <b>XXYYZZ</b>	55B-22-PE- <b>XXYYZZ</b>	

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)			CA	Conduit 1/2" NPS

\* Other options available, see page 357.

700  
900  
82  
6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : 30 to 150 PSI External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	30 to 150 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 (at 6 bar, ΔP=1bar) :</b>	Norm. Closed : 1/4" (1.4 C <sub>v</sub> ), 3/8" (1.6 C <sub>v</sub> ), Norm. Open : 1/4" (1.8 C <sub>v</sub> ), 3/8" (2.2 C <sub>v</sub> )		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA      Holding : 10.9 VA = 1 to 17 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 9 ms	De-energize : 4.8 ms
	120/60	Energize : 5-11 ms	De-energize : 5-11 ms

Spare parts : 

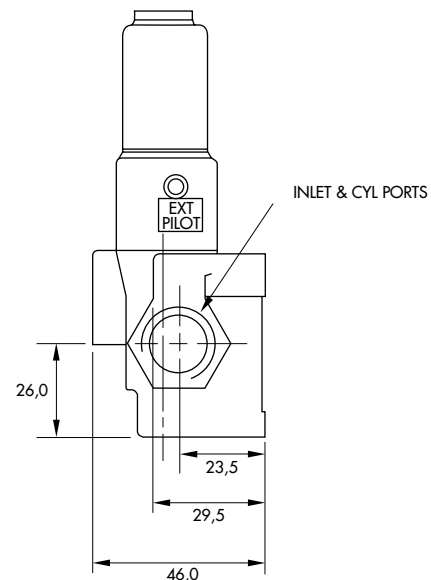
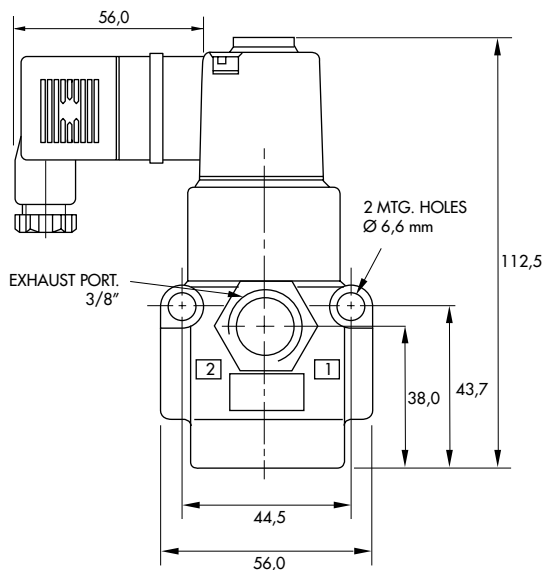
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PID-XXYZZ, including mounting screws 35214 and seal 16363. • Check valve : 70061.

Options : 

- BSPP threads.

### DIMENSIONS

Dimensions shown are metric (mm)



### Individual mounting

inline

Series

35

100

200

55

**56**

57

58

59

45

700

900

82

6300

6500

6600

1300

800

ISO 1

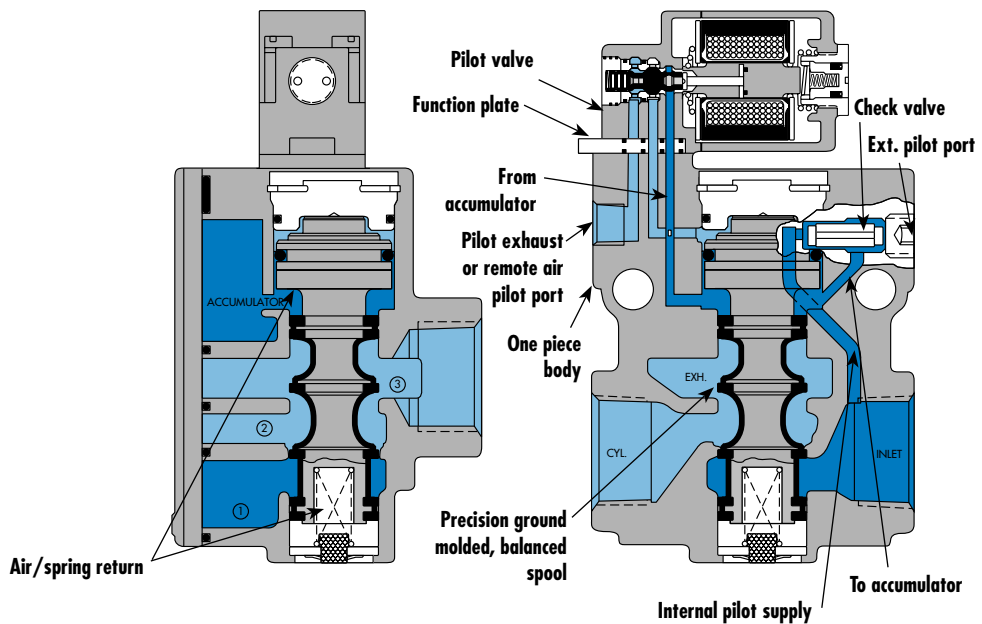
ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A



### SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Seven valve functions in one valve.
- Balanced spool unaffected by back pressure in the exhaust or by inlet restrictions.  
May be plugged for 2-way operation.
- A large checked accumulator which supplies the pilot and air/spring return for consistent shifting.
- Use on lube or non-lube service.
- Various types of manual operators and solenoid enclosures.
- Optional low wattage DC solenoids down to 1 watt.



### VALVE CONFIGURATIONS AVAILABLE

- 3-Way Normally Open or Normally Closed (solenoid or remote air).
- 2-Way (by plugging a port) Normally Open or Normally Closed (solenoid or remote air).
- Internal pilot or External pilot for vacuum to 25 PSI main valve pressures on solenoid or remote air models.
- Manual and mechanical operators available.

### SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

These remote air versions feature:

- A large checked accumulator for air/spring return.
- Balanced spool unaffected by back pressure in the exhaust or by inlet restrictions. May be plugged for 2-way operation.
- Use on lube or non-lube service.
- Optional remote air pilot, pilot operated models available when application requires a pilot signal below the main valve pressure.

### APPLICATION CONVERSION PROCEDURE

The balanced spool design and the unique N.C. and N.O. pilot valve function plate on solenoid models facilitate using the same valve for 7 different functions.

The 7 functions are as follows:

- 3-way Normally Closed-All 3 main valve ports utilized and function plate placed with "3N.C." (3-way N.C.) visible.
- 3-way Normally Open-All 3 main valve ports utilized and function plate placed with "3N.O." (3-way N.O.) visible.

- 2-way Normally Closed-Same as 3-way N.C. but also plug port #3.
- 2-way Normally Open-Same as 3-way N.O. but also plug port #3.
- Selector-Pipe higher pressure to port #1 and lower pressure port #3.
- Internal Pilot-Utilized for main valve pressures of 25-150 PSI. Includes a check rod in the body and a 1/8" pipe plug installed in the External Pilot port.
- External Pilot-An External Pilot supply is required when main valve pressures are lower than 25 PSI. If converting from an Internal Pilot model, remove the 1/8" pipe plug and check rod from the External Pilot port and install a 1/16" pipe plug in the check rod hole and pipe an external supply greater than 25 PSI to the External Pilot port. For vacuum service, make the vacuum connection to the port #3 and leave port #1 open to atmosphere or pressure port #1 for vacuum/pressure selector applications.

### N.C.-N.O. OPERATIONS:

#### SOLENOID MODELS:

With the pilot valve available either N.C. or N.O., simply by inverting the function plate, maximum flexibility is available in solenoid pilot operated models by using the N.C. main spool and installing the function plate for either N.C. or N.O. operation. Where an N.C. pilot function is desired with a N.O. main valve operation, a N.O. main spool option is available.

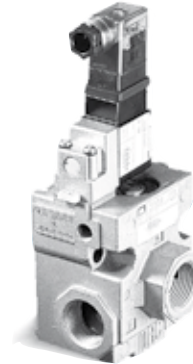
#### REMOTE AIR MODELS:

On remote air pilot operated models, N.C. and N.O. main spools are both available so that a N.C. pilot signal can always be used.

Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>5.7 C<sub>v</sub></b>	inline	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- Large spool area provides maximum shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



35

100

200

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**56**

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59

### HOW TO ORDER

Port size	Pilot air	NO only valve	
		NC pilot - NC spool	NC pilot - NO spool
<b>3/8" NPTF</b>	Internal	56C-12- <b>XXYZZ</b>	56C-22- <b>XXYZZ</b>
<b>1/2" NPTF</b>		56C-13- <b>XXYZZ</b>	56C-23- <b>XXYZZ</b>
<b>3/4" NPTF</b>		56C-17- <b>XXYZZ</b>	56C-27- <b>XXYZZ</b>
<b>3/8" NPTF</b>	External	56C-32- <b>XXYZZ</b>	56C-42- <b>XXYZZ</b>
<b>1/2" NPTF</b>		56C-33- <b>XXYZZ</b>	56C-43- <b>XXYZZ</b>
<b>3/4" NPTF</b>		56C-37- <b>XXYZZ</b>	56C-47- <b>XXYZZ</b>

45

700

### SOLENOID OPERATOR >

### XX Y ZZ\*

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

900

82

6300

\* Other options available, see page 357.

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot : 25 to 150 PSI External pilot : vacuum to 150 PSI
<b>Pilot pressure :</b>	25 to 150 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 (at 6 bar, ΔP=1bar) :</b>	Norm. Closed : 3/8" (4.4 C <sub>v</sub> ), 1/2" (5.0 C <sub>v</sub> ), 3/4" (5.4 C <sub>v</sub> ), Norm. Open : 3/8" (4.6 C <sub>v</sub> ), 1/2" (5.1 C <sub>v</sub> ), 3/4" (5.7 C <sub>v</sub> )
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~ Inrush : 14.8 VA      Holding : 10.9 VA = 1 to 17 W
<b>Response times :</b>	24 VDC (8.5 W)      Energize : 11 ms      De-energize : 10,8ms 120/60      Energize : 7-12 ms      De-energize : 9-14 ms

#### Spare parts :

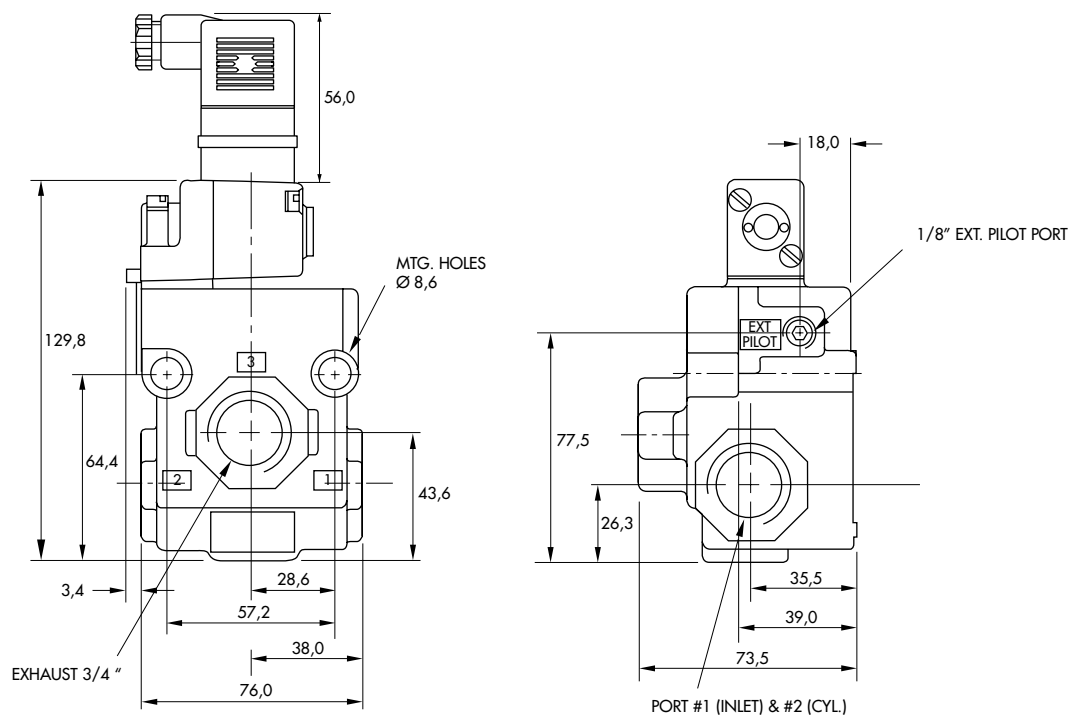
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 32184 and seal 16234.
- Pilot valve : 130B-XXYZZ, including function plate A2-7009. • Pilot mounting screws kit : N-56002.
- Check valve : 70063.

#### Options :

- BSPP threads.

### DIMENSIONS

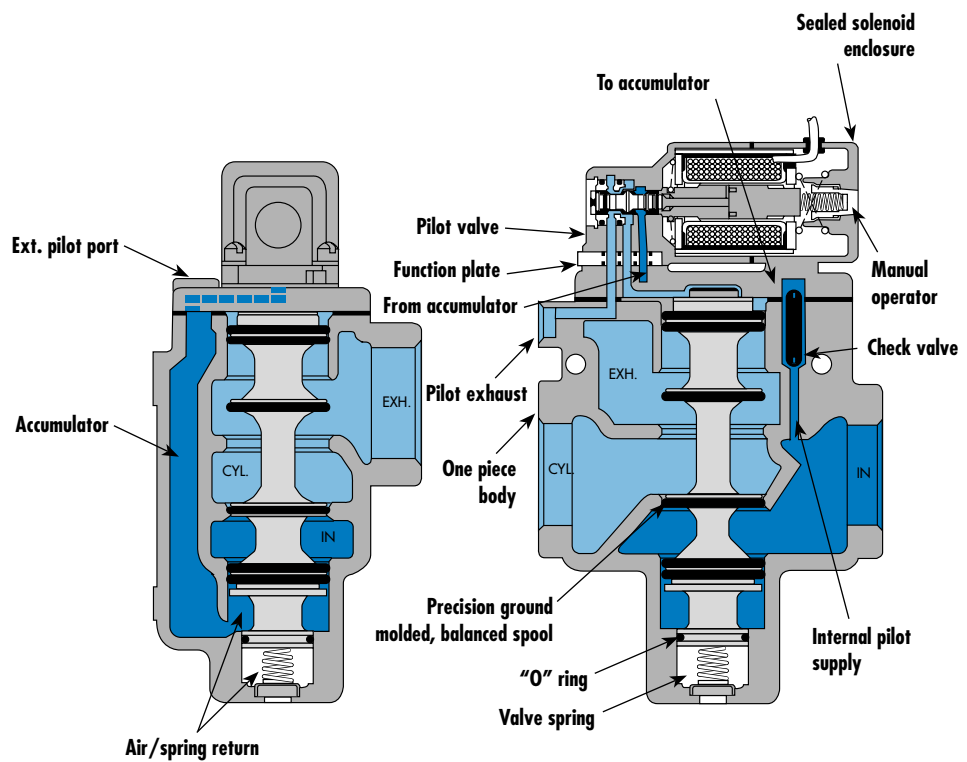
Dimensions shown are metric (mm)



### Individual mounting

inline

Series



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**57**

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700

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6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

### SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Seven valve functions in one valve.
- Balanced spool unaffected by back pressure in the exhaust.
- A large checked accumulator which supplies the pilot and air/spring return for consistent shifting.
- A triple rated coil for 120/60, 110/50 or 24 VDC (6 Watt).
- Use on lube or non-lube service.
- Various types of manual operators and solenoid enclosures.
- Optional low wattage DC coils down to 1 watt.
- Optional explosion proof models designed to meet CSA standards for Class I, Groups B, C, D and Class II, Groups E, F and G. (NEMA equivalent of Class I is NEMA 7; Class II is NEMA 9).

### VALVE CONFIGURATIONS AVAILABLE

- 3-Way Normally Open or Normally Closed (solenoid or remote air).
- 2-Way (by plugging Exhaust port), Normally Open or Normally Closed (solenoid or remote air).
- Internal pilot or External pilot for vacuum to 25 PSI main valve pressures on solenoid models.
- Manual and mechanical operators available.

### SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

The remote air versions feature:

- A large checked accumulator for air/spring return.
- Balanced spool unaffected by back pressure in the exhaust and may be plugged for 2-way operation.
- Use on lube or non-lube service.

### APPLICATION CONVERSION PROCEDURE

The balanced spool design and the unique N.C. and N.O. pilot valve function plate on solenoid models facilitate using the same valve for 7 different functions.

The 7 functions are as follows:

- 3-way Normally Closed-All 3 main valve ports utilized and function plate placed with "3-C" (3-way N.C.) visible.
- 3-way Normally Open-All 3 main valve ports utilized and function plate placed with "3-O" (3-way N.O.) visible.
- 2-way Normally Closed-Same as 3-way N.C. but also plug the Exhaust port.

- 2-way Normally Open-Same as 3-way N.O. but also plug the Exhaust port.
- Selector-Pipe higher pressure to the Inlet port and lower pressure to the Exhaust port.
- Internal Pilot-Utilized for main valve pressures of 25-150 PSI. Includes a check rod in the body and a 1/4" pipe plug installed in the External Pilot port.
- External Pilot-An External Pilot supply is required when main valve pressures are lower than 25 PSI. If converting from an Internal Pilot model, remove the 1/4" pipe plug and check rod from the External Pilot port and install a 1/8" pipe plug in the check rod hole and pipe an external supply greater than 25 PSI to the External Pilot port. For vacuum service, make the vacuum connection to the Exhaust port and leave the Inlet port open to atmosphere.

### N.C.-N.O. OPERATIONS:

#### SOLENOID MODELS:

With the pilot valve available either N.C. or N.O., simply by inverting the function plate, maximum flexibility is available in solenoid pilot operated models by using the N.C. main spool and installing the function plate for either N.C. or N.O. operation. Where an N.C. pilot function is desired with a N.O. main valve operation, a N.O. main spool option is available.

#### REMOTE AIR MODELS:

On remote air pilot operated models, N.C. and N.O. main spools are both available so that a N.C. pilot signal can always be used.

Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/2" - 3/4" - 1"</b>	<b>17.4 C<sub>v</sub></b>	inline	

**OPERATIONAL BENEFITS**

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- Large spool area provides maximum shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



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700

900

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1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

**HOW TO ORDER**

Port size	Pilot air	NO only valve	
		NC pilot - NC spool	NC pilot - NO spool
<b>1/2" NPTF</b>	Internal	57D-11- <b>XXYZZ</b>	57D-21- <b>XXYZZ</b>
<b>3/4" NPTF</b>		57D-12- <b>XXYZZ</b>	57D-22- <b>XXYZZ</b>
<b>1" NPTF</b>		57D-13- <b>XXYZZ</b>	57D-23- <b>XXYZZ</b>
<b>1/2" NPTF</b>	External	57D-31- <b>XXYZZ</b>	57D-41- <b>XXYZZ</b>
<b>3/4" NPTF</b>		57D-32- <b>XXYZZ</b>	57D-42- <b>XXYZZ</b>
<b>1" NPTF</b>		57D-33- <b>XXYZZ</b>	57D-43- <b>XXYZZ</b>

SOLENOID OPERATOR >

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50, 24 VDC (6.0 W)	<b>0</b> No operator	<b>JA</b> Square connector
<b>12</b> 240/60, 220/50	<b>1</b> Non-locking	<b>JC</b> Square connector with light
<b>22</b> 24/60, 24/50	<b>2</b> Locking	<b>BA</b> Flying leads (18")
<b>52</b> 24 VDC (2.5 W)		<b>CA</b> Conduit 1/2" NPS
<b>78</b> 24 VDC (24.0 W)		<b>EA</b> Hazardous location
<b>61</b> 24 VDC (8.5 W)		

\* Other options available, see page 357.

Note : Hazardous location option supplied with no manual operator ("0"). DC voltage not available below 6 Watts.

### TECHNICAL DATA

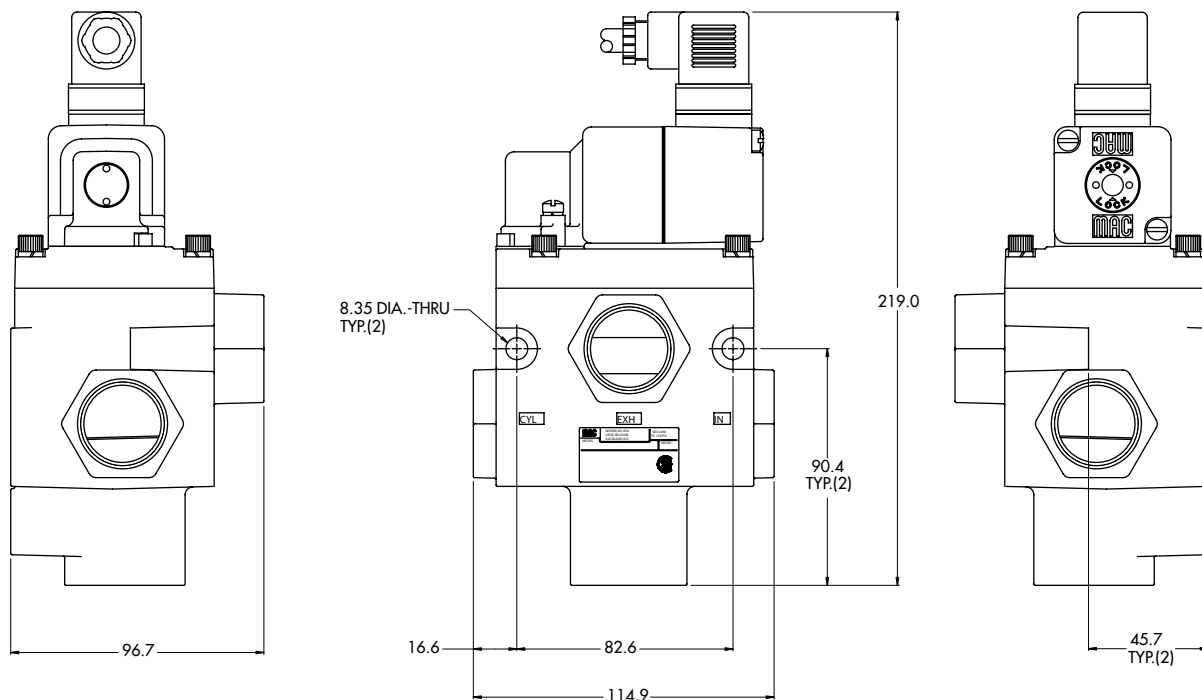
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : 25 to 150 PSI External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	25 to 150 PSI (Not to exceed main valve pressure by more than 50 PSI)		
<b>Lubrication :</b>	Not required, if used select a medium aniline 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 (at 6 bar, ΔP=1bar) :</b>	Norm. Closed : 1/2" (9.0 C <sub>v</sub> ), 3/4" (12.7 C <sub>v</sub> ), 1" (15.9 C <sub>v</sub> ), Norm. Open : 1/2" (10.0 C <sub>v</sub> ), 3/4" (13.7 C <sub>v</sub> ), 1" (17.4 C <sub>v</sub> )		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 33 VA      Holding : 19.7 VA = 1 to 24 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 23 ms	De-energize : 13ms
	120/60	Energize : 9-16 ms	De-energize : 11-22 ms

Spare parts :      • Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.  
                           • Pilot valve : 250B-XXYZZ, including mounting screws 32203 and function plate A2-7005. • Check valve : 70019.

Options :            • BSPP threads.

### DIMENSIONS

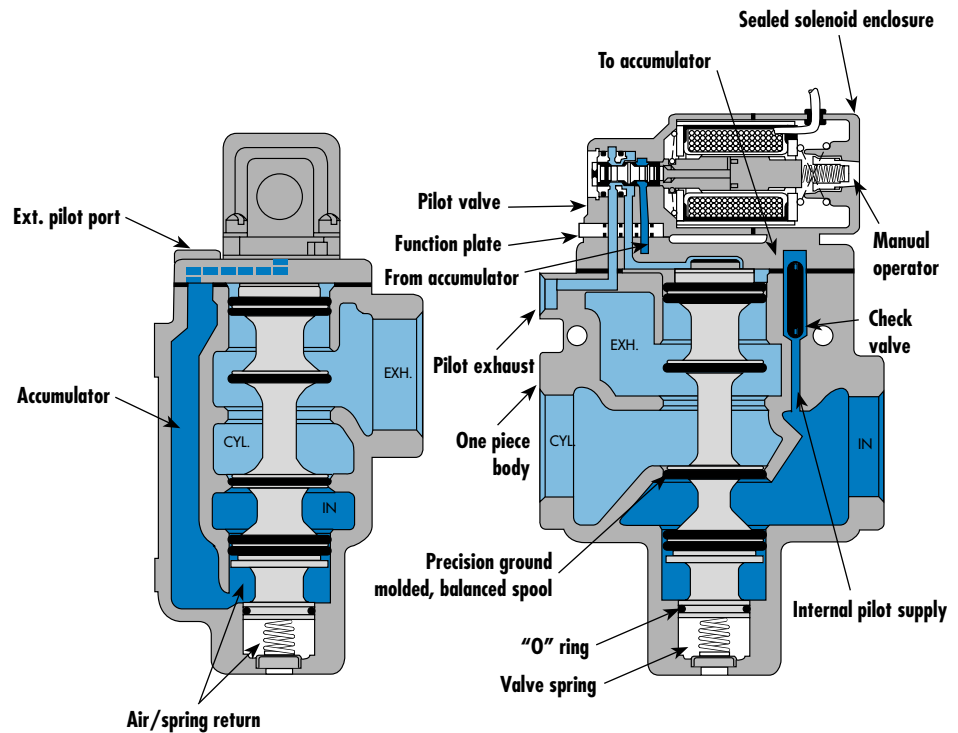
Dimensions shown are metric (mm)



### Individual mounting

inline

Series



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100

200

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56

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**58**

59

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700

900

82

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

### SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Seven valve functions in one valve.
- Balanced spool unaffected by back pressure in the exhaust.
- A large checked accumulator which supplies the pilot and air/spring return for consistent shifting.
- A triple rated coil for 120/60, 110/50 or 24 VDC (6 Watt).
- Use on lube or non-lube service.
- Various types of manual operators and solenoid enclosures.
- Optional low wattage DC coils down to 1 watt.
- Optional explosion proof models designed to meet CSA standards for Class I, Groups B, C, D and Class II, Groups E, F and G. (NEMA equivalent of Class I is NEMA 7; Class II is NEMA 9).



### VALVE CONFIGURATIONS AVAILABLE

- 3-Way Normally Open or Normally Closed (solenoid or remote air).
- 2-Way (by plugging Exhaust port), Normally Open & Normally Closed (solenoid or remote air).
- Internal pilot or External pilot for vacuum to 25 PSI main valve pressures on solenoid models.

### SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

The remote air versions feature:

- A large checked accumulator for air/spring return.
- Balanced spool unaffected by back pressure in the exhaust and may be plugged for 2-way operation.
- Use on lube or non-lube service.

### APPLICATION CONVERSION PROCEDURE

The balanced spool design and the unique N.C. and N.O. pilot valve function plate on solenoid models facilitate using the same valve for 7 different functions.

The 7 functions are as follows:

- 3-way Normally Closed-All 3 main valve ports utilized and function plate placed with "3-C" (3-way N.C.) visible.
- 3-way Normally Open-All 3 main valve ports utilized and function plate placed with "3-O" (3-way N.O.) visible.
- 2-way Normally Closed-Same as 3-way N.C. but also plug the Exhaust port.

- 2-way Normally Open-Same as 3-way N.O. but also plug the Exhaust port.
- Selector-Pipe higher pressure to the Inlet port and lower pressure to the Exhaust port.
- Internal Pilot-Utilized for main valve pressures of 25-150 PSI. Includes a check rod in the body and a 1/4" pipe plug installed in the External Pilot port.
- External Pilot-An External Pilot supply is required when main valve pressures are lower than 25 PSI. If converting from an Internal Pilot model, remove the 1/4" pipe plug and check rod from the External Pilot port and install a 1/8" pipe plug in the check rod hole and pipe an external supply greater than 25 PSI to the External Pilot port. For vacuum service, make the vacuum connection to the Exhaust port and leave the Inlet port open to atmosphere.

### N.C.-N.O. OPERATIONS:

#### SOLENOID MODELS:

With the pilot valve available either N.C. or N.O., simply by inverting the function plate, maximum flexibility is available in solenoid pilot operated models by using the N.C. main spool and installing the function plate for either N.C. or N.O. operation. Where an N.C. pilot function is desired with a N.O. main valve operation, a N.O. main spool option is available.

#### REMOTE AIR MODELS:

On remote air pilot operated models, N.C. and N.O. main spools are both available so that a N.C. pilot signal can always be used.

Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1" - 1 1/4" - 1 1/2"</b>	<b>26.0 C<sub>v</sub></b>	inline	

**OPERATIONAL BENEFITS**

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- Large spool area provides maximum shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



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100

200

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**58**

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**HOW TO ORDER**

Port size	Pilot air	NO only valve		
		NC pilot - NC spool	NO pilot - NC spool	NC pilot - NO spool
<b>1" NPTF</b>	Internal	58D-11- <b>XXYZZ</b>	58D-21- <b>XXYZZ</b>	58D-61- <b>XXYZZ</b>
<b>1 1/4" NPTF</b>		58D-12- <b>XXYZZ</b>	58D-22- <b>XXYZZ</b>	58D-62- <b>XXYZZ</b>
<b>1 1/2" NPTF</b>		58D-13- <b>XXYZZ</b>	58D-23- <b>XXYZZ</b>	58D-63- <b>XXYZZ</b>
<b>1" NPTF</b>	External	58D-31- <b>XXYZZ</b>	58D-41- <b>XXYZZ</b>	58D-71- <b>XXYZZ</b>
<b>1 1/4" NPTF</b>		58D-32- <b>XXYZZ</b>	58D-42- <b>XXYZZ</b>	58D-72- <b>XXYZZ</b>
<b>1 1/2" NPTF</b>		58D-33- <b>XXYZZ</b>	58D-43- <b>XXYZZ</b>	58D-73- <b>XXYZZ</b>

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700

900

82

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

SOLENOID OPERATOR >

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50, 24 VDC (6.0 W)	<b>0</b> No operator	<b>JA</b> Square connector
<b>12</b> 240/60, 220/50	<b>1</b> Non-locking	<b>JC</b> Square connector with light
<b>22</b> 24/60, 24/50	<b>2</b> Locking	<b>BA</b> Flying leads (18")
<b>52</b> 24 VDC (2.5 W)		<b>CA</b> Conduit 1/2" NPS
<b>78</b> 24 VDC (24.0 W)		<b>EA</b> Hazardous location
<b>61</b> 24 VDC (8.5 W)		

\* Other options available, see page 357.

Note : Hazardous location option supplied with no manual operator ("0"). DC voltage not available below 6 Watts.

**TECHNICAL DATA**

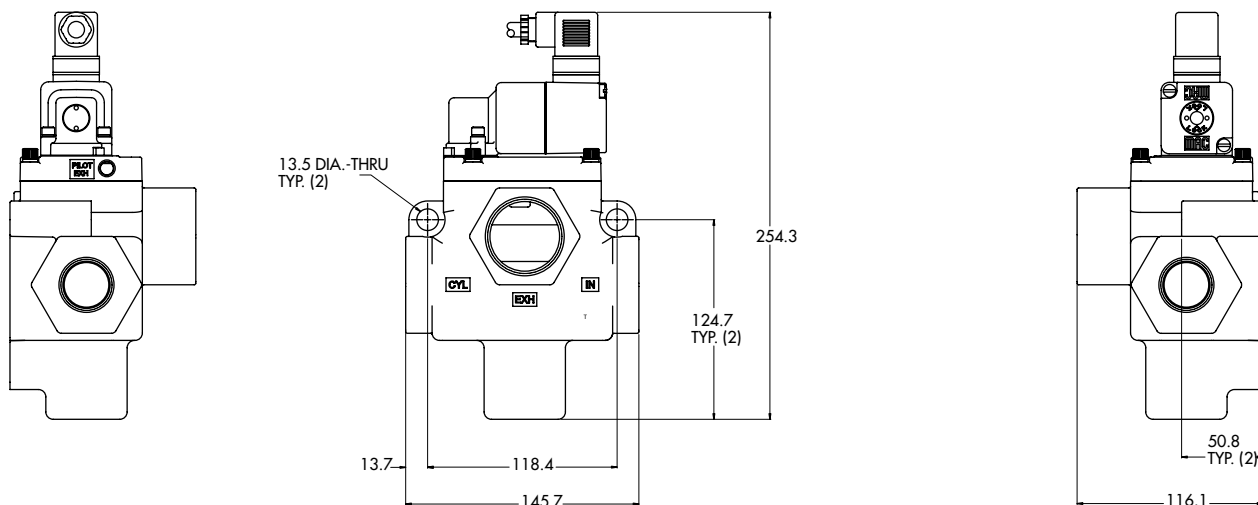
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot : 25 to 150 PSI External pilot : vacuum to 150 PSI
<b>Pilot pressure :</b>	25 to 150 PSI (Not to exceed main valve pressure by more than 50 PSI)
<b>Lubrication :</b>	Not required, if used select a medium aniline 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 (at 6 bar, ΔP=1bar) :</b>	Norm. Closed : 1" (18.7 C <sub>v</sub> ), 1 1/4" (23.0 C <sub>v</sub> ), 1 1/2" (24.9 C <sub>v</sub> ), Norm. Open : 1" (20.8 C <sub>v</sub> ), 1 1/4" (23.8 C <sub>v</sub> ), 1 1/2" (26.0 C <sub>v</sub> )
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~ Inrush : 33 VA      Holding : 19.7 VA = 1 to 24 W
<b>Response times :</b>	24 VDC (8.5 W)      Energize : 25 ms      De-energize : 18ms 120/60      Energize : 10-17 ms      De-energize : 17-22 ms

- Spare parts :
- Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.
  - Pilot valve : 250B-XXYZZ, including mounting screws 32203 and function plate A2-7005. • Check valve : 70019.

- Options :
- BSPP threads.

**DIMENSIONS**

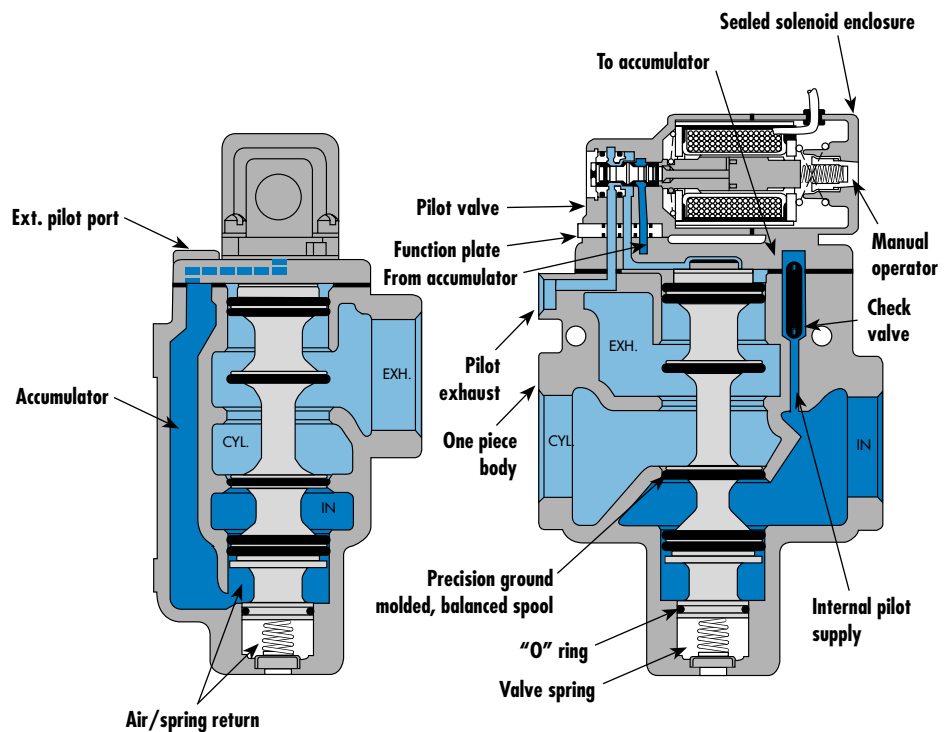
Dimensions shown are metric (mm)



### Individual mounting

inline

Series



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100

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**59**

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700

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6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

### SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Seven valve functions in one valve.
- Balanced spool unaffected by back pressure in the exhaust.
- A large checked accumulator which supplies the pilot and air/spring return for consistent shifting.
- A triple rated coil for 120/60, 110/50 or 24 VDC (6 Watt).
- Use on lube or non-lube service.
- Various types of manual operators and solenoid enclosures.
- Optional low wattage DC coils down to 1 watt.
- Optional explosion proof models designed to meet CSA standards for Class I, Groups B, C, D and Class II, Groups E, F and G. (NEMA equivalent of Class I is NEMA 7; Class II is NEMA 9).

### VALVE CONFIGURATIONS AVAILABLE

- 3-Way Normally Open (solenoid) or Normally Closed (solenoid or remote air).
- 2-Way (by plugging Exhaust port), Normally Open (solenoid) & Normally Closed (solenoid or remote air).
- Internal pilot or External pilot for vacuum to 25 PSI main valve pressures on solenoid models.

### SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

The remote air versions feature:

- A large checked accumulator for air/spring return.
- Balanced spool unaffected by back pressure in the exhaust and may be plugged for 2-way operation.
- Use on lube or non-lube service.

### APPLICATION CONVERSION PROCEDURE

The balanced spool design and the unique N.C. and N.O. pilot valve function plate on solenoid models facilitate using the same valve for 7 different functions.

The 7 functions are as follows:

- 3-way Normally Closed-All 3 main valve ports utilized and function plate placed with "3-C" (3-way N.C.) visible.
- 3-way Normally Open-All 3 main valve ports utilized and function plate placed with "3-O" (3-way N.O.) visible.

- 2-way Normally Closed-Same as 3-way N.C. but also plug the Exhaust port.
- 2-way Normally Open-Same as 3-way N.O. but also plug the Exhaust port.
- Selector-Pipe higher pressure to the Inlet port and lower pressure to the Exhaust port.
- Internal Pilot-Utilized for main valve pressures of 25-150 PSI. Includes a check rod in the body and a 1/8" pipe plug installed in the External Pilot port.
- External Pilot-An External Pilot supply is required when main valve pressures are lower than 25 PSI. If converting from an Internal Pilot model, remove the 1/8" pipe plug from the External Pilot and remove adapter plate. Remove check rod from the body and install a 1/8" pipe plug in the check rod hole and pipe an external supply greater than 25 PSI to the External Pilot port. For vacuum service, make the vacuum connection to the Exhaust port and leave the Inlet port open to atmosphere.

### N.C.-N.O. OPERATIONS:

#### SOLENOID MODELS:

With the pilot valve available either N.C. or N.O., simply by inverting the function plate, and using the N.C. main spool, N.C or NO main valve functions are achieved.

#### REMOTE AIR MODELS:

On remote air pilot operated models, N.O. pilot signal must be used for a N.C. main valve function.

Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>2" - 2 1/2"</b>	<b>60.0 C<sub>v</sub></b>	inline	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- Large spool area provides maximum shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



35  
100  
200  
55  
56  
57  
58  
59

### HOW TO ORDER

Port size	Pilot air	NC only valve NC pilot - NC spool	NO only valve NO pilot - NC spool
<b>2" NPTF</b>	Internal	59B-12- <b>XXYZZ</b>	59B-22- <b>XXYZZ</b>
<b>2 1/2" NPTF</b>	Internal	59B-13- <b>XXYZZ</b>	59B-23- <b>XXYZZ</b>
<b>2" NPTF</b>	External	59B-32- <b>XXYZZ</b>	59B-42- <b>XXYZZ</b>
<b>2 1/2" NPTF</b>	External	59B-33- <b>XXYZZ</b>	59B-43- <b>XXYZZ</b>

45  
700

### SOLENOID OPERATOR >

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50, 24 VDC (6.0 W)	<b>0</b> No operator	<b>JA</b> Square connector
<b>12</b> 240/60, 220/50	<b>1</b> Non-locking	<b>JC</b> Square connector with light
<b>22</b> 24/60, 24/50	<b>2</b> Locking	<b>BA</b> Flying leads (18")
<b>52</b> 24 VDC (2.5 W)		<b>CA</b> Conduit 1/2" NPS
<b>78</b> 24 VDC (24.0 W)		<b>EA</b> Hazardous location
<b>61</b> 24 VDC (8.5 W)		

900  
82

\* Other options available, see page 357.

Note : Hazardous location option supplied with no manual operator ("0"). DC voltage not available below 6 Watts.

6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

### TECHNICAL DATA

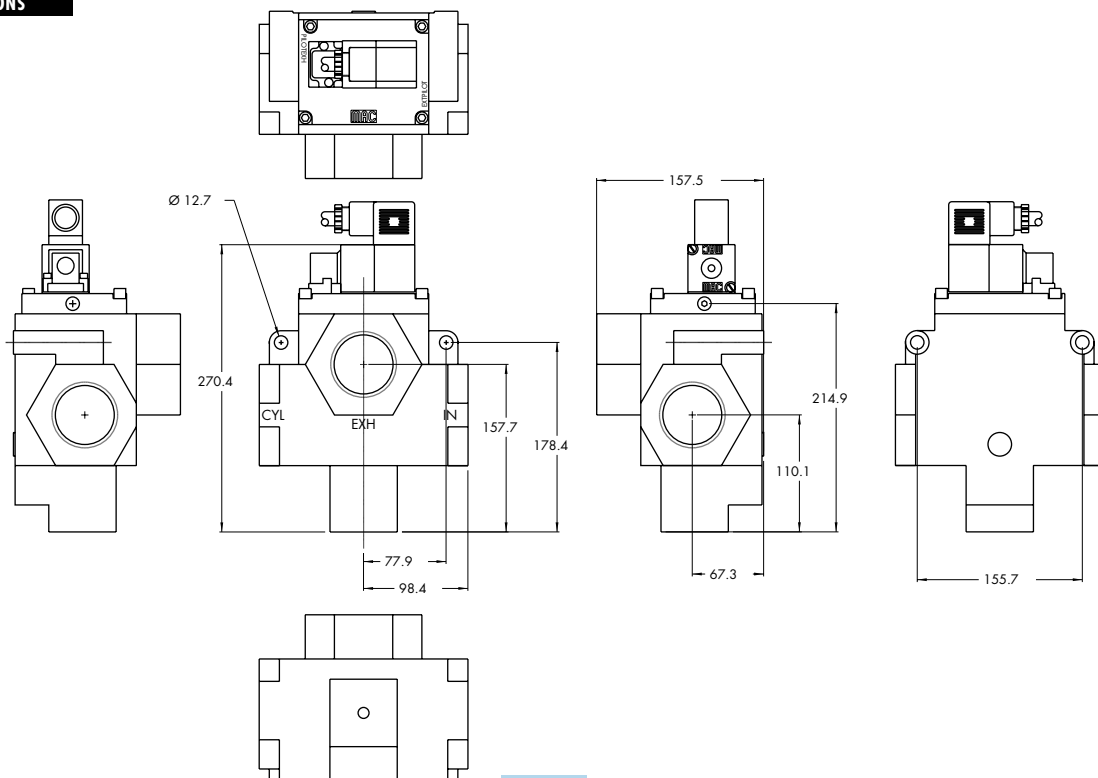
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : 25 to 150 PSI External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	25 to 150 PSI (Not to exceed main valve pressure by more than 50 PSI)		
<b>Lubrication :</b>	Not required, if used select a medium aniline 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 (at 6 bar, ΔP=1bar) :</b>	2" (55.0 C <sub>v</sub> ), 2 1/2" C <sub>v</sub> (60.0 C <sub>v</sub> )		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 33 VA      Holding : 19.7 VA = 1 to 24 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 38 ms	De-energize : 25ms
	120/60	Energize : 35-45 ms	De-energize : 25-34 ms

Spare parts :      • Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.  
                           • Pilot valve : 250B-XXYZZ, including mounting screws 32203 and function plate A2-7005. • Check valve : 70019.

Options :            • BSPP threads.

### DIMENSIONS

Dimensions shown are metric (mm)

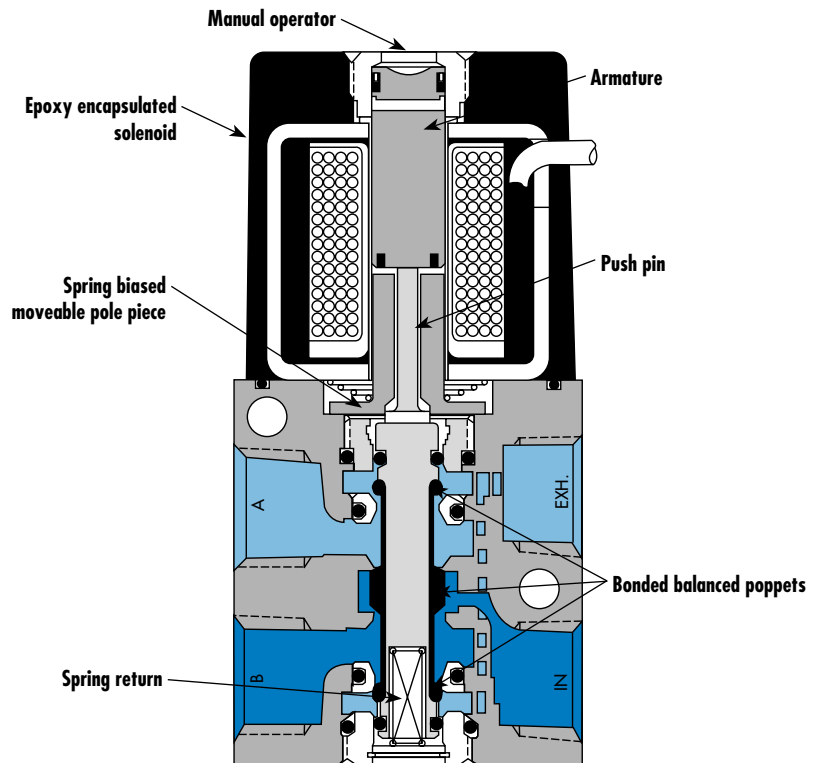


### Individual mounting

inline	sub-base non "plug-in"
--------	------------------------

### Manifold mounting

stacking	sub-base non "plug-in"	sub-base with pressure regulators	sub-base with pressure regulators and flow controls
----------	------------------------	-----------------------------------	---



### SERIES FEATURES

- Single and double solenoid or remote air.
- The patented MACSOLENOID® for fastest possible response times.
- Bonded balanced poppets for high flow, precise repeatability, and consistent operation.
- Balanced poppet design permits versatility in piping. Valves can be piped as 4-way, 3-way or 2-way, normally closed or normally open or can be used for vacuum, diverter or selector applications.
- Use on lube or non-lube service.
- Extremely high cycle rates.
- Extremely long service life due to unique poppet cushions.
- Manual overrides as standard.
- Various solenoid enclosures and plug-in connectors
- Optional surge suppression available.
- Low wattage DC solenoids — down to 1.8 watts.
- Patented MACSOLENOID® — virtually burn-out proof on AC service.

Series

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

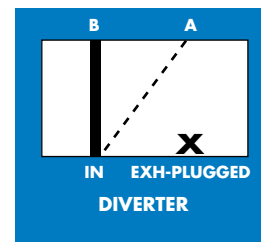
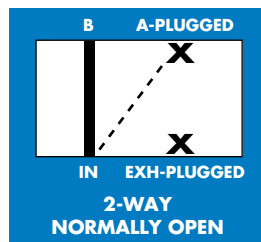
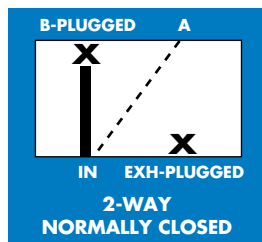
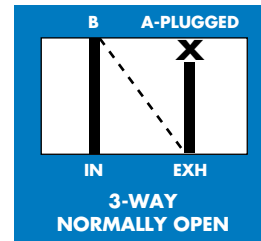
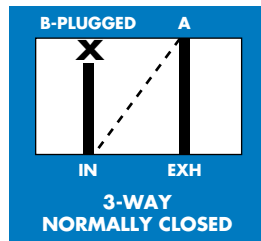
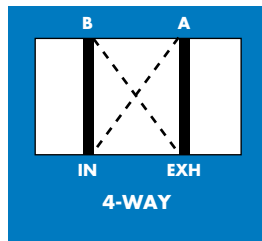


**VALVE CONFIGURATIONS AVAILABLE**

- 2-position single and double solenoid or remote air.
- Single pressure (4 or 5 ports)
- Individual, stacking and manifold base mounted models.
- Integral individual exhaust flow controls with common exhaust port.
- Integral regulators and flow controls on manifolds.

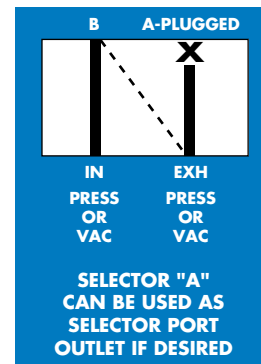
**SPECIAL APPLICATIONS :**

The balanced poppet design facilitates using the same valve for many functions and can be used for pressure, vacuum or plugged without the necessity of changing any parts. Piping suggestions are shown in the chart below.



Operator De-Energized ———

Operator Energized - - - - -



Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2</b>	<b>#10-32 - 1/8"</b>	<b>0.15 C<sub>v</sub></b>	inline	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

### HOW TO ORDER

Port size	Single operator	Double operator (Minimum DC wattage 5.4W)
<b>1/8" NPTF</b>	45A-AA1-Dxxx-xxx	45A-GA1-Dxxx-xxx
<b># 10-32 UNF</b>	45A-AB1-Dxxx-xxx	45A-GB1-Dxxx-xxx

45

### WITH INTEGRATED FLOW CONTROLS

Port size	Single operator	Double operator (Minimum DC wattage 5.4W)
<b>1/8" NPTF</b>	45A-AA2-Dxxx-xxx	45A-GA2-Dxxx-xxx
<b># 10-32 UNF</b>	45A-AB2-Dxxx-xxx	45A-GB2-Dxxx-xxx

700  
900

### SOLENOID OPERATOR ▶

D **XX X- X XX**\*

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

82  
6300  
6500  
6600

\* Other options available, see page 361.

### BOTTOM PORT OPTIONS (O'RING MOUNT)

45A-XXX-D xxx-xxx

- D-Sgl. oper. - All ports
- F-Sgl. oper. - "A" & "B" ports
- H-DbL. oper. - All ports
- J-DbL. oper. - "A" & "B" ports

1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	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 (at 6 bar, ΔP=1bar) :</b>	1.8 W : (0.1 C <sub>v</sub> ), 5.4 W : (0.15 C <sub>v</sub> )		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	- Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :

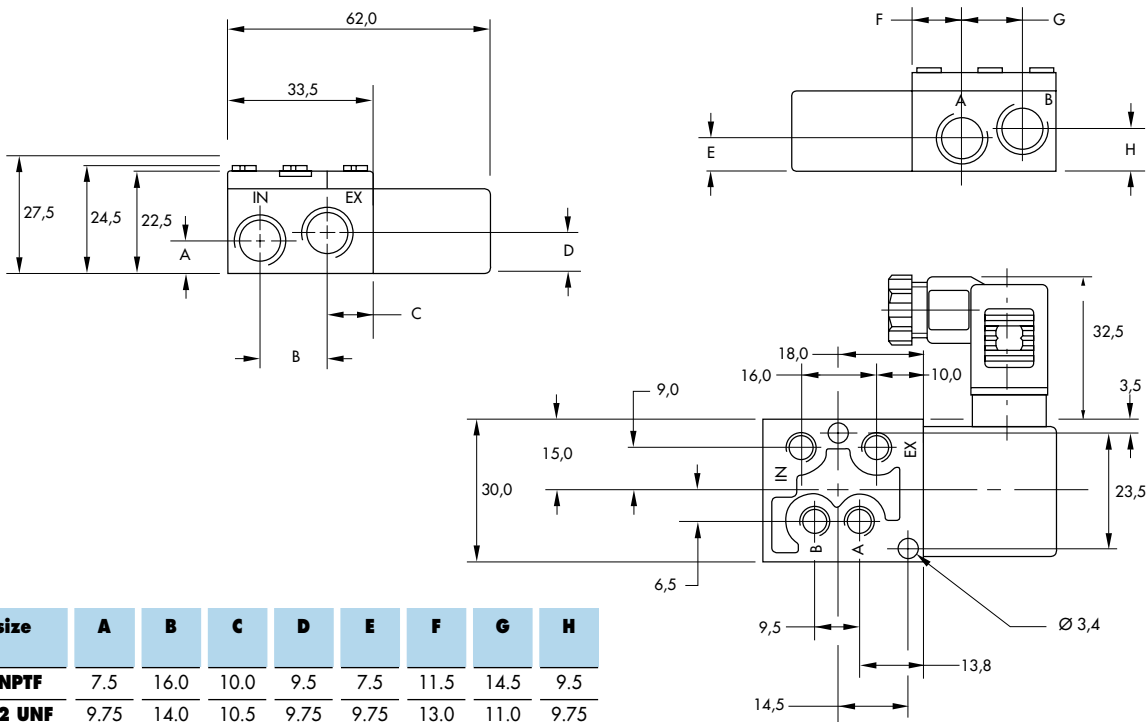
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402. • Valve cover plate with flow controls : N-45002.

Options :

- BSPP threads. • High flow up to 0.23 C<sub>v</sub> according to wattage and high flow Mod. • NAMUR interface - 45A-FA1DXXX-XXX and required NAMUR adapter kit: N-45028-03 (for 3-way operation) - N-45028-04 (for 4-way operation).

**DIMENSIONS**

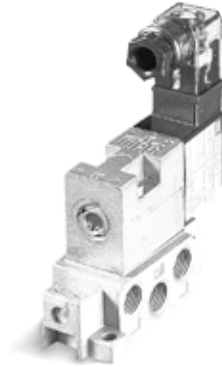
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Individual mounting	Series
4/2	#10-32 - 1/8"	0.13 C <sub>v</sub>	sub-base non "plug-in"	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Single operator	Double operator (Minimum DC wattage 5,4W)
<b>Valve less base</b>	45A-L00-Dxxx-xxx	45A-N00-Dxxx-xxx
<b>1/8" NPTF base</b>	45A-LAA-Dxxx-xxx	45A-NAA-Dxxx-xxx
<b>#10-32 UNF base</b>	45A-LBA-Dxxx-xxx	45A-NBA-Dxxx-xxx

45

WITH INTEGRATED FLOW CONTROLS

Port size	Single operator	Double operator (Minimum DC wattage 5,4W)
<b>Valve less base</b>	45A-L00-Dxxx-xxx	45A-N00-Dxxx-xxx
<b>1/8" NPTF base</b>	45A-LAB-Dxxx-xxx	45A-NAB-Dxxx-xxx
<b>#10-32 UNF base</b>	45A-LBB-Dxxx-xxx	45A-NBB-Dxxx-xxx

700  
900  
82

SOLENOID OPERATOR ►

D **XX X- X XX\***

XX Voltage	X Wire length	X Manual operator	XX
AA 120/60, 110/50	A 18" (Flying leads)	1 Non-locking	KA Square connector
AB 240/60, 220/50	J Connector	2 Locking	KD Square connector with light
AC 24/60, 24/50			BA Flying leads
FB 24 VDC (1.8 W)			
DA 24 VDC (5.4 W)			
DF 24 VDC (12.7 W)			

6300  
6500  
6600

\* Other options available, see page 361.

**OPTIONS**

45A-LAA-D xxx-xxx

Substitute "J" for 1/8" bottom cylinder ports

1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

### TECHNICAL DATA

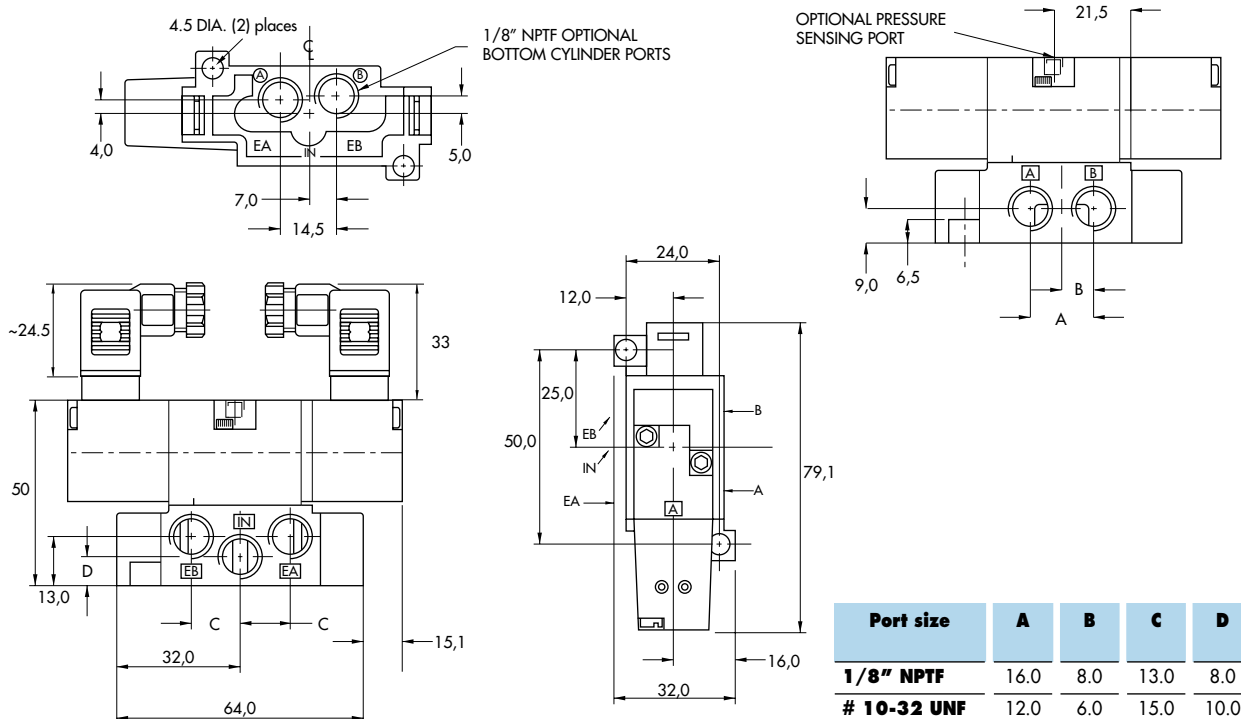
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Vacuum to 120 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1.8 W : (0.11 C <sub>v</sub> ), 5.4 W : (0.13 C <sub>v</sub> )		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :      • Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.  
                           • Seal (between solenoid and valve body) : 16402. • Seal between base and valve : 16453. • Flow control : N-45018.

Options :            • BSPP threads. • High flow up to 0.20 C<sub>v</sub> according to wattage and high flow mod.

### DIMENSIONS

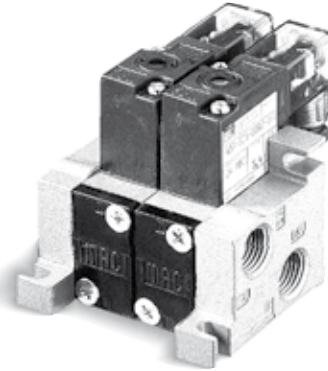
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2</b>	<b># 10-32 - 1/8"</b>	<b>0.20 C<sub>v</sub></b>	stacking	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

### HOW TO ORDER

Port size	Single operator	Double operator (Minimum DC wattage 5,4W)
<b>1/8" NPTF</b>	45A-SA1-Dxxx-xxx	45A-TA1-Dxxx-xxx
<b># 10-32 UNF</b>	45A-SB1-Dxxx-xxx	45A-TB1-Dxxx-xxx

45

### WITH INTEGRATED FLOW CONTROLS

Port size	Single operator	Double operator
<b>1/8" NPTF</b>	45A-SA2-Dxxx-xxx	45A-TA2-Dxxx-xxx
<b># 10-32 UNF</b>	45A-SB2-Dxxx-xxx	45A-TB2-Dxxx-xxx

700

900

### SOLENOID OPERATOR >

D **XX X- X XX**\*

XX	Voltage	X	Wire length	X	Manual operator	XX	
AA	120/60, 110/50	A	18" (Flying leads)	1	Non-locking	KA	Square connector
AB	240/60, 220/50	J	Connector	2	Locking	KD	Square connector with light
AC	24/60, 24/50					BA	Flying leads
FB	24 VDC (1.8 W)						
DA	24 VDC (5.4 W)						
DF	24 VDC (12.7 W)						

6300

6500

6600

\* Other options available, see page 361.

1300

End plate kit required (Port size 1/4" NPTF) : M-45001-01.

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

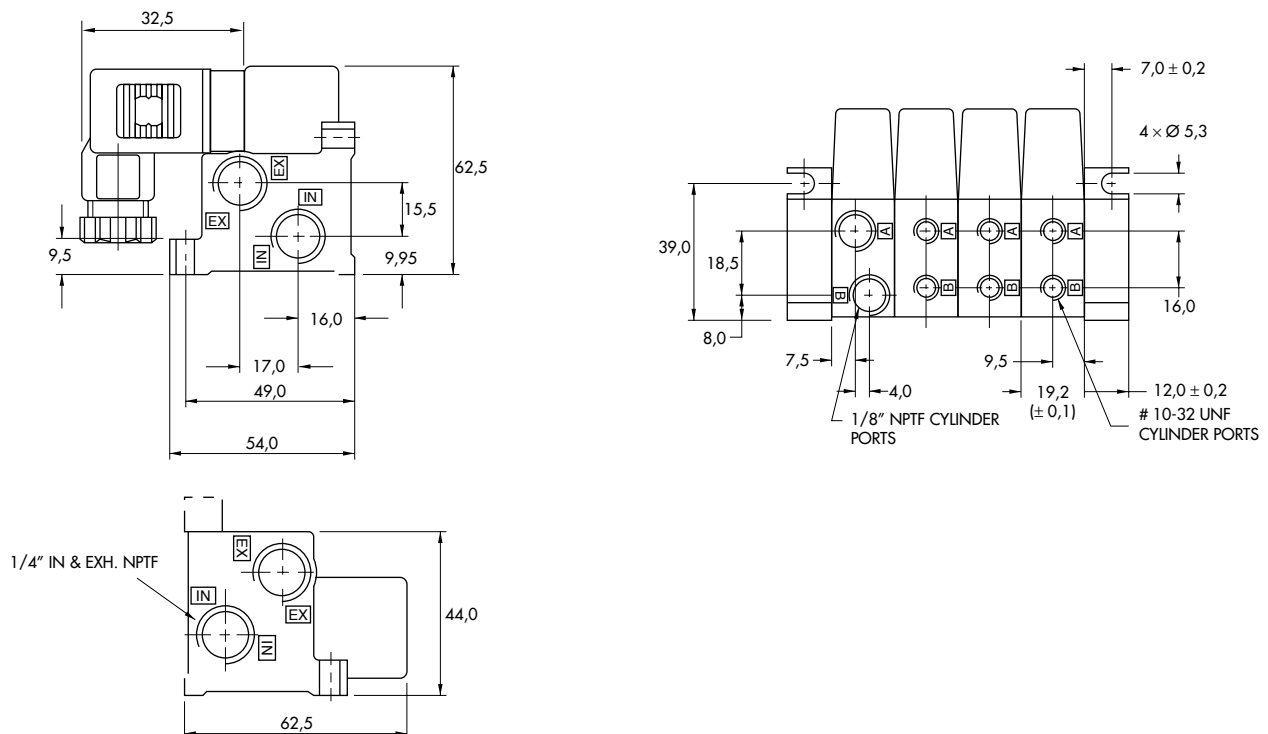
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	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 (at 6 bar, ΔP=1bar) :</b>	1.8 W : (0.14 C <sub>v</sub> ), 5.4 W : (0.2 C <sub>v</sub> )		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	- Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

- Spare parts :
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
  - Seal (between solenoid and valve body) : 16402. • Seal between valves : 16422. • Tie-rod (x2) : 19813.
  - Valve cover plate with flow controls : N-45004.
  - Inlet & exhaust isolator : N-45005. Inlet isolator : N-45006. Exhaust isolator : N-45007
- Options :
- BSPP threads. • High flow up to 0.3 C<sub>v</sub>, according to wattage and high flow mod.

**DIMENSIONS**

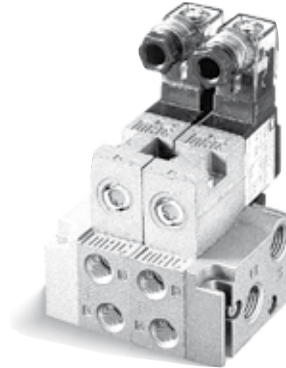
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
4/2	# 10-32 - 1/8"	0.11 C <sub>v</sub>	sub-base non "plug-in"	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Single operator	Double operator (Minimum DC wattage 5.4W)
<b>Valve less base</b>	45A-L00-Dxxx-xxx	45A-N00-Dxxx-xxx
<b>1/8" NPTF base</b>	45A-LAC-Dxxx-xxx	45A-NAC-Dxxx-xxx
<b># 10-32 UNF base</b>	45A-LBC-Dxxx-xxx	45A-NBC-Dxxx-xxx

45

WITH INTEGRATED FLOW CONTROLS

Port size	Single operator	Double operator (Minimum DC wattage 5.4W)
<b>Valve less base</b>	45A-L00-Dxxx-xxx	45A-N00-Dxxx-xxx
<b>1/8" NPTF base</b>	45A-LAD-Dxxx-xxx	45A-NAD-Dxxx-xxx
<b># 10-32 UNF base</b>	45A-LBD-Dxxx-xxx	45A-NBD-Dxxx-xxx

700  
900  
82

SOLENOID OPERATOR >

D **XX X- X XX\***

XX Voltage	X Wire length	X Manual operator	XX
AA 120/60, 110/50	A 18" (Flying leads)	1 Non-locking	KA Square connector
AB 240/60, 220/50	J Connector	2 Locking	KD Square connector with light
AC 24/60, 24/50			BA Flying leads
FB 24 VDC (1.8 W)			
DA 24 VDC (5.4 W)			
DF 24 VDC (12.7 W)			

6300  
6500  
6600

\* Other options available, see page 361.

End plate kit required (Port size 1/4" NPTF) : M-45008-01

1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A



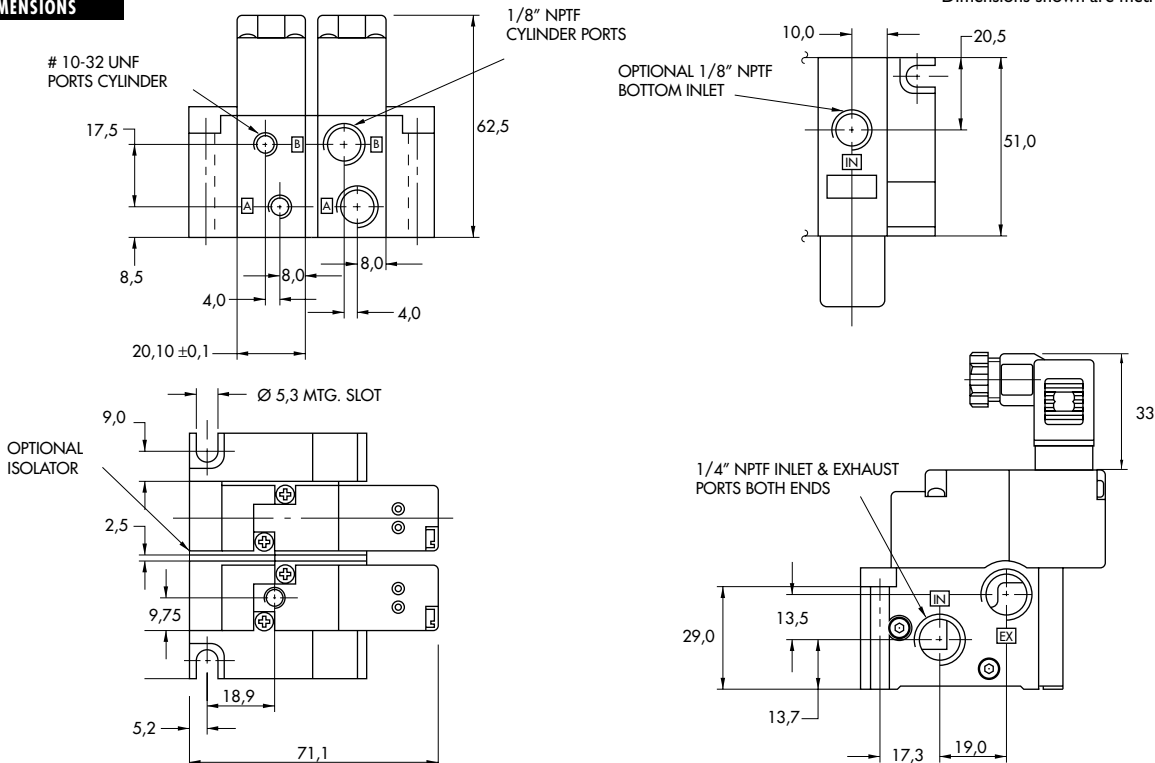
### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	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 (at 6 bar, ΔP=1bar) :</b>	1.8 W : (0.09 C <sub>v</sub> ), 5.4 W : (0.11 C <sub>v</sub> )		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 10.9 VA    Holding : 7.7 VA = 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

- Spare parts :
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
  - Seal (between solenoid and valve body) : 16402. • Seal between base and valve : 16453. • Seal between bases : 16455.
  - Tie-rod (x2) : 19753. • Side cover plate with flow controls : N-45016.
  - Inlet & exhaust isolator : N-45008. • Inlet isolator : N-45009. • Exhaust isolator : N-45010.
- Options :
- BSPP threads. • High flow up to 0.18 C<sub>v</sub> according to wattage and high flow Mod. • Bottom inlet : specify Mod. 0210.

### DIMENSIONS

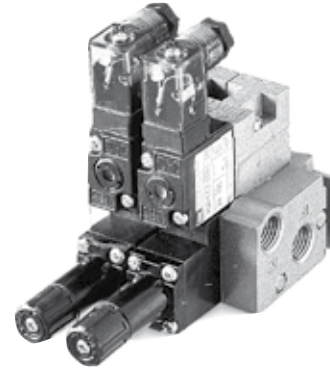
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
4/2	# 10-32 - 1/8"	0.11 C <sub>v</sub>	sub-base with pressure regulators	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Single operator	Double operator (Minimum DC wattage 5,4W)
<b>Valve less base</b>	45A-L00-Dxxx-xxx	45A-N00-Dxxx-xxx
<b>1/8" NPTF base</b>	45A-LAJ-Dxxx-xxx	45A-NAJ-Dxxx-xxx
<b># 10-32 UNF base</b>	45A-LBJ-Dxxx-xxx	45A-NBJ-Dxxx-xxx

45

SOLENOID OPERATOR ▶

D **XX X- X XX**\*

XX Voltage	X Wire length	X Manual operator	XX
AA 120/60, 110/50	A 18" (Flying leads)	1 Non-locking	KA Square connector
AB 240/60, 220/50	J Connector	2 Locking	KD Square connector with light
AC 24/60, 24/50			BA Flying leads
FB 24 VDC (1.8 W)			
DA 24 VDC (5.4 W)			
DF 24 VDC (12.7 W)			

700  
900  
82

\* Other options available, see page 361.

End plate kit required (Port size 1/4" NPTF) : M-45008-01.  
Options (with gauge port) : Single operator : replace L by M.  
Double operator : replace N by P.

**REGULATOR OPTIONS**

45A-XXJ-D xxx-xxx ("J" is for Adj. knob)  
— Replace with "E" for slotted stem  
— Replace with "G" for locking slotted stem

6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

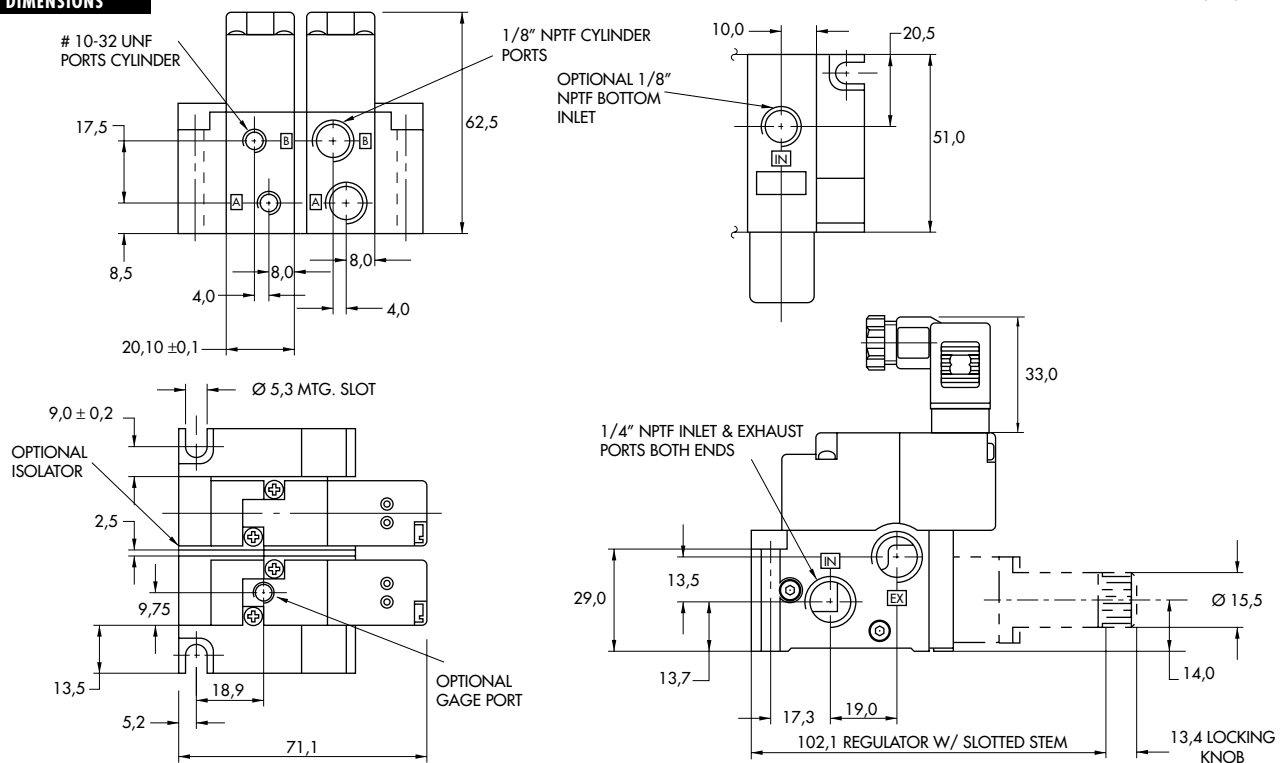
### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	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 (at 6 bar, ΔP=1bar) :</b>	1.8 W : (0.09 C <sub>v</sub> ), 5.4 W : (0.11 C <sub>v</sub> )		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	- Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

- Spare parts :
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
  - Seal (between solenoid and valve body) : 16402. • Seal between base and valve : 16453. • Seal between bases : 16455.
  - Tie-rod (x2) : 19753. • Pressure regulator : 45A-00R (Adj. Knob), 45A-00L (Slotted Stem), 45A-00M (Locking Slotted Stem).
  - Inlet & exhaust isolator : N-45008. • Inlet isolator : N-45009. • Exhaust isolator : N-45010.
- Options :
- BSPP threads. • High flow up to 0.18 C<sub>v</sub> according to wattage and high flow mod. • Bottom inlet : specify Mod. Q210.

### DIMENSIONS

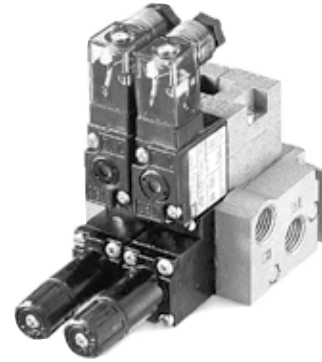
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
4/2	# 10-32 - 1/8"	0.11 C <sub>v</sub>	sub-base with pressure regulators and flow controls	



**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Single operator	Double operator (Minimum DC wattage 5,4W)
		
Valve less base	45A-L00-Dxxx-xxx	45A-N00-Dxxx-xxx
1/8" NPTF base	45A-LAK-Dxxx-xxx	45A-NAK-Dxxx-xxx
# 10-32 UNF base	45A-LBK-Dxxx-xxx	45A-NBK-Dxxx-xxx

45

SOLENOID OPERATOR ▶

D **XX X- X XX**\*

XX Voltage	X Wire length	X Manual operator	XX
AA 120/60, 110/50	A 18" (Flying leads)	1 Non-locking	KA Square connector
AB 240/60, 220/50	J Connector	2 Locking	KD Square connector with light
AC 24/60, 24/50			BA Flying leads
FB 24 VDC (1.8 W)			
DA 24 VDC (5.4 W)			
DF 24 VDC (12.7 W)			

700

900

82

\* Other options available, see page 361.

End plate kit required (Port size 1/4" NPTF) : M-45008-01.  
Options (with gauge port) : Single operator : replace L by M  
Double operator : replace N by P.

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

**REGULATOR AND F.C. OPTIONS**

45A-XXK-D xxx-xxx ("K" option is for Adj. knob and F.C.)  
— Replace with "F" for slotted stem and F.C.  
— Replace with "H" for locking slotted stem and F.C.

### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	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 (at 6 bar, ΔP=1bar) :</b>	1.8 W : (0.09 C <sub>v</sub> ), 5.4 W : (0.11 C <sub>v</sub> )		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	- Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

#### Spare parts :

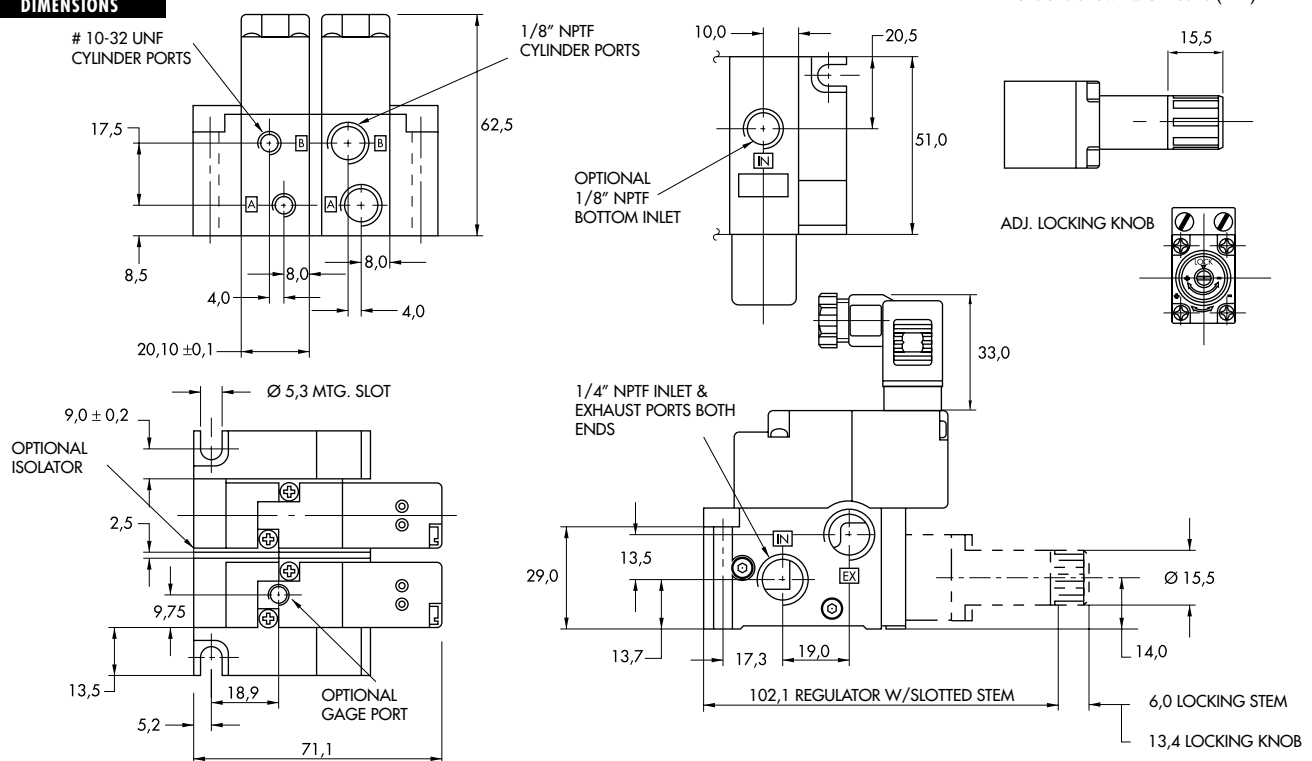
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402. • Seal between base and valve : 16453. • Seal between bases : 16455.
- Tie-rod (x2) : 19753. • Pressure regulator with flow controls : 45A-00N (Slotted Stem), 45A-00P (Locking Slotted Stem), 45A-00S(Adj. Knob). • Inlet & exhaust isolator : N-45008. • Inlet isolator : N-45009. • Exhaust isolator : N-45010.

#### Options :

- BSPP threads. • High flow up to 0.18 C<sub>v</sub> according to wattage and high flow Mod. • Bottom inlet : specify Mod. 0210.

### DIMENSIONS

Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2</b>	<b># 10-32 - 1/8"</b> 5/32 Pressed-intube receptacles	<b>0.11 Cv</b>	Manifold base plug-in	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

### HOW TO ORDER

Port size	Single operator	Double operator
<b>Valve less base</b>	45A-L00-00-DxxJ-xxx	45A-N00-00-DxxJ-xxx
<b>1/8" NPTF base</b>	45A-LSA-AC-DxxJ-xxx	45A-NSA-BL-DxxJ-xxx
<b># 10-32 UNF base</b>	45A-LSD-AC-DxxJ-xxx	45A-NSD-BL-DxxJ-xxx
<b>5/32 Pressed-in tube receptacles</b>	45A-LSF-AC-DxxJ-xxx	45A-NSF-BL-DxxJ-xxx

45

Note: Double operator valves are only available with bottom cylinder ports.

### SOLENOID OPERATOR ▶

D **XX** J-X **XX**\*

XX Voltage	X Manual operator	XX Electrical connection
<b>AA</b> 120/60, 110/50	<b>0</b> No operator	<b>FM</b> Plug-in
<b>AB</b> 240/60, 220/50	<b>1</b> Non-locking	<b>FN</b> Plug-in with diode
<b>DA</b> 24 VDC (5.4W)	<b>2</b> Locking	<b>FP</b> Plug-in with M.O.V.
<b>FA</b> 12 VDC (1.8W)		
<b>FB</b> 24 VDC (1.8W)		
<b>FE</b> 12 VDC (2.4W)		
<b>FF</b> 24 VDC (2.4W)		

700  
900  
82

\* Other options available, see page 361.

### OPTIONS

45A-L SA-A C-DxxJ-xxx

- C** Side cylinder ports - Single operator only
- L** Bottom cylinder ports - Single or double operator
- O** Base only - no valve
- L** Single solenoid - Base mount body
- M** Single solenoid - Base mount body with gage port
- N** Double solenoid - Base mount body
- P** Double solenoid - Base mount body with gage port

Example: base only: 45A-0SA-AC (1/8" NPTF wired for single operator)  
End plate kit required : M-45028-01

6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

### TECHNICAL DATA

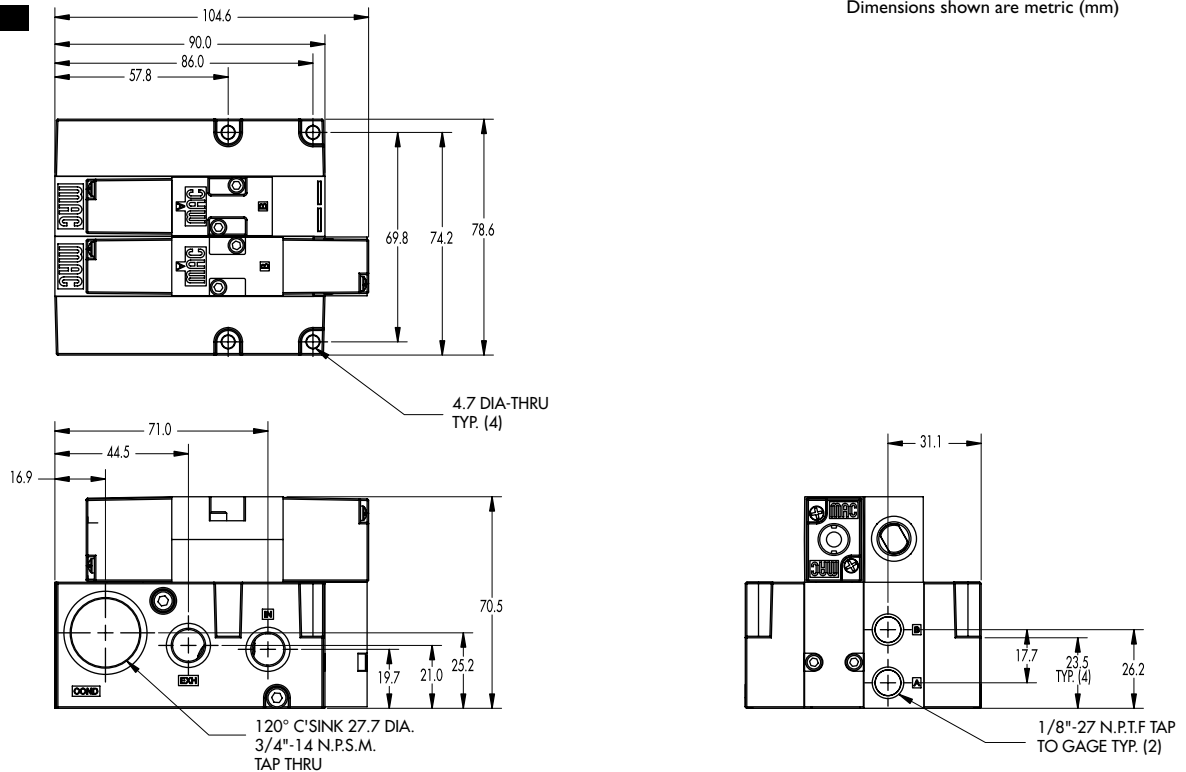
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1.8 W : (0.09 C <sub>v</sub> ), 5.4 W : (0.11 C <sub>v</sub> )
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power : 120 VAC : DC</b>	~ Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W

Spare parts :      • Inlet isolator : 28477   • Exhaust isolator : 28476  
                              • Tie rod (x2): 79244   • Seal between bases: 16762   • Seal between valve & base: 16453

Options :            • BSPP threads

### DIMENSIONS

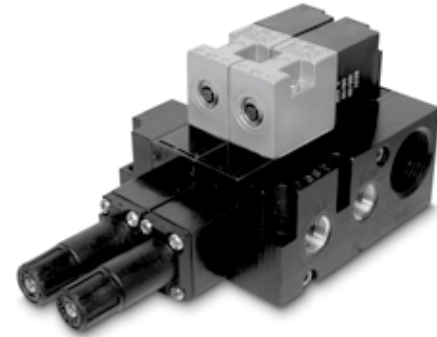
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
4/2	# 10-32 - 1/8" 5/32 Pressed-intube receptacles	0.11 Cv	Manifold base plug-in with pressure regulators	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Single operator
<b>Valve less base</b>	45A-L00-00-DxxJ-xxx
<b>1/8" NPTF base</b>	45A-LSA-AJ-DxxJ-xxx
<b># 10-32 UNF base</b>	45A-LSD-AJ-DxxJ-xxx
<b>5/32 Pressed-in tube receptacles</b>	45A-LSF-AJ-DxxJ-xxx

45

SOLENOID OPERATOR >

D **XX** J-X **XX**\*

XX Voltage	X Manual operator	XX Electrical connection
AA 120/60, 110/50	0 No operator	FM Plug-in
AB 240/60, 220/50	1 Non-locking	FN Plug-in with diode
DA 24 VDC (5.4W)	2 Locking	FP Plug-in with M.O.V.
FA 12 VDC (1.8W)		
FB 24 VDC (1.8W)		
FE 12 VDC (2.4W)		
FF 24 VDC (2.4W)		

700  
900  
82

\* Other options available, see page 361.  
Note : Bottom cylinder ports only with the regulator option.

**OPTIONS**

45A- L SA-A J -DxxJ-xxx

- J** Regulator with adjusting knob
- E** Regulator with slotted stem
- G** Regulator with locking slotted stem
- O** Base only – no valve
- L** Single solenoid - Base mount body
- M** Single solenoid - Base mount body with gage port

Example: base only with regulator: 45A-0SA-AJ  
End plate kit required : M-45028-01

6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A



**TECHNICAL DATA**

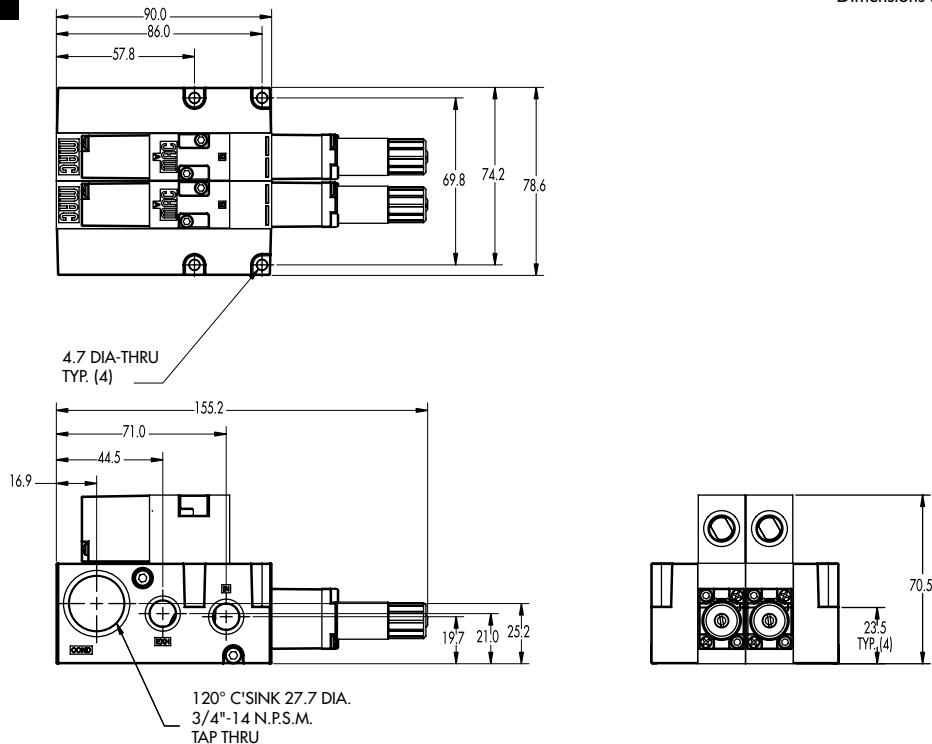
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1.8 W : (0.09 C <sub>v</sub> ), 5.4 W : (0.11 C <sub>v</sub> )
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power : 120 VAC : DC</b>	~ Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W

Spare parts :      • Inlet isolator : 28477   • Exhaust isolator : 28476  
                              • Tie rod (x2): 79244   • Seal between bases: 16762   • Seal between valve & base: 16453

Options :            • BSPP threads

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2</b>	<b># 10-32 - 1/8"</b> 5/32 Pressed-intube receptacles	<b>0.11 Cv</b>	Manifold base plug-in with flow controls	

### OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

### HOW TO ORDER

Port size	Single operator
<b>Valve less base</b>	45A-L00-00-DxxJ-xxx
<b>1/8" NPTF base</b>	45A-LSA-AD-DxxJ-xxx
<b># 10-32 UNF base</b>	45A-LSD-AD-DxxJ-xxx
<b>5/32 Pressed-in tube receptacles</b>	45A-LSF-AD-DxxJ-xxx

45

### SOLENOID OPERATOR >

D **XX** J-X **XX**\*

XX Voltage	X Manual operator	XX Electrical connection
<b>AA</b> 120/60, 110/50	<b>0</b> No operator	<b>FM</b> Plug-in
<b>AB</b> 240/60, 220/50	<b>1</b> Non-locking	<b>FN</b> Plug-in with diode
<b>DA</b> 24 VDC (5.4W)	<b>2</b> Locking	<b>FP</b> Plug-in with M.O.V.
<b>FA</b> 12 VDC (1.8W)		
<b>FB</b> 24 VDC (1.8W)		
<b>FE</b> 12 VDC (2.4W)		
<b>FF</b> 24 VDC (2.4W)		

700  
900  
82

\* Other options available, see page 361.

### OPTIONS

45A-L SA-A D-DxxJ-xxx

- D** Side cylinder ports with flow controls
- M** Bottom cylinder ports with flow controls
- O** Base only – no valve
- L** Single solenoid - Base mount body
- M** Single solenoid - Base mount body with gage port

Example: Base only with flow controls: 45A-OSA-AD  
End plate kit required : M-45028-01

6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

### TECHNICAL DATA

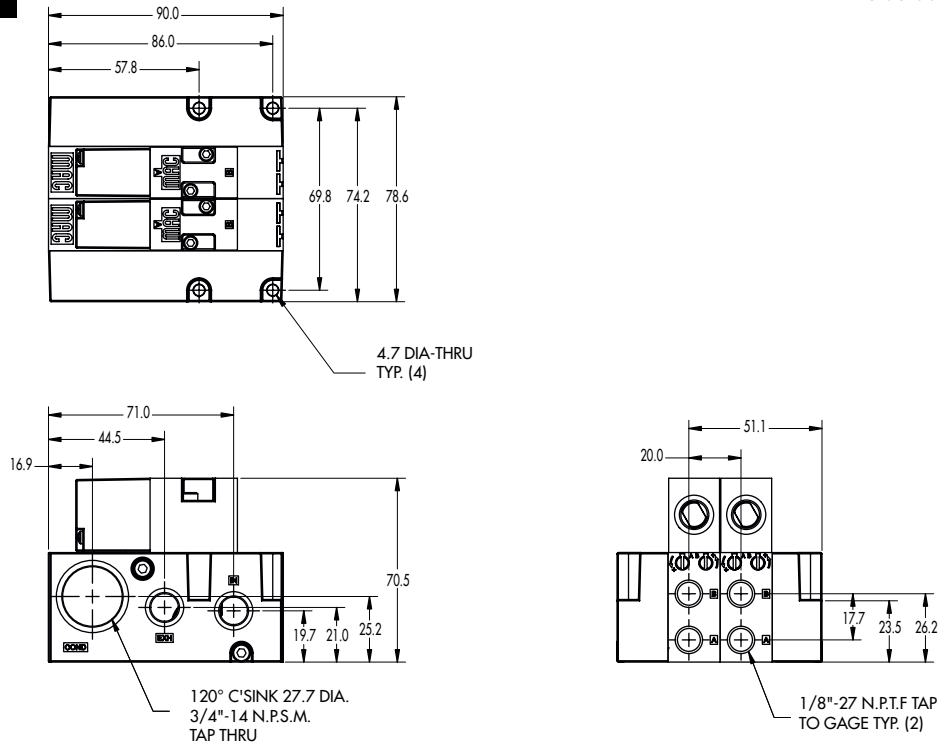
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1.8 W : (0.09 C <sub>v</sub> ), 5.4 W : (0.11 C <sub>v</sub> )
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power : 120 VAC : DC</b>	~ Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W

Spare parts :      • Inlet isolator : 28477   • Exhaust isolator : 28476  
                              • Tie rod (x2): 79244   • Seal between bases: 16762   • Seal between valve & base: 16453

Options :            • BSPP threads

### DIMENSIONS

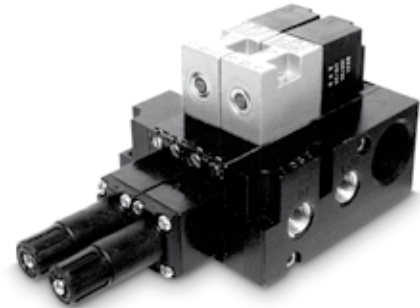
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
4/2	# 10-32 - 1/8" 5/32 Pressed-intube receptacles	0.11 Cv	Manifold base plug-in with regulator & flow controls	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Single operator
<b>Valve less base</b>	45A-L00-00-DxxJ-xxx
<b>1/8" NPTF base</b>	45A-LSA-AK-DxxJ-xxx
<b># 10-32 UNF base</b>	45A-LSD-AK-DxxJ-xxx
<b>5/32 Pressed-in tube receptacles</b>	45A-LSF-AK-DxxJ-xxx

45

SOLENOID OPERATOR ►

D **XX** J-**X** **XX**\*

XX Voltage	X Manual operator	XX Electrical connection
<b>AA</b> 120/60, 110/50	<b>0</b> No operator	<b>FM</b> Plug-in
<b>AB</b> 240/60, 220/50	<b>1</b> Non-locking	<b>FN</b> Plug-in with diode
<b>DA</b> 24 VDC (5.4W)	<b>2</b> Locking	<b>FP</b> Plug-in with M.O.V.
<b>FA</b> 12 VDC (1.8W)		
<b>FB</b> 24 VDC (1.8W)		
<b>FE</b> 12 VDC (2.4W)		
<b>FF</b> 24 VDC (2.4W)		

700  
900  
82

\* Other options available, see page 361.

Note : Bottom cylinder ports only available with the regulator & flow controls option.

**OPTIONS**

45A-**L** SA-A K-DxxJ-xxx

- K** Regulator with adjusting knob & flow controls
- F** Regulator with slotted stem & flow controls
- H** Regulator with locking slotted stem & flow controls
- O** Base only – no valve
- L** Single solenoid - Base mount body
- M** Single solenoid - Base mount body with gage port

Example: Base only with regulator and flow controls: 45A-OSA-AK  
End plate kit required : M-45028-01

6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

### TECHNICAL DATA

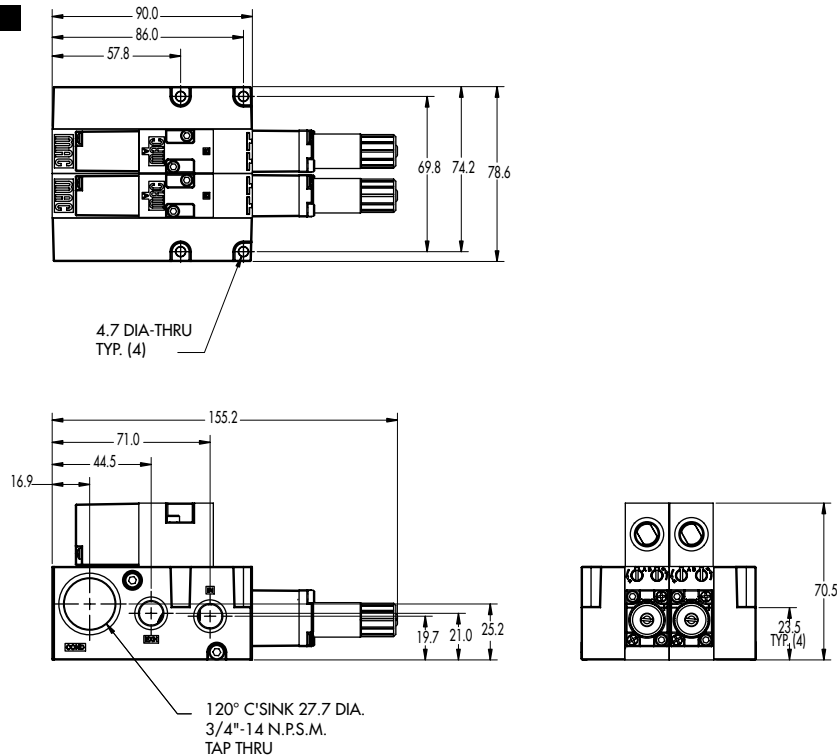
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
<b>Filtration :</b>	40 µ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1.8 W : (0.09 C <sub>v</sub> ), 5.4 W : (0.11 C <sub>v</sub> )
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power : 120 VAC : DC</b>	~ Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W

Spare parts :      • Inlet isolator : 28477    • Exhaust isolator : 28476  
                           • Tie rod (x2): 79244    • Seal between bases: 16762    • Seal between valve & base: 16453

Options :            • BSPP threads

### DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

inline	
--------	--

Manifold mounting

stacking	
----------	--

Series

35

100

200

55

56

57

58

59

45

700

900

82

6300

6500

6600

1300

800

ISO 1

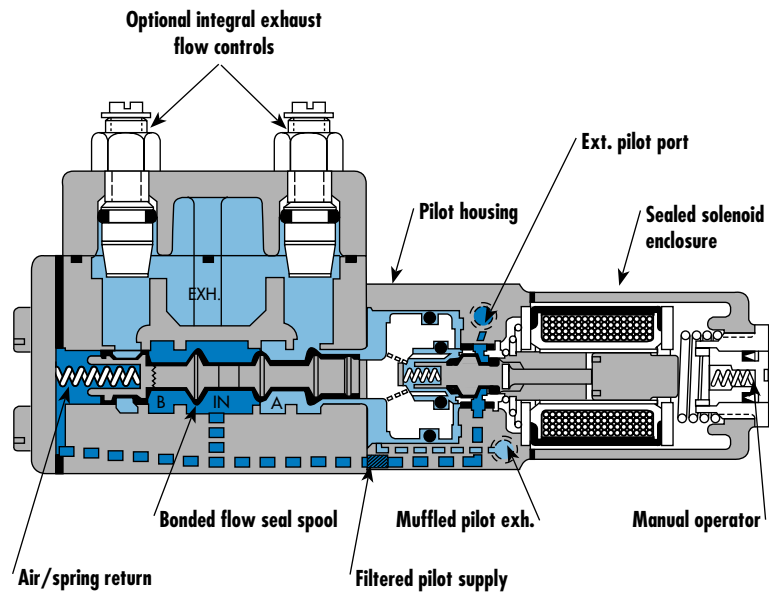
ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A



**SERIES FEATURES**

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Air/spring return for consistent shifting on single solenoid internal pilot valves.
- Use on lube or non-lube service.
- Optional integral adjustable exhaust flow controls with a single common exhaust port.
- Optional low wattage DC solenoids down to 1 watt.
- Various types of manual operators and solenoid enclosures.

### VALVE CONFIGURATIONS AVAILABLE

The 700Series is a compact 4-way valve with a Cv of up to .8. This series provides fast response, long life and high flow not commonly found in this size valve.

- 2-Pos., single or double operator (solenoid or remote air).
- Individual body or stacking body (2 common ports).
- Integral adjustable exhaust flow control models.
- Internal pilot or external pilot for vacuum to 20 psi main valve pressures.
- Manual and mechanical operators available.

### SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

The remote air versions feature:

- Air/spring return for consistent shifting on single remote air valves for main valve pressures of 20 psi or more.
- Optional integral adjustable exhaust flow controls.

### SERIES FEATURES-REMOTE AIR PILOT, PILOT OPERATED VALVES

These special air versions have the same features as the remote air pilot operated models, but additionally feature:

- Ability to use a pilot signal pressure different from the main valve pressure. Pilot signal can be from 20-150 PSI, regardless of main valve pressure.
- A manual operator/position indicator.

### SPECIAL APPLICATIONS:

On all models, energizing the operator nearest the "A" port supplies pressure to cylinder port "A" and energizing the operator nearest the "B" port supplies pressure to cylinder port "B". For the following special applications additional considerations are required.

- INTERNAL PILOT-Utilized for main valve pressures equal to or greater than minimum pilot pressures. Pilot supply is fed to both the pilot valves and the air/spring return from the inlet.
- EXTERNAL PILOT-Required for all solenoid pilot operated models when main valve pressures are below 20 PSI on single operator or 10 PSI on double operator models. Single operators require MOD 158-heavy duty spring. Pipe using either an M5x0.8 or a #10-32 UNF fitting to the external pilot port. To convert from internal to external pilot, simply rotate pilot housing 180° and install heavy duty spring.
- VACUUM APPLICATIONS-Use external pilot models only, without flow controls and connect vacuum source to the exhaust port and leave the inlet open to atmosphere.
- SELECTOR APPLICATIONS-Use models without flow controls, connect the higher pressure to the inlet port and lower pressure to the exhaust port.

Function	Port size	Flow (Max)	Individual mounting	Series
4/2	1/8" - 1/4"	0.7 C <sub>v</sub>	inline	

**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.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Pilot air	Single operator	Double operator
1/8" NPTF	Internal	711C-11-PI- <b>XXYYZZ</b>	721C-11-PI- <b>XXYYZZ</b>
1/4" NPTF	Internal	711C-12-PI- <b>XXYYZZ</b>	721C-12-PI- <b>XXYYZZ</b>
1/8" NPTF	External	711C-11-PE- <b>XXYYZZ</b>	721C-11-PE- <b>XXYYZZ</b>
1/4" NPTF	External	711C-12-PE- <b>XXYYZZ</b>	721C-12-PE- <b>XXYYZZ</b>

45

HOW TO ORDER VALVE WITH FLOW CONTROLS

Port size	Pilot air	Single operator	Double operator
1/8" NPTF	Internal	712C-11-PI- <b>XXYYZZ</b>	722C-11-PI- <b>XXYYZZ</b>
1/4" NPTF	Internal	712C-12-PI- <b>XXYYZZ</b>	722C-12-PI- <b>XXYYZZ</b>
1/8" NPTF	External	712C-11-PE- <b>XXYYZZ</b>	722C-11-PE- <b>XXYYZZ</b>
1/4" NPTF	External	712C-12-PE- <b>XXYYZZ</b>	722C-12-PE- <b>XXYYZZ</b>

700

900

82

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

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 24/50, 24/60		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)		CA Conduit 1/2" NPS

\* Other options available, see page 357.

**OPTIONS**

7XXC-XX-PX-**XXYYZZ**

└ - For bottom ports (1/8" only) replace by 2.



### TECHNICAL DATA

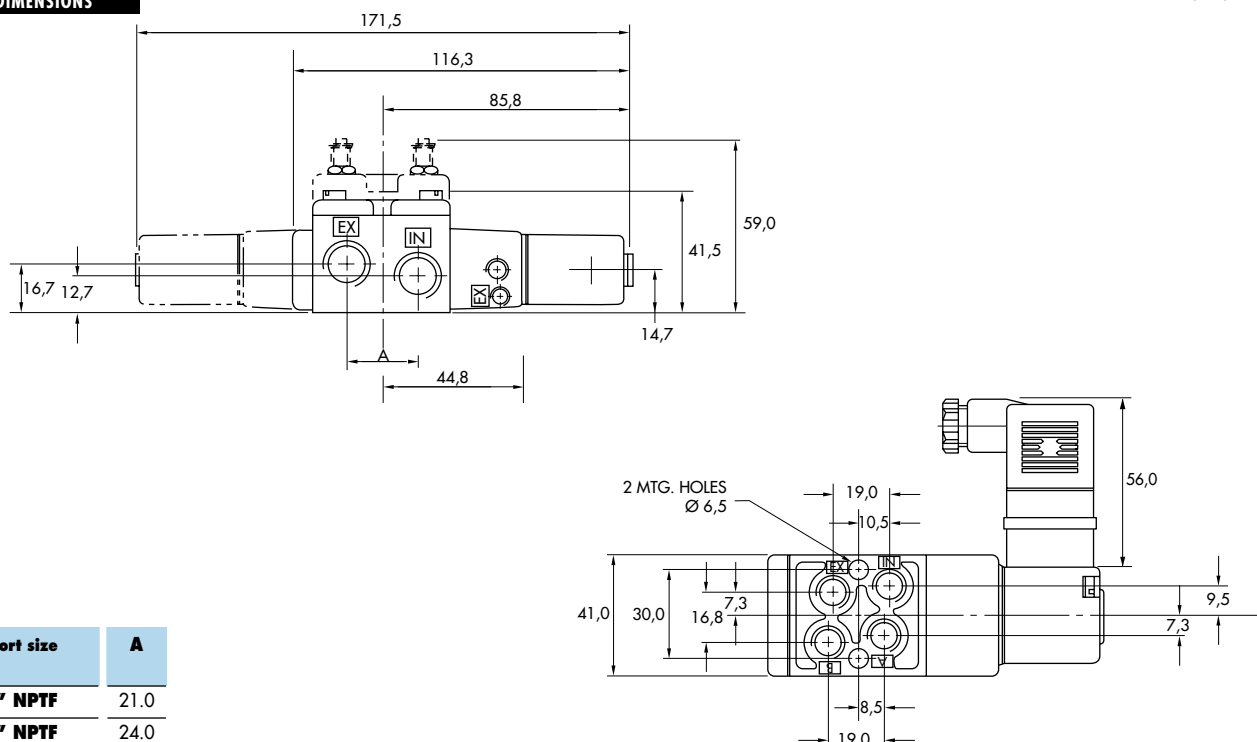
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot : single operator : 20 to 150 PSI    double operator : 10 to 150 PSI External pilot : vacuum to 150 PSI
<b>Pilot pressure :</b>	Single operator : 20 to 150 PSI    Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 µ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/8" : (0.6 C <sub>v</sub> ), 1/4" : (0.7 C <sub>v</sub> )
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~ Inrush : 14.8 VA    Holding : 10.9 VA = 1 to 17.1 W
<b>Response times :</b>	24 VDC (8.5 W)    Energize : 6.4 ms    De-energize : 8.5ms 120/60    Energize : 4-10 ms    De-energize : 7-13 ms

- Spare parts :
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
  - Pilot valve : PID-XXYZZ, including mounting screws 35214 and seal 16363.
  - Valve cover plate with integral flow controls : N-07002.

- Options :
- BSPP threads.

### DIMENSIONS

Dimensions shown are metric (mm)

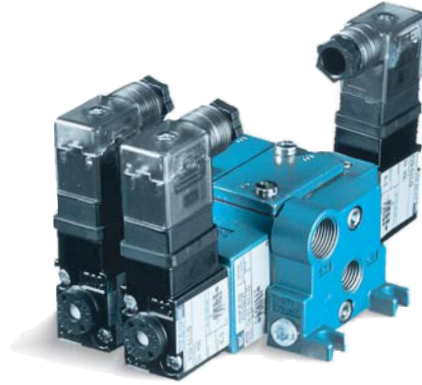


Port size	A
<b>1/8" NPTF</b>	21.0
<b>1/4" NPTF</b>	24.0

Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2</b>	<b>1/8" - 1/4"</b>	<b>0.8 C<sub>v</sub></b>	stacking	

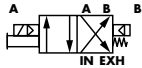
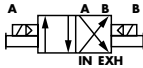
**OPERATIONAL BENEFITS**

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.



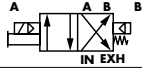
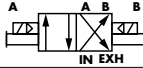
35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Pilot air	Single operator	Double operator
			
<b>1/8" NPTF</b>	Internal	713C-11-PI- <b>XXYZZ</b>	723C-11-PI- <b>XXYZZ</b>
<b>1/4" NPTF</b>		713C-12-PI- <b>XXYZZ</b>	723C-12-PI- <b>XXYZZ</b>

45

HOW TO ORDER VALVE WITH FLOW CONTROLS

Port size	Pilot air	Single operator	Double operator
			
<b>1/8" NPTF</b>	Internal	714C-11-PI- <b>XXYZZ</b>	724C-11-PI- <b>XXYZZ</b>
<b>1/4" NPTF</b>		714C-12-PI- <b>XXYZZ</b>	724C-12-PI- <b>XXYZZ</b>

700

900

82

SOLENOID OPERATOR ►

**XX Y ZZ\***

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

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

\* Other options available, see page 357.

End plate kit required (Port size 1/4") : M-07001-01-01 (internal pilot).  
M-07001-02-01 (external pilot).  
M-01002-01 (for MB option) required in addition to one of the above end plate kits.

**TECHNICAL DATA**

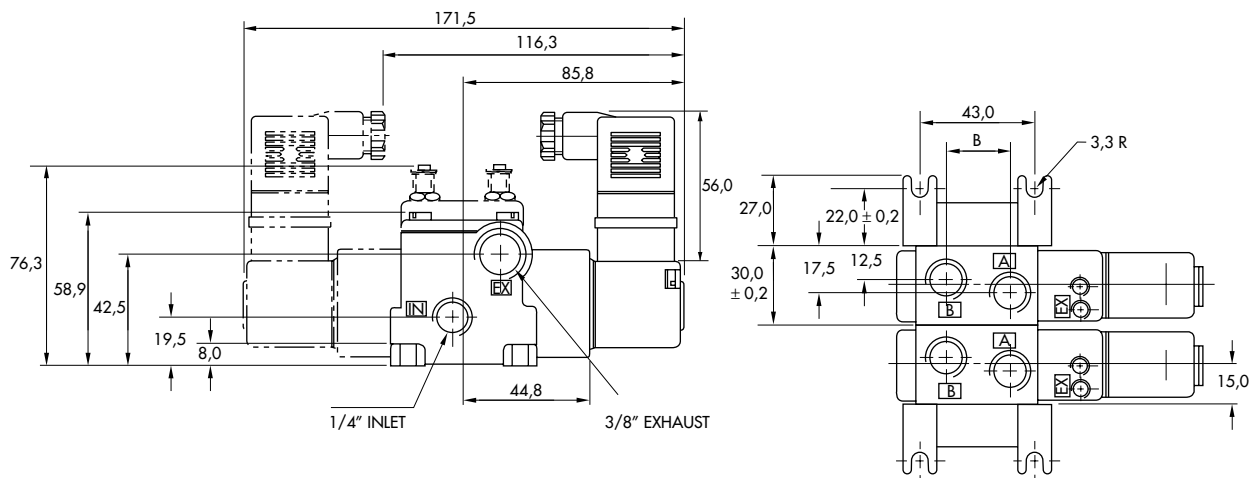
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot : single operator : 20 to 150 PSI    double operator : 10 to 150 PSI External pilot : vacuum to 150 PSI
<b>Pilot pressure :</b>	Single operator : 20 to 150 PSI    Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/8" : (0.7 C <sub>v</sub> ), 1/4" : (0.8 C <sub>v</sub> )
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~ Inrush : 14.8 VA    Holding : 10.9 VA = 1 to 17.1 W
<b>Response times :</b>	24 VDC (8.5 W)    Energize : 6.4 ms    De-energize : 8.5 ms 120/60    Energize : 4-10 ms    De-energize : 7-13 ms

- Spare parts :
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
  - Pilot valve : PID-XXYZZ, including mounting screws 35214 and seal 16363.
  - Valve cover plate with integral flow controls : N-07004. • Inlet & exhaust isolator : N-07005. • Inlet isolator : N-07006.
  - Exhaust isolator : N-07007.

- Options :
- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Port size	B
1/8" NPTF	21.0
1/4" NPTF	24.0

Individual mounting

Series

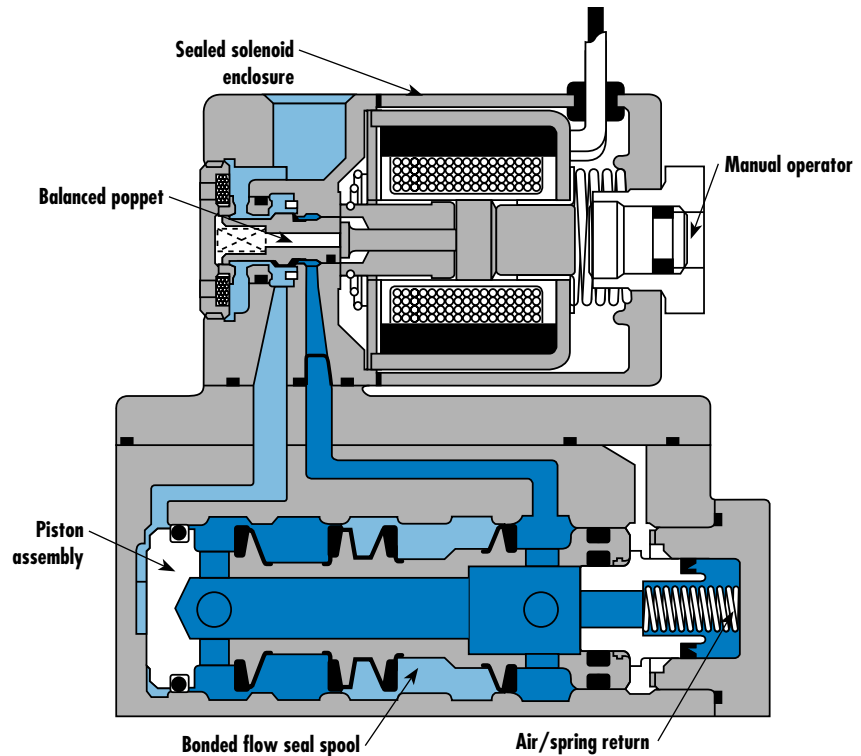
inline

Manifold mounting

35

stacking

100



200

55

56

57

58

59

45

700

**900**

82

**SERIES FEATURES**

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Air/spring return on single solenoid valves.
- Use for lube or non-lube service.
- Optional low wattage DC solenoids down to 1 watt.
- Various types of manual operators and electrical enclosures.

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A



### VALVE CONFIGURATIONS AVAILABLE

The 900 Series is a small Inline 4-way valve with a Cv of up to 1.4. This series provides fast response, long life and high flow not commonly found in this size valve.

- 2-Pos., single or double operator (solenoid or remote air).
- Individual body or stacking body models.
- Manual and mechanical operators available

### SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

The remote air versions feature:

- Air/spring return on single remote air valves
- Use for lube or non-lube service.
- Optional remote air pilot, pilot operated models available when application requires a pilot signal below the main valve pressure.

### SPECIAL APPLICATIONS:

On all models, energizing the "A" operator (solenoid or remote air) supplies pressure to cylinder port "A" and energizing the "B" operator supplies pressure to cylinder port "B". For the following special applications, additional piping considerations are required.

**VACUUM APPLICATIONS (remote Air Models Only)**-Connect the vacuum source to the Exhaust port and leave the Inlet open to atmosphere. Also specify MOD 158 which provides a heavy duty spring in lieu of air/spring.

**SELECTOR APPLICATIONS**-When using as a selector valve, connect the higher pressure to the Inlet port and the lower pressure to the Exhaust port. On solenoid models, the Inlet pressure must be a minimum of 25 PSI on singles or 10 PSI on doubles.

Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2</b>	<b>1/8" - 1/4"</b>	<b>1.2 C<sub>v</sub></b>	inline	

**OPERATIONAL BENEFITS**

1. Balanced spool, immune to variations of pressure.
2. Short stroke with high flow.
3. Large spool area 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.



- 35
- 100
- 200
- 55
- 56
- 57
- 58
- 59

**HOW TO ORDER**

Port size	Single operator	Double operator
<b>1/8" NPTF</b>	911B-PM- <b>XXYYZZ</b>	921B-PM- <b>XXYYZZ</b>
<b>1/4" NPTF</b>	912B-PM- <b>XXYYZZ</b>	922B-PM- <b>XXYYZZ</b>

45

SOLENOID OPERATOR >

**XX Y ZZ\***

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

700

900

82

\* Other options available, see page 357.

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Single operator : 25 to 150 PSI      Double operator : 10 to 150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/8" : (0.8 C <sub>v</sub> ), 1/4" : (1.2 C <sub>v</sub> )		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	- Inrush : 14.8 VA      Holding : 10.9 VA = 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 8 ms	De-energize : 10 ms
	120/60	Energize : 5-10 ms	De-energize : 8-15 ms

Spare parts :

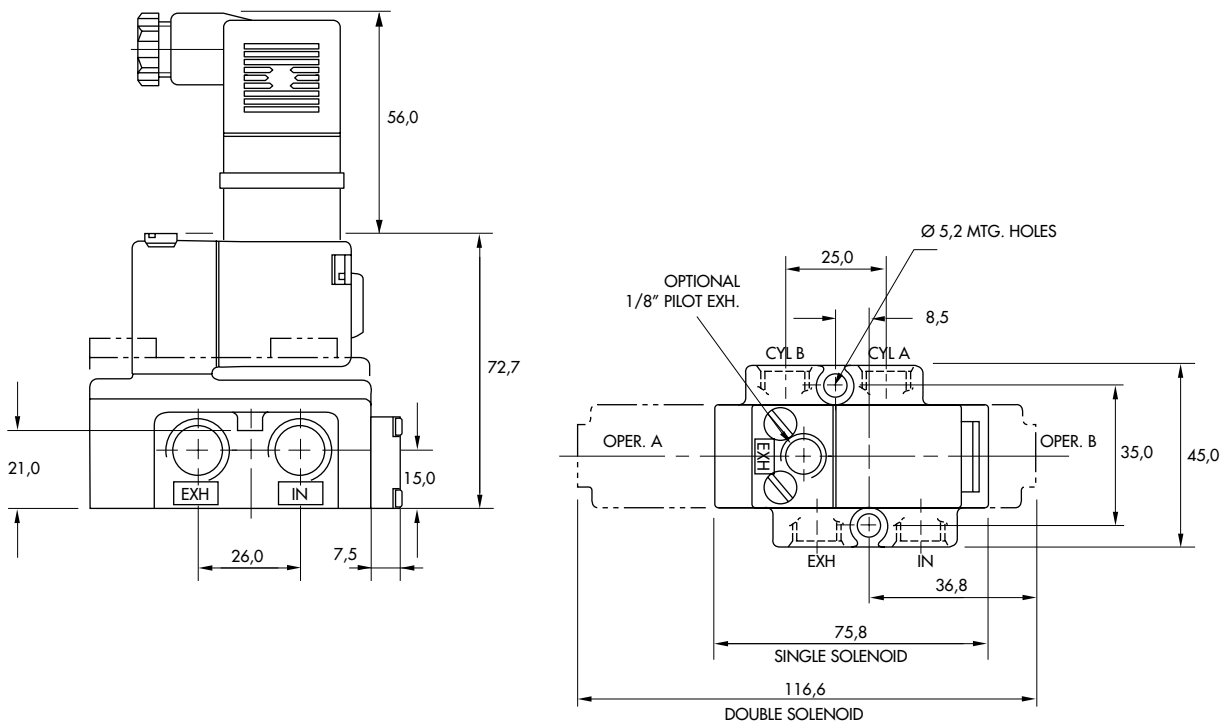
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XYZZ, including seal 16337. • Mounting screw pilot to main valve : 35219.

Options :

- BSPP threads.

**DIMENSIONS**

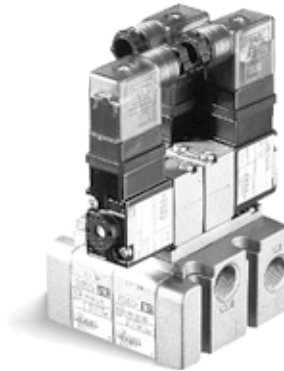
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
4/2	1/8" - 1/4" - 3/8"	1.4 C <sub>v</sub>	stacking	

**OPERATIONAL BENEFITS**

1. Balanced spool, immune to variations of pressure.
2. Short stroke with high flow.
3. Large spool area 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.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Single operator	Double operator
1/8" NPTF	913B-PM- <b>XXYZZ</b>	923B-PM- <b>XXYZZ</b>
1/4" NPTF	914B-PM- <b>XXYZZ</b>	924B-PM- <b>XXYZZ</b>
3/8" NPTF	919B-PM- <b>XXYZZ</b>	N/A

45

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 24/50, 24/60		BA Flying leads (18")
59 24 VDC (2.5 W)		MA Common conduit 1" NPS
87 24 VDC (17.1 W)		RA Conduit 3/8" NPS
61 24 VDC (8.5 W)		

700

900

82

\* Other options available, see page 357.

End plate kit required (Port size : 3/8") : M-09001-01.  
"MA" option also requires end plate kit : M-01002-01.

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A



**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Single operator : 25 to 150 PSI	Double operator : 10 to 150 PSI	
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/8" : (1.2 C <sub>v</sub> ), 1/4" : (1.4 C <sub>v</sub> ), 3/8" : (1.4 C <sub>v</sub> )		
<b>Coil :</b>	General purpose class A, continuous duty, encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 8 ms	De-energize : 10 ms
	120/60	Energize : 5-10 ms	De-energize : 8-15 ms

Spare parts :

- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XYZZ, including seal 16367. • Mounting screw pilot to main valve : 35208.
- Pressure seal between valves : 16358. • Tie-rod (x2) : 19615. • Inlet & exhaust isolator : N-09002. • Inlet isolator : N-09004.A.
- Exhaust isolator : N-09003.

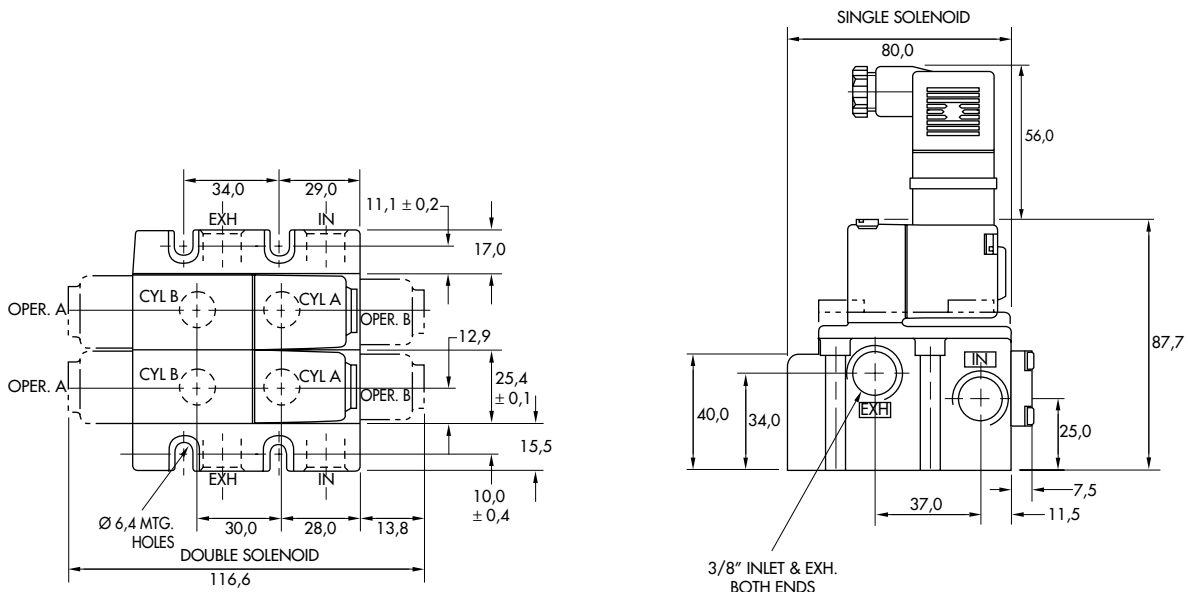
Options :

- BSPP threads.

7,5

**DIMENSIONS**

Dimensions shown are metric (mm)



### Individual mounting

sub-base  
non "plug-in"

sub-base  
"plug-in"

Series

### Manifold mounting

sub-base  
non "plug-in"

sub-base  
"plug-in"

35

100

200

55

56

57

58

59

45

700

900

82

6300

6500

6600

1300

800

ISO 1

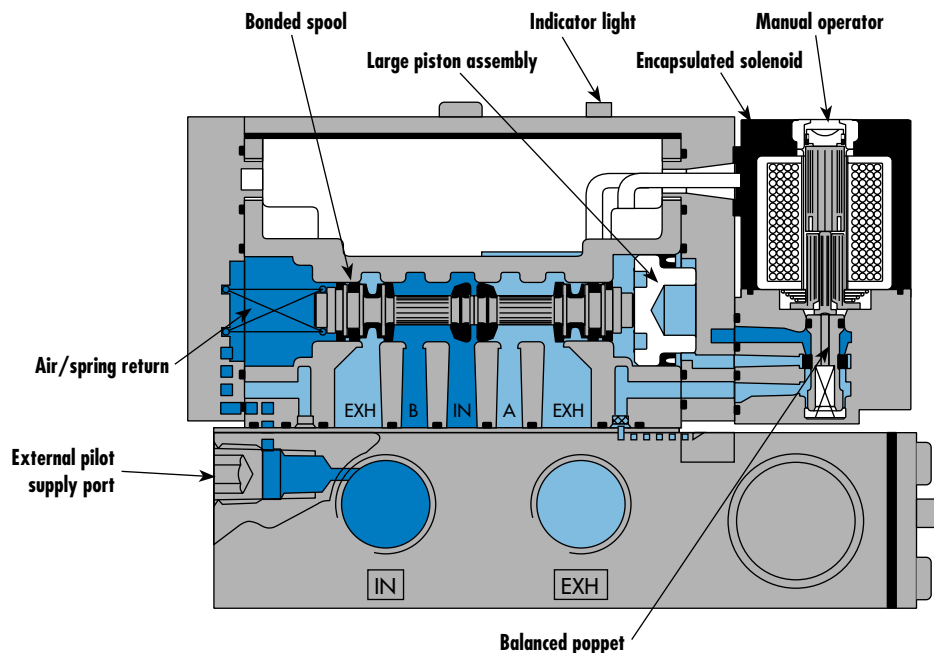
ISO 2

ISO 3

MAC 125A

MAC 250A

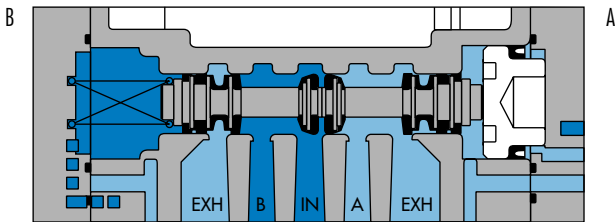
MAC 500A



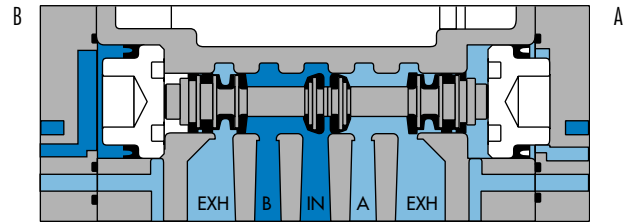
### SERIES FEATURES

- Unique patented MACSOLENOID® for fastest possible response times.
- Balanced poppet pilot valve for high flow, precise repeatability, and consistent operation.
- Large spool piston for maximum shifting force even at minimum operating pressure.
- Air/spring return for consistent shifting on single solenoid models.
- MAC spool and bore combination for wiping away contamination, eliminating sticking, and use on non-lube service.
- Patented virtually burn-out proof AC solenoid.
- Plug-in design of valves, bases, flow controls, and regulators for modular assembly and ease of maintenance.
- Optional low wattage DC solenoids down to 1.8 watts.
- Indicator lights in valve body or base and non-plug-in models available.
- Very high flow in a very compact package.

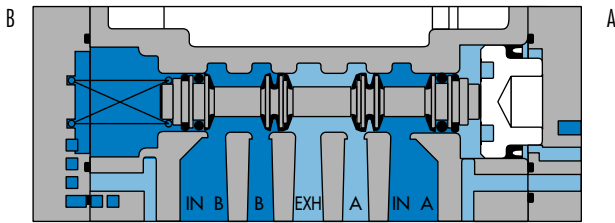
**SPOOL CONFIGURATIONS**



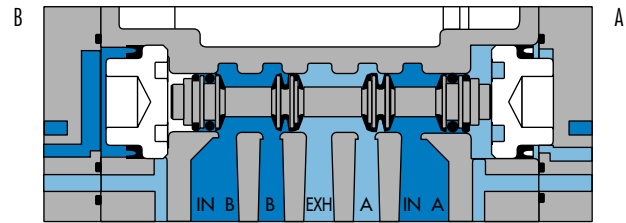
SINGLE OPERATOR  
SINGLE INLET - DUAL EXHAUST  
SHOWN WITH "B" OPERATOR ENERGIZED



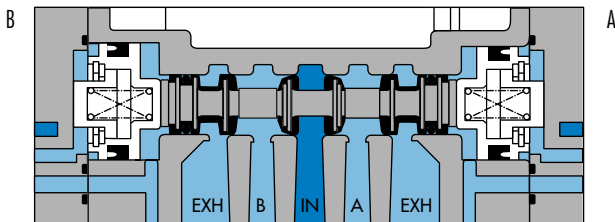
DOUBLE OPERATOR  
SINGLE INLET - DUAL EXHAUST  
SHOWN WITH "B" OPERATOR ENERGIZED



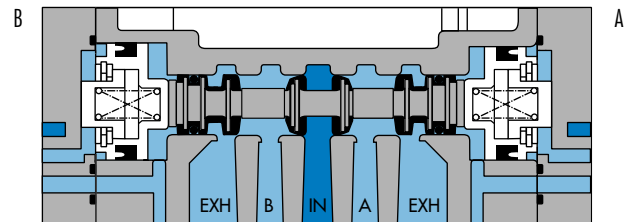
SINGLE OPERATOR  
DUAL INLET - SINGLE EXHAUST  
SHOWN WITH "B" OPERATOR ENERGIZED



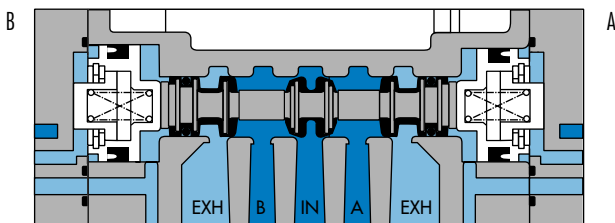
DOUBLE OPERATOR  
DUAL INLET - SINGLE EXHAUST  
SHOWN WITH "B" OPERATOR ENERGIZED



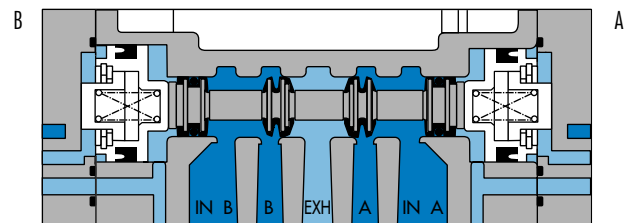
3 POSITION CLOSED CENTER



3 POSITION OPEN CENTER



3 POSITION SINGLE PRESSURE  
PRESSURE CENTER

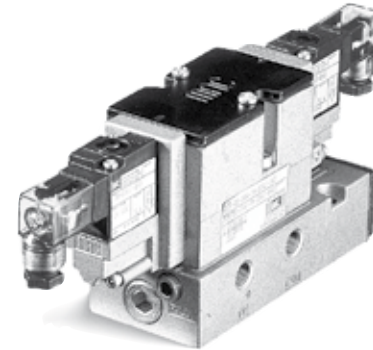


3 POSITION DUAL PRESSURE  
PRESSURE CENTER

Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>1/8" - 1/4" - 3/8"</b>	<b>1.35 C<sub>v</sub></b>	sub-base non "plug-in"	

### OPERATIONAL BENEFITS

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



35  
100  
200  
55  
56  
57  
58  
59

### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		82A-AB-000-TM-Dxxx-xxx	82A-BB-000-TM-Dxxx-xxx	82A-EB-000-TM-Dxxx-xxx	82A-FB-000-TM-Dxxx-xxx	82A-GB-000-TM-Dxxx-xxx
<b>sub-base</b>	Internal	82A-AB-AAA-TM-Dxxx-xxx	82A-BB-AAA-TM-Dxxx-xxx	82A-EB-AAA-TM-Dxxx-xxx	82A-FB-AAA-TM-Dxxx-xxx	82A-GB-AAA-TM-Dxxx-xxx
<b>1/8" NPTF</b>	External	82A-AB-AAD-TM-Dxxx-xxx	82A-BB-AAD-TM-Dxxx-xxx	82A-EB-AAD-TM-Dxxx-xxx	82A-FB-AAD-TM-Dxxx-xxx	82A-GB-AAD-TM-Dxxx-xxx
<b>sub-base</b>	Internal	82A-AB-BAA-TM-Dxxx-xxx	82A-BB-BAA-TM-Dxxx-xxx	82A-EB-BAA-TM-Dxxx-xxx	82A-FB-BAA-TM-Dxxx-xxx	82A-GB-BAA-TM-Dxxx-xxx
<b>1/4" NPTF</b>	External	82A-AB-BAD-TM-Dxxx-xxx	82A-BB-BAD-TM-Dxxx-xxx	82A-EB-BAD-TM-Dxxx-xxx	82A-FB-BAD-TM-Dxxx-xxx	82A-GB-BAD-TM-Dxxx-xxx
<b>sub-base</b>	Internal	82A-AB-CAA-TM-Dxxx-xxx	82A-BB-CAA-TM-Dxxx-xxx	82A-EB-CAA-TM-Dxxx-xxx	82A-FB-CAA-TM-Dxxx-xxx	82A-GB-CAA-TM-Dxxx-xxx
<b>3/8" NPTF</b>	External	82A-AB-CAD-TM-Dxxx-xxx	82A-BB-CAD-TM-Dxxx-xxx	82A-EB-CAD-TM-Dxxx-xxx	82A-FB-CAD-TM-Dxxx-xxx	82A-GB-CAD-TM-Dxxx-xxx

45  
700  
900

### SOLENOID OPERATOR ▶

D **XX X- X XX**

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

Note : KD connector shown in photo.

\* Other options available, see page 361.

### OPTIONS

82A-AB-000-TM-Dxxx-xxx

- For dual pressure valves, replace A by C, B by D, E by M, F by L, G by H. (Requires sandwich regulator, see pressure regulator section.)

82A-AB-000-TM-Dxxx-xxx

- TP (Piped pilot exhaust)
- For pilot exhaust out main exhaust, replace B by E. Also, TM pilot body is replaced by TU pilot body.
- Main exhaust cannot be restricted. Available only on single pressure valves.

82A-XX-BAA-TM-Dxxx-xxx

- Replace A by B for bottom ports (1/8" or 1/4" only)
- Replace A by C for side and bottom ports (1/8" or 1/4" only)

82

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/8" : (0.9 C <sub>v</sub> ), 1/4" : (1.3 C <sub>v</sub> ), 3/8" : (1.35 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty.		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 9 ms	De-energize : 6 ms
	120/60	Energize : 5-12 ms	De-energize : 6-13 ms

#### Spare parts :

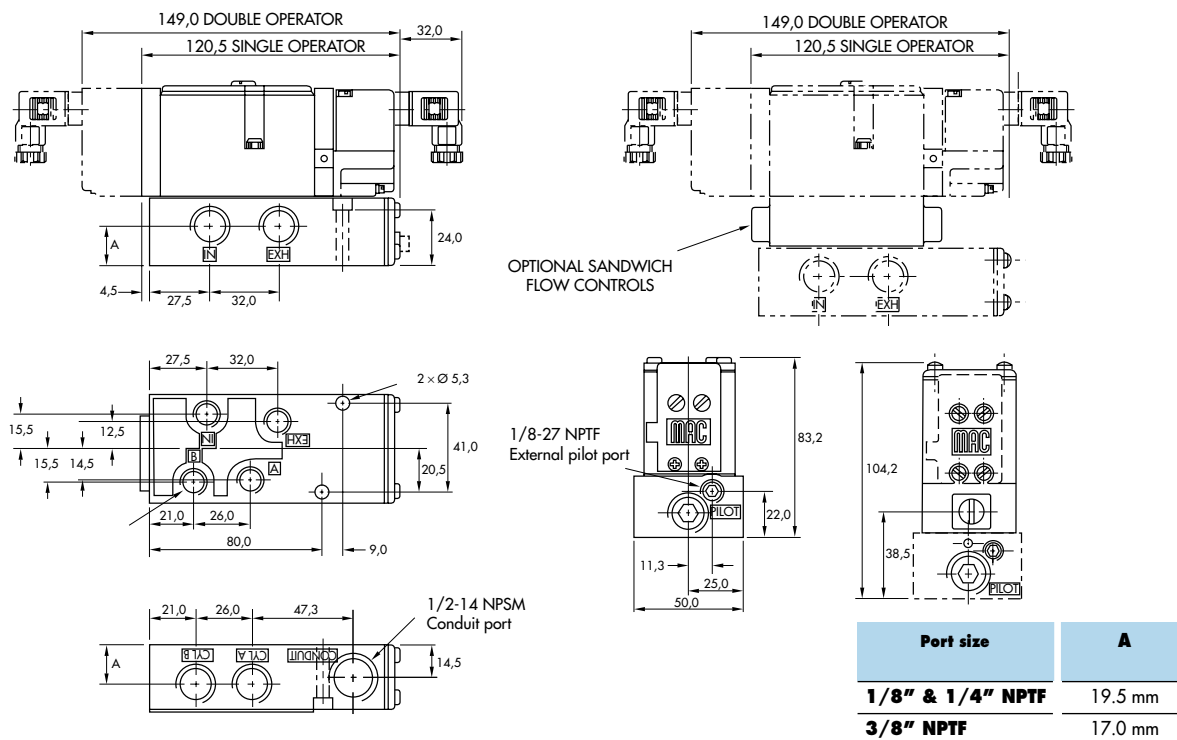
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal between solenoid and pilot body : 16402. • Pilot valve : TM-DXXX-XXX, including seal 16447.
- Mounting screw pilot to main valve : 35023. • Pressure seal between valve and base : 16446.
- Mounting screw valve to base (x2) : 35211.

#### Options :

- BSPP threads. • Flow controls (Part N° : FC82A-BA) • Explosion-proof model.

### DIMENSIONS

Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>1/8" - 1/4" - 3/8"</b>	<b>1.35 C<sub>v</sub></b>	sub-base "plug-in"	

**OPERATIONAL BENEFITS**

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



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		82A-AA-000-TM-DxxP-xDA	82A-BA-000-TM-DxxP-xDA	82A-EA-000-TM-DxxP-xDA	82A-FA-000-TM-DxxP-xDA	82A-GA-000-TM-DxxP-xDA
<b>sub-base</b>	Internal	82A-AA-AAA-TM-DxxP-xDA	82A-BA-AAA-TM-DxxP-xDA	82A-EA-AAA-TM-DxxP-xDA	82A-FA-AAA-TM-DxxP-xDA	82A-GA-AAA-TM-DxxP-xDA
<b>1/8" NPTF</b>	External	82A-AA-AAD-TM-DxxP-xDA	82A-BA-AAD-TM-DxxP-xDA	82A-EA-AAD-TM-DxxP-xDA	82A-FA-AAD-TM-DxxP-xDA	82A-GA-AAD-TM-DxxP-xDA
<b>sub-base</b>	Internal	82A-AA-BAA-TM-DxxP-xDA	82A-BA-BAA-TM-DxxP-xDA	82A-EA-BAA-TM-DxxP-xDA	82A-FA-BAA-TM-DxxP-xDA	82A-GA-BAA-TM-DxxP-xDA
<b>1/4" NPTF</b>	External	82A-AA-BAD-TM-DxxP-xDA	82A-BA-BAD-TM-DxxP-xDA	82A-EA-BAD-TM-DxxP-xDA	82A-FA-BAD-TM-DxxP-xDA	82A-GA-BAD-TM-DxxP-xDA
<b>sub-base</b>	Internal	82A-AA-CAA-TM-DxxP-xDA	82A-BA-CAA-TM-DxxP-xDA	82A-EA-CAA-TM-DxxP-xDA	82A-FA-CAA-TM-DxxP-xDA	82A-GA-CAA-TM-DxxP-xDA
<b>3/8" NPTF</b>	External	82A-AA-CAD-TM-DxxP-xDA	82A-BA-CAD-TM-DxxP-xDA	82A-EA-CAD-TM-DxxP-xDA	82A-FA-CAD-TM-DxxP-xDA	82A-GA-CAD-TM-DxxP-xDA

45  
700  
900

**SOLENOID OPERATOR** ▶

D **XX** P- **X** DA\*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)

X	Manual operator
1	Non-locking
2	Locking

82

\* Other options available, see page 361.

**OPTIONS**

82A-AA-000-TM-DxxP-xDA

- For light in body replace A by C.
- For pilot exhaust out main exhaust replace A by D. For light replace A by F. Use TU pilot body for pilot exhaust to main exhaust, main exhaust cannot be restricted (NO flow controls) available with single pressure valve only. TU replaces TM.
- For piped pilot exhaust replace TM by TP.
- For dual pressure valves, replace A by C, B by D, E by M, F by L, G by H. (Requires sandwich regulator - see pressure regulator section)

82A-AA-BAA-TM-DxxP-xDA

- Replace A by B for bottom ports (1/8" or 1/4" only)
- Replace A by C for side and bottom ports (1/8" or 1/4" only)

6300  
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800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

### TECHNICAL DATA

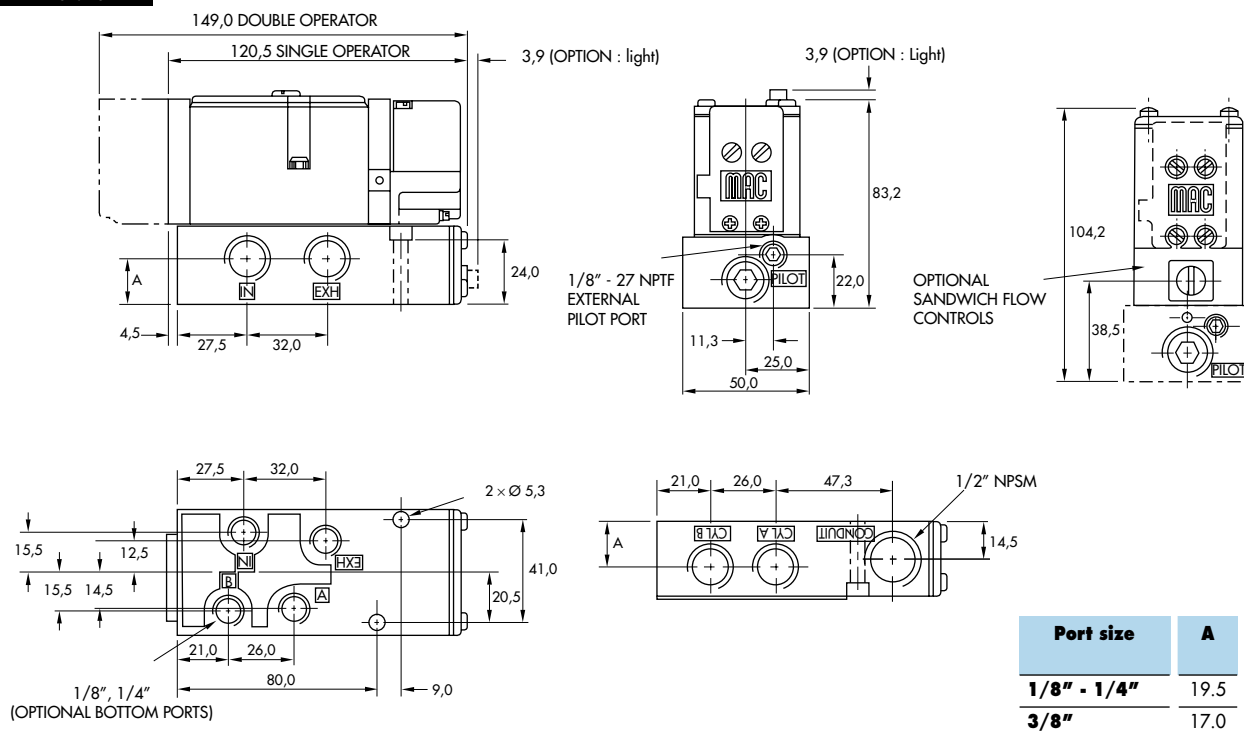
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/8" : (0.9 C <sub>v</sub> ), 1/4" (1.3 C <sub>v</sub> ), 3/8" : (1.35 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty.		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 10.9 VA      Holding : 7.7 VA = 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 9 ms	De-energize : 6 ms
	120/60	Energize : 5-12 ms	De-energize : 6-13 ms

Spare parts : • Solenoid operator (power ≥ 5.4 W) : DXXP-XDA, including mounting screws 35013. • Seal between solenoid and pilot body : 16402.  
• Pilot valve : TM-DXXP-XDA, including seal 16447. • Mounting screw pilot to main valve : 35023. • Pressure seal between valve and base : 16446.  
• Mounting screw valve to base (x2) : 35211.

Options : • BSPP threads. • Flow controls (Part N°. FC82A-AA) • Explosion-proof model. • Lights in base.

### DIMENSIONS

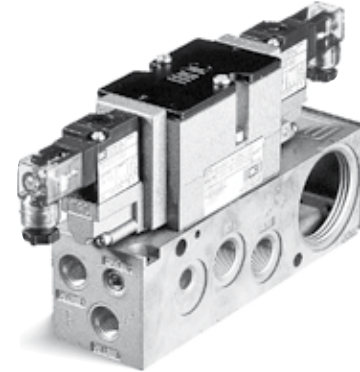
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>1/4" - 3/8"</b>	<b>1.35 C<sub>v</sub></b>	sub-base non "plug-in"	

**OPERATIONAL BENEFITS**

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



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		82A-AB-000-TM-Dxxx-xxx	82A-BB-000-TM-Dxxx-xxx	82A-EB-000-TM-Dxxx-xxx	82A-FB-000-TM-Dxxx-xxx	82A-GB-000-TM-Dxxx-xxx
<b>sub-base</b>	Internal	82A-AB-BKA-TM-Dxxx-xxx	82A-BB-BKA-TM-Dxxx-xxx	82A-EB-BKA-TM-Dxxx-xxx	82A-FB-BKA-TM-Dxxx-xxx	82A-GB-BKA-TM-Dxxx-xxx
<b>1/4" NPTF</b>	External	82A-AB-BKD-TM-Dxxx-xxx	82A-BB-BKD-TM-Dxxx-xxx	82A-EB-BKD-TM-Dxxx-xxx	82A-FB-BKD-TM-Dxxx-xxx	82A-GB-BKD-TM-Dxxx-xxx
<b>sub-base</b>	Internal	82A-AB-CKA-TM-Dxxx-xxx	82A-BB-CKA-TM-Dxxx-xxx	82A-EB-CKA-TM-Dxxx-xxx	82A-FB-CKA-TM-Dxxx-xxx	82A-GB-CKA-TM-Dxxx-xxx
<b>3/8" NPTF</b>	External	82A-AB-CKD-TM-Dxxx-xxx	82A-BB-CKD-TM-Dxxx-xxx	82A-EB-CKD-TM-Dxxx-xxx	82A-FB-CKD-TM-Dxxx-xxx	82A-GB-CKD-TM-Dxxx-xxx

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**SOLENOID OPERATOR** ▶

D **XX X - X XX**\*

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

700  
900  
82

Note : KD connector shown in photo.

\* Other options available, see page 361.

**OPTIONS**

82A-AB-000-TM-Dxxx-xxx

- For pilot exhaust out main exhaust replace B by E. Also, TM pilot body is replaced by TU pilot body. Main exhaust cannot be restricted (No flow controls) available with single pressure valve only.
- For piped pilot exhaust replace TM by TP.
- For dual pressure valves, replace A by C, B by D, E by M, F by L, G by H. (Requires sandwich regulator - see pressure regulator section)

82A-XX-BKA-TM-Dxxx-xxx

- Replace K by L for bottom cyl. ports
- Replace K by M for bottom inlet port
- Replace K by N for bottom inlet and cyl. ports
- Replace K by P for bottom and end cyl. ports
- Replace K by R for bottom and end cyl. ports w/bottom inlet
- Replace K by S for selector base with side ports

6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A



### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases	
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI
	External pilot : vacuum to 150 PSI	
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI	
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)	
<b>Filtration :</b>	40 µ	
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)	
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" (1.3 C <sub>v</sub> ), 3/8" : (1.35 C <sub>v</sub> )	
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty.	
<b>Voltage range :</b>	-15% to +10% of nominal voltage	
<b>Protection :</b>	Consult factory	
<b>Power :</b>	~ Inrush : 10.9 VA Holding : 7.7 VA = 1.8 to 12.7 W	
<b>Response times :</b>	24 VDC (5.4 W) Energize : 9 ms De-energize : 6 ms	120/60 Energize : 5-12 ms De-energize : 6-13 ms

#### Spare parts :

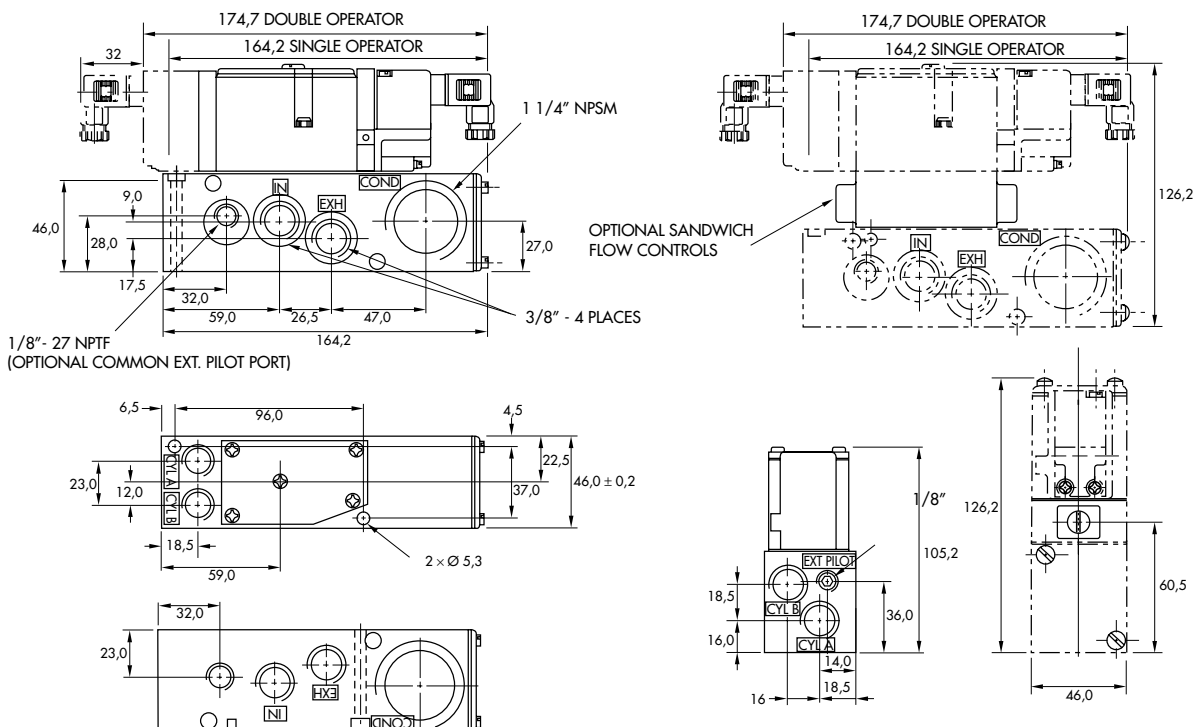
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal between solenoid and pilot body : 16402. • Pilot valve : TM-DXXX-XXX, including seal 16447.
- Mounting screw pilot to main valve : 35023. • Pressure seal between valve and base : 16446.
- Mounting screw valve to base (x2) : 35211. • Tie-rod (x2) : 19731. • Fastening kit : N-82005-01.

#### Options :

- BSPP threads. • Flow controls (Part N° : FC82A-BA) • Explosion-proof model.

### DIMENSIONS

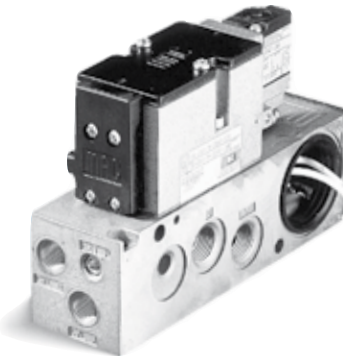
Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>1/4" - 3/8"</b>	<b>1.35 C<sub>v</sub></b>	sub-base "plug-in"	

### OPERATIONAL BENEFITS

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



35  
100  
200  
55  
56  
57  
58  
59

### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		82A-AA-000-TM-DxxP-xDA	82A-BA-000-TM-DxxP-xDA	82A-EA-000-TM-DxxP-xDA	82A-FA-000-TM-DxxP-xDA	82A-GA-000-TM-DxxP-xDA
<b>sub-base</b>	Internal	82A-AA-BKA-TM-DxxP-xDA	82A-BA-BKA-TM-DxxP-xDA	82A-EA-BKA-TM-DxxP-xDA	82A-FA-BKA-TM-DxxP-xDA	82A-GA-BKA-TM-DxxP-xDA
<b>1/4" NPTF</b>	External	82A-AA-BKD-TM-DxxP-xDA	82A-BA-BKD-TM-DxxP-xDA	82A-EA-BKD-TM-DxxP-xDA	82A-FA-BKD-TM-DxxP-xDA	82A-GA-BKD-TM-DxxP-xDA
<b>sub-base</b>	Internal	82A-AA-CKA-TM-DxxP-xDA	82A-BA-CKA-TM-DxxP-xDA	82A-EA-CKA-TM-DxxP-xDA	82A-FA-CKA-TM-DxxP-xDA	82A-GA-CKA-TM-DxxP-xDA
<b>3/8" NPTF</b>	External	82A-AA-CKD-TM-DxxP-xDA	82A-BA-CKD-TM-DxxP-xDA	82A-EA-CKD-TM-DxxP-xDA	82A-FA-CKD-TM-DxxP-xDA	82A-GA-CKD-TM-DxxP-xDA

45

### SOLENOID OPERATOR ▶

D xx P- x DA\*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)

X	Manual operator
1	Non-locking
2	Locking

700

900

82

\* Other options available, see page 361.

### OPTIONS

#### 82A-AA-000-TM-DxxP-xDA

- For light in body replace A by C.
- For pilot exhaust out main exhaust replace A by D. For light replace A by F. Use TU pilot body for pilot exhaust to main exhaust, main exhaust cannot be restricted (No flow controls) available with single pressure valve only. TU replaces TM.
- For piped pilot exhaust replace TM by TP.
- For dual pressure valves, replace A by C, B by D, E by M, F by L, G by H. (Requires sandwich regulator - see pressure regulator section)

#### 82A-XX-BKA-TM-DxxP-xDA

- Replace K by L for bottom cyl. ports
- Replace K by M for bottom inlet port
- Replace K by N for bottom inlet and cyl. ports
- Replace K by P for bottom and end cyl. ports
- Replace K by R for bottom and end cyl. ports w/bottom inlet
- Replace K by S for selector base with side ports

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" (1.3 C <sub>v</sub> ), 3/8" : (1.35 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty.		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
<b>Response times :</b>	24 VDC (5.4 W)	Energize : 9 ms	De-energize : 6 ms
	120/60	Energize : 5-12 ms	De-energize : 6-13 ms

#### Spare parts :

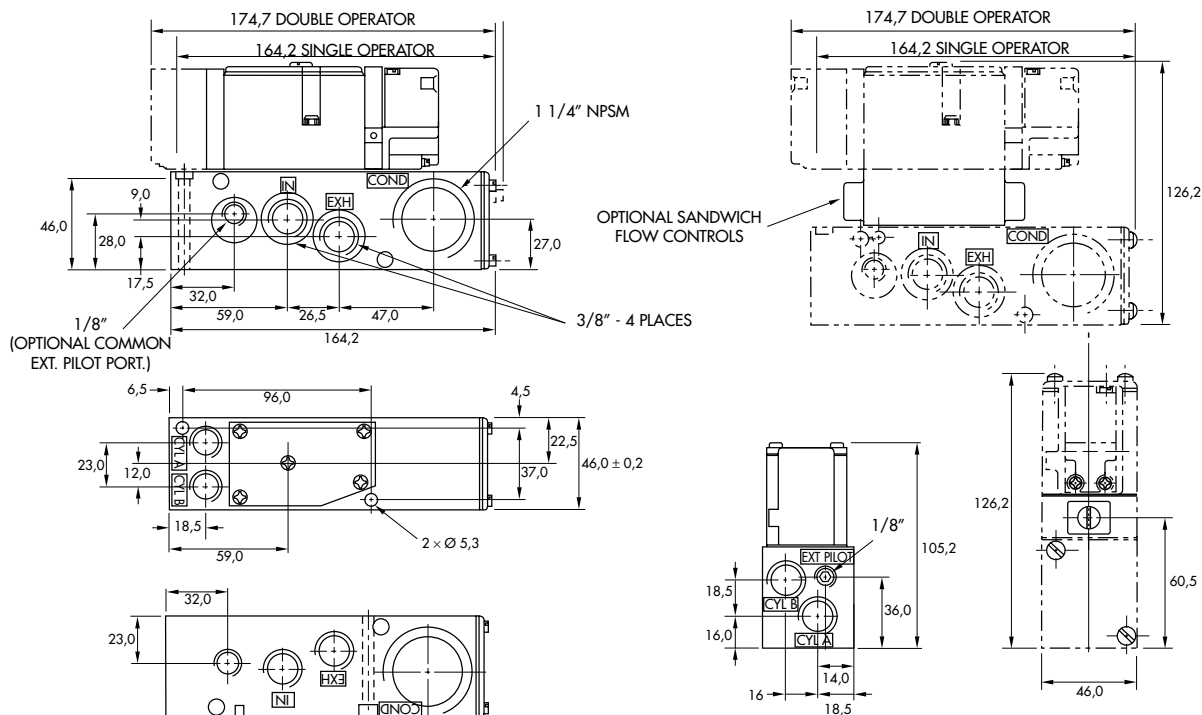
- Solenoid operator (power ≥ 5.4 W) : DXXP-XDA, including mounting screws 35013.
- Seal between solenoid and pilot body : 16402. • Pilot valve : TM-DXXP-XDA, including seal 16447.
- Mounting screw pilot to main valve : 35023. • Pressure seal between valve and base : 16446.
- Mounting screw valve to base (x2) : 35211. • Tie-rod (x2) : 19731. • Fastening kit : N-82005-01.

#### Options :

- BSP threads. • Flow controls (Part N°: FC82A-AA) • Explosion-proof model. • Lights in base.

### DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

sub-base non "plug-in"	sub-base "plug-in"	
------------------------	--------------------	--

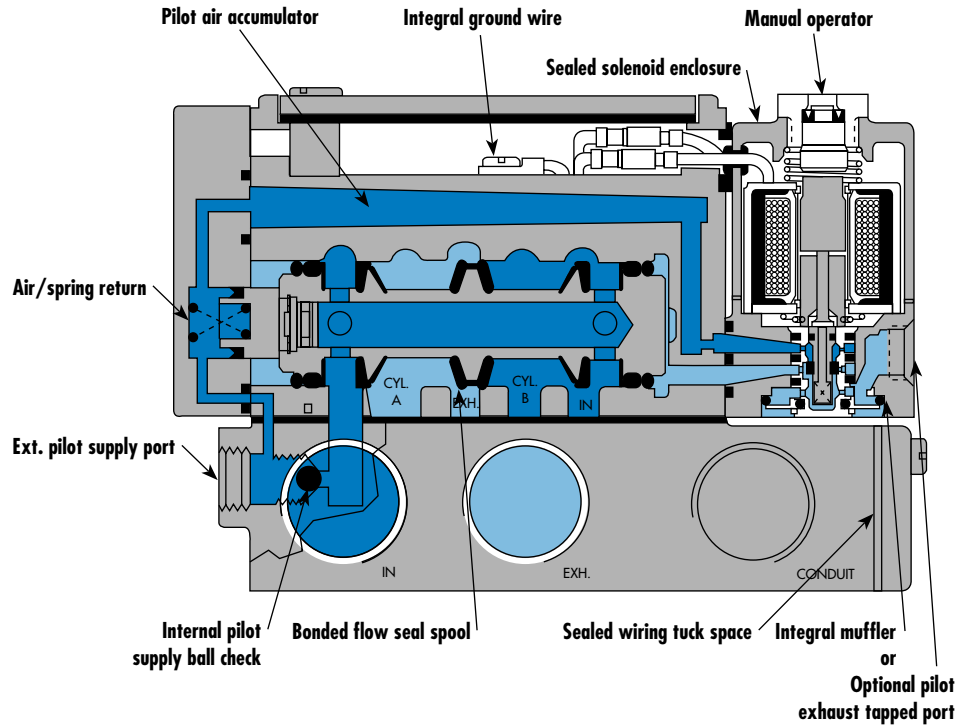
Series

Manifold mounting

sub-base non "plug-in"	sub-base "plug-in"	
------------------------	--------------------	--

35

100



200

55

56

57

58

59

45

700

900

82

**SERIES FEATURES**

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- A large checked accumulator for consistent shifting on single and double solenoid models.
- A plug-in design that provides for internal or external pilot with or without lights and all electrical and air plumbing in the base — the valve portion is the same.
- Non-lubricated or lubricated service.
- Optional low wattage DC solenoids down to 1 watt.
- Optional indicator lights, and various types of manual operators.
- Non plug-in or external plug-in models are available.

**6300**

6500

6600

1300

800

ISO 1

ISO 2

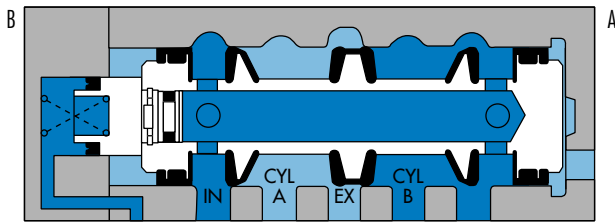
ISO 3

MAC 125A

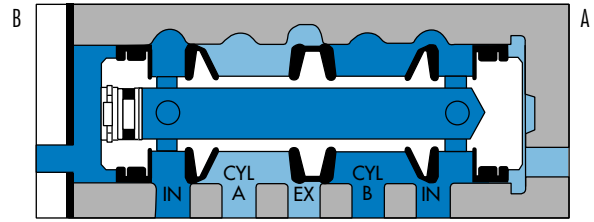
MAC 250A

MAC 500A

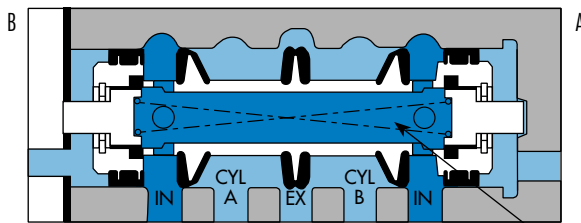
## SPOOL CONFIGURATIONS



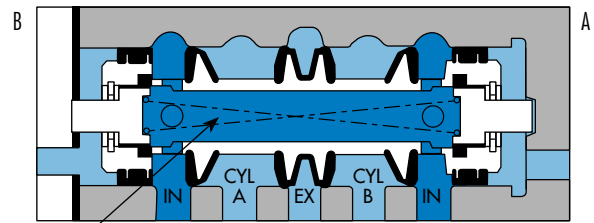
2 POS. SINGLE OPERATOR SPRING RETURN  
B ACTUATED SHOWN



2 POS. DOUBLE OPERATOR  
B ACTUATED SHOWN



3 POS. OPEN CENTER  
CENTER POSITION SHOWN



3 POS. CLOSED CENTER  
CENTER POSITION SHOWN

AIR/SPRING  
CENTERING

## VALVE CONFIGURATIONS AVAILABLE

The versatile 6300 Series provides high flow, extremely fast response, and long life in a compact package and is available in the following configurations:

- 2-Pos., single or double operators (solenoid or remote air).
- 3-Pos., double operator-Closed Center, Open Center or Pressure Center (solenoid or remote air).
- Single pressure.
- Dual pressure on manifolds with sandwich regulators.
- Individual base or add-a-unit manifold base.
- Internal pilot or for Vacuum to 25 PSI main valve pressures, external pilot.
- Manual and mechanical operators available.
- All models available with sandwich regulators (Except remote air pilot).

## REMOTE AIR PILOT OPERATED VALVES

These remote air versions feature:

- A larged checked accumulator for air/spring return on single remote air models.
- Non-lubricated or lubricated service.
- All piping connections, including the remote air pilot supply, in the base.

## REMOTE AIR PILOT, PILOT OPERATED VALVES

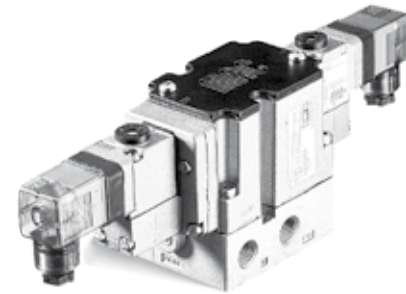
These special air versions have the same features as the remote air pilot operated models, but additionally feature:

- A manual operator and indicator.
- Ability to use a pilot signal pressure different from the main valve pressure.  
Pilot signal can be from 20 to 150 PSIG, regardless of main valve pressure.

Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>1/4" - 3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>	sub-base non "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



35  
100  
200  
55  
56  
57  
58  
59

### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center
<b>Valve less base</b>		6312D-000-PM- <b>XXYZZ</b>	6322D-000-PM- <b>XXYZZ</b>	6332D-000-PM- <b>XXYZZ</b>	6342D-000-PM- <b>XXYZZ</b>
<b>sub-base</b>	Internal	6312D-131-PM- <b>XXYZZ</b>	6322D-131-PM- <b>XXYZZ</b>	6332D-131-PM- <b>XXYZZ</b>	6342D-131-PM- <b>XXYZZ</b>
<b>1/4" NPTF</b>	External	6312D-141-PM- <b>XXYZZ</b>	6322D-141-PM- <b>XXYZZ</b>	6332D-141-PM- <b>XXYZZ</b>	6342D-141-PM- <b>XXYZZ</b>
<b>sub-base</b>	Internal	6312D-231-PM- <b>XXYZZ</b>	6322D-231-PM- <b>XXYZZ</b>	6332D-231-PM- <b>XXYZZ</b>	6342D-231-PM- <b>XXYZZ</b>
<b>3/8" NPTF</b>	External	6312D-241-PM- <b>XXYZZ</b>	6322D-241-PM- <b>XXYZZ</b>	6332D-241-PM- <b>XXYZZ</b>	6342D-241-PM- <b>XXYZZ</b>
<b>sub-base</b>	Internal	6312D-331-PM- <b>XXYZZ</b>	6322D-331-PM- <b>XXYZZ</b>	6332D-331-PM- <b>XXYZZ</b>	6342D-331-PM- <b>XXYZZ</b>
<b>1/2" NPTF</b>	External	6312D-341-PM- <b>XXYZZ</b>	6322D-341-PM- <b>XXYZZ</b>	6332D-341-PM- <b>XXYZZ</b>	6342D-341-PM- <b>XXYZZ</b>

Note : Above codes shown are for side ports.

### SOLENOID OPERATOR ►

**XX Y ZZ\***

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

\* Other options available, see page 357.

Note : Photo shown with JC connector.

### OPTIONS

6312D-XXX-PM-**XXYZZ**

- For piped pilot exhaust replace M by P.
- For bottom cylinder ports (excluding 1/2"), replace by 4.
- For dual pressure valves (see page 293 for use with sandwich regulators), replace by 5.

Note : 1. The valve less base is always the same for internal or external pilot. These options are effected in the base.  
2. To order bases without the valve, choose the base from the above table, then add 6300D as a prefix. Example 6300D-131.

45  
700  
900  
82

**6300**

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" (2.0 C <sub>v</sub> ), 3/8" : (2.6 C <sub>v</sub> ), 1/2" (3.0 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty.		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 10 ms	De-energize : 11 ms
	120/60	Energize : 4-13 ms	De-energize : 10-17 ms

Spare parts :

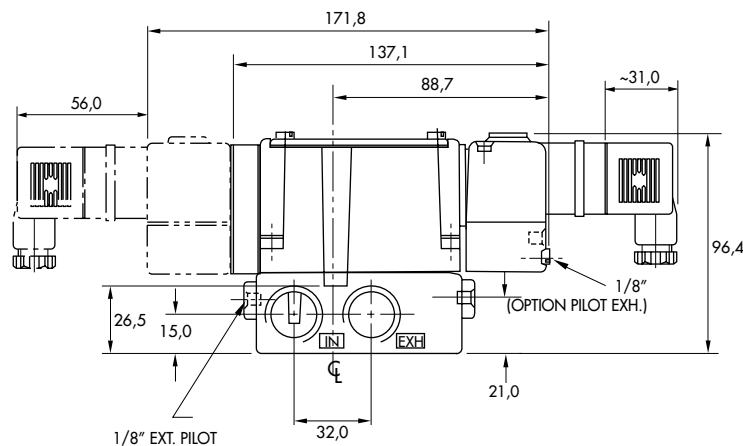
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XXYZZ, including seal 16337. • Pressure seal between valve and base : 16298.
- Mounting screw valve to base (x4) : 35303.

Options :

- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>1/4" - 3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>	sub-base "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center
<b>Valve less base</b>		6311D-000-PM- <b>XXY</b> DA	6321D-000-PM- <b>XXY</b> DA	6331D-000-PM- <b>XXY</b> DA	6341D-000-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6311D-111-PM- <b>XXY</b> DA	6321D-111-PM- <b>XXY</b> DA	6331D-111-PM- <b>XXY</b> DA	6341D-111-PM- <b>XXY</b> DA
<b>1/4" NPTF</b>	External	6311D-121-PM- <b>XXY</b> DA	6321D-121-PM- <b>XXY</b> DA	6331D-121-PM- <b>XXY</b> DA	6341D-121-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6311D-211-PM- <b>XXY</b> DA	6321D-211-PM- <b>XXY</b> DA	6331D-211-PM- <b>XXY</b> DA	6341D-211-PM- <b>XXY</b> DA
<b>3/8" NPTF</b>	External	6311D-221-PM- <b>XXY</b> DA	6321D-221-PM- <b>XXY</b> DA	6331D-221-PM- <b>XXY</b> DA	6341D-221-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6311D-311-PM- <b>XXY</b> DA	6321D-311-PM- <b>XXY</b> DA	6331D-311-PM- <b>XXY</b> DA	6341D-311-PM- <b>XXY</b> DA
<b>1/2" NPTF</b>	External	6311D-321-PM- <b>XXY</b> DA	6321D-321-PM- <b>XXY</b> DA	6331D-321-PM- <b>XXY</b> DA	6341D-321-PM- <b>XXY</b> DA

Note : Above codes shown are for side ports without lights.

### SOLENOID OPERATOR ➤

**XX Y DA\***

XX Voltage	Y Manual operator
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking
<b>12</b> 240/60, 220/50	<b>2</b> Locking
<b>22</b> 24/60, 24/50	
<b>59</b> 24 VDC (2.5 W)	
<b>87</b> 24 VDC (17.1 W)	
<b>61</b> 24 VDC (8.5 W)	

\* Other options available, see page 357.

### OPTIONS

6311D-XXX-PM- <b>XXY</b> DA	<ul style="list-style-type: none"> <li>- For piped pilot exhaust replace M by P.</li> <li>- For bottom ports (excluding 1/2"), replace by 4 (no light), by 5 (sgl. light), by 6 (dbl. light).</li> <li>- For side ports with lights on base, replace by 2 (sgl. light), by 3 (dbl. light).</li> <li>- For lights on valve body, replace by 3.</li> <li>- For dual pressure valves with lights on valve body (see page 293 for use with sandwich regulators), replace by 6.</li> </ul>
-----------------------------	---

Note : 1. The valve less base is always the same for internal or external pilot. These options are effected in the base.  
 2. To order bases without the valve, choose the base from the above table, then add 6300D as a prefix. Example 6300D-111.

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**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" (2.0 C <sub>v</sub> ), 3/8" : (2.6 C <sub>v</sub> ), 1/2" (3.0 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty.		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 10 ms	De-energize : 11 ms
	120/60	Energize : 4-13 ms	De-energize : 10-17 ms

Spare parts :

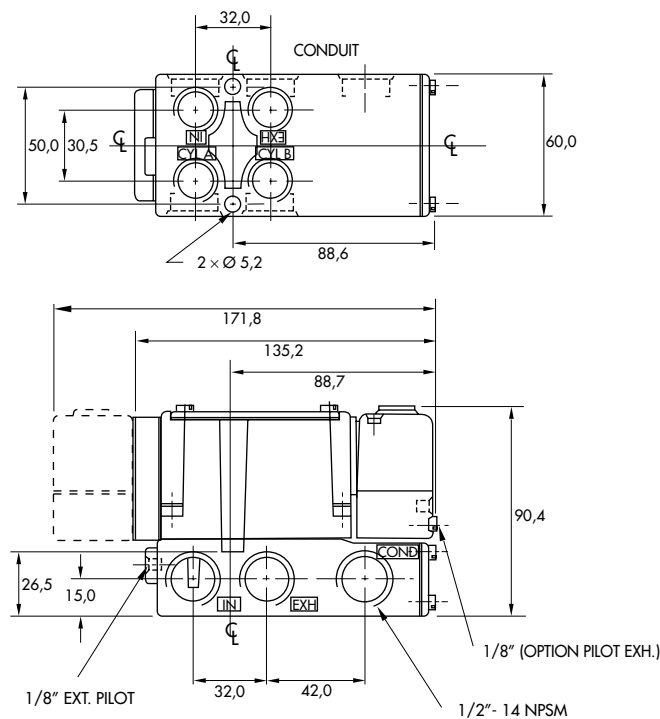
- Solenoid operator (power ≥ 4 W) : D1-XXBE, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XXYDA-BE, including seal 16337. • Pressure seal between valve and base : 16298.
- Mounting screw valve to base (x4) : 35303.

Options :

- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>	sub-base non "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.

### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		6312D-000-PM- <b>XXYYZZ</b>	6322D-000-PM- <b>XXYYZZ</b>	6332D-000-PM- <b>XXYYZZ</b>	6342D-000-PM- <b>XXYYZZ</b>	6352D-000-PM- <b>XXYYZZ</b>
<b>sub-base</b>	Internal	6312D-531-PM- <b>XXYYZZ</b>	6322D-531-PM- <b>XXYYZZ</b>	6332D-531-PM- <b>XXYYZZ</b>	6342D-531-PM- <b>XXYYZZ</b>	6352D-531-PM- <b>XXYYZZ</b>
<b>3/8" NPTF</b>	External	6312D-541-PM- <b>XXYYZZ</b>	6322D-541-PM- <b>XXYYZZ</b>	6332D-541-PM- <b>XXYYZZ</b>	6342D-541-PM- <b>XXYYZZ</b>	6352D-541-PM- <b>XXYYZZ</b>
<b>sub-base</b>	Internal	6312D-631-PM- <b>XXYYZZ</b>	6322D-631-PM- <b>XXYYZZ</b>	6332D-631-PM- <b>XXYYZZ</b>	6342D-631-PM- <b>XXYYZZ</b>	6352D-631-PM- <b>XXYYZZ</b>
<b>1/2" NPTF</b>	External	6312D-641-PM- <b>XXYYZZ</b>	6322D-641-PM- <b>XXYYZZ</b>	6332D-641-PM- <b>XXYYZZ</b>	6342D-641-PM- <b>XXYYZZ</b>	6352D-641-PM- <b>XXYYZZ</b>

Note : Above codes shown are for side cylinder ports.

### SOLENOID OPERATOR ➤

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)		

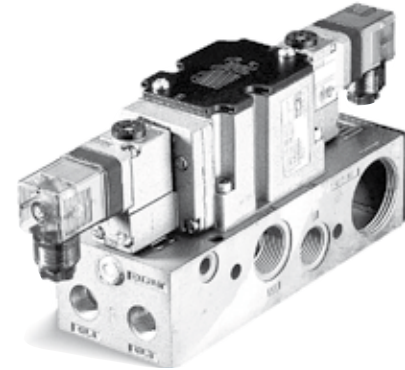
\* Other options available, see page 357.

### OPTIONS

- 6312D-XXX-PM-**XXYYZZ**
- For piped pilot exhaust replace M by P.
  - For bottom cylinder ports, replace by 4.
  - For bottom and side cylinder ports, replace by 7.
  - For dual pressure valves (see page 293 for use with sandwich regulators), replace by 5.

### MODIFICATIONS - MOD 0210 Bottom inlet port in addition to side inlet port - TO ORDER : 6312D-531-PM-111JA MOD 0210

- Note :
- The valve less base is always the same for internal or external pilot. These options are effected in the manifold.
  - To order manifolds without the valve, choose the manifold from the above table, then add 6300D as a prefix. Example 6300D-631.
  - When ordering an external pilot connection for manifold bases, a common external pilot port is standard. One connection only is required for all the valves in the manifold whether single or double solenoid.
  - Manifolds for solenoid and remote air operated valves must be ganged separately.



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**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/8" : (2.6 C <sub>v</sub> ), 1/2" (3.0 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty.		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 10 ms	De-energize : 11 ms
	120/60	Energize : 4-13 ms	De-energize : 10-17 ms

Spare parts :

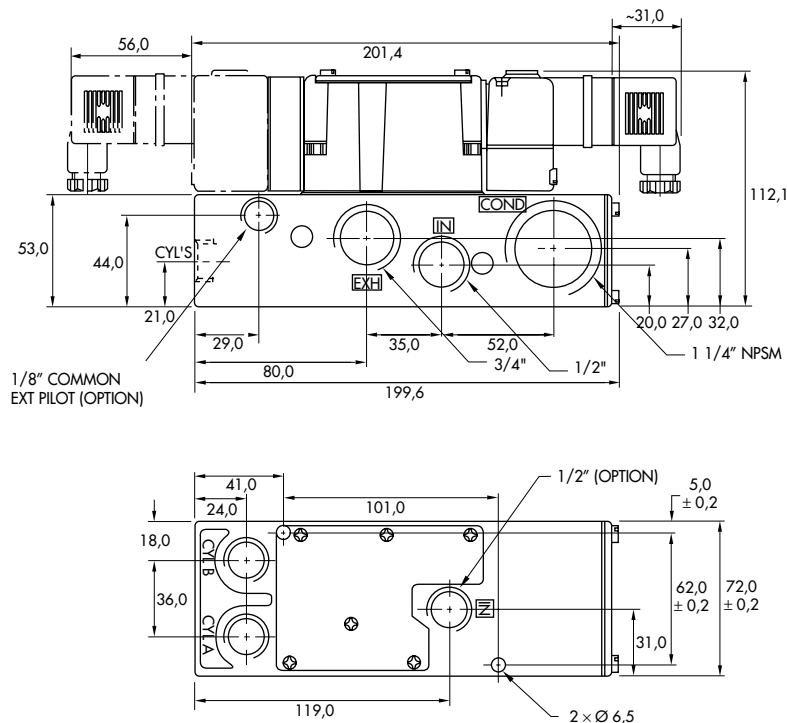
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XYZZ, including seal 16337. • Pressure seal between valve and base : 16396.
- Mounting screw valve to base (x4) : 35303. • Tie-rod (x2) : 19624. • Fastening kit : N-63002-01
- Inlet isolator : 32839. • Exhaust isolator : 28309. • Blank station cover plate : M-63014.

Options :

- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>	sub-base "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.

### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		6311D-000-PM- <b>XXY</b> DA	6321D-000-PM- <b>XXY</b> DA	6331D-000-PM- <b>XXY</b> DA	6341D-000-PM- <b>XXY</b> DA	6351D-000-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6311D-511-PM- <b>XXY</b> DA	6321D-511-PM- <b>XXY</b> DA	6331D-511-PM- <b>XXY</b> DA	6341D-511-PM- <b>XXY</b> DA	6351D-511-PM- <b>XXY</b> DA
<b>3/8" NPTF</b>	External	6311D-521-PM- <b>XXY</b> DA	6321D-521-PM- <b>XXY</b> DA	6331D-521-PM- <b>XXY</b> DA	6341D-521-PM- <b>XXY</b> DA	6351D-521-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6311D-611-PM- <b>XXY</b> DA	6321D-611-PM- <b>XXY</b> DA	6331D-611-PM- <b>XXY</b> DA	6341D-611-PM- <b>XXY</b> DA	6351D-611-PM- <b>XXY</b> DA
<b>1/2" NPTF</b>	External	6311D-621-PM- <b>XXY</b> DA	6321D-621-PM- <b>XXY</b> DA	6331D-621-PM- <b>XXY</b> DA	6341D-621-PM- <b>XXY</b> DA	6351D-621-PM- <b>XXY</b> DA

Note : Above codes shown are for side cylinder ports without lights.

### SOLENOID OPERATOR ►

**XX Y DA\***

XX Voltage	Y Manual operator
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking
<b>12</b> 240/60, 220/50	<b>2</b> Locking
<b>22</b> 24/60, 24/50	
<b>59</b> 24 VDC (2.5 W)	
<b>87</b> 24 VDC (17.1 W)	
<b>61</b> 24 VDC (8.5 W)	

\* Other options available, see page 357.

### OPTIONS

6311D-XXX-PM-**XXY**DA

- For piped pilot exhaust replace M by P.
- For bottom cylinder ports, replace by 4 (no light), by 5 (sgl. light), by 6 (dbl. light).
- For side cylinder ports with light, replace by 2 (sgl. light), by 3 (dbl. light).
- For bottom and side cylinder ports, replace by 7 (no light), by 8 (sgl. light), by 9 (dbl. light).
- For lights on valve body, replace by 3.
- For dual pressure valves with lights on valve body (see page 293 for use with sandwich regulators), replace by 6.

### MODIFICATIONS - MOD 0210 Bottom inlet port in addition to side inlet port - TO ORDER : 6311D-511-PM-111DA MOD 0210

- Note :
- The valve less base is always the same for internal or external pilot. These options are effected in the manifold.
  - To order manifolds without the valve, choose the manifold from the above table, then add 6300D as a prefix. Example 6300D-511.
  - When ordering an external pilot connection for manifold bases, a common external pilot port is standard. One connection only is required for all the valves in the manifold whether single or double solenoid.
  - Manifolds for solenoid and remote air operated valves must be ganged separately.



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200

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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**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/8" : (2.6 C <sub>v</sub> ), 1/2" (3.0 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty.		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 10 ms	De-energize : 11 ms
	120/60	Energize : 4-13 ms	De-energize : 10-17 ms

Spare parts :

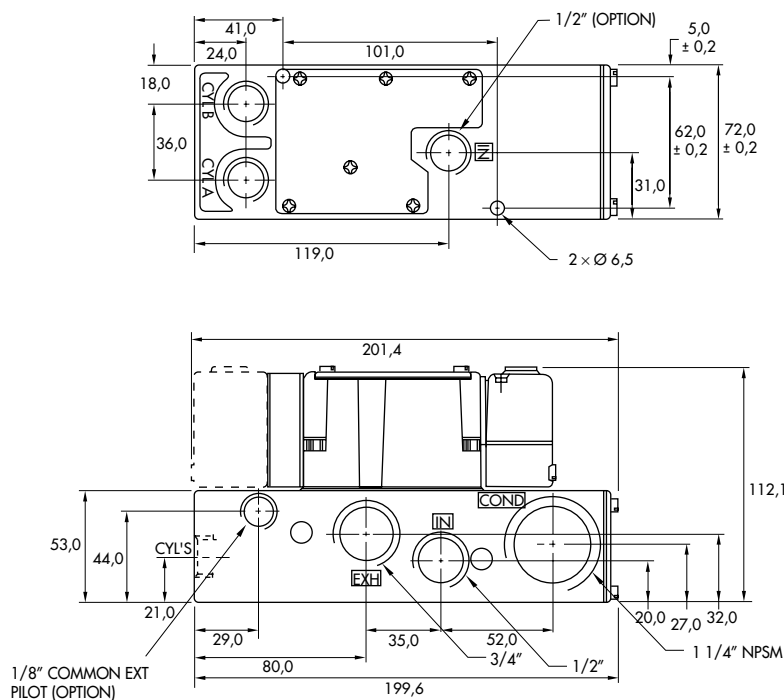
- Solenoid operator (power ≥ 4 W) : D1-XXBE, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XXYDA-BE, including seal 16337. • Pressure seal between valve and base : 16396.
- Mounting screw valve to base (x4) : 35303. • Tie-rod (x2) : 19624. • Fastening kit : N-63002-01
- Inlet isolator : 32839. • Exhaust isolator : 28309. • Blank station cover plate : M-63014.

Options :

- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Individual mounting

sub-base non "plug-in"	sub-base "plug-in"
------------------------	--------------------

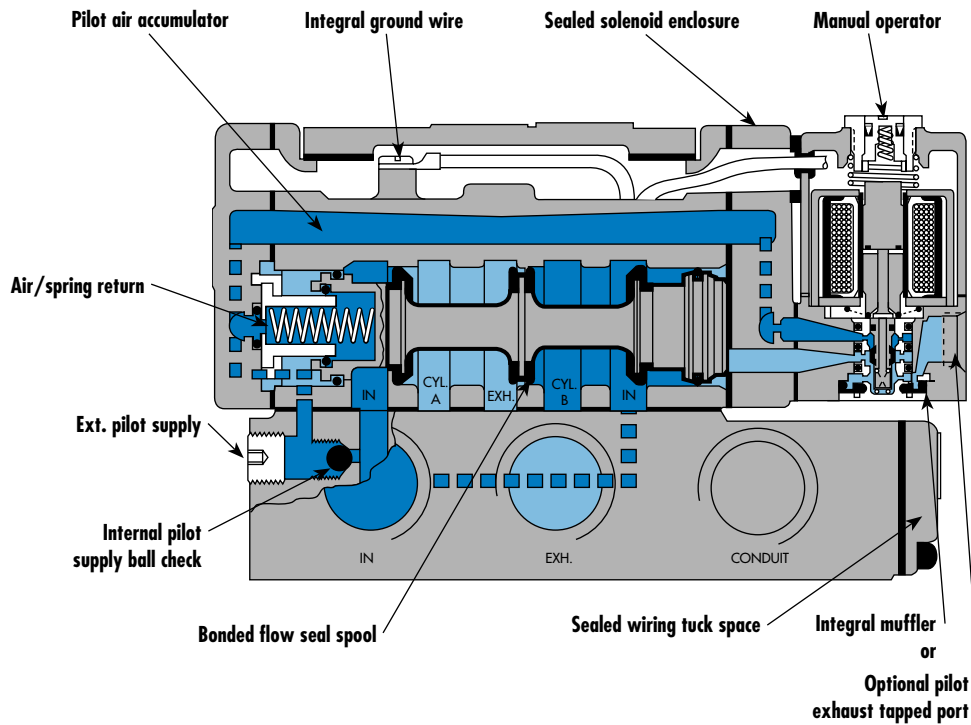
Series

Manifold mounting

sub-base non "plug-in"	sub-base "plug-in"
------------------------	--------------------

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100



200

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700

900

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6300

**6500**

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

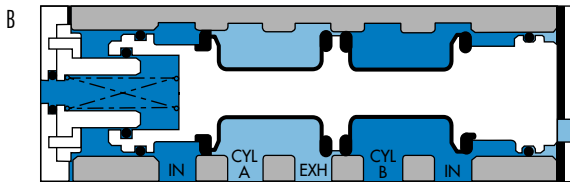
MAC 250A

MAC 500A

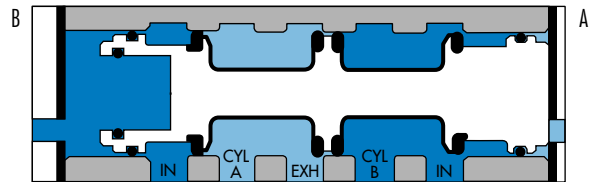
**SERIES FEATURES**

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- A large checked accumulator for consistent shifting on single and double solenoid models.
- A plug-in design that provides for internal or external pilot with or without lights and all electrical and air plumbing in the base — the valve portion is the same.
- Non-lubricated or lubricated service.
- Optional low wattage DC solenoids down to 1 watt.
- Optional indicator lights, and various types of manual operators.
- Non plug-in or external plug-in models are available.

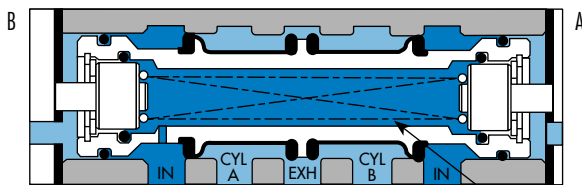
**SPOOL CONFIGURATIONS**



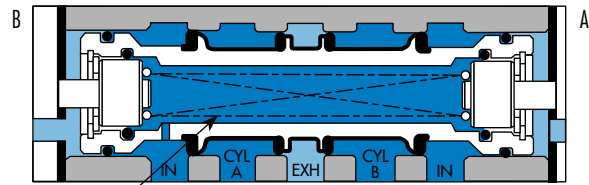
2 POS. SINGLE OPERATOR SPRING RETURN  
B ACTUATED SHOWN



2 POS. DOUBLE OPERATOR  
B ACTUATED SHOWN

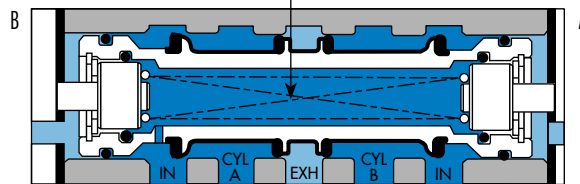


3 POS. OPEN CENTER  
CENTER POSITION SHOWN



3 POS. CLOSED CENTER  
CENTER POSITION SHOWN

AIR/SPRING  
CENTERING



3 POS. PRESSURE CENTER  
CENTER POSITION SHOWN

**VALVE CONFIGURATIONS AVAILABLE**

The versatile 6500 Series provides high flow, extremely fast response, and long life in a compact package and is available in the following configurations:

- 2-Pos., single or double operators (solenoid or remote air).
- 3-Pos., double operator-Closed Center, Open Center or Pressure Center (solenoid or remote air).
- Single pressure or dual pressure.
- Individual base or add-a-unit manifold base.
- Internal pilot or for Vacuum to 25 PSI main valve pressures, external pilot.
- Manual and mechanical operators available.

**REMOTE AIR PILOT OPERATED VALVES**

- A large checked accumulator for air/spring return on single remote air models.
- All piping connections, including the remote air pilot supply, in the base.
- Non-lubricated or lubricated service.

**REMOTE AIR PILOT, PILOT OPERATED VALVES**

These special air versions have the same features as the remote air pilot operated models, but additionally feature:

- A manual operator and indicator.
- Ability to use a pilot signal pressure different from the main valve pressure. Pilot signal can be from 20 to 150 PSIG, regardless of main valve pressure.

**ALL MODELS AVAILABLE WITH SANDWICH TYPE REGULATORS**

Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>5.1 C<sub>v</sub></b>	sub-base non "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.

### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		6512B-000-PM- <b>XXYYZZ</b>	6522B-000-PM- <b>XXYYZZ</b>	6532B-000-PM- <b>XXYYZZ</b>	6542B-000-PM- <b>XXYYZZ</b>	6552B-000-PM- <b>XXYYZZ</b>
<b>sub-base</b>	Internal	6512B-131-PM- <b>XXYYZZ</b>	6522B-131-PM- <b>XXYYZZ</b>	6532B-131-PM- <b>XXYYZZ</b>	6542B-131-PM- <b>XXYYZZ</b>	6552B-131-PM- <b>XXYYZZ</b>
<b>3/8" NPTF</b>	External	6512B-141-PM- <b>XXYYZZ</b>	6522B-141-PM- <b>XXYYZZ</b>	6532B-141-PM- <b>XXYYZZ</b>	6542B-141-PM- <b>XXYYZZ</b>	6552B-141-PM- <b>XXYYZZ</b>
<b>sub-base</b>	Internal	6512B-231-PM- <b>XXYYZZ</b>	6522B-231-PM- <b>XXYYZZ</b>	6532B-231-PM- <b>XXYYZZ</b>	6542B-231-PM- <b>XXYYZZ</b>	6552B-231-PM- <b>XXYYZZ</b>
<b>1/2" NPTF</b>	External	6512B-241-PM- <b>XXYYZZ</b>	6522B-241-PM- <b>XXYYZZ</b>	6532B-241-PM- <b>XXYYZZ</b>	6542B-241-PM- <b>XXYYZZ</b>	6552B-241-PM- <b>XXYYZZ</b>
<b>sub-base</b>	Internal	6512B-331-PM- <b>XXYYZZ</b>	6522B-331-PM- <b>XXYYZZ</b>	6532B-331-PM- <b>XXYYZZ</b>	6542B-331-PM- <b>XXYYZZ</b>	6552B-331-PM- <b>XXYYZZ</b>
<b>3/4" NPTF</b>	External	6512B-341-PM- <b>XXYYZZ</b>	6522B-341-PM- <b>XXYYZZ</b>	6532B-341-PM- <b>XXYYZZ</b>	6542B-341-PM- <b>XXYYZZ</b>	6552B-341-PM- <b>XXYYZZ</b>



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ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

Note : Above codes shown are for side ports.

### SOLENOID OPERATOR ▶

**XX Y ZZ\***

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

\* Other options available, see page 357.

Note : Photo shown with JC connector.

### OPTIONS

6512B-XXX-PM-**XXYYZZ**

- For piped pilot exhaust replace M by P.
- For dual pressure valve, replace by 4.

### MODIFICATIONS

MOD. N°	DESCRIPTION	MODEL AVAILABILITY
<b>0002</b>	Bottom inlet, exh. & cyl. ports (no side ports)	Available on individual base 3/8" & 1/2" only
<b>0004</b>	Full side porting and additional bottom inlet, exh. & cyl. ports	Available on individual base 3/8" only

- Note :
- The valve less base is always the same for internal or external pilot. These options are effected in the base.
  - Bottom ports : Refer to modification table.
  - To order bases without the valve, choose the base from the above table, then add 6500B as a prefix. Example 6500B-131.

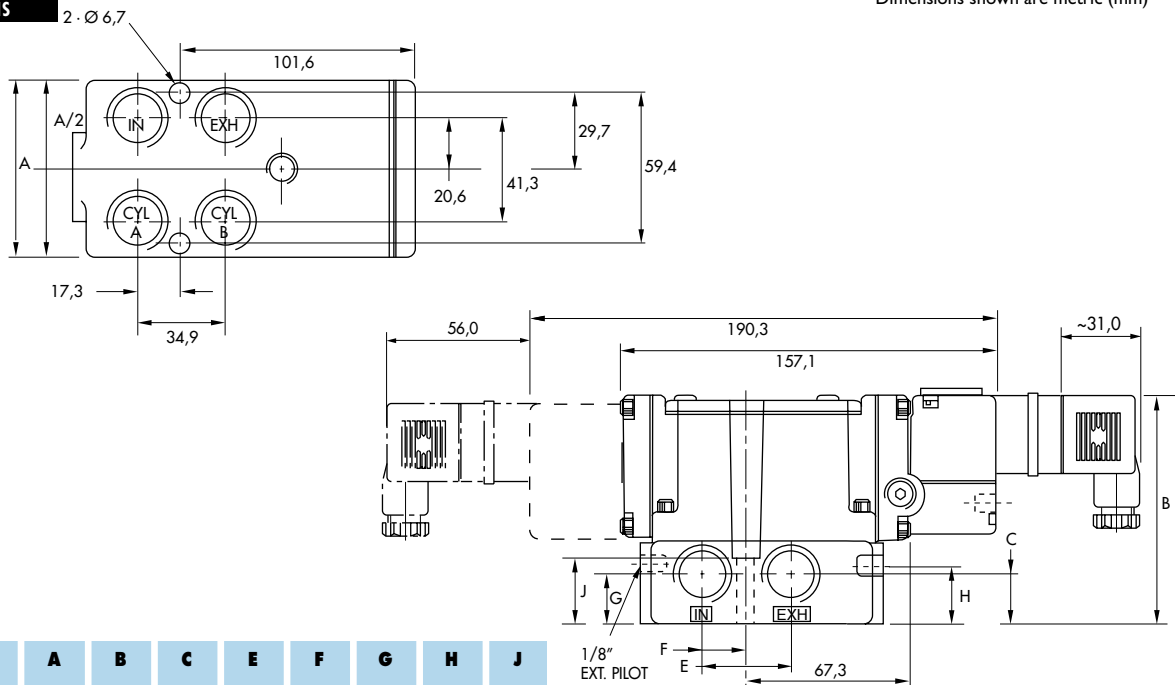


TECHNICAL DATA	
Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Internal pilot : single operator and 3 positions : 25-150 PSI      double operator : 10-150 PSI External pilot : vacuum to 150 PSI
Pilot pressure :	Single operator and 3 positions : 25-150 PSI    Double operator : 10-150 PSI
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) :	3/8" : (4.5 C <sub>v</sub> ), 1/2" : (5.0 C <sub>v</sub> ), 3/4" : (5.1 C <sub>v</sub> )
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 : 12 ms      De-energize : 12 ms 120/60      Energize : 9-14 ms      De-energize : 11-18 ms

Spare parts : Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.  
 • Pilot valve : PME-XXYZZ, including seal 16337. • Pressure seal between valve and base : 16246.  
 • Mounting screw valve to base (x4) : 32201.

Options : • BSPP threads.

**DIMENSIONS** Dimensions shown are metric (mm)



Port size	A	B	C	E	F	G	H	J
<b>3/8" - 1/2"</b>	69.6	97.4	18.3	36.0	17.9	19.0	23.6	25.4
<b>3/4"</b>	94.5	109.3	17.3	40.1	19.2	20.8	35.9	36.6

Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>5.1 C<sub>v</sub></b>	sub-base "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.

### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		6511B-000-PM- <b>XXY</b> DA	6521B-000-PM- <b>XXY</b> DA	6531B-000-PM- <b>XXY</b> DA	6541B-000-PM- <b>XXY</b> DA	6551B-000-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6511B-111-PM- <b>XXY</b> DA	6521B-111-PM- <b>XXY</b> DA	6531B-111-PM- <b>XXY</b> DA	6541B-111-PM- <b>XXY</b> DA	6551B-111-PM- <b>XXY</b> DA
<b>3/8" NPTF</b>	External	6511B-121-PM- <b>XXY</b> DA	6521B-121-PM- <b>XXY</b> DA	6531B-121-PM- <b>XXY</b> DA	6541B-121-PM- <b>XXY</b> DA	6551B-121-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6511B-211-PM- <b>XXY</b> DA	6521B-211-PM- <b>XXY</b> DA	6531B-211-PM- <b>XXY</b> DA	6541B-211-PM- <b>XXY</b> DA	6551B-211-PM- <b>XXY</b> DA
<b>1/2" NPTF</b>	External	6511B-221-PM- <b>XXY</b> DA	6521B-221-PM- <b>XXY</b> DA	6531B-221-PM- <b>XXY</b> DA	6541B-221-PM- <b>XXY</b> DA	6551B-221-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6511B-311-PM- <b>XXY</b> DA	6521B-311-PM- <b>XXY</b> DA	6531B-311-PM- <b>XXY</b> DA	6541B-311-PM- <b>XXY</b> DA	6551B-311-PM- <b>XXY</b> DA
<b>3/4" NPTF</b>	External	6511B-321-PM- <b>XXY</b> DA	6521B-321-PM- <b>XXY</b> DA	6531B-321-PM- <b>XXY</b> DA	6541B-321-PM- <b>XXY</b> DA	6551B-321-PM- <b>XXY</b> DA

Note : Above codes shown are for side ports without lights.

### SOLENOID OPERATOR ►

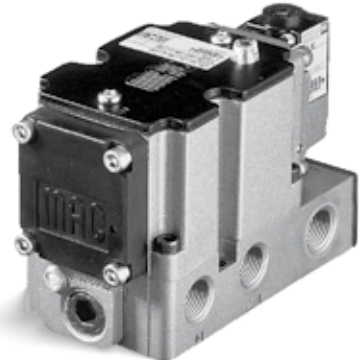
<b>XX Voltage</b>	<b>Y Manual operator</b>
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking
<b>12</b> 240/60, 220/50	<b>2</b> Locking
<b>22</b> 24/60, 24/50	
<b>59</b> 24 VDC (2.5 W)	
<b>87</b> 24 VDC (17.1 W)	
<b>61</b> 24 VDC (8.5 W)	

\* Other options available, see page 357.

### OPTIONS

6511B-XXX-PM- <b>XXY</b> DA	<ul style="list-style-type: none"> <li>- For piped pilot exhaust replace M by P.</li> <li>- For dual pressure valve replace by 4 (no light), by 5 (sgl. light), by 6 (dbl. light).</li> <li>- For lights on base, replace by 2 (sgl. light), by 3 (dbl. light).</li> <li>- For lights on valve body, replace by 3.</li> </ul>
-----------------------------	---

MODIFICATIONS		
MOD. N°	DESCRIPTION	MODEL AVAILABILITY
<b>0002</b>	Bottom inlet, exh. & cyl. ports (no side ports)	Available on individual base 3/8" & 1/2" only
<b>0004</b>	Full side porting and additional bottom inlet, exh. & cyl. ports	Available on individual base 3/8" only



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**6500**  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

Note : 1. The valve less base is always the same for internal or external pilot. These options are effected in the base.  
2. Bottom ports : Refer to modification table.  
3. To order bases without the valve, choose the base from the above table, then add 6500B as a prefix. Example 6500B-111.

**TECHNICAL DATA**

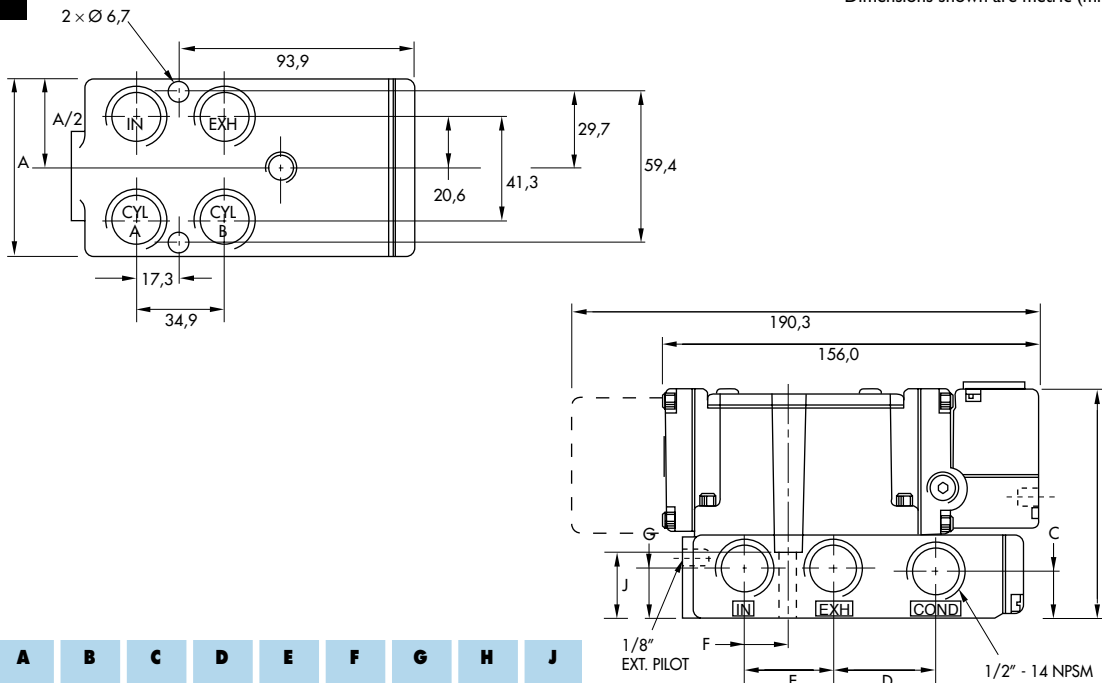
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/8" : (4.5 C <sub>v</sub> ), 1/2" : (5.0 C <sub>v</sub> ), 3/4" : (5.1 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA Holding : 10.9 VA = 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 12 ms	De-energize : 12 ms
	120/60	Energize : 9-14 ms	De-energize : 11-18 ms

- Spare parts :
- Solenoid operator (power ≥ 4 W) : D1-XXBE, cover mounting screws 35206 and seal 16234.
  - Pilot valve : PME-XXYDA-BE, including seal 16337. • Pressure seal between valve and base : 16246.
  - Mounting screw valve to base (x4) : 32201.

- Options :
- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)

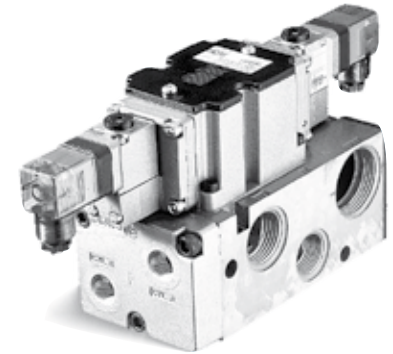


Port size	A	B	C	D	E	F	G	H	J
<b>3/8" - 1/2"</b>	69.6	97.4	18.3	40.6	36.0	17.9	19.0	23.6	25.4
<b>3/4"</b>	94.5	109.3	17.3	46.7	40.1	19.2	20.8	35.9	36.6

Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>5.1 C<sub>v</sub></b>	sub-base non "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



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### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		6512B-000-PM- <b>XXYYZZ</b>	6522B-000-PM- <b>XXYYZZ</b>	6532B-000-PM- <b>XXYYZZ</b>	6542B-000-PM- <b>XXYYZZ</b>	6552B-000-PM- <b>XXYYZZ</b>
<b>sub-base</b>	Internal	6512B-431-PM- <b>XXYYZZ</b>	6522B-431-PM- <b>XXYYZZ</b>	6532B-431-PM- <b>XXYYZZ</b>	6542B-431-PM- <b>XXYYZZ</b>	6552B-431-PM- <b>XXYYZZ</b>
<b>3/8" NPTF</b>	External	6512B-441-PM- <b>XXYYZZ</b>	6522B-441-PM- <b>XXYYZZ</b>	6532B-441-PM- <b>XXYYZZ</b>	6542B-441-PM- <b>XXYYZZ</b>	6552B-441-PM- <b>XXYYZZ</b>
<b>sub-base</b>	Internal	6512B-531-PM- <b>XXYYZZ</b>	6522B-531-PM- <b>XXYYZZ</b>	6532B-531-PM- <b>XXYYZZ</b>	6542B-531-PM- <b>XXYYZZ</b>	6552B-531-PM- <b>XXYYZZ</b>
<b>1/2" NPTF</b>	External	6512B-541-PM- <b>XXYYZZ</b>	6522B-541-PM- <b>XXYYZZ</b>	6532B-541-PM- <b>XXYYZZ</b>	6542B-541-PM- <b>XXYYZZ</b>	6552B-541-PM- <b>XXYYZZ</b>
<b>sub-base</b>	Internal	6512B-631-PM- <b>XXYYZZ</b>	6522B-631-PM- <b>XXYYZZ</b>	6532B-631-PM- <b>XXYYZZ</b>	6542B-631-PM- <b>XXYYZZ</b>	6552B-631-PM- <b>XXYYZZ</b>
<b>3/4" NPTF</b>	External	6512B-641-PM- <b>XXYYZZ</b>	6522B-641-PM- <b>XXYYZZ</b>	6532B-641-PM- <b>XXYYZZ</b>	6542B-641-PM- <b>XXYYZZ</b>	6552B-641-PM- <b>XXYYZZ</b>

Note : Above codes shown are for side cylinder ports.

### SOLENOID OPERATOR ▶

**XX Y ZZ\***

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

Note : Photo shown with JC connector.

\* Other options available, see page 357.

### OPTIONS

- 6512B-XXX-PM-**XXYYZZ**
- For piped pilot exhaust replace M by P.
  - For dual pressure valve, replace by 4.

MODIFICATIONS		
MOD. N°	DESCRIPTION	MODEL AVAILABILITY
<b>0112</b>	Side inlet & exhaust with bottom cyl. ports (No end cyl. ports)	Available on all manifold models
<b>0210</b>	Porting as ordered in model number plus an additional bottom inlet	Available on all manifold models
<b>0364</b>	Sgl. pressure — side inlet & exh. and additional bottom inlet with bottom cyl. ports (No end cyl. ports) DUAL PRESSURE — Same as sgl. pressure except with two bottom inlets.	Available on all manifold models

- Note :
- The valve less base is always the same for internal or external pilot. These options are effected in the manifold.
  - Bottom ports : Refer to modification table.
  - To order manifolds without the valve, choose the manifold from the above table, then add 6500B as a prefix. Example 6500B-431.

45  
700  
900  
82  
6300  
**6500**  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/8" : (4.5 C <sub>v</sub> ), 1/2" : (5.0 C <sub>v</sub> ), 3/4" : (5.1 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 12 ms	De-energize : 12 ms
	120/60	Energize : 9-14 ms	De-energize : 11-18 ms

Spare parts :

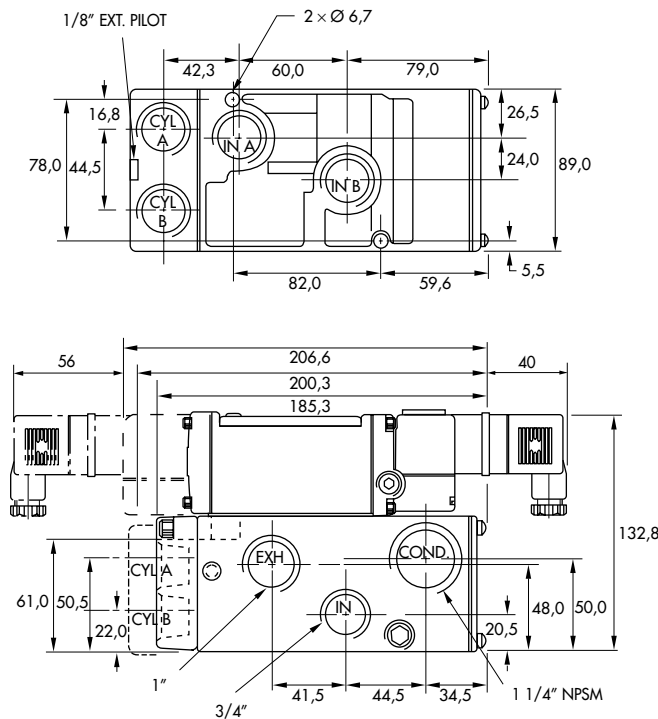
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XXYZZ, including seal 16337. • Pressure seal between valve and base : 16246.
- Mounting screw valve to base (x4) : 32201. • Tie-rod (x2) : 19540. • Fastening kit : N-65002-01
- Inlet isolator : 28309. • Exhaust isolator : 28310. • Blank station cover plate : N-65009.

Options :

- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>5.1 C<sub>v</sub></b>	sub-base "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



35  
100  
200  
55  
56  
57  
58  
59

### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		6511B-000-PM- <b>XXY</b> DA	6521B-000-PM- <b>XXY</b> DA	6531B-000-PM- <b>XXY</b> DA	6541B-000-PM- <b>XXY</b> DA	6551B-000-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6511B-411-PM- <b>XXY</b> DA	6521B-411-PM- <b>XXY</b> DA	6531B-411-PM- <b>XXY</b> DA	6541B-411-PM- <b>XXY</b> DA	6551B-411-PM- <b>XXY</b> DA
<b>3/8" NPTF</b>	External	6511B-421-PM- <b>XXY</b> DA	6521B-421-PM- <b>XXY</b> DA	6531B-421-PM- <b>XXY</b> DA	6541B-421-PM- <b>XXY</b> DA	6551B-421-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6511B-511-PM- <b>XXY</b> DA	6521B-511-PM- <b>XXY</b> DA	6531B-511-PM- <b>XXY</b> DA	6541B-511-PM- <b>XXY</b> DA	6551B-511-PM- <b>XXY</b> DA
<b>1/2" NPTF</b>	External	6511B-521-PM- <b>XXY</b> DA	6521B-521-PM- <b>XXY</b> DA	6531B-521-PM- <b>XXY</b> DA	6541B-521-PM- <b>XXY</b> DA	6551B-521-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6511B-611-PM- <b>XXY</b> DA	6521B-611-PM- <b>XXY</b> DA	6531B-611-PM- <b>XXY</b> DA	6541B-611-PM- <b>XXY</b> DA	6551B-611-PM- <b>XXY</b> DA
<b>3/4" NPTF</b>	External	6511B-621-PM- <b>XXY</b> DA	6521B-621-PM- <b>XXY</b> DA	6531B-621-PM- <b>XXY</b> DA	6541B-621-PM- <b>XXY</b> DA	6551B-621-PM- <b>XXY</b> DA

45  
700

Note : Above codes shown are for side cylinder ports without lights.

### SOLENOID OPERATOR >

**XX Y DA\***

XX Voltage	Y Manual operator
11 120/60, 110/50	1 Non-locking
12 240/60, 220/50	2 Locking
22 24/60, 24/50	
59 24 VDC (2,5 W)	
87 24 VDC (17,1 W)	
61 24 VDC (8,5 W)	

900  
82  
6300

\* Other options available, see page 357.

### OPTIONS

6511B-XXX-PM- <b>XXY</b> DA	- For piped pilot exhaust replace M by P.	- For dual pressure valve replace by 4 (no light), by 5 (sgl. light), by 6 (dbl. light).
	- For lights on valve body, replace by 3.	- For lights on manifold, replace by 2 (sgl. light), by 3 (dbl. light).

MOD. N°	DESCRIPTION	MODEL AVAILABILITY
<b>0112</b>	Side inlet & exhaust with bottom cyl. ports (No end cyl. ports)	Available on all manifold models
<b>0210</b>	Porting as ordered in model number plus an additional bottom inlet	Available on all manifold models
<b>0364</b>	Sgl. pressure — side inlet & exh. and additional bottom inlet with bottom cyl. ports (No end cyl. ports) DUAL PRESSURE — Same as sgl. pressure except with two bottom inlets.	Available on all manifold models

Note : 1. The valve less base is always the same for internal or external pilot. These options are effected in the manifold.  
2. Bottom ports : Refer to modification table.  
3. To order manifolds without the valve, choose the manifold from the above table, then add 6500B as a prefix. Example 6500B-411.

**6500**  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI		double operator : 10-150 PSI
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/8" : (4.5 C <sub>v</sub> ), 1/2" : (5.0 C <sub>v</sub> ), 3/4" : (5.1 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA      Holding : 10.9 VA = 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 12 ms	De-energize : 12 ms
	120/60	Energize : 9-14 ms	De-energize : 11-18 ms

Spare parts :

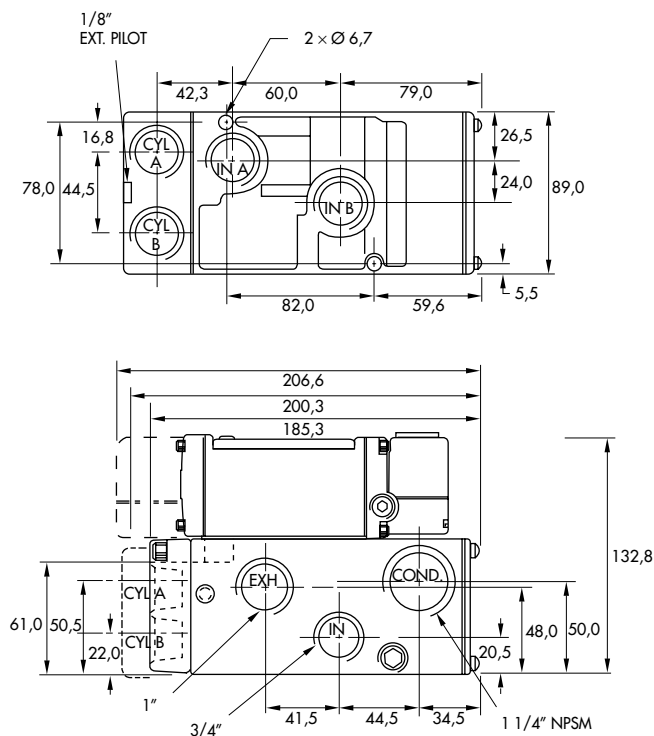
- Solenoid operator (power ≥ 4 W) : D1-XXBE, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XXYDA-BE, including seal 16337. • Pressure seal between valve and base : 16246.
- Mounting screw valve to base (x4) : 32201. • Tie-rod (x2) : 19540. • Fastening kit : N-65002-01
- Inlet isolator : 28309. • Exhaust isolator : 28310. • Blank station cover plate : N-65009.

Options :

- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Individual mounting

sub-base non "plug-in"	sub-base "plug-in"
------------------------	--------------------

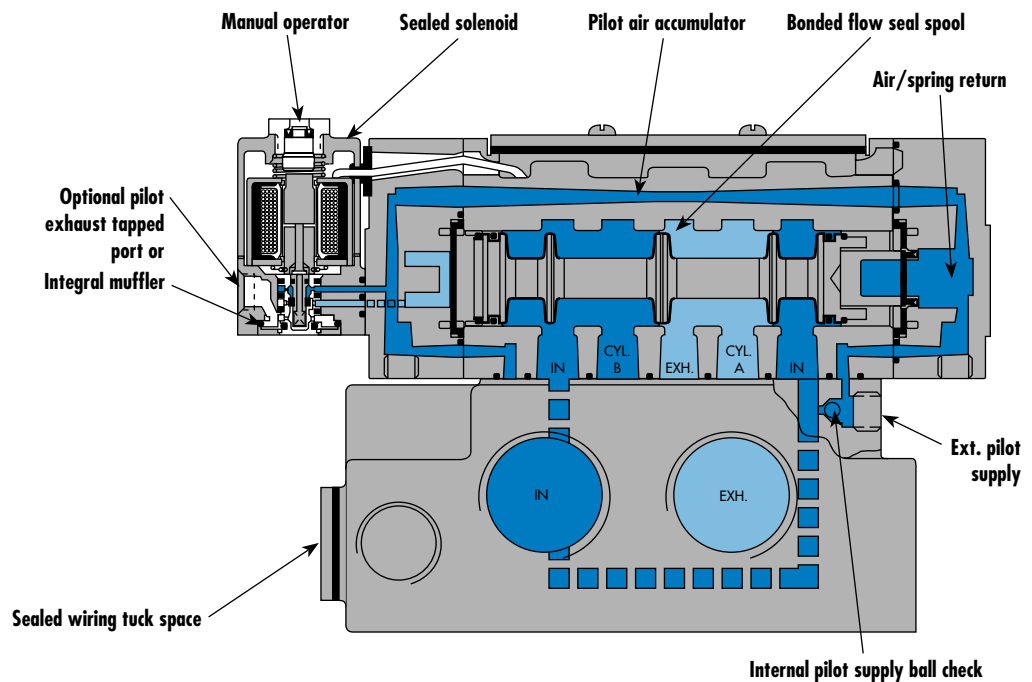
Series

Manifold mounting

sub-base non "plug-in"	sub-base "plug-in"
------------------------	--------------------

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

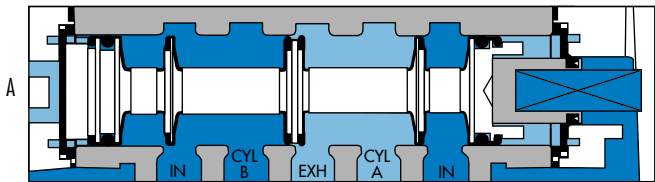
MAC 500A

**SERIES FEATURES**

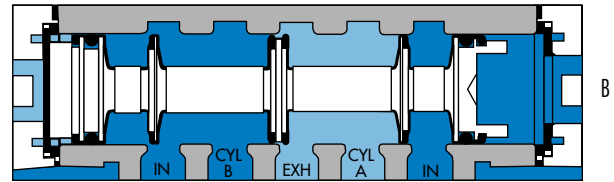
- The patented MACSOLENOID® with its non-burn out feature on AC service.
- A large checked accumulator for consistent shifting on single and double solenoid models.
- A plug-in design that provides for internal or external pilot with or without lights and all electrical and air plumbing in the base.
- Non-lubricated or lubricated service.
- Optional low wattage DC solenoids down to 1 watt.
- Optional indicator lights, and various types of manual operators.
- Non plug-in or external plug-in models are available.



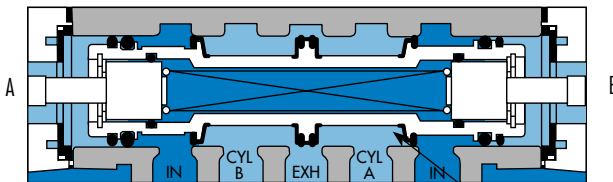
## SPOOL CONFIGURATIONS



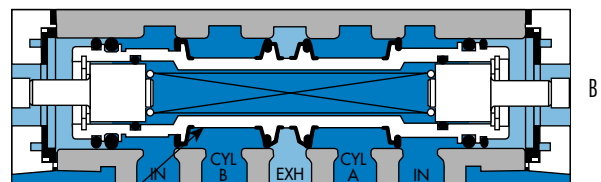
2 POS. SINGLE OPERATOR SPRING RETURN  
B ACTUATED SHOWN



2 POS. DOUBLE OPERATOR  
B ACTUATED SHOWN

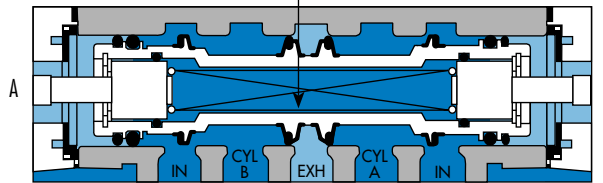


3 POS. OPEN CENTER  
CENTER POSITION SHOWN



3 POS. CLOSED CENTER  
CENTER POSITION SHOWN

PATENTED  
AIR/SPRING  
CENTERING



3 POS. PRESSURE CENTER  
CENTER POSITION SHOWN

## VALVE CONFIGURATIONS AVAILABLE

The versatile 6600 Series provides high flow, extremely fast response, and long life in a compact package and is available in the following configurations:

- 2-Pos., single or double operators (solenoid or remote air).
- 3-Pos., double operator-Closed Center, Open Center or Pressure Center (solenoid or remote air).
- Single pressure or dual pressure.
- Individual base.
- Internal pilot or for Vacuum to 25 PSI main valve pressures, external pilot.
- Manual and mechanical operators available.

## REMOTE AIR PILOT OPERATED VALVES

These remote air versions feature:

- A large checked accumulator for air/spring return on single remote air models.
- All piping connections, including the remote air pilot supply, in the base.
- Non-lubricated or lubricated service.

## REMOTE AIR PILOT, PILOT OPERATED VALVES

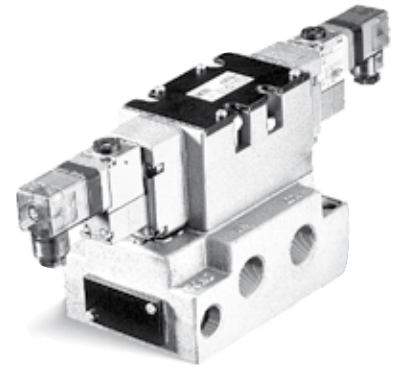
These special air versions have the same features as the remote air pilot operated models, but additionally feature:

- A manual operator and indicator.
- Ability to use a pilot signal pressure different from the main valve pressure. Pilot signal can be from 20 to 150 PSIG, regardless of main valve pressure.

Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>3/4" - 1"</b>	<b>9.6 C<sub>v</sub></b>	sub-base non "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



35  
100  
200  
55  
56  
57  
58  
59

### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		6612A-000-PM- <b>XXYZZ</b>	6622A-000-PM- <b>XXYZZ</b>	6632A-000-PM- <b>XXYZZ</b>	6642A-000-PM- <b>XXYZZ</b>	6652A-000-PM- <b>XXYZZ</b>
<b>sub-base</b>	Internal	6612A-231-PM- <b>XXYZZ</b>	6622A-231-PM- <b>XXYZZ</b>	6632A-231-PM- <b>XXYZZ</b>	6642A-231-PM- <b>XXYZZ</b>	6652A-231-PM- <b>XXYZZ</b>
<b>3/4" NPTF</b>	External	6612A-241-PM- <b>XXYZZ</b>	6622A-241-PM- <b>XXYZZ</b>	6632A-241-PM- <b>XXYZZ</b>	6642A-241-PM- <b>XXYZZ</b>	6652A-241-PM- <b>XXYZZ</b>
<b>sub-base</b>	Internal	6612A-331-PM- <b>XXYZZ</b>	6622A-331-PM- <b>XXYZZ</b>	6632A-331-PM- <b>XXYZZ</b>	6642A-331-PM- <b>XXYZZ</b>	6652A-331-PM- <b>XXYZZ</b>
<b>1" NPTF</b>	External	6612A-341-PM- <b>XXYZZ</b>	6622A-341-PM- <b>XXYZZ</b>	6632A-341-PM- <b>XXYZZ</b>	6642A-341-PM- <b>XXYZZ</b>	6652A-341-PM- <b>XXYZZ</b>

Note : Above codes shown are for side ports.

### SOLENOID OPERATOR ►

**XX Y ZZ\***

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

Note : Photo shown with JC connector.

\* Other options available, see page 357.

### OPTIONS

- 6612A-XXX-PM-**XXYZZ**
  - For piped pilot exhaust replace M by P.
  - For dual pressure valve, replace by 4.

MODIFICATIONS		
MOD. N°	DESCRIPTION	MODEL AVAILABILITY
<b>0002</b>	Bottom inlet, exh. & cyl ports (side ports plugged)	3/4" individual base
<b>0004</b>	Full side porting and additional. Bottom inlet, exh. & cyl ports	3/4" individual base
<b>0112</b>	Side inlet & exhaust with bottom cyl. ports (side cyl.ports plugged)	3/4" individual base

**TO ORDER** - Add the appropriate modification number after the valve number;  
**EXAMPLE** : 6612A-231-PM-111JA **MOD 0002**

- Note : 1. The valve less base is always the same for internal or external pilot. These options are effected in the base.  
 2. Bottom ports : Refer to modification table.  
 3. To order bases without the valve, choose the base from the above table, then add 6600A as a prefix. Example 6600A-231.  
 4. 2 position and 3 position valve bodies are not interchangeable.

700  
900  
82  
6300  
6500  
**6600**  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

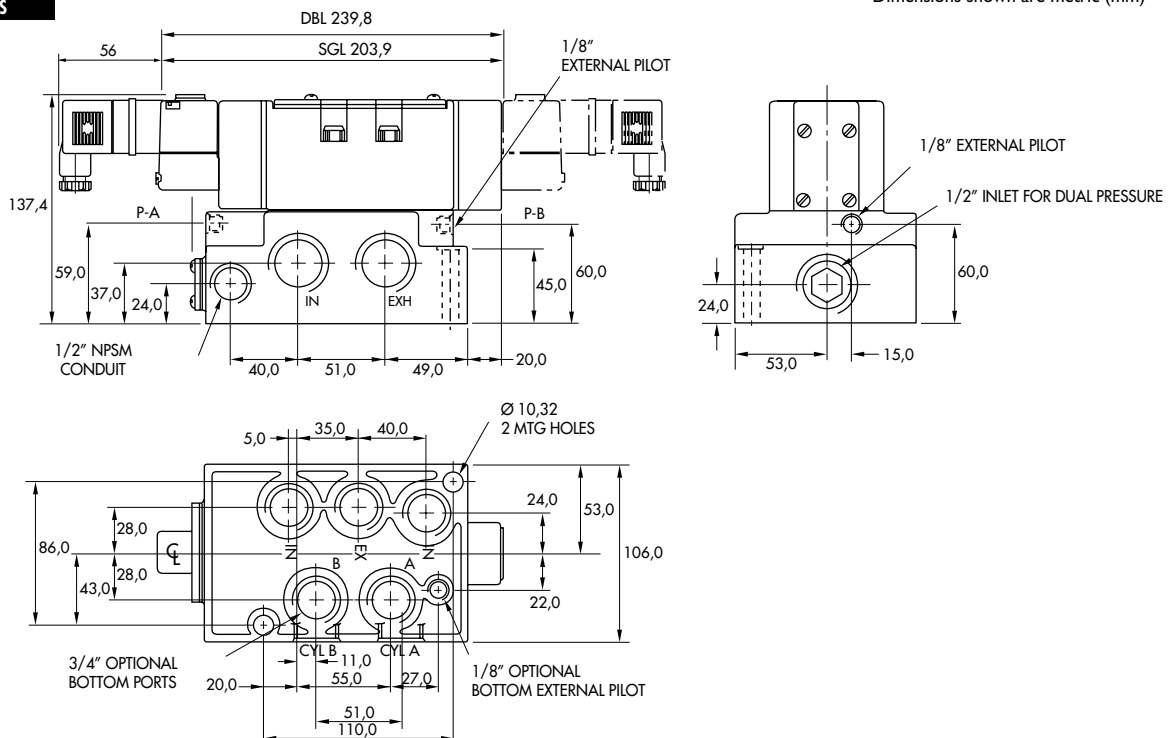
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/4" : (9.0 C <sub>v</sub> ), 1" : (9.6 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA Holding : 10.9 VA = 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 18 ms	De-energize : 20 ms
	120/60	Energize : 15-25 ms	De-energize : 19-28 ms

- Spare parts :
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
  - Pilot valve : PME-XXYZZ, including seal 16337. • Pressure seal between valve and base : 16436.
  - Mounting screw valve to base (x4) : 35416.

- Options :
- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>3/4" - 1"</b>	<b>9.6 C<sub>v</sub></b>	sub-base "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.

### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		6611A-000-PM-XXYDA	6621A-000-PM-XXYDA	6631A-000-PM-XXYDA	6641A-000-PM-XXYDA	6651A-000-PM-XXYDA
<b>sub-base</b>	Internal	6611A-211-PM-XXYDA	6621A-211-PM-XXYDA	6631A-211-PM-XXYDA	6641A-211-PM-XXYDA	6651A-211-PM-XXYDA
<b>3/4" NPTF</b>	External	6611A-221-PM-XXYDA	6621A-221-PM-XXYDA	6631A-221-PM-XXYDA	6641A-221-PM-XXYDA	6651A-221-PM-XXYDA
<b>sub-base</b>	Internal	6611A-311-PM-XXYDA	6621A-311-PM-XXYDA	6631A-311-PM-XXYDA	6641A-311-PM-XXYDA	6651A-311-PM-XXYDA
<b>1" NPTF</b>	External	6611A-321-PM-XXYDA	6621A-321-PM-XXYDA	6631A-321-PM-XXYDA	6641A-321-PM-XXYDA	6651A-321-PM-XXYDA

Note : Above codes shown are for side ports without lights.

### SOLENOID OPERATOR >

XX Voltage	Y Manual operator
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking
<b>12</b> 240/60, 220/50	<b>2</b> Locking
<b>22</b> 24/60, 24/50	
<b>59</b> 24 VDC (2.5 W)	
<b>87</b> 24 VDC (17.1 W)	
<b>61</b> 24 VDC (8.5 W)	

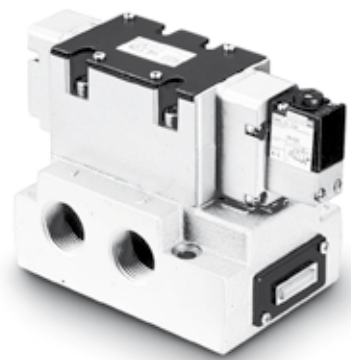
\* Other options available, see page 357.

### OPTIONS

- 6611A-XXX-PM-XXYDA
- For piped pilot exhaust replace M by P.
  - For dual pressure valve replace by 4 (no light), by 5 (sgl. light), by 6 (dbl. light).
  - For lights on base, replace by 2 (sgl. light), by 3 (dbl. light).
  - For lights on valve body, replace by 3.

MODIFICATIONS		
MOD. N°	DESCRIPTION	MODEL AVAILABILITY
<b>0002</b>	Bottom inlet, exh. & cyl ports (side ports plugged)	3/4" individual base
<b>0004</b>	Full side porting and additional bottom inlet, exh. & cyl ports	3/4" individual base
<b>0112</b>	Side inlet & exhaust with bottom cyl. ports (side cyl.ports plugged)	3/4" individual base

**TO ORDER** - Add the appropriate modification number after the valve number;  
**EXAMPLE** : 6611A-211-PM-111DA **MOD 0002**



35  
100  
200  
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59  
45  
700  
900  
82  
6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

- Note : 1. The valve less base is always the same for internal or external pilot. These options are effected in the base.  
 2. Bottom ports : Refer to modification table.  
 3. To order bases without the valve, choose the base from the above table, then add 6600A as a prefix. Example 6600A-211.  
 4. 2 position and 3 position valve bodies are not interchangeable.

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/4" : (9.0 C <sub>v</sub> ), 1" : (9.6 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA Holding : 10.9 VA = 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 18 ms	De-energize : 20 ms
	120/60	Energize : 15-25 ms	De-energize : 19-28 ms

Spare parts :

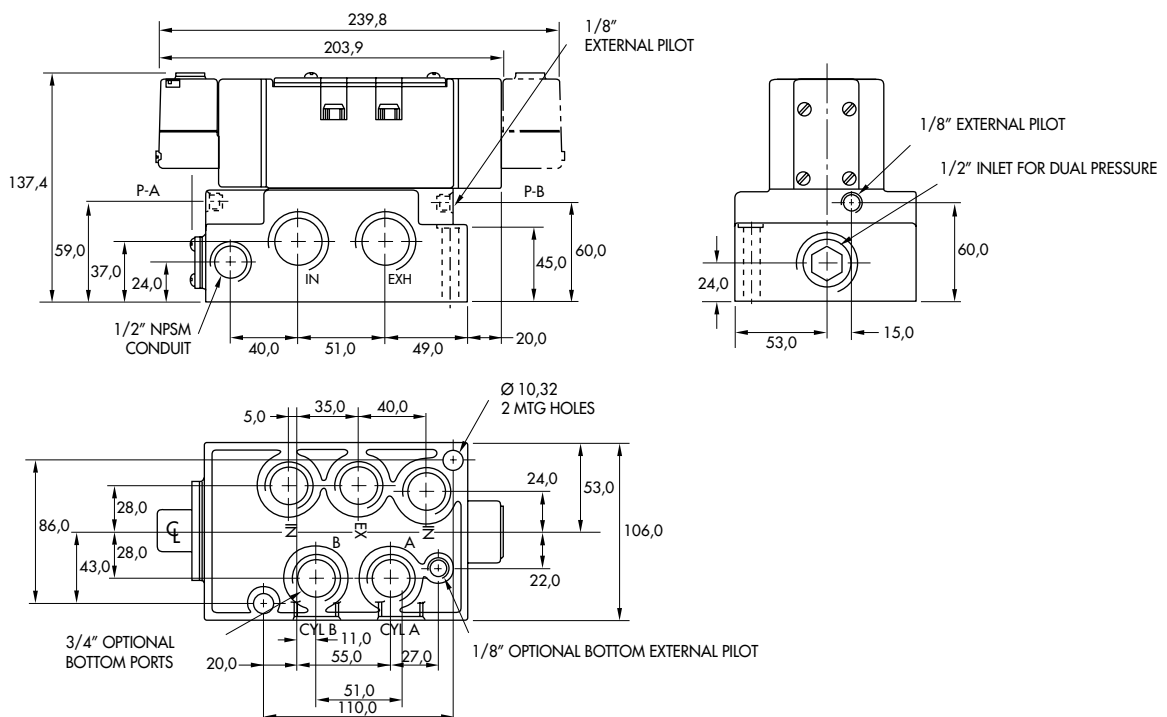
- Solenoid operator (power ≥ 4 W) : D1-XXBE, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XXYDA-BE, including seal 16337. • Pressure seal between valve and base : 16436.
- Mounting screw valve to base (x4) : 35416.

Options :

- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)

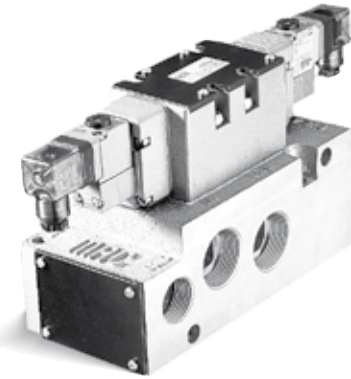


Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>3/4" - 1" - 1 1/4"</b>	<b>9.6 C<sub>v</sub></b>	sub-base non "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.

### HOW TO ORDER



35  
100  
200  
55  
56  
57  
58  
59

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		6612A-000-PM- <b>XXYZZ</b>	6622A-000-PM- <b>XXYZZ</b>	6632A-000-PM- <b>XXYZZ</b>	6642A-000-PM- <b>XXYZZ</b>	6652A-000-PM- <b>XXYZZ</b>
<b>sub-base</b>	Internal	6612A-431-PM- <b>XXYZZ</b>	6622A-431-PM- <b>XXYZZ</b>	6632A-431-PM- <b>XXYZZ</b>	6642A-431-PM- <b>XXYZZ</b>	6652A-431-PM- <b>XXYZZ</b>
<b>3/4" NPTF</b>	External	6612A-441-PM- <b>XXYZZ</b>	6622A-441-PM- <b>XXYZZ</b>	6632A-441-PM- <b>XXYZZ</b>	6642A-441-PM- <b>XXYZZ</b>	6652A-441-PM- <b>XXYZZ</b>
<b>sub-base</b>	Internal	6612A-531-PM- <b>XXYZZ</b>	6622A-531-PM- <b>XXYZZ</b>	6632A-531-PM- <b>XXYZZ</b>	6642A-531-PM- <b>XXYZZ</b>	6652A-531-PM- <b>XXYZZ</b>
<b>1" NPTF</b>	External	6612A-541-PM- <b>XXYZZ</b>	6622A-541-PM- <b>XXYZZ</b>	6632A-541-PM- <b>XXYZZ</b>	6642A-541-PM- <b>XXYZZ</b>	6652A-541-PM- <b>XXYZZ</b>
<b>sub-base</b>	Internal	6612A-631-PM- <b>XXYZZ</b>	6622A-631-PM- <b>XXYZZ</b>	6632A-631-PM- <b>XXYZZ</b>	6642A-631-PM- <b>XXYZZ</b>	6652A-631-PM- <b>XXYZZ</b>
<b>1 1/4" NPTF</b>	External	6612A-641-PM- <b>XXYZZ</b>	6622A-641-PM- <b>XXYZZ</b>	6632A-641-PM- <b>XXYZZ</b>	6642A-641-PM- <b>XXYZZ</b>	6652A-641-PM- <b>XXYZZ</b>

45  
700

Note : Above codes shown are for side ports.

### SOLENOID OPERATOR ►

**XX Y ZZ\***

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

\* Other options available, see page 357.

Note : Photo shown with JC connector.

900  
82  
6300  
6500

### OPTIONS

- 6612A-XXX-PM-**XXYDA**
- For piped pilot exhaust replace M by P.
  - For dual pressure valve, replace by 4.

MODIFICATIONS		
MOD. N°	DESCRIPTION	MODEL AVAILABILITY
<b>0210</b>	1 1/4" Bottom inlet	Manifold base
<b>0364</b>	1 1/4" Bottom inlet, 3/4" or 1" Bottom cyl.	Manifold base
<b>0112</b>	Side inlet & exhaust with bottom cyl. ports (side cyl.ports plugged)	1" Manifold base

**TO ORDER** - Add the appropriate modification number after the valve number;  
**EXAMPLE** : 6612A-431-PM-111JA **MOD 0364**

- Note : 1. The valve less base is always the same for internal or external pilot. These options are effected in the manifold.  
 2. Bottom ports : Refer to modification table.  
 3. To order manifolds without the valve, choose the manifold from the above table, then add 6600A as a prefix. Example 6600A-431.  
 4. When ordering an external pilot connection for manifold bases, a common external pilot part is standard. One connection only is required for all the valves in the manifold whether single or double solenoid.  
 5. 2 position and 3 position valve bodies are not interchangeable.

6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/4" : (9.0 C <sub>v</sub> ), 1" : (9.6 C <sub>v</sub> ), 1 1/4" : (9.6 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 18 ms	De-energize : 20 ms
	120/60	Energize : 15-25 ms	De-energize : 19-28 ms

Spare parts :

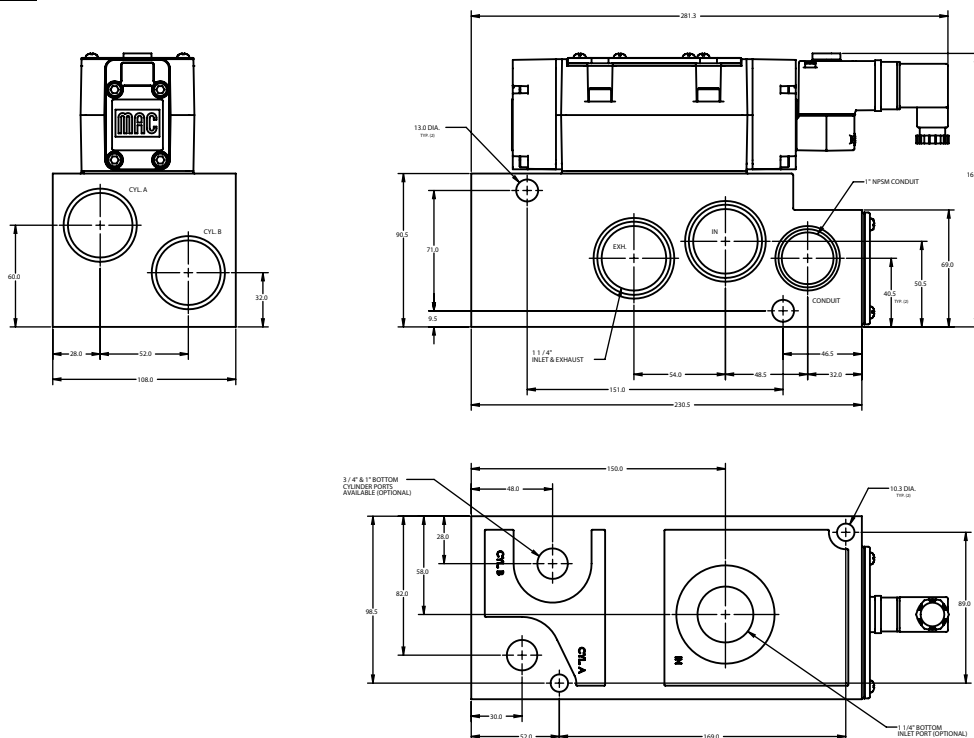
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XYZZ, including seal 16337. • Pressure seal between valve and base : 16436.
- Mounting screw valve to base (x4) : 35416. • Tie-rod (x2) : 19789. • Fastening kit : N-66002-01.
- Inlet & exhaust isolator : 28367.

Options :

- BSPP threads.

**DIMENSIONS**

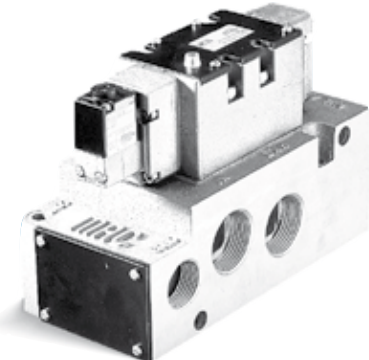
Dimensions shown are metric (mm)



Function	Port size	Flow [Max]	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>3/4" - 1" - 1 1/4"</b>	<b>9.6 C<sub>v</sub></b>	sub-base "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



35  
100  
200  
55  
56  
57  
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59

### HOW TO ORDER

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>		6611A-000-PM- <b>XXY</b> DA	6621A-000-PM- <b>XXY</b> DA	6631A-000-PM- <b>XXY</b> DA	6641A-000-PM- <b>XXY</b> DA	6651A-000-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6611A-411-PM- <b>XXY</b> DA	6621A-411-PM- <b>XXY</b> DA	6631A-411-PM- <b>XXY</b> DA	6641A-411-PM- <b>XXY</b> DA	6651A-411-PM- <b>XXY</b> DA
<b>3/4" NPTF</b>	External	6611A-421-PM- <b>XXY</b> DA	6621A-421-PM- <b>XXY</b> DA	6631A-421-PM- <b>XXY</b> DA	6641A-421-PM- <b>XXY</b> DA	6651A-421-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6611A-511-PM- <b>XXY</b> DA	6621A-511-PM- <b>XXY</b> DA	6631A-511-PM- <b>XXY</b> DA	6641A-511-PM- <b>XXY</b> DA	6651A-511-PM- <b>XXY</b> DA
<b>1" NPTF</b>	External	6611A-521-PM- <b>XXY</b> DA	6621A-521-PM- <b>XXY</b> DA	6631A-521-PM- <b>XXY</b> DA	6641A-521-PM- <b>XXY</b> DA	6651A-521-PM- <b>XXY</b> DA
<b>sub-base</b>	Internal	6611A-611-PM- <b>XXY</b> DA	6621A-611-PM- <b>XXY</b> DA	6631A-611-PM- <b>XXY</b> DA	6641A-611-PM- <b>XXY</b> DA	6651A-611-PM- <b>XXY</b> DA
<b>1 1/4" NPTF</b>	External	6611A-621-PM- <b>XXY</b> DA	6621A-621-PM- <b>XXY</b> DA	6631A-621-PM- <b>XXY</b> DA	6641A-621-PM- <b>XXY</b> DA	6651A-621-PM- <b>XXY</b> DA

Note : Above codes shown are for side cylinder ports without lights.

### SOLENOID OPERATOR >

**XX Y DA\***

XX Voltage	Y Manual operator
11 120/60, 110/50	1 Non-locking
12 240/60, 220/50	2 Locking
22 24/60, 24/50	
59 24 VDC (2.5 W)	
87 24 VDC (17.1 W)	
61 24 VDC (8.5 W)	

\* Other options available, see page 357.

### OPTIONS

6611A-XXX-PM-**XXY**DA

- For piped pilot exhaust replace M by P.
- For lights on valve body, replace by 3.
- For dual pressure valve replace by 4 (no light), by 5 (sgl. light), by 6 (dbl. light).
- For lights on manifold, replace by 2 (sgl. light), by 3 (dbl. light).

MOD. N°	DESCRIPTION	MODEL AVAILABILITY
<b>0210</b>	1 1/4" Bottom inlet	Manifold base
<b>0364</b>	1 1/4" Bottom inlet, 3/4" or 1" Bottom cyl.	Manifold base
<b>0112</b>	Side inlet & exhaust with bottom cyl. ports (side cyl.ports plugged)	1" Manifold base

**TO ORDER** - Add the appropriate modification number after the valve number;  
**EXAMPLE** : 6611A-411-PM-111DA **MOD 0364**

- Note :
- The valve less base is always the same for internal or external pilot. These options are effected in the manifold.
  - Bottom ports : Refer to modification table.
  - To order manifolds without the valve, choose the manifold from the above table, then add 6600A as a prefix. Example 6600A-411.
  - When ordering an external pilot connection for manifold bases, a common external pilot port is standard. One connection only is required for all the valves in the manifold whether single or double solenoid.
  - 2 position and 3 position valve bodies are not interchangeable.

Consult "Precautions" page 364 before use, installation or service of MAC Valves

45  
700  
900  
82  
6300  
6500  
6600  
1300  
800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A



**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/4" : (9.0 C <sub>v</sub> ), 1" : (9.6 C <sub>v</sub> ), 1 1/4" : (9.6 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 18 ms	De-energize : 20 ms
	120/60	Energize : 15-25 ms	De-energize : 19-28 ms

Spare parts :

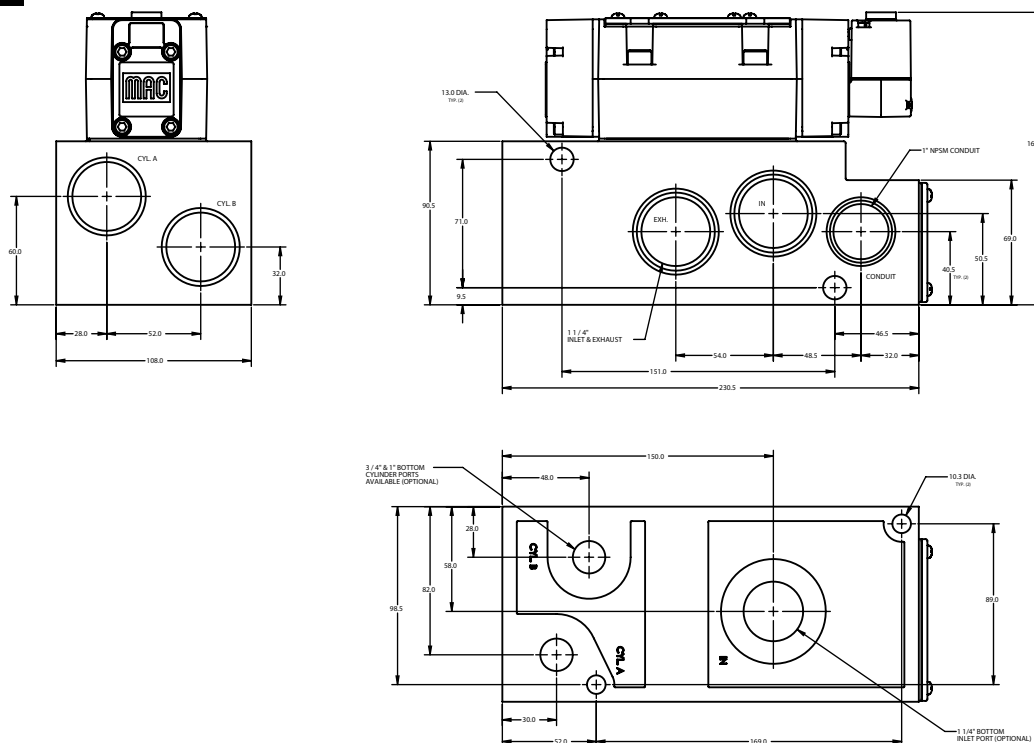
- Solenoid operator (power ≥ 4 W) : D1-XXBE, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XXYDA-BE, including seal 16337. • Pressure seal between valve and base : 16436.
- Mounting screw valve to base (x4) : 35416. • Tie-rod (x2) : 19789. • Fastening kit : N-66002-01.
- Inlet & exhaust isolator : 28367.

Options :

- BSPP threads.

**DIMENSIONS**

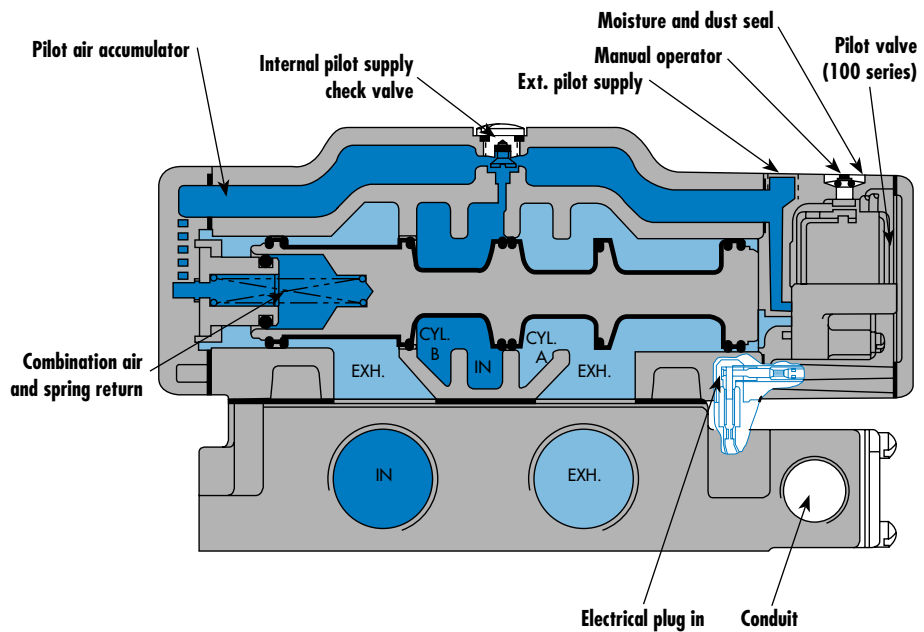
Dimensions shown are metric (mm)



Individual mounting

Series

sub-base  
"plug-in"



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**

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- A large checked accumulator for consistent shifting on single and double solenoid models.
- A plug-in design that provides for internal or external pilot with or without lights and all electrical in the base.
- Non-lubricated or lubricated service.
- Optional indicator lights, and various types of manual operators.

### SOLENOID PILOT

The solenoid pilot utilized on the 1300 Series is the extremely fast and reliable, spring biased MAC 100 Series three-way manifold valve which features a high flow balanced poppet. The patented spring biased floating pole piece MACSOLENOID® of the 100 Series practically eliminates the two most common causes of solenoid valve failures: coil burnout on AC service and failure to shift. The versatility of the 100 Series permits either internal or external pilot supply. The solenoid housing incorporates a 1/8" NPTF pilot exhaust connection which can be either muffled or piped away and the external pilot supply connection.

### MAIN VALVE

The main valve contains a MAC all bonded, lightweight one-piece aluminium spool. All spool seals are permanently bonded, precision ground and chemically surface hardened to provide long, stick-free operation. These valves with their pressure balanced design are not affected by restrictions or back pressure in the exhaust and can be plugged for use as three-way valves. The one-piece silicon aluminium body used with any of these valves incorporates an integral accumulator.

### ACCUMULATOR

A large accumulator housed in the main valve body supplies both pilots on double solenoid valves as well as the air assisted spring return on single solenoid pilot or single

remote air pilot operated valves. Internally piloted, the accumulator is protected from inlet pressure fluctuations in the main valve by a check valve. The check valve is designed to bleed off the accumulator when the main supply pressure is removed. For external pilot supply operations, the check valve is reversed, blocking the internal pilot supply to the accumulator. The accumulator is then supplied through the external supply connection.

### DIFFERENTIAL RETURN

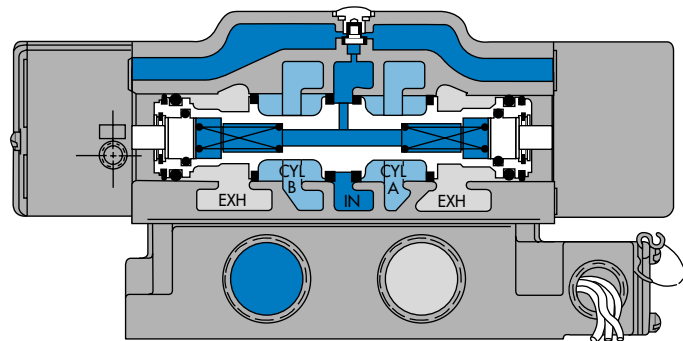
Single solenoid pilot or single air pilot operated models contain a combination spring and air assisted differential return. Supplied from the accumulator it balances the shifting forces for consistent operation and positive spool return.

### BASES

The 4-port aluminium base design simplifies piping and enables the use of a single muffler or piped exhaust. They are provided with an integral electrical wiring space, sealed with a convenient access cover. The access cover also houses the optional indicator lights, available in voltages of 120/60, 110/50 or 240/60, 220/50 or 24 VDC in either single or double lights.

### 3-POSITION VALVES

The 1300 Series solenoid pilot 3-position valves, are centered by MAC's exclusive combination spring and pressure assisted spool design. The combination spring and air assist assures fast, positive return of the main spool when the pilots are de-energized. Available in external or internal pilot supply models, with either a closed center spool (all ports blocked) or open center spool (inlet blocked, cylinder ports open to exhaust).



3-POSITION DOUBLE  
SOLENOID CLOSED CENTER

Function	Port size	Flow [Max]	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>3/4" - 1" - 1 1/4" - 1 1/2"</b>	<b>15.9 C<sub>v</sub></b>	sub-base "plug-in"	

### OPERATIONAL BENEFITS

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure.
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



35  
100  
200  
55  
56  
57  
58  
59

### HOW TO ORDER

Port size	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center
<b>Valve less base</b>	1301G- <i>XXYD-XX</i>	1303G- <i>XXYD-XX</i>	1307G- <i>XXYD-XX</i>	1308G- <i>XXYD-XX</i>
<b>Sub base 3/4" NPTF</b>	1321G- <i>XXYD-XX</i>	1323G- <i>XXYD-XX</i>	1327G- <i>XXYD-XX</i>	1328G- <i>XXYD-XX</i>
<b>Sub base 1" NPTF</b>	1331G- <i>XXYD-XX</i>	1333G- <i>XXYD-XX</i>	1337G- <i>XXYD-XX</i>	1338G- <i>XXYD-XX</i>
<b>Sub base 1 1/4" NPTF</b>	1351G- <i>XXYD-XX</i>	1353G- <i>XXYD-XX</i>	1357G- <i>XXYD-XX</i>	1358G- <i>XXYD-XX</i>
<b>Sub base 1 1/2" NPTF</b>	1361G- <i>XXYD-XX</i>	1363G- <i>XXYD-XX</i>	1367G- <i>XXYD-XX</i>	1368G- <i>XXYD-XX</i>

45

### SOLENOID OPERATOR ▶

**XX Y D - X X \***

XX Voltage	Y Manual operator	X Pilot air	X Indicator light
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking	<b>1</b> Internal	<b>5</b> With light in base
<b>12</b> 240/60, 220/50	<b>2</b> Locking	<b>2</b> External	
<b>22</b> 24/60, 24/50			
<b>59</b> 24 VDC (2.5 W)			
<b>87</b> 24 VDC (17.1 W)			
<b>61</b> 24 VDC (8.5 W)			

700  
900  
82

\* Other options available, see page 357.

Bases	
10952-0005	3/4" BASE ASS'Y - SGL (NPTF)
10952-0006	3/4" BASE ASS'Y - DBL (NPTF)
10952-XX05	3/4" BASE ASS'Y - SGL - W/LIGHT (NPTF)
10952-XX06	3/4" BASE ASS'Y - DBL - W/LIGHT (NPTF)
10953-0005	1" BASE ASS'Y - SGL (NPTF)
10953-0006	1" BASE ASS'Y - DBL (NPTF)
10953-XX05	1" BASE ASS'Y - SGL - W/LIGHT (NPTF)
10953-XX06	1" BASE ASS'Y - DBL - W/LIGHT (NPTF)
10954-0005	1 1/4" BASE ASS'Y - SGL (NPTF)
10954-0006	1 1/4" BASE ASS'Y - DBL (NPTF)
10954-XX05	1 1/4" BASE ASS'Y - SGL - W/LIGHT (NPTF)
10954-XX06	1 1/4" BASE ASS'Y - DBL - W/LIGHT (NPTF)
10955-0005	1 1/2" BASE ASS'Y - SGL (NPTF)
10955-0006	1 1/2" BASE ASS'Y - DBL (NPTF)
10955-XX05	1 1/2" BASE ASS'Y - SGL - W/LIGHT (NPTF)
10955-XX06	1 1/2" BASE ASS'Y - DBL - W/LIGHT (NPTF)

Light options	
XX =	11 - 110V-120V
	12 - 220V-240V
	61 - 24V-28V

6300  
6500  
6600  
**1300**

**BOTTOM PORTS** available only on 3/4" valves  
For bottom ports only specify **MOD 0002**  
For side and bottom ports specify **MOD 0004**  
**EXAMPLE** : 1321G-1111D-1 **MOD 0002**

800  
ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

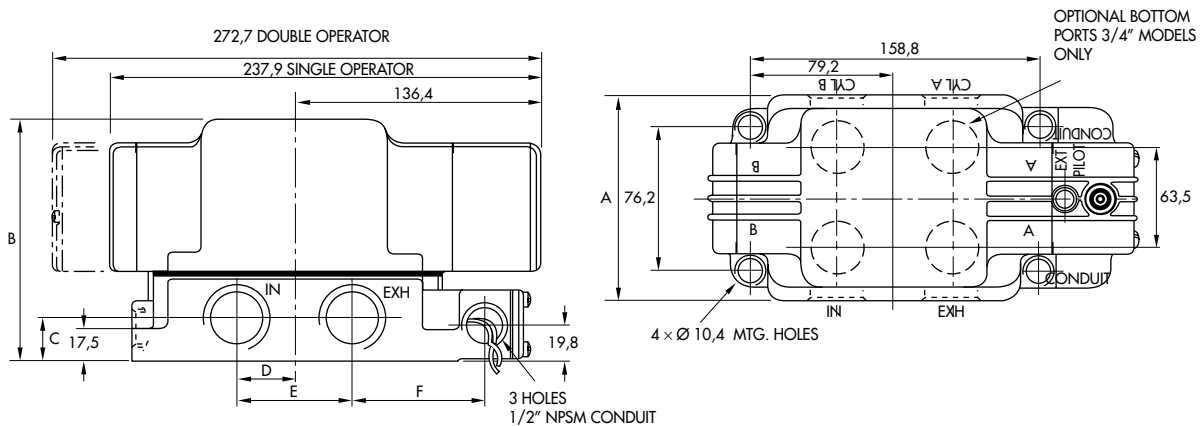
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/4" : (11.5 C <sub>v</sub> ), 1" : (13.7 C <sub>v</sub> ), 1 1/4" : (15.4 C <sub>v</sub> ), 1 1/2" : (15.9 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA Holding : 10.9 VA = 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 20 ms	De-energize : 28 ms
	120/60	Energize : 17-23 ms	De-energize : 29-35 ms

- Spare parts :
- Solenoid operator (power ≥ 4 W) : D1-XXBD.
  - Pressure seal between valve and base : 16083.
  - Pilot valve : 150B-XXBD, including mounting screws 32180 and adaptor plate N-03001.
  - Mounting screw valve to base (x4) : 32396.

- Options :
- BSPP threads.
  - Lights in base.

**DIMENSIONS**

Dimensions shown are metric (mm)



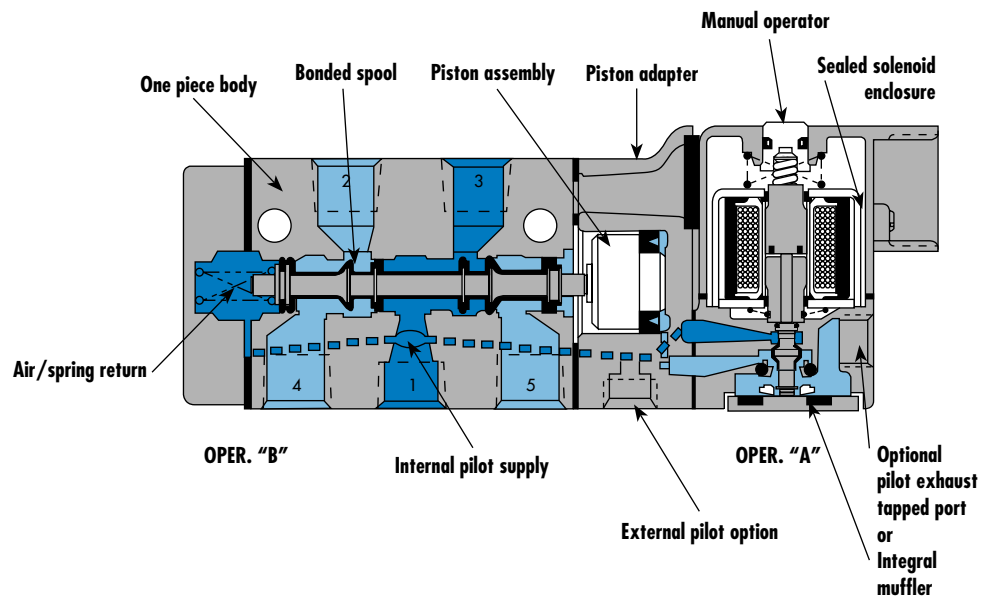
Port size	A	B	C	D	E	F
<b>3/4", 1" NPTF</b>	111.3	132.4	23.8	31.7	63.5	71.4
<b>1 1/4" NPTF</b>	114.3	148.3	30.2	38.1	76.2	65.0
<b>1 1/2" NPTF</b>				35.0	69.9	68.0

Individual mounting

inline
--------

Manifold mounting

stacking body with 1 common port (inlet)	stacking body with 3 common ports (inlet & exhausts)	stacking body with 3 common ports and integral F.C.	stacking body with 3 common ports with common conduit	stacking body with 3 common ports with C. C. & integral exh. F. C.
--	--	---	---	--



**SERIES FEATURES**

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Air/spring return on single solenoid valves.
- Use for lube or non-lube service.
- Optional common conduit stacking valve with integral wiring space and indicator lights
- Optional integral individual exhaust flow controls.
- Optional low wattage DC solenoids down to 1 watt.
- Various types of manual operators and solenoid enclosures.

Series

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

### SPECIAL APPLICATIONS :

On all single pressure models, energizing the operator closest to port #5 supplies pressure to cylinder port "2" and energizing the operator closest to port #4 supplies pressure to cylinder port "3". For the following special applications, additional piping considerations are required.

### EXTERNAL PILOT APPLICATIONS :

An External Pilot is only required when the main valve pressure is less than 20 PSIG on single solenoid or 10 PSIG on double solenoid valves in 2-position models, or less than 20 PSIG on 3-position double solenoid models. Also an External Pilot is required when main valve pressure is in excess of 150 PSIG.

**INDIVIDUAL VALVES:** The External Pilot supply is connected to the External Pilot port in the piston adapter. The valve must be an External Pilot model.

**STACKING VALVES:** The External Pilot supply is connected to the External Pilot ports in the end plates. The valve is the same valve for either Internal or External Pilot. The end plate must be the external pilot type.

### DUAL PRESSURE (TWO INLET) APPLICATIONS :

When two pressures are required within a valve, a Dual Pressure (Inlet) model must be used. Additionally the following must be adhered to:

**INDIVIDUAL VALVES:** If both pressures are below the minimum, use an External Pilot supply as described above for Individual valves and connect the two pressures to ports #4 and #5. Otherwise, use an Internal Pilot model and connect the higher pressure to port #5 and the lower pressure to port #4.

**STACKING VALVES:** Use an External Pilot Manifold End Plate Kid, as described above for Stacking Valves and connect the two pressures to the Exhaust ports in the end plate.

### MULTIPLE PRESSURES TO A STACK :

By isolating, different pressures can be supplied to each end of a stack to provide two pressures. If more than two pressures are required, a Dual Inlet Pressure Block can be installed providing 2 more inlet pressures to a stack. With the use of 1 or more of these Pressure Blocks, a stack can have virtually unlimited inlet pressures.

### VACUUM APPLICATIONS :

Use an External Pilot model as described under "External Pilot Applications", (Individual valve or Stacking).

For single pressure, dual exhaust type valve ports #4 & #5 (Exhausts) should be connected to the vacuum supply and port #1 (Inlet) to atmosphere.

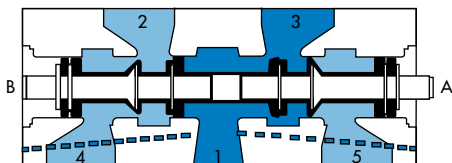
For dual pressure, single exhaust type valves, vacuum should be connected to port #1 (Inlet) and ports #4 & #5 (Exhausts) to atmosphere.

### SELECTOR APPLICATIONS :

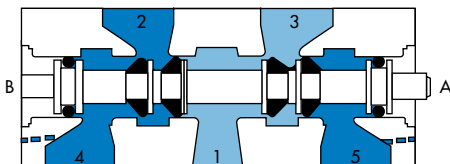
Use an External Pilot model as described above, if both pressures are below the minimum pilot pressure; otherwise use an Internal Pilot model. In either case, use a single pressure model and connect the higher pressure to port #1 (Inlet) and the lower pressure to port #4 (Exhaust) if using cylinder port #2 or to port #5 (Exhaust) if using cylinder port #3.

### SPOOL CONFIGURATIONS

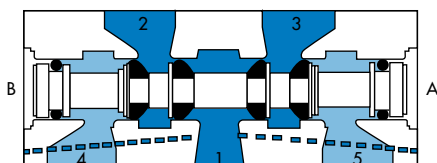
2-POSITION SGL. PRESSURE (SPOOL #12184)  
B ACTUATED SHOWN



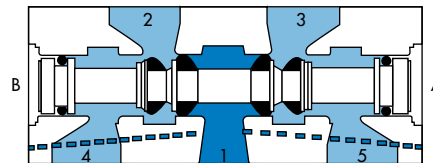
2-POSITION DUAL PRESSURE  
(SPOOL ASSY.#10266) B ACTUATED SHOWN



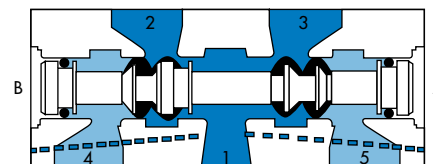
3-POSITION SGL. PRESS. CLOSED CENTER  
(SPOOL ASSY. #S-00004) CENTER POSITION SHOWN



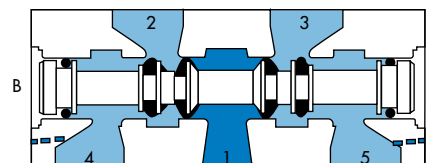
3-POSITION SGL. PRESS. OPEN CENTER  
(SPOOL ASSY.#S-00003) CENTER POSITION SHOWN



3-POSITION SGL. PRESS. PRESSURE CENTER  
(SPOOL ASSY. #S-08003) CENTER POSITION SHOWN



3-POSITION DUAL PRESS. PRESSURE CENTER  
(SPOOL ASSY. #S-08002) CENTER POSITION SHOWN



Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2 - 5/3</b>	<b>1/4"</b>	<b>1.4 C<sub>v</sub></b>	inline	

**OPERATIONAL BENEFITS**

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



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
<b>1/4" NPTF</b>	Internal	811C-PM- <b>XXYZZ</b> -152	821C-PM- <b>XXYZZ</b> -152	825C-PM- <b>XXYZZ</b> -552	825C-PM- <b>XXYZZ</b> -652	825C-PM- <b>XXYZZ</b> -852
	External	812C-PM- <b>XXYZZ</b> -112	822C-PM- <b>XXYZZ</b> -112	826C-PM- <b>XXYZZ</b> -512	826C-PM- <b>XXYZZ</b> -612	826C-PM- <b>XXYZZ</b> -812

45

SOLENOID OPERATOR ▶

**XX Y ZZ\***

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

700

900

82

\* Other options available, see page 357.

**MODIFICATIONS - N° 0358** - 3/8" inlet and cylinder ports, exhaust ports 1/4"

**MODIFICATIONS - N° 1080** - NAMUR interface.

Add mod. N° after valve part n°. - **EXAMPLE** : 811C-PM-111CA-152 Mod. 0358.

6300

6500

6600

1300

800

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

**OPTIONS**

- 811C-PM-111CA-152 - For 2 position dual pressure : replace by 2.
- 825C-PM-111CA-852 - For 3 position dual pressure, pressure center : replace by 7.



### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases	
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 20-150 PSI	double operator : 10-150 PSI
	External pilot : vacuum to 200 PSI	
<b>Pilot pressure :</b>	Single operator and 3 positions : 20-150 PSI Double operator : 10-150 PSI	
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)	
<b>Filtration :</b>	40 µ	
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)	
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" : (1.4 C <sub>v</sub> )	
<b>Coil :</b>	General purpose - class A wires - Continuous duty - Encapsulated	
<b>Voltage range :</b>	-15% to +10% of nominal voltage	
<b>Protection :</b>	Consult factory	
<b>Power :</b>	~ Inrush : 14.8 VA Holding : 10.9 VA = 1 to 17.1 W	
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 8 ms De-energize : 10 ms
	120/60	Energize : 5-11 ms De-energize : 9-16 ms

Spare parts : 

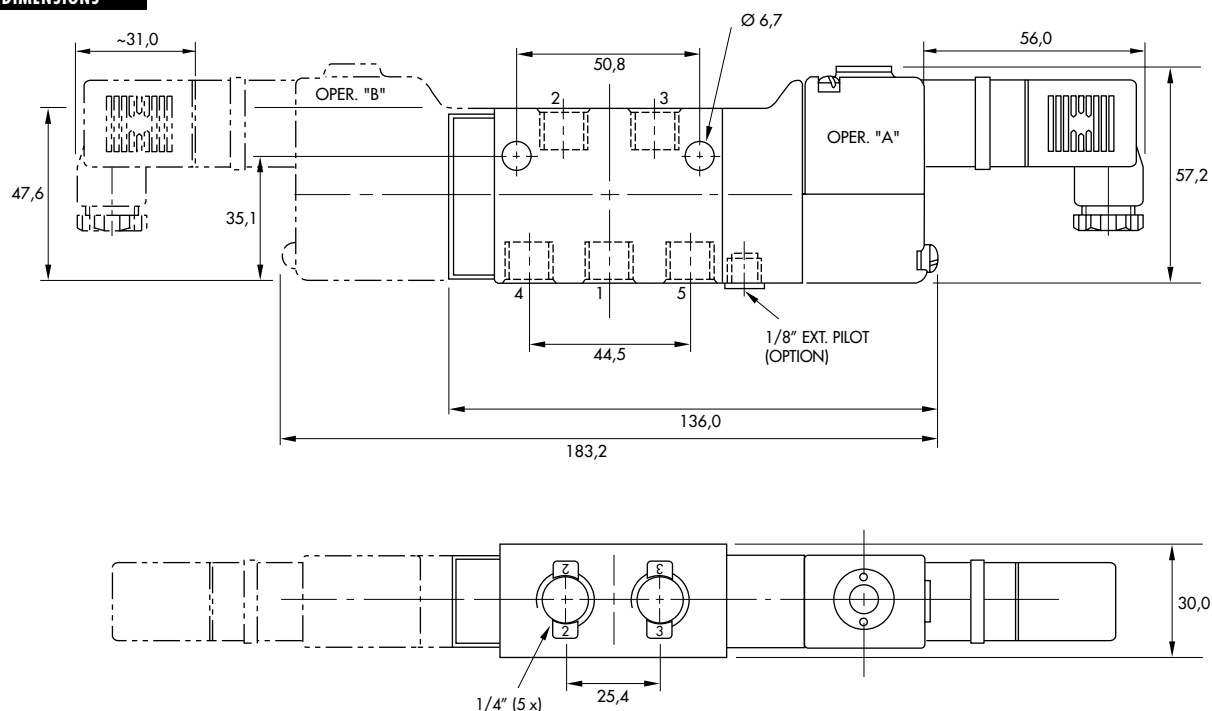
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XXYZZ, including seal 16337. • Mounting screw kit for pilot : N-08003.

Options : 

- BSPP threads. • NAMUR interface. • Explosion-proof model. • Flow control/muffler (1/4") : 10951

### DIMENSIONS

Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold Mounting	Series
<b>5/2 - 5/3</b>	<b>1/4"</b>	<b>1.4 C<sub>v</sub></b>	stacking body with 1 common port (inlet)	

**OPERATIONAL BENEFITS**

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



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
<b>1/4" NPTF</b>	811C-PM- <b>XXYYZ</b> -132	821C-PM- <b>XXYYZ</b> -132	825C-PM- <b>XXYYZ</b> -532	825C-PM- <b>XXYYZ</b> -632	825C-PM- <b>XXYYZ</b> -832

45

**SOLENOID OPERATOR** ▶

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking	<b>JB</b> Rectangular connector
<b>12</b> 240/60, 220/50	<b>2</b> Locking	<b>JD</b> Rectangular connector with light
<b>22</b> 24/60, 24/50		<b>RA</b> Conduit 3/8" NPS
<b>59</b> 24 VDC (2.5 W)		<b>BA</b> Flying leads (18")
<b>87</b> 24 VDC (17.1 W)		
<b>61</b> 24 VDC (8.5 W)		

700  
900

\* Other options available, see page 357.

82

**MANIFOLD END PLATE KITS (NPTF)\***

INT. PILOT - PART N°.	EXT. PILOT - PART N°.	MODELS USED WITH
M-08001-01-01	M-08001-02-01	3 com. port or 1 com. port models, stacks of 1 thru 16 valves
M-00005-01-01	M-00005-02-01	3 com. port or 1 com. port models, stacks of 17 or more valves

6300

\* Add letter **P** at end of part N°. for BSPP threads; **EXAMPLE** : M-08001-01-01**P**

Note : (1) end plate kit required per stack.

6500

6600

**OPTIONS**

- 811C-PM-111BA-132 - For 2 position dual pressure : replace by 2.
- 825C-PM-111BA-832 - For 3 position dual pressure, pressure center : replace by 7.

1300

**800**

ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

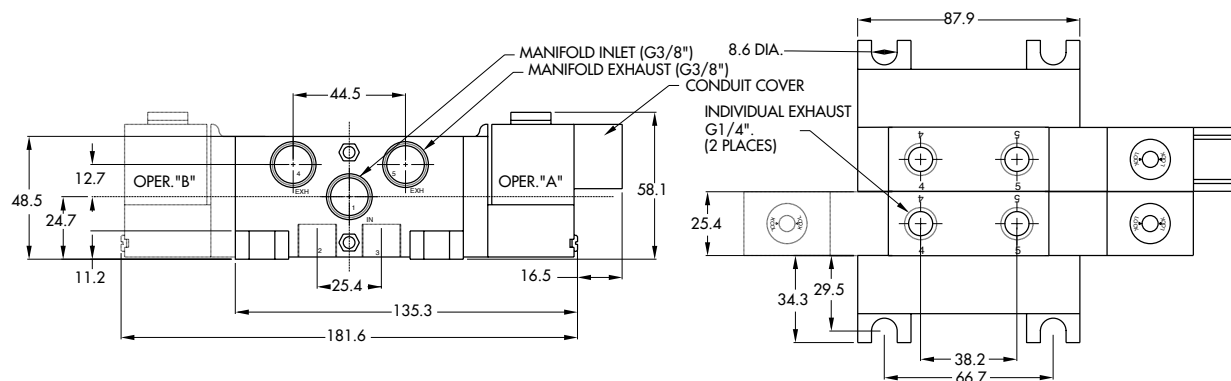
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 20-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 200 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 20-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" : (1.4 C <sub>v</sub> )		
<b>Coil :</b>	General purpose - class A wires - Continuous duty - Encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 8 ms	De-energize : 10 ms
	120/60	Energize : 5-11 ms	De-energize : 9-16 ms

- Spare parts :
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
  - Pilot valve : PME-XYZZ, including seal 16337. • Mounting screw kit for pilot : N-08003.
  - Inlet isolator : N-08001 • Exhaust isolator (x2) : N-08002

- Options :
- BSPP threads. • Dual inlet block: M-08003 • Flow control/muffler (1/4") : 10951

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.4 C<sub>v</sub></b>	stacking body with 3 common ports (inlet & exhausts)	

**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.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
<b>1/4" NPTF</b>	811C-PM- <b>XXYZZ</b> -122	821C-PM- <b>XXYZZ</b> -122	825C-PM- <b>XXYZZ</b> -522	825C-PM- <b>XXYZZ</b> -622	825C-PM- <b>XXYZZ</b> -822
<b>3/8" NPTF</b>	811C-PM- <b>XXYZZ</b> -123	821C-PM- <b>XXYZZ</b> -123	825C-PM- <b>XXYZZ</b> -523	825C-PM- <b>XXYZZ</b> -623	825C-PM- <b>XXYZZ</b> -823

45

**SOLENOID OPERATOR** ▶

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking	<b>JB</b> Rectangular connector
<b>12</b> 240/60, 220/50	<b>2</b> Locking	<b>JD</b> Rectangular connector with light
<b>22</b> 24/60, 24/50		<b>RA</b> Conduit 3/8" NPS
<b>59</b> 24 VDC (2.5 W)		<b>BA</b> Flying leads (18")
<b>87</b> 24 VDC (17.1 W)		
<b>61</b> 24 VDC (8.5 W)		

700

\* Other options available, see page 357.

900

82

**MANIFOLD END PLATE KITS (NPTF)\***

INT. PILOT - PART N°.	EXT. PILOT - PART N°.	MODELS USED WITH
M-08001-01-01	M-08001-02-01	3 com. port or 1 com. port models, stacks of 1 thru 16 valves
M-00005-01-01	M-00005-02-01	3 com. port or 1 com. port models, stacks of 17 or more valves

6300

6500

\* Add letter **P** at end of part N°. for BSPP threads; **EXAMPLE** : M-08001-01-01**P**

Note : (1) end plate kit required per stack.

6600

**OPTIONS**

- 811C-PM-111RA-122 - For 2 position dual pressure : replace by 2.
- 825C-PM-111RA-822 - For 3 position dual pressure, pressure center: replace by 7.

1300

800

ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

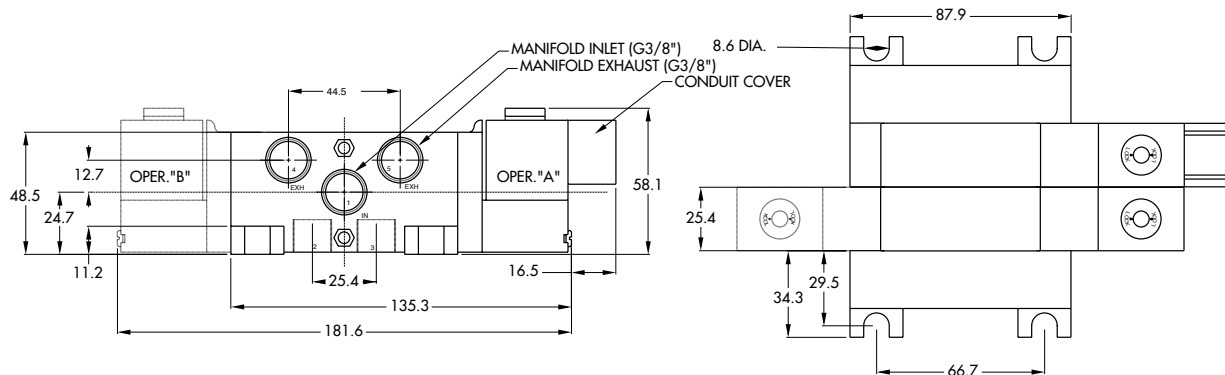
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 20-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 200 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 20-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" : (1.4 C <sub>v</sub> ), 3/8" : (1.4 C <sub>v</sub> )		
<b>Coil :</b>	General purpose - class A wires - Continuous duty - Encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 8 ms	De-energize : 10 ms
	120/60	Energize : 5-11 ms	De-energize : 9-16 ms

- Spare parts :
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
  - Pilot valve : PME-XXYZZ, including seal 16337. • Mounting screw kit for pilot : N-08003.
  - Inlet isolator : N-08001 • Exhaust isolator (x2) : N-08002.

- Options :
- BSPP threads. • Dual inlet block: M-08003.

**DIMENSIONS**

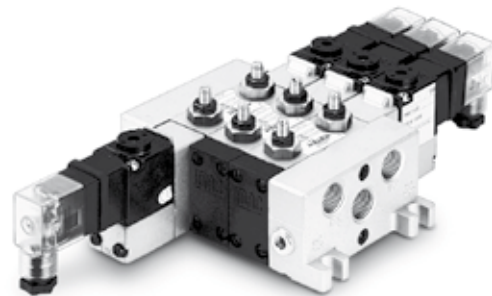
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.4 C<sub>v</sub></b>	stacking body with 3 common ports and integral F.C.	

**OPERATIONAL BENEFITS**

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



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
<b>1/4" NPTF</b>	811C-PM- <b>XXYZZ</b> -192	821C-PM- <b>XXYZZ</b> -192	825C-PM- <b>XXYZZ</b> -592	825C-PM- <b>XXYZZ</b> -692	825C-PM- <b>XXYZZ</b> -892
<b>3/8" NPTF</b>	811C-PM- <b>XXYZZ</b> -193	821C-PM- <b>XXYZZ</b> -193	825C-PM- <b>XXYZZ</b> -593	825C-PM- <b>XXYZZ</b> -693	825C-PM- <b>XXYZZ</b> -893

45

SOLENOID OPERATOR ►

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking	<b>JB</b> Rectangular connector
<b>12</b> 240/60, 220/50	<b>2</b> Locking	<b>JD</b> Rectangular connector with light
<b>22</b> 24/60, 24/50		<b>RA</b> Conduit 3/8" NPS
<b>59</b> 24 VDC (2.5 W)		<b>BA</b> Flying leads (18")
<b>87</b> 24 VDC (17.1 W)		
<b>61</b> 24 VDC (8.5 W)		

700

\* Other options available, see page 357.

900

82

**MANIFOLD END PLATE KITS (NPTF)\***

INT. PILOT - PART N°.	EXT. PILOT - PART N°.	MODELS USED WITH
M-08001-01-01	M-08001-02-01	3 com. port or 1 com. port models, stacks of 1 thru 16 valves
M-00005-01-01	M-00005-02-01	3 com. port or 1 com. port models, stacks of 17 or more valves

6300

6500

6600

1300

\* Add letter **P** at end of part N°. for BSPP threads; **EXAMPLE** : M-08001-01-01**P**

Note : (1) end plate kit required per stack.

**OPTIONS**

- 811C-PM-111RA-192 - For 2 position dual pressure : replace by 2.
- 825C-PM-111RA-892 - For 3 position dual pressure, pressure center: replace by 7.

800

ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

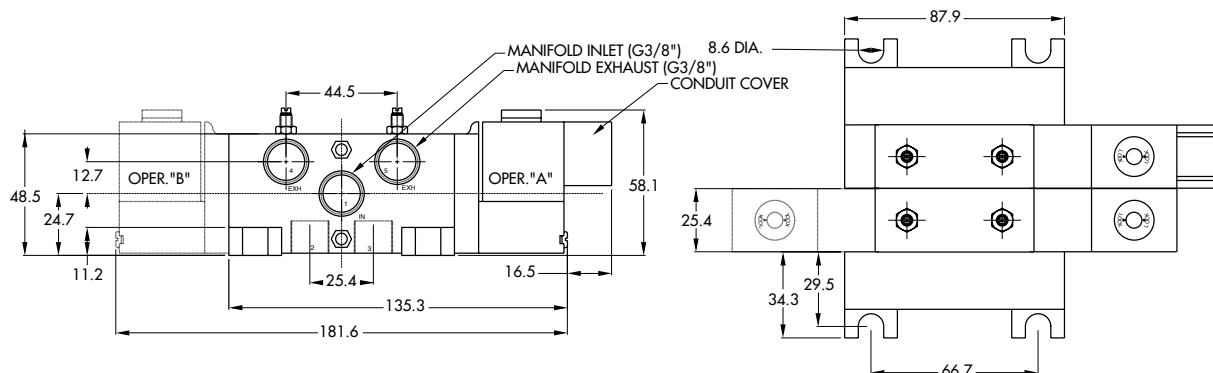
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 20-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 200 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 20-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" : (1.4 Cv), 3/8" : (1.4 Cv)		
<b>Coil :</b>	General purpose - class A wires - Continuous duty - Encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 8 ms	De-energize : 10 ms
	120/60	Energize : 5-11 ms	De-energize : 9-16 ms

- Spare parts :
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
  - Pilot valve : PME-XYZZ, including seal 16337. • Mounting screw kit for pilot : N-08003.
  - Inlet isolator : N-08001 • Exhaust isolator (x2) : N-08002.

- Options :
- BSPP threads. • Dual inlet block: M-08003.

**DIMENSIONS**

Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.4 C<sub>v</sub></b>	stacking body with 3 common ports with common conduit	

**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.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
<b>1/4" NPTF</b>	811C-PM- <b>XXYZZ</b> -142	821C-PM- <b>XXYZZ</b> -142	825C-PM- <b>XXYZZ</b> -542	825C-PM- <b>XXYZZ</b> -642	825C-PM- <b>XXYZZ</b> -842
<b>3/8" NPTF</b>	811C-PM- <b>XXYZZ</b> -143	821C-PM- <b>XXYZZ</b> -143	825C-PM- <b>XXYZZ</b> -543	825C-PM- <b>XXYZZ</b> -643	825C-PM- <b>XXYZZ</b> -843

45

SOLENOID OPERATOR ►

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking	<b>DA</b> Common conduit
<b>12</b> 240/60, 220/50	<b>2</b> Locking	
<b>22</b> 24/60, 24/50		
<b>59</b> 24 VDC (2.5 W)		
<b>87</b> 24 VDC (17.1 W)		
<b>61</b> 24 VDC (8.5 W)		

700  
900  
82

\* Other options available, see page 357.

MODIFICATIONS		
MOD. N°	DESCRIPTION	MODEL AVAILABILITY
<b>0387</b>	Indicator light 24 VDC	Single & double solenoid
<b>0295</b>	Indicator light 120 V/60/50	
<b>0296</b>	Indicator light 240 V/60/50	

6300  
6500  
6600

**TO ORDER** - Add the appropriate modification number after the valve number; **EXAMPLE** : 811C-PM-111DA-142 **MOD 0295**

MANIFOLD END PLATE KITS (NPTF)*		
INT. PILOT - PART N°.	EXT. PILOT - PART N°.	MODELS USED WITH
M-08002-01-01	M-08002-02-01	Com. conduit models, stacks of 1 thru 16 valves
M-00007-01-01	M-00007-02-01	Com. conduit models, stacks of 17 or more valves

1300  
800

\* Add letter **P** at end of part N°. for BSPP threads; **EXAMPLE** : M-08002-01-01**P**

Note : (1) end plate kit required per stack.

**OPTIONS**

811C-PM-111DA-142

- For 2 position dual pressure : replace by 2.

825C-PM-111DA-842

- For 3 position dual pressure, pressure center : replace by 7.

ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A



**TECHNICAL DATA**

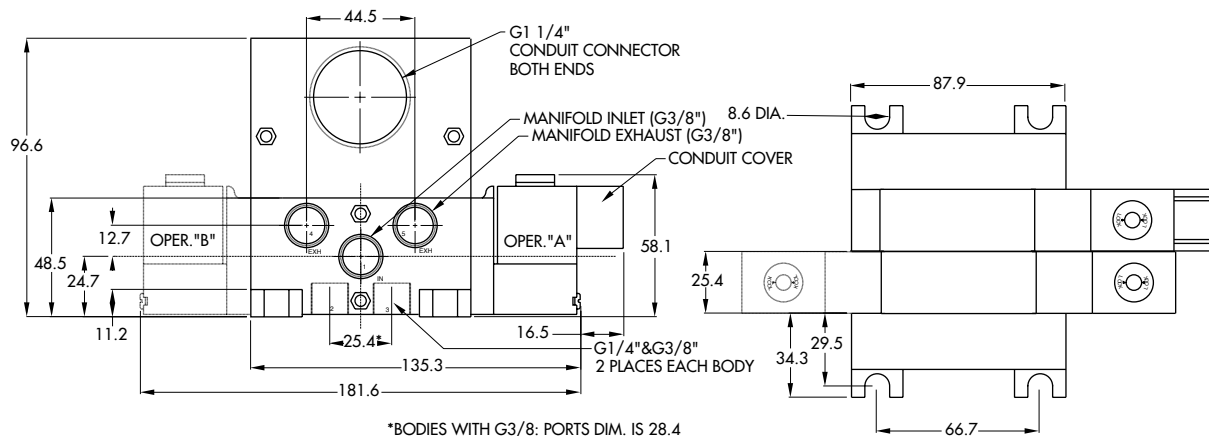
<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 20-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 200 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 20-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" : (1.4 C <sub>v</sub> ), 3/8" : (1.4 C <sub>v</sub> )		
<b>Coil :</b>	General purpose - class A wires - Continuous duty - Encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 8 ms	De-energize : 10 ms
	120/60	Energize : 5-11 ms	De-energize : 9-16 ms

- Spare parts :
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
  - Pilot valve : PME-XXYZZ, including seal 16337. • Mounting screw kit for pilot : N-08003.
  - Inlet isolator : N-08001 • Exhaust isolator (x2) : N-08002.

- Options :
- BSPP threads. • Dual inlet block: M-00014.

**DIMENSIONS**

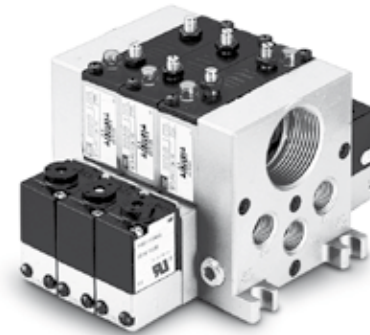
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.4 C<sub>v</sub></b>	stacking body with 3 common ports with C. C. & integral exh. F. C.	

**OPERATIONAL BENEFITS**

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



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
<b>1/4" NPTF</b>	811C-PM- <b>XXYZZ</b> -162	821C-PM- <b>XXYZZ</b> -162	825C-PM- <b>XXYZZ</b> -562	825C-PM- <b>XXYZZ</b> -662	825C-PM- <b>XXYZZ</b> -862
<b>3/8" NPTF</b>	811C-PM- <b>XXYZZ</b> -163	821C-PM- <b>XXYZZ</b> -163	825C-PM- <b>XXYZZ</b> -563	825C-PM- <b>XXYZZ</b> -663	825C-PM- <b>XXYZZ</b> -863

45

SOLENOID OPERATOR ➤

**XX Y ZZ\***

XX Voltage	Y Manual operator	ZZ Electrical connection
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking	<b>DA</b> Common conduit
<b>12</b> 240/60, 220/50	<b>2</b> Locking	
<b>22</b> 24/60, 24/50		
<b>59</b> 24 VDC (2.5 W)		
<b>87</b> 24 VDC (17.1 W)		
<b>61</b> 24 VDC (8.5 W)		

700

\* Other options available, see page 357.

900

82

MODIFICATIONS		
MOD. N°	DESCRIPTION	MODEL AVAILABILITY
<b>0387</b>	Indicator light 24 VDC	
<b>0295</b>	Indicator light 120 V/60/50	Single & double solenoid
<b>0296</b>	Indicator light 240 V/60/50	

6300

6500

6600

**TO ORDER** - Add the appropriate modification number after the valve number; **EXAMPLE** : 811C-PM-111DA-162 **MOD 0295**

1300

MANIFOLD END PLATE KITS (NPTF)*		
INT. PILOT - PART N°.	EXT. PILOT - PART N°.	MODELS USED WITH
M-08002-01-01	M-08002-02-01	Com. conduit models, stacks of 1 thru 16 valves
M-00007-01-01	M-00007-02-01	Com. conduit models, stacks of 17 or more valves

800

\* Add letter **P** at end of part N°. for BSPP threads; **EXAMPLE** : M-08002-01-01P  
Note : (1) end plate kit required per stack.

ISO 1

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

**OPTIONS**

811C-PM-111DA-162

- For 2 position dual pressure : replace by 2.

825C-PM-111DA-862

- For 3 position dual pressure, pressure center : replace by 7.

### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 20-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 200 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 20-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 µ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" : (1.4 C <sub>v</sub> ), 3/8" : (1.4 C <sub>v</sub> )		
<b>Coil :</b>	General purpose - class A wires - Continuous duty - Encapsulated		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 8 ms	De-energize : 10 ms
	120/60	Energize : 5-11 ms	De-energize : 9-16 ms

#### Spare parts :

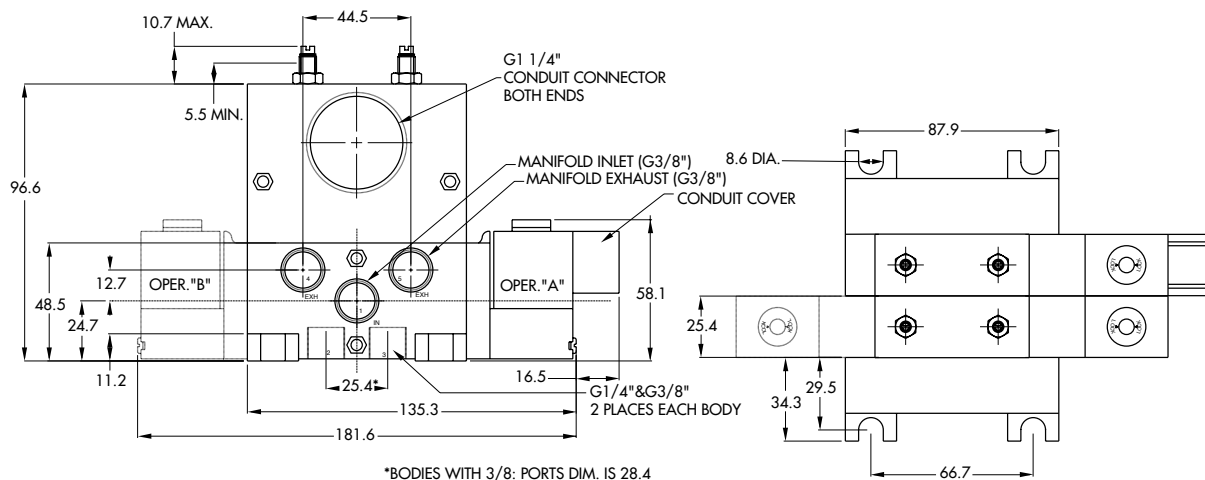
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XYZZ, including seal 16337. • Mounting screw kit for pilot : N-08003.
- Inlet isolator : N-08001 • Exhaust isolator (x2) : N-08002.

#### Options :

- BSPP threads. • Dual inlet block: M-00014.

### DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

valve only
------------

Series

Manifold mounting

valve only
------------

35

100

200

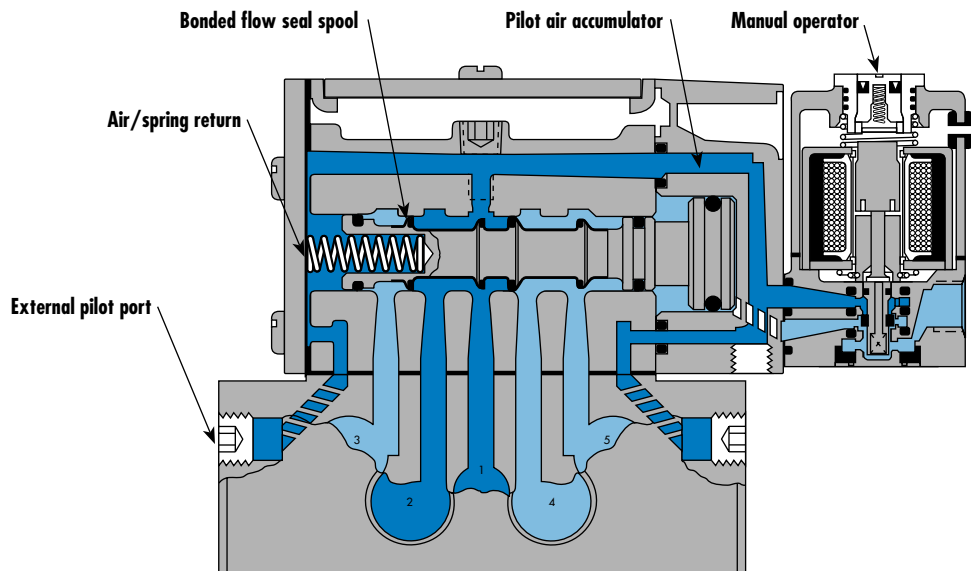
55

56

57

58

59



45

700

900

82

6300

6500

6600

1300

800

**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 of external pilot models available.

**ISO 1**

ISO 2

ISO 3

MAC 125A

MAC 250A

MAC 500A

### 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.

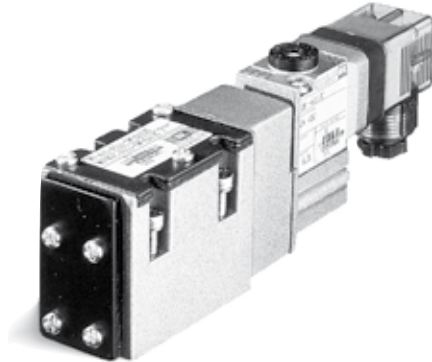
**TWO PRESSURE APPLICATIONS** - For Internal Pilot models specify the model number for connecting either port #3 or 5, whichever is to be the higher pressure, to the Internal Pilot supply. For external Pilot models, pipe as described above for "External Pilot Application."

\*Note: 1Bar = 14.5 PSIG

Function	Port size	Flow (Max)	Individual mounting & Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.6 C<sub>v</sub></b>	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.



35  
100  
200  
55  
56  
57  
58  
59

**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- <b>XXYZZ</b>	MV-A1C-A211-PM- <b>XXYZZ</b>	MV-A1C-A312-PM- <b>XXYZZ</b>	MV-A1C-A311-PM- <b>XXYZZ</b>
External	MV-A1C-A121-PM- <b>XXYZZ</b>	MV-A1C-A221-PM- <b>XXYZZ</b>	MV-A1C-A322-PM- <b>XXYZZ</b>	MV-A1C-A321-PM- <b>XXYZZ</b>

45

**DUAL PRESSURE VALVES**

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

700  
900  
82

**SOLENOID OPERATOR ▶**

**XX Y ZZ\***

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

6300  
6500  
6600  
1300

\* Other options available, see page 357.  
Note : ISO valves are delivered w/o base. See page 281 for base code.

Note : Photo shown with JC connector.

800

**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.

**ISO 1**  
**ISO 2**  
**ISO 3**  
**MAC 125A**  
**MAC 250A**  
**MAC 500A**

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" : (1.6 C <sub>v</sub> ), 3/8" : (1.6 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA Holding : 10.9 VA = 1 to 17.1 W		
<b>Response times :</b>	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 :

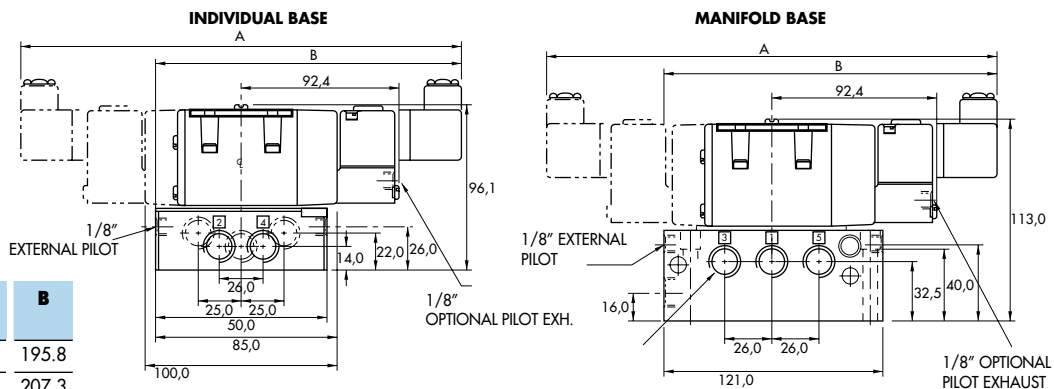
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XYZZ, including seal 16337. • Pressure seal between valve and base : 16344.
- Mounting screw valve to base (x4) : 35304.

**DIMENSIONS**

Dimensions shown are metric (mm)

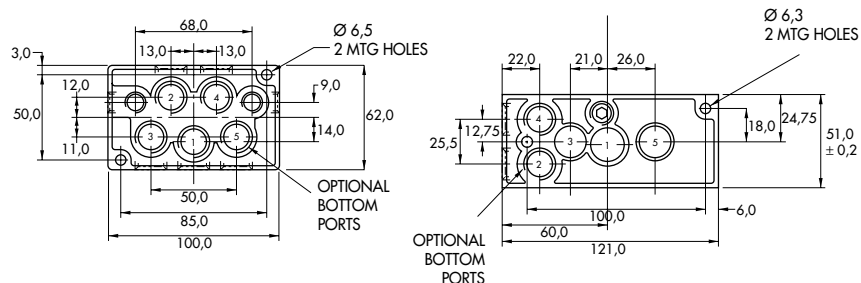
**ISO 1 Manifold mounting**

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



Individual mounting

valve only

Series

Manifold mounting

valve only

35

100

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59

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700

900

82

6300

6500

6600

1300

800

ISO 1

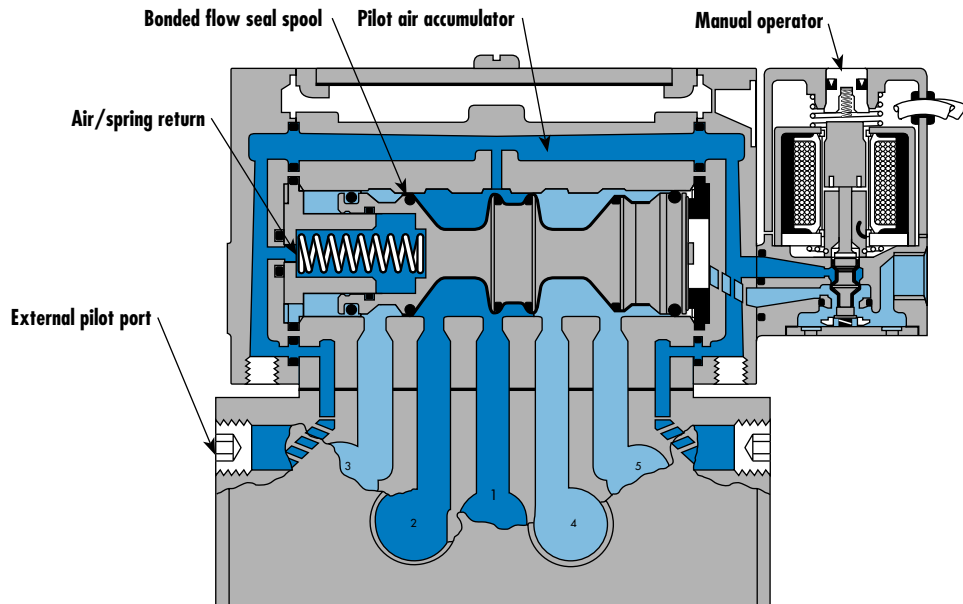
**ISO 2**

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 of 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.

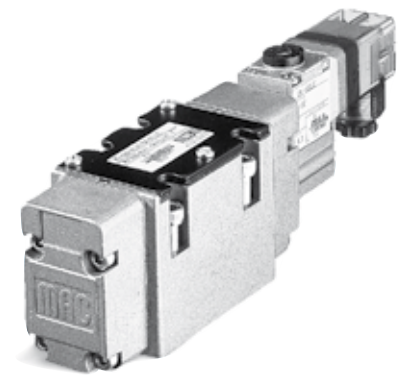
**TWO PRESSURE APPLICATIONS** - For Internal Pilot models specify the model number for connecting either port #3 or 5, whichever is to be the higher pressure, to the Internal Pilot supply. For external Pilot models, pipe as described above for "External Pilot Application."

\*Note: 1Bar = 14.5 PSIG

Function	Port size	Flow (Max)	Individual mounting & Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>	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.



35  
100  
200  
55  
56  
57  
58  
59

**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-A2B-A111-PM- <b>XXYYZZ</b>	MV-A2B-A211-PM- <b>XXYYZZ</b>	MV-A2B-A312-PM- <b>XXYYZZ</b>	MV-A2B-A311-PM- <b>XXYYZZ</b>
External	MV-A2B-A121-PM- <b>XXYYZZ</b>	MV-A2B-A221-PM- <b>XXYYZZ</b>	MV-A2B-A322-PM- <b>XXYYZZ</b>	MV-A2B-A321-PM- <b>XXYYZZ</b>

45

**DUAL PRESSURE VALVES**

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal port 3	MV-A2B-A131-PM- <b>XXYYZZ</b>	MV-A2B-A231-PM- <b>XXYYZZ</b>	MV-A2B-A331-PM- <b>XXYYZZ</b>
Internal port 5	MV-A2B-A135-PM- <b>XXYYZZ</b>	MV-A2B-A232-PM- <b>XXYYZZ</b>	MV-A2B-A332-PM- <b>XXYYZZ</b>
External	MV-A2B-A141-PM- <b>XXYYZZ</b>	MV-A2B-A241-PM- <b>XXYYZZ</b>	MV-A2B-A341-PM- <b>XXYYZZ</b>

700  
900  
82

**SOLENOID OPERATOR ▶**

**XX Y ZZ\***

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

Note : Photo shown with JC connector.

\* Other options available, see page 357.  
Note : ISO valves are delivered w/o base. See page 281 for base code.

**OPTIONS**

- MV-A2B-A111-PM-**XXYYZZ**
  - 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.

6300  
6500  
6600  
1300  
800  
ISO 1  
**ISO 2**  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases		
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI	
	External pilot : vacuum to 150 PSI		
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI		
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)		
<b>Filtration :</b>	40 μ		
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)		
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/8" : (3.0 C <sub>v</sub> ), 1/2" : (3.0 C <sub>v</sub> )		
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty		
<b>Voltage range :</b>	-15% to +10% of nominal voltage		
<b>Protection :</b>	Consult factory		
<b>Power :</b>	~ Inrush : 14.8 VA Holding : 10.9 VA = 1 to 17.1 W		
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 10 ms	De-energize : 15 ms
	120/60	Energize : 6-15 ms	De-energize : 10-17 ms

Spare parts :

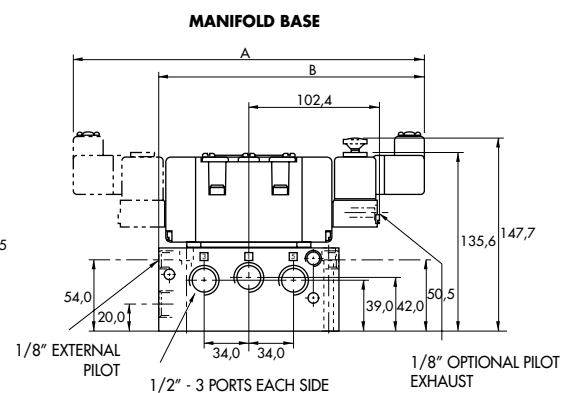
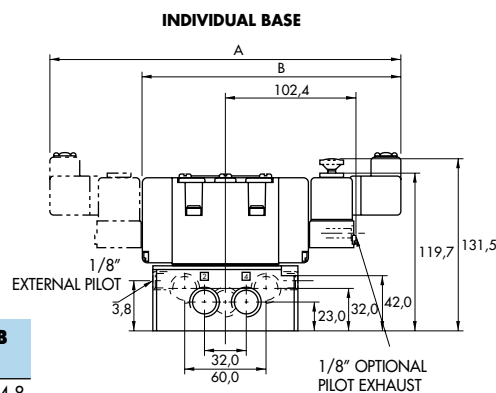
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XYZZ, including seal 16337. • Pressure seal between valve and base : 16351.
- Mounting screw valve to base (x4) : 35412.

**DIMENSIONS**

Dimensions shown are metric (mm)

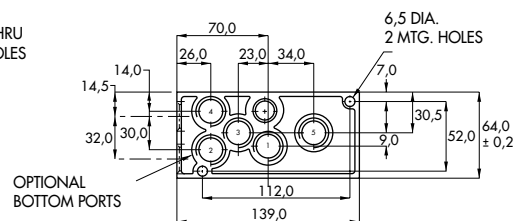
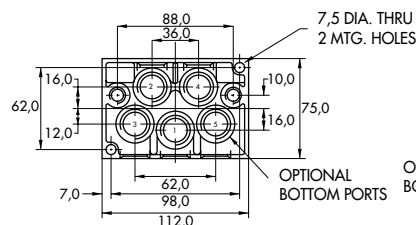
**ISO 2 Manifold mounting**

TYPE	A	B
JA & JC	291.6	214.8
JB & JD	314.6	226.3



**ISO 2 Individual mounting**

TYPE	A	B
JA & JC	291.6	212.3
JB & JD	314.6	223.8



Individual mounting

valve only
------------

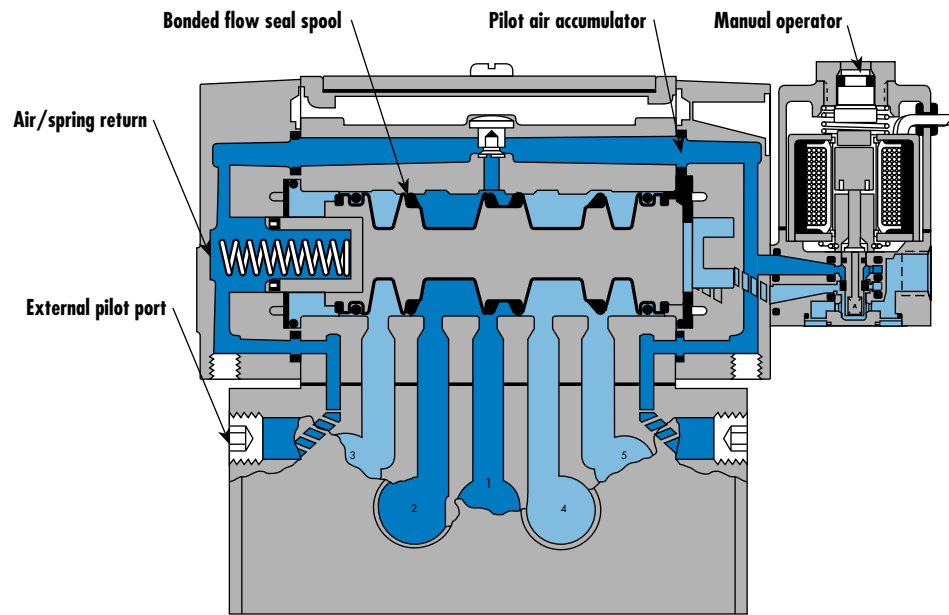
Series

Manifold mounting

valve only
------------

35

100



200

55

56

57

58

59

45

700

900

82

**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 of external pilot models available.

6300

6500

6600

1300

800

ISO 1

ISO 2

**ISO 3**

MAC 125A

MAC 250A

MAC 500A

**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.
- 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.

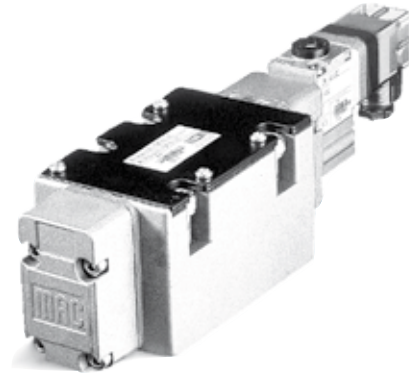
**TWO PRESSURE APPLICATIONS** - For Internal Pilot models specify the model number for connecting either port #3 or 5, whichever is to be the higher pressure, to the Internal Pilot supply. For external Pilot models, pipe as described above for "External Pilot Application."

\*Note: 1Bar = 14.5 PSIG

Function	Port size	Flow (Max)	Individual mounting & Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>1/2" - 3/4"</b>	<b>6.3 C<sub>v</sub></b>	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.



35  
100  
200  
55  
56  
57  
58  
59

**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-A3B-A111-PM- <b>XXYYZZ</b>	MV-A3B-A211-PM- <b>XXYYZZ</b>	MV-A3B-A312-PM- <b>XXYYZZ</b>	MV-A3B-A311-PM- <b>XXYYZZ</b>
External	MV-A3B-A121-PM- <b>XXYYZZ</b>	MV-A3B-A221-PM- <b>XXYYZZ</b>	MV-A3B-A322-PM- <b>XXYYZZ</b>	MV-A3B-A321-PM- <b>XXYYZZ</b>

45

**DUAL PRESSURE VALVES**

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal port 3	MV-A3B-A131-PM- <b>XXYYZZ</b>	MV-A3B-A231-PM- <b>XXYYZZ</b>	MV-A3B-A331-PM- <b>XXYYZZ</b>
Internal port 5	MV-A3B-A135-PM- <b>XXYYZZ</b>	MV-A3B-A232-PM- <b>XXYYZZ</b>	MV-A3B-A332-PM- <b>XXYYZZ</b>
External	MV-A3B-A141-PM- <b>XXYYZZ</b>	MV-A3B-A241-PM- <b>XXYYZZ</b>	MV-A3B-A341-PM- <b>XXYYZZ</b>

700  
900  
82

**SOLENOID OPERATOR ▶**

**XX Y ZZ\***

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

6300  
6500  
6600  
1300

Note : Photo shown with JC connector.

\* Other options available, see page 357.  
Note : ISO valves are delivered w/o base. See page 281 for base code.

**OPTIONS**

MV-A3B-A111-PM- <b>XXYYZZ</b>	- 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.

800  
ISO 1  
ISO 2  
**ISO 3**  
MAC 125A  
MAC 250A  
MAC 500A

**TECHNICAL DATA**

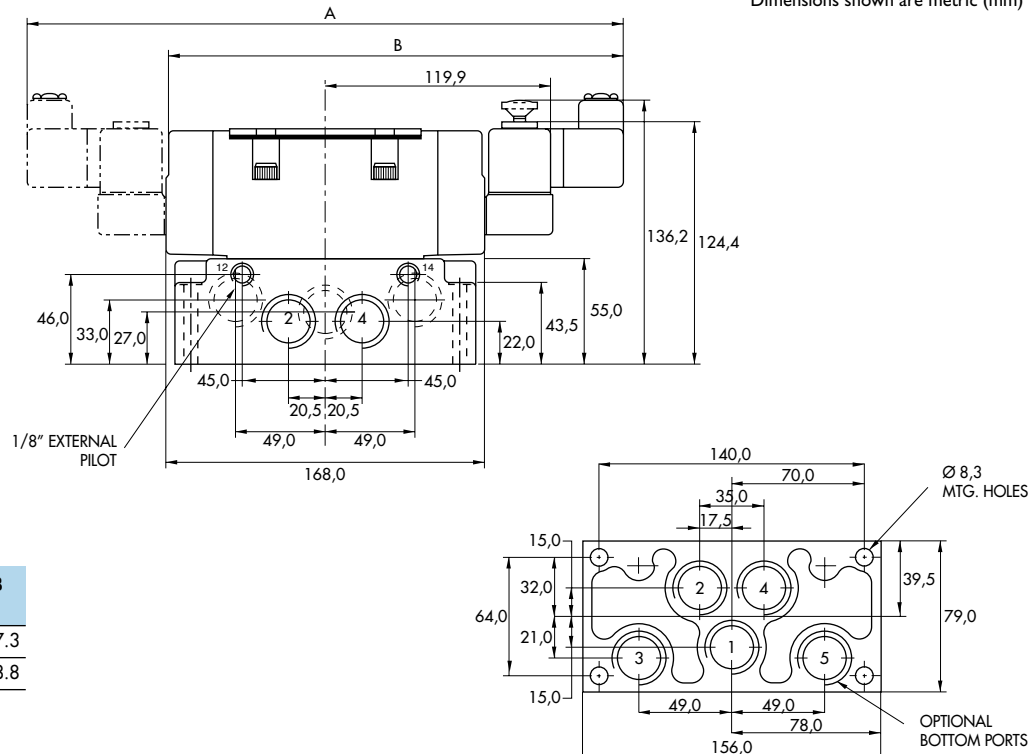
<b>Fluid :</b>	Compressed air, vacuum, inert gases	
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI	double operator : 10-150 PSI
	External pilot : vacuum to 150 PSI	
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI Double operator : 10-150 PSI	
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)	
<b>Filtration :</b>	40 μ	
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)	
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/2" : (6.3 C <sub>v</sub> ), 3/4" : (6.3 C <sub>v</sub> )	
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty	
<b>Voltage range :</b>	-15% to +10% of nominal voltage	
<b>Protection :</b>	Consult factory	
<b>Power :</b>	~ Inrush : 14.8 VA Holding : 10.9 VA = 1 to 17.1 W	
<b>Response times :</b>	24 VDC (8.5 W)	Energize : 18 ms De-energize : 20 ms
	120/60	Energize : 15-25 ms De-energize : 19-28 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 : 16436.
- Mounting screw valve to base (x4) : 35416. • Check valve : 70002 (+M-00011).

**DIMENSIONS**

Dimensions shown are metric (mm)



**ISO 3 Individual mounting**

TYPE	A	B
JA & JC	326.6	247.3
JB & JD	349.6	258.8

Individual mounting

Series

valve only	
------------	--

Manifold mounting

**35**

valve only	
------------	--

**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**



The MAC 125 series is designed to interface with the Ford/Chrysler standard base. This series is available in the following configurations:

- single or double solenoid
- 2 or 3 position
- single or dual pressure
- with or without indicator lights
- various electrical connections and manual operations

Valves and bases must be ordered separately. These may be assembled prior to shipping by adding the suffix -9 after the valve code.

**EXAMPLE:** MAC 125A-V1B1-PM-111DA-9  
MAC 125A-B21A-9

**SPECIAL APPLICATION INSTRUCTIONS**

The 'A' cylinder port is normally open. On a spring return valve, the spring is the 'A' operator, the solenoid the 'B' operator. Energizing the 'B' operator pressurizes the 'B' port; energizing the 'A' operator pressurizes the 'A' port.

**EXTERNAL PILOT APPLICATIONS**

An external pilot supply is only required when the main valve pressure is less than 25 psi on single solenoid or 3 position valves and less than 10 psi on double solenoid 2 position valves. Pipe the external pilot supply to the External Pilot Port supplied in the valve base or manifold.

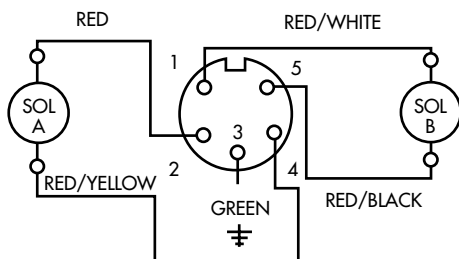
**VACUUM APPLICATIONS**

(2-Pos. Valves Only) - Use an External Pilot model as described above and also connect the vacuum source to the Exhaust Port and leave the Inlet Port open to atmosphere. The Inlet port may be connected to a pressure source to provide a selector application (vacuum/pressure).

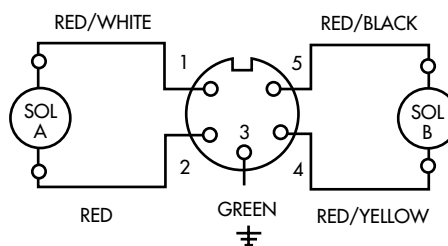
**SELECTOR APPLICATIONS**

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 the Inlet Port and the lower to Port EA or EB depending on which cylinder port is to be active.

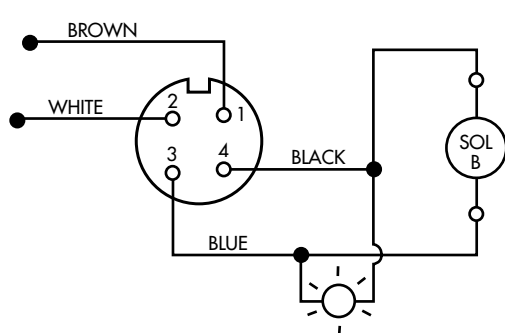
**FORD**



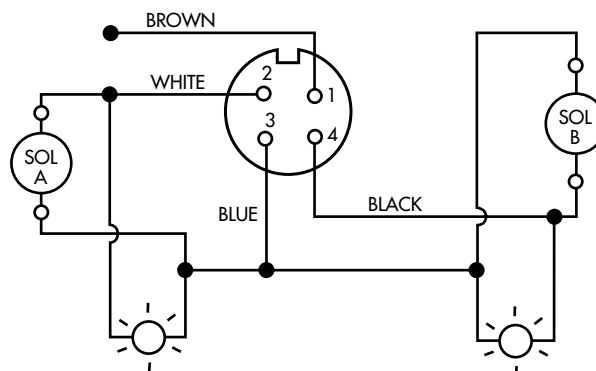
**CHRYSLER**



**4 PIN CONNECTOR : SINGLE**



**4 PIN CONNECTOR : DOUBLE**



Function	Port size	Flow [Max]	Individual mounting & Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>2.5 C<sub>v</sub></b>	valve only	

**OPERATIONAL BENEFITS**

- Balanced spool, immune to variations of pressure.
- Short stroke with high flow.
- High shifting forces.
- Checked accumulator guarantees maximum pilot pressure
- Powerful return force thanks to the combination of mechanical and air springs.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- Wiping effect eliminates sticking.
- Pilot valve with balanced poppet, high flow, short and consistent response times.



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

**SINGLE PRESSURE VALVES (WITH LIGHTS)**

Electrical connector	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
<b>5 PIN (Ford wired)</b>	Internal	MAC125A-V1A2-PM- <b>XXY</b> -DA	MAC125A-V2A2-PM- <b>XXY</b> -DA	MAC125A-V5A2-PM- <b>XXY</b> -DA	MAC125A-V6A2-PM- <b>XXY</b> -DA
	External	MAC125A-V1A4-PM- <b>XXY</b> -DA	MAC125A-V2A4-PM- <b>XXY</b> -DA	MAC125A-V5A4-PM- <b>XXY</b> -DA	MAC125A-V6A4-PM- <b>XXY</b> -DA
<b>5 PIN (Chrysler wired)</b>	Internal	MAC125A-V1B2-PM- <b>XXY</b> -DA	MAC125A-V2B2-PM- <b>XXY</b> -DA	MAC125A-V5B2-PM- <b>XXY</b> -DA	MAC125A-V6B2-PM- <b>XXY</b> -DA
	External	MAC125A-V1B4-PM- <b>XXY</b> -DA	MAC125A-V2B4-PM- <b>XXY</b> -DA	MAC125A-V5B4-PM- <b>XXY</b> -DA	MAC125A-V6B4-PM- <b>XXY</b> -DA
<b>4 PIN MICRO</b>	Internal	MAC125A-V1G2-PM- <b>XXY</b> -DA	MAC125A-V2G2-PM- <b>XXY</b> -DA	MAC125A-V5G2-PM- <b>XXY</b> -DA	MAC125A-V6G2-PM- <b>XXY</b> -DA
	External	MAC125A-V1G4-PM- <b>XXY</b> -DA	MAC125A-V2G4-PM- <b>XXY</b> -DA	MAC125A-V5G4-PM- <b>XXY</b> -DA	MAC125A-V6G4-PM- <b>XXY</b> -DA
<b>3 PIN (Ford wired)</b>	Internal	MAC125A-V1E2-PM- <b>XXY</b> -DA	MAC125A-V2E2-PM- <b>XXY</b> -DA	MAC125A-V5E2-PM- <b>XXY</b> -DA	MAC125A-V6E2-PM- <b>XXY</b> -DA
	External	MAC125A-V1E4-PM- <b>XXY</b> -DA	MAC125A-V2E4-PM- <b>XXY</b> -DA	MAC125A-V5E4-PM- <b>XXY</b> -DA	MAC125A-V6E4-PM- <b>XXY</b> -DA
<b>5 PIN MICRO (Chrysler wired)</b>	Internal	MAC125A-V1F2-PM- <b>XXY</b> -DA	MAC125A-V2F2-PM- <b>XXY</b> -DA	MAC125A-V5F2-PM- <b>XXY</b> -DA	MAC125A-V6F2-PM- <b>XXY</b> -DA
	External	MAC125A-V1F4-PM- <b>XXY</b> -DA	MAC125A-V2F4-PM- <b>XXY</b> -DA	MAC125A-V5F4-PM- <b>XXY</b> -DA	MAC125A-V6F4-PM- <b>XXY</b> -DA

45  
700  
900  
82

**DUAL PRESSURE VALVES (WITH LIGHTS)**

Electrical connector	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
<b>5 PIN (Ford wired)</b>	External	MAC125A-V3A4-PM- <b>XXY</b> -DA	MAC125A-V4A4-PM- <b>XXY</b> -DA	MAC125A-V7A4-PM- <b>XXY</b> -DA
<b>5 PIN (Chrysler wired)</b>	External	MAC125A-V3B4-PM- <b>XXY</b> -DA	MAC125A-V4B4-PM- <b>XXY</b> -DA	MAC125A-V7B4-PM- <b>XXY</b> -DA
<b>4 PIN MICRO</b>	External	MAC125A-V3G4-PM- <b>XXY</b> -DA	MAC125A-V4G4-PM- <b>XXY</b> -DA	MAC125A-V7G4-PM- <b>XXY</b> -DA
<b>3 PIN (Ford wired)</b>	External	MAC125A-V3E4-PM- <b>XXY</b> -DA	MAC125A-V4E4-PM- <b>XXY</b> -DA	MAC125A-V7E4-PM- <b>XXY</b> -DA
<b>5 PIN MICRO (Chrysler wired)</b>	External	MAC125A-V3F4-PM- <b>XXY</b> -DA	MAC125A-V4F4-PM- <b>XXY</b> -DA	MAC125A-V7F4-PM- <b>XXY</b> -DA

6300  
6500  
6600  
1300  
800

**SOLENOID OPERATOR** ➤

**XX Y DA\***

XX Voltage	Y Manual operator
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking
<b>12</b> 240/60, 220/50	<b>2</b> Locking
<b>22</b> 24/60, 24/50	
<b>59</b> 24 VDC (2.5 W)	
<b>87</b> 24 VDC (17.1 W)	
<b>61</b> 24 VDC (8.5 W)	

\* Other options available, see page 357.  
Note : Valves are supplied without base. For base code see page 291.

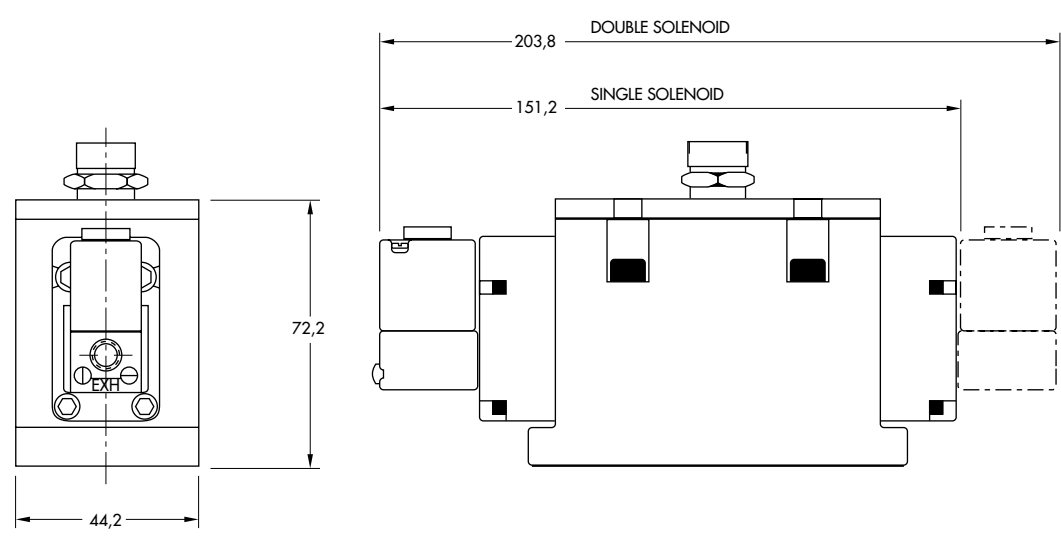
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI      double operator : 10-150 PSI External pilot : vacuum to 150 PSI
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI    Double operator : 10-150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 µ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" : (2.2 C <sub>v</sub> ), 3/8" : (2.5 C <sub>v</sub> )
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~ Inrush : 14.8 VA      Holding : 10.9 VA = 1 to 17.1 W

- Spare parts :
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
  - Pilot valve : PME-XXYZZ, including seal 16337. • Pressure seal between valve and base : 16485
  - Mounting screw valve to base (x3) : 32296.

**DIMENSIONS**

Dimensions shown are metric (mm)



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**

The MAC 250 series is designed to interface with the Ford/Chrysler standard base. This series is available in the following configurations:

- single or double solenoid
- 2 or 3 position
- single or dual pressure
- with or without indicator lights
- various electrical connections and manual operations

Valves and bases must be ordered separately. These may be assembled prior to shipping by adding the suffix -9 after the valve code.

**EXAMPLE:** MAC 250A-V1B1-PM-111DA-9  
MAC 250A-B21A-9

**SPECIAL APPLICATION INSTRUCTIONS**

The 'A' cylinder port is normally open. On a spring return valve, the spring is the 'A' operator, the solenoid the 'B' operator. Energizing the 'B' operator pressurizes the 'B' port; energizing the 'A' operator pressurizes the 'A' port.

**EXTERNAL PILOT APPLICATIONS**

An external pilot supply is only required when the main valve pressure is less than 25 psi on single solenoid or 3 position valves and less than 10 psi on double solenoid 2 position valves. Pipe the external pilot supply to the External Pilot Port supplied in the valve base or manifold.

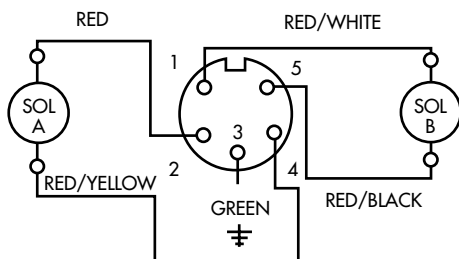
**VACUUM APPLICATIONS**

(2-Pos. Valves Only) - Use an External Pilot model as described above and also connect the vacuum source to the Exhaust Port and leave the Inlet Port open to atmosphere. The Inlet port may be connected to a pressure source to provide a selector application (vacuum/pressure).

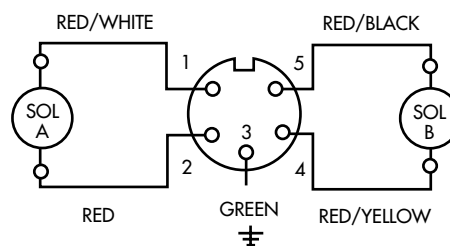
**SELECTOR APPLICATIONS**

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 the Inlet Port and the lower to Port EA or EB depending on which cylinder port is to be active.

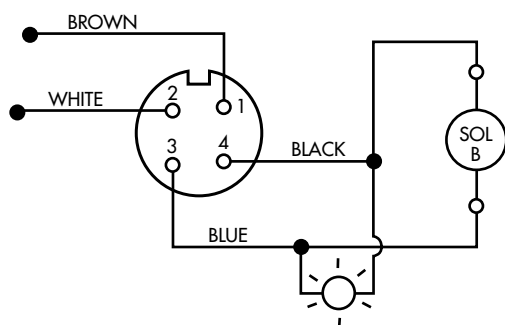
**FORD**



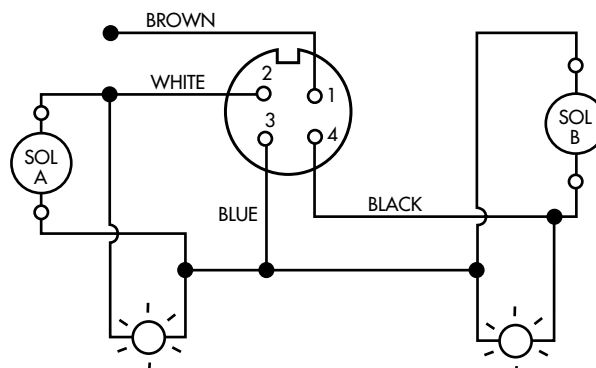
**CHRYSLER**



**4 PIN CONNECTOR : SINGLE**



**4 PIN CONNECTOR : DOUBLE**



Function	Port size	Flow [Max]	Individual mounting & Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>1/2" - 3/4" - 1"</b>	<b>7.0 C<sub>v</sub></b>	valve only	

**OPERATIONAL BENEFITS**




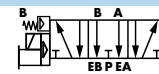
1. Balanced spool, immune to variations of pressure.
2. Short stroke with high flow.
3. High shifting forces.
4. Checked accumulator guarantees maximum pilot pressure
5. Powerful return force thanks to the combination of mechanical and air springs.
6. Bonded spool with minimum friction, shifting in a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



35  
100  
200  
55  
56  
57  
58  
59

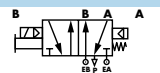
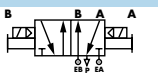
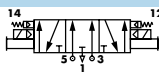
**HOW TO ORDER**

**SINGLE PRESSURE VALVES (WITH LIGHTS)**

Electrical connector	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
					
<b>5 PIN (Ford wired)</b>	Internal	MAC250A-V1A2-PM- <b>XXY</b> -DA	MAC250A-V2A2-PM- <b>XXY</b> -DA	MAC250A-V5A2-PM- <b>XXY</b> -DA	MAC250A-V6A2-PM- <b>XXY</b> -DA
	External	MAC250A-V1A4-PM- <b>XXY</b> -DA	MAC250A-V2A4-PM- <b>XXY</b> -DA	MAC250A-V5A4-PM- <b>XXY</b> -DA	MAC250A-V6A4-PM- <b>XXY</b> -DA
<b>5 PIN (Chrysler wired)</b>	Internal	MAC250A-V1B2-PM- <b>XXY</b> -DA	MAC250A-V2B2-PM- <b>XXY</b> -DA	MAC250A-V5B2-PM- <b>XXY</b> -DA	MAC250A-V6B2-PM- <b>XXY</b> -DA
	External	MAC250A-V1B4-PM- <b>XXY</b> -DA	MAC250A-V2B4-PM- <b>XXY</b> -DA	MAC250A-V5B4-PM- <b>XXY</b> -DA	MAC250A-V6B4-PM- <b>XXY</b> -DA
<b>4 PIN MICRO</b>	Internal	MAC250A-V1G2-PM- <b>XXY</b> -DA	MAC250A-V2G2-PM- <b>XXY</b> -DA	MAC250A-V5G2-PM- <b>XXY</b> -DA	MAC250A-V6G2-PM- <b>XXY</b> -DA
	External	MAC250A-V1G4-PM- <b>XXY</b> -DA	MAC250A-V2G4-PM- <b>XXY</b> -DA	MAC250A-V5G4-PM- <b>XXY</b> -DA	MAC250A-V6G4-PM- <b>XXY</b> -DA
<b>3 PIN (Ford wired)</b>	Internal	MAC250A-V1E2-PM- <b>XXY</b> -DA	MAC250A-V2E2-PM- <b>XXY</b> -DA	MAC250A-V5E2-PM- <b>XXY</b> -DA	MAC250A-V6E2-PM- <b>XXY</b> -DA
	External	MAC250A-V1E4-PM- <b>XXY</b> -DA	MAC250A-V2E4-PM- <b>XXY</b> -DA	MAC250A-V5E4-PM- <b>XXY</b> -DA	MAC250A-V6E4-PM- <b>XXY</b> -DA
<b>5 PIN MICRO (Chrysler wired)</b>	Internal	MAC250A-V1F2-PM- <b>XXY</b> -DA	MAC250A-V2F2-PM- <b>XXY</b> -DA	MAC250A-V5F2-PM- <b>XXY</b> -DA	MAC250A-V6F2-PM- <b>XXY</b> -DA
	External	MAC250A-V1F4-PM- <b>XXY</b> -DA	MAC250A-V2F4-PM- <b>XXY</b> -DA	MAC250A-V5F4-PM- <b>XXY</b> -DA	MAC250A-V6F4-PM- <b>XXY</b> -DA

45  
700  
900  
82

**DUAL PRESSURE VALVES (WITH LIGHTS)**

Electrical connector	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
				
<b>5 PIN (Ford wired)</b>	External	MAC250A-V3A4-PM- <b>XXY</b> -DA	MAC250A-V4A4-PM- <b>XXY</b> -DA	MAC250A-V7A4-PM- <b>XXY</b> -DA
<b>5 PIN (Chrysler wired)</b>	External	MAC250A-V3B4-PM- <b>XXY</b> -DA	MAC250A-V4B4-PM- <b>XXY</b> -DA	MAC250A-V7B4-PM- <b>XXY</b> -DA
<b>4 PIN MICRO</b>	External	MAC250A-V3G4-PM- <b>XXY</b> -DA	MAC250A-V4G4-PM- <b>XXY</b> -DA	MAC250A-V7G4-PM- <b>XXY</b> -DA
<b>3 PIN (Ford wired)</b>	External	MAC250A-V3E4-PM- <b>XXY</b> -DA	MAC250A-V4E4-PM- <b>XXY</b> -DA	MAC250A-V7E4-PM- <b>XXY</b> -DA
<b>5 PIN MICRO (Chrysler wired)</b>	External	MAC250A-V3F4-PM- <b>XXY</b> -DA	MAC250A-V4F4-PM- <b>XXY</b> -DA	MAC250A-V7F4-PM- <b>XXY</b> -DA

6300  
6500  
6600  
1300  
800

**SOLENOID OPERATOR** ▶

**XX Y DA\***

XX Voltage	Y Manual operator
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking
<b>12</b> 240/60, 220/50	<b>2</b> Locking
<b>22</b> 24/60, 24/50	
<b>59</b> 24 VDC (2.5 W)	
<b>87</b> 24 VDC (17.1 W)	
<b>61</b> 24 VDC (8.5 W)	

\* Other options available, see page 357.

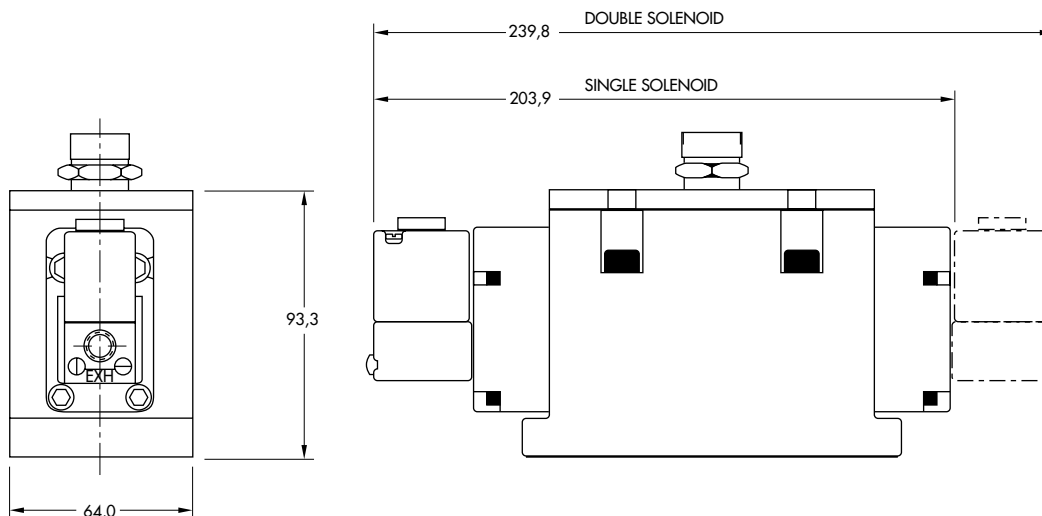
Note : Valves are supplied without base. For base code see page 291.

TECHNICAL DATA	
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI      double operator : 10-150 PSI External pilot : vacuum to 150 PSI
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI    Double operator : 10-150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 µ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/2" : (6.3 C <sub>v</sub> ), 3/4" : (6.4 C <sub>v</sub> ), 1" : (7.0 C <sub>v</sub> )
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~ Inrush : 14.8 VA      Holding : 10.9 VA = 1 to 17.1 W

Spare parts :

- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
- Pilot valve : PME-XXYZZ, including seal 16337. • Pressure seal between valve and base : 16487
- Mounting screw valve to base (x3) : 32346.

**DIMENSIONS** Dimensions shown are metric (mm)



Individual mounting

valve only
------------

Series

**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**



The MAC 500 series is designed to interface with the Ford/Chrysler standard base. This series is available in the following configurations:

- single or double solenoid
- 2 or 3 position
- single or dual pressure
- with or without indicator lights
- various electrical connections and manual operations

Valves and bases must be ordered separately. These may be assembled prior to shipping by adding the suffix -9 after the valve code.

**EXAMPLE:** MAC 500A-V1B1-PM-111DA-9  
MAC 500A-B21A-9

**SPECIAL APPLICATION INSTRUCTIONS**

The 'A' cylinder port is normally open. On a spring return valve, the spring is the 'A' operator, the solenoid the 'B' operator. Energizing the 'B' operator pressurizes the 'B' port; energizing the 'A' operator pressurizes the 'A' port.

**EXTERNAL PILOT APPLICATIONS**

An external pilot supply is only required when the main valve pressure is less than 25 psi on single solenoid or 3 position valves and less than 10 psi on double solenoid 2 position valves. Pipe the external pilot supply to the External Pilot Port supplied in the valve base or manifold.

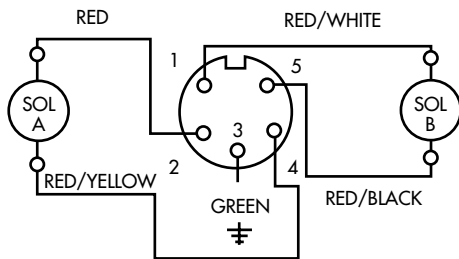
**VACUUM APPLICATIONS**

(2-Pos. Valves Only) - Use an External Pilot model as described above and also connect the vacuum source to the Exhaust Port and leave the Inlet Port open to atmosphere. The Inlet port may be connected to a pressure source to provide a selector application (vacuum/pressure).

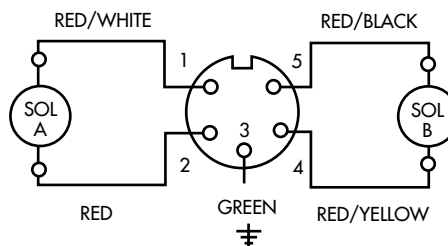
**SELECTOR APPLICATIONS**

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 the Inlet Port and the lower to Port EA or EB depending on which cylinder port is to be active.

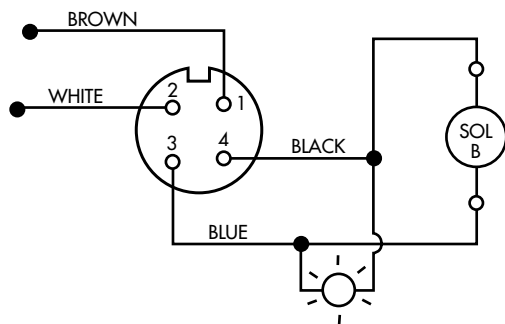
**FORD**



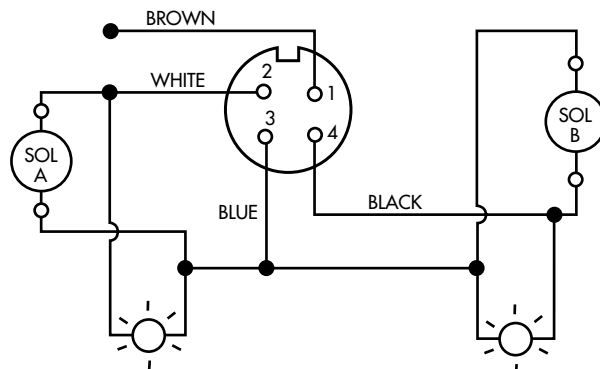
**CHRYSLER**



**4 PIN CONNECTOR : SINGLE**



**4 PIN CONNECTOR : DOUBLE**



Function	Port size	Flow [Max]	Individual mounting	Series
<b>5/2 - 5/3</b>	<b>1" - 1 1/4"</b>	<b>11.2 C<sub>v</sub></b>	valve only	

**OPERATIONAL BENEFITS**

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



35  
100  
200  
55  
56  
57  
58  
59

**HOW TO ORDER**

**SINGLE PRESSURE VALVES (WITH LIGHTS)**

Electrical connector	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
<b>5 PIN (Ford wired)</b>	Internal	MAC500A-V1A2-PM- <b>XXY</b> -DA	MAC500A-V2A2-PM- <b>XXY</b> -DA	MAC500A-V5A2-PM- <b>XXY</b> -DA	MAC500A-V6A2-PM- <b>XXY</b> -DA
	External	MAC500A-V1A4-PM- <b>XXY</b> -DA	MAC500A-V2A4-PM- <b>XXY</b> -DA	MAC500A-V5A4-PM- <b>XXY</b> -DA	MAC500A-V6A4-PM- <b>XXY</b> -DA
<b>5 PIN (Chrysler wired)</b>	Internal	MAC500A-V1B2-PM- <b>XXY</b> -DA	MAC500A-V2B2-PM- <b>XXY</b> -DA	MAC500A-V5B2-PM- <b>XXY</b> -DA	MAC500A-V6B2-PM- <b>XXY</b> -DA
	External	MAC500A-V1B4-PM- <b>XXY</b> -DA	MAC500A-V2B4-PM- <b>XXY</b> -DA	MAC500A-V5B4-PM- <b>XXY</b> -DA	MAC500A-V6B4-PM- <b>XXY</b> -DA
<b>4 PIN MICRO</b>	Internal	MAC500A-V1G2-PM- <b>XXY</b> -DA	MAC500A-V2G2-PM- <b>XXY</b> -DA	MAC500A-V5G2-PM- <b>XXY</b> -DA	MAC500A-V6G2-PM- <b>XXY</b> -DA
	External	MAC500A-V1G4-PM- <b>XXY</b> -DA	MAC500A-V2G4-PM- <b>XXY</b> -DA	MAC500A-V5G4-PM- <b>XXY</b> -DA	MAC500A-V6G4-PM- <b>XXY</b> -DA
<b>3 PIN (Ford wired)</b>	Internal	MAC500A-V1E2-PM- <b>XXY</b> -DA	MAC500A-V2E2-PM- <b>XXY</b> -DA	MAC500A-V5E2-PM- <b>XXY</b> -DA	MAC500A-V6E2-PM- <b>XXY</b> -DA
	External	MAC500A-V1E4-PM- <b>XXY</b> -DA	MAC500A-V2E4-PM- <b>XXY</b> -DA	MAC500A-V5E4-PM- <b>XXY</b> -DA	MAC500A-V6E4-PM- <b>XXY</b> -DA
<b>5 PIN MICRO (Chrysler wired)</b>	Internal	MAC500A-V1F2-PM- <b>XXY</b> -DA	MAC500A-V2F2-PM- <b>XXY</b> -DA	MAC500A-V5F2-PM- <b>XXY</b> -DA	MAC500A-V6F2-PM- <b>XXY</b> -DA
	External	MAC500A-V1F4-PM- <b>XXY</b> -DA	MAC500A-V2F4-PM- <b>XXY</b> -DA	MAC500A-V5F4-PM- <b>XXY</b> -DA	MAC500A-V6F4-PM- <b>XXY</b> -DA

45  
700  
900  
82

**DUAL PRESSURE VALVES (WITH LIGHTS)**

Electrical connector	Pilot air	5/2 Single operator	5/2 Double operator
<b>5 PIN (Ford wired)</b>	External	MAC500A-V3A4-PM- <b>XXY</b> -DA	MAC500A-V4A4-PM- <b>XXY</b> -DA
<b>5 PIN (Chrysler wired)</b>	External	MAC500A-V3B4-PM- <b>XXY</b> -DA	MAC500A-V4B4-PM- <b>XXY</b> -DA
<b>4 PIN MICRO</b>	External	MAC500A-V3G4-PM- <b>XXY</b> -DA	MAC500A-V4G4-PM- <b>XXY</b> -DA
<b>3 PIN (Ford wired)</b>	External	MAC500A-V3E4-PM- <b>XXY</b> -DA	MAC500A-V4E4-PM- <b>XXY</b> -DA
<b>5 PIN MICRO (Chrysler wired)</b>	External	MAC500A-V3F4-PM- <b>XXY</b> -DA	MAC500A-V4F4-PM- <b>XXY</b> -DA

6300  
6500  
6600  
1300  
800

**SOLENOID OPERATOR** ▶

**XX Y DA\***

XX Voltage	Y Manual operator
<b>11</b> 120/60, 110/50	<b>1</b> Non-locking
<b>12</b> 240/60, 220/50	<b>2</b> Locking
<b>22</b> 24/60, 24/50	
<b>59</b> 24 VDC (2.5 W)	
<b>87</b> 24 VDC (17.1 W)	
<b>61</b> 24 VDC (8.5 W)	

\* Other options available, see page 357.

Note : Valves are supplied without base. For base code see page 291.

ISO 1  
ISO 2  
ISO 3  
MAC 125A  
MAC 250A  
MAC 500A

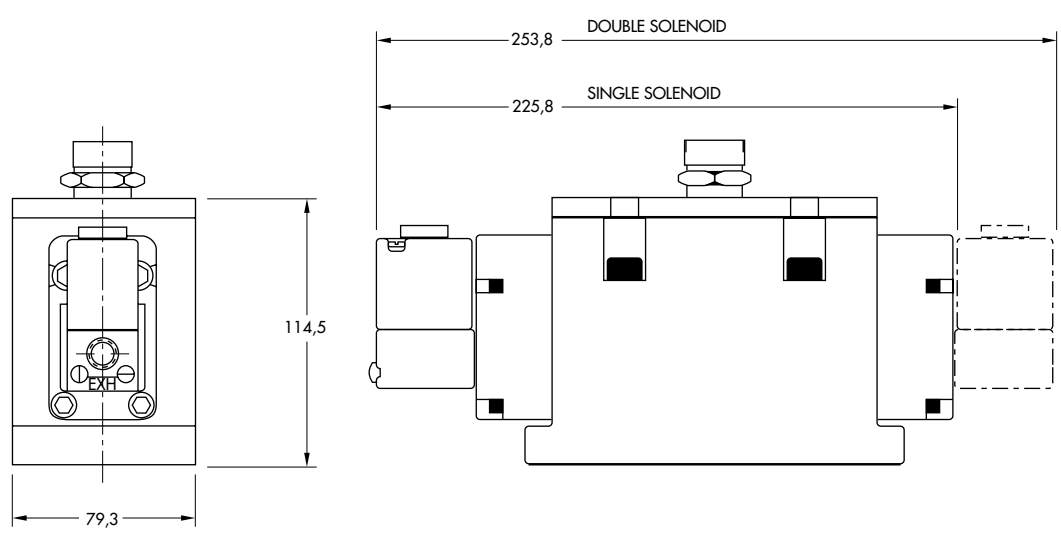
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Internal pilot : single operator and 3 positions : 25-150 PSI                      double operator : 10-150 PSI External pilot : vacuum to 150 PSI
<b>Pilot pressure :</b>	Single operator and 3 positions : 25-150 PSI    Double operator : 10-150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 µ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1" : (11.0 C <sub>v</sub> ), 1 1/4" : (11.2 C <sub>v</sub> )
<b>Coil :</b>	Epoxy encapsulated - class A wires - Continuous duty
<b>Voltage range :</b>	-15% to +10% of nominal voltage
<b>Protection :</b>	Consult factory
<b>Power :</b>	~ Inrush : 14.8 VA            Holding : 10.9 VA = 1 to 17.1 W

- 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 : 16535
  - Mounting screw valve to base (x3) : 32434.

**DIMENSIONS**

Dimensions shown are metric (mm)





## Section 2 Remote air valves

Function	Port size	Flow [Max]
<b>3/2 - 2/2</b>	<b>1/8" - 1/4"</b>	<b>0.18 C<sub>v</sub></b>
<b>3/2 - 2/2</b>	<b>1/8"</b>	<b>0.18 C<sub>v</sub></b>
<b>3/2 - 2/2</b>	<b>1/4" - 3/8"</b>	<b>2.5 C<sub>v</sub></b>
<b>3/2 - 2/2</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>6.2 C<sub>v</sub></b>
<b>3/2 - 2/2</b>	<b>1/2" - 3/4" - 1"</b>	<b>17.4 C<sub>v</sub></b>
<b>3/2 - 2/2</b>	<b>1" - 1 1/4" - 1 1/2"</b>	<b>33.5 C<sub>v</sub></b>
<b>3/2 - 2/2</b>	<b>2" - 2 1/2"</b>	<b>65.0 C<sub>v</sub></b>
<b>4/2</b>	<b>1/8" - 1/4"</b>	<b>0.7 C<sub>v</sub></b>
<b>4/2</b>	<b>1/8" - 1/4"</b>	<b>0.8 C<sub>v</sub></b>
<b>4/2</b>	<b>1/8" - 1/4"</b>	<b>1.4 C<sub>v</sub></b>
<b>4/2 - 4/3</b>	<b>1/8" - 1/4" - 3/8"</b>	<b>1.35 C<sub>v</sub></b>
<b>4/2 - 4/3</b>	<b>1/4" - 3/8"</b>	<b>1.35 C<sub>v</sub></b>
<b>4/2 - 4/3</b>	<b>1/4" - 3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>
<b>4/2 - 4/3</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>5.1 C<sub>v</sub></b>
<b>4/2 - 4/3</b>	<b>3/4" - 1"</b>	<b>9.6 C<sub>v</sub></b>
<b>4/2 - 4/3</b>	<b>3/4" - 1" - 1 1/4" - 1 1/2"</b>	<b>15.9 C<sub>v</sub></b>
<b>5/2 - 5/3</b>	<b>1/4"</b>	<b>1.4 C<sub>v</sub></b>
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.6 C<sub>v</sub></b>
<b>5/2 - 5/3</b>	<b>3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>
<b>5/2 - 5/3</b>	<b>1/2" - 3/4"</b>	<b>6.3 C<sub>v</sub></b>

Individual mounting

Manifold mounting

Series

Individual mounting			Manifold mounting			Series
inline	sub-base	valve only	stacking	sub-base	valve only	
P. 187				P. 189		<b>1100</b>
P. 193						<b>55</b>
P. 197						<b>56</b>
P. 201						<b>57</b>
P. 205						<b>58</b>
P. 209						<b>59</b>
P. 213						<b>700</b>
P. 219			P. 215			<b>900</b>
	P. 225		P. 221			<b>82</b>
				P. 227		<b>6300</b>
	P. 231			P. 233		<b>6500</b>
	P. 237			P. 239		<b>6600</b>
	P. 243			P. 245		<b>2700</b>
	P. 249					<b>1800</b>
P. 253						<b>ISO 1</b>
		P. 257			P. 257	<b>ISO 2</b>
		P. 261			P. 261	<b>ISO 3</b>
		P. 265				





Individual mounting

Inline	
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Manifold mounting

sub-base	
----------	--

Series

**1100**

**55**

**56**

**57**

**58**

**59**

**700**

**900**

**82**

**6300**

**6500**

**6600**

**2700**

**1800**

**ISO 1**

**ISO 2**

**ISO 3**



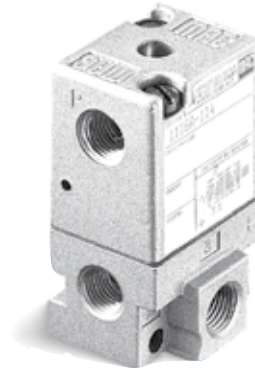


Series **1100**

Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8" - 1/4"</b>	<b>0.18 C<sub>v</sub></b>	Inline	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. Powerful return spring.
4. Maximum shifting forces.



**1100**

**55**

**56**

**57**

**58**

**59**

**HOW TO ORDER**

Port size	Universal valve	NC only valve
<b>1/8" NPTF</b>	1111A-111	1161A-111
<b>1/4" NPTF</b>	1113A-111	1163A-111

**700**

**900**

Air pilot port : 1/8" NPTF.

**82**

**6300**

**6500**

**6600**

**2700**

**1800**

**ISO 1**

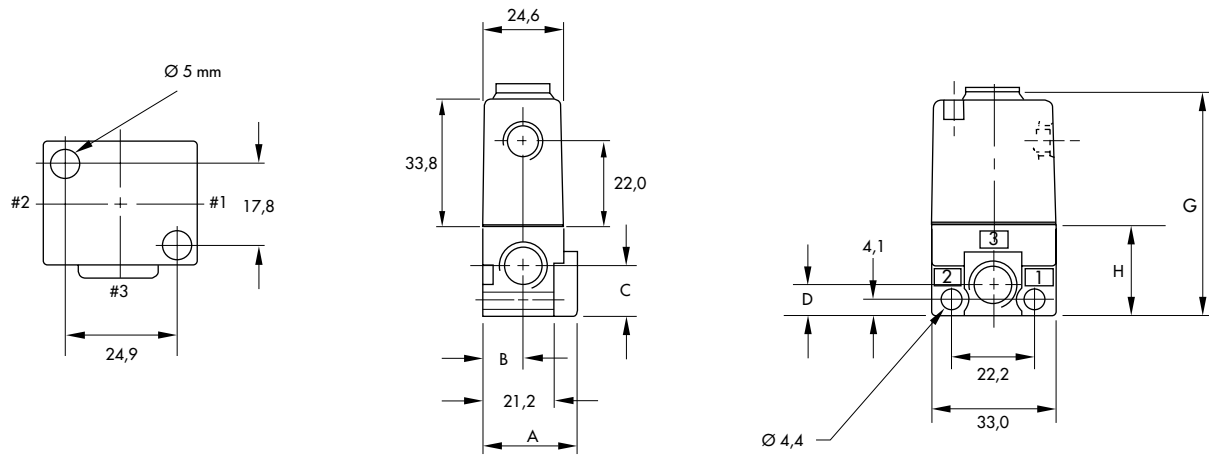
**ISO 2**

**ISO 3**

TECHNICAL DATA	
Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Vacuum to 1.50 PSI
Air signal pressure :	20 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 140°F (-18°C to 60°C)
Flow (at 6 bar, ΔP=1bar) :	0.18 C <sub>v</sub>

Options : • BSPP threads.

**DIMENSIONS** Dimensions shown are metric (mm)



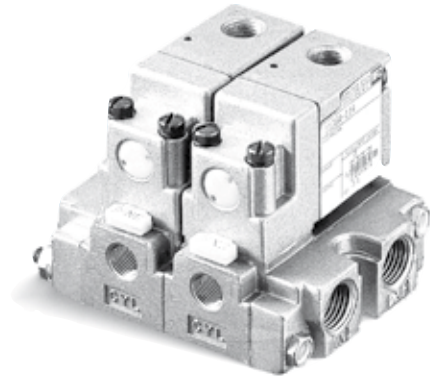
<b>1/8"</b>	28.4	12.7	14.0	8.0	60.1	23.2
<b>1/4"</b>	29.8	13.3	12.7	9.9	60.9	24.1

Series **1100**

Function	Port size	Flow (Max)	Manifold mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8"</b>	<b>0.18 C<sub>v</sub></b>	sub-base	

**OPERATIONAL BENEFITS**

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. Powerful return spring.
4. Maximum shifting forces.



**1100**

**55**

**56**

**57**

**58**

**59**

**HOW TO ORDER**

Port size	Universal valve	NC only valve
<b>Valve less base</b>	1130A-111	1170A-111
<b>Sub-base 1/8" NPTF</b>	1132A-111	1172A-111

**700**

**900**

Air pilot port : 1/8" NPTF.  
End plate kit (1/4" ports) : A2-5004-01.

**82**

**OPTIONS**

11X2A-111

- Replace by 2 for 2-way normally closed.
- Replace by 4 for 2-way normally open.

**6300**

**6500**

**6600**

**2700**

**1800**

**ISO 1**

**ISO 2**

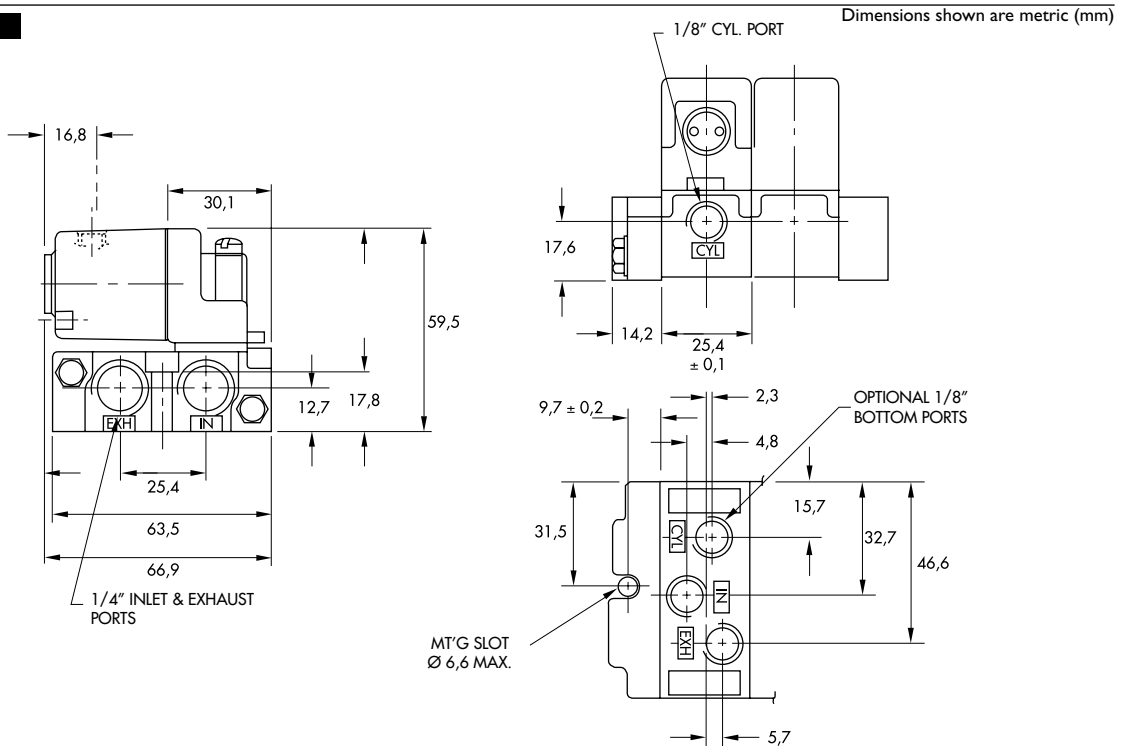
**ISO 3**

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	20 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 140°F (-18°C to 60°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/8" : (0.18 C <sub>v</sub> )

- Spare parts :      • Function plate : A2-7009. • Pressure seal between bases : 16226. • Tie-rod (x2) : 19546.
- Options :            • BSPP threads.

**DIMENSIONS**



Individual mounting

Inline	
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Series

1100

**55**

56

57

58

59

700

900

82

6300

6500

6600

2700

1800

ISO 1

ISO 2

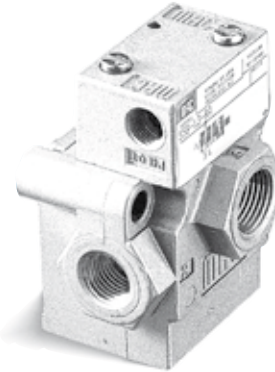
ISO 3



Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/4" - 3/8"</b>	<b>2.5 C<sub>v</sub></b>	Inline	

**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.



1100

55

56

57

58

59

**HOW TO ORDER**

Port size	Air spring	NC valve	NO valve
<b>1/4" NPTF</b>	Internal	55B-11-RA	55B-21-RA
<b>3/8" NPTF</b>	Internal	55B-12-RA	55B-22-RA
<b>1/4" NPTF</b>	External	55B-11-RE	55B-21-RE
<b>3/8" NPTF</b>	External	55B-12-RE	55B-22-RE

700

900

82

Air pilot port : 1/8" NPTF.

Note: Designation "RE" required on remote air pilot models with main valve pressures of vacuum to 25 PSI. "RE" provides an external pilot port and should have a pressure range of 25-100 PSI. Since the external pilot supplies the air spring, it must not exceed the remote air pilot signal pressure.

6300

6500

6600

2700

1800

ISO 1

ISO 2

ISO 3



### TECHNICAL DATA

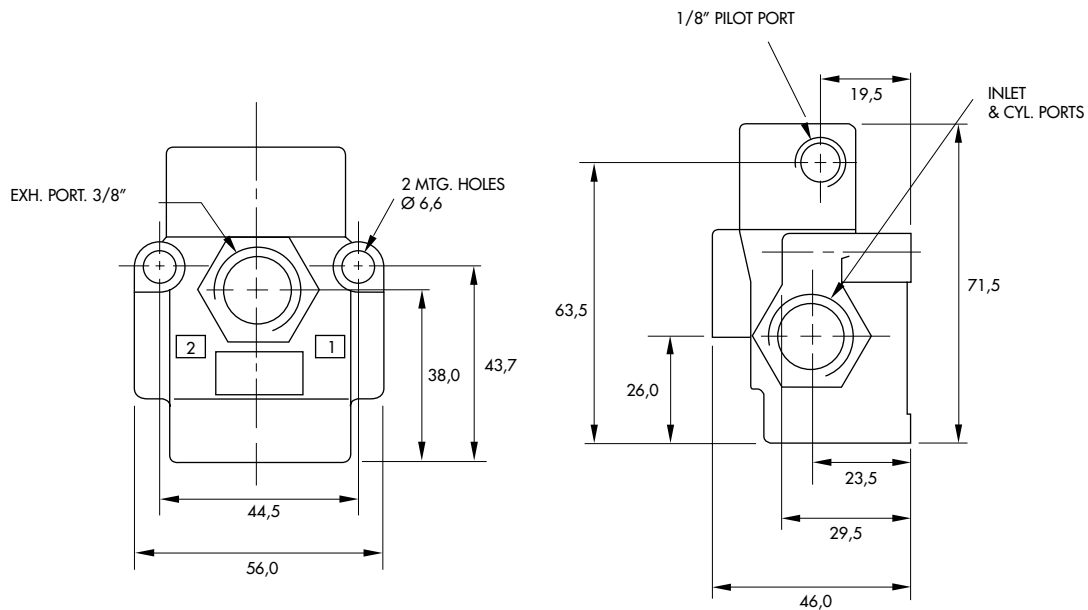
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	25 - 150 PSI $\geq$ main valve pressure
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, <math>\Delta P=1bar</math>) :</b>	1/4" : (2.5 C <sub>v</sub> ), 3/8" : (2.5 C <sub>v</sub> )

Spare parts : • Remote air operator : R-55001-01. • Check valve : 70061.

Options : • BSPP threads.

### DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

Inline	
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Series

1100

55

**56**

57

58

59

700

900

82

6300

6500

6600

2700

1800

ISO 1

ISO 2

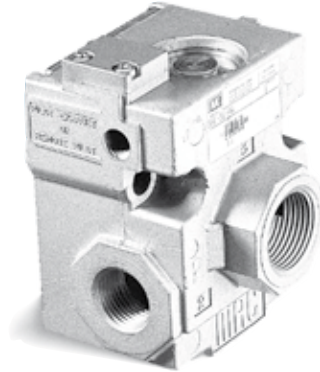
ISO 3



Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>6.2 C<sub>v</sub></b>	Inline	

**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.



1100  
55  
**56**  
57  
58  
59

**HOW TO ORDER**

Port size	Air spring	NC valve	NO valve
<b>3/8" NPTF</b>	Internal	56C-52-RA	56C-82-RA
<b>1/2" NPTF</b>		56C-53-RA	56C-83-RA
<b>3/4" NPTF</b>		56C-57-RA	56C-87-RA
<b>3/8" NPTF</b>	External	56C-52-RE	56C-82-RE
<b>1/2" NPTF</b>		56C-53-RE	56C-83-RE
<b>3/4" NPTF</b>		56C-57-RE	56C-87-RE

700  
900  
82

Air pilot port : 1/8" NPTF.

Note: Designation "RE" required on remote air pilot models with main valve pressures of vacuum to 25 PSI. "RE" provides an external pilot port and should have a pressure range of 25-100 PSI. Since the external pilot supplies the air spring, it must not exceed the remote air pilot signal pressure.

6300  
6500  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

### TECHNICAL DATA

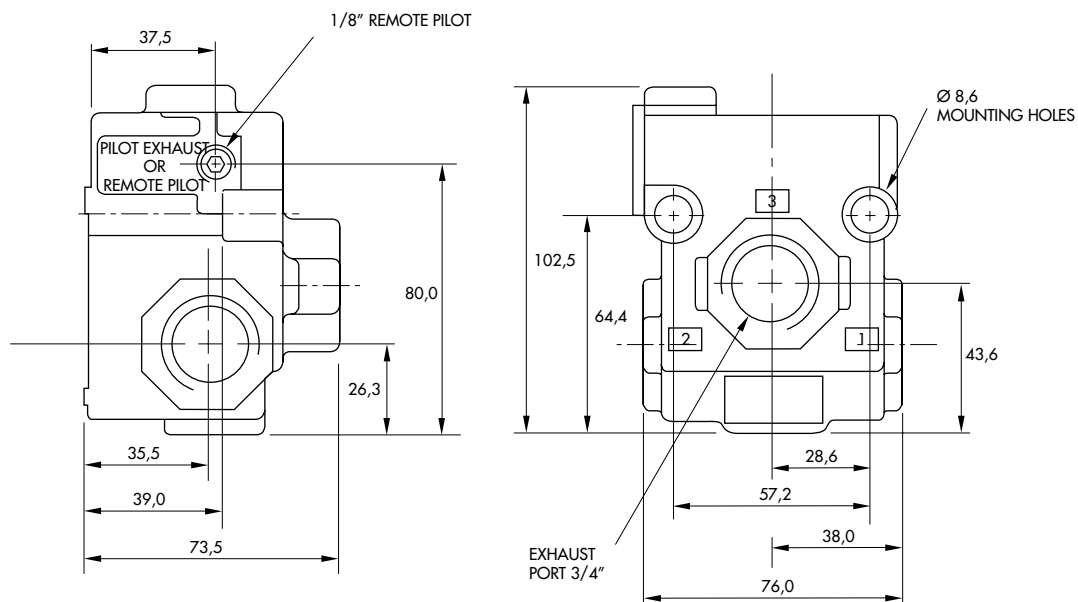
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	25 - 150 PSI ≥ main valve pressure
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	3/8" : (6.0 C <sub>v</sub> ), 1/2" : (6.1 C <sub>v</sub> ), 3/4" : (6.2 C <sub>v</sub> )

Spare parts :      • Remote air operator : R-56001. • Check valve : 70063.

Options :            • BSPP threads.

### DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

Inline	
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Series

1100

55

56

**57**

58

59

700

900

82

6300

6500

6600

2700

1800

ISO 1

ISO 2

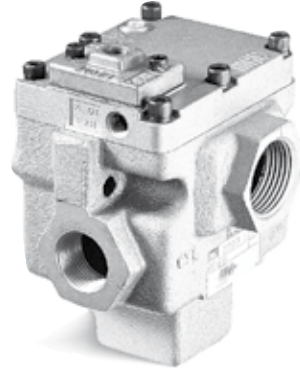
ISO 3



Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/2" - 3/4" - 1"</b>	<b>17.4 C<sub>v</sub></b>	Inline	

**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.



1100  
55  
56  
**57**  
58  
59

**HOW TO ORDER**

Port size	Air spring	NC valve	NO valve
<b>1/2" NPTF</b>	Internal	57D-51-RA	57D-81-RA
<b>3/4" NPTF</b>		57D-52-RA	57D-82-RA
<b>1" NPTF</b>		57D-53-RA	57D-83-RA
<b>1/2" NPTF</b>	External	57D-51-RE	57D-81-RE
<b>3/4" NPTF</b>		57D-52-RE	57D-82-RE
<b>1" NPTF</b>		57D-53-RE	57D-83-RE

700  
900  
82

Air pilot port : 1/8" NPTF.

Note: Designation "RE" required on remote air pilot models with main valve pressures of vacuum to 25 PSI. "RE" provides an external pilot port and should have a pressure range of 25-75 PSI. Since the external pilot supplies the air spring, it must not exceed the remote air pilot signal pressure.

6300  
6500  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3



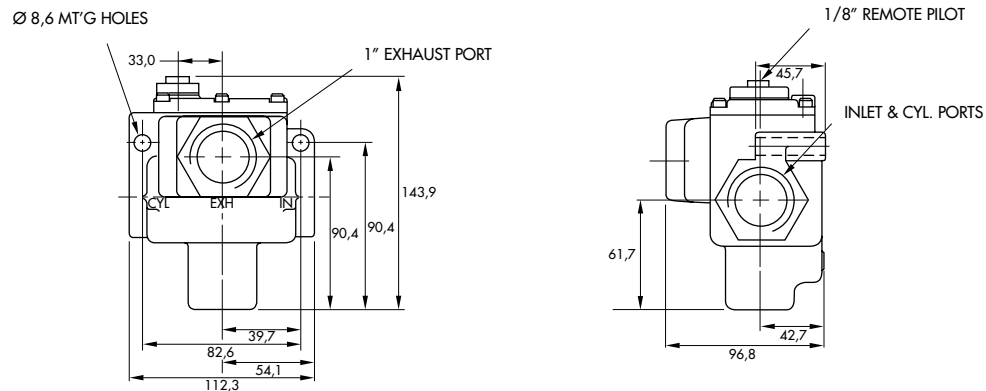
### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	25 - 150 PSI ≥ main valve pressure
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/2" : (11.0 C <sub>v</sub> ), 3/4" : (15.3 C <sub>v</sub> ), 1" : (17.4 C <sub>v</sub> )

- Spare parts :      • Remote air pilot block : R-59003. • Check valve : 70019.
- Options :            • BSPP threads.

### DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

Inline	
--------	--

Series

1100

55

56

57

**58**

59

700

900

82

6300

6500

6600

2700

1800

ISO 1

ISO 2

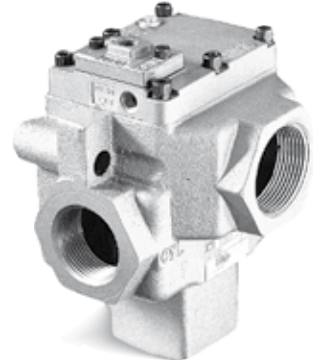
ISO 3



Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1" - 1 1/4" - 1 1/2"</b>	<b>33.5 C<sub>v</sub></b>	Inline	

**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.



1100  
55  
56  
57  
**58**  
59

**HOW TO ORDER**

Port size	Air spring	NC valve	NO valve
<b>1" NPTF</b>	Internal	58D-51-RA	58D-81-RA
<b>1 1/4" NPTF</b>		58D-52-RA	58D-82-RA
<b>1 1/2" NPTF</b>		58D-53-RA	58D-83-RA
<b>1" NPTF</b>	External	58D-51-RE	58D-81-RE
<b>1 1/4" NPTF</b>		58D-52-RE	58D-82-RE
<b>1 1/2" NPTF</b>		58D-53-RE	58D-83-RE

700  
900  
82

Air pilot port : 1/8" NPTF.

Note: Designation "RE" required on remote air pilot models with main valve pressures of vacuum to 25 PSI. "RE" provides an external pilot port and should have a pressure range of 25-75 PSI. Since the external pilot supplies the air spring, it must not exceed the remote air pilot signal pressure.

6300  
6500  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

### TECHNICAL DATA

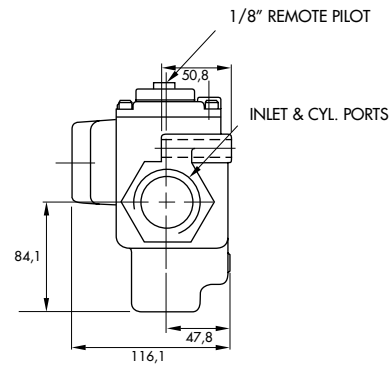
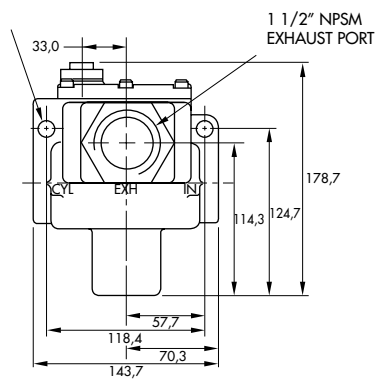
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	25 - 150 PSI ≥ main valve pressure
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	Norm. Closed : 1" (18.7 Cv), 1 1/4" (23.0 Cv), 1 1/2" (24.9 Cv), Norm. Open : 1" (20.8Cv), 1 1/4" (23.8 Cv), 1 1/2" (26.0 Cv)

- Spare parts :      • Remote air pilot block : R-59003. • Check valve : 70019.
- Options :            • BSPP threads.

### DIMENSIONS

Dimensions shown are metric (mm)

Ø 13,5 MT'G HOLES



Individual mounting

Inline	
--------	--

Series

1100

55

56

57

58

**59**

700

900

82

6300

6500

6600

2700

1800

ISO 1

ISO 2

ISO 3



Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>2" - 2 1/2"</b>	<b>65.0 C<sub>v</sub></b>	Inline	

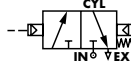
**OPERATIONAL BENEFITS**

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.



1100  
55  
56  
57  
58  
**59**

**HOW TO ORDER**

Port size	Air spring	NC valve
<b>2" NPTF</b>	Internal	
<b>2 1/2" NPTF</b>		59B-52-RA
<b>2" NPTF</b>	External	59B-53-RA
<b>2 1/2" NPTF</b>		59B-52-RE
		59B-53-RE

700  
900  
82

Air pilot port : 1/8" NPTF.

Note: Designation "RE" required on remote air pilot models with main valve pressures of vacuum to 25 PSI. "RE" provides an external pilot port and should have a pressure range of 25-75 PSI. Since the external pilot supplies the air spring, it must not exceed the remote air pilot signal pressure.

6300  
6500  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3



### TECHNICAL DATA

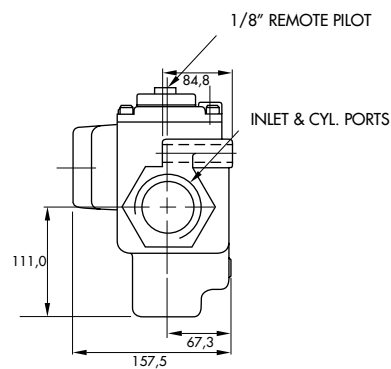
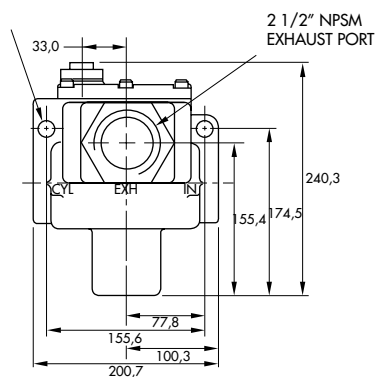
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	25 - 150 PSI ≥ main valve pressure
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	2" : (60.0 C <sub>v</sub> ), 2 1/2" : (65.0 C <sub>v</sub> )

- Spare parts :      • Remote air pilot block : R-59003. • Check valve : 70019.
- Options :            • BSPP threads.

### DIMENSIONS

Dimensions shown are metric (mm)

Ø 13,5 MT'G HOLES



Individual mounting

Inline	
--------	--

Manifold mounting

stacking	
----------	--

Series

**1100**

**55**

**56**

**57**

**58**

**59**

**700**

**900**

**82**

**6300**

**6500**

**6600**

**2700**

**1800**

**ISO 1**

**ISO 2**

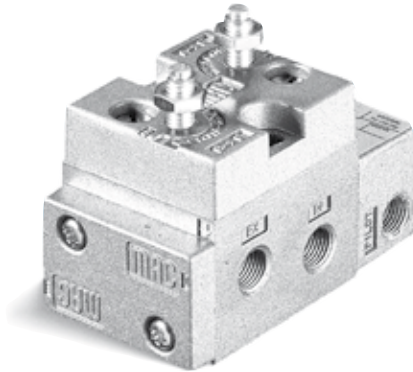
**ISO 3**



Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2</b>	<b>1/8" - 1/4"</b>	<b>0.7 C<sub>v</sub></b>	Inline	

**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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Single operator	Double operator
<b>1/8" NPTF</b>	711C-11-RA	721C-11-RA
<b>1/4" NPTF</b>	711C-12-RA	721C-12-RA

700  
900

HOW TO ORDER VALVE WITH FLOW CONTROLS

Port size	Single operator	Double operator
<b>1/8" NPTF</b>	712C-11-RA	722C-11-RA
<b>1/4" NPTF</b>	712C-12-RA	722C-12-RA

82  
6300  
6500  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

Air pilot port : 1/8" NPTF.

**TECHNICAL DATA**

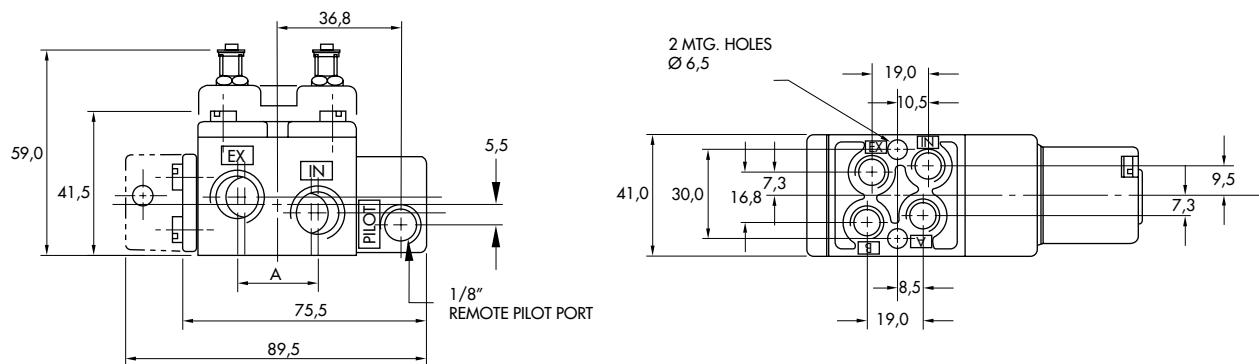
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single operator : 20 to 150 PSI ≥ main valve pressure Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/8" : (0.6 C <sub>v</sub> ), 1/4" : (0.7 C <sub>v</sub> )

Spare parts : • Remote air operator : R-07002. • Valve cover plate with integral flow controls : N-07002.

Options : • BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)

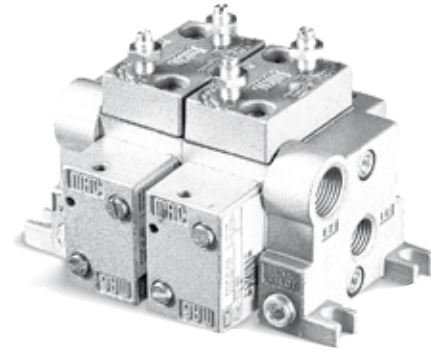


<b>1/8"</b>	21.0
<b>1/4"</b>	24.0

Function	Port size	Flow (Max)	Manifold mounting	Series
4/2	1/8" - 1/4"	0.8 C <sub>v</sub>	stacking	

**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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Single operator	Double operator
1/8" NPTF	713C-11-RA	723C-11-RA
1/4" NPTF	713C-12-RA	723C-12-RA

700  
900

HOW TO ORDER VALVE WITH FLOW CONTROLS

Port size	Single operator	Double operator
1/8" NPTF	714C-11-RA	724C-11-RA
1/4" NPTF	714C-12-RA	724C-12-RA

82  
6300  
6500

End plate kit (Port size 1/4") : M-07001-01-01, internal pilot.  
M-07001-02-01, external pilot.

Air pilot port : 1/8" NPTF.

6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

### TECHNICAL DATA

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single operator : 20 to 150 PSI $\geq$ main valve pressure Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, <math>\Delta P=1bar</math>) :</b>	1/8" : (0.7 C <sub>v</sub> ), 1/4" : (0.8 C <sub>v</sub> )

Spare parts : 

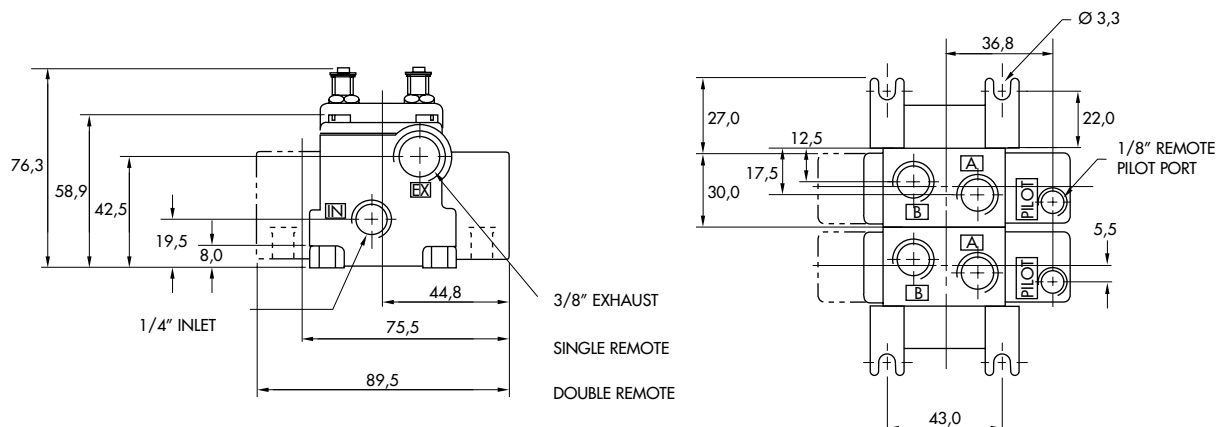
- Remote air operator : R-07002. • Valve cover plate with integral flow controls : N-07004. • Pressure seal between valves : 16368. • Tie-rod (x2) : 19674.

Options : 

- BSPP threads.

### DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

Inline	
--------	--

Series

Manifold mounting

stacking	
----------	--

**1100**

**55**

**56**

**57**

**58**

**59**

**700**

**900**

**82**

**6300**

**6500**

**6600**

**2700**

**1800**

**ISO 1**

**ISO 2**

**ISO 3**

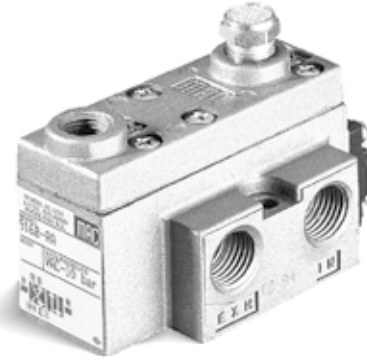




Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2</b>	<b>1/8" - 1/4"</b>	<b>1.4 C<sub>v</sub></b>	Inline	

**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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Single operator	Double operator
<b>1/8" NPTF</b>	911B-RA	921B-RA
<b>1/4" NPTF</b>	912B-RA	922B-RA

700  
900

Air pilot port : 1/8" NPTF.

82

6300  
6500  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

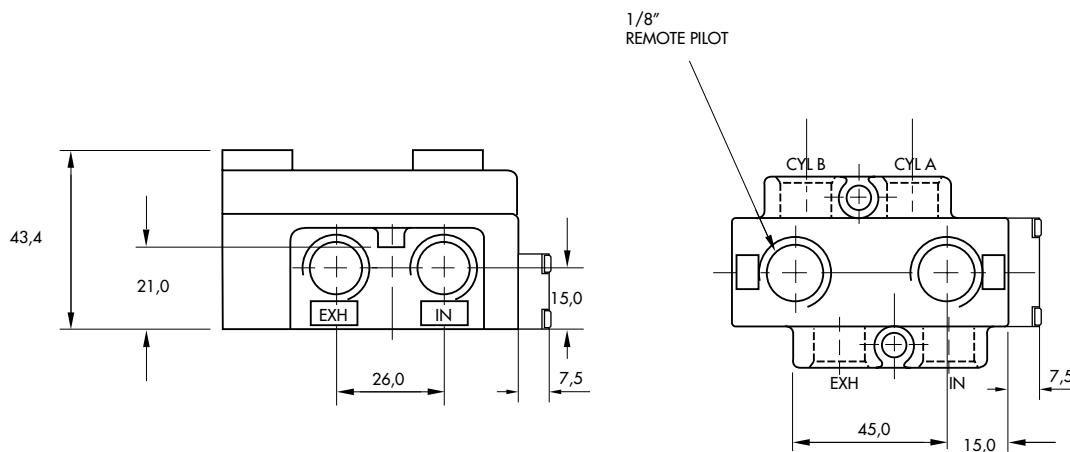
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single operator : 25 to 150 PSI ≥ main valve pressure Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/8" : (0.8 C <sub>v</sub> ), 1/4" : (1.2 C <sub>v</sub> )

- Spare parts :      • Remote air operator (single operator) : R-09002-01. • Remote air operator ( double operator) : R-09002-02.
- Options :            • BSPP threads.

**DIMENSIONS**

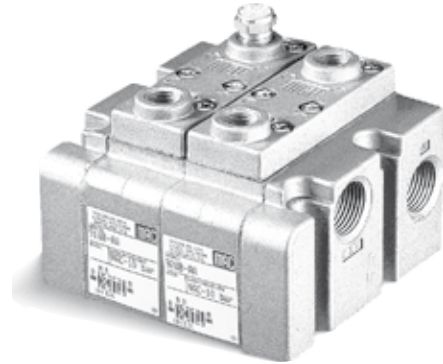
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2</b>	<b>1/8" - 1/4"</b>	<b>1.4 C<sub>v</sub></b>	stacking	

**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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Single operator	Double operator
<b>1/8" NPTF</b>	913B-RA	923B-RA
<b>1/4" NPTF</b>	914B-RA	924B-RA

700  
900

Air pilot port : 1/8" NPTF.  
Manifold fastening kit (3/8" NPTF) : M-09001-01.

82

6300  
6500  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

### TECHNICAL DATA

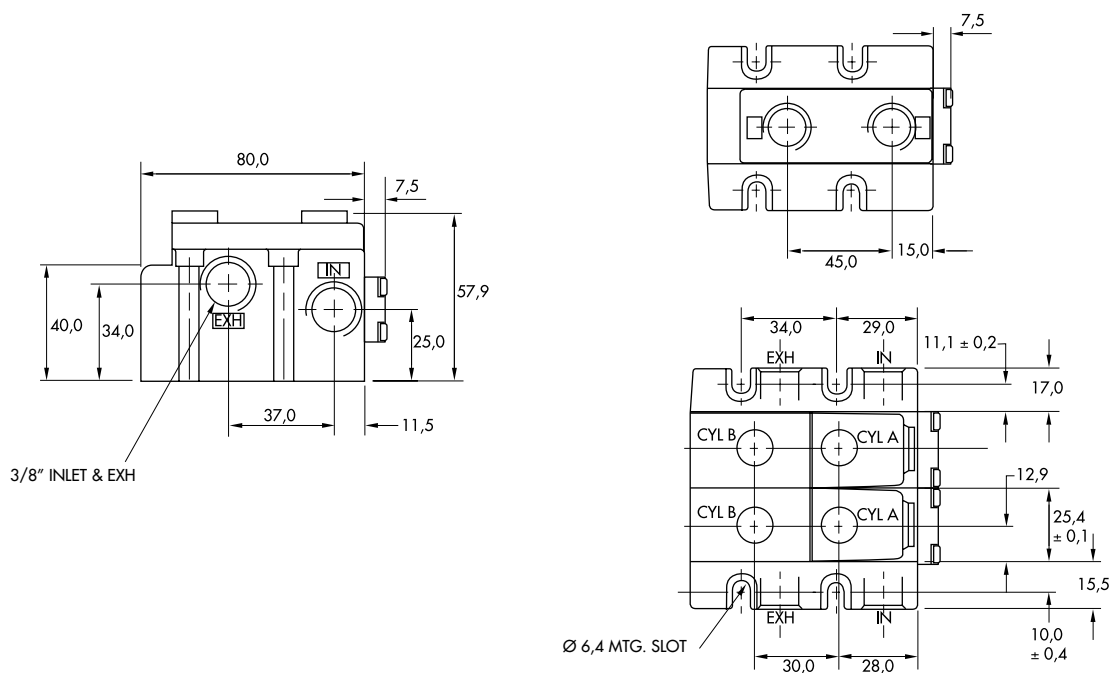
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single operator : 25 to 150 PSI $\geq$ main valve pressure Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, <math>\Delta P=1</math>bar) :</b>	1/8" : (0.8 C <sub>v</sub> ), 1/4" : (1.2 C <sub>v</sub> )

Spare parts :   
 • Remote air operator (single operator) : R-09002-01. • Remote air operator (double operator) : R-09002-02.   
 • Pressure seal between valves : 16358. • Tie-rod (x2) : 19615.

Options :   
 • BSPP threads.

### DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

sub-base	
----------	--

Series

Manifold mounting

sub-base	
----------	--

**1100**

**55**

**56**

**57**

**58**

**59**

**700**

**900**

**82**

**6300**

**6500**

**6600**

**2700**

**1800**

**ISO 1**

**ISO 2**

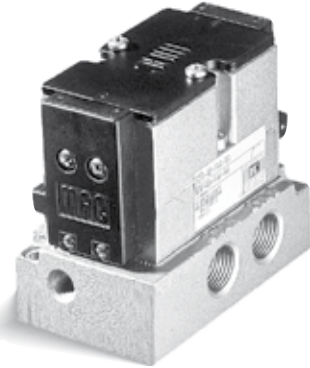
**ISO 3**



Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>1/8" - 1/4" - 3/8"</b>	<b>1.35 C<sub>v</sub></b>	sub-base	

**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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>	82A-AB-000-RA	82A-BB-000-RA	82A-EB-000-RA	82A-FB-000-RA	82A-GB-000-RA
<b>Sub-base 1/8" NPTF</b>	82A-AB-AAA-RA	82A-BB-AAD-RA	82A-EB-AAD-RA	82A-FB-AAD-RA	82A-GB-AAD-RA
<b>Sub-base 1/4" NPTF</b>	82A-AB-BAA-RA	82A-BB-BAD-RA	82A-EB-BAD-RA	82A-FB-BAD-RA	82A-GB-BAD-RA
<b>Sub-base 3/8" NPTF</b>	82A-AB-CAA-RA	82A-BB-CAD-RA	82A-EB-CAD-RA	82A-FB-CAD-RA	82A-GB-CAD-RA

700  
900

**OPTIONS**

82A-AB-000-RA

└ - For dual pressure valves, replace A by C, B by D, E by M, F by L, G by H.

82

6300  
6500  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3



### TECHNICAL DATA

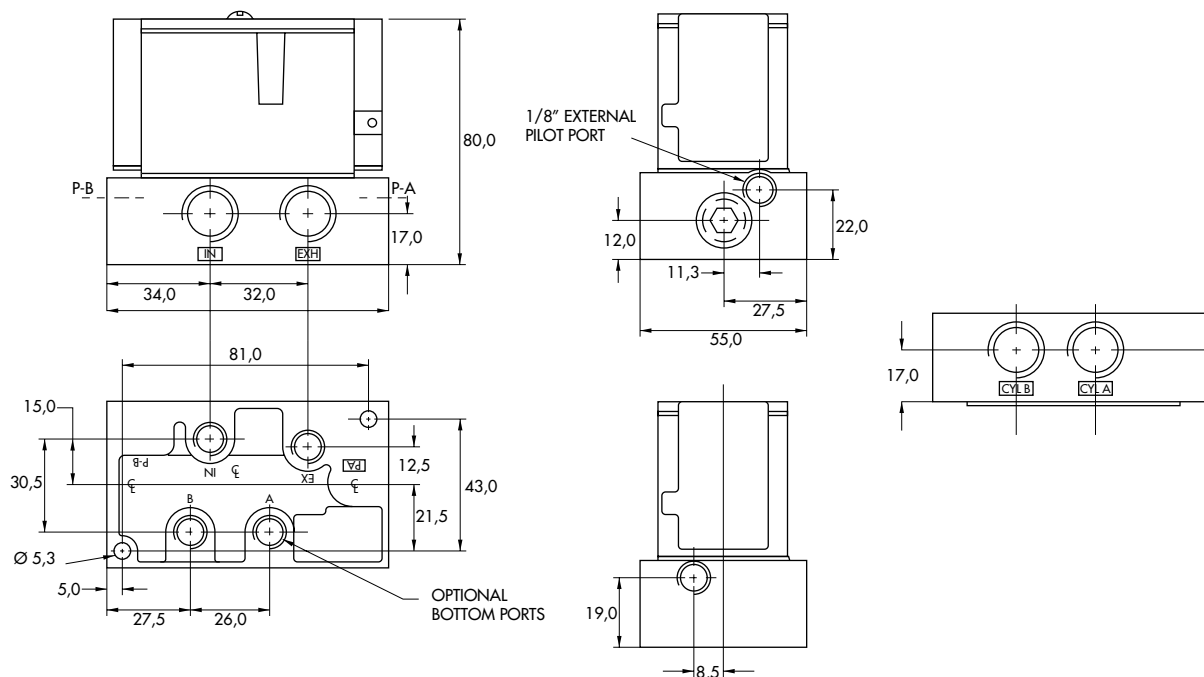
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single operator and 3 positions : 25 to 150 PSI $\geq$ main valve pressure      Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, <math>\Delta P=1\text{bar}</math>) :</b>	1/8" : (0.9 C <sub>v</sub> ), 1/4" : (1.3 C <sub>v</sub> ), 3/8" : (1.35 C <sub>v</sub> )

Spare parts :      • Remote air adapter assy.: R-82003.

Options :            • BSPP threads.

### DIMENSIONS

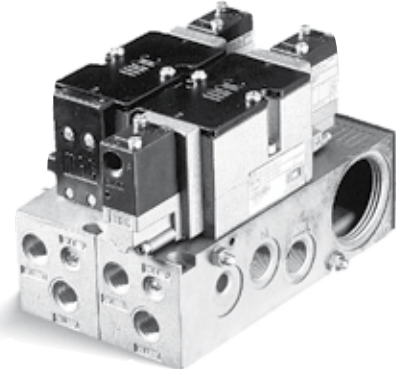
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>1/4" - 3/8"</b>	<b>1.35 C<sub>v</sub></b>	sub-base	

**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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
<b>Valve less base</b>	Internal only	82A-AB-000-TM-RA11	82A-BB-000-TM-RA11	82A-EB-000-TM-RA11	82A-FB-000-TM-RA11	82A-GB-000-TM-RA11
<b>Sub-base</b>	Internal	82A-AB-BKA-TM-RA11	82A-BB-BKA-TM-RA11	82A-EB-BKA-TM-RA11	82A-FB-BKA-TM-RA11	82A-GB-BKA-TM-RA11
<b>1/4" NPTF</b>	External	82A-AB-BKD-TM-RA11	82A-BB-BKD-TM-RA11	82A-EB-BKD-TM-RA11	82A-FB-BKD-TM-RA11	82A-GB-BKD-TM-RA11
<b>Sub-base</b>	Internal	82A-AB-CKA-TM-RA11	82A-BB-CKA-TM-RA11	82A-EB-CKA-TM-RA11	82A-FB-CKA-TM-RA11	82A-GB-CKA-TM-RA11
<b>3/8" NPTF</b>	External	82A-AB-CKD-TM-RA11	82A-BB-CKD-TM-RA11	82A-EB-CKD-TM-RA11	82A-FB-CKD-TM-RA11	82A-GB-CKD-TM-RA11

700  
900

82

**OPTIONS**

82A-AB-000-TM-RA11

— For dual pressure valves, replace A by C, B by D, E by M, F by L, G by H.

Manifold fastening kit : N-82005-01.

6300  
6500  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

### TECHNICAL DATA

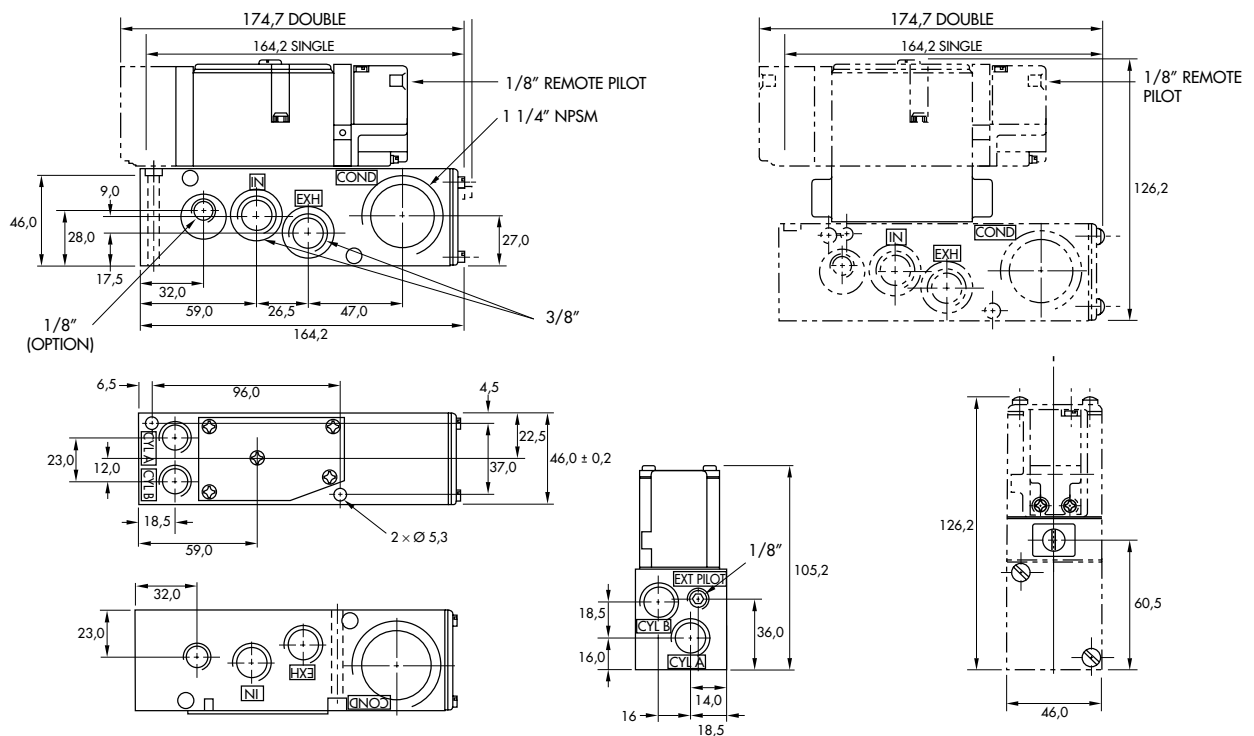
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single operator and 3 positions : 25 to 150 PSI    Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" : (1.3 C <sub>v</sub> ), 3/8" : (1.35 C <sub>v</sub> )

Spare parts :            • Remote air operated pilot : TM-RA11.

Options :                 • BSPP threads.

### DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

sub-base	
----------	--

Series

Manifold mounting

sub-base	
----------	--

**1100**

**55**

**56**

**57**

**58**

**59**

**700**

**900**

**82**

**6300**

**6500**

**6600**

**2700**

**1800**

**ISO 1**

**ISO 2**

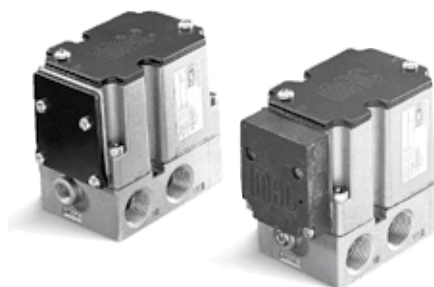
**ISO 3**



Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>1/4" - 3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>	sub-base	

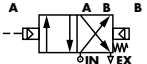
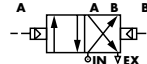
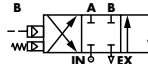
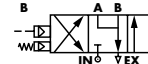
**OPERATIONAL BENEFITS**

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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center
<b>Valve less base</b>	 6312D-000-RA	 6322D-000-RA	 6332D-000-RA	 6342D-000-RA
<b>Sub-base 1/4" NPTF</b>	6312D-131-RA	6322D-141-RA	6332D-141-RA	6342D-141-RA
<b>Sub-base 3/8" NPTF</b>	6312D-231-RA	6322D-241-RA	6332D-241-RA	6342D-241-RA
<b>Sub-base 1/2" NPTF</b>	6312D-331-RA	6322D-341-RA	6332D-341-RA	6342D-341-RA

700  
900  
82

**OPTIONS**

6312D-131-RA  
 - For bottom ports (excluding 1/2"), replace by 4.

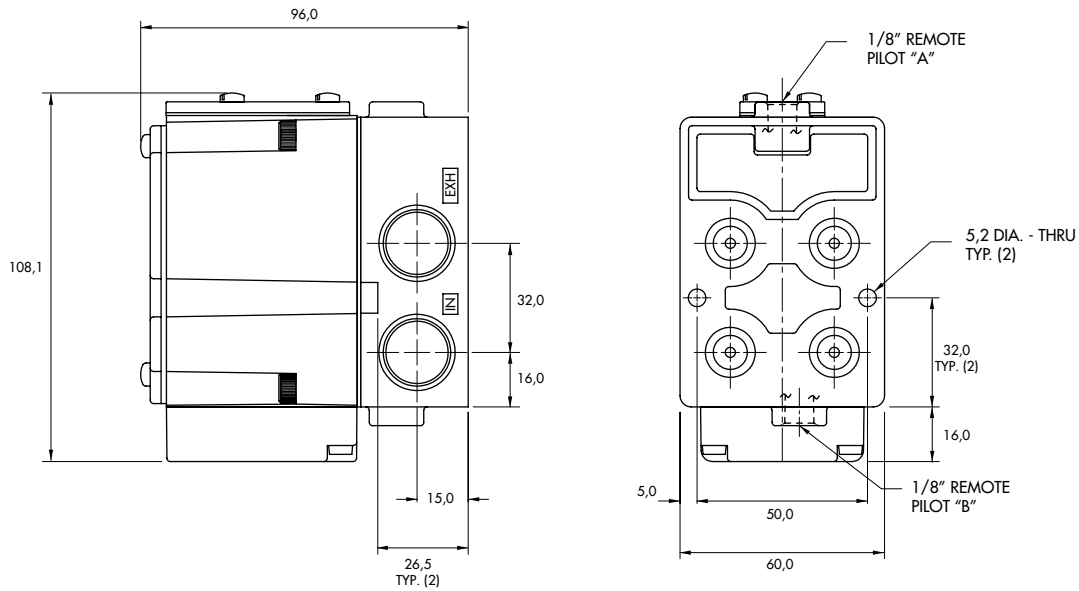
6300  
6500  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

TECHNICAL DATA	
Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Vacuum to 150 PSI
Air signal pressure :	Single operator and 3 positions : 25 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 $\mu$
Temperature range :	0°F to 120°F (-18°C to 50°C)
Flow (at 6 bar, $\Delta P=1$ bar) :	1/4" : (2.0 C <sub>v</sub> ), 3/8" : (2.6 C <sub>v</sub> ), 1/2" : (3.0 C <sub>v</sub> )

- Spare parts :
- Remote air operator (A side) : R-63004A.
  - Remote air operator (B side) : R-63005A.
  - Seal between valve and base : 16298.
  - Mounting screw valve to base (x4) : 35303.

- Options :
- BSPP threads.

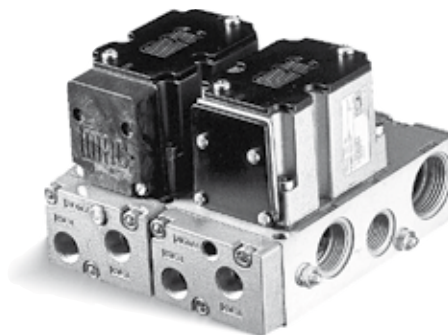
**DIMENSIONS** Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>1/4" - 3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>	sub-base	

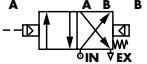
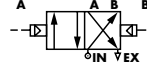
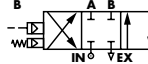
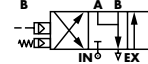
**OPERATIONAL BENEFITS**

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.




1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center
				
<b>Valve less base</b>	6312D-000-RA	6322D-000-RA	6332D-000-RA	6342D-000-RA
<b>Sub-base 1/4" NPTF</b>	6312D-431-RA	6322D-441-RA	6332D-441-RA	6342D-441-RA
<b>Sub-base 3/8" NPTF</b>	6312D-531-RA	6322D-541-RA	6332D-541-RA	6342D-541-RA
<b>Sub-base 1/2" NPTF</b>	6312D-631-RA	6322D-641-RA	6332D-641-RA	6342D-641-RA

700  
900  
82

**OPTIONS**

6312D-431-RA  
 - For bottom cylinder ports, replace by 4.

Fastening kit : N-63002-01

6300  
6500  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

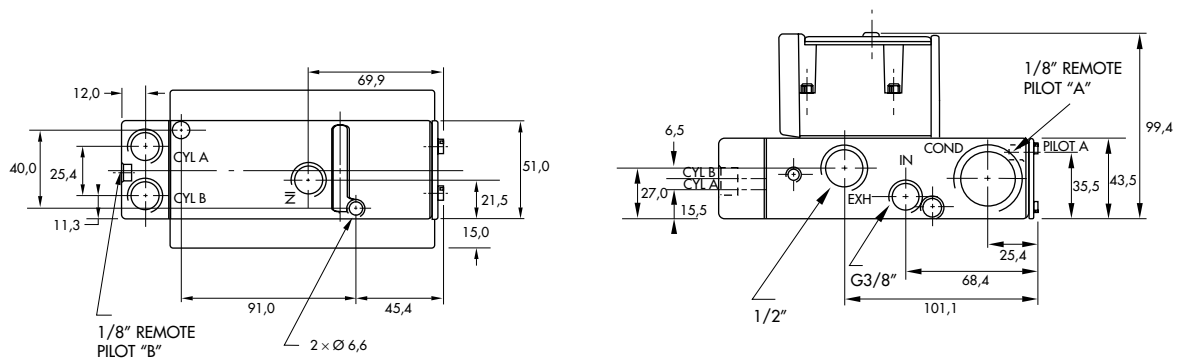


TECHNICAL DATA	
Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Vacuum to 150 PSI
Air signal pressure :	Single operator and 3 positions : 25 to 150 PSI $\geq$ main valve pressure      Double operator : 10 to 150 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
Filtration :	40 $\mu$
Temperature range :	0°F to 120°F (-18°C to 50°C)
Flow (at 6 bar, $\Delta P=1$ bar) :	1/4" : (2.0 C <sub>v</sub> ), 3/8" : (2.6 C <sub>v</sub> ), 1/2" : (3.0 C <sub>v</sub> )

Spare parts :      • Remote air operator (A side) : R-63004A. • Remote air operator (B side) : R-63005A. • Seal between valve and base : 16298.  
 • Mounting screw valve to base (x4) : 35303. • Tie-rod (x2) : 19624.

Options :      • BSPP threads.

**DIMENSIONS** Dimensions shown are metric (mm)





# R e m o t e a i r v a l v e s

## Individual mounting

sub-base	
----------	--

## Series

## Manifold mounting

sub-base	
----------	--

**1100**

**55**

**56**

**57**

**58**

**59**

**700**

**900**

**82**

**6300**

**6500**

**6600**

**2700**

**1800**

**ISO 1**

**ISO 2**

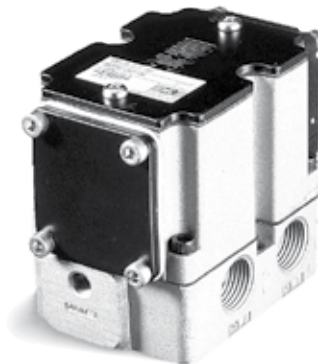
**ISO 3**



Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>5.1 C<sub>v</sub></b>	sub-base	

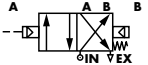
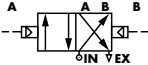
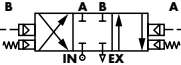
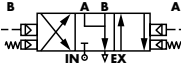

**OPERATIONAL BENEFITS**

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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
					
<b>Valve less base</b>	6512B-000-RA	6522B-000-RA	6532B-000-RA	6542B-000-RA	6552B-000-RA
<b>Sub-base 3/8" NPTF</b>	6512B-131-RA	6522B-141-RA	6532B-141-RA	6542B-141-RA	6552B-141-RA
<b>Sub-base 1/2" NPTF</b>	6512B-231-RA	6522B-241-RA	6532B-241-RA	6542B-241-RA	6552B-241-RA
<b>Sub-base 3/4" NPTF</b>	6512B-331-RA	6522B-341-RA	6532B-341-RA	6542B-341-RA	6552B-341-RA

700  
900  
82

**OPTIONS**

6512B-131-RA

Dual pressure valves : replace by 4. (excluding 3/4" base)

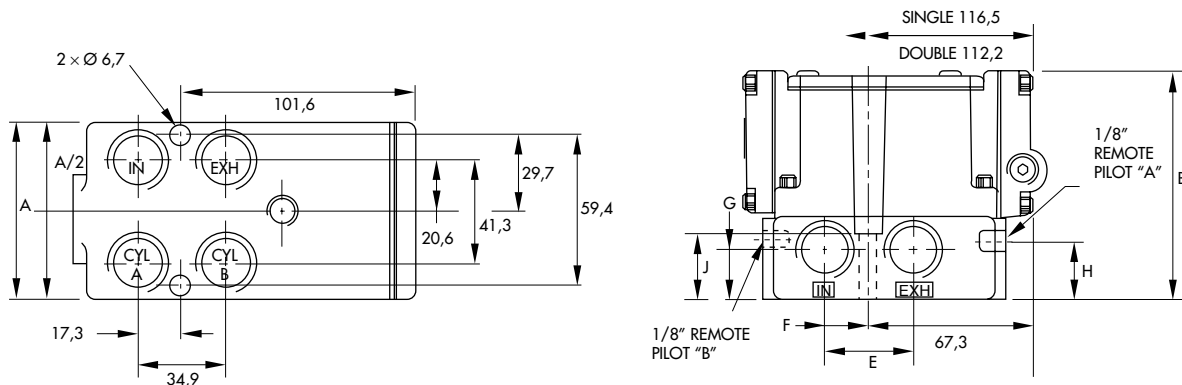
6300  
**6500**  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

TECHNICAL DATA	
Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Vacuum to 150 PSI
Air signal pressure :	Single operator and 3 positions : 25 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 $\mu$
Temperature range :	0°F to 120°F (-18°C to 50°C)
Flow (at 6 bar, $\Delta P=1\text{bar}$ ) :	3/8" : (4.5 C <sub>v</sub> ), 1/2" : (5.0 C <sub>v</sub> ), 3/4" : (5.1 C <sub>v</sub> )

Spare parts :                    • Remote air operator : R-00008. • Seal between valve and base : 16246. • Mounting screw valve to base (x4) : 32201.

Options :                         • BSPP threads.

**DIMENSIONS** Dimensions shown are metric (mm)

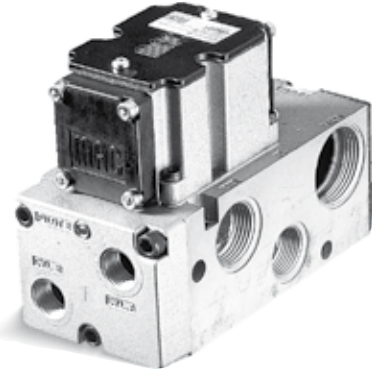


<b>3/8" &amp; 1/2"</b>	69.6	97.4	36.0	17.9	19.0	23.6	25.4
<b>3/4"</b>	94.5	109.3	40.1	19.2	20.8	35.9	36.6

Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>3/8" - 1/2" - 3/4"</b>	<b>5.1 C<sub>v</sub></b>	sub-base	

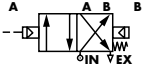
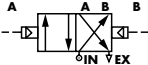
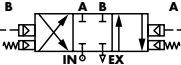
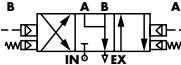

**OPERATIONAL BENEFITS**

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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
					
<b>Valve less base</b>	6512B-000-RA	6522B-000-RA	6532B-000-RA	6542B-000-RA	6552B-000-RA
<b>Sub-base 3/8" NPTF</b>	6512B-431-RA	6522B-441-RA	6532B-441-RA	6542B-441-RA	6552B-441-RA
<b>Sub-base 1/2" NPTF</b>	6512B-531-RA	6522B-541-RA	6532B-541-RA	6542B-541-RA	6552B-541-RA
<b>Sub-base 3/4" NPTF</b>	6512B-631-RA	6522B-641-RA	6532B-641-RA	6542B-641-RA	6552B-641-RA

700  
900  
82

**OPTIONS**

6512B-431-RA

For dual pressure valves, replace by 4.

Fastening kit : N-65002-01.

6300  
**6500**  
6600  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

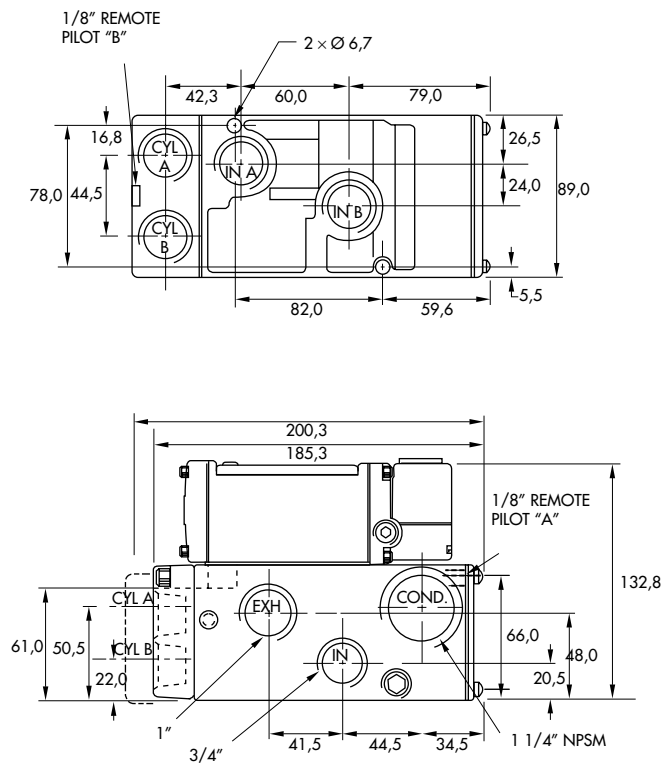
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single operator and 3 positions : 25 to 150 PSI $\geq$ main valve pressure      Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, <math>\Delta P=1</math>bar) :</b>	3/8" : (4.5 C <sub>v</sub> ), 1/2" : (5.0 C <sub>v</sub> ), 3/4" : (5.1 C <sub>v</sub> )

- Spare parts :
- Remote air operator : R-00008. • Seal between valve and base : 16246.
  - Mounting screw valve to base (x4) : 32201. • Tie-rod (x2) : 19540.
- Options :
- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Individual mounting

sub-base	
----------	--

Series

Manifold mounting

sub-base	
----------	--

**1100**

**55**

**56**

**57**

**58**

**59**

**700**

**900**

**82**

**6300**

**6500**

**6600**

**2700**

**1800**

**ISO 1**

**ISO 2**

**ISO 3**

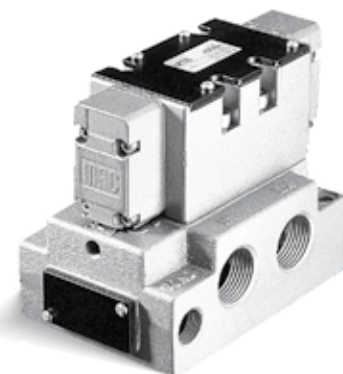




Function	Port size	Flow (Max)	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>3/4" - 1"</b>	<b>9.6 C<sub>v</sub></b>	sub-base	

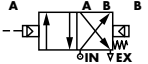
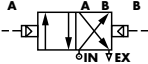
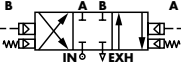
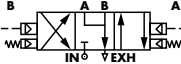

**OPERATIONAL BENEFITS**

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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
					
<b>Valve less base</b>	6612A-000-RA	6622A-000-RA	6632A-000-RA	6642A-000-RA	6652A-000-RA
<b>Sub-base 3/4" NPTF</b>	6612A-231-RA	6622A-241-RA	6632A-241-RA	6642A-241-RA	6652A-241-RA
<b>Sub-base 1" NPTF</b>	6612A-331-RA	6622A-341-RA	6632A-341-RA	6642A-341-RA	6652A-341-RA

700  
900  
82

**OPTIONS**

6612A-231-RA  
Dual pressure valves : replace by 4.

6300  
6500  
**6600**  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

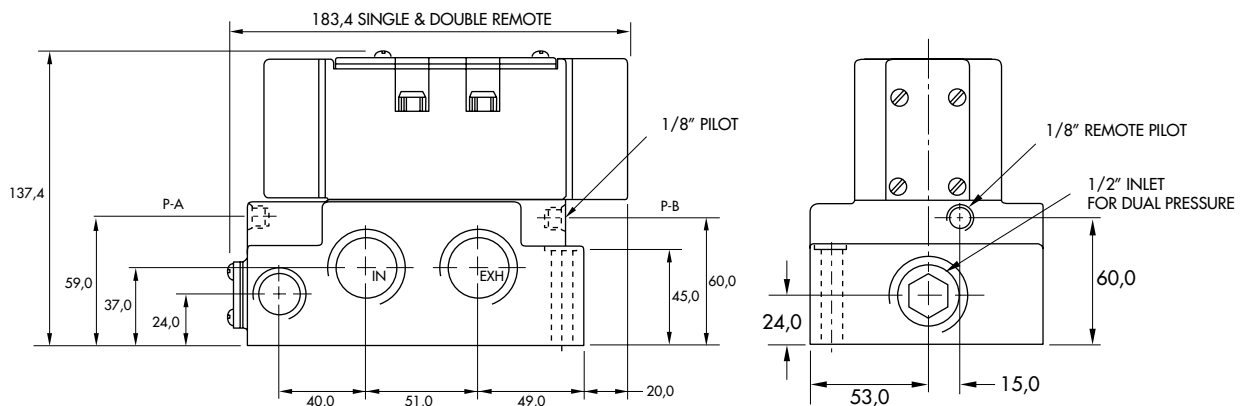
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single operator and 3 positions : 25 to 150 PSI $\geq$ main valve pressure      Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, <math>\Delta P=1</math>bar) :</b>	3/4" : (9.0 C <sub>v</sub> ), 1" : (9.6 C <sub>v</sub> )

- Spare parts :      • Remote air operator : R-A3004. • Pressure seal between valve and base : 16436. • Mounting screw valve to base (x4) : 35416.
- Options :            • BSPP threads.

**DIMENSIONS**

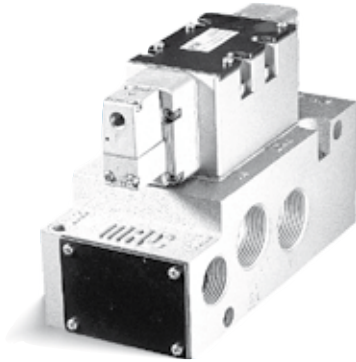
Dimensions shown are metric (mm)



Function	Port size	Flow (Max)	Manifold mounting	Series
<b>4/2 - 4/3</b>	<b>3/4" - 1"</b>	<b>9.6 C<sub>v</sub></b>	sub-base	

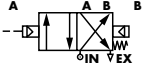
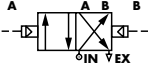
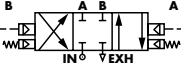
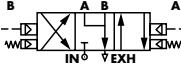

**OPERATIONAL BENEFITS**

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.




1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center	4/3 Pressure center
					
<b>Valve less base</b>	6612A-000-PM-RA11	6622A-000-PM-RA11	6632A-000-PM-RA11	6642A-000-PM-RA11	6652A-000-PM-RA11
<b>Sub-base 3/4" NPTF</b>	6612A-431-PM-RA11	6622A-441-PM-RA11	6632A-441-PM-RA11	6642A-441-PM-RA11	6652A-441-PM-RA11
<b>Sub-base 1" NPTF</b>	6612A-531-PM-RA11	6622A-541-PM-RA11	6632A-541-PM-RA11	6642A-541-PM-RA11	6652A-541-PM-RA11

700  
900  
82

**OPTIONS**

6612A-XXX-PM-RA11  
 For dual pressure valves, replace by 4.

Fastening kit : N-66002-01.

6300  
6500  
**6600**  
2700  
1800  
ISO 1  
ISO 2  
ISO 3

**TECHNICAL DATA**

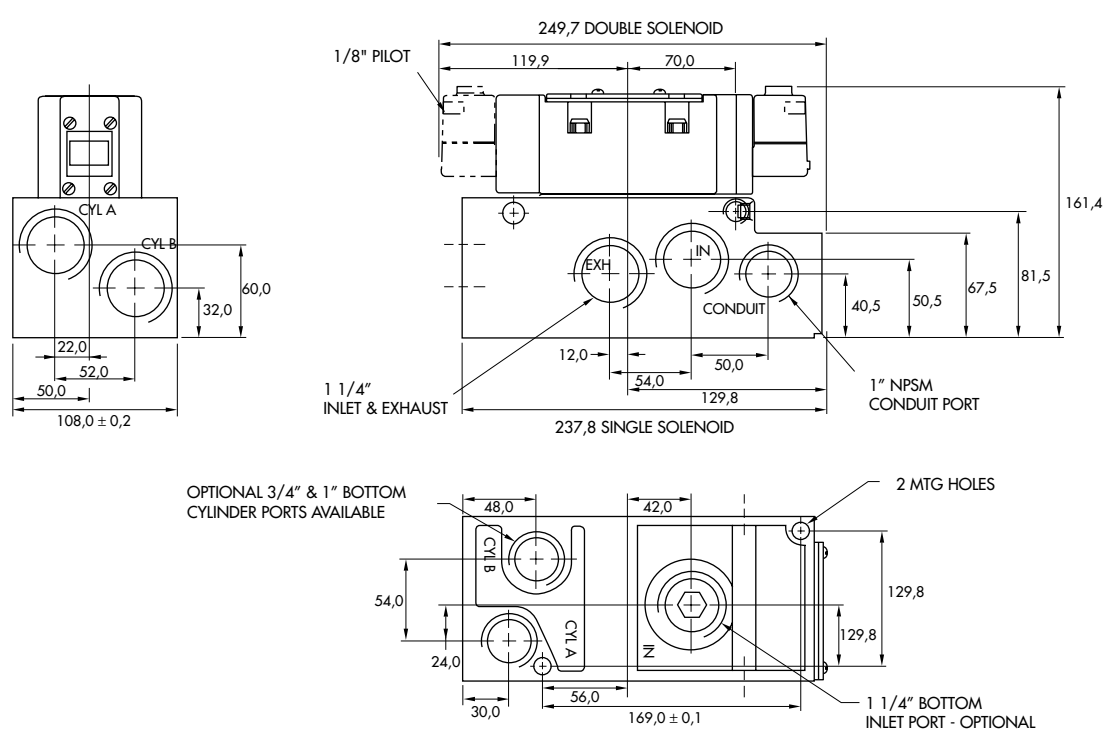
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single operator and 3 positions : 25 to 150 PSI $\geq$ main valve pressure      Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, <math>\Delta P=1</math>bar) :</b>	3/4" : (9.0 C <sub>v</sub> ), 1" : (9.6 C <sub>v</sub> )

Spare parts :      • Remote air operator : R-A3004. • Pressure seal between valve and base : 16436. • Mounting screw valve to base (x4) : 35416.  
                              • Tie-rod (x2) : 19789. • Remote air pilot : PME-RA11.

Options :            • BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Individual mounting

sub-base	
----------	--

Series

1100

55

56

57

58

59

700

900

82

6300

6500

6600

**2700**

1800

ISO 1

ISO 2

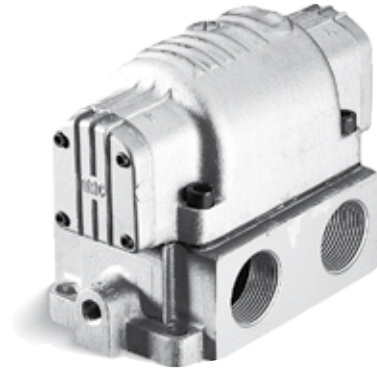
ISO 3



Function	Port size	Flow [Max]	Individual mounting	Series
<b>4/2 - 4/3</b>	<b>3/4" - 1" - 1 1/4" - 1 1/2"</b>	<b>15.9 C<sub>v</sub></b>	sub-base	

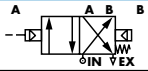
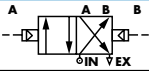
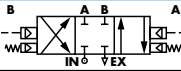
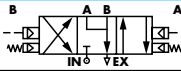
**OPERATIONAL BENEFITS**

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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	Pilot air	4/2 Single operator	4/2 Double operator	4/3 Closed center	4/3 Open center
					
<b>Valve less base</b>		2701G-1			
<b>Sub-base 3/4" NPTF</b>	Internal	2721G-1			
<b>Sub-base 1" NPTF</b>		2731G-1			
<b>Sub-base 1 1/4" NPTF</b>		2751G-1			
<b>Sub-base 1 1/2" NPTF</b>		2761G-1			
<b>Valve less base</b>			2701G-2	2703G-2	2707G-2
<b>Sub-base 3/4" NPTF</b>	External	2721G-2	2723G-2	2727G-2	2728G-2
<b>Sub-base 1" NPTF</b>		2731G-2	2733G-2	2737G-2	2738G-2
<b>Sub-base 1 1/4" NPTF</b>		2751G-2	2753G-2	2757G-2	2758G-2
<b>Sub-base 1 1/2" NPTF</b>		2761G-2	2763G-2	2767G-2	2768G-2

700  
900  
82  
6300  
6500  
6600

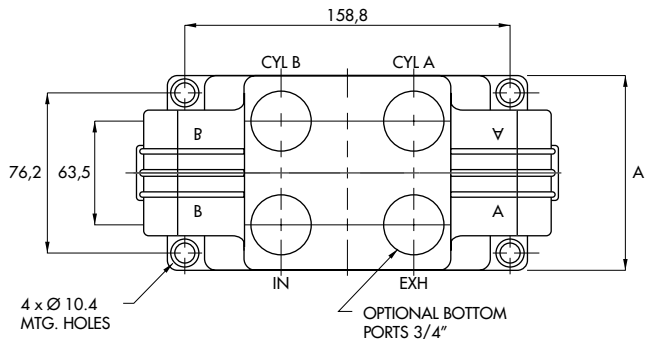
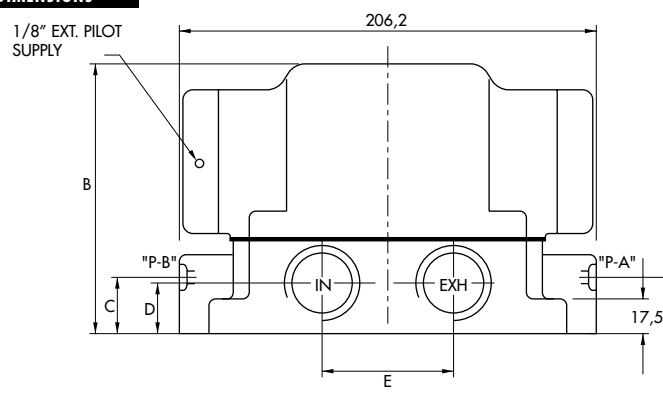
**2700**  
1800  
ISO 1  
ISO 2  
ISO 3



TECHNICAL DATA	
Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Vacuum to 150 PSI
Air signal pressure :	Single operator and 3 positions : 25 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 $\mu$
Temperature range :	0°F to 120°F (-18°C to 50°C)
Flow (at 6 bar, $\Delta P=1\text{bar}$ ) :	3/4" : (11.5 C <sub>v</sub> ), 1" : (13.4 C <sub>v</sub> ), 1 1/4" : (15.4 C <sub>v</sub> ), 1 1/2" : (15.9 C <sub>v</sub> )

- Spare parts :      • Remote air end plate : R-00016B. • Pressure seal between valve and base : 16083. • Mounting screw valve to base (x4) : 32214.
- Options :            • BSPP threads.

**DIMENSIONS** Dimensions shown are metric (mm)



	A	B	C	D	E
<b>3/4" NPTF</b>	95.3	132.3	28.4	25.4	63.5
<b>1" NPTF</b>					
<b>1 1/4" NPTF</b>	114.3	148.3	23.9	30.2	76.2
<b>1 1/2" NPTF</b>					69.9



Individual mounting

Series

Inline	
--------	--

1100

55

56

57

58

59

700

900

82

6300

6500

6600

2700

**1800**

ISO 1

ISO 2

ISO 3



Function	Port size	Flow (Max)	Individual mounting	Series
<b>5/2 - 5/3</b>	<b>1/4"</b>	<b>1.4 C<sub>v</sub></b>	Inline	

**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.



1100  
55  
56  
57  
58  
59

**HOW TO ORDER**

Port size	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center
<b>1/4" NPTF</b>	180001-112-0003	180003-112-0003	180304-512-0304	180304-612-0304	180304-812-0304

700  
900

Air pilot port : 1/8" NPTF.

Options : Side pilot port : replace code 0003 by 0010 (2 positions valves only).

82  
6300  
6500  
6600  
2700  
**1800**

ISO 1  
ISO 2  
ISO 3

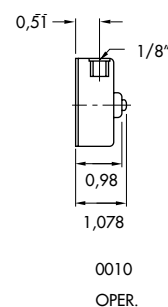
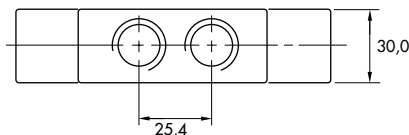
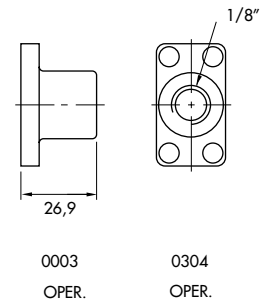
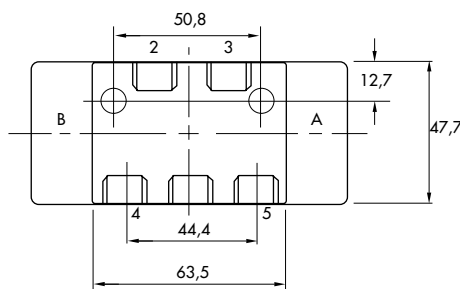
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 200 PSI
<b>Air signal pressure :</b>	Single operator and 3 positions : 20 to 150 PSI      Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/4" - 3/8" : (1.4 C <sub>v</sub> )

- Spare parts :      • Remote air operator (2 positions) : 180003. • Remote air operator (3 positions) : 180304.
- Options :            • BSPP threads. • 3/8" ports (ports 1, 2 & 3 - MOD. 0358 required).

**DIMENSIONS**

Dimensions shown are metric (mm)



Individual mounting

valve only	
------------	--

Series

Manifold mounting

sub-base	
----------	--

**1100**

**55**

**56**

**57**

**58**

**59**

**700**

**900**

**82**

**6300**

**6500**

**6600**

**2700**

**1800**

**ISO 1**

**ISO 2**

**ISO 3**

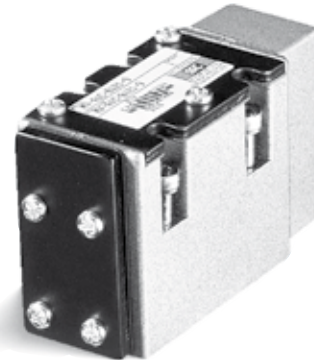


## Series ISO 1

Function	Port size	Flow (Max)	Individual mounting & Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>1/4" - 3/8"</b>	<b>1.6 C<sub>v</sub></b>	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.



1100  
55  
56  
57  
58  
59

### 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

700  
900

#### 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

82  
6300  
6500  
6600  
2700  
1800

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

ISO 1  
ISO 2  
ISO 3



**TECHNICAL DATA**

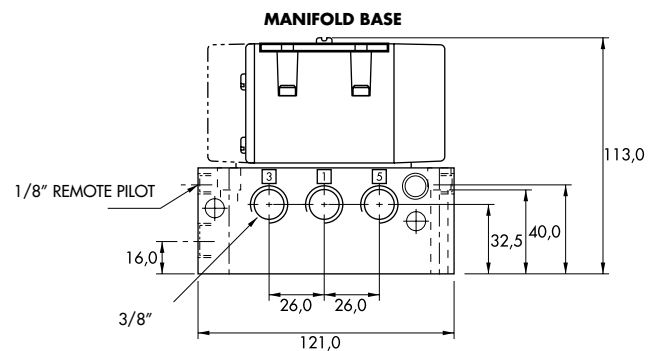
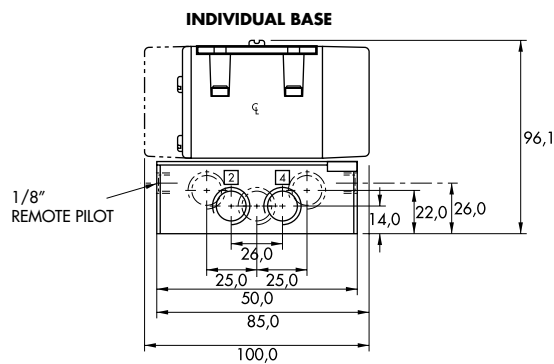
<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single operator and 3 positions : 20 to 150 PSI $\geq$ main valve pressure      Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline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

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)



Individual mounting

valve only	
------------	--

Series

Manifold mounting

sub-base	
----------	--

**1100**

**55**

**56**

**57**

**58**

**59**

**700**

**900**

**82**

**6300**

**6500**

**6600**

**2700**

**1800**

**ISO 1**

**ISO 2**

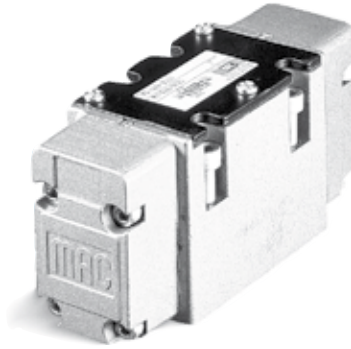
**ISO 3**



Function	Port size	Flow (Max)	Individual mounting & Manifold mounting	Series
<b>5/2 - 5/3</b>	<b>3/8" - 1/2"</b>	<b>3.0 C<sub>v</sub></b>	valve only	

### OPERATIONAL BENEFITS

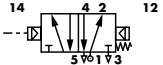
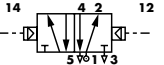
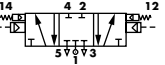
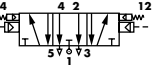
1. Balanced spool, immune to variations of pressure.
2. Short stroke with high flow.
3. The piston (booster) provides maximum shifting forces.
4. Powerful return thanks to the combination of mechanical and air springs.
5. Bonded spool with minimum friction, shifting in a glass-like finished bore.
6.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



1100  
55  
56  
57  
58  
59

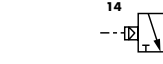

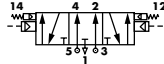
### HOW TO ORDER

#### SINGLE PRESSURE VALVES

Air spring	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
Internal	 MV-A2B-B111	 ----	 ----	 ----
External	MV-A2B-B121	MV-A2B-B221	MV-A2B-B322	MV-A2B-B321

700  
900

#### DUAL PRESSURE VALVES

Air spring	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal port 3	 MV-A2B-B131	 ----	 ----
Internal port 5	MV-A2B-B135	----	----
External	MV-A2B-B141	MV-A2B-B241	MV-A2B-B341

82  
6300  
6500  
6600

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

2700  
1800  
ISO 1  
ISO 2  
ISO 3

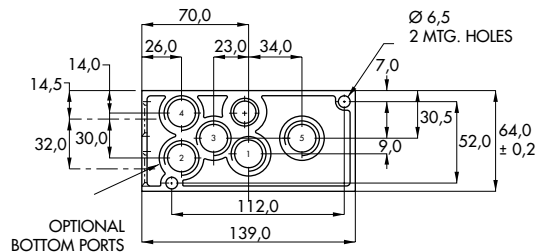
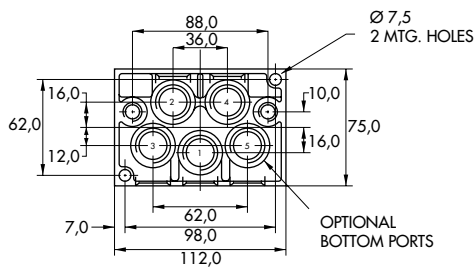
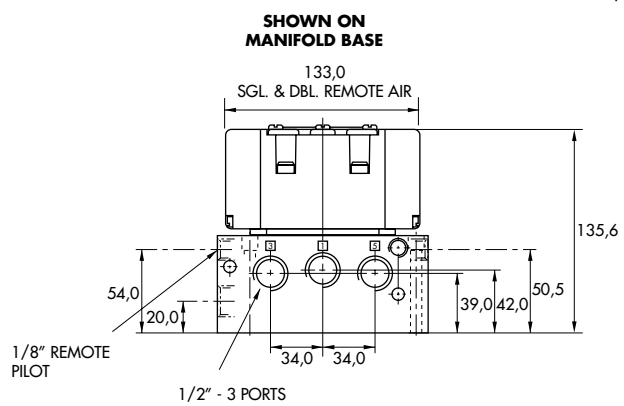
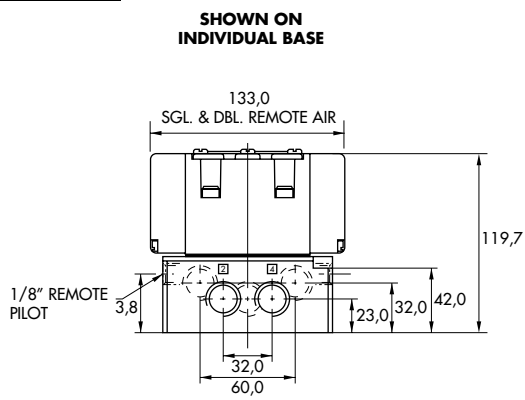
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Air signal pressure :</b>	Single operator and 3 positions : 25 to 150 PSI $\geq$ main valve pressure      Double operator : 10 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 $\mu$
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, <math>\Delta P=1\text{bar}</math>) :</b>	3/8" - 1/2" : (3.0 C <sub>v</sub> )

Spare parts :      • Remote air operator : R-A3004. • Pressure seal between valve and base : 16351. • Mounting screw body to base (x4) : 35412.

**DIMENSIONS**

Dimensions shown are metric (mm)  
Dimensions shown are metric (mm)





Individual mounting

Series

valve only	
------------	--

1100

55

56

57

58

59

700

900

82

6300

6500

6600

2700

1800

ISO 1

ISO 2

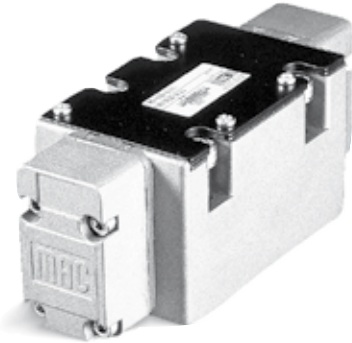
**ISO 3**



Function	Port size	Flow (Max)	Individual mounting	Series
<b>5/2 - 5/3</b>	<b>1/2" - 3/4"</b>	<b>6.3 C<sub>v</sub></b>	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.



1100  
55  
56  
57  
58  
59

**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-A3B-B111	-----	-----	-----
External	MV-A3B-B121	MV-A3B-B221	MV-A3B-B322	MV-A3B-B321

700  
900

**DUAL PRESSURE VALVES**

Air spring	5/2 Single operator	5/2 Double operator	5/3 Pressure center
Internal port 3	MV-A3B-B131	-----	-----
Internal port 5	MV-A3B-B135	-----	-----
External	MV-A3B-B141	MV-A3B-B241	MV-A3B-B341

82  
6300  
6500  
6600

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

2700  
1800  
ISO 1  
ISO 2  
**ISO 3**







Section 3 Mechanically and manually operated valves



Function	Port size	Flow (Max)
<b>3/2 - 2/2</b>	<b>1/8" - 1/4"</b>	<b>0.18 C<sub>v</sub></b>
<b>3/2 - 2/2</b>	<b>1/8" - 1/4"</b>	<b>0.14 C<sub>v</sub></b>
<b>5/2 - 5/3</b>	<b>1/4"</b>	<b>1.35 C<sub>v</sub></b>

Individual mounting	Manifold mounting	Series
Inline	sub-base	
P. 273	P. 275	1100
P. 279		1800



Individual mounting

Series

Inline	
--------	--

Manifold mounting

**1100**

sub-base	
----------	--

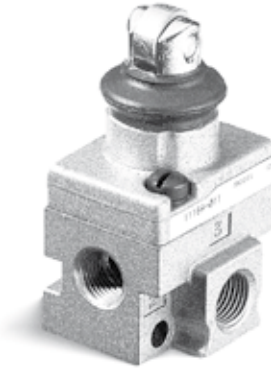
**1800**



Function	Port size	Flow (Max)	Individual mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8" - 1/4"</b>	<b>0.18 C<sub>v</sub></b>	Inline	

### OPERATIONAL BENEFITS

1. Short stroke with high flow.
2. Powerful return spring.



1100

1800

### HOW TO ORDER

Port size	Universal valve	NC only valve
<b>1/8" NPTF</b>	1111A- <b>XXX</b>	1161A- <b>XXX</b>
<b>1/4" NPTF</b>	1113A- <b>XXX</b>	1163A- <b>XXX</b>

### MECHANICAL OPERATOR >

**XXX**

Code	Description	Code	Description	Code	Description
<b>011</b>	Cam roller parallel to ports 1 & 2	<b>023</b>	Lever locking pull perpendicular to ports 1 & 2	<b>031</b>	Push button
<b>012</b>	Cam roller perpendicular to ports 1 & 2	<b>024</b>	Lever non-locking pull perpendicular to ports 1 & 2	<b>032</b>	Push button (panel mounting)
<b>013</b>	Lever cam perpendicular to ports 1 & 2	<b>025</b>	Lever locking push parallel to ports 1 & 2	<b>033</b>	Push button with guard
<b>014</b>	Lever cam parallel to ports 1 & 2	<b>026</b>	Lever non-locking push parallel to ports 1 & 2	<b>036</b>	Palm button
<b>021</b>	Lever locking push perpendicular to ports 1 & 2	<b>027</b>	Lever locking pull parallel to ports 1 & 2	<b>037</b>	Palm button (panel mounting)
<b>022</b>	Lever non-locking push perpendicular to ports 1 & 2	<b>028</b>	Lever non-locking pull parallel to ports 1 & 2	<b>038</b>	Palm button with guard



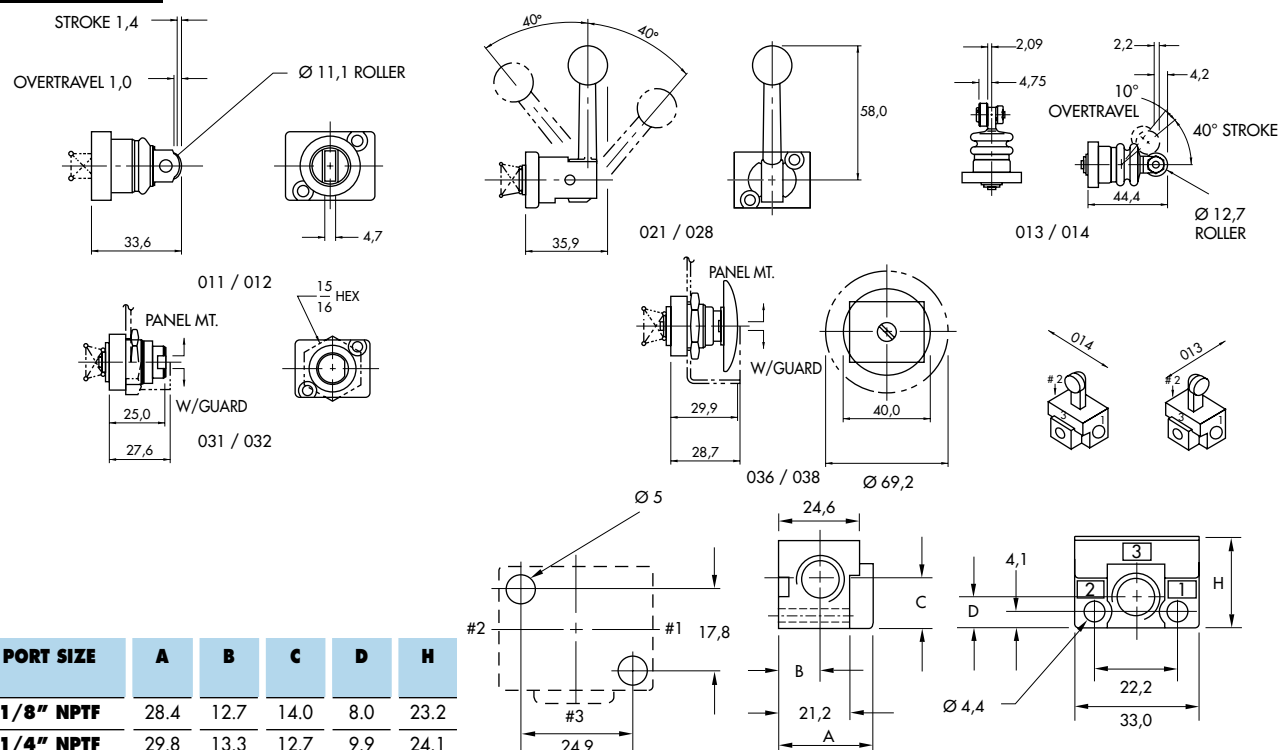
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/8" - 1/4" : (0.18-C <sub>v</sub> )

- Spare parts :      • Operator : 1100A-XXX (see codification).
- Options :            • BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



PORT SIZE	A	B	C	D	H
<b>1/8" NPTF</b>	28.4	12.7	14.0	8.0	23.2
<b>1/4" NPTF</b>	29.8	13.3	12.7	9.9	24.1

Function	Port size	Flow (Max)	Manifold mounting	Series
<b>3/2 NO-NC, 2/2 NO-NC</b>	<b>1/8"</b>	<b>0.14 C<sub>v</sub></b>	sub-base	

**OPERATIONAL BENEFITS**



1. Short stroke with high flow.
2. Powerful return spring.



**1100**


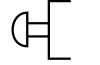

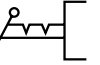

**1800**

**HOW TO ORDER**

Port size	Universal valve	NC only valve
		
<b>Valve less base</b>	1130A- <b>XXX</b>	1170A- <b>XXX</b>
<b>Sub-base 1/8" NPTF</b>	1132A- <b>XXX</b>	1172A- <b>XXX</b>

MECHANICAL OPERATOR >

**XXX**

Code	Description	Code	Description
<b>025</b>	Lever locking push parallel to ports 1 & 2 	<b>031</b>	Push button 
<b>026</b>	Lever non-locking push parallel to ports 1 & 2 	<b>028</b>	Lever non-locking pull parallel to ports 1 & 2 
<b>027</b>	Lever locking pull parallel to ports 1 & 2 		

End plate kit (Port size 1/4" NPTF) : A2-5004-01.

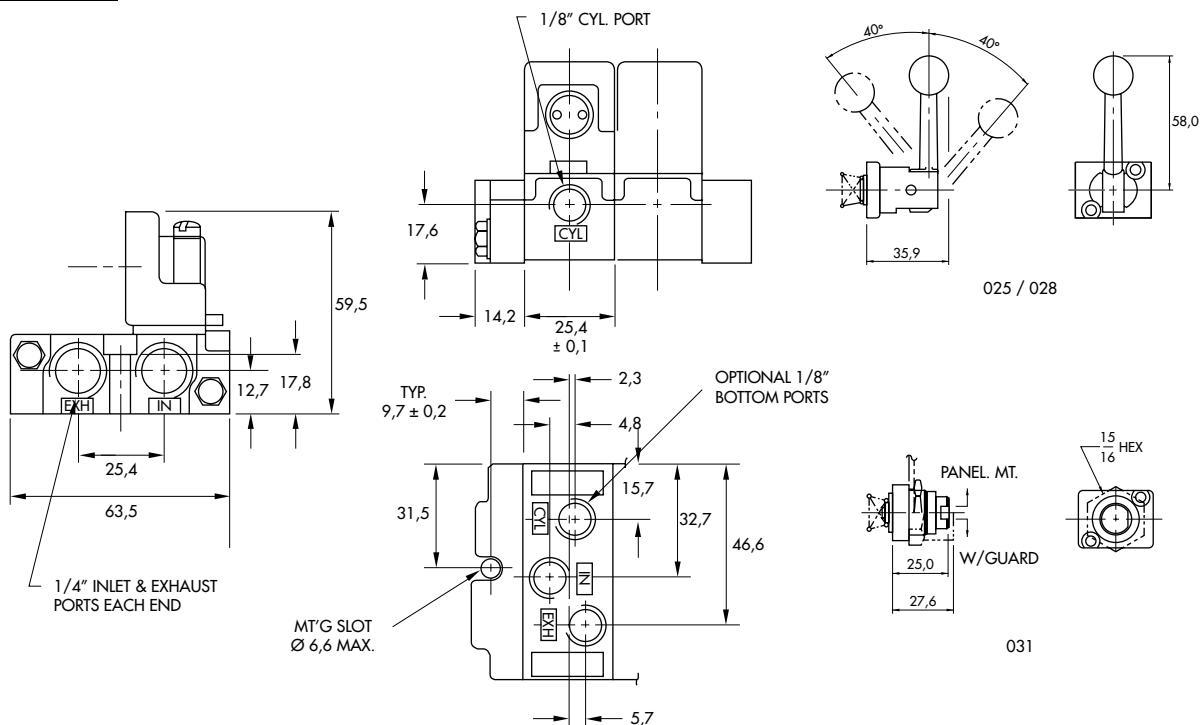
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, vacuum, inert gases
<b>Pressure range :</b>	Vacuum to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	1/8" : (0.14-C <sub>v</sub> )

- Spare parts :
- Operator : 1100A-XXX (see codification).
  - Function plate : A2-7009.
  - Pressure seal between bases : 16226.
  - Tie-rod (x2) : 19546.
- Options :
- BSPP threads.

**DIMENSIONS**

Dimensions shown are metric (mm)



Individual mounting

Series

Inline	
--------	--

1100

**1800**



Function	Port size	Flow (Max)	Individual mounting	Series
<b>5/2</b>	<b>1/4"</b>	<b>1.4 C<sub>v</sub></b>	Inline	

**OPERATIONAL BENEFITS**

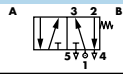
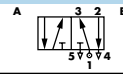
1. Short stroke with high flow.
2. Powerful return force.
3. Bonded spool with minimum friction, shifting in a glass-like finished bore.
4. Wiping effect eliminates sticking.
5. Long service life.



1100

1800

**HOW TO ORDER**

Port size	Single operator	Double operator
<b>1/4" NPTF</b>	 180001-112-xxxx	 18xxxx-112-xxxx

MECHANICAL OPERATOR >

**XXXX**

Code	Description	Code	Description	Code	Description
<b>0111</b>	Cam roller parallel to ports 2 & 3	<b>0024</b>	Lever non-locking pull perpendicular to body	<b>0033</b>	Push button with guard
<b>0112</b>	Cam roller perpendicular to ports 2 & 3	<b>0025</b>	Lever locking push parallel to body	<b>0034</b>	Push Pull
<b>0013</b>	Lever cam perpendicular to ports 2 & 3	<b>0026</b>	Lever non-locking push parallel to body	<b>0035</b>	Push Pull (panel mounting)
<b>0014</b>	Lever cam parallel to ports 2 & 3	<b>0027</b>	Lever locking pull parallel to body	<b>0036</b>	Palm button
<b>0021</b>	Lever locking push perpendicular to body	<b>0028</b>	Lever non-locking pull parallel to body	<b>0037</b>	Palm button (panel mounting)
<b>0022</b>	Lever non-locking push perpendicular to body	<b>0031</b>	Push button	<b>0038</b>	Palm button with guard
<b>0023</b>	Lever locking pull perpendicular to body	<b>0032</b>	Push button (panel mounting)	<b>0039</b>	Push Pull palm button

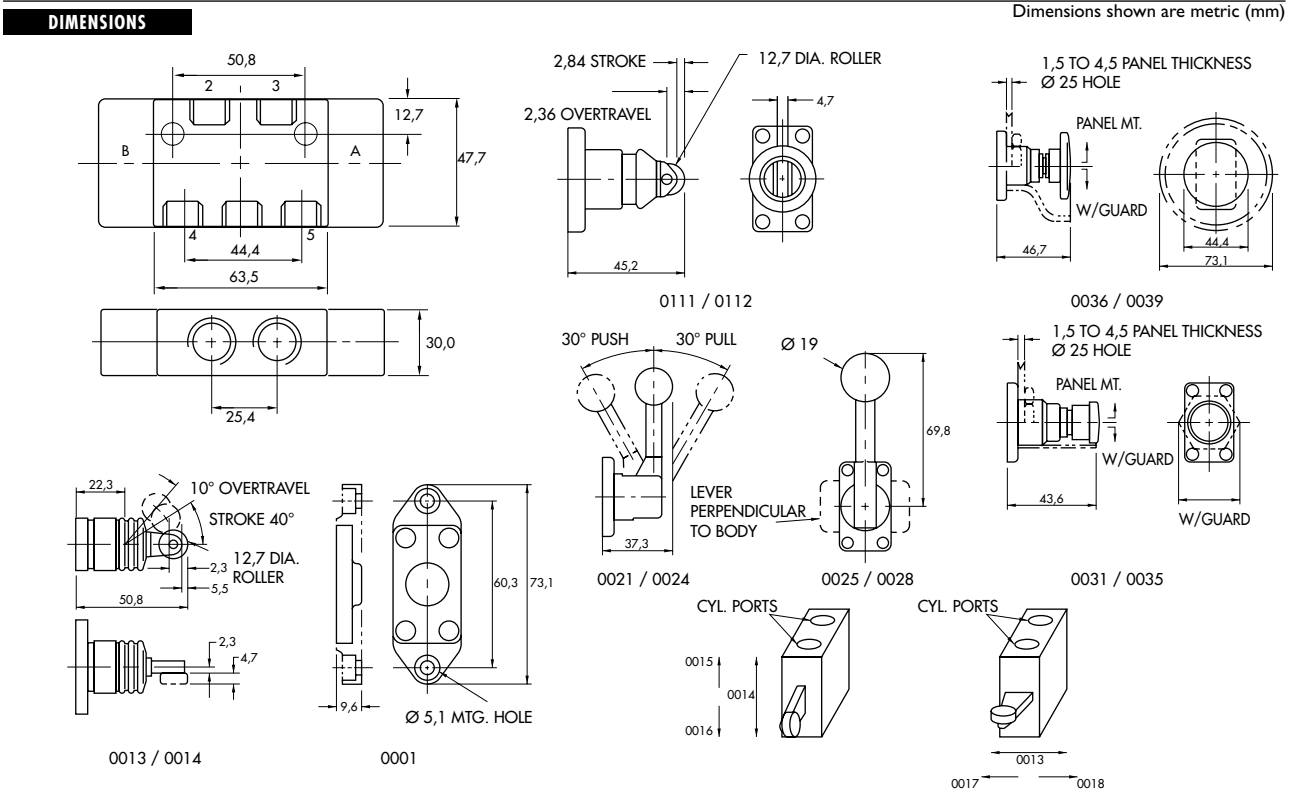
**OPTIONS**

002X

Replace 0 by 2 for lever operator with boot (see photo)

TECHNICAL DATA	
Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Vacuum to 200 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" : (1.4-C <sub>v</sub> )

- Spare parts :      • Operator : 18XXXX (see codification).
- Options :            • BSPP threads. • 3/8" ports (ports 1,2 & 3 - MOD. 0358 required).





## Section 4 Bases according to ISO 5599





			Series
ISO 1	ISO 2	ISO 3	
P. 285			<b>ISO 1</b>
	P. 287		<b>ISO 2</b>
		P. 289	<b>ISO 3</b>

**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
<b>1/4" NPTF</b>	MB-A1C-221	MB-A1C-223	MB-A1C-222	MB-A1C-224
<b>3/8" NPTF</b>	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
<b>1/4" NPTF</b>	MM-A1C-221	MM-A1C-223	MM-A1C-222	MM-A1C-224
<b>3/8" NPTF</b>	MM-A1C-231	MM-A1C-233	MM-A1C-232	MM-A1C-234

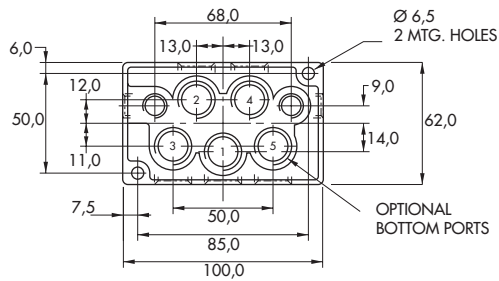
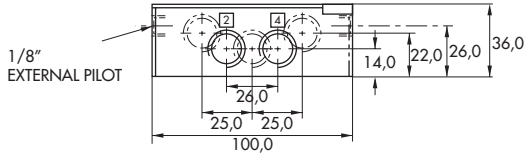
Manifold fastening kit : N-63002-01.

**DIMENSIONS**

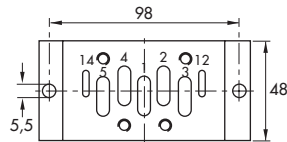
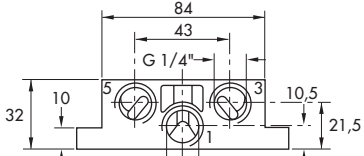
Dimensions shown are metric (mm)

Individual

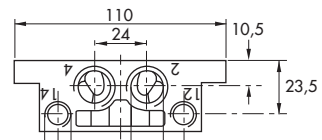
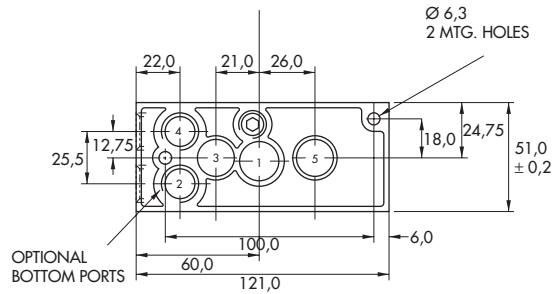
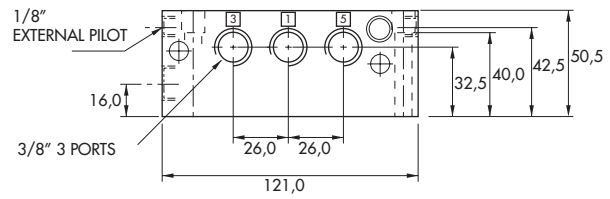
DIN 5599/1



VDMA



Manifold



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
<b>3/8" NPTF</b>	MB-A2B-221	MB-A2B-223	MB-A2B-222	MB-A2B-224
<b>1/2" NPTF</b>	MB-A2B-231	MB-A2B-233	MB-A2B-232	MB-A2B-234

MANIFOLD BASE

Port size	Side ports	Bottom ports	Bottom cylinder ports 2 and 4.	Bottom inlet port 1
<b>3/8" NPTF</b>	MM-A2B-221	MM-A2B-223	MM-A2B-222	MM-A2B-224
<b>1/2" NPTF</b>	MM-A2B-231	MM-A2B-233	MM-A2B-232	MM-A2B-234

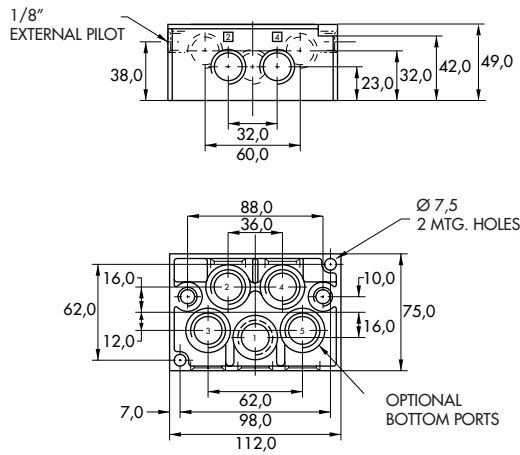
Manifold fastening kit : N-63002-01.

DIMENSIONS

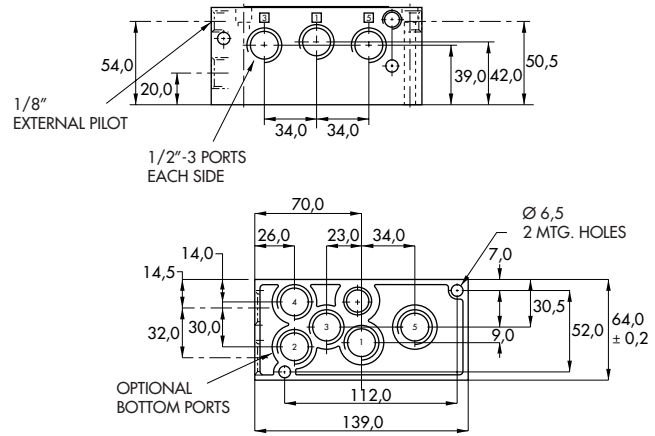
Dimensions shown are metric (mm)

Individual

DIN 5599/1



Manifold



Series

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
<b>1/2" NPTF</b>	MB-A3B-221	MB-A3B-223	MB-A3B-222	MB-A3B-224
<b>3/4" NPTF</b>	MB-A3B-231	MB-A3B-233	MB-A3B-232	MB-A3B-234

Options:

MB-A3B-XXXF

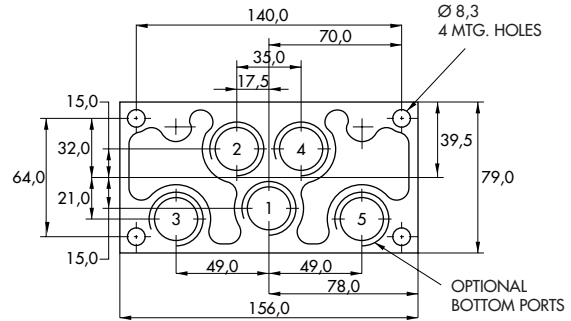
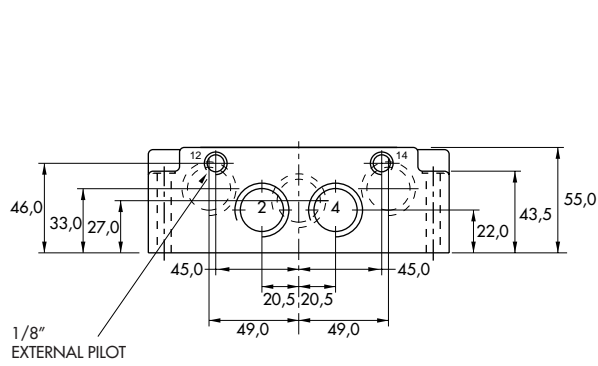
└ Optional Integral Flow Controls

**DIMENSIONS**

Dimensions shown are metric (mm)

Individual

ISO DIN 5599/1





Section 5 Interchangable sub-bases and manifolds





# Interchangable sub-bases and manifolds

			Series
MAC 125	MAC 250	MAC 500	
P. 295			<b>MAC 125</b>
	P. 297		<b>MAC 250</b>
		P. 299	<b>MAC 500</b>

**MAC 125**

**MAC 250**

**MAC 500**



**HOW TO ORDER**

INDIVIDUAL BASE

Port size	Side ports
<b>1/4" NPTF</b>	MAC125A-B21A
<b>3/8" NPTF</b>	MAC125A-B31A

MANIFOLD BASE

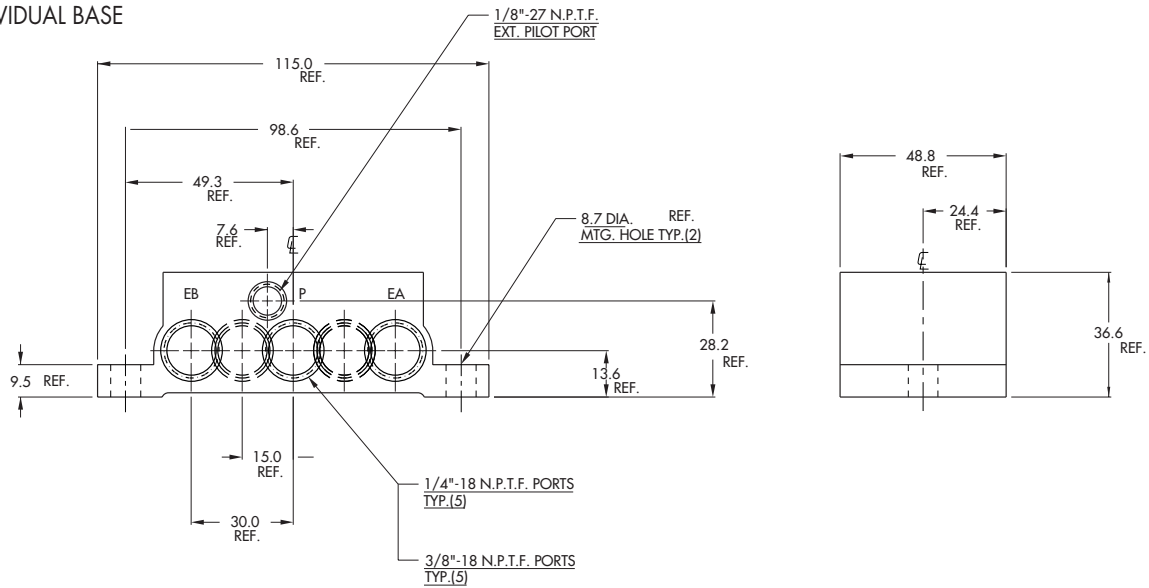
Port size	Bottom cylinder ports	Side & bottom cylinder ports
<b>1/4" NPTF</b>	MAC125A-M21B	MAC125A-M21C
<b>3/8" NPTF</b>	MAC125A-M31B	MAC125A-M31C

Manifold fastening kit : M-12001-01 (3/8" NPTF)

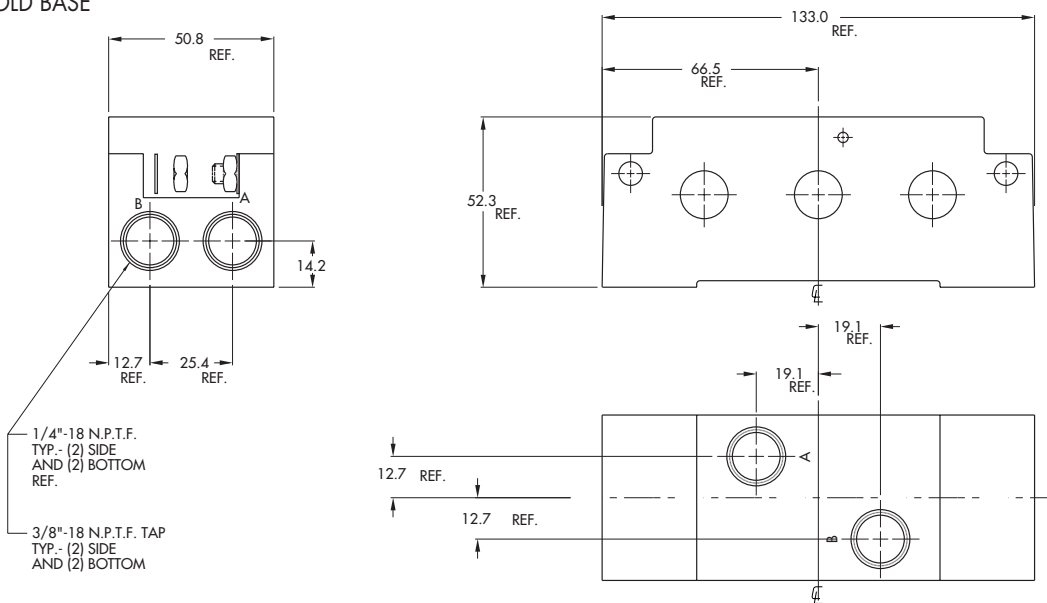
**DIMENSIONS**

Dimensions shown are metric (mm)

**INDIVIDUAL BASE**



**MANIFOLD BASE**





MAC 125

MAC 250

MAC 500

**HOW TO ORDER**

INDIVIDUAL BASE

Port size	Side ports
<b>1/2" NPTF</b>	MAC250A-B21A
<b>3/4" NPTF</b>	MAC250A-B31A
<b>1" NPTF</b>	MAC250A-B41A

MANIFOLD BASE

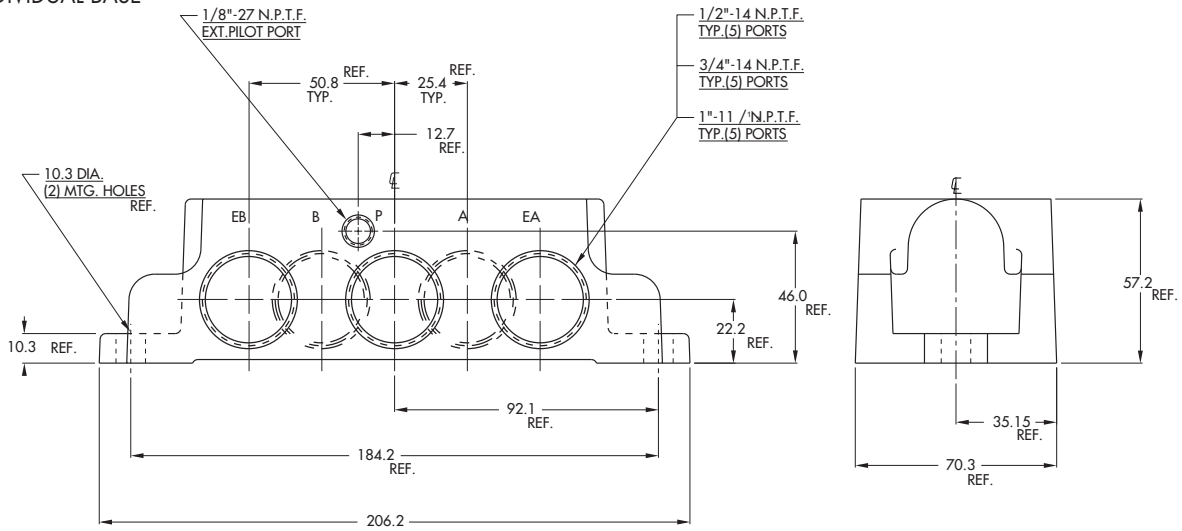
Port size	Bottom cylinder ports	Side & bottom cylinder ports
<b>1/2" NPTF</b>	MAC250A-M21B	MAC250A-M21C
<b>3/4" NPTF</b>	MAC250A-M31B	MAC250A-M31C

Manifold fastening kit : M-25001-01 (only required for manifolds with side & bottom cylinder ports)

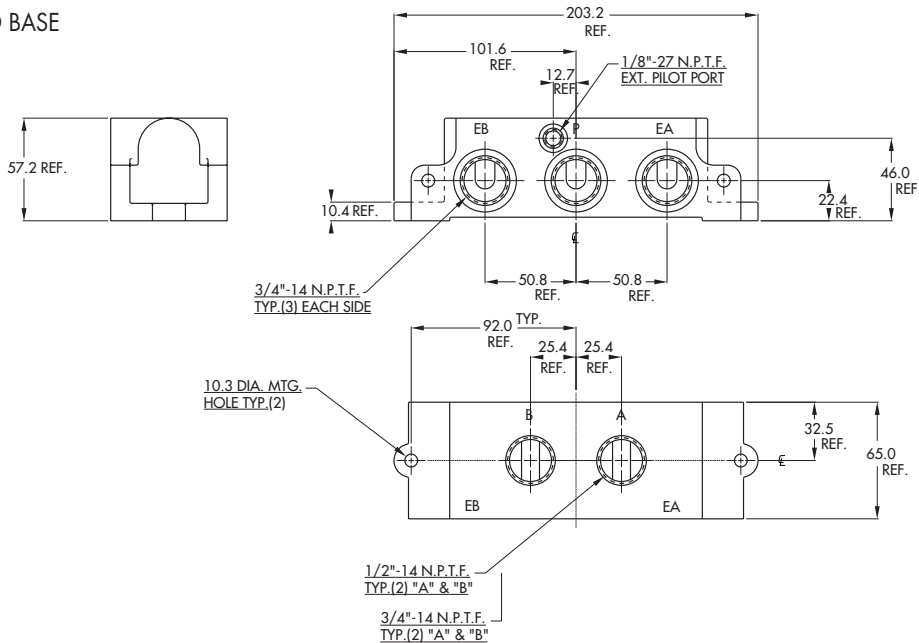
**DIMENSIONS**

Dimensions shown are metric (mm)

**INDIVIDUAL BASE**



**MANIFOLD BASE**



Series

MAC 125  
 MAC 250  
**MAC 500**



**HOW TO ORDER**

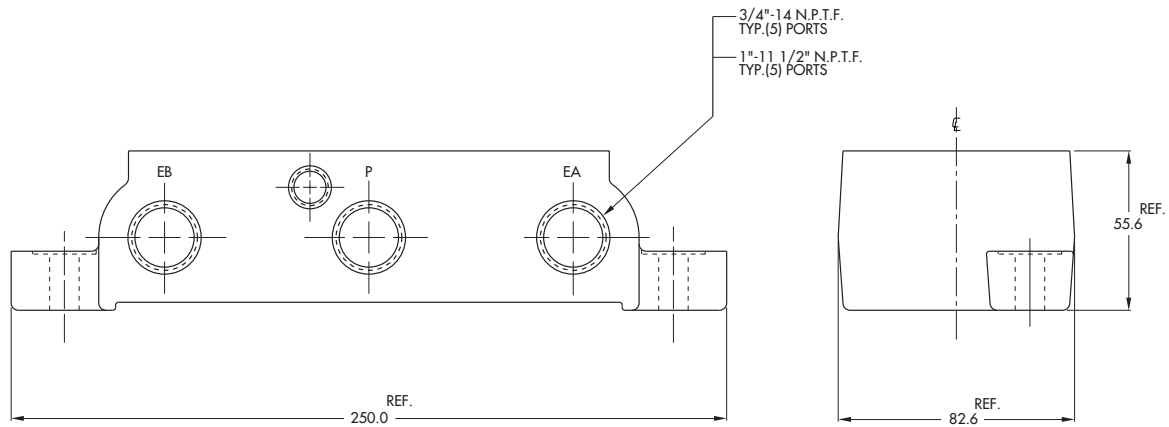
INDIVIDUAL BASE

Port size	Side ports
<b>3/4" NPTF</b>	MAC500A-B21A
<b>1" NPTF</b>	MAC500A-B31A

**DIMENSIONS**

Dimensions shown are metric (mm)

INDIVIDUAL BASE





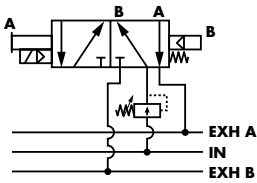
Section 6 Pressure regulators

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# Manual adjust

Single regulator  
Single pressure

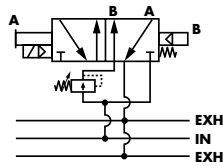


P. 305

P. 309

P. 313

Single regulator  
Dual pressure

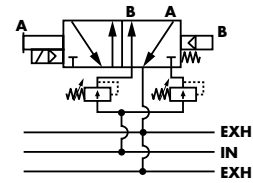


P. 305

P. 309

P. 313

Dual regulator  
Dual pressure

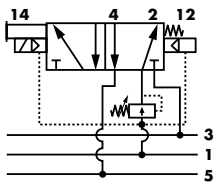


P. 305

P. 309

P. 313

Single regulator  
Single pressure

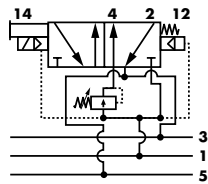


P. 317

P. 321

P. 325

Single regulator  
Dual pressure

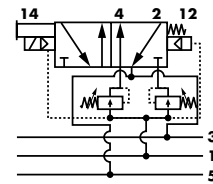


P. 317

P. 321

P. 325

Dual regulator  
Dual pressure

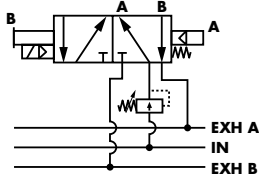


P. 317

P. 321

P. 325

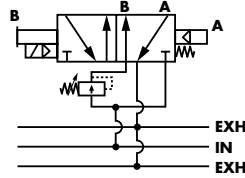
Single regulator  
Single pressure



P. 329

P. 333

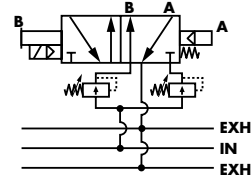
Single regulator  
Dual pressure



P. 329

P. 333

Dual regulator  
Dual pressure



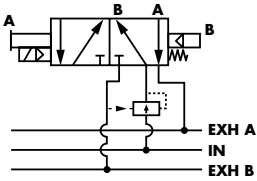
P. 329

P. 333

# Air adjust

Series

Single regulator  
Single pressure

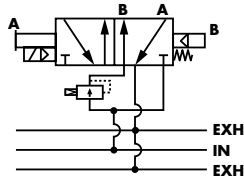


P. 307

P. 311

P. 315

Single regulator  
Dual pressure

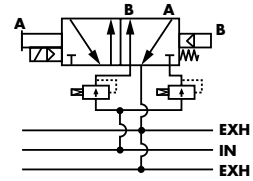


P. 307

P. 311

P. 315

Dual regulator  
Dual pressure



P. 307

P. 311

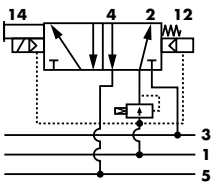
P. 315

**PR82A**

**PR63D**

**PR65C**

Single regulator  
Single pressure

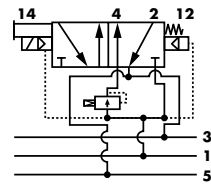


P. 319

P. 323

P. 327

Single regulator  
Dual pressure

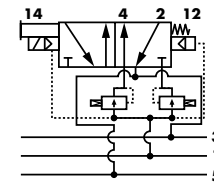


P. 319

P. 323

P. 327

Dual regulator  
Dual pressure



P. 319

P. 323

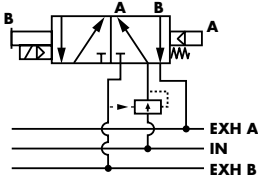
P. 327

**PRA1A**

**PRA2D**

**PRA3C**

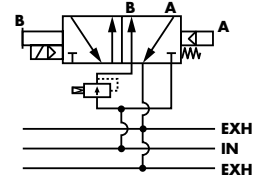
Single regulator  
Single pressure



P. 331

P. 335

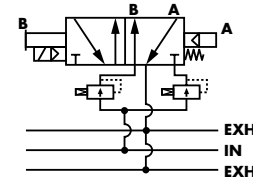
Single regulator  
Dual pressure



P. 331

P. 335

Dual regulator  
Dual pressure



P. 331

P. 335

**PR125A**

**PR250B**

**Sandwich pressure regulator with manual adjust locking 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**

REGULATORS FOR "PLUG-IN" VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
<b>No gauge</b>	PR82A-GADA	PR82A-GCDA	PR82A-GBDA	PR82A-GDDA
<b>Gauge parallel to regulator</b>	PR82A-GACA	PR82A-GCCA	PR82A-GBCA	PR82A-GDCA
<b>Gauge perpendicular to regulator</b>	PR82A-GABA	PR82A-GCBA	PR82A-GBBA	PR82A-GDBA

REGULATORS FOR "NON PLUG-IN" AND REMOTE AIR VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
<b>No gauge</b>	PR82A-HADA	PR82A-HCDA	PR82A-HBDA	PR82A-HDDA
<b>Gauge parallel to regulator</b>	PR82A-HACA	PR82A-HCCA	PR82A-HBCA	PR82A-HDCA
<b>Gauge perpendicular to regulator</b>	PR82A-HABA	PR82A-HCBA	PR82A-HBBA	PR82A-HDBA

**PRA1A**  
**PRA2D**  
**PRA3C**

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

\* To be used with dual pressure valves.

**ADJUSTMENT OPTIONS**

PR82A-**xxxx**

- Replace by A for "plug-in" with slotted stem adjustment.
- Replace by B for "non plug-in" with slotted stem adjustment.
- Replace by K for "plug-in" with locking slotted stem adjustment.
- Replace by L for "non plug-in" with locking slotted stem adjustment.

\*\* **SELECTOR OPTIONS** selects pressure to inlet of adjacent valve.

PR82A-**xxxx**

- Replace by S for dual regulators.
- Replace by T for regulator on "B" end with by-pass on "A" end.

\*\* This option must be used with a single pressure valve and selector manifold base.

**PR125A**  
**PR250B**

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 120 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	(1.08 C <sub>v</sub> )

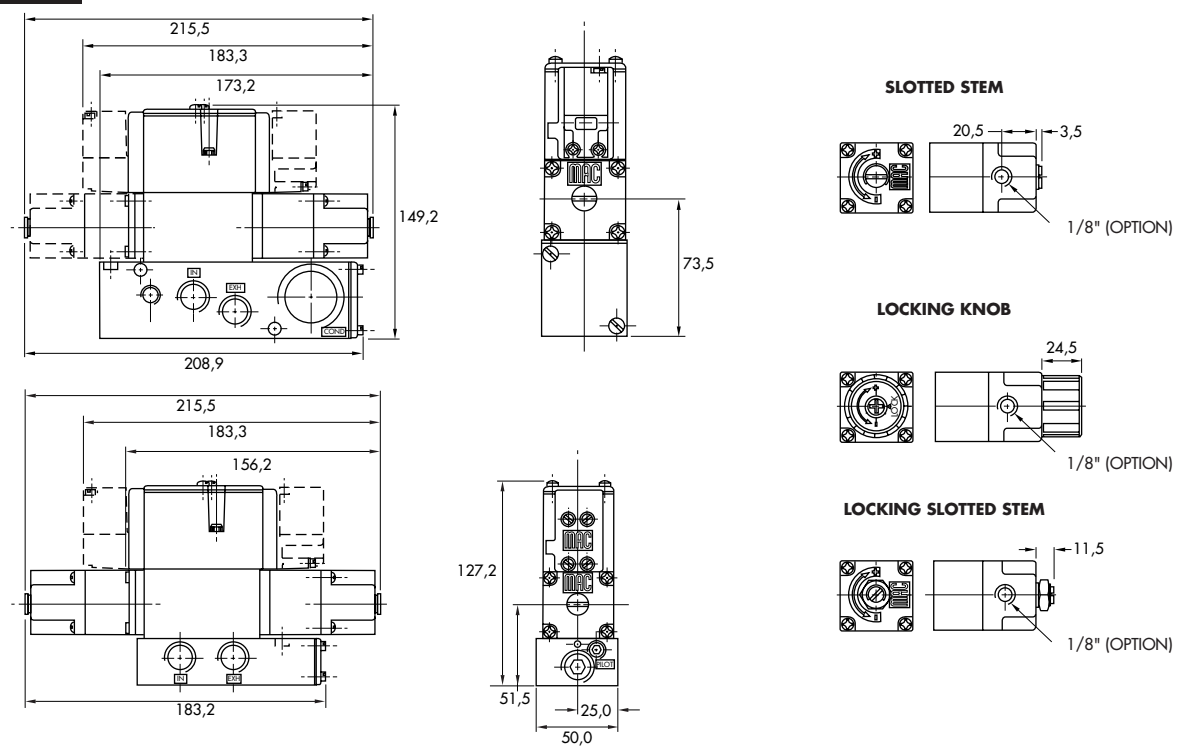
- Spare parts :
- Pressure regulator (less sandwich block) : PR82A-J0AA (KNOB), PR82A-C0AA (SLOTTED STEM), PR82A-M0AA (LOCKING SLOTTED STEM).
  - Gauges : N-82016-01 (0-120 PSI perpendicular)  
 N-82016-02 (0-120 PSI parallel)  
 N-82016-03 (0-80 PSI perpendicular)  
 N-82016-04 (0-80 PSI parallel)  
 N-82016-05 (0-30 PSI perpendicular)  
 N-82016-06 (0-30 PSI parallel)

Regulating range options : PR82A-XXXX

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

REGULATORS FOR "PLUG-IN" VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
<b>No gauge</b>	PR82A-DADA	PR82A-DCDA	PR82A-DBDA	PR82A-DDDA
<b>Gauge parallel to regulator</b>	PR82A-DACA	PR82A-DCCA	PR82A-DBCA	PR82A-DDCA
<b>Gauge perpendicular to regulator</b>	PR82A-DABA	PR82A-DCBA	PR82A-DBBA	PR82A-DDBA

REGULATORS FOR "NON PLUG-IN" AND REMOTE AIR VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
<b>No gauge</b>	PR82A-EADA	PR82A-ECDA	PR82A-EBDA	PR82A-EDDA
<b>Gauge parallel to regulator</b>	PR82A-EACA	PR82A-ECCA	PR82A-EBCA	PR82A-EDCA
<b>Gauge perpendicular to regulator</b>	PR82A-EABA	PR82A-ECBA	PR82A-EBBA	PR82A-EDBA

\* To be used with dual pressure valves.

**PRA1A**  
**PRA2D**  
**PRA3C**

**PR125A**  
**PR250B**

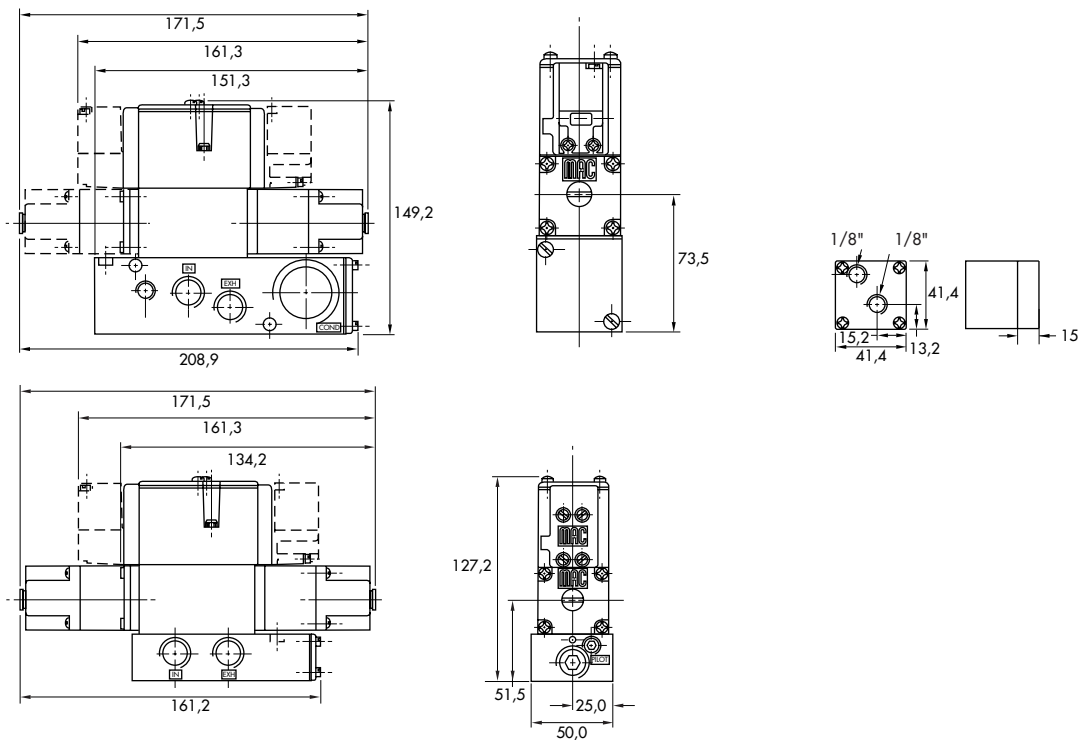
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	(1.08 C <sub>v</sub> )

- Spare parts :
- Pressure regulator (less sandwich block) : PR82A-FOAA.
  - Gauges : N-82016-01 (0-120 PSI perpendicular)  
N-82016-02 (0-120 PSI parallel)

**DIMENSIONS**

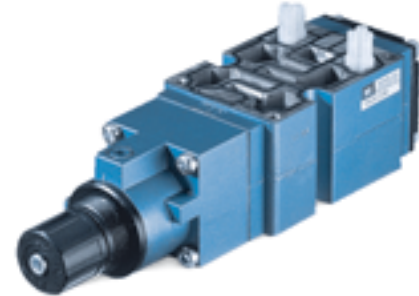
Dimensions shown are metric (mm)



**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**

REGULATORS FOR "PLUG-IN" VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port B *	Dual pressure Regulator B end Regulated pressure to port A *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
No gauge	PR63D-22AA	PR63D-21AA	PR63D-24AA	PR63D-23AA	PR63D-25AA
Glycerine filled gauge on regulator(s)	PR63D-22BA	PR63D-21BA	PR63D-24BA	PR63D-23BA	PR63D-25DA
Glycerine filled gauge opposite to regulator	PR63D-22CA	PR63D-21CA	PR63D-24CA	PR63D-23CA	-----
Non-filled gauge on regulator(s)	PR63D-22FA	PR63D-21FA	PR63D-24FA	PR63D-23FA	PR63D-25HA
Non-filled gauge opposite to regulator	PR63D-22GA	PR63D-21GA	PR63D-24GA	PR63D-23GA	-----

Note : above models are coded for use with double solenoid plug-in valves.

REGULATORS FOR "NON PLUG-IN" AND REMOTE AIR VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port B *	Dual pressure Regulator B end Regulated pressure to port A *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
No gauge	PR63D-32AA	PR63D-31AA	PR63D-34AA	PR63D-33AA	PR63D-35AA
Glycerine filled gauge on regulator(s)	PR63D-32BA	PR63D-31BA	PR63D-34BA	PR63D-33BA	PR63D-35DA
Glycerine filled gauge opposite to regulator	PR63D-32CA	PR63D-31CA	PR63D-34CA	PR63D-33CA	-----
Non-filled gauge on regulator(s)	PR63D-32FA	PR63D-31FA	PR63D-34FA	PR63D-33FA	PR63D-35HA
Non-filled gauge opposite to regulator	PR63D-32GA	PR63D-31GA	PR63D-34GA	PR63D-33GA	-----

Note : regulating range for above models is 0-150 PSI.  
For other ranges see technical data page.

\* To be used with dual pressure valves (manifolds only).

**PLUG-IN OPTIONS**

PR63D-xxxx  
- Replace by 1 for single solenoid plug-in with knob adjustment.

**ADJUSTMENT OPTIONS**

PR63D-xxxx  
- Replace by A for slotted stem adjustment for single solenoid plug-in.

- Replace by B for slotted stem adjustment for double solenoid plug-in.
- Replace by C for slotted stem adjustment for non plug-in valves.
- Replace by E for slotted stem with locknut for single solenoid plug-in.
- Replace by F for slotted stem with locknut for double solenoid plug-in.
- Replace by G for slotted stem with locknut for non plug-in valves.

Consult "Precautions" page 364 before use, installation or service of MAC Valves

**PRA1A**  
**PRA2D**  
**PRA3C**

**PR125A**  
**PR250B**

**TECHNICAL DATA**

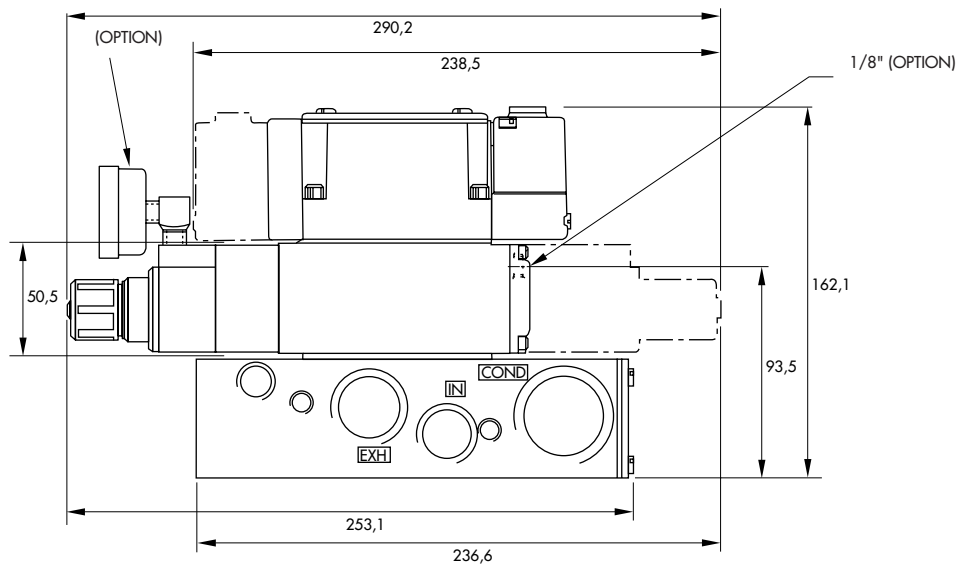
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	(2.4 C <sub>v</sub> )

Spare parts :  
 • Pressure regulator (less sandwich block) : PR63D-41AA (KNOB), PR63D-D1AA (SLOTTED STEM), PR63D-H1AA (SLOTTED STEM WITH LOCKNUT).  
 • Gauges : • Glycerine filled : N-62015-01  
 • Non filled : N-62016-01

Regulating range options : PR63D-XXXX  
 — Replace by B - 0 to 100 PSI  
 — Replace by C - 0 to 45 PSI

**DIMENSIONS**

Dimensions shown are metric (mm)

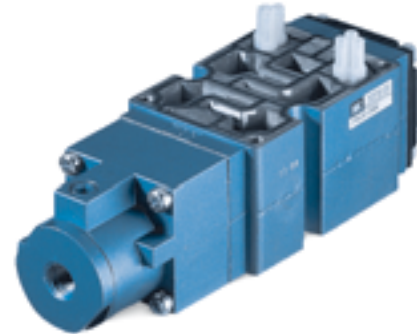




**Sandwich pressure regulator with air pilot adjust.**

**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**

REGULATORS FOR "PLUG-IN" VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port B *	Dual pressure Regulator B end Regulated pressure to port A *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
No gauge	PR63D-2BAA	PR63D-2AAA	PR63D-2DAA	PR63D-2CAA	PR63D-2EAA
Glycerine filled gauge on regulator(s)	PR63D-2BBA	PR63D-2ABA	PR63D-2DBA	PR63D-2CBA	PR63D-2EDA
Glycerine filled gauge opposite to regulator	PR63D-2BCA	PR63D-2ACA	PR63D-2DCA	PR63D-2CCA	-----
Non-filled gauge on regulator(s)	PR63D-2BFA	PR63D-2AFA	PR63D-2DFA	PR63D-2CFA	PR63D-2EHA
Non-filled gauge opposite to regulator	PR63D-2BGA	PR63D-2AGA	PR63D-2DGA	PR63D-2CGA	-----

Note : above models are coded for use with double solenoid plug-in valves.

REGULATORS FOR "NON PLUG-IN" AND REMOTE AIR VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port B *	Dual pressure Regulator B end Regulated pressure to port A *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
No gauge	PR63D-3BAA	PR63D-3AAA	PR63D-3DAA	PR63D-3CAA	PR63D-3EAA
Glycerine filled gauge on regulator(s)	PR63D-3BBA	PR63D-3ABA	PR63D-3DBA	PR63D-3CBA	PR63D-3EDA
Glycerine filled gauge opposite to regulator	PR63D-3BCA	PR63D-3ACA	PR63D-3DCA	PR63D-3CCA	-----
Non-filled gauge on regulator(s)	PR63D-3BFA	PR63D-3AFA	PR63D-3DFA	PR63D-3CFA	PR63D-3EHA
Non-filled gauge opposite to regulator	PR63D-3BGA	PR63D-3AGA	PR63D-3DGA	PR63D-3CGA	-----

\* To be used with dual pressure valves (available only on manifolds).

**PLUG-IN OPTIONS**

PR63D-**x**xxx

- Replace by 1 for single solenoid plug-in.

**PRA1A**  
**PRA2D**  
**PRA3C**

**PR125A**  
**PR250B**

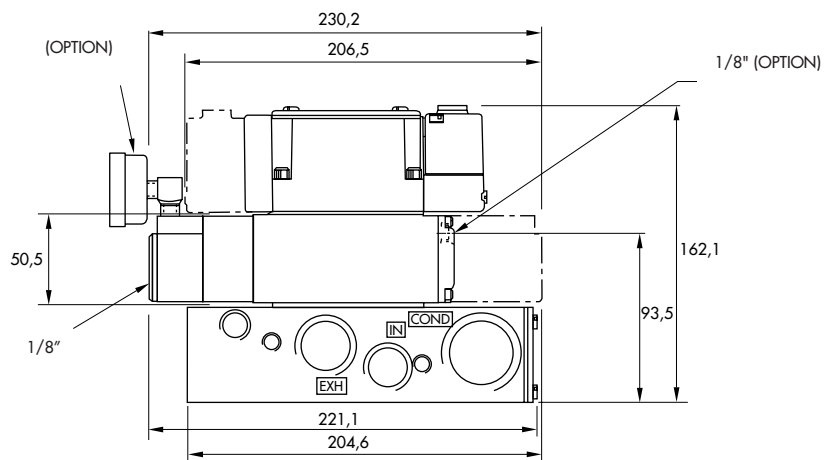
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	(2.4 C <sub>v</sub> )

- Spare parts :
- Pressure regulator (less sandwich block) : PR63D-4AAA.
  - Gauges :
    - Glycerine filled : N-62015-01
    - Non filled : N-62016-01

**DIMENSIONS**

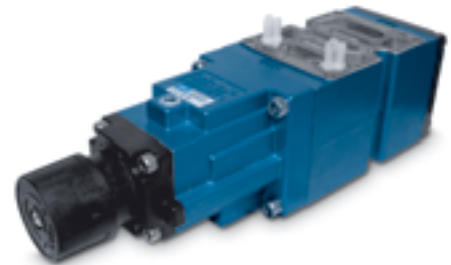
Dimensions shown are metric (mm)



**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**

REGULATORS FOR "PLUG-IN" VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port B	Dual pressure Regulator B end Regulated pressure to port A	Dual pressure Dual regulator Two regulated pressures to ports A and B
No gauge	PR65C-22AA	PR65C-21AA	PR65C-24AA	PR65C-23AA	PR65C-25AA
Glycerine filled gauge on regulator(s)	PR65C-22BA	PR65C-21BA	PR65C-24BA	PR65C-23BA	PR65C-25DA
Glycerine filled gauge opposite to regulator	PR65C-22CA	PR65C-21CA	PR65C-24CA	PR65C-23CA	-----
Non-filled gauge on regulator(s)	PR65C-22FA	PR65C-21FA	PR65C-24FA	PR65C-23FA	PR65C-25HA
Non-filled gauge opposite to regulator	PR65C-22GA	PR65C-21GA	PR65C-24GA	PR65C-23GA	-----

Note : above models are coded for use with double solenoid plug-in valves.

REGULATORS FOR "NON PLUG-IN" AND REMOTE AIR VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port B	Dual pressure Regulator B end Regulated pressure to port A	Dual pressure Dual regulator Two regulated pressures to ports A and B
No gauge	PR65C-32AA	PR65C-31AA	PR65C-34AA	PR65C-33AA	PR65C-35AA
Glycerine filled gauge on regulator(s)	PR65C-32BA	PR65C-31BA	PR65C-34BA	PR65C-33BA	PR65C-35DA
Glycerine filled gauge opposite to regulator	PR65C-32CA	PR65C-31CA	PR65C-34CA	PR65C-33CA	-----
Non-filled gauge on regulator(s)	PR65C-32FA	PR65C-31FA	PR65C-34FA	PR65C-33FA	PR65C-35HA
Non-filled gauge opposite to regulator	PR65C-32GA	PR65C-31GA	PR65C-34GA	PR65C-33GA	-----

Note : regulating range for above models is 0-150 PSI.  
For other ranges see technical data page.

**PLUG-IN OPTIONS**

PR65C-xxxx  
- Replace by 1 for single solenoid plug-in with knob adjustment.

**ADJUSTMENT OPTIONS**

- PR65C-xxxx
- Replace by A for slotted stem adjustment for single solenoid plug-in.
  - Replace by B for slotted stem adjustment for double solenoid plug-in.
  - Replace by C for slotted stem adjustment for non plug-in valves.
  - Replace by E for slotted stem with locknut for single solenoid plug-in.
  - Replace by F for slotted stem with locknut for double solenoid plug-in.
  - Replace by G for slotted stem with locknut for non plug-in valves.

Consult "Precautions" page 364 before use, installation or service of MAC Valves

**PRA1A**  
**PRA2D**  
**PRA3C**

**PR125A**  
**PR250B**

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow (at 6 bar, ΔP=1bar) :</b>	(4.0 C <sub>v</sub> )

Spare parts :

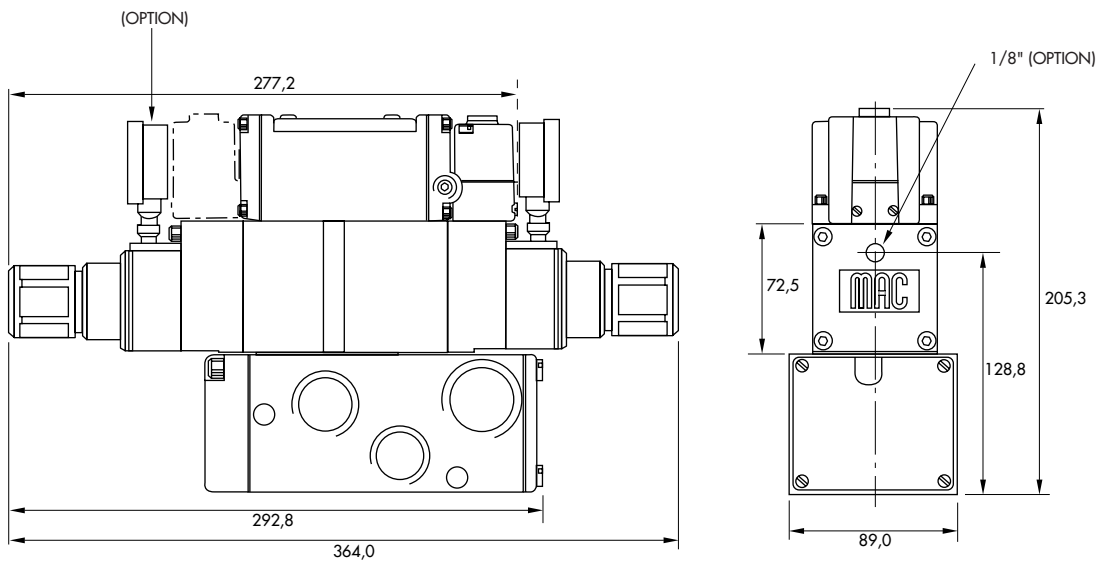
- Pressure regulator (less sandwich block) : PR65C-41AA (KNOB), PR65C-D1AA (SLOTTED STEM), PR65C-H1AA (SLOTTED STEM WITH LOCKNUT).
- Gauges : • Glycerine filled : N-62015-01  
• Non filled : N-62016-01

Regulating range options : PR65C-XXXX

- Replace by B - 0 to 100 PSI
- Replace by C - 0 to 45 PSI

**DIMENSIONS**

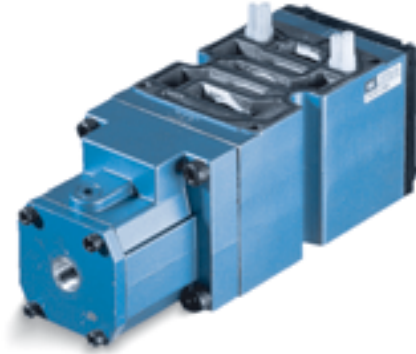
Dimensions shown are metric (mm)



**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**

REGULATORS FOR "PLUG-IN" VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port B	Dual pressure Regulator B end Regulated pressure to port A	Dual pressure Dual regulator Two regulated pressures to ports A and B
No gauge	PR65C-2BAA	PR65C-2AAA	PR65C-2DAA	PR65C-2CAA	PR65C-2EAA
Glycerine filled gauge on regulator(s)	PR65C-2BBA	PR65C-2ABA	PR65C-2DBA	PR65C-2CBA	PR65C-2EDA
Glycerine filled gauge opposite to regulator	PR65C-2BCA	PR65C-2ACA	PR65C-2DCA	PR65C-2CCA	-----
Non-filled gauge on regulator(s)	PR65C-2BFA	PR65C-2AFA	PR65C-2DFA	PR65C-2CFA	PR65C-2EHA
Non-filled gauge opposite to regulator	PR65C-2BGA	PR65C-2AGA	PR65C-2DGA	PR65C-2CGA	-----

Note : above models are coded for use with double solenoid plug-in valves.

REGULATORS FOR "NON PLUG-IN" AND REMOTE AIR VALVES

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port B	Dual pressure Regulator B end Regulated pressure to port A	Dual pressure Dual regulator Two regulated pressures to ports A and B
No gauge	PR65C-3BAA	PR65C-3AAA	PR65C-3DAA	PR65C-3CAA	PR65C-3EAA
Glycerine filled gauge on regulator(s)	PR65C-3BBA	PR65C-3ABA	PR65C-3DBA	PR65C-3CBA	PR65C-3EDA
Glycerine filled gauge opposite to regulator	PR65C-3BCA	PR65C-3ACA	PR65C-3DCA	PR65C-3CCA	-----
Non-filled gauge on regulator(s)	PR65C-3BFA	PR65C-3AFA	PR65C-3DFA	PR65C-3CFA	PR65C-3EHA
Non-filled gauge opposite to regulator	PR65C-3BGA	PR65C-3AGA	PR65C-3DGA	PR65C-3CGA	-----

**PRA1A**  
**PRA2D**  
**PRA3C**

**PLUG-IN OPTIONS**

PR65C-xxxx

- Replace by 1 for single solenoid plug-in.

**PR125A**  
**PR250B**

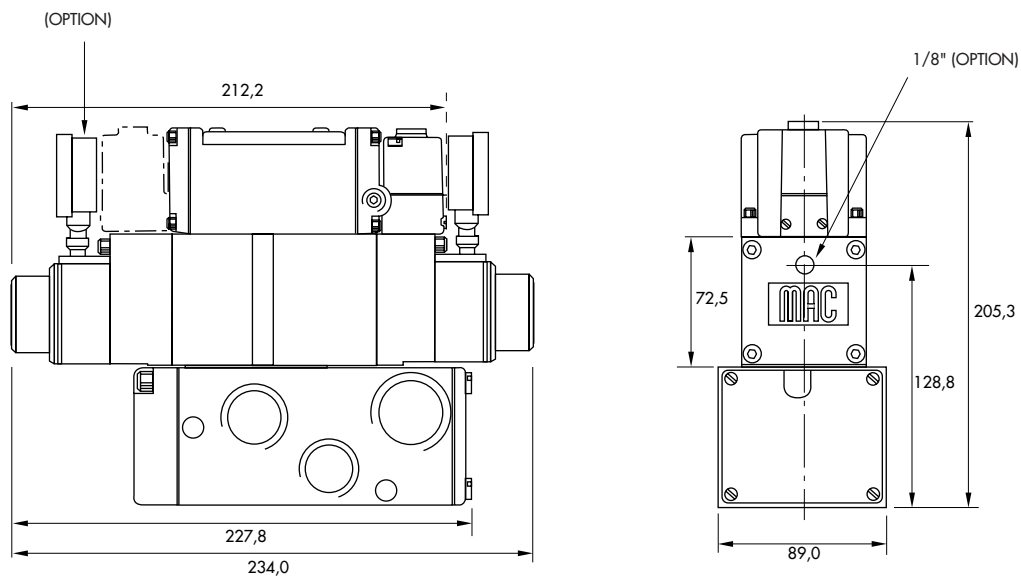
TECHNICAL DATA

Fluid :	Compressed air, inert gases
Pressure range :	0 to 150 PSI
Regulating range :	0 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, ΔP=1bar) :	(4.0 C <sub>v</sub> )

- Spare parts :
- Pressure regulator (less sandwich block) : PR65C-4AAA.
  - Gauges :
    - Glycerine filled : N-62015-01
    - Non filled : N-62016-01

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

**PRA1A**  
**PRA2D**  
**PRA3C**

\* - 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)  
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.

**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)

**PR125A**  
**PR250B**

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 120 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	(1.0 C <sub>v</sub> )

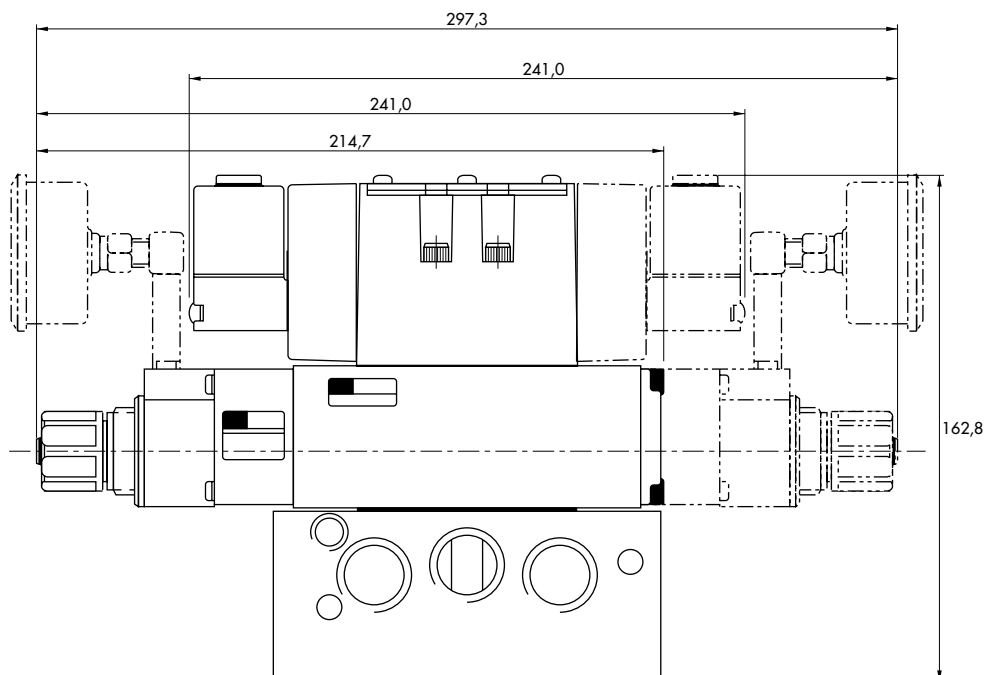
- Spare parts :
- Pressure regulator (less sandwich block) : PRA1A-J0AA (KNOB), PRA1A-C0AA (SLOTTED STEM), PRA1A-M0AA (SLOTTED STEM WITH LOCKNUT).
  - Gauges : N-82016-01 (0-120 PSI perpendicular)  
 N-82016-02 (0-120 PSI parallel)  
 N-82016-03 (0-80 PSI perpendicular)  
 N-82016-04 (0-80 PSI parallel)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

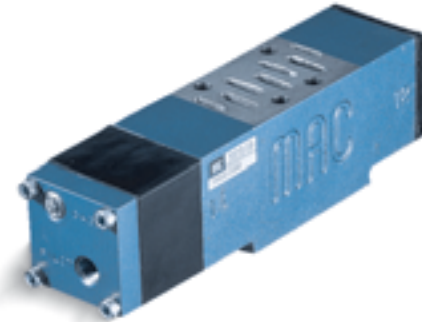




**Sandwich pressure regulator with air pilot adjust.**

**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

**PRA1A**  
**PRA2D**  
**PRA3C**

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.

**PR125A**  
**PR250B**

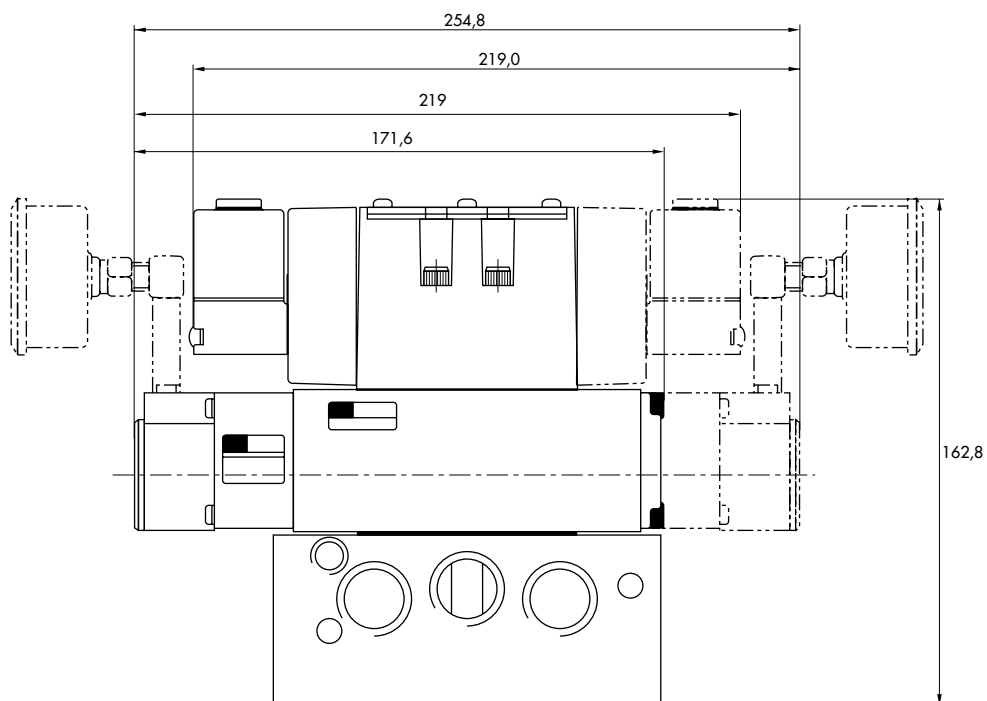
**TECHNICAL DATA**

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

- 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)



**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	PRA2D-1AAA	PRA2D-1EAA	PRA2D-1BAA	PRA2D-1FAA	PRA2D-1JAA
Non-filled gauge on regulator(s)	PRA2D-1ADA	PRA2D-1EDA	PRA2D-1BDA	PRA2D-1FDA	PRA2D-1JEA
Non-filled gauge opposite to regulator	PRA2D-1CDA	PRA2D-1GDA	PRA2D-1DDA	PRA2D-1HDA	----
Glycerine filled gauge on regulator(s)	PRA2D-1ABA	PRA2D-1EBA	PRA2D-1BBA	PRA2D-1FBA	PRA2D-1JCA
Glycerine filled gauge opposite to regulator	PRA2D-1CBA	PRA2D-1GBA	PRA2D-1DBA	PRA2D-1HBA	----

**PRA1A**  
**PRA2D**  
**PRA3C**

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	PRA2D-2AAA	PRA2D-2EAA	PRA2D-2BAA	PRA2D-2FAA	PRA2D-2JAA
Non-filled gauge on regulator(s)	PRA2D-2ADA	PRA2D-2EDA	PRA2D-2BDA	PRA2D-2FDA	PRA2D-2JEA
Non-filled gauge opposite to regulator	PRA2D-2CDA	PRA2D-2GDA	PRA2D-2DDA	PRA2D-2HDA	----
Glycerine filled gauge on regulator(s)	PRA2D-2ABA	PRA2D-2EBA	PRA2D-2BBA	PRA2D-2FBA	PRA2D-2JCA
Glycerine filled gauge opposite to regulator	PRA2D-2CBA	PRA2D-2GBA	PRA2D-2DBA	PRA2D-2HBA	----

\* - To be used with dual pressure valves.  
Valve code is : MV-A2B-AX5X-PM-XXYYZ (sgl. pressure ext. pilot)  
Valve code is : MV-A2B-AX4X-PM-XXYYZ (dual pressure ext. pilot)  
Note : regulating range for above models is 0-150 PSI.  
For other ranges see technical data page.

**ADJUSTMENT OPTIONS**

PRA2D-xxxx

- Replace by A for slotted stem adjustment (internal pilot)
- Replace by B for slotted stem adjustment (external pilot)
- Replace by D for slotted stem with locknut (internal pilot)
- Replace by E for slotted stem with locknut (external 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 #19177.

**PR125A**  
**PR250B**

**TECHNICAL DATA**

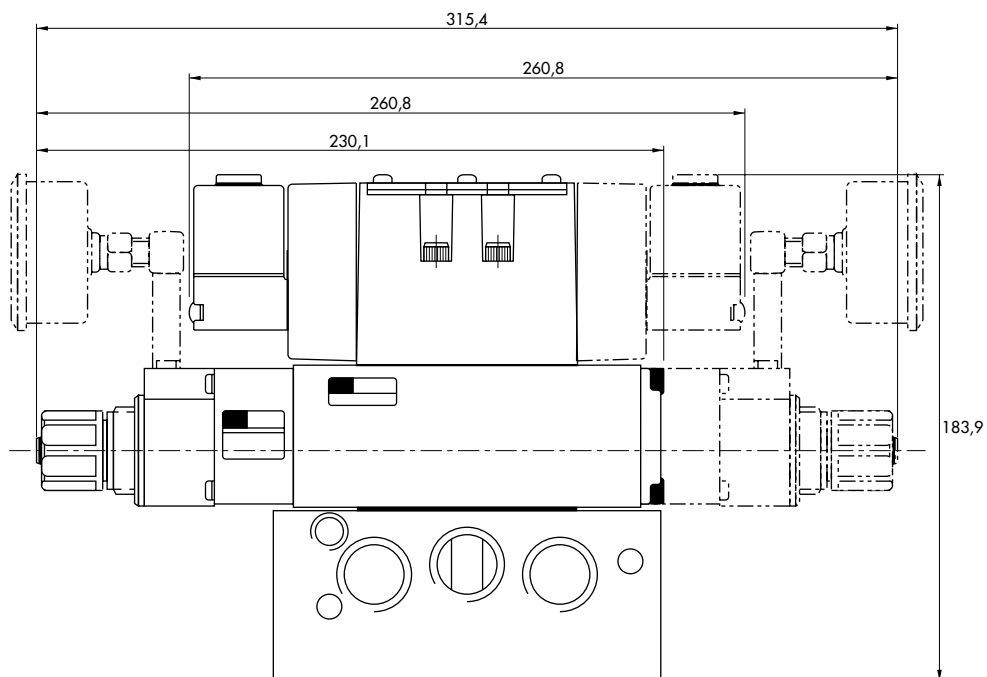
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	(2.3 C <sub>v</sub> )

Spare parts :   
 • Pressure regulator (less sandwich block) : PRA2D-30AA (KNOB), PRA2D-C0AA (SLOTTED STEM), PRA2D-F0AA (SLOTTED STEM WITH LOCKNUT).  
 • Gauges : • Glycerine filled : N-62015-01  
 • Non filled : N-62016-01

Regulating range options : PRA2-XXXX  
 — Replace by B - 0 to 100 PSI  
 — Replace by C - 0 to 45 PSI

**DIMENSIONS**

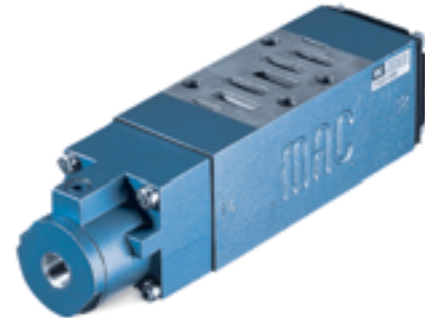
Dimensions shown are metric (mm)



**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	PRA2D-4AAA	PRA2D-4EAA	PRA2D-4BAA	PRA2D-4FAA	PRA2D-4JAA
Non-filled gauge on regulator(s)	PRA2D-4ADA	PRA2D-4EDA	PRA2D-4BDA	PRA2D-4FDA	PRA2D-4JEA
Non-filled gauge opposite to regulator	PRA2D-4CDA	PRA2D-4GDA	PRA2D-4DDA	PRA2D-4HDA	-----
Glycerine filled gauge on regulator(s)	PRA2D-4ABA	PRA2D-4EBA	PRA2D-4BBA	PRA2D-4FBA	PRA2D-4JCA
Glycerine filled gauge opposite to regulator	PRA2D-4CBA	PRA2D-4GBA	PRA2D-4DBA	PRA2D-4HBA	-----

**PRA1A**  
**PRA2D**  
**PRA3C**

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	PRA2D-5AAA	PRA2D-5EAA	PRA2D-5BAA	PRA2D-5FAA	PRA2D-5JAA
Non-filled gauge on regulator(s)	PRA2D-5ADA	PRA2D-5EDA	PRA2D-5BDA	PRA2D-5FDA	PRA2D-5JEA
Non-filled gauge opposite to regulator	PRA2D-5CDA	PRA2D-5GDA	PRA2D-5DDA	PRA2D-5HDA	-----
Glycerine filled gauge on regulator(s)	PRA2D-5ABA	PRA2D-5EBA	PRA2D-5BBA	PRA2D-5FBA	PRA2D-5JCA
Glycerine filled gauge opposite to regulator	PRA2D-5CBA	PRA2D-5GBA	PRA2D-5DBA	PRA2D-5HBA	-----

**PR125A**  
**PR250B**

\* - To be used with dual pressure valves.  
Valve code is : MV-A2B-AX5X-PM-XXYZZ (sgl. pressure ext. pilot)  
Valve code is : MV-A2B-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 #19177.

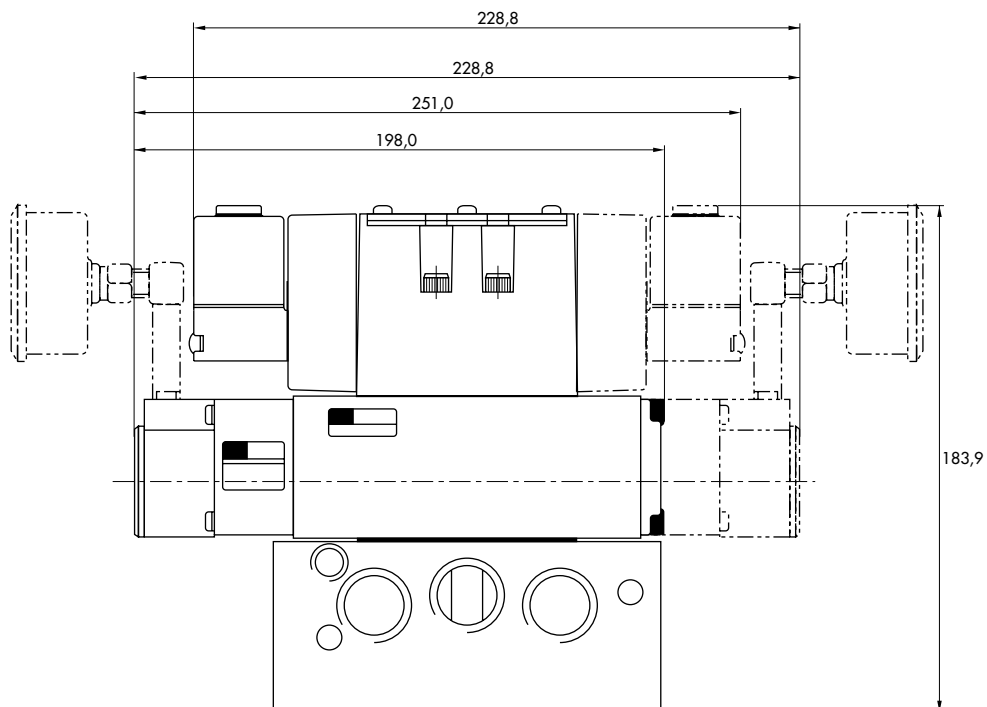
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	(2.3 C <sub>v</sub> )

- Spare parts :
- Pressure regulator (less sandwich block) : PRA2D-60AA.
  - Gauges : • Glycerine filled : N-62015-01  
• Non filled : N-62016-01

**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	PRA3C-1AAA	PRA3C-1EAA	PRA3C-1BAA	PRA3C-1FAA	PRA3C-1JAA
Non-filled gauge on regulator(s)	PRA3C-1ADA	PRA3C-1EDA	PRA3C-1BDA	PRA3C-1FDA	PRA3C-1JEA
Non-filled gauge opposite to regulator	PRA3C-1CDA	PRA3C-1GDA	PRA3C-1DDA	PRA3C-1HDA	----
Glycerine filled gauge on regulator(s)	PRA3C-1ABA	PRA3C-1EBA	PRA3C-1BBA	PRA3C-1FBA	PRA3C-1JCA
Glycerine filled gauge opposite to regulator	PRA3C-1CBA	PRA3C-1GBA	PRA3C-1DBA	PRA3C-1HBA	----

**PRA1A**  
**PRA2D**  
**PRA3C**

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	PRA3C-2AAA	PRA3C-2EAA	PRA3C-2BAA	PRA3C-2FAA	PRA3C-2JAA
Non-filled gauge on regulator(s)	PRA3C-2ADA	PRA3C-2EDA	PRA3C-2BDA	PRA3C-2FDA	PRA3C-2JEA
Non-filled gauge opposite to regulator	PRA3C-2CDA	PRA3C-2GDA	PRA3C-2DDA	PRA3C-2HDA	----
Glycerine filled gauge on regulator(s)	PRA3C-2ABA	PRA3C-2EBA	PRA3C-2BBA	PRA3C-2FBA	PRA3C-2JCA
Glycerine filled gauge opposite to regulator	PRA3C-2CBA	PRA3C-2GBA	PRA3C-2DBA	PRA3C-2HBA	----

\* - To be used with dual pressure valves.  
Valve code is : MV-A3B-AX5X-PM-XXYZZ (sgl. pressure ext. pilot)  
Valve code is : MV-A3B-AX4X-PM-XXYZZ (dual pressure ext. pilot)  
Note : regulating range for above models is 0-150 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 #35418.

**ADJUSTMENT OPTIONS**

PRA3C-xxxx

- Replace by A for slotted stem adjustment (internal pilot)
- Replace by B for slotted stem adjustment (external pilot)
- Replace by D for slotted stem with locknut (internal pilot)
- Replace by E for slotted stem with locknut (external pilot)

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 150 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	(5.4 C <sub>v</sub> )

Spare parts :

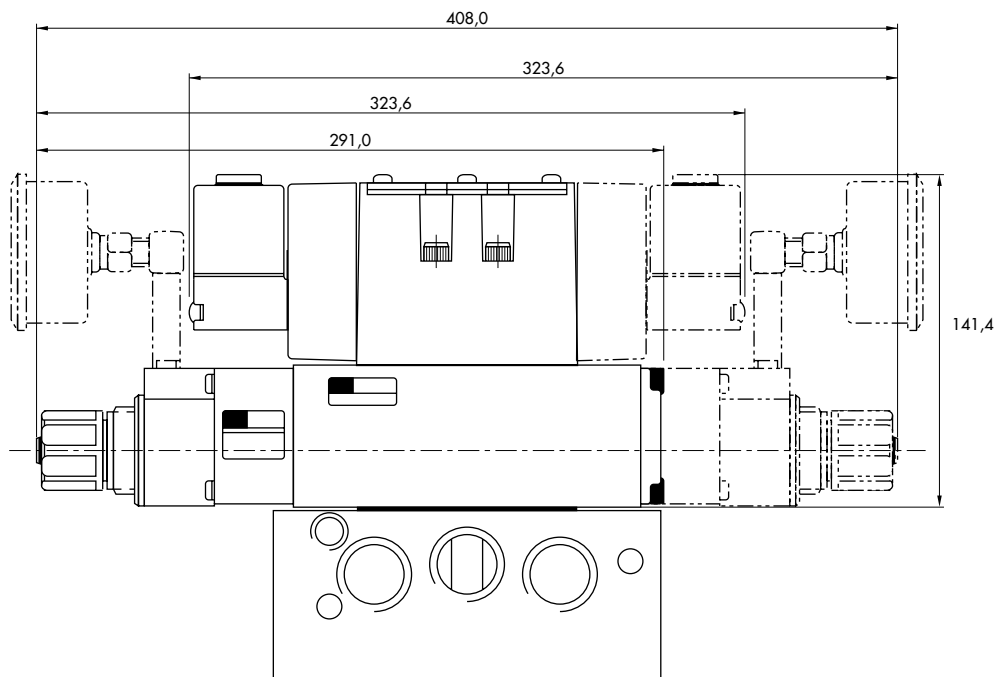
- Pressure regulator (less sandwich block) : PRA3C-30AA (KNOB), PRA3C-C0AA (SLOTTED STEM), PRA3C-F0AA (SLOTTED STEM WITH LOCKNUT).
- Gauges :
  - Glycerine filled : N-62015-01
  - Non filled : N-62016-01

Regulating pressure options :

PRA3C-XXXA  
 ┌─── Replace by B - 0 to 100 PSI  
 └─── Replace by C - 0 to 45 PSI

**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**

**PRA1A**  
**PRA2D**  
**PRA3C**

**PR125A**  
**PR250B**

**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	PRA3C-4AAA	PRA3C-4EAA	PRA3C-4BAA	PRA3C-4FAA	PRA3C-4JAA
Non-filled gauge on regulator(s)	PRA3C-4ADA	PRA3C-4EDA	PRA3C-4BDA	PRA3C-4FDA	PRA3C-4JEA
Non-filled gauge opposite to regulator	PRA3C-4CDA	PRA3C-4GDA	PRA3C-4DDA	PRA3C-4HDA	----
Glycerine filled gauge on regulator(s)	PRA3C-4ABA	PRA3C-4EBA	PRA3C-4BBA	PRA3C-4FBA	PRA3C-4JCA
Glycerine filled gauge opposite to regulator	PRA3C-4CBA	PRA3C-4GBA	PRA3C-4DBA	PRA3C-4HBA	----

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	PRA3C-5AAA	PRA3C-5EAA	PRA3C-5BAA	PRA3C-5FAA	PRA3C-5JAA
Non-filled gauge on regulator(s)	PRA3C-5ADA	PRA3C-5EDA	PRA3C-5BDA	PRA3C-5FDA	PRA3C-5JEA
Non-filled gauge opposite to regulator	PRA3C-5CDA	PRA3C-5GDA	PRA3C-5DDA	PRA3C-5HDA	----
Glycerine filled gauge on regulator(s)	PRA3C-5ABA	PRA3C-5EBA	PRA3C-5BBA	PRA3C-5FBA	PRA3C-5JCA
Glycerine filled gauge opposite to regulator	PRA3C-5CBA	PRA3C-5GBA	PRA3C-5DBA	PRA3C-5HBA	----

\* - To be used with dual pressure valves.

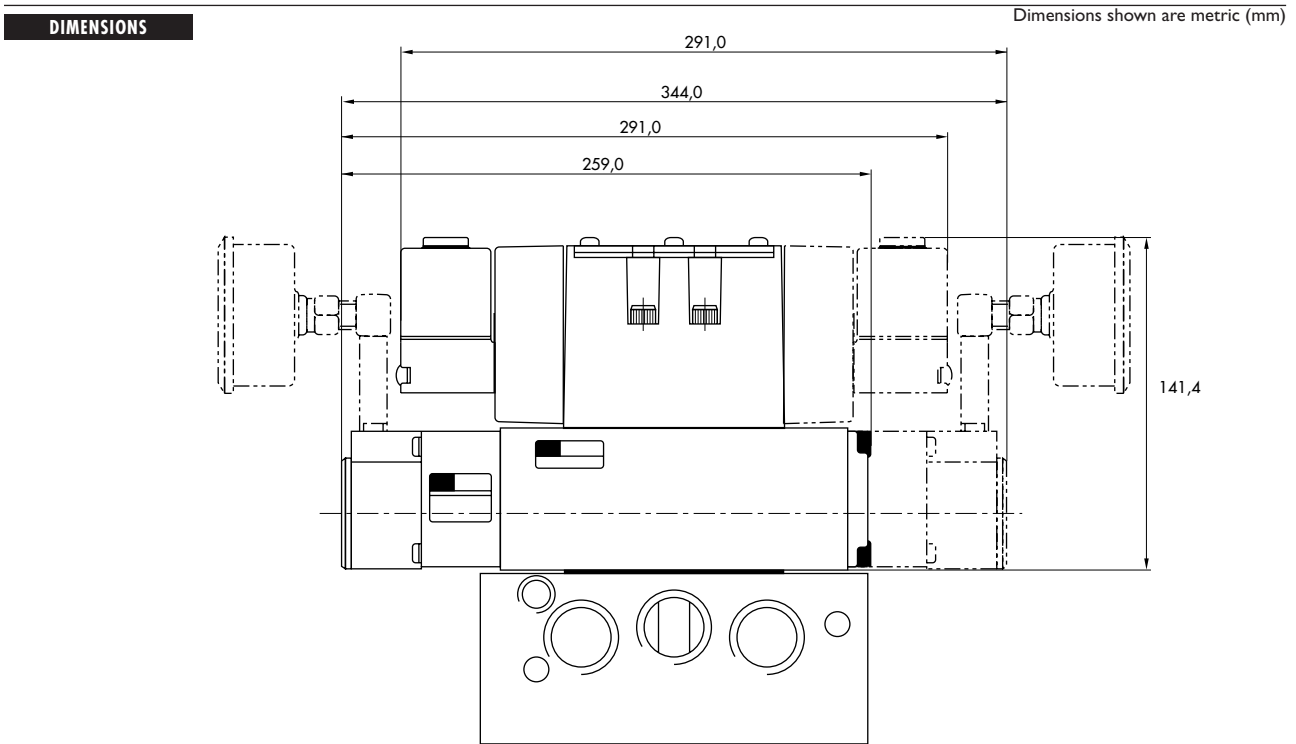
Valve code is : MV-A3B-AX5X-PM-XXYZZ (sgl. pressure ext. pilot)

Valve code is : MV-A3B-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 #35418.

TECHNICAL DATA	
Fluid :	Compressed air, inert gases
Pressure range :	0 to 150 PSI
Regulating range :	0 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 :	(5.4 C <sub>v</sub> )

- Spare parts :
- Pressure regulator (less sandwich block) : PRA3C-60AA.
  - Gauges :
    - Glycerine filled : N-62015-01
    - Non filled : N-62016-01



**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 REGULATORS

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
No gauge	PR125A-GCAA	PR125A-GAAA	PR125A-GDAA	PR125A-GBAA	PR125A-GEAA
Gauge parallel to regulator(s)	PR125A-GCDA	PR125A-GADA	PR125A-GDDA	PR125A-GBDA	PR125A-GEEA
Gauge perpendicular to regulator(s)	PR125A-GCBA	PR125A-GABA	PR125A-GDBA	PR125A-GBBA	PR125A-GECA

PRA1A  
PRA2D  
PRA3C

EXTERNAL PILOT REGULATORS

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
No gauge	PR125A-HCAA	PR125A-HAAA	PR125A-HDAA	PR125A-HBAA	PR125A-HEAA
Gauge parallel to regulator(s)	PR125A-HCDA	PR125A-HADA	PR125A-HDDA	PR125A-HBDA	PR125A-HEEA
Gauge perpendicular to regulator(s)	PR125A-HCBA	PR125A-HABA	PR125A-HDBA	PR125A-HBBA	PR125A-HECA

\* - To be used with dual pressure valves.

Valve code is : MAC125A-VXX4-PM-XXYZZ (valves must be external pilot models for either single or dual pressure valves)

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

**ADJUSTMENT OPTIONS**

PR125A-xxxx

- Replace by A for internal pilot with slotted stem
- Replace by B for external pilot with slotted stem
- Replace by K for internal pilot with locking slotted stem
- Replace by L for external pilot with locking slotted stem

PR125A  
PR250B

**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 120 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	(1.8 C <sub>v</sub> )

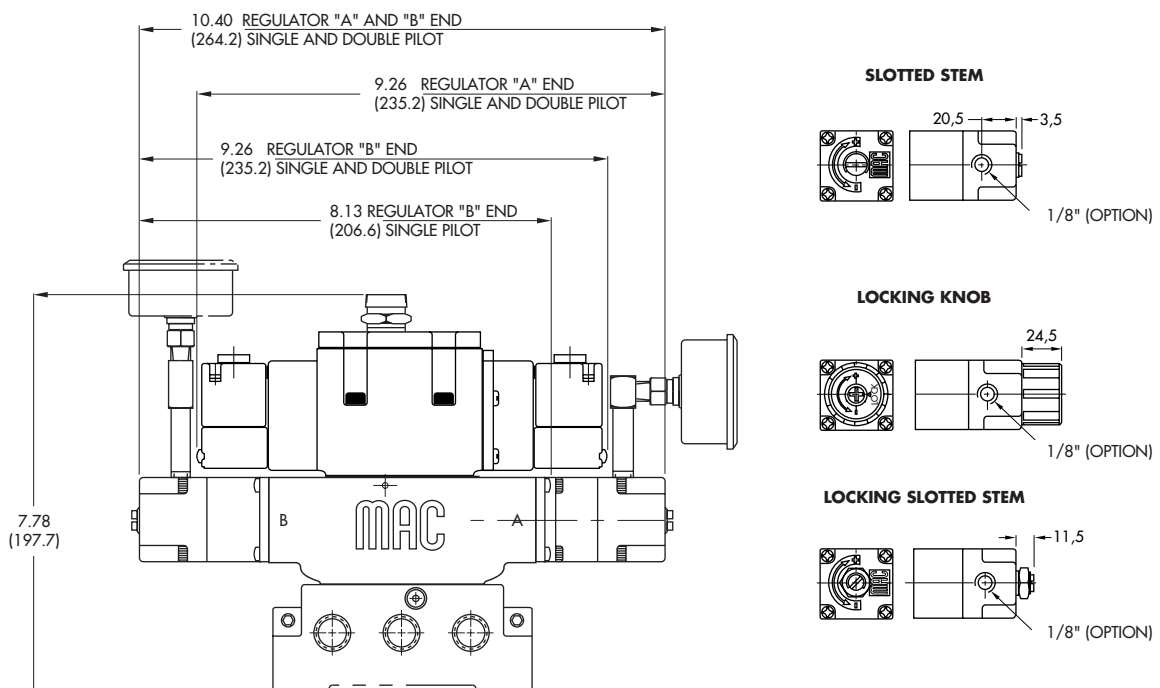
- Spare parts :
- Pressure regulator (less sandwich block) : PR125A-JOAA (KNOB), PR125A-COAA (SLOTTED STEM), PR125A-MOAA (LOCKING SLOTTED STEM).
  - Gauges : N-82016-01 (0-120 PSI perpendicular)  
 N-82016-02 (0-120 PSI parallel)  
 N-82016-03 (0-80 PSI perpendicular)  
 N-82016-04 (0-80 PSI parallel)  
 N-82016-05 (0-30 PSI perpendicular)  
 N-82016-06 (0-30 PSI parallel)

Regulating range options : PR125A-XXXA

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

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
No gauge	PR125A-DCAA	PR125A-DAAA	PR125A-DDAA	PR125A-DBAA	PR125A-DEAA
Gauge parallel to regulator(s)	PR125A-DCDA	PR125A-DADA	PR125A-DDDA	PR125A-DBDA	PR125A-DEEA
Gauge perpendicular to regulator(s)	PR125A-DCBA	PR125A-DABA	PR125A-DDBA	PR125A-DBBA	PR125A-DECA

PRA1A  
PRA2D  
PRA3C

EXTERNAL PILOT REGULATORS

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Two regulated pressures to ports A and B *
No gauge	PR125A-ECAA	PR125A-EAAA	PR125A-EDAA	PR125A-EBAA	PR125A-EEAA
Gauge parallel to regulator(s)	PR125A-ECDA	PR125A-EADA	PR125A-EDDA	PR125A-EBDA	PR125A-EEEA
Gauge perpendicular to regulator(s)	PR125A-ECBA	PR125A-EABA	PR125A-EDBA	PR125A-EBBA	PR125A-EECA

\* - To be used with dual pressure valves.

Valve code is : MAC125A-VXX4-PM-XXYZZ (valves must be external pilot models for either single or dual pressure valves)

PR125A  
PR250B

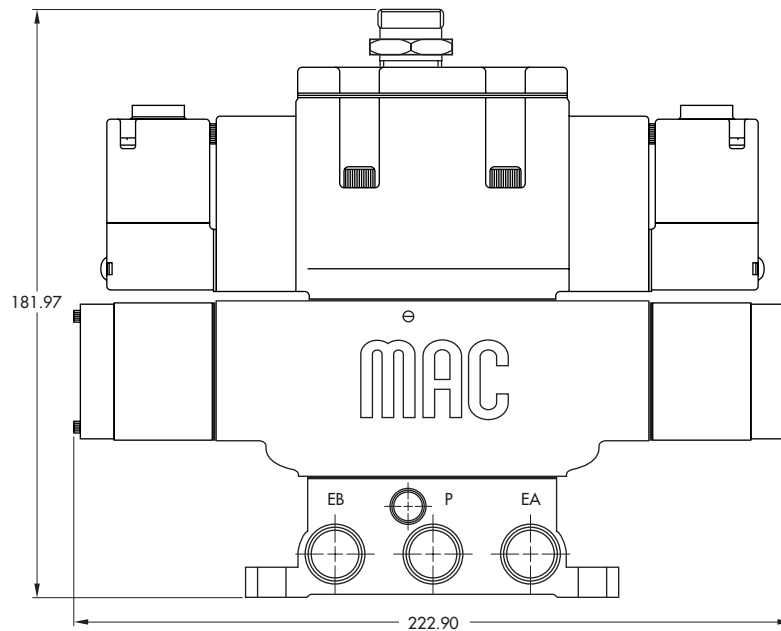
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	0 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	(1.8 C <sub>v</sub> )

- Spare parts :
- Pressure regulator (less sandwich block) : PR125A-FOAA
  - Gauges : N-82016-01 (0-120 PSI perpendicular)  
N-82016-02 (0-120 PSI parallel)

**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 REGULATORS

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Regulated pressures to ports A and B *
No gauge	PR250B-ACAA	PR250B-AAAA	PR250B-ADAA	PR250B-ABAA	PR250B-AEAA
Dry Gauge	PR250B-ACCA	PR250B-AACA	PR250B-ADCA	PR250B-ABCA	PR250B-AEEA
Glycerine Gauge	PR250B-ACBA	PR250B-AABA	PR250B-ADBA	PR250B-ABBA	PR250B-AEDA

PRA1A  
PRA2D  
PRA3C

EXTERNAL PILOT REGULATORS

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Regulated pressures to ports A and B *
No gauge	PR250B-BCAA	PR250B-BAAA	PR250B-BDAA	PR250B-BBAA	PR250B-BEAA
Dry Gauge	PR250B-BCCA	PR250B-BACA	PR250B-BDCA	PR250B-BBCA	PR250B-BEEA
Glycerine Gauge	PR250B-BCBA	PR250B-BABA	PR250B-BDBA	PR250B-BBBA	PR250B-BEDA

\* - To be used with dual pressure valves.

Valve code is : MAC250A-VXX4-PM-XYZZ (valves must be external pilot models for either single or dual pressure valves)

Note : regulating pressure range for above models is 7-120 PSI. For other ranges see technical data page.

PR125A  
PR250B

**TECHNICAL DATA**

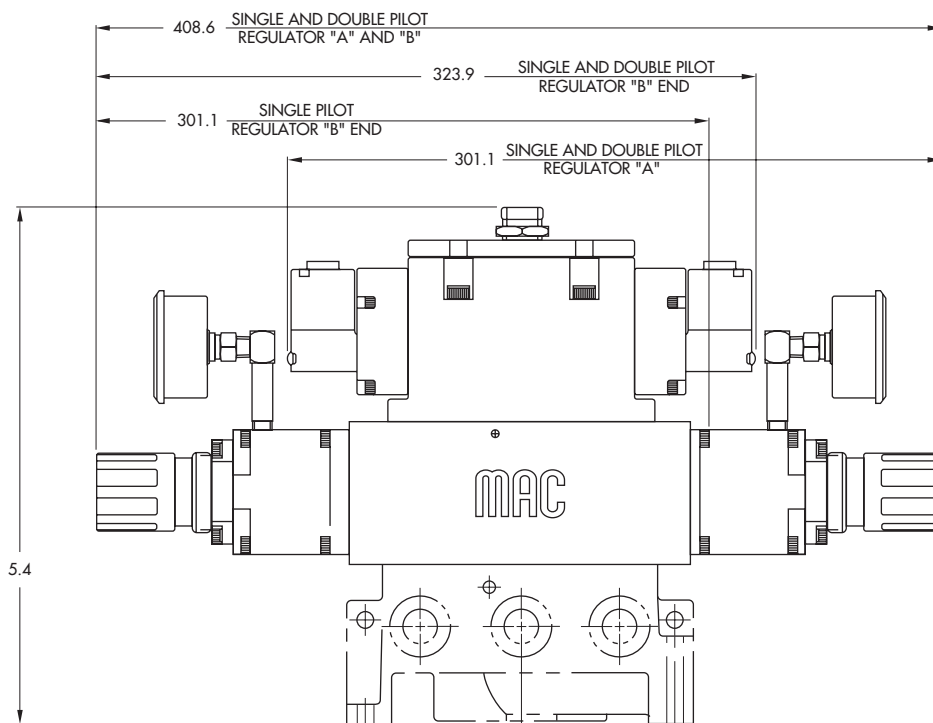
<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	7 to 120 PSI (other ranges see below)
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	(4.7 C <sub>v</sub> )

- Spare parts :
- Pressure regulator (less sandwich block) : PR250B-COAA (KNOB)
  - Gauges :
    - N-82016-01 (perpendicular)
    - N-82016-02 (parallel)

Regulating range options : PR250B-XXXA  
 └─── Replace by B - 7 to 60 PSI

**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 REGULATORS

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Regulated pressures to ports A and B *
No gauge	PR250B-DCAA	PR250B-DAAA	PR250B-DDAA	PR250B-DBAA	PR250B-DEAA
Dry Gauge	PR250B-DCCA	PR250B-DACA	PR250B-DDCA	PR250B-DBCA	PR250B-DEEA
Glycerine Gauge	PR250B-DCBA	PR250B-DABA	PR250B-DDBA	PR250B-DBBA	PR250B-DEDA

PRA1A  
PRA2D  
PRA3C

EXTERNAL PILOT REGULATORS

Gauges	Single pressure Regulator A end Same regulated pressure to ports A and B	Single pressure Regulator B end Same regulated pressure to ports A and B	Dual pressure Regulator A end Regulated pressure to port A *	Dual pressure Regulator B end Regulated pressure to port B *	Dual pressure Dual regulator Regulated pressures to ports A and B *
No gauge	PR250B-ECAA	PR250B-EAAA	PR250B-EDAA	PR250B-EBAA	PR250B-EEAA
Dry Gauge	PR250B-ECCA	PR250B-EACA	PR250B-EDCA	PR250B-EBCA	PR250B-EEEA
Glycerine Gauge	PR250B-ECBA	PR250B-EABA	PR250B-EDBA	PR250B-EBBA	PR250B-EEDA

\* - To be used with dual pressure valves.  
Valve code is : MAC250A-VXX4-PM-XXYZZ (valves must be external pilot models for both single or dual pressure valves)

PR125A  
**PR250B**

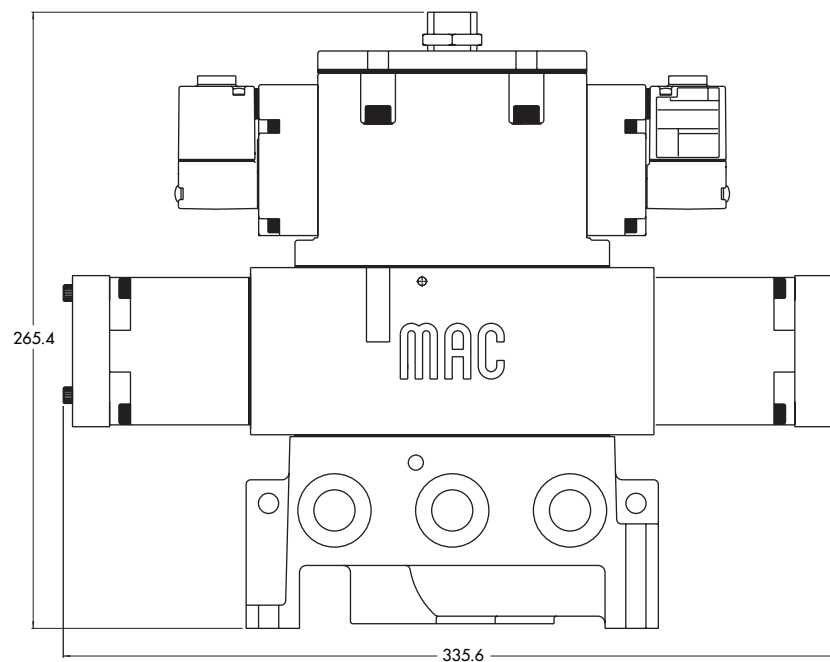
**TECHNICAL DATA**

<b>Fluid :</b>	Compressed air, inert gases
<b>Pressure range :</b>	0 to 150 PSI
<b>Regulating range :</b>	7 to 120 PSI
<b>Lubrication :</b>	Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)
<b>Filtration :</b>	40 μ
<b>Temperature range :</b>	0°F to 120°F (-18°C to 50°C)
<b>Flow :</b>	(4.7 C <sub>v</sub> )

- Spare parts :
- Pressure regulator (less sandwich block) : PR250B-FOAA
  - Gauges : N-82016-01 (0-120 PSI perpendicular)  
N-82016-02 (0-120 PSI parallel)

**DIMENSIONS**

Dimensions shown are metric (mm)





## Section 7 Intrinsically Safe Valves

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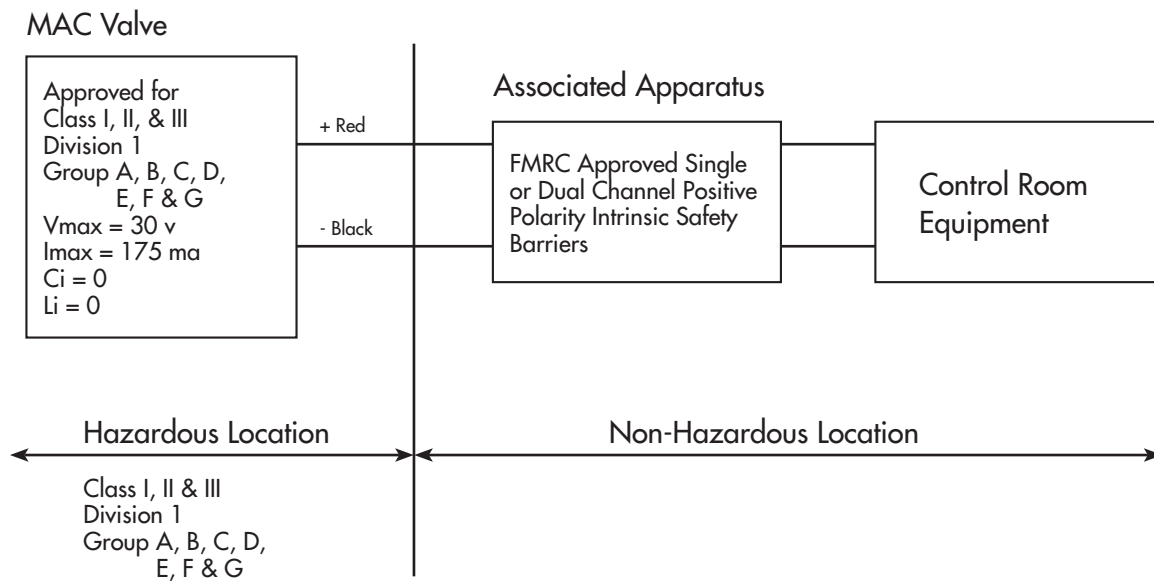


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*Dimensional information (35, 57, & 58 series)	353

\*Dimensional information differs from "Standard Valve" dimensions.

### INTRINSICALLY SAFE CIRCUIT

In order to use an intrinsically safe valve in a hazardous location, the installation must be in accordance with the following installation diagram :



There are 3 basic parts to an intrinsically safe circuit :

#### 1. FIELD DEVICE

This is defined as the device that will be used in the hazardous location. In this case, the field device will be the intrinsically safe valve.

#### 2. ASSOCIATED APPARATUS

This will be an energy limiting device also known as a barrier.

#### 3. FIELD WIRING

Wiring used to connect the two above devices.

When the MAC intrinsically safe valves were tested for approval, they were tested and approved for the following atmospheres.

Class I, II, III  
Division 1  
Groups ; A, B, C, D, E, F, G

under the following parameters :

$V_{max} : 30 \text{ VDC}$   
 $I_{max} : 175 \text{ ma}$   
 $C_i : 0$   
 $L_i : 0$

What this means is that the intrinsically safe valves were tested against each atmosphere with up to 30 VDC and 175 ma of current across the solenoid and found to still be safe. The other two parameters are values to indicate how much energy can be stored or created by the valve :

$C_i$  : Internal capacitance of the solenoid.

This indicates how much energy the solenoid is capable of storing.

$L_i$  : Internal inductance of the solenoid.

This indicates the solenoid's ability to create or increase energy beyond what is supplied.

When applying an intrinsically safe valve in a hazardous location, a proper barrier must first be selected. The barrier selection process must first take into account the parameters the valve was approved for and compared in the following way :

- $V_{max}$  must be greater than or equal to  $V_{oc}$  of the barrier.  
 $V_{oc}$  = Voltage open circuit or maximum allowed out of the barrier
- $I_{max}$  must be greater than or equal to  $I_{sc}$  of the barrier.  
 $I_{sc}$  = Current short circuit or the maximum current allowed out of the barrier
- $C_i$  plus field wiring must be less than  $C_a$  of the barrier.  
 $C_a$  = Allowed capacitance
- $L_i$  plus field wiring must be less than  $L_a$  of the barrier.  
 $L_a$  = Allowed inductance

When properly combined, the barrier will never allow more energy to the intrinsically safe valve than what it was tested and approved for.

The following page can be used as your guide to help ask the right questions when working with an intrinsically safe circuit. Also included is a partial list of intrinsically safe barriers that have been tested with the MAC intrinsically safe valves.



**Approval :** Factory Mutual Research 2X7A8.AX (3610)

Approved as intrinsically safe apparatus and associated apparatus for use in Class I, II, III - Division 1, Group : A, B, C, D, E, F & G.

**Parameters :** Vmax : 30 VDC

I<sub>max</sub> : 175 ma

C<sub>i</sub> : 0

L<sub>i</sub> : 0

Operating voltage greater than 11.5 volts

Coil resistance : Approximately 250 ohms

Current draw : 50 ma

Wattage : 0.6 watts

**Circuit Check Lists :**

- Is V<sub>max</sub> greater than or equal to V<sub>oc</sub> ?
- Is I<sub>max</sub> greater than or equal to I<sub>sc</sub> ?
- Is C<sub>i</sub> less than C<sub>a</sub> ?
- Is L<sub>i</sub> less than L<sub>a</sub> ?
- Is the barrier capable of handling 50 ma draw ?
- Is the internal resistance of the barrier 250 ohms or less ?

If all answers to the above questions are “yes” the barrier may be a good choice in combination with the MAC intrinsically safe valve.

To calculate voltage across the solenoid, plug values into the following equations :

$$I_{TOTAL} = \frac{\text{SUPPLY VOLTAGE}}{250 + \text{BARRIER RESISTANCE}} = \text{_____} \quad \leftarrow \text{Plug } I_{TOTAL} \text{ in below}$$

Voltage at Solenoid =  $I_{TOTAL} \times 250 \text{ ohms} = \text{_____}$  volts

Manufacturer	Model #	Barrier Res.	Voltage w/o Light	Voltage w/Light	Groups	Type
Turck	MK72-S01-EX		11.2 v	10.2 v*	A-G	T.I.B.
Crouse-Hinds	SB19140-M2410		13.2 v	12.6 v	C-G	Zener
IMO Industries (Gems Sensors)	114072	234 OHMS	12.0 v	11.4 v	C-G	Zener
Pepperl & Fuchs	KHZ-922/EX-1	270 OHMS	11.6 v	11.06 v	A-G	Zener
	KHZ-922/EX-2	270 OHMS	11.6 v	11.06 v	A-G	Zener
	KHZ-922/EX-3	270 OHMS	11.6 v	11.06 v	A-G	Zener
Stahl	9001/01-280-165-10		13.5 v	12.9 v	C-G	Zener
	9351/10-14-10	80 OHMS	13.7 v	13.4 v	A-G	T.I.B.
Ronan	X57-229P	200 OHMS	12.7 v	12.05 v	C-G	Zener
Measurement Technology	MTL728P+	250 OHMS	11.9 v	11.4 v	A-G	Zener
	MTL3022		15.0 v	14.5 v	C-G	T.I.B.

Above data is based on a 24 v DC supply voltage to the input of the barrier. A 12 v DC, 243 OHM, .6 watt intrinsically safe solenoid is used. The measurement with light is an LED with a current limiting resistor.

Groups indicate what atmosphere the barrier has been approved for. All MAC intrinsically safe valves have been approved for Class I, II and III, Division 1, Groups A, B, C, D, E, F and G indoor hazardous locations.

T.I.B. = Transformer Isolated Barrier

\* = Not a recommended combination

Series 35-45

HOW TO ORDER



BODY TYPE	PORT SIZE	VALVE FUNCTION/MANIFOLD TYPE
<b>Inline</b>	<b>O</b> Manifold Body Only	<b>O</b> Manifold Body Only
<b>A</b> Individual Inline	<b>B</b> #10-32 UNF (Inline Only)	<b>B</b> 3 way N.C. Only (Inline)
<b>D</b> Indiv. Inline w/2 Manifold Mount Ports	<b>D</b> M5 (Inline Only)	
<b>Manifold</b>		
<b>E</b> Manifold Body (N.C. Only)		
<b>G</b> Manifold Body w/Gage Port (N.C. Only)		

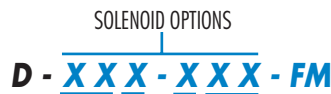
Note : there is no manifold base for the 35 series. The manifold valve can only mount to a circuit bar, see note below



BODY TYPE	PORT SIZE	VALVE FUNCTION/MANIFOLD TYPE
<b>Inline</b>	<b>O</b> Manifold Body Only	<b>Inline</b>
<b>A</b> 4 Port Body	<b>A</b> 1/8" NPT	<b>1</b> No Flow Controls
<b>B</b> 5 Port Body	<b>B</b> #10-32 UNF	<b>Bases - Regulators</b>
<b>D</b> 4 Port Body "O" Ring Mount -All Bottom Ports	<b>C</b> 1/8" BSPPL	<b>O</b> Valve Only - No Base
<b>E</b> 5 Port Body "O" Ring Mount -3 Bottom Ports Inlet and Cylinders	<b>D</b> M5 (Metric)	<b>A</b> Individual Base
<b>F</b> 4 Port Body "O" Ring Mount-Bottom Cylinder Ports Only	<b>F</b> #10-32 UNF Bottom Ports	<b>C</b> Manifold Base
	<b>G</b> M5 Bottom Ports	<b>E</b> Manifold w/Regulator w/Slotted Stem
	<b>H</b> "O" Ring Mount Ports	<b>G</b> Manifold w/Regulator w/Locking Slotted Stem
	<b>J</b> 1/8" NPT Bottom Ports	<b>J</b> Manifold w/Regulator w/Locking Knob
	<b>K</b> 1/8" BSPPL Bottom Ports	
<b>Base Mount</b>		
<b>O</b> For Base Only - No Valve		
<b>L</b> Base Mount Body		
<b>M</b> Base Mount Body with Gage Port		

MANIFOLD MOUNT ACCESSORIES

- M-45008-01** End Plate Kit
- 16455** Pressure Seal Between Manifold
- 19753** Tie Rod
- N-45008** Isolator Kit - Inlet and Exhaust
- N-45009** Isolator Kit - Inlet only
- N-45010** Isolator Kit - Exhaust only
- N-45015** End Cover Plate - Plain
- N-45016** End Cover Plate w/Flow Controls
- N-45017** Flow Control Needle Assembly



VOLTAGE	LEAD LENGTH	MANUAL OPERATOR	ELECTRICAL CONNECTION
<b>FR</b> 12VDC (0.6 W)	<b>A</b> 18" Leads	<b>0</b> No operator	<b>BA</b> Grommet
<b>FS</b> 24VDC (0.6 W)	<b>B</b> 24" Leads	<b>1</b> Non-locking Recessed	<b>CA</b> Conduit 1/2" NPS†
	<b>C</b> 36" Leads	<b>2</b> Locking Recessed	<b>CM</b> Metal Conduit 1/2" NPS†
	<b>D</b> 48" Leads	<b>3</b> Non-locking Extended	<b>CN</b> Metal Conduit w/grd. 1/2" NPS†
	<b>E</b> 72" Leads	<b>4</b> Locking Extended	<b>External Plug-in</b>
	<b>J*</b> 6" Leads		<b>FM</b> Plug-in (For ECD & ECE Bar)
			<b>JB</b> Rectangular Plug-in†
			<b>JM</b> Rectangular Male only†
			<b>KA</b> Mini Plug-in
			<b>KJ</b> Mini Plug-in Male only
			<b>TA</b> Dual Tabs (.110) Plain
			<b>TJ</b> Dual Tabs (.110) Plain

\*Use "J" for external plug-in connectors

NOTE : For valves mounted to a circuit bar reference MAC circuit bar Catalog for ordering info. For the 35 series circuit bar, use MOD FM01 after circuit bar part number.

† Available on individual valves and circuit bars.



**HOW TO ORDER**

**BODY OPTIONS**

**1 X X B - (XXYZZ) - FM - SOLENOID OPTIONS**

SEE BELOW

SERIES ——— REVISION LEVEL

VALVE FUNCTION		PORT SIZE/BODY STYLE	
6	N.C. only ind. inline	0	Manifold valve less base
7	N.C. only manifold	1	1/8" NPTF ind.inline
8	Stacking body	2	1/8" NPTF manifold
		3	1/4" NPTF ind.inline
		4	1/8" NPTF stacking, 3-way N.C. only
		5	1/4" NPTF stacking, 3-way N.C. only
		6	1/8" BSPP inline
		7	1/4" BSPP inline
		8	1/8" BSPP stacking, 3-way N.C. only
		9	1/4" BSPP stacking, 3-way N.C. only

**SOLENOID OPTIONS**

**EXAMPLE : XX Y ZZ - FM**

XX	DC VOLTAGE	Y	MANUAL OPERATOR	ZZ	ENCLOSURE
A5	12 VDC (0.6 W)	0	No operator	AA	JIC w/1/2" NPS Conduit
A6	24 VDC (0.6 W)	1	Non-locking Recessed (std.)	BA	Grommet
		2	Locking Recessed	CA	Conduit 1/2" NPS
		3	Non-locking Extended	CC	Conduit 1/2" NPT (CSA threads)
		4	Locking Extended	JB	Rectangular Plug-in
				JM	Rectangular Male only
				NA	Conduit 1/2" NPS w/ground wire
				RA	Conduit 3/8" NPS for Manifold models
				MA	Com. Conduit 1" NPS (Manifold models)
				MB	Com. Conduit 1" NPS (Stacking models)

(MA & MB common conduit covers require 1#M-01002-01 conduit end plate kit per stack)

**100 SERIES-SUPPLEMENTAL TECHNICAL DATA**

MOD. NO.	DESCRIPTION	MODEL AVAILABILITY
0004	All bottom and side ports	Manifold models only
0009	Bottom and side cylinder ports with side only inlet and exhaust ports	Manifold models only
0210	Additional bottom inlet	Manifold & stacking models
313P	For isolating the common inlet passage between manifold bases	Manifold models only
313E	For isolating the common exhaust passage between manifold bases	Manifold models only

**TO ORDER** Add the appropriate modification number from the table above after the valve number, **EXAMPLE :** 172B-A51BA-FM MOD 0004.

**STACKING BODY ACCESSORIES : STACKING END PLATE KIT-**  
For each gang one kit is required.

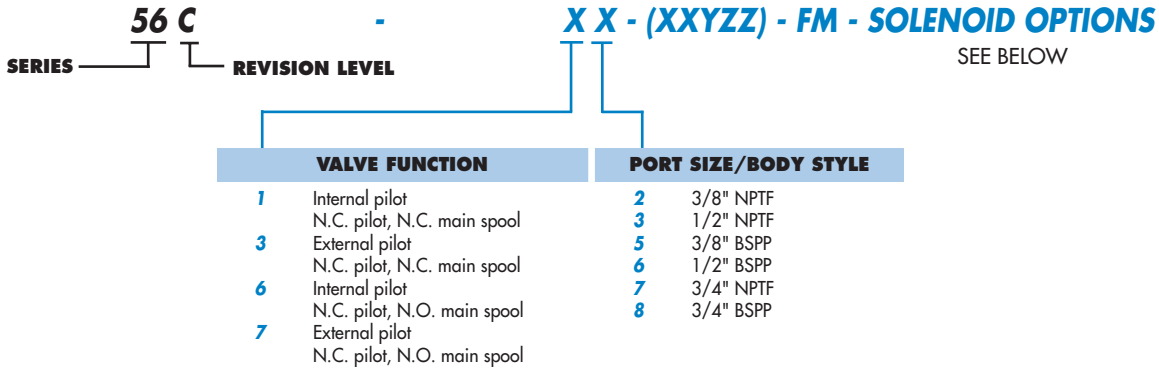
**TO ORDER-** Specify number M-01001-01 (1/4" NPTF) or M-01001-01P (1/4" BSPP).  
INLET ISOLATOR PLATE N-01003  
EXHAUST ISOLATOR PLATE N-01004

**MANIFOLD ACCESSORIES : MANIFOLD END PLATE KIT-**  
For each gang one kit is required.

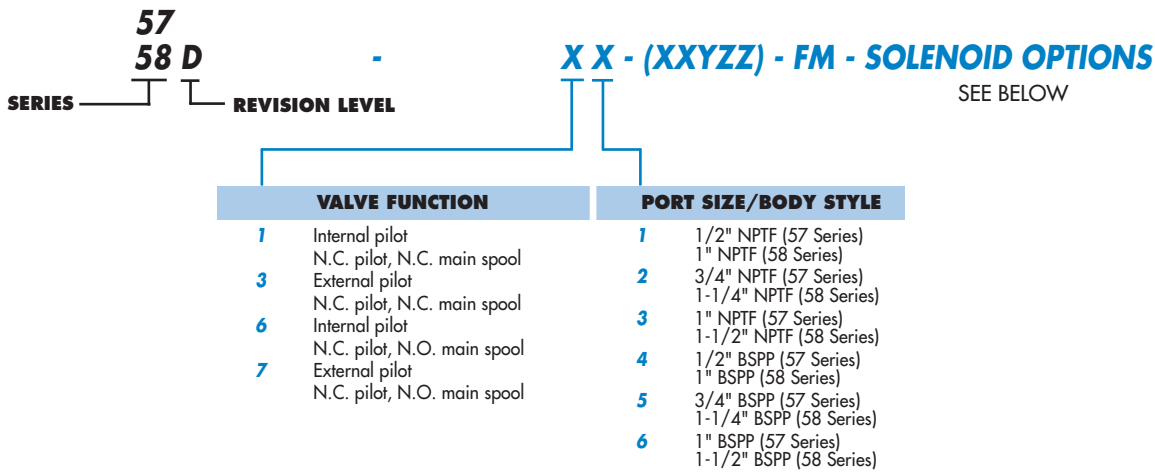
**TO ORDER-** Specify number A2-5004-01 (1/4" NPTF) or A2-5004-01P (1/4" BSPP).

HOW TO ORDER

VALVE BODY ASSEMBLY

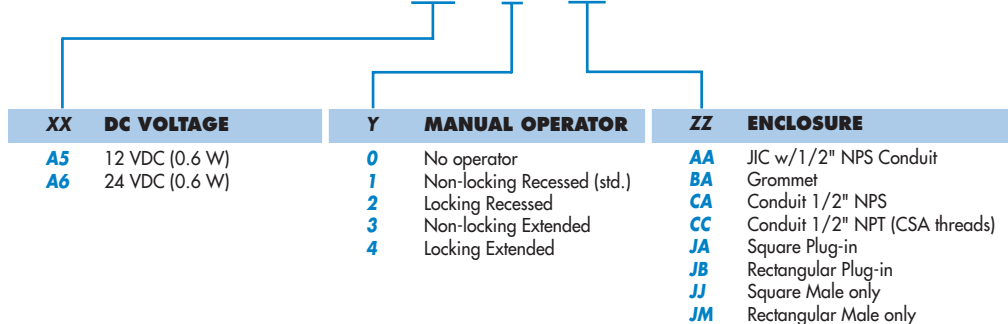


VALVE BODY ASSEMBLY



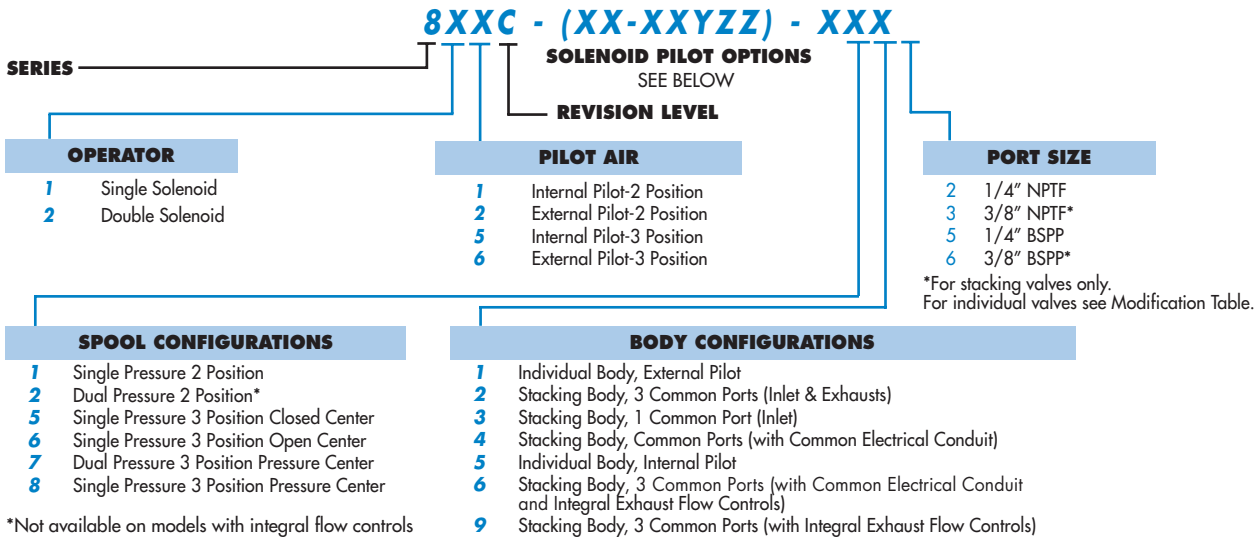
SOLENOID OPTIONS

EXAMPLE : **XX Y ZZ - FM**

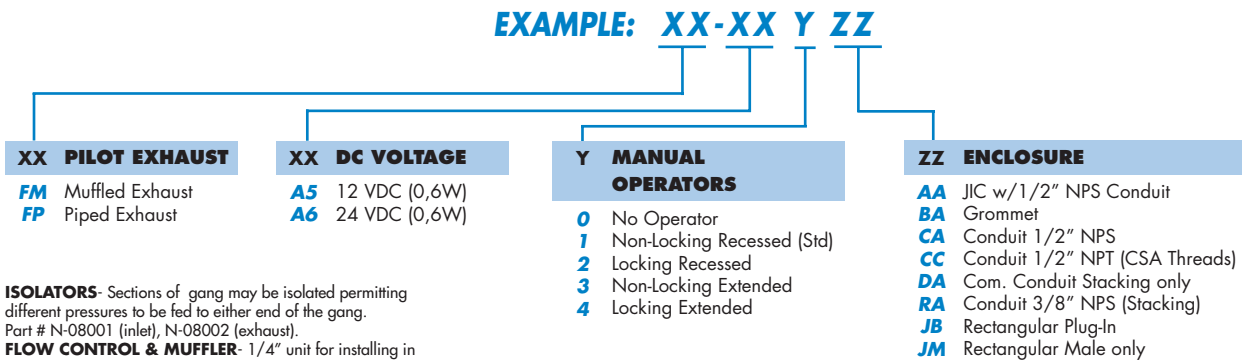


**HOW TO ORDER**

**BODY OPTIONS**



**SOLENOID PILOT OPTIONS**



**ISOLATORS**- Sections of gang may be isolated permitting different pressures to be fed to either end of the gang. Part # N-08001 (inlet), N-08002 (exhaust).

**FLOW CONTROL & MUFFLER**- 1/4" unit for installing in individual exhaust ports. Part #10951.

**DUAL INLET PRESSURE BLOCK**- For 3 common ports or 1 common port stacking valves. Provides 2 additional inlet pressure ports to a stack. Part #M-08003. For Common Conduit Valves. Part #M-00014.

**ACCESSORIES**

MANIFOLD END PLATE KITS (NPTF)*		
INT. PILOT PART NO.	EXT. PILOT PART NO.	MODELS USED WITH
M-08001-01-01	M-08001-02-01	3 com. port or 1 com. port models, stacks of 1 thru 16 valves.
M-08002-01-01	M-08002-02-01	Com. conduit models, stacks of 1 thru 16 valves.
M-00005-01-01	M-00005-02-01	3 com. port or 1 com. port models, stacks of 17 or more valves.
M-00007-01-01	M-00007-02-01	Com. conduit models, stacks of 17 or more valves.

\*Add letter P at end of part number for BSPP threads;  
EXAMPLE: M-08001-01-01P

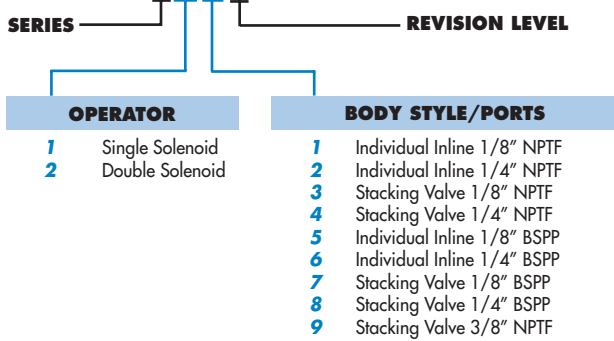
**MODIFICATIONS**

MOD. NO.	DESCRIPTION	MODEL AVAILABILITY
0358	3/8" Inlet & Cylinder Ports	Individual Valves

**HOW TO ORDER**

**BODY OPTIONS**

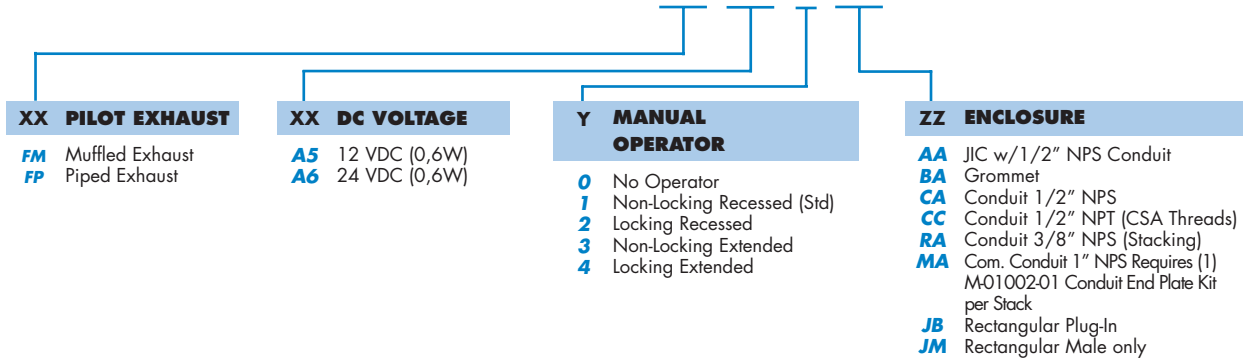
**9XXB - (XX-XXYZZ) - SOLENOID OPTIONS - SEE BELOW**



For stacking valve 3/8"BSPP ports, use MOD 0005 after complete valve code 919B-FM-A51BA MOD 0005.

**SOLENOID PILOT OPTIONS**

**EXAMPLE: XX-XX Y ZZ**



**MODIFICATIONS**

PART. NO.	DESCRIPTION
M-09001-01	Manifold End Plate Kit (3/8" NPTF)
M-09001-01P	Manifold End Plate Kit (3/8" BSPP)
N-09002	Isolator Plate Kit - Inlet & Exhaust
N-09003	Isolator Plate Kit - Exhaust only
N-09004A	Isolator Plate Kit - Inlet only

**MANIFOLD ACCESSORIES:**

**MANIFOLD END PLATE KIT:** For each stack one kit is required.

**ISOLATORS:** Sections of a stack may be isolated permitting different pressures to be fed to either end of the stack.

**TO ORDER:** Select the appropriate part number from the adjacent table.

### HOW TO ORDER

**82A - XX - XXX - (XX - DXXX - XXX)**

**SPOOL TYPE - VALVE FUNCTION**

- O** Individual base or manifold only
- A** Single Operator - single pressure
- B** Double operator - single pressure
- C** Single operator - dual pressure
- D** Double operator - dual pressure
- E** 3-position closed center
- F** 3-position open center
- G** 3-position single pressure, pressure center
- H** 3-position dual pressure, \* pressure center
- J** Single solenoid single pressure solenoid on B end
- K** Single solenoid dual pressure solenoid on B end
- L** 3-position dual pressure, \* open center
- M** 3-position dual pressure, \* closed center

\* Note: For dual pressure w/o regulators consult factory.

**BODY TYPE**

- A** Plug-in body
- B** Non Plug-in body

**PORT SIZE - THREAD TYPE**

- O** Valve only - no base
- A** 1/8" NPTF
- B** 1/4" NPTF
- C** 3/8" NPTF
- D** 1/8" BSPPL
- E** 1/4" BSPPL
- F** 3/8" BSPPL

**IND. & MANIFOLD BASE PORT CONFIG.**

**--Individual Base--**

- O** Valve only - no base
- A** Standard side ports (1/8", 1/4", or 3/8")
- B** Bottom ports only\*
- C** Side and bottom ports\*
- D** Side inlet, side exhaust, bottom cylinder ports\*

\* Bottom ports available in 1/8" & 1/4" only in individual base

**--Manifold Base--**

- K** Standard ports (1/4" or 3/8" only)
- L** Bottom cylinder ports\*
- M** Bottom inlet port
- N** Bottom inlet and cylinder ports\*
- P** Bottom and end cylinder ports\*
- R** Bottom cylinder & end cylinder ports w/bottom inlet port\*
- S** Selector base - standard side ports

\* Bottom parts available in 1/4" & 3/8" only on manifold. Bottom inlet available 1/4" only. For bottom O-ring ports, consult factory.

**INT. OR EXT. PILOT\***

**--Internal Pilot--**

- O** Valve only - no base
- A** No light in base

**--External Pilot--**

- O** Valve only - no base
- D** No light in base

\* Use internal for main valve pressures of 25-150 PSIG. Use external for main valve pressures of 28" Hg vacuum - 25 PSIG

### PILOT VALVE OPTIONS - (XX - DXXX - XXX)

**PILOT EXHAUST**

- FA** Muffled exhaust

**VOLTAGE**

- FR** 12VDC (0,6w)
- FS** 24VDC (0,6w)

**LEAD WIRE LENGTH**

**--Plug-in Valve/Base--**

- P** Plug-in 8" - standard
- 1** 18"    **4** 48"
- 2** 24"    **5** 72"
- 3** 36"    **6** 96"

**--Non Plug-in Valve/Base--**

- A** 18"    **E** 72"
- B** 24"    **F** 96"
- C** 36"    **J** 6"
- D** 48"

\* Lead wire length for external plug-in connectors must be "J"

**ELECTRICAL CONN.**

**--Plug-in Valve/Base--**

- DA** Plug-in (standard)

**--Non Plug-in Valve/Base--**

- BA** Grommet
- CA** Conduit 1/2" NPS
- CM** Metal conduit 1/2" NPS
- CN** Metal conduit w/grd. 1/2" NPS

**--External Plug-in--**

- JB** Rectangular plug-in
- JM** Rectangular male only
- KA** Mini plug-in
- KJ** Mini plug-in male only
- TA** Dual tabs (.110) w/ receptables
- TJ** Dual tabs (.110) w/o receptables

**MANUAL OPERATOR**

- 0** No manual operator
- 1** Nonlocking operator
- 2** Locking operator
- 3** Nonlocking extended operator
- 4** Locking extended operator

### HOW TO ORDER 82 SERIES FLOW CONTROL MODULE\*

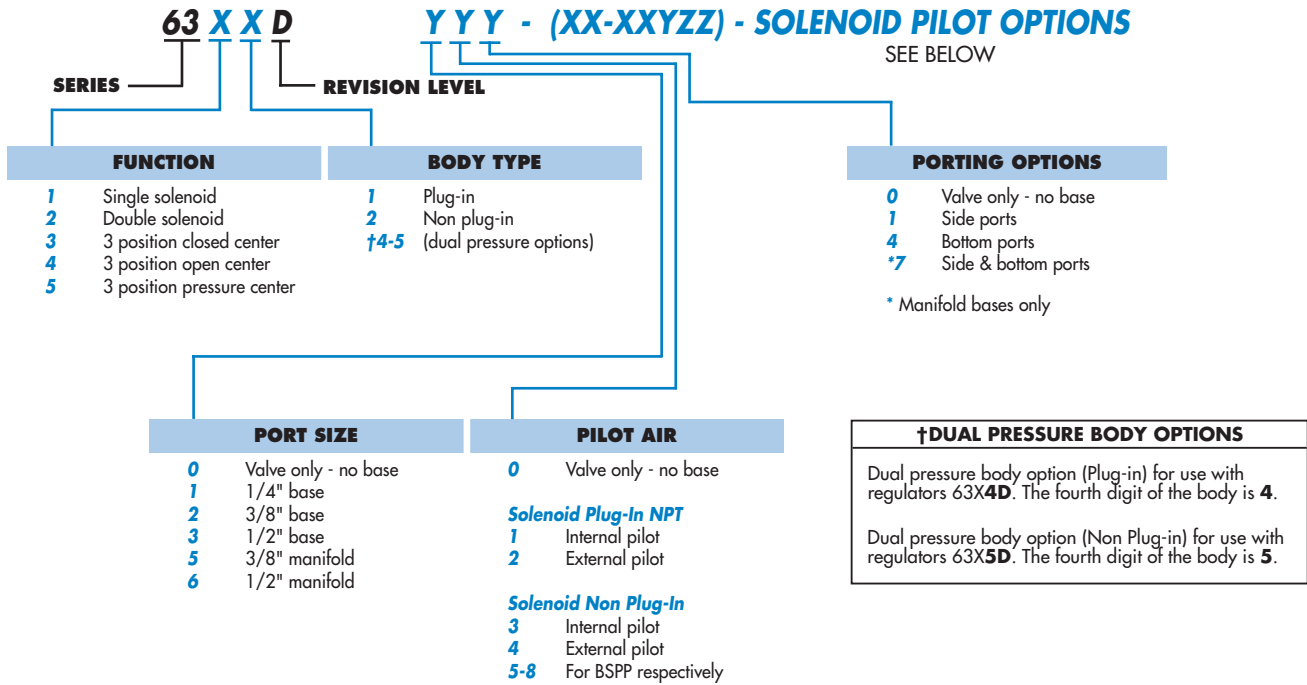
FC 82A-AA	Plug-in flow control assembly
FC 82A-BA	Non plug-in flow control assembly

\*If flow control module is to be installed between valve and base or valve and manifold at the factory, add -9 after the flow control model number, i.e., FC82A-AA-9. The flow control model number should follow the valve model number on which it is to be installed.

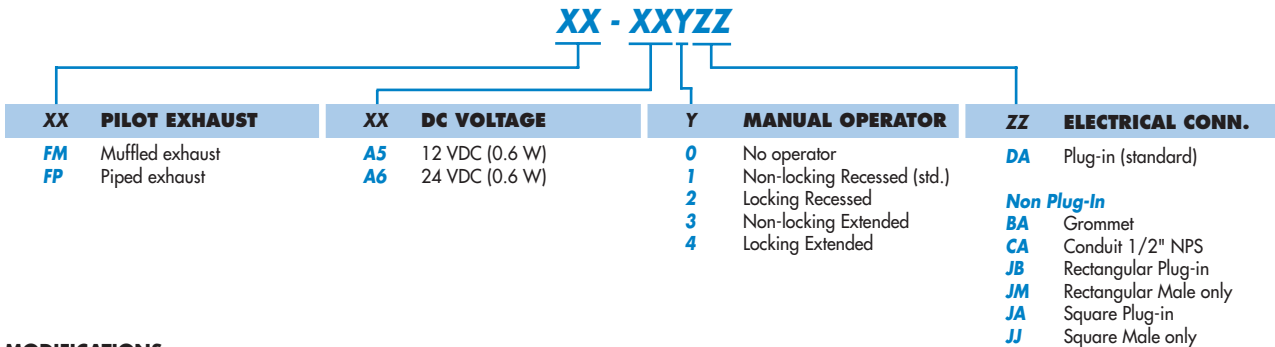
NOTE: Reference regulator ordering section if a sandwich regulator is required.  
NOTE: If a flow control assembly is used with the dual pressure regulator option, only the flow control on the "A" end is functional. (Controls both cylinder ports.)

HOW TO ORDER

BODY/BASE OPTIONS



PILOT VALVE OPTIONS



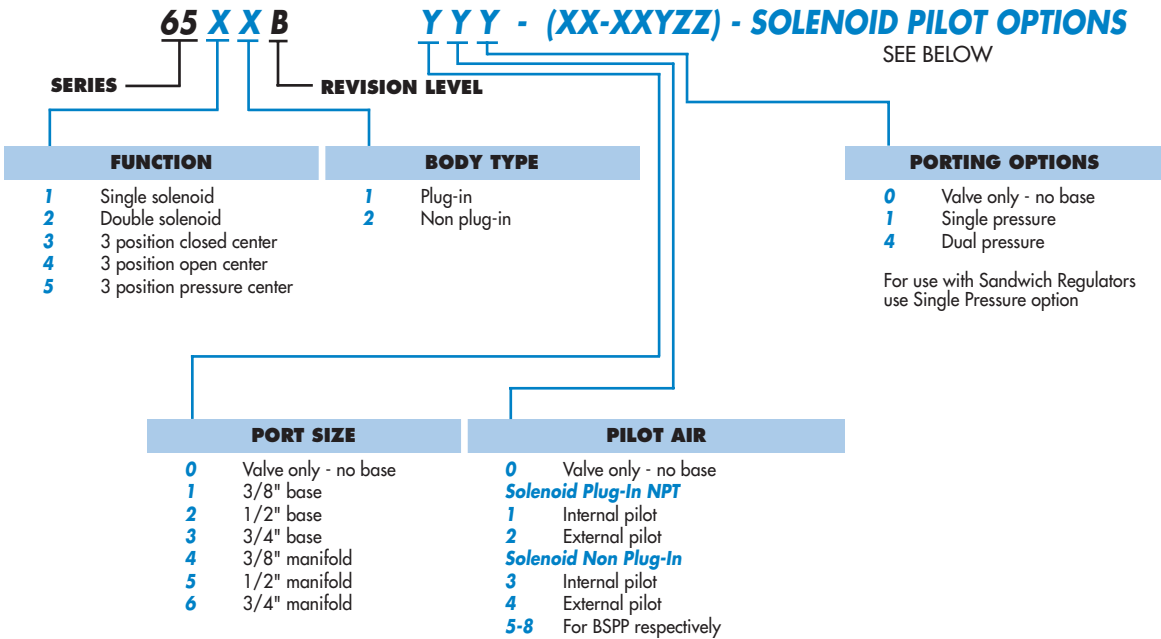
MODIFICATIONS

**MOD 0210** Bottom inlet port in addition to side inlet port (manifolds only)  
**TO ORDER:** 6311D-511-FM-A51DA **MOD 0210**  
 Manifold Accessories: Inlet Isolators #32839. Exhaust Isolator #28309.

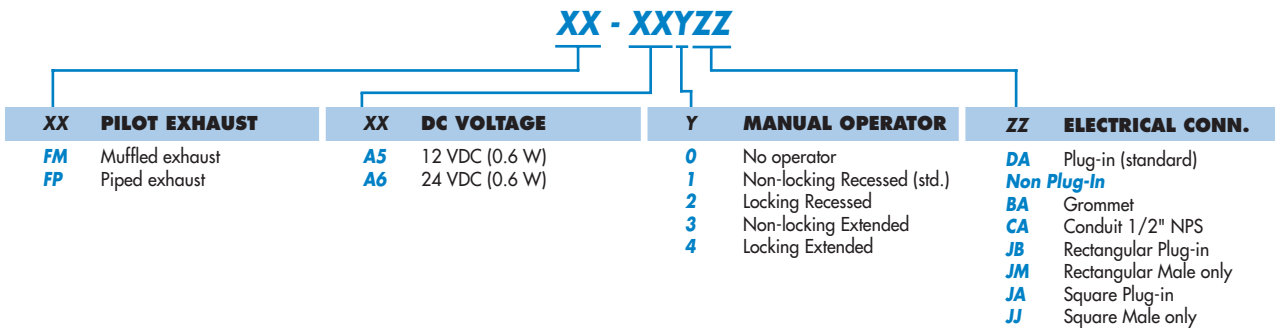
**NOTE:** 1. The valve less base is always the same for internal or external pilot. These options are effected in the base or manifold.  
 2. When ordering an external pilot connection for manifold bases, a common external pilot is standard. One connection only is required for all the valves in the manifold whether single or double solenoid.

**HOW TO ORDER**

**BODY/BASE OPTIONS**



**PILOT VALVE OPTIONS**



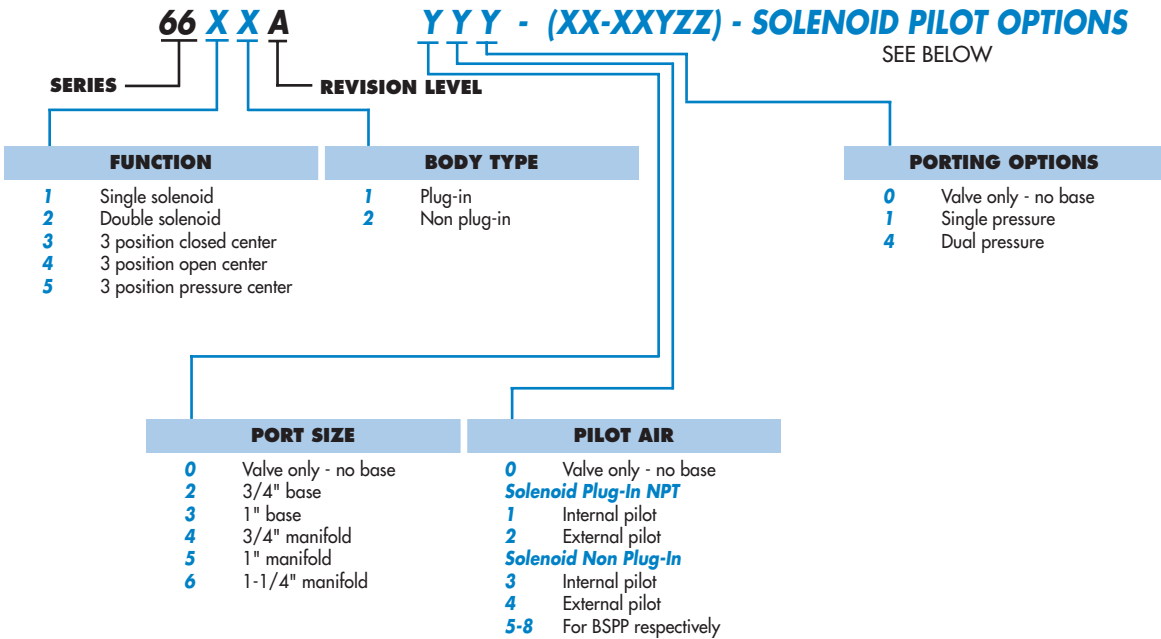
**NOTE:** 1. The valve less base is always the same for internal or external pilot. These options are effected in the base or manifold.  
 2. Bottom ports: Refer to modification table below.  
 3. Manifold Accessories: Inlet Isolator #28309. Exhaust Isolator #28310.

**MODIFICATIONS**

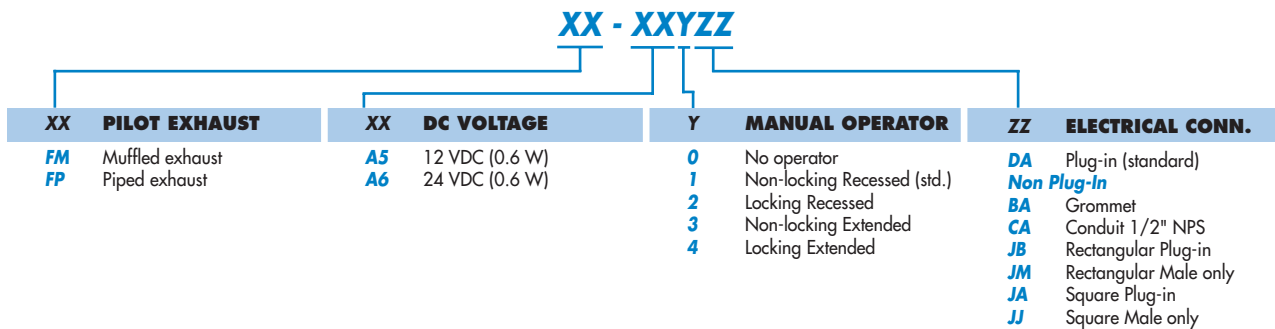
MOD. NO.	DESCRIPTION	MODEL AVAILABILITY
0002	Bottom inlet, exhaust, & cylinder ports (no side ports)	Available on individual base 3/8" & 1/2" only
0004	Full side porting and additional bottom inlet, exhausts, and cylinder ports	Available on individual base 3/8" only
0112	Side inlet & exhaust with bottom cylinder ports (no end cylinder ports)	Available on all manifold models
0210	Porting as ordered in model number plus an additional bottom inlet	Available on all manifold models
0364	Single Pressure - Side inlet & exhaust and additional bottom inlet with bottom cylinder ports (no end cylinder ports) Dual Pressure - Same as single pressure except with two bottom inlets	Available on all manifold models

**HOW TO ORDER**

**BODY/BASE OPTIONS**



**PILOT VALVE OPTIONS**



- NOTE:**
1. The valve less base is always the same for internal or external pilot. These options are effected in the base or manifold.
  2. Bottom ports: Refer to modification table below.
  3. When ordering an external pilot connection for manifold bases, a common external pilot port is standard. One connection only is required for all the valves in the manifold whether single or double solenoid.
  4. Manifold Accessories: Inlet & Exhaust Isolator #28367.

**MODIFICATIONS**

MOD. NO.	DESCRIPTION	MODEL AVAILABILITY
0002	Bottom inlet, exhaust, & cylinder ports (no side ports)	Available on individual base 3/4" only
0004	Full side porting and additional bottom inlet, exhausts, and cylinder ports	Available on individual base 3/4" only
0112	Side inlet & exhaust with bottom cylinder ports (no end cylinder ports)	3/4" individual base & 3/4" & 1" manifold base
0210	1-1/4" bottom inlet	Manifold base
0364	1-1/4" bottom inlet & 3/4" or 1" bottom cyl.	Manifold base

**TO ORDER** Add the appropriate modification number after the valve number, **EXAMPLE :** 6611A-211-FM451DA **MOD 0002.**



**MV-A1C ISO 1**  
**MV-A2B ISO 2**  
**MV-A3B ISO 3**

MAC ISO valves are built to International Standards Organization (ISO) Std. 5599/1. They are available in 3 sizes; ISO 1, 2 & 3. To select the ISO size required, insert the appropriate ISO number in the 5th position of the model code; EXAMPLE MV-A1C for ISO 1, MV-A2B for ISO 2, or MV-A3B for ISO 3. Bases and manifolds must be ordered separately from the table below.

**HOW TO ORDER**

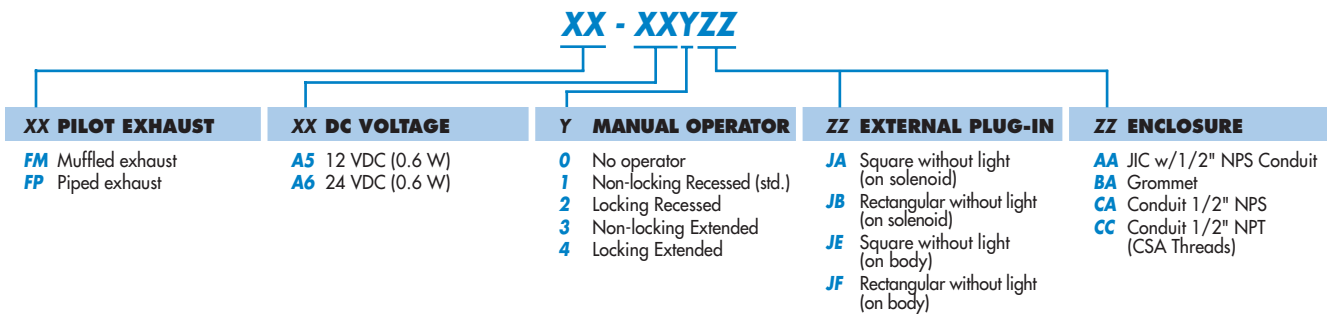
**SOLENOID PILOT OPERATED VALVES LESS BASE**  
**SINGLE PRESSURE VALVES**

SGL. OPERATOR AIR/SPRING RETURN	DBL. OPERATOR 2-POSITION	PILOT SUPPLY	DBL. OPER. 3-POS. CLOSED CENTER	DBL. OPER. 3-POS. OPEN CENTER
MV-AXB-A111-FM-A51JA MV-AXB-A121-FM-A51JA MV-AXB-A151-FM-A51JA	MV-AXB-A211-FM-A51JA MV-AXB-A221-FM-A51JA MV-AXB-A251-FM-A51JA	Internal Pilot External Pilot External Pilot for use with Regulator	MV-AXB-A312-FM-A51JA MV-AXB-A322-FM-A51JA MV-AXB-A352-FM-A51JA	MV-AXB-A311-FM-A51JA MV-AXB-A321-FM-A51JA MV-AXB-A351-FM-A51JA

**DUAL PRESSURE VALVES**

SGL. OPERATOR AIR/SPRING RETURN	DBL. OPERATOR 2-POSITION	PILOT SUPPLY	DBL. OPER. 3-POS. PRESSURE CENTER
MV-AXB-A131-FM-A51JA MV-AXB-A135-FM-A51JA MV-AXB-A141-FM-A51JA	MV-AXB-A231-FM-A51JA MV-AXB-A232-FM-A51JA MV-AXB-A241-FM-A51JA	Int. Pilot-From Port 3 Int. Pilot-From Port 5 External Pilot	MV-AXB-A331-FM-A51JA MV-AXB-A332-FM-A51JA MV-AXB-A341-FM-A51JA

**SOLENOID PILOT VALVE OPTIONS**



**BASE TABLE**

ISO TYPE	PORT SIZE	INDIVIDUAL BASE		MANIFOLD BASE	
		BSPB	NPTF	BSPB	NPTF
ISO 1	1/4"	MB-A1C-121	MB-A1C-221	MM-A1C-121	MM-A1C-221
	3/8"	MB-A1C-131	MB-A1C-231	MM-A1C-131	MM-A1C-231
ISO 2	3/8"	MB-A2B-121	MB-A2B-221	MM-A2B-121	MM-A2B-221
	1/2"	MB-A2B-131	MB-A2B-231	MM-A2B-131	MM-A2B-231
ISO 3	1/2"	MB-A3B-121	MB-A3B-221	MM-A3B-121	N/A
	3/4"	MB-A3B-131	MB-A3B-231	MM-A3B-131	N/A

For manifold bases a common external pilot port is available. One connection only is required for all valves in the manifold whether single or double solenoid. Bottom ports are also available; consult factory for ordering information for these options.

**MANIFOLD FASTENING KIT** — For each gang, one kit is required. To order specify par number **N-63002-01**.

**HOW TO ORDER**

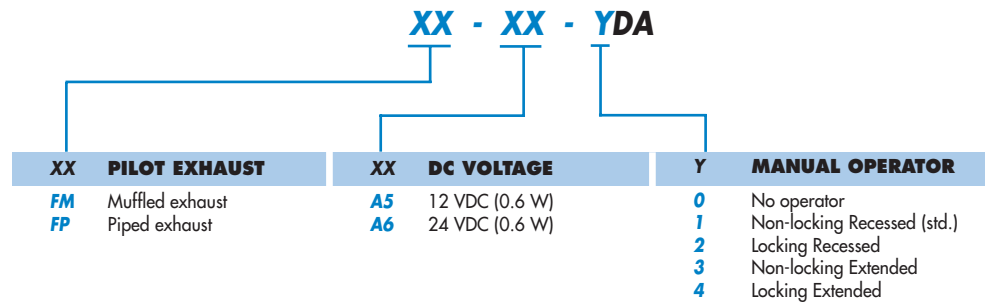
**VALVE OPTIONS**

**MAC125A - VXXX - XX - XXYDA - 9 VALVE ASSEMBLED TO BASE**  
**MAC250A**



FUNCTION	ELECTRICAL CONN. IN TOP PLATE	PILOT
<b>1</b> Single Operator, 2 Position, Single Pressure	<b>A</b> 5 Pin (Ford Wiring)	<b>1</b> Internal Pilot
<b>2</b> Double Operator, 2 Position, Single Pressure	<b>B</b> 5 Pin (Chrysler Wiring)	<b>3</b> External Pilot
<b>3</b> Single Operator, 2 Position, Dual Pressure	<b>G</b> 4 Pin Micro	
<b>4</b> Double Operator, 2 Position, Dual Pressure	<b>E</b> 3 Pin (Ford Wiring)	
<b>5</b> 3 Position, Closed Center	<b>F</b> 5 Pin Micro (Chrysler Wiring)	
<b>6</b> 3 Position, Open Center		
<b>7</b> 3 Position, Dual Pressure, Pressure Center		

**SOLENOID PILOT OPTIONS**



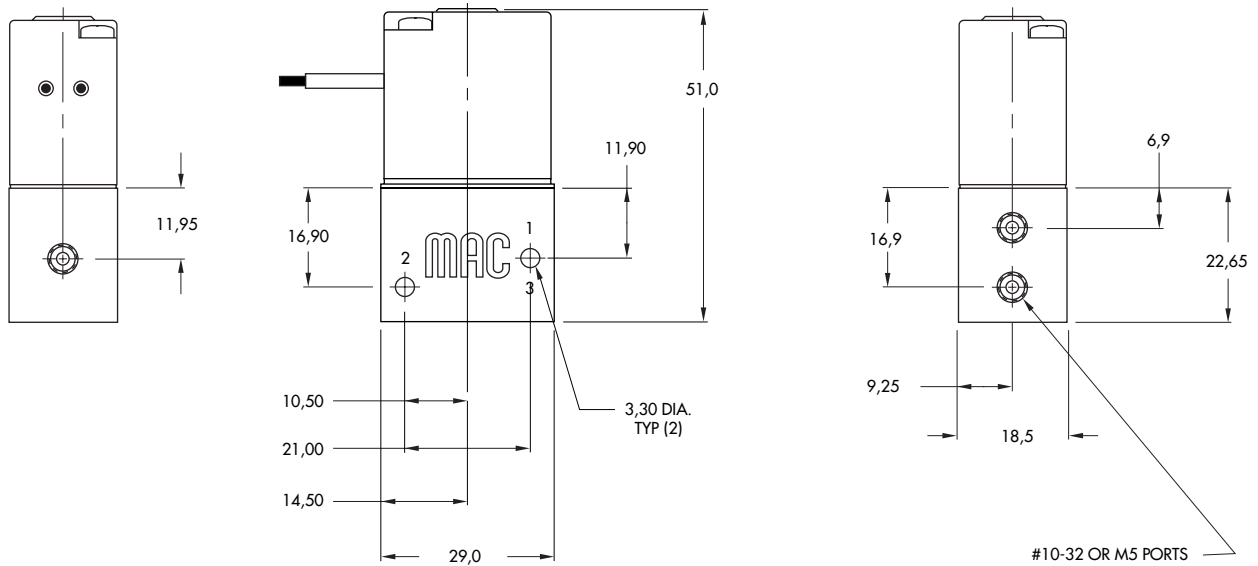
ORDERING EXAMPLE: MAC125A-V1A1-FM-A51DA

**BASE/MANIFOLD TABLE**

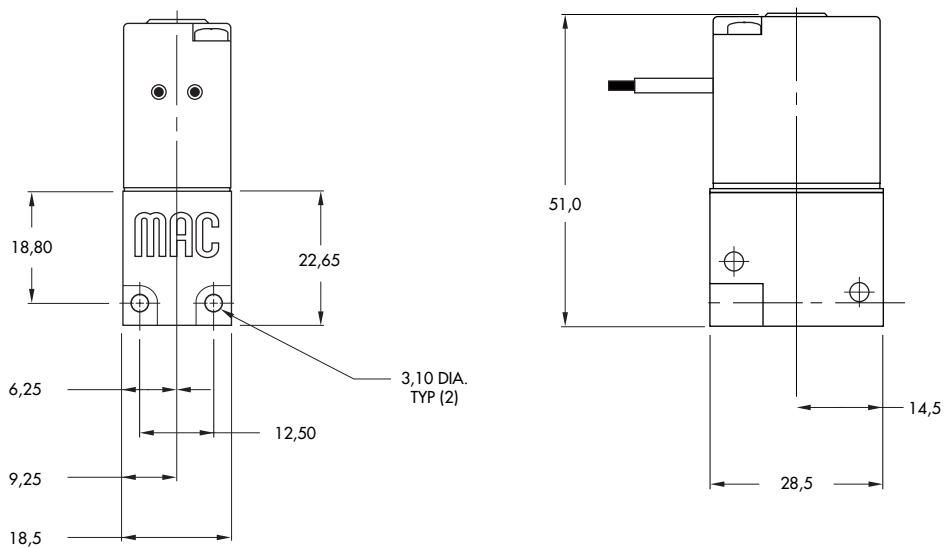
TYPE	PORT SIZE	INDIVIDUAL BASE	MANIFOLD BASE (btm. cyl. ports)	MANIFOLD BASE** (side & btm. cyl. ports)
MAC125	1/4"	MAC125A-B21A	MAC125A-M21B	MAC125A-M21C
	3/8"	MAC125A-B31A	MAC125A-M31B	MAC125A-M31C
MAC250	1/2"	MAC250A-B21A	MAC250A-M21B	MAC250A-M21C
	3/4"	MAC250A-B31A	MAC250A-M31B	MAC250A-M31C
	1"	MAC250A-B41A	N/A	N/A

Individual base available with side ports only.  
 \*\*Requires End Plate Kit M-12002-01 (125 Series), M-25002-01 (250 Series)  
 Bases & manifolds coded for internal pilot. For external pilot, last number of code is 2. ORDERING EXAMPLE: MAC125A-B22A.

### 35 Series Inline

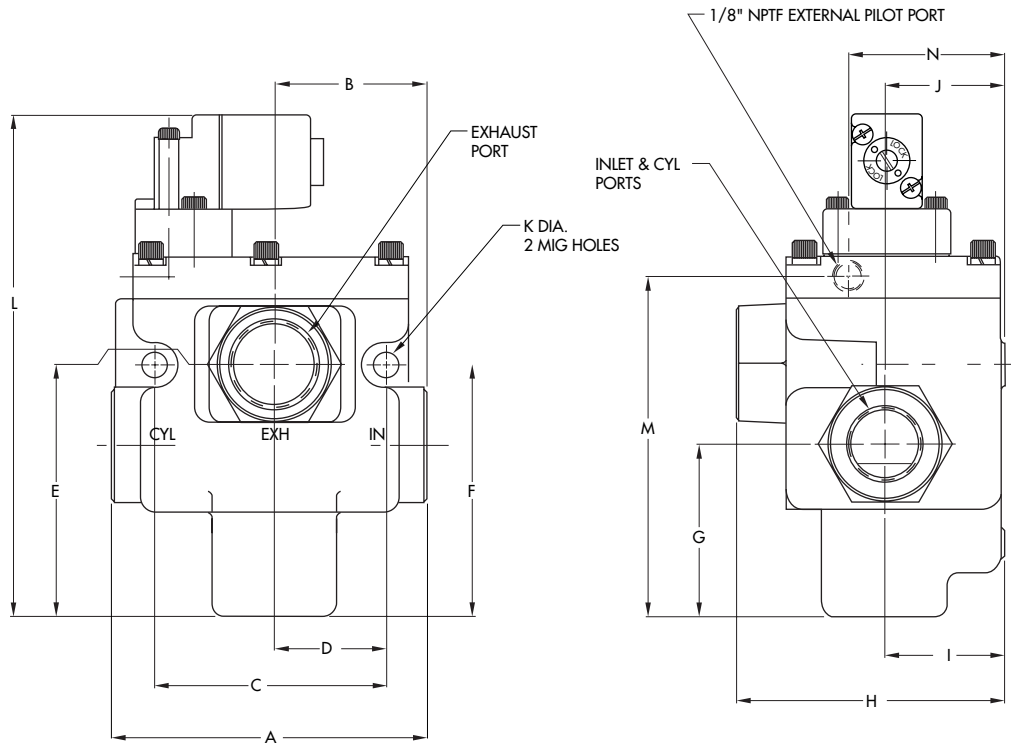


### 35 Series Manifold



**57 & 58 Intrinsically Safe**

Dimensions shown are metric (mm)



DIMENSIONS		A	B	C	D	E	F	G	H	I	J	K	L	M	N
<b>57</b>	Inches	4.42	2.13	3.25	1.56	3.56	3.56	2.43	3.18	1.68	1.80	.34	7.04	4.78	2.19
<b>Series</b>	MM	112.3	54.1	82.6	39.7	90.4	90.4	61.7	96.8	42.7	45.7	8.6	78.9	121.5	55.7
<b>58</b>	Inches	5.66	2.77	4.66	2.27	4.5	4.91	3.31	4.57	1.88	2.00	.53	8.41	6.15	2.39
<b>Series</b>	MM	143.7	70.3	118.4	57.7	114.3	124.7	84.1	116.1	47.8	50.8	13.5	213.6	156.3	60.8



## Section 8 Options

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**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"> <li>- valves type 100 Series</li> <li>- pilot valves "CNOMO"</li> </ul>	<ul style="list-style-type: none"> <li>- valves type 200 Series</li> </ul>
<ul style="list-style-type: none"> <li>- Pilot operated valves with pilots type 100 Series</li> <li>Series : 55 - 56 - 700 - 800 - 900</li> <li style="padding-left: 20px;">- 6300 - 6500 - 6600 - 1300</li> <li style="padding-left: 20px;">- ISO 1 - ISO 2 - ISO 3.</li> <li style="padding-left: 20px;">- MAC 125 - MAC 250 - MAC 500</li> </ul>	<ul style="list-style-type: none"> <li>- pilot operated valves with pilots type 200 Series</li> <li>Series : 200 - 57 - 58 - 59.</li> </ul>
<ul style="list-style-type: none"> <li>- Pilot operated valves with pilots "CNOMO"</li> <li>Series : ISO1 - ISO2 - ISO3</li> </ul>	

Used on valve series: 100, 55, 56, 700, 800, 900, 6300, 6500, 6600, 1300, MVA1C, MVA2B, MVA3B, MAC125, MAC250, MAC500.

Used on valve series: 200, 57, 58, 59.

1. VOLTAGE (100 Serie type coil)		1. VOLTAGE (200 Serie type coil)	
- XX Y ZZ	VOLTAGE	- XX Y ZZ	VOLTAGE
11	120/60, 110/50	11	120/60, 110/50, 24 VDC (6 W)
12	240/60, 220/50	12	240/60, 220/50
13	100/60, 100/50	13	100/60, 100/50
15	200/60, 200 /50	14	200/60, 200/50
16	10/60	20	6/60
20	6/60	21	12/60
21	12/50, 12/60	22	24/60, 24/50
22	24/60, 24/50	23	32/60, 32/50
23	32/60, 32/50	24	48/60, 42/50
24	48/60, 42/50	25	240/50
26*	380/50, 440/50, 440/60, 480/60	26	480/60, 440/50
29	220/60	27	127/60
34	127/50, 120/50	28	415/50
35	48/50	29	220/60
36	16/60	30	380/50
B1	24/50	31	550/60, 550/50
50	24 VDC (6 W)	32	120/60, 110/50
51	24 VDC (4 W)	33	600/60
54	12 VDC (4 W)	34	127/50
55	12 VDC (6 W)	35	48/50
57	12 VDC (2.5 W)	50	24 VDC (6 W)
59	24 VDC (2.5 W)	51	24 VDC (4.5 W)
60	12 VDC (8.5 W)	52	24 VDC (2.5 W)
61	24 VDC (8.5 W)	53	24 VDC (1.0 W)
64	6 VDC (6 W)	55	12 VDC (6 W)
65	32 VDC (7 W)	57	12 VDC (2.5 W)
66	48 VDC (5.8 W)	58	48 VDC (2.5 W)
67	64 VDC (7.5 W)	60	12 VDC (9.5 W)
68	120 VDC (6.4 W)	61	24 VDC (8.5 W)
69*	220 VDC (8.7 W), 250 VDC (11.2 W)	64	6 VDC (8.5 W)
75	90 VDC (8.8 W)	65	32 VDC (10 W)
76*	100 VDC (6.9 W)	66	48 VDC (11.5 W)
84*	125 VDC (10.9 W)	67	64 VDC (10.5 W)
87*	24 VDC (17.1 W)	68	120 VDC (12.3 W)
88*	12 VDC (17.4 W)	69	250 VDC (9.2 W)
89*	36 VDC (18.8 W)	71	8 VDC (8.2 W)
90	28 VDC (8.2 W)	72	24 VDC (12 W)
91*	6 VDC (10.6 W)	73	198 VDC (10 W)
92	190 VDC (6.5 W)	74	72 VDC (11.3 W)
94	3 VDC (7 W)	75	90 VDC (11.3 W)
95	38 VDC (6.4 W)	76	100 VDC (9 W)
A1	24 VDC (1 W)	77	220 VDC (10 W), 230 VDC (11.6 W)
A2	12 VDC (1 W)	78*	24 VDC (24 W)
A3	9 VDC (1 W)	80	55 VDC (10.6 W)
		82	170 VDC (11.1 W)
		83	15 VDC (8.1 W)
		84	125 VDC (10 W)
		86	36 VDC (11 W)
		93*	12 VDC (24 W)

MOD. DD01 : Protection diode (DC) - MAX. 8.5W

MOD. MOV1 : Protection varistor (AC) - MAX. 8.5W

\* Voltages are CLSF only

**2. MANUAL OPERATOR (Common options for 100 & 200 Series type coils)**

- XX Y ZZ	MANUAL OPERATOR
<b>0</b>	No operator
<b>1</b>	Non-locking recessed
<b>2</b>	Locking recessed
<b>3</b>	Non-locking extended
<b>4</b>	Locking extended

<b>5*</b>	No Operator with Light
<b>6*</b>	Non-Locking Recessed with Light
<b>7*</b>	Locking Recessed with Light
<b>8*</b>	Non-Locking Extended with Light
<b>9*</b>	Locking Extended with Light

\* Lights used with "AA" electrical connection

**3. ELECTRICAL CONNECTION (100 Serie type coil)**

- XX Y ZZ	ELECTRICAL CONNECTION
<b>AA</b>	Wiring box with 1/2" NPS conduit
<b>BA</b>	Flying leads
<b>CA</b>	1/2" NPS conduit
<b>CC</b>	1/2" NPT conduit
<b>FA</b>	Military type 2 PIN
<b>GA</b>	Military type 3 PIN
<b>HA</b>	AA with ground wire
<b>JA*</b>	Square connector
<b>JB</b>	Rectangular connector
<b>JC*</b>	Square connector with light
<b>JD</b>	Rectangular connector with light
<b>JE</b>	Square connector on top (ISO2, ISO3)
<b>JF</b>	Rectangular connector on top (ISO1, ISO2, ISO3)
<b>JG</b>	JE with light
<b>JH</b>	JF with light
<b>JJ</b>	Square connector, male only
<b>JM</b>	Rectangular connector, male only
<b>MA</b>	Electrical common conduit (100 Series-Manifold/900 Series)
<b>MB</b>	Electrical common conduit (100 Series-Stacking/700 Series)
<b>NA</b>	CA with ground wire
<b>NC</b>	CC with ground wire
<b>RA</b>	3/8" NPS conduit

\* Not to be used with 100, 800 and 900 Series manifold mounting

**3. ELECTRICAL CONNECTION (200 Serie type coil)**

- XX Y ZZ	ELECTRICAL CONNECTION
<b>AA</b>	Wiring box with 1/2" NPS conduit
<b>BA</b>	Flying leads
<b>CA</b>	1/2" NPS conduit
<b>CC</b>	1/2" NPT conduit
<b>EA</b>	Explosion proof (200 Series)
<b>EA</b>	Explosion proof (57, 58 & 59 Series)
<b>FA</b>	Military type 2 PIN
<b>GA</b>	Military type 3 PIN
<b>HA</b>	AA with ground wire
<b>JA*</b>	Square connector
<b>JC</b>	Square connector with light
<b>JJ</b>	Square connector, male only
<b>NA</b>	CA with ground wire
<b>NC</b>	CC with ground wire



**4. COIL WIRE LENGTH (Common options for 100 & 200 Serie type coils)**

<b>- XX Y ZZ (-VV)</b>	<b>WIRE LENGTH</b>
<b>AA</b>	18"
<b>AB</b>	24"
<b>AD</b>	36"
<b>AE</b>	48"
<b>AF</b>	72"
<b>AG</b>	6"
<b>AR</b>	12"
<b>AU</b>	120"
<b>BA</b>	60"
<b>BB</b>	144"
Series 6000 : wire length, from the base	
<b>MOD L024</b>	24"
<b>MOD L036</b>	36"
<b>MOD L048</b>	48"
<b>MOD L060</b>	60"
<b>MOD L072</b>	72"
<b>MOD L120</b>	120"

**Codification table for voltages / Wire length / Manual operators / Electrical connections**

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

**OPTIONS AVAILABLE FOR**

- Solenoid valves 35, 45 and 82 Series

## 1. VOLTAGE

- D XX	X - X XX	VOLTAGE
AA		120/60, 110/50
AB		240/60, 220/50
AC		24/60, 24/50
AD		24/60
AE		200/60
AF		240/50
AG		100/50, 100/60, 110/60
DA		24 VDC (5.4 W)
DB		12 VDC (5.4 W)
DC		12 VDC (7.5 W)
DD		24 VDC (7.3 W)
DE		12 VDC (12.7 W) - CLSFonly
DF		24 VDC (12.7 W) - CLSF only
DK		110 VDC (4.7 W)
DL		64 VDC (6 W)
DM		36 VDC (5.3 W)
DN		6 VDC (6 W)
DP		48 VDC (5.8 W)
DU		24 VDC (6 W)
EA		12 VDC (6 W)
FA		12 VDC (1.8 W)
FB		24 VDC (1.8 W)
FE		12 VDC (2.4 W)
FF		24 VDC (2.4 W)

## 2. WIRE LENGTH

- D XX	X - X XX	WIRE LENGTH
A		18"
B		24"
C		36"
D		48"
E		72"
F		96"
J		For external plug-in connector ("J", "K" & "T" type electrical connection)
P		For plug-in valves (82 Series only)

### 3. MANUAL OPERATOR

**- D XX X - X XX      MANUAL OPERATOR**

<b>0</b>	No operator
<b>1</b>	Non-locking recessed
<b>2</b>	Locking recessed
<b>3</b>	Non-locking extended
<b>4</b>	Locking extended

### 4. ELECTRICAL CONNECTION

**- D XX X - X XX      ELECTRICAL CONNECTION**

<b>BA</b>	Flying leads
<b>BK</b>	BA with protection diode
<b>BL</b>	BA with protection varistor (M.O.V.)
<b>** CA</b>	1/2" NPS conduit
<b>** CM</b>	1/2" NPS metal conduit
<b>** CN</b>	1/2" NPS metal conduit w/ground
<b>** JB</b>	Rectangular connector
<b>** JD</b>	Rectangular connector with light
<b>** JM</b>	Rectangular connector, male only
<b>KA</b>	Square connector
<b>KB</b>	Square connector with protection diode
<b>KC</b>	Square connector with protection varistor (M.O.V.)
<b>KD</b>	Square connector with light
<b>KE</b>	Square connector with light and protection diode
<b>KF</b>	Square connector with light and protection varistor (M.O.V.)
<b>KG</b>	Square connector with LED light & diode
<b>KJ</b>	Square connector (male only)
<b>KK</b>	Square connector with protection diode (male only)
<b>KL</b>	Square connector with protection varistor (male only) (M.O.V.)
<b>*** MA</b>	Electrical common conduit
<b>TA</b>	Dual tabs
<b>TB</b>	TA with protection diode
<b>TD</b>	TA with light
<b>TE</b>	TA with light and protection diode
<b>TJ</b>	Dual tabs (male only)
<b>TK</b>	TJ with protection diode
<b>TM</b>	TJ with light
<b>TN</b>	TJ with light and protection diode
<b>DA*</b>	Plug-in connector
<b>DK*</b>	DA with protection diode
<b>DL*</b>	DA with protection varistor (M.O.V.)
<b>FM</b>	Plug-in
<b>FN</b>	Plug-in with diode
<b>FP</b>	Plug-in with M.O.V.

\* To be used with 82 Series only  
 \*\* Inline valves only for 35 & 45 series. No restrictions for 82 series.  
 \*\*\* Stacking valves only for 35 & 45 series. Conduit end plate kit required, one per stack.

35 series : M-35002-01  
 45 series : M-45005-01

## 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

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## MAC VALVES Warranty, Warranty Limitations, Flat Rate Rebuild Program

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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.

Алматы (7273)495-231  
Ангарск (3955)60-70-56  
Архангельск (8182)63-90-72  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Благовещенск (4162)22-76-07  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
Владикавказ (8672)28-90-48  
Владимир (4922)49-43-18  
Вологда (8172)26-41-59  
Воронеж (473)204-51-73  
Екатеринбург (343)384-55-89

Иваново (4932)77-34-06  
Ижевск (3412)26-03-58  
Иркутск (395)279-98-46  
Казань (843)206-01-48  
Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
Коломна (4966)23-41-49  
Кострома (4942)77-07-48  
Краснодар (861)203-40-90  
Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Курган (3522)50-90-47  
Липецк (4742)52-20-81

Магнитогорск (3519)55-03-13  
Москва (495)268-04-70  
Мурманск (8152)59-64-93  
Набережные Челны (8552)20-53-41  
Нижний Новгород (831)429-08-12  
Новокузнецк (3843)20-46-81  
Ноябрьск (3496)41-32-12  
Новосибирск (383)227-86-73  
Омск (3812)21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
Пенза (8412)22-31-16  
Петрозаводск (8142)55-98-37  
Пермь (342)205-81-47

Ростов-на-Дону (863)308-18-15  
Рязань (4912)46-61-64  
Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78  
Севастополь (8692)22-31-93  
Саранск (8342)22-96-24  
Симферополь (3652)67-13-56  
Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Сургут (3462)77-98-35  
Сыктывкар (8212)25-95-17  
Тамбов (4752)50-40-97  
Тверь (4822)63-31-35

Тольятти (8482)63-91-07  
Томск (3822)98-41-53  
Тула (4872)33-79-87  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Улан-Удэ (3012)59-97-51  
Уфа (347)229-48-12  
Хабаровск (4212)92-98-04  
Чебоксары (8352)28-53-07  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Чита (3022)38-34-83  
Якутск (4112)23-90-97  
Ярославль (4852)69-52-93

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