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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 - compact packaging

- speed - modularity

- repeatability - specific application modifications

- non lube service - low wattage

- ease of maintenance - broad electrical options

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

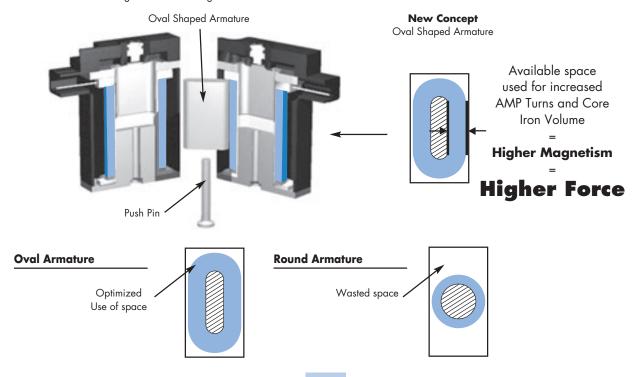
The patented Latching Solenoid is another new offering to the MAC product line. The latching solenoid provides the function of a double solenoid operated valve utilizing only one solenoid.

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:

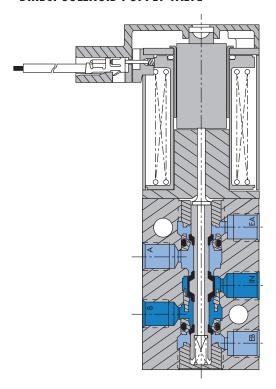
- Increased coil windings (amp turns)
- Increased core iron volume

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





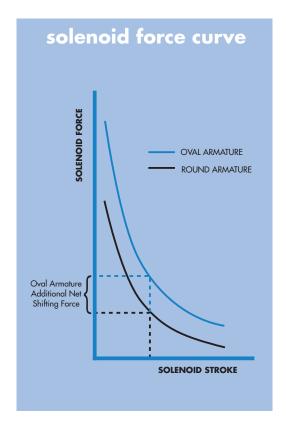
Short Stroke = High solenoid force

Short Stroke = High return spring force

Short Stroke = Low current to shift solenoid

DIRECT OPERATED 10 MM DESIGN WITH OVAL SHAPED ARMATURE

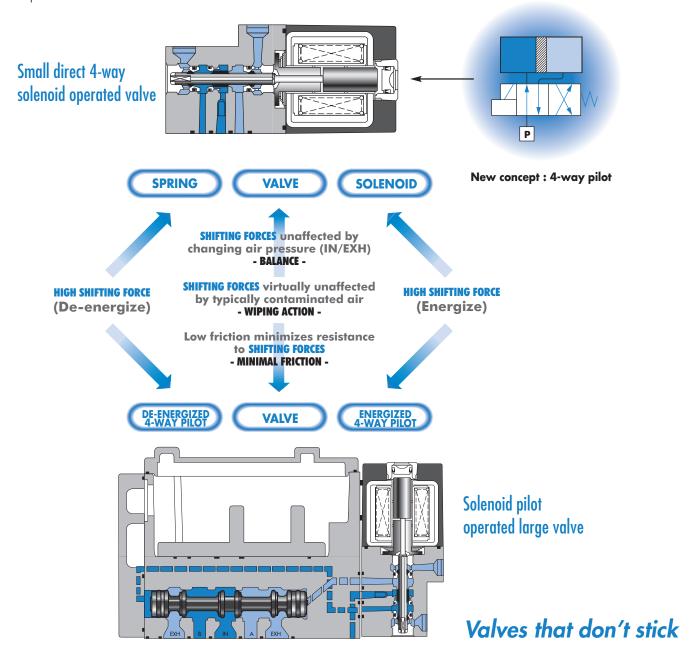
- Balanced poppet, with no seals of any kind in a bore no friction
- New patented MAC solenoid® with "oval" shaped armature provides high shifting force through more core iron and magnet wire
- Balanced poppet high shifting forces unaffected by fluctuations in air pressure
- Short stroke direct operated poppet valve (patented adjustable inlet seat controls stroke) - high shifting force - without small piston and no minimum operating pressure
- Large orifice "0.0024 in²"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.
- eliminates cutting long life
- Every valve calibrated for flow for a given coil wattage consistent flow





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.







MAC DISTRIBUTORS NETWORK

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



45 countries

O 3500 employees

200 service centers

• \$ 50 million inventory

O 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, Hysterisis, 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	999981
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.

- <u>Direct solenoid valves 3 ways :</u> universal The following functions are available
 - 3 ways NC
 - 3 ways NO
 - 2 ways NC
 - 2 ways NO
 - Selector
 - Divertor
- <u>Pilot operated valves 3 ways :</u> 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)

• 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



Section 1

Direct solenoid and solenoid pilot operated valves



Function	Port size	Floш (Max) Cv	Individual mounting

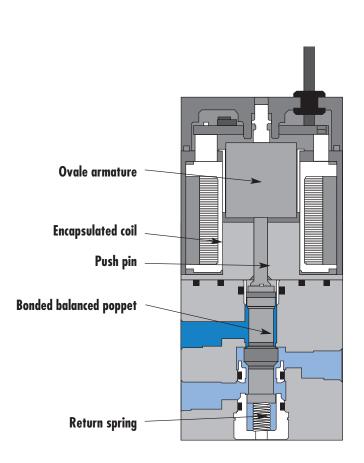
I DIICHUII	1 011 3126	LIOM (LIUV) CA	IIIuiviuvui II	IIODIIIIIII						
			Inline	Sub-base non "plug-in"	Sub-base "plug-in"	Sub-base/ manifold base non "plug-in" with latching solenoid	Sub-base/ manifold base "plug-in" with latching solenoid	Valve only – No base non "plug-in" Conform to ISO 5599/1	Valve only – No base "plug-in" Conform to ISO 5599/2	Valve only – No base non "plug-in" Conform to ISO 15407/1
3/2	M3	0.082	P. 15							
3/2 - 2/2	M5 - #10-32	0.12	P. 19							
3/2	1/8"	0.3	P. 23							
3/2	1/8" - #10-32	0.3	-							
3/2	1/8" - 5/32 O.D. pressed-in tube receptacle	0.3	-			, ,				
3/2	1/8"	0.4	-	P. 33						
3/2	#10-32 - 1/4" O.D. tube receptacle	0.4	-		P. 35	P. 41	P. 43			
3/2	1/8" - 1/4"	0.5	P. 47	P. 49						
3/2	1/8" - 1/4" O.D. tube receptacle	1.2	-	P. 53	P. 55	P. 59	P. 61			
3/2 - 2/2	1/8" - 1/4"	1.5	P. 65							
3/2 - 2/2	3/4" - 1"	20.0	P. 69							
3/2 - 2/2	1 1/2" - 2" - 2 1/2"	60.0	P. 73							
5/2	M5 - #10-32	0.1	P. 77							
4/2	1/8" - #10-32	0.3	P. 81							
4/2	1/8" - 5/32 O.D. pressed-in tube receptacle	0.3	-							
5/2 - 5/3	#10-32 - 1/4" O.D. tube receptacle	0.4		P. 95	P. 97					
5/2	#10-32 - 1/4" O.D. tube receptacle	0.4	-			P. 103	P. 105			
5/2	1/8" - 1/4"	0.5	P. 111	P. 113						
5/2	1/8"	1.0	P. 121							
5/2 - 5/3	1/8"	1.1	_	P. 125	P. 127					
5/2	1/8"	1.1				P. 133	P. 135			
5/2 - 5/3	1/8" - 1/4"	1.0	P. 141	P. 143						
5/2 - 5/3	1/8" - 1/4" - 3/8"	1.2	-	P. 147	P. 149					
5/2 - 5/3	1/4" - 3/8"	1.2								
5/2 - 5/3	3/8" - 1/2"	3.8	P. 159							
5/2 - 5/3	1/4" - 3/8" - 1/2"	3.4	-	P. 161	P. 163					
5/2 - 5/3	1/4"	1.0	-							P. 173
5/2 - 5/3	1/8"	0.43								P. 177
5/2 - 5/3	1/4" - 3/8"	1.8	-	-				P. 181	P. 165	
5/2 - 5/3	3/8" - 1/2"	3.0						P. 187	P. 189	
5/2 - 5/3	1/2" - 3/4"	6.1	-					P. 193	P. 195	

Manifold m	ounting										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	
											33
											34
D 05	ı ———									-	
P. 25		P. 27	P. 29								36
		1. 2/	1. 2/								
	P. 37	P. 39				P. 41	P. 43				32
											37
	P. 57	P. 55				P. 59	P. 61				38
											52 67
											69
											44
P. 83											46
	P. 99	P. 85 P. 101	P. 87	P. 89	P. 91						
	Г. 77	r. 101				P. 103	P. 105				42
P. 115		P. 117									47
											48P
	P. 129	P. 131				D 100	D 105				48
						P. 133	P. 135				400
	P. 151	P. 153									92
	P. 165	P. 167									93
										P.173	
										P.173	ISO 01 ISO 02
								P. 181	P. 183		ISO 1
								P. 187	P. 189		ISO 2
								P. 193	P. 195		ISO 3



8 mm valve

Individual mounting Series



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	3

33 34

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37 38 52

67 69 44

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ISO 01

ISO 02

ISO 1



Function	Port	size	Flow (Ma	x]		Individual m	ounting		Series
3/2 NC	мз		0.082		Inline				
PERATIONAL BENEI	FITS					Patents an	d patents	pending	33
8mm valve direct s	olenoid operated. immune to pressure variat	ions							34
Short stroke with hi Patented solenoid of Low wattage soleno Powerful return spr	igh flow. develops high shifting forc oids. ing.								36
Extremely fast resp	onse times.								32
								Profesion .	37
						111	100	0	38
						1	0		52
HOW TO ORDER									67
	Port size		N.C.	Only			N.C	. Only **	69
				2				2	44
				Z/, w			Z/1,3w		46
	мз		33A-AAB-	Rxxx-xxx		33A-BAB-R <i>xxx-xxx</i>			
OLENOID OPE			r required. (Consult factory)	X-<i>XX</i>	<u>X</u>				42 47 48P
XX Voltag	je	X	Lead wire length	X	Manual ope	rator	XX	Electrical connection	701
DA 24 VDC	(0.5W)	0	No Lead wire*	0	No manual opera		BA	Flying leads	48
DB 24 VDC DC 24 VDC		A B	18"	3	Non-locking rece Non-locking exte		BB BC	Flying leads w/LED Flying leads w/MOV	40
DF 24 VDC	(4.0W)	С	36"		Them recking onto		BD	Flying leads w/LED & MOV	
DG 12 VDC (D E	48" 72"				RA	Mini JAC Solenoid plug-in	400
DJ 12 VDC	(1.8W)						RB	Mini JAC Solenoid plug-in	
DM 12 VDC	(4.0W)		* Not available for flying leads connectors				RC	w/LED Mini JAC Solenoid plug-in	92
								w/MOV	
Other options avai	lable, see page 321.						RD	Mini JAC Solenoid plug-in w/LED & MOV	93
	is possible for the "B" an	d "R" t	ype electrical connectors.				TA	JST Solenoid plug-in	70
onsult factory for ord			•				TB	JST Solenoid plug-in w/LED	ISO 01
							TC TD	JST Solenoid plug-in w/MOV JST Solenoid plug-in w/LED &	
								MOV	ISO 02
									ISO 1
									ISO 2
									ISO 3







Power:

 Fluid:
 Compressed air, vacuum, inert gases

 Pressure range:
 Vacuum to 120 PSI

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

 Filtration:
 40μ

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

 Flow:
 4W: (Cv .082) - 3W: (Cv .062) - 2.5W: (Cv .062) - 1.8W: (Cv .055) - 1.0W: (Cv .030) - 0.5W: (Cv .020)

 Coil:
 Class A wire (#26 AWG x18), continuous duty

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

4.0W - 3.0W - 2.5W - 1.8W - 1.0W - 0.5W

DIMENSIONS

Dimensions shown are metric (mm)

Shown with JST Connector

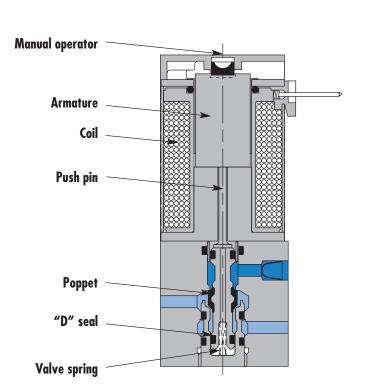
10,6
4,5
4,6
4,0
20,2
Thru Typ (2)

8,00
4,00

7,5



Individual mounting Series



SERIES FEATURES

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

ISO 3

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92



Function	Port size	Flow (Max)	Individual mounting	Series
3/2 NO-NC, 2/2 NO-NC	M5, # 10-32	0.12 C _V	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.



Electrical connection

MAC JAC Solenoid plug-in w/Diode

MAC JAC Solenoid plug-in

MAC JAC Solenoid plug-in w/LED

MAC JAC Solenoid plug-in w/Diode & LED

MAC JAC Solenoid plug-in w/MOV & LED

MAC JAC Solenoid plug-in

MAC JAC Solenoid plug-in w/Rectifier & LED

Plug-in wire assembly with rectifier and light

Plug-in wire assembly with

Plug-in wire assembly

Flying leads with light MAC JAC Solenoid plug-in

Flying leads

w/MOV

w/Rectifier

light

XX

GA

GB

GC

GD

GE

GF

GH

KA

КС

КТ

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ISO 01 ISO 02

ISO 1

ISO 2 ISO 3

HOW TO ORDER

Port size	Universal valve	NC only valve		
M5	34C-ABA-G xxx-xxx	34C-ABB-G xxx-xxx		
# 10-32	34C-AAA-G xxx-xxx	34C-AAB-G xxx-xxx		

SOLENOID OPERATOR ➤	G <u>xx</u>	X - XXX *	
XX Voltage	X Wire length	X Me	anual operator
AA 120 VAC (2.5W) DC 24 VDC (1.8W)	A 18" B 24"		n-locking recessed n-locking extended
DD 24 VDC (2.5W) DF 24 VDC (4.0W)	C 36"	-	-

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.







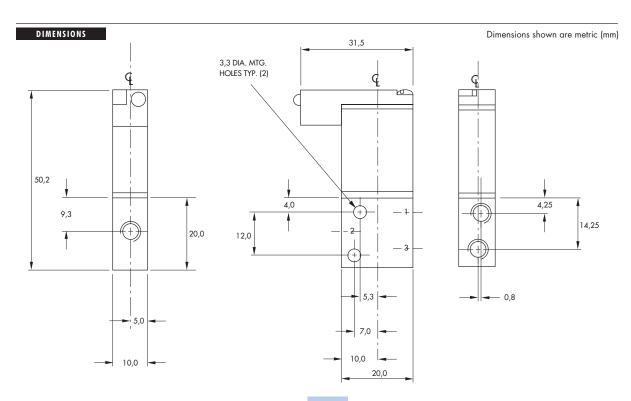
Response times:

(with 4 W coil)

Energize: 3.4 ms

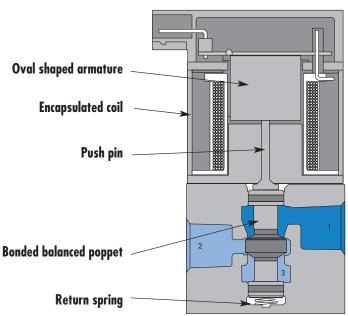
De-energize : 1.5 ms

Fluid: Compressed air, vacuum, inert gases Vacuum to 120 PSI Pressure range: 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: 4 W: (0.12 C_v) - 2.5 W: (0.10 C_v) - 1.8 W: (0.06 C_v) Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage Power: 4 W - 2.5 W - 1.8 W





Individual mounting Series Inline 33 34 Manifold mounting 36 'plug-in" with 32



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.

69 44

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42

47 48P

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400

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ISO 01

ISO 02

ISO 1

ISO 2



Function	Port size	Flow (Max)	Individual mounting	Series
3/2	1/8"	0.3 C _v	Inline	

OPERATIONAL BENEFITS

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



33 34

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37 38

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69 44

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48P

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400

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ISO 01 ISO 02

ISO 1

ISO 2

ISO 3

HOW TO ORDER

Port size	Universal valve	NC only valve
		Z 2 W
1/8" NPTF	36A-AAA-J xxx-xxx	36A-AAB-J xxx-xxx

SOLENOID OPERATOR ➤

$J \times XXX - XXX$ (-G) Add "G" for ground

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

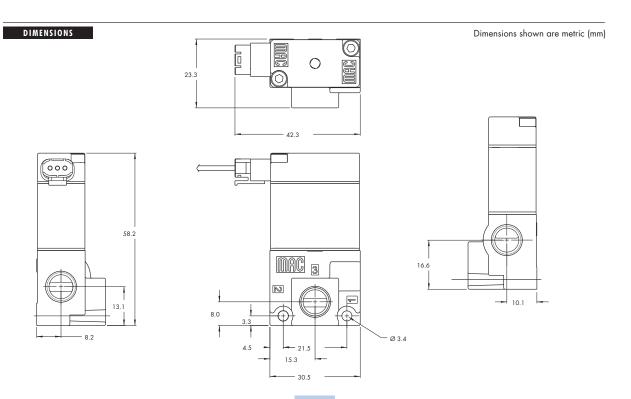






Fluid: Compressed air, vacuum, inert gases Pressure range: Vacuum to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 µ Temperature range: 0°F to 120°F (-18°C to +50°C) Flow: 1.8 Watt: (0.15 C_v), 2.4 Watt: (0.15 C_v), 5.4 Watt: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

Option : • BSPP threads





Function	Port size	Flow (Max)	Individual mounting	Series
3/2	1/8" - # 10-32	0.3 C _v	Stacking	

OPERATIONAL BENEFITS

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



HOW TO ORDER

Port size	NC only stacking	NC stacking Universal poppet	NO stacking Universal poppet	
	CYL W T T T	W	CYL W T T T	
1/8" NPTF	36A-SAB-J xxx-xxx	36A-SAC-J xxx-xxx	36A-SAD-J xxx-xxx	
# 10-32	36A-SBB-J xxx-xxx	36A-SBC-J xxx-xxx	36A-SBD-J xxx-xxx	

SOLENOID OPERATOR ➤

$J \underline{xxx}.\underline{xxx}$ (-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)	В	24"	2	Locking recessed	GA	MAC JAC solenoid plug-in
DB	12 VDC (5.4W)	С	36"			GB	MAC JAC solenoid plug-in
DC	24 VDC (2.4W)			_			with diode
DD	12 VDC (2.4W)					GD	MAC JAC solenoid plug-in with light
Othar a	ntions available, see nage 317					GG	MAC JAC solenoid plug-in with rectifier

BODY TYPE OPTIONS

36A-SAB-Jxxx-xxx

Stacking body
T Stacking body with bottom inlet

ISO 3

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34

36

32

37 38 **52**

67 69 44

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42

47 48P

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ISO 01

ISO 02

ISO 1

^{*} 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.







Fluid:
Compressed air, vacuum, inert gases

Vacuum 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:
1.8 Watt: (0.15 C_V), 2.4 Watt: (0.15 C_V), 5.4 Watt: (0.30 C_V)

Coil:
Class A wire (#22 AWG x 12), continuous duty

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

 Protection :
 Consult factory

 Power :
 5.4 W - 2.4 W - 1.8 W

Option : • BSPP threads

Spare parts : • Inlet & exhaust isolator plate : N-36001 • Inlet isolator : N-36002

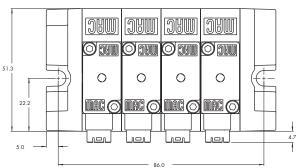
• Exhaust isolator : N-36003 • Tie rod (x2) : 79411

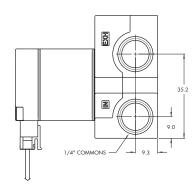
DIMENSIONS

15.0 — 10.5 — 0.3 — 15.0 — 15.0 — 14.1 — 15.0 — 14.1 — 14.1 — 15.0 — 14.1 — 14.

Dimensions shown are metric (mm)

Note: Isolator adds 2.5 mm to length of stack.







Function	Port size	Floш (Max)	Individual mounting	Series
3/2	1/8" - 5/32 Pressed-in tube receptacle	0.3 C _V	Manifold base "plug-in"	
OPERATIONAL BENEFITS	I			33
1. Balanced poppet, im	mune to variations of			34
pressure. 2. Patented solenoid develops high shifting forces.				36
3. Short stroke with high				
Higher forces result in lower wattages for given flow. Powerful return spring.				32

HOW TO ORDER

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

SOLENG	OID OPERATOR ➤		J <u>xx</u> P- <u>xxx</u> * (-G) A	\dd "(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)				
DD	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.

48

37 38 **52**

67 69 44

46

42

47

48P

400

92

93

ISO 01

ISO 02

ISO 1

ISO 2







Power:

Option:

DIMENSIONS

Fluid: Compressed air, vacuum, inert gases Pressure range: Vacuum 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 $+50^{\circ}$ C) Flow: $1.8W : (0.20 C_v) - 2.4W : (0.20 C_v) - 5.4W : (0.30 C_v)$ Coil: Class A continuous duty, #22 AWG x 12 base leads Voltage range: -15% to +10% of nominal voltage Protection: Consult Factory

Spare parts : • Inlet isolator : 28501 • Exhaust isolator : 28502 • Valve cover plate : M-46002

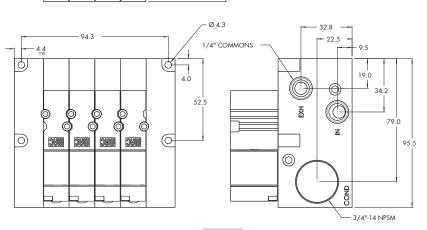
• Tie rod (x2) : 79443

5.4 W - 2.4 W - 1.8 W

• BSPP threads

Dimensions shown are metric (mm)

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





Note : All manifold bases are only available with a bottom cylinder port.

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

Example: Manifold base only: 36A-0SA-AJ (Normally closed manifold base & regulator with knob).

Direct solenoid and solenoid pilot operated valves

Function	Port size		Floш (Max)) Individu	al mounting	Series
3/2	1/8" -	5/32 Pressed-in tube receptacle	0.3 C _V	Manifold "plug-in" pressu regulat	with re	
PERATIONAL BENEFITS						33
Balanced poppet, immune	e to variations of					34
pressure. Patented solenoid develop	os high shifting					
forces.						36
Short stroke with high flow Higher forces result in low						
given flow.						32
Powerful return spring.					000	
						37
						38
						52
HOW TO ORDER						67
Port size		Universal Valve		Universal Valve	Normally Closed Only	69
		Normally Closed		Normally Open	,,	44
					2 / w	
Valve less base		36A-J00-00-J xx P- x 2		36A-K00-00-J xx P- xxx	36A-L00-00-J xxP-xxx	46
1/8" NPTF		36A-JSA-AG-J <i>XXP-X</i>		36A-KSA-AH-J xxP-xxx	36A-LSA-AG-J xxP-xxx	
5/32 tube receptor		36A-JSF-AG-J xxP-x		36A-KSF-AH-J xxP-xxx	36A-LSF-AG-J xxP-xxx	42
OLENOID OPERATOR	>		J <u>xx</u> P	- xxx (-G) Add "	G" for ground	47 48P
XX Voltage		X Mo	ınual ope	rator XX	Electrical connection	40
AA 120 VAC (5.4W) DA 24 VDC (5.4W)			n-locking reces	ssed FA FB	Base plug-in Base plug-in with diode	48
DB 12 VDC (5.4W)			ang recessed	FG	Base plug-in with alode	
DC 24 VDC (2.4W) DD 12 VDC (2.4W)						400
Other options available, see	page 317.					
te : AC voltage requires cor	nnector with rectitier.					92
OPTIONS						
36A-JSA-A G -J <i>xx</i> P- <i>xxx</i>				36A-KSA-A H -J xx P- xxx		93
G NC m	nanifold & regulator w	rith slotted stem adjustn	nent	H NO manifold	& regulator with slotted stem adjustment	ISO 01
J NC m	nanifold & regulator w nanifold & regulator w	rith locking slotted stem rith knob adjustment	aajustment	K NO manifold	& regulator with slotted stem adjustment & regulator with locking slotted stem adjustment & regulator with knob adjustment	ISO 02
to . All manifold bases are	م مانین مامامانسیس م					130 0

ISO 1

ISO 2







Fluid: Compressed air, vacuum, inert gases

Pressure range: Vacuum 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 : $0^{\circ}F$ to $120^{\circ}F$ (- $18^{\circ}C$ to $+50^{\circ}C$)

Flow: $1.8W: (0.20 C_v) - 2.4W: (0.20 C_v) - 5.4W: (0.30 C_v)$

Class A continuous duty, #22 AWG x 12 base leads

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

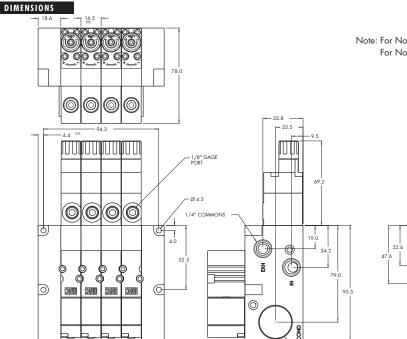
Protection : Consult Factory

Power: 5.4 W - 2.4 W - 1.8 W

Option : • BSPP threads

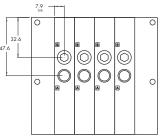
Spare parts : • Inlet isolator : 28501 • Exhaust isolator : 28502 • Valve cover plate : M-46002

• Tie rod (x2) : 79443



Dimensions shown are metric (mm)

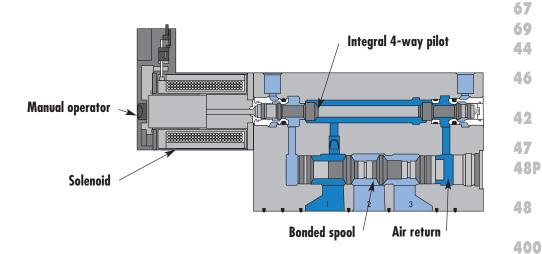
Note: For Normally closed manifold the "A" port is plugged. For Normally open manifold the "B" port is plugged.



3/4"-14 NPSM



Individual mounting Series Sub-base "plug-in" on "plug-in' 33 34 Manifold mounting Manifold base non "plug-in" 36



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.

32

37 38 **52**

69

42

48P

92

93

ISO 01

ISO 02

ISO 1



Function	Port size	Flow (Max)	Individual mounting	Series
3/2 NO-NC	1/8"	0.4 C _v	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 $C_{\rm v}$).
- 4. Fast, repeatable response times.
- 5. Maximum shifting forces in both directions.



Electrical connection

Flying leads with light
MAC JAC Solenoid plug-in

MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in

MAC JAC Solenoid plug-in w/LED

MAC JAC Solenoid plug-in

MAC JAC Solenoid plug-in

w/Rectifier

MAC JAC Solenoid plug-in

Plug-in wire assy. with rectifier & light & ground

Flying leads

w/MOV

w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED

w/Rectifier & LED

Plug-in wire assy. Plug-in wire assy. with light

BA

GA GB

GC

GD

GE

GF

GG

GH

KA

KT

KD

36

33

34

32 37

38 52 67

69

44

46

42

47 **48P**

48

400

92

93

ISO 01 ISO 02

ISO 1

ISO 2

ISO 3

HOW TO ORDER

Pilot air	NO valve	NC valve	Universal valve
	10 12 JZ	10 2 12 d/l	10 2 12 10 3 01
Internal	32B-BMA-000-G <i>xxx-xxx</i>	32B-AMA-000-Gxxx-xxx	
External	32B-BMB-000-G xxx-xxx	32B-AMB-000-Gxxx-xxx	32B-GMB-000-G xxx-xxx
Internal	32B-BMA-CAL-G <i>xxx-xxx</i>	32B-AMA-CAL-Gxxx-xxx	
External	32B-BMB-CAM-Gxxx-xxx	32B-AMB-CAM-Gxxx-xxx	32B-GMB-CAM-Gxxx-xxx
	Internal External Internal	10	Internal 32B-BMA-000-Gxxx-xxx 32B-AMA-000-Gxxx-xxx S2B-AMB-000-Gxxx-xxx 32B-AMB-000-Gxxx-xxx Internal 32B-BMA-CAL-Gxxx-xxx 32B-AMA-CAL-Gxxx-xxx 32B-AMA-CAL-Gxx-xxx 32B-AMA-CAL-Gxxx-xxx 32B-AMA-CAL-Gxx-xxx 32B-AMA-CAL-Gxxx-xxx 32B-AMA-CAL-Gxx-xxx 32B-AMA-CAL-Gxxx-xxx 32B-AMA-CAL-Gxxx-xxx 32B-AMA-CAL-Gxxx-xxx 32B-AMA-CAL-Gxxx-xxx 32B-AMA-CAL-Gxxx-xxx 32B-AMA-CAL-Gxxx-xxx 32B-AMA-CAL-Gxxx-xxx 32B-AMA-CAL-Gxxx-xxx 3

Note: Above codes are for side port.

STANDARD SOLENOID OPERATOR ➤

				'	1	
XX	Voltage	X	Wire length		X	Manual operator
AA	120 VAC (2.5W)	Α	18"		1	Non-locking recessed
DA	24 VDC (1.0W)	В	24"		2	Locking recessed
DC	24 VDC (1.8W)	С	36"			
DD	24 VDC (2,5W)			_		
DF	24 VDC (4.0W)					

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- x N	Λx-xA	x-Gxxx	-XXX
	l	A B	Individual base – Side port Individual base – Bottom por
		М	Pilot exhaust muffled

P Pilot exhaust piped (# 10-32) U Pilot exhaust to main exhaust (not available with external pilot)



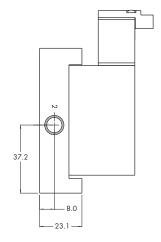


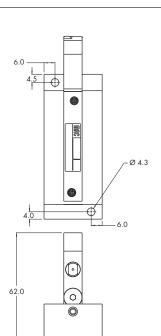


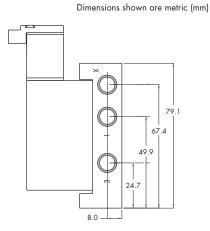
Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot: 20 to 120 PSI External Pilot : Vacuum to 120 PSI 20 to 120 PSI Pilot pressure: Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 µ Temperature range: 0°F to 120°F (-18°C to +50°C) Flow: 1/8" : (0.40 C_v) Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize : 5 ms (with 4 W coil) De-energize : 5 ms

Options : • BSPP threads

DIMENSIONS







34

31.8



nction		Port size	Flow (Max)		Individua	l mounting	Series
/2 NO-NC		# 10-32 - 1/4″ O.D. tube receptacle	0.4 C _v		Sub-base "plug-in"		
ERATIONAL BENEFITS							33
3-way valve with 4-w							34
10 mm valve (stacks of High flow (up to 0.4	C _v).	iters).				1	0.7
Fast, repeatable resp Maximum shifting for		ctions.					36
3							
						- 511	32
							37
							38
							52
HOW TO ORDER							67
Port size	Pilot gir	NO valve		NC valve		Universal valve	69
	7 1107 4111						44
		10 2 12 D 37		10 2 1: D / \ 371	2	10 2 12 D 4 47	
Valve less base		₩ 3 °1		▼ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ Ţ		<u> </u>	46
valve less base	Internal External	32B-BMA-000-G xx P- 32B-BMB-000-G xx P-		32B-AMA-000-Gxxl		32B-GMB-000-GxxP-xxx	-
# 10-32	Internal	32B-BMA-AAA-GxxP		32B-AMA-AAA-Gxx			42
	External	32B-BMB-AAB-G xx P-		32B-AMB-AAB-GXX		32B-GMB-AAB-GxxP-xxx	47
1/4" O.D. Tube receptacle	Internal External	32B-BMA-EAA-GxxP- 32B-BMB-EAB-GxxP-		32B-AMA-EAA-Gxx 32B-AMB-EAB-GxxI		32B-GMB-EAB-GxxP-xxx	47 48P
ote : Above codes are fo		SZD DIVID LAD OAAI		320 AIVID LAD OAAI	****		407
TANDARD SOLEN		OR ➤	G XX P-2	XXX.			40
							48
XX Voltage		X M	lanual opera	tor	XX	Electrical connection	400
AA 120 VAC (2.3	5W)		on-locking recessed		SA	Base plug-in	400
DA 24 VDC (1.0\) DC 24 VDC (1.8\)		<u>2</u> Lo	cking recessed		SJ SS	Base plug-in with light Base plug-in with rectifier & light & ground	92
DD 24 VDC (2.5) DF 24 VDC (4.0)	/ /)						
		rectifier.					93
Other options available tching solenoid also ava	e, see page 311. ailable, see page	rectifier. 43. actory for modification number					70
ashdown capability is p	ossible, consult to	actory tor moditication number	·.				ISO 01
OPTIONS							ISO 02
lot/Base Configuration							ISO 1
32B- xM x- xA x-Gxx P-		c· l					ISO 2
	ndividual base – ndividual base –	Side port Bottom port					ISO 3
W E	Pilot exhaust muffl	led					
Р	ilot exhaust pipe	d (# 10-32) ain exhaust (not available with	automal milat				





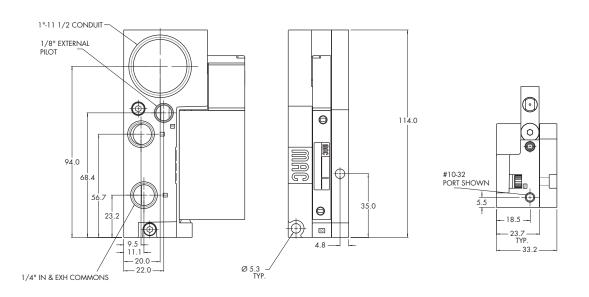


Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI Pilot pressure: 20 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 µ Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: # $10-32 : (0.35 C_v) - 1/4$ tube receptacle : $(0.40 C_v)$ Coil: Class A continuous duty, #22 AWG x 12 base leads Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize: 5 ms (with 4 W coil) 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
3/2 NO-NC	# 10-32 - 1/4" O.D. tube receptacle	0.4 C _V	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 $C_{\rm v}$).
- 4. Fast, repeatable response times.
- 5. Maximum shifting forces in both directions.



33 34

36

32

37 38 52

67 69 44

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42

47 48P

48

400

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93

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

HOW TO ORDER

Port size	Pilot air	NO valve	NC valve	Universal valve
				10 2 12
Valve less base	Internal	32B-BMA-000-G xxx-xxx	32B-AMA-000-G <i>xxx-xxx</i>	
	External	32B-BMB-000-G xxx-xxx	32B-AMB-000-G xxx-xxx	32B-GMB-000-G xxx-xxx
# 10-32	Internal	32B-BMA-AJL-Gxxx-xxx	32B-AMA-AJL-Gxxx-xxx	
	External	32B-BMB-AJM-Gxxx-xxx	32B-AMB-AJM-Gxxx-xxx	32B-GMB-AJM-Gxxx-xxx
1/4" O.D.	Internal	32B-BMA-EJL-Gxxx-xxx	32B-AMA-EJL-Gxxx-xxx	
Tube receptacle	External	32B-BMB-EJM-Gxxx-xxx	32B-AMB-EJM-Gxxx-xxx	32B-FMB-EJM-Gxxx-xxx

Note: Above codes are for side port.

STANDARD SOLENOID OPERATOR ➤

G	<u>X</u>	XX	<u>-)</u>	XX	
		_	- 1		

				— ე	
XX	Voltage	X	Wire length	X	Manual operator
AA	120 VAC (2.5W)	Α	18"	1	Non-locking recessed
DA	24 VDC (1.0W)	В	24"	2	Locking recessed
DC	24 VDC (1.8W)	С	36"		
DD	24 VDC (2.5W)				
DF	24 VDC (4.0W)				

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-**xM**x-**xJ**x-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) XX

BT

GA

GB

GC

GD

GE

GF

GG

KA

KD

Electrical connection

Flying leads with light
MAC JAC Solenoid plug-in

w/Diode & LED

MAC JAC Solenoid plug-in

MAC JAC Solenoid plug-in

w/Rectifier
MAC JAC Solenoid plug-in

Plug-in wire assy. with light

Plug-in wire assy. with rectifier & light & ground

w/MOV & LED

w/Rectifier & LED

Plug-in wire assy.

Flying leads

w/Diode

w/MOV

w/LED



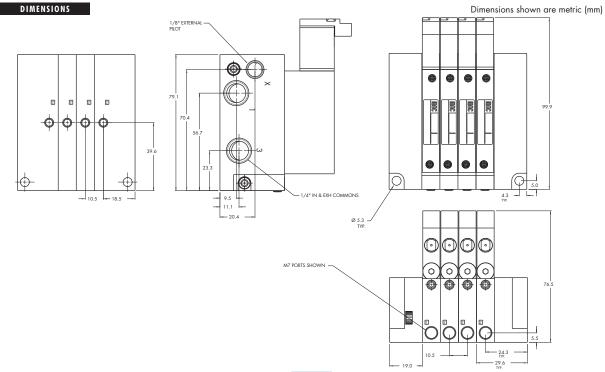




Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI Pilot pressure: 20 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 µ Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: # $10-32 : (0.35 C_v) - 1/4$ tube receptacle : $(0.40 C_v)$ Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize : 5 ms (with 4 W coil) De-energize : 5 ms

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

• Inlet/Exhaust Isolator : 28454





Function	Port size	Flow (Max)	Individual mounting	Series
3/2 NO-NC	# 10-32 - 1/4" O.D. tube receptacle	0.4 C _v	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 $C_{\rm v}$).
- 4. Fast, repeatable response times.
- 5. Maximum shifting forces in both directions.



37

69 44

46

42

47 48P

48

400

92

93

ISO 01 ISO 02

ISO 1

ISO 2

ISO 3

HOW TO ORDER

Port size	Pilot air	NO valve	NC valve	Universal valve
			10 2 12 47/1 47/1	10 2 12 dZ/
Valve less base	Internal	32B-BMA-000-G xx P- xxx	32B-AMA-000-G <i>xx</i> P- <i>xxx</i>	
	External	32B-BMB-000-G <i>xx</i> P- <i>xxx</i>	32B-AMB-000-GxxP-xxx	32B-GMB-000-G xx P- xxx
# 10-32	Internal	32B-BMA-AJA-G xx P- xxx	32B-AMA-AJA-GxxP-xxx	
	External	32B-BMB-AJB-GxxP-xxx	32B-AMB-AJB-GxxP-xxx	32B-GMB-AJB-GxxP-xxx
1/4" O.D.	Internal	32B-BMA-EJA-G <i>xx</i> P- <i>xxx</i>	32B-AMA-EJA-GxxP-xxx	
Tube receptacle	External	32B-BMB-EJB-GxxP-xxx	32B-AMB-EJB-GxxP-xxx	32B-GMB-EJB-GxxP-xxx

G xx P-xxx

Note: Above codes are for side port.

Voltage

120 VAC (2.5W) 24 VDC (1.0W) 24 VDC (1.8W) 24 VDC (2.5W)

STANDARD SOLENOID OPERATOR ➤

Х	Manual operator	XX	Electrical connection
1	Non-locking recessed	SA	Base plug-in
2	Locking recessed	SJ	Base plug-in with light
		55	Base plug-in with rectifier & light & ground

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

Base only:

DC DD

> 32B-000-**xxx** (i.e. 32B-000-AJA)

Base Configuration :

32B-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").







Response times:

(with 4 W coil)

Options :

Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI Pilot pressure: 20 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: # $10-32 : (0.35 C_v) - 1/4$ tube receptacle : $(0.40 C_v)$ Coil: Class A continuous duty, #22 AWG x 12 base leads Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power:

De-energize : 5 ms

Energize: 5 ms

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

DIMENSIONS Dimensions shown are metric (mm) 1"-11 1/2 CONDUIT 1/8" EXTERNAL PILOT 2 2 2 φ 10 0 1/4" IN & EXH COMMONS #10-32 PORT SHOWN



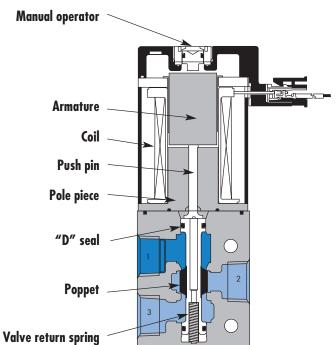
Individual mounting Inline

Series

33 34

36

ISO 2



- 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.

	32
Manual operator	37
	38
	52
	67
Armature	69
Coil	44
Push pin	46
Pole piece	42
	47
"D" seal	48P
Poppet	48
ve return spring	400
	92
SERIES FEATURES	93
 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. 	ISO 01 ISO 02 ISO 1
 Built-in wear compensation - valve stroke is shorter than solenoid stroke. 	130 1



unction	Port size	Flow (Max]	Individual mounting	Series
/2 NO-NC	1/8" -	1/4" 0.5	c _v	Inline	
ERATIONAL BENEFITS					33
Balanced poppet equals forces.	s consistent high shifting	g			34
Valve shifting forces are of pressure fluctuations. High solenoid and return speed and precise reper	n spring forces ensure			,	36
Built-in wear compensati than solenoid stroke.	tion – valve stroke is sh	orter		-	32
Constant high flow mair pressure range.	_			G	37
Exhaust contaminants ar Full flow exhaust.	re isolated from the sol	enoid.			38
Jniversal porting – 6 fu	nctions in one valve.			C	52
HOW TO ORDER					67
Port :	size	Unive	ersal valve	NC or	nly valve 69
			2	_	2_
			/ w		7, , w 46
1/8"	NPTF	37A-A	1 3 40-H xxx-xxx	37A-BA	0-H xxx-xxx
1/4"	NPTF	37A-A	80-Н ххх-ххх	37A-BB	0-H xxx-xxx
					42
DLENOID OPERATOI	R ➤	H <u>X</u>	KX-XXX		47
			┚└┺──		48P
XX Voltage	х	Wire length	X Manual o	perator XX	Electrical connection**
AA 120 VAC (6.7W) DA 24 VDC (5.2W)	<u>A</u> B	18" 24"	Non-locking re Locking recess		Plug-in wire assembly with
DB 24 VDC (2.4W)					Plua-in wire assembly with
		24			light
24 VDC (1.8W)		24		BA BC	light Flying leads Flying leads with light
24 VDC (1.6W)		24	Locking recess	BA	light Flying leads Flying leads with light
		<i>L</i> 4	a boung recos	BA BC	light Flying leads Flying leads with light Plug-in wire assembly with rectifier & light
e : AC voltage requires co	onnector with rectifier.	24	2 EURING TOCOS	BA BC	light Flying leads Flying leads with light
e : AC voltage requires co	onnector with rectifier.	24	a county recess	BA BC	light Flying leads Flying leads with light Plug-in wire assembly with rectifier & light
e : AC voltage requires co	onnector with rectifier.	24	a county recess	BA BC	light Flying leads Flying leads with light Plug-in wire assembly with rectifier & light 92
e : AC voltage requires co	onnector with rectifier.	24	a county recess	BA BC	light Flying leads Flying leads with light Plug-in wire assembly with rectifier & light 92 150 0
e : AC voltage requires co	onnector with rectifier.	24	a county recess	BA BC	light Flying leads Flying leads with light Plug-in wire assembly with rectifier & light 92
te : AC voltage requires co	onnector with rectifier.	24	a county recess	BA BC	light Flying leads Flying leads with light Plug-in wire assembly with rectifier & light 92 150 0
te : AC voltage requires co Other options available, se	onnector with rectifier.	24	a county recess	BA BC	light Flying leads Flying leads with light Plug-in wire assembly with rectifier & light 92 93 ISO 0 ISO 0





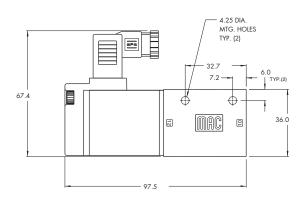


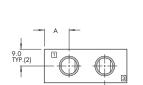
Fluid:	Compressed air, vacuum, inert gases
Pressure range :	Vacuum to 120 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
Filtration:	40 μ
Temperature range:	0°F to 120°F (-18°C to +50°C)
Flow:	5.2 W : (0.5 C _V) – 2.4 W : (0.35 C _V)
Coil:	Class A wire (#22 AWG x 18), continuous duty
Voltage range:	-15% to +10% of nominal voltage
Power:	5.2 W – 2.4 W
Response times :	Energize: 16.9 ms
(with 5.2 W coil)	De-energize : 6.7 ms

Options : • BSPP ports

DIMENSIONS

Dimensions shown are metric (mm)





18.0

Shown with Mini Square Connector ("K" Type)

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



Detailed the property of the p	Function	Port size	Flow	[Max]	Individual r	mounting	Series
Bolanced poppet equals consistent high shifting forces. Valve shifting forces are consistent and independent of pressure fluctuations. It high selencid and return spring forces ensure high speed and practice repeatability. Bullin wear compensation - valve stroke is shorter than solenoid stroke. Constant high flow maintained throughout the pressure trange. Exhaust conteminants are isolated from the solenoid. Full flow aboust. Universal porting - 6 functions in one valve. Port size Universal valve NC only valve NC only valve NC only valve NC only valve Valve less base 37A-CID-H XXXXXXX 37A-DID-H XXXXXXX 37A-DID-H XXXXXXX 37A-DA-H XXXXXXX 37A-DA-H XXXXXXX 42 1/8" NPTF 37A-CB-H XXXXXXX 37A-DA-H XXXXXXX 42 **Toland And Toland A	3/2 NO-NC	1/8" - 1	/4" 0.5	c _v	Sub-base non plug-in		
Volve shifting forces are consistent and independent of pressure fluctuotions. High selencid and return spring forces ensure high speed and precise repeatability.	OPERATIONAL BENEFITS						33
pressure fluctuotions. It high solenoid and return spring forces ensure high speed and precise repeatability. It high solenoid compensation - valve stroke is shorter than solenoid stroke. Constant high flow maintained throughout the pressure range. It have contained solenoid. It have contained throughout the pressure range. It have to obtain the solenoid. It have been shown. It have been shown. It have less base 37A-C10-H XXX-XXX 37A-D10-H XX-XX-XX 37A-D10-H XX-XX-							34
solenoid stroke. Constant high flow maintained throughout the pressure range. Constant high flow maintained throughout the pressure range. Full flow exhaust. Universal porting – 6 functions in one valve. Port size Universal valve NC only valve MC only valve Port size Universal valve NC only valve MC only val	pressure fluctuations. 3. High solenoid and return speed and precise repeated and precise repeated are speed and precise repeated and precise repeated are speed are	n spring forces ensure h atability.	igh		/		36
Definition of the solenoid. Full flow exhaust. Universal porting – 6 functions in one valve. Full flow exhaust. Universal porting – 6 functions in one valve. Full flow exhaust. Valve less base 37A-C10-H XXX-XXX 37A-D10-H XX-XXX-XX 37A-D10-H XX-XXX-XX 37A-D10-H XX-XX-XX 37A-D10-H XX-XX-XX 37A-D10-H XX-XX-XX 37A-D10-H XX-XX-XX 37A-D10-H	solenoid stroke. 5. Constant high flow main					1	32
HOW TO ORDER Port size Universal valve NC only valve 44 Valve less base 37A-C10-H XXX-XXX 1/8" NPTF 37A-CAA-H XXX-XXX 37A-D10-H XXX-XXX 37A-DAA-H XXX-XXX 37A-DAA-H XXX-XXX 47 NOPERATOR > H XXX-XXX AND OPERATOR > H XXX-XXX AND OPERATOR > H XXX-XXX AND OPERATOR > Wire length X Manual operator XX Electrical connection AA 120 VAC (6.7W) A 18" 1 Non-locking recessed MA Plug-in wire assembly With light DB 24 VDC (2.4W) DB 24 VDC (2.4W) DB 24 VDC (2.4W) DC 24 VDc (1.8W) AND OPERATOR BC Plying leads with light MT Plug-in wire assembly with recitive 8 light AND OPERATOR AND OPERATOR AND Plug-in wire assembly With light MT Plug-in wire assembly with recitive 8 light AND OPERATOR AND OPERATOR AND Plug-in wire assembly With light MT Plug-in wire assembly with recitive 8 light AND OPERATOR AND OPERATOR AND OPERATOR AND Plug-in wire assembly With light MT Plug-in wire assembly with recitive 8 light SOPTIONS 150 07 37A-OBA [1/41]		e isolated from the sole	noid.				37
Port size	7. Full flow exhaust. 8. Universal portina – 6 fui	nctions in one valve.					38
Port size Universal valve NC only valve 44 Valve less base 37A-C10+H XXX-XXX 1/8" NPTF 37A-CAA+H XXX-XXX 37A-D10+H XXX-XXX 37A-DAA-H XXX-XXX 37A-DAA-H XXX-XXX 37A-DAA-H XXX-XXX 42 SOLENOID OPERATOR ➤ H XXX-XXX ** ** ** ** ** ** ** **	o. o, o.ou. pog	ioneno in ene vario:					52
Valve less base 37A-C10-H XXX-XXX 37A-D10-H XXX-XXX 47 48P 48	HOW TO ORDER						67
Valve less base 37A-C10-H XXX-XXX 37A-D10-H XXX-XXX 37A-DAA-H XXX-XXX 37A-DBA-H XXX-XXX 37A-DBA-H XXX-XXX 42 47 48 47 48 47 48 47 48 48	Port :	size	Univ	versal valve		NC only valve	69
Valve less base 37A-C10-H XXX-XXX 37A-D10-H XXX-XXX 42 42 42 42 42 43 44 44				2		2	44
Valve less base 37A-C10-H XXX-XXX 37A-D10-H XXX-XXX 42 42 42 42 42 43 44 44			<u>L</u>	/ _T \w		r / v w	4.6
T/4" NPTF 37A-CBA-H XXX-XXX 42 37A-DBA-H XXX-XXX 47 48P 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 with light page 24 VDC (1.8W) DB 24 VDC (1.8W) DC 24 VDC (1.8W) BA Flying leads with light MT Plug-in wire assembly with rectifier & light Alote: AC voltage requires connector with rectifier. Other options available, see page 315. OPTIONS lase only: 37A-OAA (1/8") 37A-OBA (1/4")	Valve le	ss base		1 3 210-H xxx-xxx		37A-D10-H xxx-xxx	40
AA 120 VAC (6.7W) A 18" DA 24 VDC (5.2W) B 24" 2 Locking recessed MC Plug-in wire assembly with light With light BA Flying leads BC Flying	1/8"	NPTF	37A-0	CAA-H xxx-xxx		37A-DAA-H xxx-xxx	
AA 120 VAC (6.7W) A 18" DA 24 VDC (5.2W) B 24" DC 24 VDC (1.8W) A Flying leads with light with rectifier. Other options available, see page 315. OPTIONS A 37A-0AA (1/8") 37A-0BA (1/4") A 18" A 18" A 1 Non-locking recessed A 1 Plug-in wire assembly with light with light rectifier. Of the options available, see page 315.	1/4"	NPTF	37A-0	CBA-H xxx-xxx		37A-DBA-H xxx-xxx	42
AA 120 VAC (6.7W) A 18" DA 24 VDC (5.2W) B 24" DC 24 VDC (1.8W) A Flying leads with light with rectifier. Other options available, see page 315. OPTIONS A 37A-0AA (1/8") 37A-0BA (1/4") A 18" A 18" A 1 Non-locking recessed A 1 Plug-in wire assembly with light with light rectifier. Of the options available, see page 315.							47
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 DB 24 VDC (2.4W) DC 24 VDC (1.8W) BA Flying leads BC Flying leads with light MT Plug-in wire assembly with light BA Flying leads with light MT Plug-in wire assembly with rectifier. Other options available, see page 315. OPTIONS Gase only: 37A-0AA (1/8") 37A-0BA (1/4")	SOLENOID OPERATOI	₹ >	H <u>x</u>	<u>XX-XXX</u> *			
AA 120 VAC (6.7W) DA 24 VDC (5.2W) DB 24 VDC (2.4W) DC 24 VDC (1.8W) A 18" I Non-locking recessed MA Plug-in wire assembly with light BA Flying leads BC Flying leads with light MT Plug-in wire assembly with rectifier. Other options available, see page 315. OPTIONS Gase only: 37A-0AA [1/8"] 37A-0BA [1/4"]				╵┚└┺			701
DA 24 VDC (5.2W) DB 24 VDC (2.4W) DC 24 VDC (1.8W) DC 24 VDC (1.8W) DC 24 VDC (2.4W) DC 24 VDC (2.4W) DC 24 VDC (3.2W) DC 24 VDC (1.8W) DC 18 VDC (1.8W	XX Voltage	Х	Wire length	X	Manual operator	XX Electrical co	nnection // O
DB 24 VDC (2.4W) DC 24 VDc (1.8W) BA Flying leads BC Flying leads with light MT Plug-in wire assembly with rectifier. Other options available, see page 315. OPTIONS Jase only: 37A-0AA [1/8"] 37A-0BA [1/4"]	AA 120 VAC (6.7W)	A					embly
BC Flying leads with light MT Plug-in wire assembly with rectifier & light 92 Note: AC voltage requires connector with rectifier. Other options available, see page 315. OPTIONS Gase only: 37A-0AA (1/8") 37A-0BA (1/4")	DB 24 VDC (2.4W)		24		ocking recessed		
Acte : AC voltage requires connector with rectifier. Other options available, see page 315. OPTIONS dase only : 37A-0AA (1/8") 37A-0BA (1/4")	DC 24 VDc (1.8W)					BC Flying leads with	light
Note: AC voltage requires connector with rectifier. Other options available, see page 315. OPTIONS 37A-0AA (1/8") 37A-0BA (1/4")						MT Plug-in wire asso rectifier & light	
Other options available, see page 315. OPTIONS 93 dase only: 37A-0AA (1/8") 37A-0BA (1/4")	Note : AC voltage requires co	onnector with rectifier.					72
37A-0AA (1/8") 37A-0BA (1/4")	* Other options available, se	ee page 315.					0.0
37A-0AA (1/8") 37A-0BA (1/4")	OPTIONS						93
37A-0AA (1/8") 37A-0BA (1/4")	Base only :						ISO 01
37A-0BA (1/4")	37A-0AA (1/8")						
	37A-0BA (1/4")						100 02
ISO 1							
150 2							100 2
ISO 3							ISO 3

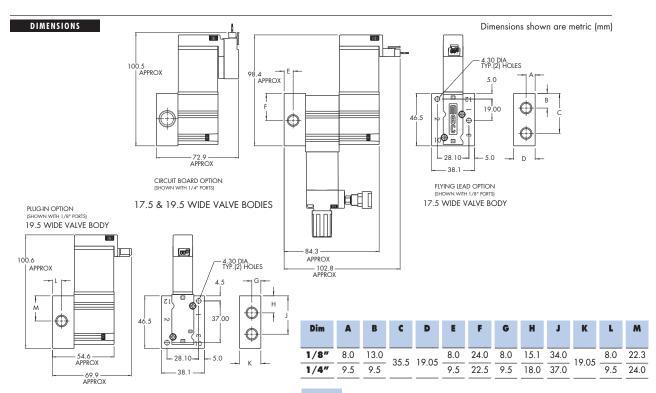






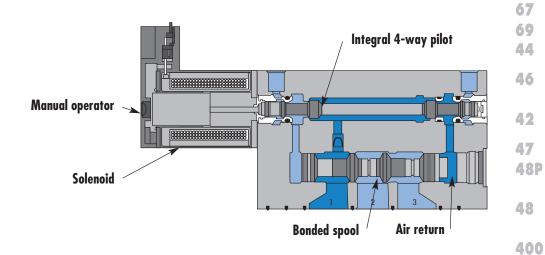
Compressed air, vacuum, inert gases Fluid: Pressure range: Vacuum to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 μ Temperature range: 0°F to 120°F (-18°C to +50°C) Flow: 5.2 W: (0.5 C_v) - 2.4 W: (0.35 C_v) Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage Power: 5.2 W - 2.4 W Energize: 16.9 ms Response times: (with 5.2 W coil) De-energize : 6.7 ms

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





Sub-base non "plug-in" Sub-base mon "plug-in" Sub-base mon "plug-in" Sub-base mon "plug-in" Sub-base mon "plug-in" With latching solenoid Manifold base mon "plug-in" Manifold base mon "plug-in" Sub-base/monifold base monifold base mon "plug-in" Sub-base/monifold base monifold base monifold base mon "plug-in" Sub-base/monifold base monifold base monifold



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.

32

37 38 52

92

93

ISO 01

ISO 02

ISO 1



unction	P	ort size		Flow (Max)		In	dividual mour	ıting		Series
/2 NO-NC	1	1/8" 1.2 C _y		1.2 C _V	Sub-base non "plug-in"					
PERATIONAL BENEFITS									26	33
3-way valve with 4-wa										34
High flow (up to 1.2 C Fast, repeatable respondant shifting force	Cv). onse times.								1	36
·								0	1	32
								-	- 0	37
							- 4			38
							-	9		52
HOW TO ORDER										67
Dout sine	Pilot air		NO valve			NC valve			Universal valve	69
Port size	Pilot air		NO valve			NC valve			Universal valve	44
			10 2 12 D \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	2		10 2 12 D / 3Z1			10 2 12 15 4 37L	44
			V3 01	1		V3 01			V3 01	46
Valve less base	Internal	38	8B-BMA-000-G xxx	-xxx	38	BB-AMA-000-G xxx-x	xx			
	External		8B-BMB-000-G xxx			8B-AMB-000-G xxx-x		38	BB-GMB-000-Gxxx-xxx	42
1/8" NPTF	Internal		BB-BMA-AAL-Gxxx			BB-AMA-AAL-Gxxx-x		0.0	D CALD A A A A Commercial Commerc	44
e : Above codes are fo	External -	30	BB-BMB-AAM-Gxxx		30	BB-AMB-AAM-G xxx -x		30	B-GMB-AAM-Gxxx-xxx	47
ANDARD SOLENC		D ~		C vvv	VV	v*				48P
IANDARD SOLLING	JID OFERATO			G <u>xx</u> x	- ^^	<u> </u>				
										48
XX Voltage		X	Wire length	1	X	Manual opera		XX	Electrical connection	
AA 120 VAC (2.5 DA 24 VDC (1.0V		A B	18" 24"		2	Non-locking recessed Locking recessed	:d	BA BT	Flying leads Flying leads with light	400
DC 24 VDC (1.8V		С	36"		4	Locking recessed		GA	MAC JAC Solenoid plug-in	700
DD 24 VDC (2.5V DF 24 VDC (4.0V								GB	MAC JAC Solenoid plug-in w/Diode	92
		ectifier					_	GC	MAC JAC Solenoid plug-in	7 4
Other options available	, see page 311.						_	GD	w/MOV MAC JAC Solenoid plug-in	
e : AC voltage requires Other options available hing solenoid also avai h MAC JAC electrical c	nable, see page 5 onnector washdo	ov. own capal	bility is possible.						w/LED	93
sult factory for modific	ation number.							GE	MAC JAC Solenoid plug-in w/Diode & LED	
OBTIONS								GF	MAC JAC Solenoid plug-in w/MOV & LED	ISO 01
OPTIONS							_	GG	MAC JAC Solenoid plug-in w/Rectifier	ISO 02
t/Base Configuration 8B- xMx-xAx- Gxxx-x							_	GH	MAC JAC Solenoid plug-in w/Rectifier & LED	ISO 1
T T		ido ror					_	KA	Plug-in wire assembly	ISO 2
B In	dividual base – S dividual base – B	ide port						KT	Plug-in wire assembly with light	
	dividual base L	опот ро	rt							
M Pi	lot exhaust muffle	ed .					_	KD	Plug-in wire assembly with rectifier & light & ground	ISO 3







Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI 20 to 120 PSI Pilot pressure: 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: 1/8" bottom port: $(1.2 C_v)$ - 1/8" side port: $(1.0 C_v)$ Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage

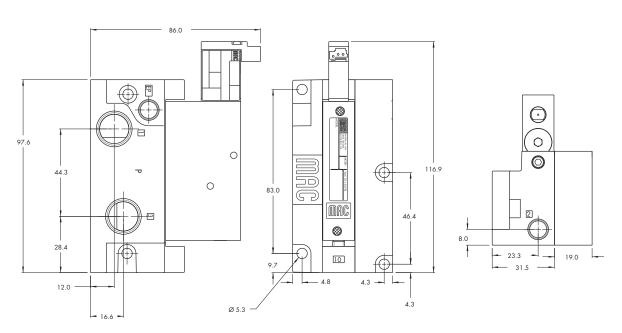
 Power:
 1.0 to 4.0 W

 Response times:
 Energize: 6 ms

 (with 4 W coil)
 De-energize: 6 ms

Options : • BSPP threads

DIMENSIONS





ınction		Port size	Flow (Max)	Individual m	ounting	Series
2 NO-NC		1/8" - 1/4" O.D. tube receptacle	1.2 C _V	Sub-base "plug-in"		
ERATIONAL BENEFITS						33
3-way valve with 4-wo						34
10 mm valve (stacks of High flow (up to 1.2 C Fast, repeatable responsations shifting force	C _V). onse times.	·			1	36
Ū						32
					100	37
					10	38
				-	4	52
HOW TO ORDER						67
Port size	Pilot air	NO valve		NC valve	Universal valve	69
POFT SIZE	Pilot air	NO valve		NC valve	Universal Valve	44
		10 2 12 D \ J	10	2 12	10 2 12	44
		D 1 4/1	D	√ 1 1 ² √ 3 01	□	46
Valve less base	Internal	38B-BMA-000-GxxP-x	38B-A	MA-000-GxxP-xxx		_
	External	38B-BMB-000-GxxP-x	XX 38B-A	MB-000-GxxP-xxx	38B-GMB-000-GxxP-xxx	- 40
1/8" NPTF	Internal	38B-BMA-AAA-GxxP-	XXX 38B-A	MA-AAA-G xx P- xxx		42
	External	38B-BMB-AAB-GxxP-x	XX 38B-A	MB-AAB-G xx P- xxx	38B-GMB-BAB-G xx P- xxx	47
1/4" O.D.	Internal	38B-BMA-EAA-GxxP-)		MA-EAA-GxxP-xxx		47
Tube receptacle	External	38B-BMB-EAB-GxxP-x	38B-A	MB-EAB-GxxP-xxx	38B-GMB-EAB-GxxP-xxx	48P
lote : Above codes are fo TANDARD SOLENG		OR > (G <u>xx</u> P-x <u>xx</u>			48
XX Voltage		X Me	anual operator	XX E	lectrical connection	400
AA 120 VAC (2.5			n-locking recessed		ase plug-in	_
DA 24 VDC (1.0V DC 24 VDC (1.8V		2 Loc	king recessed		ase plug-in with light ase plug-in with rectifier & light & ground	- 92
DD 24 VDC (2.5V	V)					_
DF 24 VDC (4.0V	-	ef:				0.2
ote : AC voltage requires Other options available atching solenoid also ava	e, see page 311.	recinier.				93
tching solenoid also ava	ılable, see page	61.				ISO 01
OPTIONS						
						ISO 02
						ISO 1
	VVV					160.0
38B- xMx - xA x-Gxx P-2		c: l				130 2
	xxx ndividual base – ndividual base –					ISO 2
38B- xM x- xA x- G xx P-x	ndividual base –	Bottom port Ted				150 2

Washdown capability is possible, consult factory for modification number.



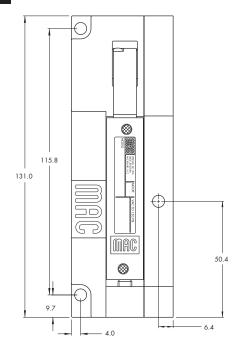


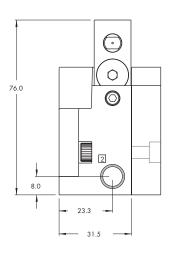


Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI Pilot pressure: 20 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 µ Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: 1/8" bottom port: (1.2 $\rm C_v$) - 1/8" side port: (1.0 $\rm C_v$) - 1/4" tube receptacle: (0.85 $\rm C_v$) Coil: Class A continuous duty, #22 AWG x 12 base leads Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize : 6 ms (with 4 W coil) De-energize : 6 ms

Options : • BSPP threads

DIMENSIONS







nction	Po	ort size	Floш (Max)		Manifold ı	nounting	Series
/2 NO-NC		/8" - /4" O.D. tube receptacle	1.2 C _v		Manifold ba "plug-in"	se	
PERATIONAL BENEFITS						-	33
3-way valve with 4-wa		1				1	34
. 10 mm valve (stacks o . High flow (up to 1.2 C	· _v).	ersj.					0.7
 Fast, repeatable respo Maximum shifting force 		ons.					36
						A SA	32
					T.		
							37
						20 2 19	38
							52
HOW TO ORDER							67
Port size	Pilot air	NO valve		NC valve		Universal valve	69
		10 2 12		10 2 1 D / 3/	2	10 2 12	44
		D 3 1			1		46
Valve less base	Internal	38B-BMA-000-GxxP-		38B-AMA-000-GXX		000 040 000 0-0	_
1/8" NPTF	_ External Internal	38B-BMB-000-G <i>xx</i> P- 38B-BMA-AJA-G <i>xx</i> P-		38B-AMB-000-Gxx 38B-AMA-AJA-Gxx		38B-GMB-000-GxxP-xxx	42
-,	External	38B-BMB-AJB-G xx P-		38B-AMB-AJB-G xx		38B-GMB-BJB-GxxP-xxx	
1/4" O.D.	Internal	38B-BMA-EJA-G xx P-		38B-AMA-EJA-G xx			47
Tube receptacle	External	38B-BMB-EJB-GxxP-	<u> </u>	38B-AMB-EJB-Gxx	P-XXX	38B-GMB-EJB-GxxP-xxx	_ 48P
Note : Above codes are for	•						
Standard solenc	DID OPERATO	R ➤	G <u>XX</u> P-	<u> </u>			48
] -			
XX Voltage			lanual opera		XX	Electrical connection	400
AA 120 VAC (2.5° DA 24 VDC (1.0W	<u>'</u>		on-locking recesse cking recessed	d	SA SJ	Base plug-in Base plug-in with light	92
DC 24 VDC (1.8W DD 24 VDC (2.5W	<u>()</u> ()				55	Base plug-in with rectifier & light & ground	_
DF 24 VDC (4.0W	1)	fr					93
tote : AC voltage requires Other options available,	see page 311.	ctifier. 1. tory for modification number					70
Vashdown capability is po	ossible, consult fac	tory for modification number	·.				ISO O
OPTIONS							ISO 0
ase only :							ISO 1
38B-000- xxx							ISO 2
(i.e. 38B-000-AJA)							ISO 3
ase Configuration :							
38B-xxx-xJx-Gxx P-xx		o port					
KM	anifold base – Sid anifold base – Bot ft end manifold bo	tom port					
M Le	tt end manitold bo	ise – Side porr ise – Bottom port pase – Side port pase – Bottom port					

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







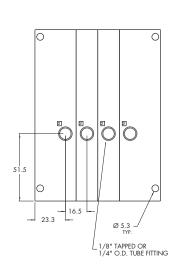
Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI Pilot pressure: 20 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 µ Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: 1/8" bottom port: (1.2 C_v) - 1/8" side port: (1.0 C_v) - 1/4" tube receptacle: (0.85 C_v) Coil: Class A continuous duty, #22 AWG x 12 base leads -15% to +10% of nominal voltage Voltage range: 1.0 to 4.0 W Power: Response times: Energize : 6 ms

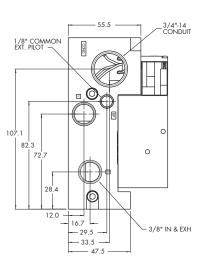
Options : • BSPP threads

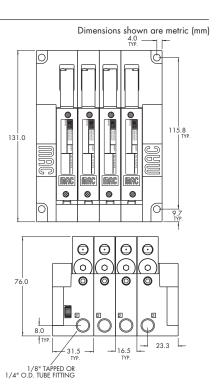
De-energize : 6 ms

DIMENSIONS

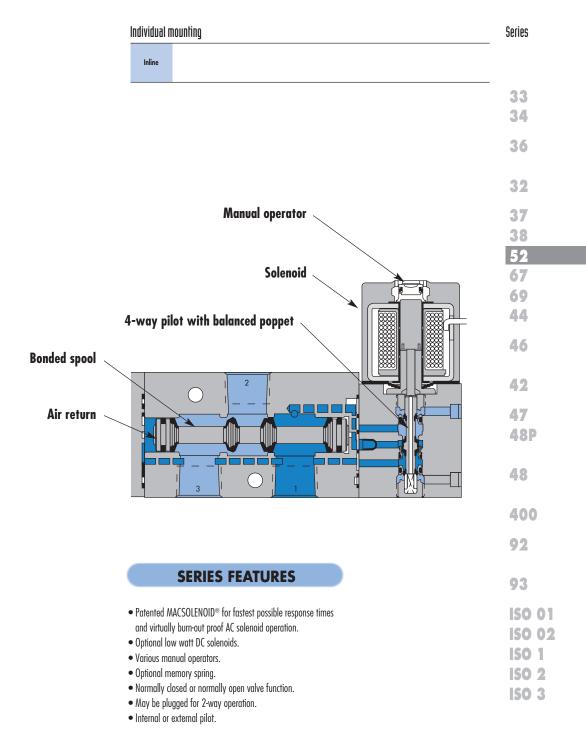
(with 4 W coil)









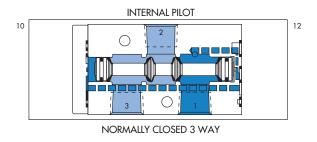


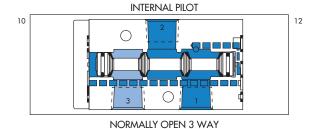






SPOOL CONFIGURATIONS







52A-3<u>1</u>-A0A-XX-X-xxx

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

ınction		Port size	Flow (Max)	Individual I	mounting	Series
/2 NO-NC, 2	2/2 NO-NC	1/8" - 1/4"	1.5 C _v	Inline		
PERATIONAL BEI	NEFITS					33
. The 4-way pilo		iximum shifting				34
	g available. bl, immune to v provides high				4	36
. Short stroke w . Bonded spool in a glass-like	with minimum finished bore.	. •		8		32
Pilot with bala and consistent	1 11 1	•		1	EL /	37
 Wiping effect Long service li 		king.		19W	30.00	38
20119 001 1100 11						52
HOW TO ORD	ER					67
Port size	Pilot air	Single	Operator		Double Operator	69
		NO Valve	NC Valve	NO Valve	NC Valve	44
		10 2 12	10 2 12	10 2	7 7 7	
1/8" NPTF	Internal	52A-31-A0A-XX-X-XXX	52A-11-A0A-XX-X-XX	(-XXX) 52A-41-A0A-XX-X-X	±3 61 52A-21-A0A-XX-X-X	46
1/4" NPTF	-	52A-31-B0A-XX-X- xxx - xxx	52A-11-B0A-XX-X- xxx			XX-XXX
1/8" NPTF	External	52A-31-A0B-XX-X- xxx - xxx	52A-11-A0B-XX-X-XXX	52A-41-A0B-XX-X-X	52A-21-A0B-XX-X-X	xx-xxx 42
1/4" NPTF		52A-31-B0B-XX-X- xxx - xxx	52A-11-B0B-XX-X- xxx	52A-41-B0B-XX-X-X	52A-21-B0B-XX-X-X	(X-XXX 47
OLENOID OF	PERATOR >]	DM-D <u>xxx</u> - <u>x</u>	<u>x</u> ·		48P
XX Volt	_	X Wire le		Manual operator	XX Electrical conne	ction 48
	50, 120/60 (2.9 50, 240/60 (2.9			Non-locking recessed Locking recessed	KA Square connector KD Square connector wi	th light
	(2.9W) IC (1.8W)	J Connector		<u> </u>	JB Rectangular connector JD Rectangular connector	or 400
DA 24 VD	C (5.4W)				light	92
	C (12.7W)				BA Flying leads	72
OLENOID OF	PERATOR >		6M-G <u>xxx</u> - <u>x</u> x	X		
						93
XX Volt	age	X Wire le	ngth X	Manual operator	XX Electrical conne	ction ISO 01
	C (1.8W)	A 18" B 24"	1 2	Non-locking recessed Locking recessed	BA Flying leads BT Flying leads with light	ISO 02
	C (4.0W)	C 36"		Locking recessed	KA Plug-in wire assy.	
Other options a	vailable, see pa	ige 309.			KT Plug-in wire assy. wit	
Other options a	variable, see po	ige sis.				ISO 2
OPTIONS						ISO 3



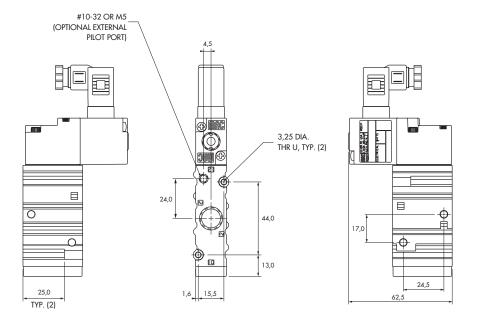


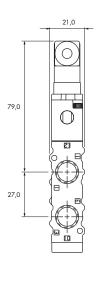


Fluid:	Compressed air, vacuum, inert gases							
Pressure range :	Internal Pilot : 20 to 120 PSI							
	External Pilot : Vacuum to 120 PSI							
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)							
Filtration:	40 µ							
Temperature range :	0°F to 120°F (-18°C to +50°C)							
Flow:	$1/8": (1.2 C_V) - 1/4": (1.5 C_V)$							
Coil:	Class A continuous duty, #22 AWG x 18 lead wires							
Voltage range :	-15% to +10% of nominal voltage							
Protection:	Consult factory							
Power:	~Inrush: 10.9 VA Holding: 7.7 VA							
	= 1.8 to 12.7 W							
Response times :	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







Individual mounting Series

33 34

36

32

37 38 52

69

44

46

42

47

48

400

92

93

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

48P

Manual operator

Solenoid

4-way pilot with balanced poppet

Bonded spool

Air return

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.



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

G O-Ring mount

unction		Port size		Flow (Max		Individual n	nounting		Series
/2 NO-NC, 2/	2 NO-NO	3/4" -	1″	20.0 C _v	,	Inline			
ERATIONAL BENEF	FITS								33
The 4-way pilot d	levelops ma	ximum shifting							34
force both ways. Memory spring a								0	
Balanced spool, i pressure, also pro Short stroke with	ovides high					_	0		36
Bonded spool wit	th minimum	friction, shifting						9	32
in a glass-like fini Pilot with balance	ed poppet, l								37
and consistent res Wiping effect elir							4	• ,	38
1 0							ME	1	52
HOW TO ORDER						-4			67
	Pilot air		Sinale (Operator			Double C	perator	69
FOIT 3126	riioi uii	NO Vo		NC Vo	ılve	NO Valve		NC Valve	44
		10 2	7 12 47	10 2	12	10 2	12 1	10 2 12 75 7 37	
3/4" NPTF	Internal	67A-C x -AAA-D	M-Dxxx-xxx	67A-A x -AAA-D)M-Dxxx-xxx	67A-D x -AAA-DM-D x	xx-xxx	67A-B <i>x</i> -AAA-DM-D <i>xxx-xxx</i>	46
1" NPTF		67A-C x -BAA-D		67A-A x -BAA-D		67A-Dx-BAA-DM-Dx		67A-B x -BAA-DM-D xxx-xxx	
3/4" NPTF	External	67A-C x -AAB-D	M-Dxxx-xxx	67A-A x -AAB-D	M-Dxxx-xxx	67A-Dx-AAB-DM-Dx	хх-ххх	67A-Bx-AAB-DM-Dxxx-xxx	42
1" NPTF		67A-Cx-BAB-Di	M-DXXX-XXX	67A-Ax-BAB-D	M-DXXX-XXX	67A-Dx-BAB-DM-Dxx	CX-XXX	67A-Bx-BAB-DM-Dxxx-xxx	47
DLENOID OPER	RATOR ➤		D	M-D xxx	-XXX [*]				48P
					· Ţ 				
XX Voltag	je	Х	Wire len	gth	X Me	anual operator	ХХ	Electrical connection	48
	120/60 (2.9 240/60 (2.9		18" 24"			n-locking recessed king recessed	KA KD	Square connector Square connector with light	
JC 24/60 (2	2.9W)		Connector		2 100	king recessed	JB	Rectangular connector	400
FB 24 VDC (DA 24 VDC (JD	Rectangular connector with light	
DF 24 VDC (12.7W)						BA	Flying leads	92
Other options avail	lable, see pa	ge 309.							93
ool type :				Spool return	:				70
A- X X-AAA-DM-D)xxx-xxx				A-DM-Dxxx-x	xx			ISO 01
G Single	e operator u	niversal spool			1 Standard r	return			ISO 02
	ole operator (universal spool			2 Standard r (for use wit	return with memory spring th single operator only)			ISO 1
t configuration :				Pilot style :	A D&A D				ISO 2
'A-XX-A X A-DM-D T				67A-XX-AA	A-D M -D <i>xxx-x</i> T	XX			ISO 3
ь В	Standard pi Pilot exhaus Pilot exhaus	lot exhaust t to main exhaust* t out adapter* bilot. Replace DM v	uith DII		└── P ₽	Pilot exhaust muffled Pilot exhaust piped (#10-3 Pilot exhaust to main exhau	2) ust		
ounting style :	nust use DU į	энот. керіасе DM v	VITTI DU						
oming siyle .									



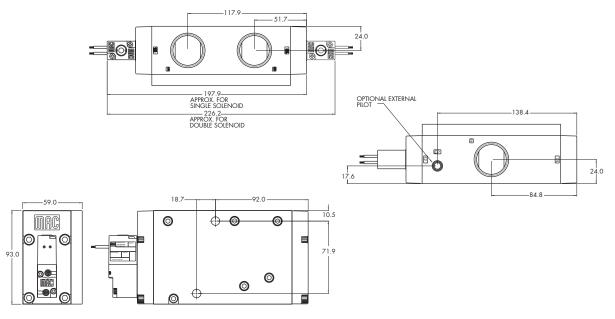




Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot: 20 to 120 PSI External Pilot : Vacuum to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: Temperature range: 0°F to 120°F (-18°C to +50°C) Flow: 3/4": (14.5 C_v) - 1": (20.0 C_v) Coil: Class A continuous duty, #22 AWG x 18 lead wires -15% to +10% of nominal voltage Voltage range: Protection: Consult factory ~ Inrush : 7.6 VA Power: Holding: 4.8 VA = 12.7 to 1.0 WResponse times: Energize: 29 ms (with 5.4 W coil) De-energize: 21 ms

Options : • BSPP threads

DIMENSIONS





Individual mounting Series

33 34

36

32

92

93

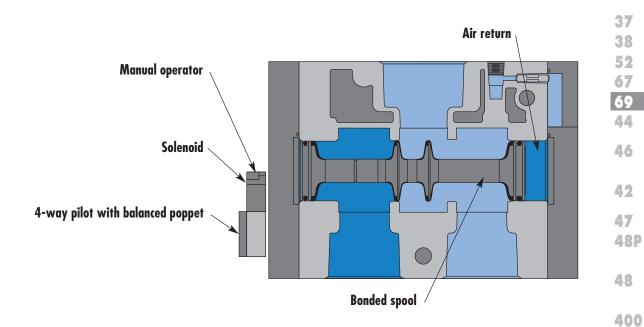
ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



SERIES FEATURES

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

71



SOLENOID OPERATOR > JXXX-XXX* (-G) Add "G" for ground XX Voltage X Lead wire length X Manual operator XX Electrical connection* AA 120 VAC (5,4W) 0 No lead wire 1 Non-locking BA Flying leads DA 24 VDC (5,4W) A 18" 2 Locking GA MAC JAC Solenoid Plug-in DB 12 VDC (5,4W) B 24" DC 24 VDC (2,4W) C 36" DD 12 VDC (2,4W) C 36" 40 GG MAC JAC Solenoid Plug-in with rectifier JB Rectangular connector JD Rectangular connector JD Rectangular connector with light KA Mini square connector with light Note: use "0" No lead wire for "J", "K" and "I" type electrical connectors.	unction		Port size	Flow (Max)	Individual mo	unting	Series
1. The 4-way pilot develops maximum shifting force both ways. 2. Bedinned 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 glassifile finished bone. 5. Pilot with belanced poppet, high flow, short and consistent response times. 6. Wiping affect eliminates stricking and contamination. HOW TO ORDER Port size Pilot air Single Operator NC valve Single Operator NC valve RO valve 1 1/2" 69A-A1-AA-JXXX-XXX 69A-C1-AA-JXXX-XXX 69A-C1-AA-JXXX-XXX 40 2 1/2" 69A-A1-AA-JXXX-XXX 69A-C1-AA-JXXX-XXX 69A-C1-CAB-JXXX-XXX 69A-C1-CAB	3/2 NO-NC, 2/2 N	IO-NC	1 1/2" - 2" - 2 1/2"	60.0 C _v	Inline		
force both ways. Z. Bolanced spool, immune to variations of pressure, also provides high flow. 3. Short stroke with high flow. 3. Short stroke h	OPERATIONAL BENEFITS						33
pressure, also provides high flow. 1. Short stroke with high flow. 2. Short stroke with high flow. 3. Wiping effect eliminates sticking and contamination. 3. Wiping effect elimination. 3. Wiping	force both ways.	•	· ·				34
in a glass-like finished bore. Pilot with balanced poppet, high flow, short and consistent response times. Wiping effect eliminates sticking and contamination. ### HOW 10 ORDER Port size	pressure, also provide . Short stroke with high	es high flow. flow.			•		36
HOW TO ORDER Port size Pilot air Single Operator NC valve Single Operator Single Operator NC valve Single Operator NC v	in a glass-like finished . Pilot with balanced po	l bore. oppet, high flov	· ·				32
Port sixe	. Wiping effect elimina		I		-		
Port size	contamination.						
Port size							
1 1/2" 69A-A1-AAA-JXXX-XXX 69A-C1-AAA-JXXX-XXX 2" Internal 69A-A1-BAA-JXXX-XXX 69A-C1-BAA-JXXX-XXX 69A-C1-CAA-JXXX-XXX 2 1/2" 69A-A1-CAA-JXXX-XXX 69A-C1-CAA-JXXX-XXX 42 1/2" 69A-A1-AAB-JXXX-XXX 69A-C1-CAA-JXXX-XXX 42 2 2" External 69A-A1-BAB-JXXX-XXX 69A-C1-CAB-JXXX-XXX 47 47 47 47 48 47 48 48	HOW TO ORDER						
1 1/2" 69A-A1-AAA-JXXX-XXX 69A-C1-AAA-JXXX-XXX 2" Internal 69A-A1-BAA-JXXX-XXX 69A-C1-BAA-JXXX-XXX 42 1/2" 69A-A1-CAA-JXXX-XXX 69A-C1-CAA-JXXX-XXX 42 1/2" 69A-A1-AAB-JXXX-XXX 69A-C1-ABA-JXXX-XXX 47 1/2" 69A-A1-BAB-JXXX-XXX 69A-C1-BAB-JXXX-XXX 47 47 69A-A1-BAB-JXXX-XXX 69A-C1-BAB-JXXX-XXX 48 47 48 48 48 48 48 48	Port size	Pilot air					
2" Internal 69A-A1-BAA-JXXX-XXX 69A-C1-BAA-JXXX-XXX 42 1/2" 69A-A1-CAA-JXXX-XXX 69A-C1-CAA-JXXX-XXX 69A-C1-CAA-JXXX-XXX 69A-C1-CAA-JXXX-XXX 47			10	2 12 3 01		10 2 12 D 3/1	
2 1/2" 69A-A1-CAA-JXXX-XXX 69A-C1-CAA-JXXX-XXX 42 1 1/2" 69A-A1-AAB-JXXX-XXX 69A-C1-AAB-JXXX-XXX 47 2" External 69A-A1-BAB-JXXX-XXX 69A-C1-BAB-JXXX-XXX 47 2 1/2" 69A-A1-CAB-JXXX-XXX 69A-C1-BAB-JXXX-XXX 48 OLENOID 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) 0 No lead wire 1 Non-locking BA Flying leads DA 24 VDC (5,4W) A 18" 2 Locking GA MAC JAC Solenoid Plug-in With rectifier DB 12 VDC (5,4W) B 24" GG MAC JAC Solenoid Plug-in with rectifier JB Rectangular connector with light Collections available, see page 317. One: use "0" No lead wire for "J", "K" and "I" type electrical connectors.	<u> </u>						
1 1/2" 69A-A1-AAB-JXXX-XXX 69A-C1-AAB-JXXX-XXX 47 2" External 69A-A1-BAB-JXXX-XXX 69A-C1-BAB-JXXX-XXX 47 2 1/2" 69A-A1-CAB-JXXX-XXX 69A-C1-BAB-JXXX-XXX 48 OLENOID OPERATOR ➤ JXXX-XXX (-G) Add "G" for ground XX Voltage X Lead wire length X Manual operator XX Electrical connection* AA 120 VAC (5,4W) 0 No lead wire 1 Non-locking BA Flying leads GA MAC JAC Solenoid Plug-in DB 12 VDC (5,4W) B 24" DC 24 VDC (5,4W) G 36" GG MAC JAC Solenoid Plug-in with rectifier JB Rectangular connector With light (A Mini square connector With light KA Mini square connector With light (A Mini square connector with light Vpe electrical connectors.		Internal					42
2 1/2" 69A-A1-CAB-JXXX-XXX 69A-C1-CAB-JXXX-XXX 48I OLENOID OPERATOR > J XXX-XXX (-G) Add "G" for ground 48 XX Voltage							
OLENOID OPERATOR > JXXX-XXX* (-G) Add "G" for ground XX Voltage X Lead wire length X Manual operator XX Electrical connection* AA 120 VAC (5,4W) 0 No lead wire 1 Non-locking BA Flying leads DA 24 VDC (5,4W) A 18" 2 Locking GA MAC JAC Solenoid Plug-in DB 12 VDC (5,4W) B 24" DC 24 VDC (2,4W) C 36" DD 12 VDC (2,4W) C 36" Other options available, see page 317. othe: use "0" No lead wire for "J", "K" and "L" type electrical connectors. YX Electrical connection* AA 120 VAC (5,4W) BA Flying leads GA MAC JAC Solenoid Plug-in with rectifier JB Rectangular connector JD Rectangular connector Mini square connector with light KA Mini square connector with light	2"	 External	69A-A1	-BAB-J xxx-xxx	69	A-C1-BAB-J xxx-xxx	47
XX Voltage X Lead wire length X Manual operator XX Electrical connection* AA 120 VAC (5,4W) DA 24 VDC (5,4W) B 24" DC 24 VDC (2,4W) DD 12 VDC (2,4W) C 36" Other options available, see page 317. ote: use "0" No lead wire for "J", "K" and "L" type electrical connectors.	2 1/2"		69A-A1	-CAB-J xxx-xxx	69	A-C1-CAB-J xxx-xxx	48P
AA 120 VAC (5,4W) 0 No lead wire 1 Non-locking BA Flying leads DA 24 VDC (5,4W) A 18" 2 Locking GA MAC JAC Solenoid Plug-in DB 12 VDC (5,4W) B 24" DC 24 VDC (2,4W) C 36" DD 12 VDC (2,4W) C 36" Other options available, see page 317. Lote: use "0" No lead wire for "1", "K" and "1" type electrical connectors. D No lead wire for "1", "K" and "1" type electrical connectors.	OLENOID OPERAT	OR ➤		J <u>xx</u> x- <u>xx</u>	<u>x</u> * (-G) Add "G"	for ground	48
AA 120 VAC (5,4W) 0 No lead wire 1 Non-locking BA Flying leads DA 24 VDC (5,4W) A 18" 2 Locking GA MAC JAC Solenoid Plug-in DB 12 VDC (5,4W) B 24" DC 24 VDC (2,4W) C 36" DD 12 VDC (2,4W) C 36" Other options available, see page 317. Lote: use "0" No lead wire for "1", "K" and "L" type electrical connectors. BA Flying leads GA MAC JAC Solenoid Plug-in with rectifier BA Flying leads GA MAC JAC Solenoid Plug-in with rectifier JB Rectangular connector JD Rectangular connector KA Mini square connector KD Mini square connector with light	XX Voltage		X Lead wire	ength X	Manual operator	XX Electrical connection*	400
DB 12 VDC (5,4W) B 24" DC 24 VDC (2,4W) C 36" DD 12 VDC (2,4W) Other options available, see page 317. lote: use "0" No lead wire for ""," "K" and "L" type electrical connectors. DB 24" GG MAC JAC Solenoid Plug-in with rectifier JB Rectangular connector JD Rectangular connector with light KA Mini square connector KD Mini square connector with light							700
DC 24 VDC (2,4W) C 36" DD 12 VDC (2,4W) C 36" With rectifier JB Rectangular connector JD Rectangular connector with light KA Mini square connector KD Mini square connector with light KD Mini square connector with light					Locking	GG MAC JAC Solenoid Plug-in MAC JAC Solenoid Plug-in	92
Other options available, see page 317. ote: use "0" No lead wire for "J", "K" and "L" type electrical connectors. JD Rectangular connector with light KA Mini square connector KD Mini square connector with light	DC 24 VDC (2,4V	V)			-	with rectifier	
	, , .		_		- - -	JD Rectangular connector with light KA Mini square connector	93
AC voltage requires connector with rectifier.	ote: use "0" No lead wi AC voltage requires	re for "J", "K" a s connector with	nd "L" type electrical connect rectifier.	ors.	-	Mini square connector with light	ISO 01

OPTIONS

Pilot exhaust configuration:

69A-xx-<u>xx</u> **X**-J*xxx-xxx* A Standard pilot exhaust
B Pilot exhaust out main exhaust - M Manifold O'Ring Mount

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

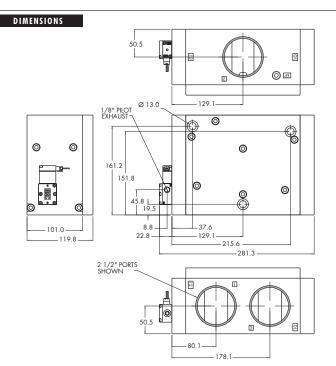


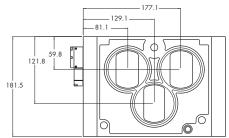




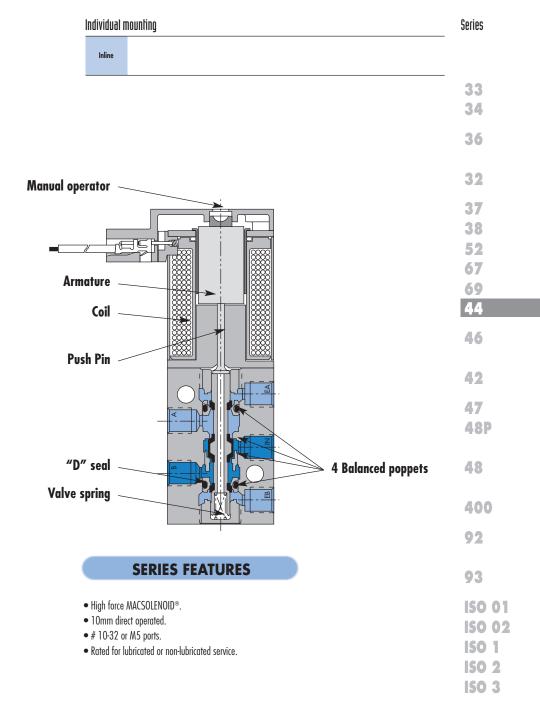
Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI Pilot Pressure: 20 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 µ Temperature range : 0°F to 120°F (-18°C to +50°C) Cv 60.0 Flow: Coil: Class A wire, #22 AWG x 18, continuous duty Voltage range: -15% to +10% of nominal voltage 5.4W - 2.4W - 1.8W Power:

Options : • BSPP threads











Function	Port size	Flow (Max)	Individual Mounting	Series
5/2	M5, # 10-32	0.1 C _v	Inline	
1. 10 mm valve, direct s 2. Balanced poppet, im	solenoid operated.			33 34
pressure. 3. Short stroke with high 4. The patented solenoid forces.	h flow.			36
5. Powerful return spring 6. Flow is specifically of				32
7. Manual operator star	ndard on all valves.		6	37
				38 52
HOW TO ORDER	I			67
SOLENOID OPERAT	TOR			69
Po	ort size	Universal valve	For use with external flow controls	44
		WI DO ON EA	W SE V ON EA	46
	M5	44C-ABA-G xxx-xxx	44C-BBA-G xxx-xxx	
	10-32	44C-AAA-G xxx-xxx	44C-BAA-G xxx-xxx	47
				48P
				48
				400
SOLENOID OPERA	TOR ➤	G <u>xxx-xxx</u> .		92
				93
XX Voltage AA 120 VAC (2.	X Wire I .5W) A 18"	ength X Manual o		ISO 01
DC 24 VDC (1.8°	B 24"	2 Locking recess		- 100 00
DF 24 VDC (4.0)			KA Plug-in wire assembly.	ISO 12
* Other options availab Note : AC voltage require	ole, see page 311. es connector with rectifier		KC Plug-in wire assembly with rectifier & light KT Plug-in wire assembly with	- ISO 2
			light	— ISO 3





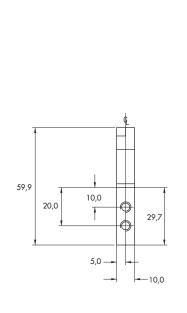


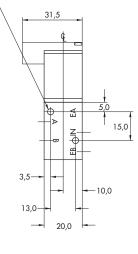
Fluid: Compressed air, vacuum, inert gases Vacuum to 120 PSI Pressure range: Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) 40 µ Filtration: Temperature range: 0°F to 120°F (-18°C to +50°C) 4 W: (0.10 C_v) - 2.5 W: (0.08 C_v) - 1.8 W: (0.06 C_v) - 1.0W: (0.05 C_v) Flow: Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage Power: 4 W - 2.5 W - 1.8 W - 1.0 W Response times: Energize: 3.4 ms (with 4 W coil) De-energize: 1.5 ms

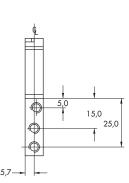
Note: • Valve and coil are not interchangeable.

Ø 3.3 MTG. HOLES

DIMENSIONS

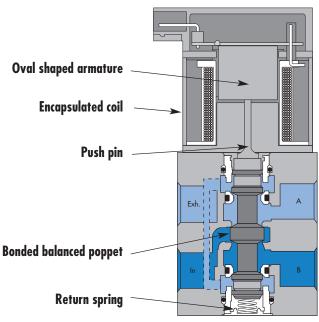








Individual mounting Series Inline Manifold mounting



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.

42

33 34

36

32

69

44

46

47 48P

48

400

92

93

ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

Function	Port size	Flow (Max)	Individual mounting		Series	
4/2	1/8" - # 10-32	0.3 C _V	Inline			
OPERATIONAL BENEFITS					33	
Balanced poppet, immune to	variations of				34	
pressure. 2. Patented solenoid develops h	nigh shifting				2.6	
forces. 3. Short stroke with high flow.					36	
 Higher forces result in lower given flow. Powerful return spring. 	wattages for		5		32	
			A		37	
					38	
					52	
HOW TO ORDER					67	
	Single O	perator	Double C	perator	69	
Port size	Without flow controls	With flow controls	Without flow controls	With flow controls	44	
	A B B	A B B	A B B	A B B	46	
	EXH V OIN	EXH V OIN	EXH V OIN	EXH V OIN		
1/8" NPTF	46A-AA1-J xxx-xxx	46A-AA2-J xxx-xxx	46A-GA1-J xxx-xxx	46A-GA2-J xxx-xxx	42	
# 10-32	46A-AB1-J xxx-xxx	46A-AB2-J xxx-xxx	46A-GB1-J xxx-xxx	46A-GB2-J xxx-xxx		
2015/1015 0555/705		1		ı	47 40D	
SOLENOID OPERATOR >		J <u>XX</u> X- <u>XXX</u>	(-G) Add "G" for	ground	48P	
		\ \			40	
XX Voltage	X Wire leng		anual operator XX	Electrical connection	48	
Single & double solenoid AA 120 VAC (5.4W)	** O No leads A 18"		n-locking recessed BA king recessed GA	Flying leads MAC JAC solenoid plug-in		
DA 24 VDC (5.4W) DB 12 VDC (5.4W)	B 24" C 36"		GG	MAC JAC solenoid plug-in with rectifier	400	
Single solenoid only			JB JD	Rectangular connector	0.0	
DC 24 VDC (2.4W) DD 12 VDC (2.4W)				Rectangular connector with light	92	
Other options available, see pag	 ge 317.		KA KD	Mini square connector Mini square connector with		
* Use with rectangular and mini of the state	connectors			light	93	
	ndown capability is possible. Consult	factory for washdown modification	on number.		ISO 01	
					100.00	
OPTIONS					ISO 02	
46A- AA 1-J <i>xxx-xxx</i>					ISO 1	
G Use with O ring mount (body option 'D' & 'H')						
					ISO 3	
D Single ope F Single ope G Double op	erator - 4 port body with side ports erator - 4 port body with bottom por erator - Bottom O ring mount - All p erator - Bottom O ring mount - Cylin perator - 4 Port body - With side por perator - Bottom O ring mount - All p	orts (No side ports) der ports only – Side inlet & exho ts				

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







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

Options : • BSPP threads

Single solenoid Double solenoid Double solenoid Double solenoid 7.5 2.2.5



Function		Port size		Flow (Max)	Manifold Mo	ounting		Series
4/2		1/8" -	# 10-32	0.3 C _v	Stacking			
OPERATIO	NAL BENEFITS							33
1. Balance	ed poppet, immune to varia	tions of				-		34
Patente forces.	ed solenoid develops high sh troke with high flow.	nifting						= 36
given f	forces result in lower wattag low. ul return spring.	ges for				7		32
						0		37
							a la	38
						1		52
HOW	TO ORDER							67
	Port size			Without flow controls		With f	low controls	69
				A A B B		Α [A B B	44
				EXH V IN		\Box	EXH V OIN	46
	1/8" NPTF			46A-SA1-J xxx-xxx		46A-SA2-J xxx-xxx		
	# 10-32			46A-SB1-J xxx-xxx		46A-S	B2-J xxx-xxx	42
COLENIC	OID OBERATOR >			I vvv vvv* /	C) A dd "C"	, [
20TEING	OID OPERATOR ➤			J <u>xx</u> x- <u>xxx</u> * (-G) Add G	for g	jrouna	47
				<u></u> _				48P
XX	Voltage	Х	Wire length		nual operator	XX	Electrical connection	
AA DA	120 VAC (5.4W) 24 VDC (5.4W)	A	18" 24"		-locking recessed ing recessed	BA GA	Flying leads MAC JAC solenoid plug-in	48
DB	12 VDC (5.4W)	С	36"		g	GB	MAC JAC solenoid plug-in	
DC DD	24 VDC (2.4W) 12 VDC (2.4W)	_				GG	with diode MAC JAC solenoid plug-in with rectifier	400
								0.0
Note : - A	options available, see page 31 C voltage requires connector v (ith the MAC IAC washdown	with rectifier.	possible Consult fr	actory for washdown modification	number			92
				iciory for washaown mounicanor	r nomber.			93
End plate l	kit required (port size 1/4") :	M-46001-01.						93
								ISO 01
								ISO 02
								ISO 1
								ISO 2
								ISO 3
								130 3



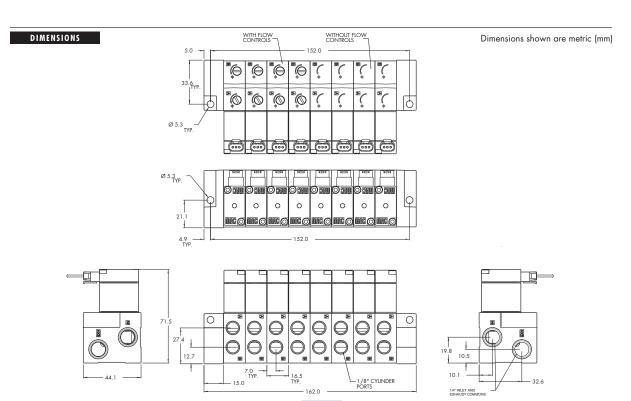




Fluid: Compressed air, vacuum, inert gases Pressure range: Vacuum to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 μ Temperature range: 0°F to 120°F (-18°C to +50°C) Flow: $1.8W : (0.20 C_v) - 2.4W : (0.20 C_v) - 5.4W : (0.30 C_v)$ Coil: Class A wire (#22 AWG x 18), continuous duty -15% to +10% of nominal voltage Voltage range: Protection: Consult factory 5.4W - 2.4W - 1.8W Power: Response times: Energize: 7.20 ms (with 5.4 W coil) 4.20ms De-energize :

Options : • BSPP threads

Spare parts: • Inlet isolator: 28494 • Exhaust isolator: 28493 • Tie rod (x2): 79411





Function	Port size		Floш (Max)	Manifold mounting	Series
4/2	1/8" -	5/32 O.D. Pressed-in tube receptacles	0.3 C _v	Manifold base "plug-in"	
OPERATIONAL BENEFITS					33
l . Balanced poppet, im	mune to variations of				34
pressure. L. Patented solenoid de	velops high shifting				
forces.					36
. Short stroke with high . Higher forces result in					
given flow. Powerful return spring	1			00	32
. т отполог тогот торгт.	9.			96 9 0	37
				200	38
					52
HOW TO ORDER	I				67
Po	ort size	Sing	gle solenoid	Double solenoid	
		Ą	A B B	A A B B	44
		<u></u>	EXH V OIN	EXH V OIN	46
	less base		00-00-J xx P- xxx	46A-N00-00-J xxP-x	
	B" NPTF ed-in tube receptacles		SA-AC-J xxP-xxx SF-AC-J xxP-xxx	46A-NSA-BL-J xx P- x 46A-NSF-BL-J xx P- x	
7,02 0.5111055	ou-iii iono iotopiutio		or recording		
COLENIOID OBED 4	TOD >	Lw	vD vvv* 1 (C)	47
Solenoid Opera	IOR >	J <u>X</u>	X P-XXX (-C	G) Add "G" for ground	48P
XX Voltage	!-		operator	XX Electrical connecti	on 48
Single & double sole AA 120 VAC (5,			9	FA Base plug-in Base plug-in with diode	
AC 24 VAC (5,4 DA 24 VDC (5,4				FG Base plug-in with rectifier	400
DB 12 VDC (5,4	W)				
Single solenoid only DC 24 VDC (2,4					92
DD 12 VDC (2,4	W)				
Other options availabl	e, see page 317.				93
• •	es connector with rectifier. [Double solenoid requires mini	mum 5.4 watts.		
OPTIONS	l				ISO 01
46A-LSB-AC-JxxP-x	xx				ISO 02
c	Single solenoid - Side cyli Single & double solenoid	nder ports			ISO 1
		- poriom cylinder ports			ISO 2
L Sin	e only - no valve gle solenoid - Base mount b	oody			ISO 3
N Doi	gle solenoid - Base mount b uble solenoid - Base mount uble solenoid - Base mount	body with gage port			
P Doi	ubie solenoid - Base mount	boay with gage port			

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







Fluid: Compressed air, vacuum, inert gases

Pressure range: Vacuum 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)

Orific e 3.3 mm

Flow: $1.8W : [0.20 C_v] - 2.4W : [0.20 C_v] - 5.4W : [0.30 C_v]$

Coil: Epoxy encapsulated – Class A wires – 100% ED

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

Protection: IP54 (electrical connection)

 Power:
 5.4W - 2.4W - 1.8W

 Response times:
 Energize: 7.20 m

times: 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** -35.5— 8.5— 0 0 0 000 Ŏ 22.5 풆 0 9 3911 0 0



Function	Port size		F	Tow (Max)	Manifo	d mounting	Series
4/2	1/8" -	5/32 O.D. tube recepta).3 C _v	Manifold "plug-in' pressu regula	with re	
OPERATIONAL BENE	FITS						33
	, immune to variations of						34
forces. 3. Short stroke with	I develops high shifting high flow. ult in lower wattages for						36
given flow.	·						32
5. Powerful return sp	oring.					0	37
						200	38
					6	0	52
HOW TO ORDER					-		67
HOW TO ORDER							
	Port size (Bottom ports on	y)			Мо	del number	69
	•	• .			Α	A B B	44
						EXH V IN	46
	Valve less base	1				00-00-J xxP-xxx	
	1/8" NPTF /32 O.D. Pressed-in tube	rocontrolos				SA-AJ-J xxP-xxx SF-AJ-J xxP-xxx	42
	OZ O.B. Flesseu-iii iobe	receptacies		_			
SOLENOID OPE	RATOR ➤		J <u>xx</u>	P- XXX * (-	G) Add "	G" for ground	47
						-	48P
XX Voltag	ge	Х	Manual o	perator	ХХ	Electrical connection	
AA 120 VAC		1 2	Non-locking re Locking recess		FA FB	Base plug-in Base plug-in with diode	48
DB 12 VDC	(5.4W)		LOCKING Tecess	eu	FG	Base plug-in with rectifier	
DC 24 VDC							400
* Other options avail Note: AC voltage red	ilable, see page 317. quires connector with rectifier.						
OPTIONS							92
46A-LSA-AJ-JXX	YP-XXX						
	J Regulator with adjusting & E Regulator with slotted ster G Regulator with slotted ster	nob					93
		n with locknut					ISO 01
0 L	Base only – no valve Base mount body Base mount body with gage po						ISO 02
		ort					ISO 1
Example : base only v End plate kit required	with regulator : 46A-0SA-AJ. (port size 1/4") : M-46003-0	l.					ISO 2
							ISO 3
							130 3







Compressed air, vacuum, inert gases Fluid: Pressure range: Vacuum 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: $1.8W : (0.20 C_v) - 2.4W : (0.20 C_v) - 5.4W : (0.30 C_v)$ Coil: Class A continuous duty, #22 AWG x 12 base leads Voltage range: -15% to +10% of nominal voltage Protection: Consult factory 5.4W - 2.4W - 1.8W Power:

Power: 5.4W - 2.4W - 1.8W

Response times: Energize: 7.20 ms

(with 5.4 W coil) De-energize: 4.20ms

Options : • BSPP threads

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

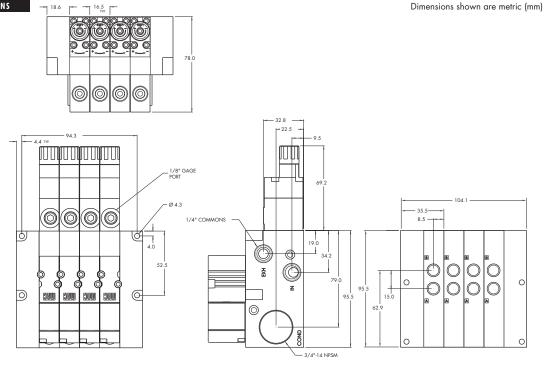
Replacement regulators: PR46A-OAAA (slotted stem)
 PR46A-OBAA (adjusting knob)

PR46A-OCAA (slotted stem with locknut)

Regulating range options : • PR46A-xxx

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

DIMENSIONS





Function	Port size	1	Flow (Max) М	anifold mounting	Series
4/2	1/8" -	5/32 O.D. Pressed-in tube receptacles	0.3 C _v	lanifold base plug-in" with low controls	
OPERATIO	NAL BENEFITS				33
	ed poppet, immune to variations of				34
forces. 3. Short st	d solenoid develops high shifting troke with high flow.				36
given fl	forces result in lower wattages for low. ul return spring.			- 100	32
				S U0	37
				33 00	38
					52
HOW	TO ORDER				67
	Port size			Model number	69
	Port size			Model number	44
				A B B	-7-7
				EXH V OIN	46
	Valve less base			46A-L00-00-J <i>xx</i> P- <i>xxx</i> 16A-LSA-AD-J <i>xx</i> P- <i>xxx</i>	
	5/32 O.D. Pressed-in tube	receptacles		16A-LSA-AD-J XXP-XXX	42
SOLENC	DID OPERATOR ➤			d "G" for ground	47
				\neg	48P
XX	Voltage	X Manual o	perator	XX Electrical connection	
AA	120 VAC (5.4W)	1 Non-locking r		FA Base plug-in	48
DA DB	24 VDC (5.4W) 12 VDC (5.4W)	2 Locking recess	sed	FB Base plug-in with diode FG Base plug-in with rectifier	
DC	24 VDC (2.4W)	_	_	, 0	400
* Other o	ptions available, see page 317.				400
	voltage requires connector with rectifier.				92
	SA-A D -JxxP-xxx				
40/	D Side cylinder ports M Bottom cylinder ports				93
	O Base only – no valve				ISO 01
L	O Base only – no valve L Base mount body M Base mount body with gage po	rt			ISO 02
Example :	base only with flow controls: 46A-0SA-AE	l.			ISO 1
End plate l	kit required (port size 1/4") : M-46003-01				ISO 2
					ISO 3
					1000







Fluid: Compressed air, vacuum, inert gases

Pressure range: Vacuum 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 : $0^{\circ}F$ to $120^{\circ}F$ (- $18^{\circ}C$ to $+50^{\circ}C$)

Flow: $1.8W: (0.20 C_v) - 2.4W: (0.20 C_v) - 5.4W: (0.30 C_v)$

Class A continuous duty, #22 AWG x 12 base leads

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

Protection: Consult factory

Power: 5.4W - 2.4W - 1.8W

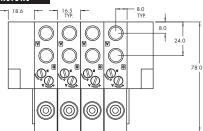
Response times: Energize: 7.20 ms
De-energize: 4.20ms

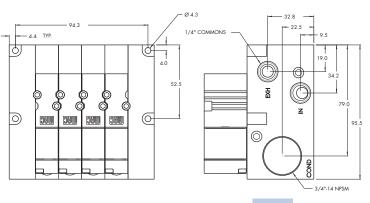
Options : • BSPP threads

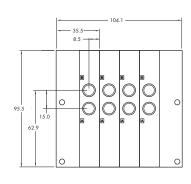
Spare parts: • Inlet isolator: 28501 • Exhaust isolator: 28502 • Valve cover plate: M-46002

• Tie rod (x2) : 79443

DIMENSIONS









Function	Port size	FI	loш (Max)	Manifold mounting	Series
4/2	1/8" -	5/32 O.D. Pressed-in tube receptacles).3 C _v	Manifold base "plug-in" with PR & FC	
OPERATIONAL BENEFIT	s				33
1. Balanced poppet, im	nmune to variations of				34
pressure. 2. Patented solenoid de forces. 3. Short stroke with hig 4. Higher forces result i	h flow.				36
given flow. 5. Powerful return sprin				2	32
5. Fowerior return sprin	9.				37
				100	38
				0.00	52
HOW TO ORDER	•				67
HOW TO ORDER	•				~ -
	Port size (Bottom ports onl	v)		Model number	69
	• • • • • • • • • • • • • • • • • • • •	*		A	44
				EXH V °IN	46
	Valve less base			46A-L00-00-J xx P- xxx	
	1/8" NPTF			46A-LSA-AK-J xxP-xxx	42
5/32	2 O.D. Pressed-in tube	receptacles		46A-LSF-AK-J xxP-xxx	
SOLENOID OPERA	TOR ➤	J XX	P-xxx (-G) Ad	ld "G" for groun	47
					48P
XX Voltage		X Manual op	perator	XX Electrical connec	tion
AA 120 VAC (5 DA 24 VDC (5.4		1 Non-locking re 2 Locking recesse		FA Base plug-in Base plug-in with diode	48
DB 12 VDC (5.4	1W)	Z Locking recesse	<u>-</u> -	FB Base plug-in with diode FG Base plug-in with rectifi	er
DC 24 VDC (2.4					400
* Other options availab Note : AC voltage requir	es connector with rectifier.				
OPTIONS	1				92
46A- L SA-A K -J <i>xx</i> P-7		nob & flow controls & flow controls with locknut & flow controls			93
	 Regulator with slotted stem se only – no valve 	with locknut & flow controls			ISO 01
L Ba	se only – no valve se mount body se mount body with gage po	urt .			ISO 02
	,				ISO 1
End plate kit required (po	n regulator : 46A-0SA-AK. ort size 1/4") : M-46003-01				ISO 2
					ISO 3
					130 3







Fluid: Compressed air, vacuum, inert gases

Pressure range: Vacuum 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: $1.8W: (0.20 C_v) - 2.4W: (0.20 C_v) - 5.4W: (0.30 C_v)$ Coil: Class A continuous duty, #22 AWG x 12 base leads

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

Protection: Consult factory

 Power:
 5.4W - 2.4W - 1.8W

 Response times:
 Energize: 7.20 m

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

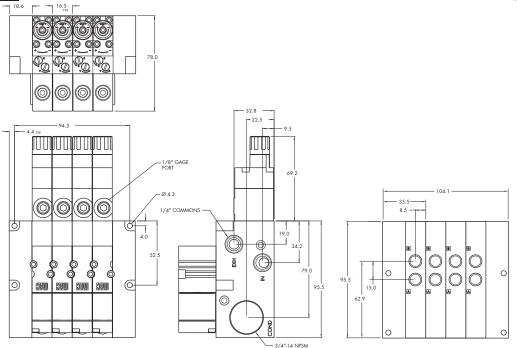
Replacement regulators: PR46A-OAAA (slotted stem)
 PR46A-OBAA (adjusting knob)

PR46A-OBAA (adjusting knob)
PR46A-OCAA (slotted stem with locknut)

Regulating range options : • PR46A-xxx

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

DIMENSIONS





Individual mounting Sub-base non "plug-in" Sub-base non "plug-in" Sub-base non "plug-in" with latching solenoid Manifold base non "plug-in" Manifold base non "plug-in" Manifold base non "plug-in" Manifold base non "plug-in" "with latching solenoid Sub-base/manifold base non "plug-in" with latching solenoid 334

32

69 44

46

42

47 48P

48

400

92

93

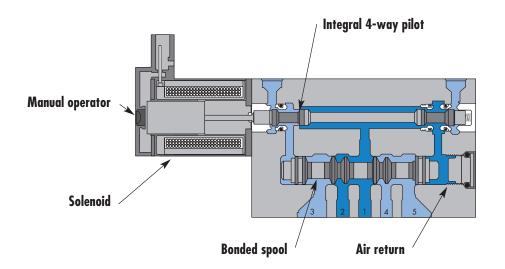
ISO 01

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.
- $\bullet \ {\it Latching solenoid technology}.$



unction		Port size	Floш (Max)	Individual mounting		Series
5/2, 5/3		# 10-32 - 1/4" O.D. tube receptor	0.4 C _V	Sub-base non "plug-in"		
PERATIONAL BEN	EFITS					33
. 4-way valve with . 10 mm valve (st					â.	34
High flow (up to Fast repeatable Maximum shiftin	0.4 C _v). response time	·s.			W 18	36
Long life.				43		32
				100	20	37
				3		38
				0.00		52
HOW TO ORDE	R			-		67
		.S (VALVE WITH BASE COD	ED EOD SIDE DODTS!			69
Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Closed center	5/3 Open center	44
FOII 3126	Filor un	12 2 4 14	12 2 4 14	12 2 4 14	12 2 4 14	44
						46
Valve less	Internal	42B-AMA-000-G xxx-xxx	42B-BMA-000-G xxx-xxx	42B-EMA-000-G <i>xxx-xxx</i>	42B-FMA-000-G xxx-xxx	
base	External	42B-AMD-000-G xxx-xxx	42B-BMD-000-G xxx-xxx	42B-EMD-000-Gxxx-xxx	42B-FMD-000-G xxx-xxx	42
# 10-32	Internal	42B-AMA-AAL-G xxx-xxx	42B-BMA-AAL-G xxx-xxx	42B-EMA-AAL-G xxx-xxx	42B-FMA-AAL-Gxxx-xxx	-12
	External	42B-AMD-AAM-Gxxx-xxx	42B-BMD-AAM-Gxxx-xxx	42B-EMD-AAM-Gxxx-xxx	42B-FMD-AAM-Gxxx-xxx	47
1/4" O.D.	Internal	42B-AMA-EAL-Gxxx-xxx	42B-BMA-EAL-Gxxx-xxx	42B-EMA-EAL-Gxxx-xxx	42B-FMA-EAL-Gxxx-xxx	
ube receptacles	External	42B-AMD-EAM-Gxxx-xxx	42B-BMD-EAM-Gxxx-xxx	42B-EMD-EAM-Gxxx-xxx	42B-FMD-EAM-Gxxx-xxx	48P
UAL PRESSUR	E MODELS	(VALVE WITH BASE CODE	FOR SIDE PORTS)			48
Port size		Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Pressure center	40
			14		12 2 4 14 STM STM ST 3 1 5	400
Valve less be	nse Int	ernal Supply #3 port	42B-CMB-000-G xxx-xxx	42B-DMB-000-Gxxx-xxx	42B-HMB-000-G xxx-xxx	
		Supply #5 port	42B-CMC-000-Gxxx-xxx	42B-DMC-000-G xxx-xxx	42B-HMC-000-Gxxx-xxx	92
		ternal	42B-CMD-000-Gxxx-xxx	42B-DMD-000-Gxxx-xxx	42B-HMD-000-Gxxx-xxx	
# 10-32	Int	ernal Supply #3 port	42B-CMB-AAL-Gxxx-xxx	42B-DMB-AAL-Gxxx-xxx	42B-HMB-AAL-Gxxx-xxx	93
		Supply #5 port	42B-CMC-AAL-Gxxx-xxx	42B-DMC-AAL-Gxxx-xxx	42B-HMC-AAL-Gxxx-xxx	7.0
1/4" O.D.		ternal	42B-CMD-AAM-GXXX-XXX 42B-CMB-EAL-GXXX-XXX	42B-DMD-AAM-Gxxx-xxx 42B-DMB-EAL-Gxxx-xxx	42B-HMD-AAM-GXXX-XXX 42B-HMB-EAL-GXXX-XXX	ISO O
tube receptaci		Supply #3 port Supply #5 port	42B-CMC-EAL-GXXX-XXX	42B-DMC-EAL-GXXX-XXX	42B-HMC-EAL-GXXX-XXX	ISO O
Tobe Teceptuc		ternal -	42B-CMD-EAM-GXXX-XXX	42B-DMD-EAM-GXXX-XXX	42B-HMD-EAM-Gxxx-xxx	ISO 1
TANIDADD CO		-	C			
tandard so	IENOID OI	PERATOR >	G <u>xx</u> x- <u>xxx</u> *			150 2
						150 3
XX Volta	ige .	X Wire leng	th X Mo	anual operator XX	Electrical connection	
	C (2.5W)	A 18"		n-locking recessed BA	Flying leads	
	C (1.8W) C (2.5W)	B 24" C 36"	<u>2</u> Loc	king recessed BT GA	Flying leads with light MAC JAC solenoid Plug-in	
DF 24 VDC	(4.0W)			KA	Plug-in wire assy.	
lote · AC voltage re	equires connec	tor with rectifier. ge 311. 2 valves. 4 2 series valves, see page 107		KT	Plug-in wire assy. with light	
Other -	:1	211		KD	Plug-in wire assy. with	





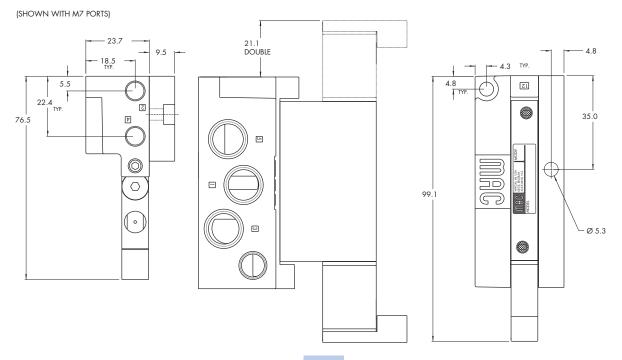


Compressed air, vacuum, inert gases Fluid: Pressure range: Internal Pilot - 2 pos. : 20 to 120 PSI 3 pos. : 40 to 120 PSI External Pilot : vacuum to 120 PSI Pilot pressure: 2 position : 20 to 120 PSI 3 position: 40 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 µ 0°F to 120°F (-18°C to +50°C) Temperature range : Flow: # 10-32 : (0.35 C_v) - 1/4" O.D. tube receptacle : (0.4 C_v) Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize : 5 ms (with 24V 4 W coil) 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





Function	Port size	Flow (Max)	Individual mounting	Series
5/2, 5/3	# 10-32 - 1/4" O.D. tube receptacle	0.4 C _v	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 $C_{\rm v}$).
- 4. Fast repeatable response times.
- 5. Maximum shifting forces in both directions.
- 6. Long life.



69

44

46

42

47 48P

48

400

92

93

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

ISO 3

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
		12 2 4 14 175 14 14 315		12 2 4 14 MMD 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 2 4 14 MD T T T T T T T T T T T T T T T T T T T
Valve less	Internal	42B-AMA-000-GxxP-xxx	42B-BME-000-GxxP-xST	42B-EME-000-GxxP-xST	42B-FME-000-GxxP-xST
base	External	42B-AMD-000-GxxP-xxx	42B-BMH-000-GxxP-xST	42B-EMH-000-GxxP-xST	42B-FMH-000-G xx P- x ST
# 10-32	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
1/4" O.D.	Internal	42B-AMA-EAA-GxxP-xxx	42B-BME-EAC-GxxP-xST	42B-EME-EAC-GxxP-xST	42B-FME-EAC-GxxP-xST
tube receptacles	External	42B-AMD-EAB-GxxP-xxx	42B-BMH-EAD-GxxP-xST	42B-EMH-EAD-GxxP-xST	42B-FMH-EAD-GxxP-xST

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
		14 4 2 12 1/5 7 3	14 2 12 17D T 3 0 0 3	12 2 4 14 MMD 3 1 5
Valve less base	Internal Supply #3 port	42B-CMB-000-GxxP-xxx	42B-DMF-000-G xx P- x ST	42B-HMF-000-GxxP-xST
	Supply #5 port	42B-CMC-000-GxxP-xxx	42B-DMG-000-GxxP-xST	42B-HMG-000-G xx P- x ST
	External	42B-CMD-000-GxxP-xxx	42B-DMH-000-GxxP-xST	42B-HMH-000-G xx P- x ST
# 10-32	Internal Supply #3 port	42B-CMB-AAA-GxxP-xxx	42B-DMF-AAC-GxxP-xST	42B-HMF-AAC-GxxP-xST
	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
1/4" O.D.	Internal Supply #3 port	42B-CMB-EAA-GxxP-xxx	42B-DMF-EAC-GxxP-xST	42B-HMF-EAC-GxxP-xST
tube receptacles	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

STANDARD SOLENOID OPERATOR ➤

		— <u> </u>	
XX	Voltage	X Manual operator	XX Electrical connection
AA	120 VAC (2.5W)	 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
lote : AC	voltage requires connector with rectifier (for do	uble solenoid consult factory).	55 Base plug-in with rectifier & light & ground

G XX P-XXX

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.





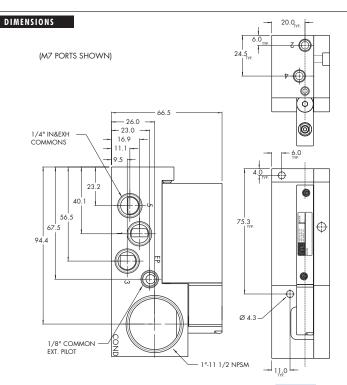


Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot - 2 pos. : 20 to 120 PSI 3 pos. : 40 to 120 PSI External Pilot : vacuum to 120 PSI Pilot pressure: 2 position : 20 to 120 PSI 3 position: 40 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 µ Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: # 10-32 : (0.35 C_v) - 1/4" O.D. tube receptacle : (0.4 C_v) Coil: Class A continuous duty, #22 AWG x 12 base leads Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize: 5 ms (with 24V 4 W coil) 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



75.0



unction		Port size	Flow (Max)	Manifold mounting		Series
/2, 5/3		# 10-32 - 1/4" O.D. tube recepto	0.4 C _V	Manifold base non "plug-in"		
PERATIONAL BEN	EFITS				***	33
4-way valve with	h 4-way integi	ral pilot.			1	34
 10 mm valve (store) High flow (up tore) Fast repeatable Maximum shifting 	0.4 C _v). response time	s.		6		36
. Long life.				. II.		32
				N		37
				- 1	100	38
					15 10 0	
						52
HOW TO ORDE	R					67
ingle pressu	JRE MODEL	S (MIDDLE STATION MAN	IFOLDS WITH SIDE PORTS	5)		69
Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Closed center	5/3 Open center	44
		12 2 4 14 TD T T T	12 2 4 14 T 14 3 15	12 2 4 14 MCD 11 1 4 9 MM 17 1 1 1 4 9 MM 3 1 5	12 2 4 14 3 1 M	46
Valve less	Internal	42B-AMA-000-G xxx-xxx	42B-BMA-000-G xxx-xxx	42B-EMA-000-G xxx-xxx	42B-FMA-000-G xxx-xxx	
base	External	42B-AMD-000-Gxxx-xxx	42B-BMD-000-Gxxx-xxx	42B-EMD-000-Gxxx-xxx	42B-FMD-000-G xxx-xxx	42
# 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	47
1/4" O.D.	Internal	42B-AMA-EJL-Gxxx-xxx	42B-BMA-EJL-Gxxx-xxx	42B-EMA-EJL-Gxxx-xxx	42B-FMA-EJL-Gxxx-xxx	48P
ube receptacles	External	42B-AMD-EJM-Gxxx-xxx	42B-BMD-EJM-Gxxx-xxx	42B-EMD-EJM-Gxxx-xxx	42B-FMD-EJM-Gxxx-xxx	701
	E MODELS	(MIDDLE STATION MANIF	·			48
Port size		Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Pressure center	70
				12 12 12 12 12 12 12 12 12 12 12 12 12 1		400
Valve less bo	use Int	ernal Supply #3 port	42B-CMB-000-Gxxx-xxx	42B-DMB-000-Gxxx-xxx	42B-HMB-000-G xxx-xxx	
		Supply #5 port	42B-CMC-000-Gxxx-xxx	42B-DMC-000-Gxxx-xxx	42B-HMC-000-Gxxx-xxx	92
"		ternal	42B-CMD-000-Gxxx-xxx	42B-DMD-000-Gxxx-xxx	42B-HMD-000-Gxxx-xxx	
# 10-32	Int	ernal Supply #3 port	42B-CMB-AJL-Gxxx-xxx	42B-DMB-AJL-Gxxx-xxx	42B-HMB-AJL-Gxxx-xxx	93
		Supply #5 port	42B-CMC-AJL-GXXX-XXX	42B-DMC-AJL-GXXX-XXX	42B-HMC-AJL-GXXX-XXX	
1/4" O.D.		ernal Supply #3 port	42B-CMD-AJM-GXXX-XXX 42B-CMB-EJL-GXXX-XXX	42B-DMD-AJM-GXXX-XXX 42B-DMB-EJL-GXXX-XXX	42B-HMD-AJM-Gxxx-xxx 42B-HMB-EJL-Gxxx-xxx	ISO O
tube receptaci		Supply #5 port	42B-CMC-EJL-GXXX-XXX	42B-DMC-EJL-GXXX-XXX	42B-HMC-EJL-GXXX-XXX	ISO O
		ternal	42B-CMD-EJM-Gxxx-xxx	42B-DMD-EJM-Gxxx-xxx	42B-HMD-EJM-Gxxx-xxx	ISO 1
tandard so	LENOID OI	PERATOR ➤	G <u>xx</u> x- <u>x</u> xx*			ISO 2
						ISO 3
XX Volta	ıae	X Wire leng	jth X Mc	inual operator XX	Electrical connection	
	C (2.5W)	A 18"		n-locking recessed BA	Flying leads	
DC 24 VDC	(1.8W)	B 24"		king recessed BT	Flying leads with light	
	2 (2.5W) 2 (4.0W)	C 36"		GA KA	MAC JAC solenoid plug-in Plug-in wire assy.	

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.

Plug-in wire assy.

Plug-in wire assy. with light Plug-in wire assy. with rectifier & light & ground

KT



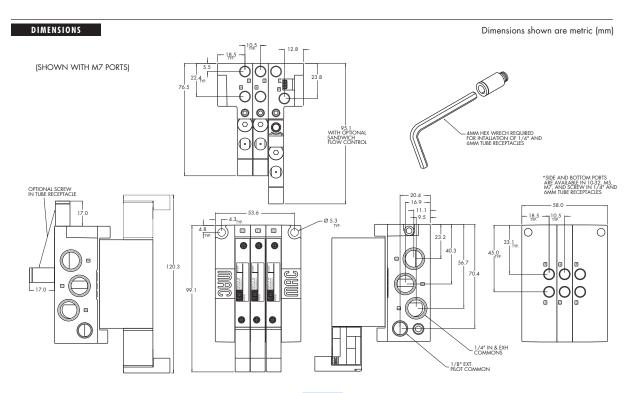




Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot - 2 pos. : 20 to 120 PSI 3 pos. : 40 to 120 PSI External Pilot : vacuum to 120 PSI Pilot pressure: 2 position : 20 to 120 PSI 3 position: 40 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) 40 µ Filtration: Temperature range : 0° F to 120° F (- 18° C to + 50° C) Flow: # 10-32 : (0.35 C_v) - 1/4" O.D. tube receptacle : (0.4 C_v) Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize: 5 ms (with 24V 4 W coil) 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





Function		Port size	Flow (Max)	Manifold mounting	S	eries
5/2, 5/3		# 10-32 - 1/4" O.D. tube receptor	0.4 C _V	Manifold base "plug-in"		
PERATIONAL BENE	EFITS				1	33
. 4-way valve with						34
. 10 mm valve (sta . High flow (up to . Fast repeatable r . Maximum shifting	0.4 C _v). response time	· s.				36
. Long lite.				1	00	32
						37
						38
						52
HOW TO ORDE	R					5 7
		C /IED CTANIDADD EVOED	T EOD CINICIE COLENIOID	CI		
		•	T FOR SINGLE SOLENOID	·		69
Port size	Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Closed center	12 2 4 14	44
		315	315		10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	46
Valve less	Internal	42B-AMA-000-GxxP-xxx	42B-BME-000-G xx P- x ST	42B-EME-000-GxxP-xST	42B-FME-000-GxxP-xST	-
base	External	42B-AMD-000-GxxP-xxx	42B-BMH-000-GxxP-xST	42B-EMH-000-GxxP-xST	42B-FMH-000-GxxP-xST	42
# 10-32	Internal	42B-AMA-AJA-GxxP-xxx	42B-BME-AJC-GxxP-xST	42B-EME-AJC-GxxP-xST	42B-PME-AJC-GXXP-X31	
1/4" O.D.	External Internal	42B-AMD-AJB-GxxP-xxx 42B-AMA-EJA-GxxP-xxx	42B-BMH-AJD-GxxP-xST 42B-BME-EJC-GxxP-xST	42B-EMH-AJD-GxxP-xST 42B-EME-EJC-GxxP-xST	42B-FMH-AJD-GxxP-xST 42B-FME-EJC-GxxP-xST	47
ube receptacles	External	42B-AMD-EJB-GxxP-xxx	42B-BMH-EJD-GxxP-xST	42B-EMH-EJD-GxxP-xST		48P
		(LED STANDARD EXCEPT F				
Port size		Pilot air	5/2 Single solenoid	5/2 Double solenoid	5/3 Pressure center	48
			14 4 2 12 17 5 0 0 0 3	14 2 12 12 12 12 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	12 2 4 14 MD 17 1 14 17 1 17 18 18 18 18 18 18 18 18 18 18 18 18 18	400
Valve less ba	ise Int	ernal Supply #3 port	42B-CMB-000-GxxP-xxx	42B-DMF-000-GxxP-xST	42B-HMF-000-GxxP-xST	100
		Supply #5 port	42B-CMC-000-GxxP-xxx	42B-DMG-000-G xx P- x ST		92
	Ex	ternal	42B-CMD-000-GxxP-xxx	42B-DMH-000-G xx P- x ST	42B-HMH-000-GxxP-xST	
# 10-32	Int	ernal Supply #3 port	42B-CMB-AJA-GxxP-xxx	42B-DMF-AJC-GxxP-xST	42B-HMF-AJC-GxxP-xST	93
		Supply #5 port	42B-CMC-AJA-GxxP-xxx	42B-DMG-AJC-GxxP-xST	42D-11/NG-AJC-GAAF-A31	73
		ternal	42B-CMD-AJB-GxxP-xxx	42B-DMH-AJD-GxxP-xST	42B-HMH-AJD-GxxP-xST	SO 01
1/4" O.D.		ernal Supply #3 port	42B-CMB-EJA-GxxP-xxx	42B-DMF-EJC-GxxP-xST	420-1 1/VII -LJC-GAAF-A31	SO 02
tube receptaci		Supply #5 port	42B-CMC-EJA-GxxP-xxx	42B-DMG-EJC-GXXP-XST		
		ternal	42B-CMD-EJB-GxxP-xxx	42B-DMH-EJD-GxxP-xST Above numbers are middle st	42B-HMH-EJD-GxxP-xST ation manifolds with side ports	SO 1
STANDARD SO	LENOID O	PERATOR ➤	G <u>xx</u> P- <u>xxx</u> *	And the invincers are initially st	· I	SO 2
						30 3
	ae	X	Manual operator	XX Electric	cal connection	
XX Volta	9-					
AA 120 VA	.C (2.5W)	1	Non-locking recessed		& 3 position models	
AA 120 VA DC 24 VDC	~	1 2	Non-locking recessed Locking recessed	Double solenoid ST Base plug Single solenoid	j-in	

* 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.

Base plug-in with rectifier & light & ground

SJ 55 Base plug-in Base plug-in with light





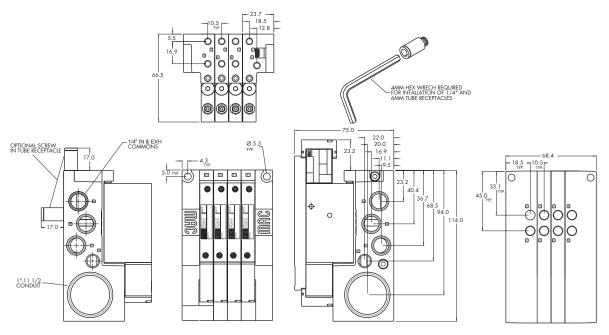


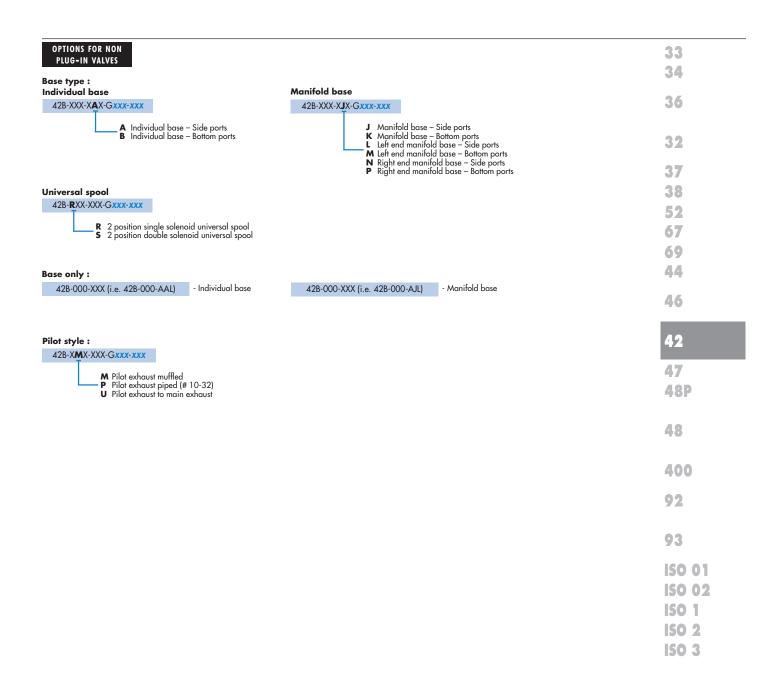
Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot - 2 pos. : 20 to 120 PSI 3 pos. : 40 to 120 PSI External Pilot : vacuum to 120 PSI Pilot pressure: 2 position : 20 to 120 PSI 3 position: 40 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) 40 µ Filtration: Temperature range : 0° F to 120° F (- 18° C to + 50° C) Flow: # 10-32 : (0.35 C_v) - 1/4" O.D. tube receptacle : (0.4 C_v) Coil: Class A continuous duty, #22 AWG x 12 base leads Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize: 5 ms (with 24V 4 W coil) De-energize : 5 ms

Options :

- \bullet M5 ports, M7 ports, 6 mm O.D. tube receptacles \bullet 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





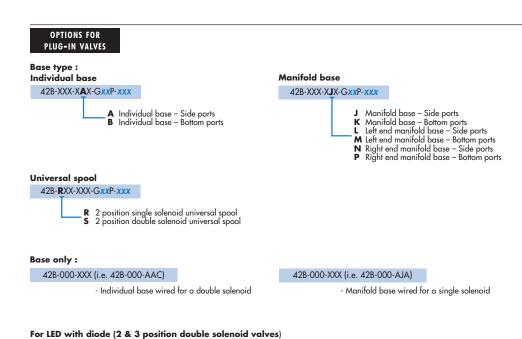
42B-XX**J**-XXX-G**xx**P-**x**ST

42B-XMX-XXX-GxxP-xxx

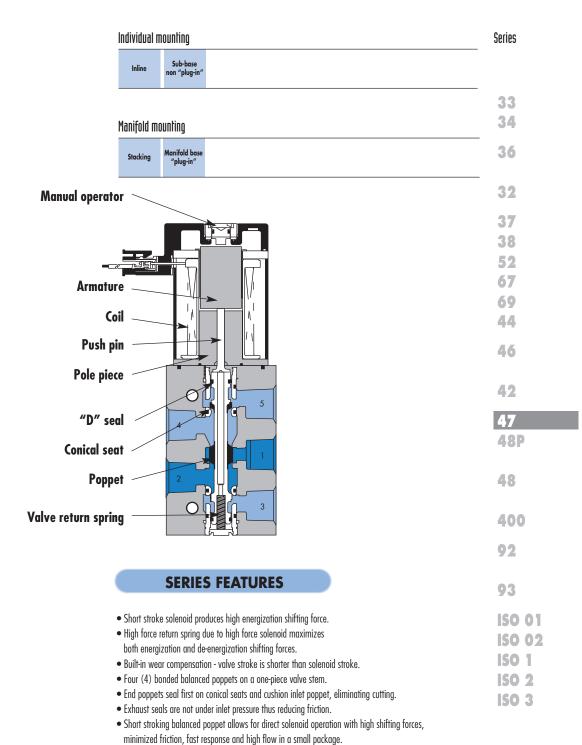
Pilot style:

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

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









OPTIONS

47A-C**X**O-H**xxx-xxx**

Namur Mount Option (w/o flow controls)

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

Function	Port size	Flow (Max)		Individual Mounting	Series
5/2	1/8" - 1/	4" 0.5 C _v		Inline	
Short stroke solenoid energization shifting f High force return springles.	force. ng due to high force 8	. Integral non-rising flow contr inline models. . Short stroking balanced pop	pet allows for		33 34
solenoid maximizes b de-energization shiftin 3. Built-in wear compens shorter than solenoid 4. Four bonded balance	oth energization and ng forces. sation – valve stroke is stroke.	direct solenoid operation wit forces, minimized friction, fa high flow in a small package	h high shifting st response and		36
piece valve stem. 5. End poppets seal first cushion inlet poppet, 6. Exhaust seals are not reducing friction.	on conical seats and eliminating cutting.			0,4	37 38 52
HOW TO ORDER	rt size	Without flow	controls	With flow co	67
		12 W 13 15	14	12 W T T T	44
	B" NPTF	47A-AA0-H >		47A-BA0-H xx	x-xxx
SOLENOID OPERAT	" NPTF OR ➤	— 47А-АВО-Н X		47A-BB0-H xx	42 47 48P
XX Voltage DA 24 VDC (5.2V DB 24 VDC (2.4V DC 24 VDC (1.8V DC 1.8V DC 1.8V DC 1.8V DC 1.8V DC DC DC DC DC DC DC D	M) A 1 M) B 2	8" 4" 6"	X Manual ope 1 Non-locking recessed 2 Locking recessed	ssed MA Plug-i MC Plug-ii light	n wire assembly n wire assembly with
DD 24 VDC (1.0V AA 120 VAC (6.7	N)			MT Plug-ii	leads leads with light wire assembly with er & light
* Other options available Note: AC voltage requires	e, see page 315. connector with rectifier.				92
					93
					ISO 01
					ISO 02
					ISO 1
* Other options available	e, see page 319.				ISO 2 ISO 3





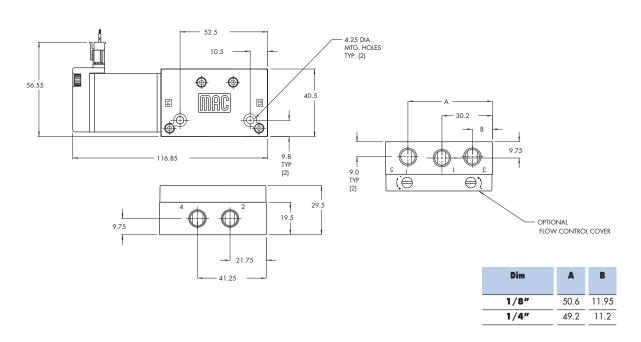


Fluid: Compressed air, vacuum, inert gases Pressure range: Vacuum to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) 40 µ Filtration: Temperature range: 0°F to 120°F (-18°C to +50°C) Flow: $5.2W: (0.50 C_v) - 2.4W: (0.35 C_v) - 1.0W: (0.30 C_v)$ Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage Power: 5.2W - 2.4W - 1.0W Response times: Energize: 17.4 ms (with 5.2 W coil) De-energize : 3.8 ms

Options : • BSPP threads

Spare parts : • Flow control assembly : N-47004

DIMENSIONS





Function	Port size	Flow (Mi	ax]		Individual Mount	ing		Series
5/2	1/8" -	1/4" 0.5 C ₁	,		Sub-base non "plug-in"			
OPERATIONAL BENEFITS 1. Short stroke solenoid produces h energization shifting force.		7. Integral non-rising flow of inline models.						33 34
High force return spring due to his solenoid maximizes both energized de-energization shifting forces. Built-in wear compensation – valv	ation and	 Short stroking balanced direct solenoid operation forces, minimized friction high flow in a small pack 	with high n, fast resp	shifting		-4		36
shorter than solenoid stroke. 4. Four bonded balanced poppets o piece valve stem.	n a one-							32
End poppets seal first on conical a cushion inlet poppet, eliminating a cushion inlet poppet, eliminating a cushion inlet poppet, eliminating a cushion inlet poppet.								37
Exhaust seals are not under inlet preducing friction.					-48		2	38
HOW TO ORDER						-		52 67
Port size		Without fi	ow contr	als	V	Vish 6	low controls	69
FOII SIAG		Williou	ow tolli	013	· ·		iow toilifois	44
		12 W T T T T T T T T T T T T T T T T T T	14			12 W T 3 1	4 14 5	46
Valve less base 1/8" NPTF			H xxx-xx				O-H xxx-xxx AB-H xxx-xxx	
1/4" NPTF			-п <i>ххх-хх</i> -Н <i>ххх-хх</i>				BB-H xxx-xxx	42
SOLENOID OPERATOR ➤		Н <u>хх</u>	x-<u>x</u>x T	<u>x</u> .				47 48P
XX Voltage	X	Lead Wire length	X	Manual ope	rator	XX	Electrical connection	40
DA 24 VDC (5.2W) DB 24 VDC (2.4W) DC 24 VDC (1.8W)	A B C	18" 24" 36"	1 2	Non-locking recessed	ssed	MA MC	Plug-in wire assembly Plug-in wire assembly with light	48
DD 24 VDC (1.0W) AA 120 VAC (6.7W)	_					BA BC MT	Flying leads Flying leads with light Plug-in wire assembly with	400
* Other options available, see page S Note: AC voltage requires connector w	3]5.				_		rectifier & light	92
Note: AC voltage requires connector w	rith rectifier.							93
								ISO 01 ISO 02 ISO 1 ISO 2 ISO 3

^{*} Other options available, see page 319.







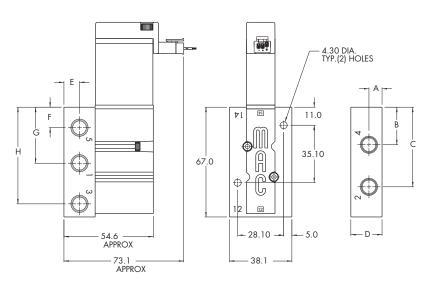
Fluid: Compressed air, vacuum, inert gases Pressure range: Vacuum to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: Temperature range: 0°F to 120°F (-18°C to +50°C) Flow: $5.2W: (0.50 C_v) - 2.4W: (0.35 C_v) - 1.0W: (0.30 C_v)$ Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage Power: 5.2W - 2.4W - 1.0W Response times: Energize: 17.4 ms De-energize : 3.8 ms (with 5.2 W coil)

Options : • BSPP threads

Spare parts : • Pressure seal body to base: 16628 • Mounting screw (x2): 35043

• Flow control assembly (x2): N-04001

DIMENSIONS



DIM.	A	В	C	D	E	F	G	н
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



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

unction	Port size	Flow (Max)	Manifold	Mounting	Series
/2	1/8" - 1/4"	0.5 C _V	Stacking		
ERATIONAL BENEFITS					33
Short stroke solenoid p		gral non-rising flow controls	available on		34
energization shifting for High force return spring solenoid maximizes bot de-energization shifting	due to high force 8. Sho h energization and dire forces. force	ne models. rt stroking balanced poppet ct solenoid operation with h ct solenoid operation, fast r	igh shifting	P. Carl	36
Built-in wear compensat shorter than solenoid str Four bonded balanced	oke.	n flow in a small package.			32
piece valve stem. End poppets seal first o	n conical seats and				37
cushion inlet poppet, eli	minating cutting.			0	38
exhaust seals are not un educing friction.	ider inlet pressure thus				52
HOW TO ORDER					67
	size	Wish and flam	utuala	With flow controls	69
Port	size	Without flow co	ntrois	With flow controls	44
		12 w T	14	12 W T 14	46
1/8"	NPTF	47A-SA0-H xxx	-xxx	47A-TA0-H xxx-xxx	_ 40
1/4"	NPTF	47A-SB0-H xxx -	XXX	47A-TB0-H xxx-xxx	_ 42
XX Voltage DA 24 VDC (5.2W)	X Lead A 18"	H XXX-X	Manual operator Non-locking recessed	XX Electrical connection MA Plug-in wire assembly	47 48P
DB 24 VDC (2.4W) DC 24 VDC (1.8W)	C 36"		Locking recessed	MC Plug-in wire assembly with light	48
24 VDC (1.0W) AA 120 VAC (6.7W				BA Flying leads BC Flying leads with light MT Plug-in wire assembly with rectifier & light	400
Other options available, s e: AC voltage requires co	see page 315. onnector with rectifier.				92
TCHING OPERATO	R ≻	L <u>XX</u> X- <u>X</u>	<u>XX</u> *		93
					160.01
XX Voltage		Wire length	•	XX Electrical connection	
DA 24 VDC (5.2W) DF 12 VDC (5.2W)	B 24"		No operator	BA 2 Wire Flying leads BJ 4 Wire Flying leads	_ ISO 02
	C 36"			LA 3 Wire Plug-in (Polarity switching cover)	ISO 1
				MA 2 Wire Plug-in ME 4 Wire Plug-in	ISO 2







(with 5.2 W coil)

Fluid: Compressed air, vacuum, inert gases Pressure range: Vacuum 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: $5.2W: (0.50 C_v) - 2.4W: (0.35 C_v) - 1.0W: (0.30 C_v)$ Coil: Class A wires (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage Power: 5.2W - 2.4W - 1.0W Response times: Energize: 17.4 ms

Options : • BSPP threads

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

De-energize : 3.8 ms

DIMENSIONS Dimensions shown are metric (mm) **⊕** -21 ÷ \oplus \oplus \oplus OHW OHM **DHW** * (A) **+** [4] -**+** 14 -**P P** Diw Dim DHW Ø 6.3 THRU. 0 Dim 1/8" 22.8 18.4 1/4" 19 24.2

Direct solenoid and solenoid pilot operated valves

	Port size		Flow (Max	[]	Manifold	Mounting	Series
5/2	1/8" -	1/4"	0.5 C _V		Manifold b		
PERATIONAL BENEFITS						_	33
Short stroke solenoid				ntrols available on			34
energization shifting for High force return sprint solenoid maximizes be de-energization shifting	ng due to high force oth energization and g forces.	direct sole forces, mi	king balanced po enoid operation v inimized friction,	with high shifting fast response and			36
 Built-in wear compensor shorter than solenoid s Four bonded balanced 	stroke.	high flow	in a small packa	ige.	-	•	32
piece valve stem. End poppets seal first	on conical seats and						37
cushion inlet poppet, e	eliminating cutting.						38
 Exhaust seals are not useducing friction. 	under inlet pressure thus					Photo: Middle sta	
HOW TO ORDER						manifold b	
	Port size				Mad	el number	69
	PORT SIZE				Mod	ei iioiiiber	44
					12 w	4 14	
					3	\ \\ \ \ \ \ \ \ \ \ \ \ \ \	46
	Valve less base					ALLL SYP-XXX	
	1/8" NPTF 1/4" NPTF					AJ-H xxP-xxx BJ-H xxP-xxx	42
OLENOID OPERATO	OR ≻		H <u>XX</u> F	D-XXX*			47
SOLENOID OPERATO	OR ►		H <u>xx</u> F	0- XXX .			47 48P
XX Voltage		Х	Manual ope	rator	XX	Electrical connection	
XX Voltage DA 24 VDC (5.2W	√)	X 1 2	Manual ope	rator	XX FA FB	Base plug-in	47 48P 48
XX Voltage DA 24 VDC (5.2W DB 24 VDC (2.4W DC 24 VDC (1.8W	V) V) V)	1	Manual ope	rator	FA FB FC	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light	48
XX Voltage DA 24 VDC (5.2W DB 24 VDC (2.4W	v) v) v)	1	Manual ope	rator	FA FB	Base plug-in Base plug-in w/ ground	
XX Voltage DA 24 VDC (5.2W DB 24 VDC (2.4W DC 24 VDC (1.8W DD 24 VDC (1.0W AA 120 VAC (6.7 Other options available	V) V) V) V) W) , see page 315.	1	Manual ope	rator	FA FB FC FD	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground	48
XX Voltage	V) V) V) V) W) , see page 315.	1	Manual ope Non-locking rece Locking recessed	erator	FA FB FC FD	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground	48
XX Voltage	V) V) V) V) W) , see page 315.	1	Manual ope	erator	FA FB FC FD	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground	48
XX Voltage	V) V) V) V) W) , see page 315.	1	Manual ope Non-locking rece Locking recessed	prator pressed P-XXX*	FA FB FC FD	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground	48 400 92
DA 24 VDC (5.2W DB 24 VDC (2.4W DC 24 VDC (1.8W DD 24 VDC (1.0W AA 120 VAC (6.7 Other options available lote: AC voltage requires ATCHING SOLENC XX Voltage DA 24 VDC (5.2W	v) v) v) v) w) w) w) y, see page 315. s connector with rectifier.	1 2	Manual ope Non-locking rece Locking recessed	prator pressed P-XXX*	FA FB FC FD FT	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground Base plug-in w/ rectifier and light Electrical connection Base plug-in w/ ground	48 400 92
DA 24 VDC (5.2W DB 24 VDC (2.4W DC 24 VDC (1.8W DD 24 VDC (1.0W AA 120 VAC (6.7) Other options available lote: AC voltage requires ATCHING SOLENC XX Voltage	v) v) v) v) w) w) w) y, see page 315. s connector with rectifier.	1 2	Manual ope Non-locking rece Locking recessed	prator pressed P-XXX*	FA FB FC FD FT	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground Base plug-in w/ rectifier and light	48 400 92
DA 24 VDC (5.2W DB 24 VDC (2.4W DC 24 VDC (1.8W DD 24 VDC (1.0W AA 120 VAC (6.7 Other options available lote: AC voltage requires ATCHING SOLENC XX Voltage DA 24 VDC (5.2W	v) v) v) v) w) w) w) y, see page 315. s connector with rectifier.	1 2	Manual ope Non-locking rece Locking recessed	prator pressed P-XXX*	FA FB FC FD FT XX FA FB	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground Base plug-in w/ rectifier and light Electrical connection Base plug-in w/ ground Base plug-in w/ ground Base plug-in w/ ground	48 400 92
DA 24 VDC (5.2W DB 24 VDC (2.4W DC 24 VDC (1.8W DD 24 VDC (1.0W AA 120 VAC (6.7) Other options available lote: AC voltage requires ATCHING SOLENC XX Voltage DA 24 VDC (5.2W DF 12 VDC (5.2W	v) v) v) v) v) w) y, see page 315. s connector with rectifier. DID >	1 2	Manual ope Non-locking rece Locking recessed	prator pressed P-XXX*	FA FB FC FD FT XX FA FB FC	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground Base plug-in w/ rectifier and light Electrical connection Base plug-in w/ ground Base plug-in w/ ground Base plug-in w/ ground & LED Base plug-in 4 wire w/ ground	48 400 92
DA 24 VDC (5.2W DB 24 VDC (2.4W DC 24 VDC (1.8W DD 24 VDC (1.0W AA 120 VAC (6.7 Other options available ATCHING SOLENC XX Voltage DA 24 VDC (5.2W DF 12 VDC (5.2W Other options available	v) v) v) v) v) w) y, see page 315. s connector with rectifier. DID >	1 2	Manual ope Non-locking rece Locking recessed	prator pressed P-XXX*	FA FB FC FD FT XX FA FB FC	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground Base plug-in w/ rectifier and light Electrical connection Base plug-in w/ ground Base plug-in w/ ground Base plug-in w/ ground & LED Base plug-in 4 wire w/ ground	48 400 92 93 ISO 01 ISO 02 ISO 1 ISO 2
DA 24 VDC [5.2W DB 24 VDC [2.4W DC 24 VDC [1.8W DD 24 VDC [1.0W AA 120 VAC [6.7W Other options available Note: AC voltage requires ATCHING SOLENC XX Voltage DA 24 VDC [5.2W DF 12 VDC [5.2W Other options available	v) v) v) v) v) w) y, see page 315. s connector with rectifier. DID >	1 2	Manual ope Non-locking rece Locking recessed	prator pressed P-XXX*	FA FB FC FD FT XX FA FB FC	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground Base plug-in w/ rectifier and light Electrical connection Base plug-in w/ ground Base plug-in w/ ground Base plug-in w/ ground & LED Base plug-in 4 wire w/ ground	48 400 92
DA 24 VDC (5.2W DB 24 VDC (2.4W DC 24 VDC (1.8W DD 24 VDC (1.0W AA 120 VAC (6.7 Other options available lote: AC voltage requires ATCHING SOLENC XX Voltage DA 24 VDC (5.2W DF 12 VDC (5.2W Other options available OPTIONS	v) v) v) v) v) w) v) w) v) v) v) v) see page 315. connector with rectifier. DID >	1 2 X 0	Manual ope Non-locking rece Locking recessed L XX Manual ope No operator	prator pressed P-XXX*	FA FB FC FD FT XX FA FB FC	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground Base plug-in w/ rectifier and light Electrical connection Base plug-in w/ ground Base plug-in w/ ground Base plug-in w/ ground & LED Base plug-in 4 wire w/ ground	48 400 92 93 ISO 01 ISO 02 ISO 1 ISO 2
DA 24 VDC (5.2W DB 24 VDC (2.4W DC 24 VDC (1.8W DD 24 VDC (1.0W AA 120 VAC (6.7 Other options available Note: AC voltage requires ATCHING SOLENC XX Voltage DA 24 VDC (5.2W DF 12 VDC (5.2W Other options available OPTIONS 47A-xxJ-xxxP-xxx K M	v) v) v) v) v) w) v) w) v, see page 31.5. s connector with rectifier. DID > v) v) v) v) v, see page 31.9.	X 0	Manual ope Non-locking rece Locking recessed L XX F Manual ope No operator	prator ssed	FA FB FC FD FT XX FA FB FC	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground Base plug-in w/ rectifier and light Electrical connection Base plug-in w/ ground Base plug-in w/ ground Base plug-in w/ ground & LED Base plug-in 4 wire w/ ground	48 400 92 93 ISO 01 ISO 02 ISO 1 ISO 2
DA 24 VDC (5.2W DB 24 VDC (2.4W DC 24 VDC (1.8W DD 24 VDC (1.0W AA 120 VAC (6.7W Other options available Note: AC voltage requires ATCHING SOLENC XX Voltage DA 24 VDC (5.2W DF 12 VDC (5.2W Other options available OPTIONS 47A-xxJ-xxxP-xxx J M K M L Ri	V) V) V) V) W) V) W) y, see page 315. s connector with rectifier. D)D ➤ V) V) y, see page 319.	X 0	Manual ope Non-locking rece Locking recessed L XX F Manual ope No operator	prator ssed	FA FB FC FD FT XX FA FB FC	Base plug-in Base plug-in w/ ground Base plug-in w/ LED light Base plug-in w/ LED light w/ ground Base plug-in w/ rectifier and light Electrical connection Base plug-in w/ ground Base plug-in w/ ground Base plug-in w/ ground & LED Base plug-in 4 wire w/ ground	48 400 92 93 ISO 01 ISO 02 ISO 1 ISO 2

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







Fluid: Compressed air, vacuum, inert gases

Pressure range: Vacuum 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 : $0^{\circ}F$ to $120^{\circ}F$ (- $18^{\circ}C$ to $+50^{\circ}C$)

Flow (at 6 bar, $\Delta P = 1$ bar): 5.2W: $(0.50 \text{ C}_{v}) - 2.4\text{W}$: $(0.35 \text{ C}_{v}) - 1.0\text{W}$: (0.30 C_{v})

Class A continuous duty, #22 AWG x 12 base leads

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

 Power :
 5.2W - 2.4W - 1.0W

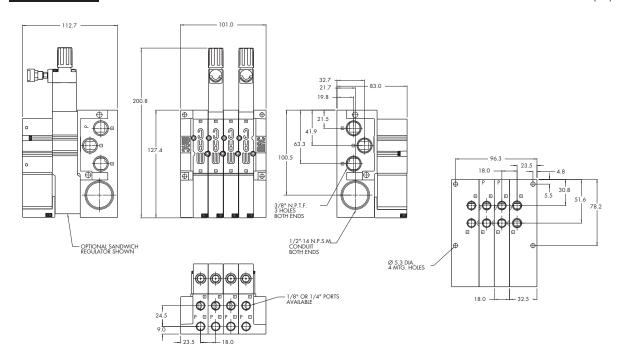
 Response times :
 Energize : 17.4 ms

 (with 5,2 W coil)
 De-energize : 3.8 ms

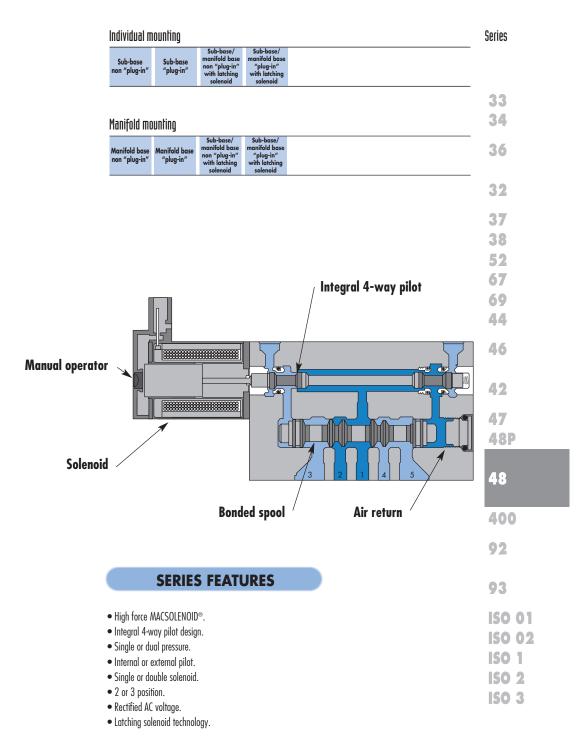
Options:
• BSPP threads • Sandwich flow control: FC47A-AA • Sandwich regulator: see "Regulator" section

Spare parts : • Inlet/exhaust isolator: 28447 • Valve cover plate: M-47001

DIMENSIONSDimensions shown are metric (mm)









Function	Port size	Flow (Max)	Individual mounting	Series
5/2, 5/3	1/8"	1.1 C _v	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 $C_{\rm v}$).
- 4. Fast repeatable response times.
- 5. Maximum shifting forces in both directions.
- 6. Long life.



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
		12 2 4 14 170 14 14 315		12 2 4 14 MD 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 2 4 14 MDD 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Valve less	Internal	48B-AMA-000-G xxx-xxx	48B-BMA-000-Gxxx-xxx	48B-EMA-000-Gxxx-xxx	48B-FMA-000-G xxx-xxx
base	External	48B-AMD-000-G xxx-xxx	48B-BMD-000-Gxxx-xxx	48B-EMD-000-Gxxx-xxx	48B-FMD-000-Gxxx-xxx
1/8" NPTF	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)

			Single solenoid	Double solenoid	Pressure center
					12 2 4 14 14 17 17 17 17 17 17 17 17 17 17 17 17 17
Valve less base	Internal	Supply #3 port	48B-CMB-000-Gxxx-xxx	48B-DMB-000-Gxxx-xxx	48B-HMB-000-G xxx-xxx
		Supply #5 port	48B-CMC-000-Gxxx-xxx	48B-DMC-000-Gxxx-xxx	48B-HMC-000-Gxxx-xxx
	External		48B-CMD-000-G xxx-xxx	48B-DMD-000-Gxxx-xxx	48B-HMD-000-G xxx-xxx
1/8" NPTF	Internal	Supply #3 port	48B-CMB-AAL-Gxxx-xxx	48B-DMB-AAL-Gxxx-xxx	48B-HMB-AAL-Gxxx-xxx
		Supply #5 port	48B-CMC-AAL-Gxxx-xxx	48B-DMC-AAL-Gxxx-xxx	48B-HMC-AAL-Gxxx-xxx
	External		48B-CMD-AAM-Gxxx-xxx	48B-DMD-AAM-Gxxx-xxx	48B-HMD-AAM-Gxxx-xxx

G XXX-XXX

STANDARD SOLENOID OPERATOR ➤

				$T \mid T$	
				J ५ ¯	
XX	Voltage	X	Wire length	X	Manual operator
AA	120 VAC (2.5W)	Α	18"	1	Non-locking recessed
DC	24 VDC (1.8W)	В	24"	2	Locking recessed
DD	24 VDC (2.5W)	С	36"		
DF	24 VDC (4.0W)			_	

^{*} 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.

32

33

34

36

37 38 **52**

> 67 69

44 46

42

47 **48P**

48

400

92

93

ISO 01

ISO 02

ISO 1 **ISO 2**

ISO 3

Electrical connection

MAC JAC solenoid plug-in Plug-in wire assy. Plug-in wire assy. with light Plug-in wire assy. with rectifier & light & ground

Flying leads Flying leads with light

GA







Compressed air, vacuum, inert gases Fluid: Pressure range: Internal pilot: 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External pilot: vacuum to 120 PSI Pilot pressure: 2 position : 20 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) 40 µ Filtration: Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: 1/8" side ports: (1.0 C_v) – 1/8" bottom ports: (1.1 C_v) Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize: 6 ms (with 4 W coil) 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) 1/8" EXT. — PILOT COMMON 21.5 16.7 12.0 15.3 24.9 \otimes 69.2 116.9 I APPROX. 0 \oplus 1/8" PORTS MAC 2 50.4 4 \otimes 29.0 8.0 -3/8" IN & EXH COMMONS 6.3 23.3 13.9 Ø 5.3 86.00



Function	Port size	Flow (Max)	Individual mounting	Series
5/2, 5/3	1/8"	1.1 C _V	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 $C_{\rm v}$).
- 4. Fast repeatable response times.
- 5. Maximum shifting forces in both directions.
- 6. Long life.



69

44

46

42

47 **48P**

48

400

92

93

ISO 01

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

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
		12 2 4 14 17 1 4 3 15		12 2 4 14 MMD 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 2 4 14 MMD 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Valve less	Internal	48B-AMA-000-GxxP-xxx	48B-BME-000-GxxP-xST	48B-EME-000-GxxP-xST	48B-FME-000-GxxP-xST
base	External	48B-AMD-000-GxxP-xxx	48B-BMH-000-G xx P- x ST	48B-EMH-000-GxxP-xST	48B-FMH-000-G xx P- x ST
1/8" NPTF	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-G xx P- x ST	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
		14 17D 10 10 10 10 10 10 10 10 10 10 10 10 10	14 4 2 12 17D 7 3	12 2 4 14 MD 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Valve less base	Internal Supply #3 port	48B-CMB-000-GxxP-xxx	48B-DMF-000-GxxP-xST	48B-HMF-000-GxxP-xST
	Supply #5 port	48B-CMC-000-GxxP-xxx	48B-DMG-000-GxxP-xST	48B-HMG-000-G xx P- x ST
	External	48B-CMD-000-GxxP-xxx	48B-DMH-000-GxxP-xST	48B-HMH-000-GxxP-xST
1/8" NPTF	Internal Supply #3 port	48B-CMB-AAA-GxxP-xxx	48B-DMF-AAC-GxxP-xST	48B-HMF-AAC-GxxP-xST
	Supply #5 port	48B-CMC-AAA-GxxP-xxx	48B-DMG-AAC-GxxP-xST	48B-HMG-AAC-GxxP-xST
	External	48B-CMD-AAB-GxxP-xxx	48B-DMH-AAD-GxxP-xST	48B-HMH-AAD-GxxP-xST
STANDARD SOLENC	DID OPERATOR >	G xx P-xxx*		

STANDARD SOLENOID OPERATOR >	3	XX P)-X	
•				•

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

^{*} 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.





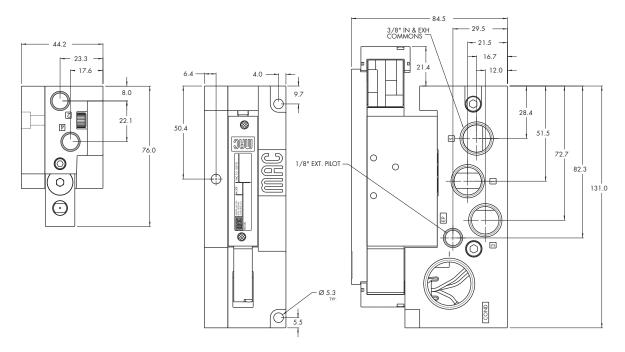


Compressed air, vacuum, inert gases Fluid: Pressure range: Internal pilot: 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External pilot: vacuum to 120 PSI Pilot pressure: 2 position : 20 to 120 PSI - 3 position : 35 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) 40 µ Filtration: Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: 1/8" side ports: (1.0 C_v) – 1/8" bottom ports: (1.1 C_v) Coil: Class A continuous duty, #22 AWG x 12 base leads Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize : 6 ms (with 4 W coil) 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



Function	Port size	Floш (Max)	Manifold mounting	Series
5/2, 5/3	1/8"	1.1 C _V	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 $C_{\rm v}$).
- 4. Fast repeatable response times.
- 5. Maximum shifting forces in both directions.
- 6. Long life.



33

34

36

32

37 38 **52**

67 69

44

46

42

47 **48P**

48

400

92

93

ISO 01

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

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
		12 2 4 14 17 3 15	12 2 4 14 17 7 7 7 3 15	12 2 4 14 MMD 1 1 1 1 3 MM 17 1 1 1 3 MM 3 1 5	12 2 4 14 DDW 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
Valve less	Internal	48B-AMA-000-G xxx-xxx	48B-BMA-000-G xxx-xxx	48B-EMA-000-G xxx-xxx	48B-FMA-000-G xxx-xxx
base	External	48B-AMD-000-G xxx-xxx	48B-BMD-000-G xxx-xxx	48B-EMD-000-G xxx-xxx	48B-FMD-000-G xxx-xxx
1/8" NPTF	Internal	48B-AMA-AJL-Gxxx-xxx	48B-BMA-AJL-Gxxx-xxx	48B-EMA-AJL-Gxxx-xxx	48B-FMA-AJL-G xxx-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
		14 4 2 12 17D 1 3 4 7 3		12 2 4 14 MDD T T T T T T T T T T T T T T T T T T
Valve less base	Internal Supply #3 port	48B-CMB-000-Gxxx-xxx	48B-DMB-000-Gxxx-xxx	48B-HMB-000-G xxx-xxx
	Supply #5 port	48B-CMC-000-Gxxx-xxx	48B-DMC-000-G xxx-xxx	48B-HMC-000-G xxx-xxx
	External	48B-CMD-000-Gxxx-xxx	48B-DMD-000-G xxx-xxx	48B-HMD-000-G xxx-xxx
1/8" NPTF	Internal Supply #3 port	48B-CMB-AJL-Gxxx-xxx	48B-DMB-AJL-Gxxx-xxx	48B-HMB-AJL-Gxxx-xxx
	Supply #5 port	48B-CMC-AJL-Gxxx-xxx	48B-DMC-AJL-Gxxx-xxx	48B-HMC-AJL-Gxxx-xxx
	External	48B-CMD-AJM-Gxxx-xxx	48B-DMD-AJM-Gxxx-xxx	48B-HMD-AJM-Gxxx-xxx

CTYVIDYDD	CUIENIUID	OPERATOR ➤
SIAINDAKD	OUT FINE HIT	



				 ⊤ +	$\overline{}$			
					1			
XX	Voltage	X	Wire length	1	K	Manual operator	XX	Electrical connection
AA	120 VAC (2.5W)	Α	18"		1	Non-locking recessed	BA	Flying leads
DC	24 VDC (1.8W)	В	24"		2	Locking recessed	BT	Flying leads with light
DD	24 VDC (2.5W)	С	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
* Other o	options available, see page 311.							rectifier & light & ground

^{*} Other options available, see page 311.
Latching solencid 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.



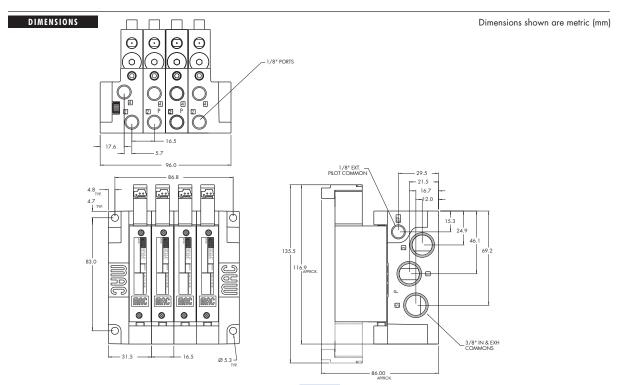




Fluid: Compressed air, vacuum, inert gases Pressure range: Internal pilot: 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External pilot: vacuum to 120 PSI Pilot pressure: 2 position : 20 to 120 PSI - 3 position : 35 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) 40 µ Filtration: Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: 1/8" side ports: (1.0 C_v) – 1/8" bottom ports: (1.1 C_v) Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize : 6 ms (with 4 W coil) 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





unction		Port size	Floш (Max)	Manifold mounting		Series
/2, 5/3		1/8"	1.1 C _v	Manifold base "plug-in"		
PERATIONAL BEN	EFITS					33
4-way valve wit						34
 16 mm valve (st High flow (up to Fast repeatable Maximum shiftir 	1.1 C _v). response time	es.				36
. Long life.				Č Š		32
					0.00	37
				4000	1000	38
					B.	52
HOW TO ORD	ER					67
		S (IED STANDARD EYCE	PT FOR SINGLE SOLENOIDS	SI		69
Port size	Pilot gir	5/2	5/2	5/ 3	5/3	44
. 0.1 3120	11101 411	Single solenoid	Double solenoid	Closed center	Open center	-9-10
		12 2 4 14 17 7 7 3 15	12 2 4 14 14 17 3 15 15 15 15 15 15 15 15 15 15 15 15 15	12 2 4 14 MDD 1 1 1 3 MM 17D 1 1 1 3 MM 3 1 5	12 2 4 14 MDD 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	46
Valve less	Internal	48B-AMA-000-GxxP-xxx	48B-BME-000-G xx P- x ST	48B-EME-000-GxxP-xST	48B-FME-000-G <i>xx</i> P- <i>x</i> ST	42
base	External	48B-AMD-000-GxxP-xxx	48B-BMH-000-GxxP-xST	48B-EMH-000-GxxP-xST	48B-FMH-000-GxxP-xST	7.2
1/8" NPTF	Internal External	48B-AMA-AJA-GxxP-xxx 48B-AMD-AJB-GxxP-xxx	48B-BME-AJC-GxxP-xST 48B-BMH-AJD-GxxP-xST	48B-EME-AJC-GxxP-xST 48B-EMH-AJD-GxxP-xST	48B-FME-AJC-GxxP-xST 48B-FMH-AJD-GxxP-xST	47
IIAI DDECCIID			FOR SINGLE SOLENOIDS)			48P
Port size		Pilot air	5/2	5/2	5/3	
1 011 0120			Single solenoid	Double solenoid	Pressure center	48
					12 2 4 14 14 17 17 17 17 17 17 17 17 17 17 17 17 17	400
Valve less b	ase In	ternal Supply #3 port	48B-CMB-000-GxxP-xxx	48B-DMF-000-GxxP-xST	48B-HMF-000-G xx P- x ST	400
		Supply #5 port	48B-CMC-000-GxxP-xxx	48B-DMG-000-GxxP-xST	48B-HMG-000-GxxP-xST	92
1/8" NPT		ternal	48B-CMD-000-GxxP-xxx	48B-DMH-000-GXXP-XST	48B-HMH-000-GxxP-xST	
I/8" NPT	r Ini	Supply #3 port Supply #5 port	48B-CMB-AJA-GxxP-xxx 48B-CMC-AJA-GxxP-xxx	48B-DMF-AJC-GxxP-xST 48B-DMG-AJC-GxxP-xST	48B-HMF-AJC-GxxP-xST 48B-HMG-AJC-GxxP-xST	02
		tternal	48B-CMD-AJB-GxxP-xxx	48B-DMH-AJD-GXXP-XST	48B-HMH-AJD-GxxP-xST	93
					ation manifolds with side ports	ISO 01
tandard sc	DLENOID O	PERATOR ➤	G <u>xx</u> P- <u>xxx</u> *			ISO 02
						ISO 1
VV Value	ıge	X	Manual operator	XX Electric	al connection	ISO 1
XX Volte	_	1	Non-locking recessed		& 3 position models	ISO 2
AA 120 VA				ST Base plug	in	1000
AA 120 VA	C (1.8W)		Locking recessed			ISO 3
AA 120 VA DC 24 VD0 DD 24 VD0			Locking recessed	Single solenoid in SA Base plug	nodels	150 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.





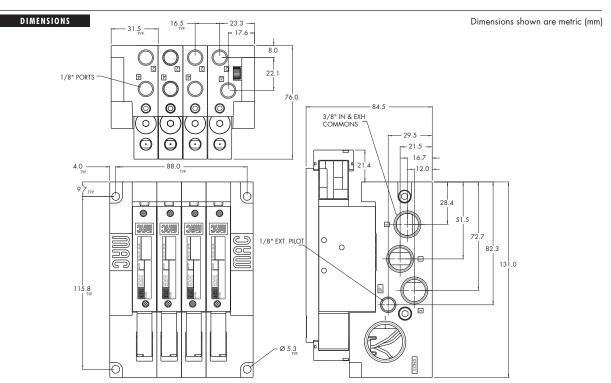


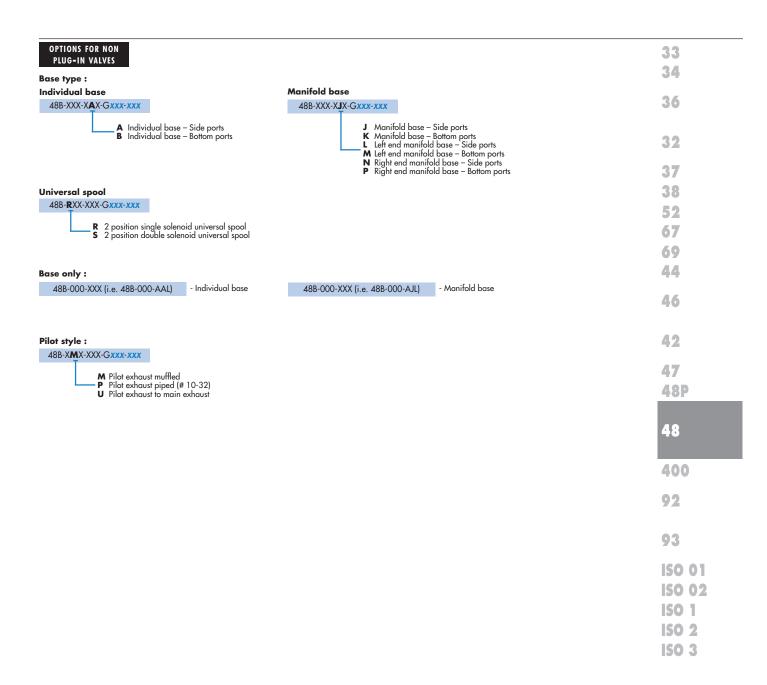
Fluid: Compressed air, vacuum, inert gases Pressure range: Internal pilot: 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External pilot: vacuum to 120 PSI Pilot pressure: 2 position : 20 to 120 PSI - 3 position : 35 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: 40 μ Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: 1/8" side ports: (1.0 C_v) – 1/8" bottom ports: (1.1 C_v) Coil: Class A wire (#22 AWG x 18), continuous duty Voltage range: -15% to +10% of nominal voltage 1.0 to 4.0 W Power: Response times: Energize: 6 ms (with 4 W coil)

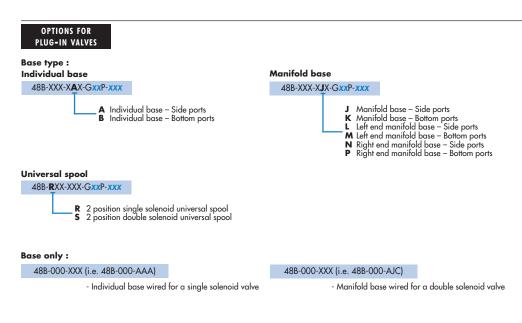
Options :

- 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

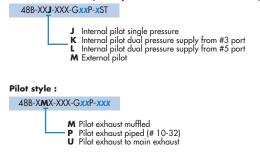
De-energize : 6 ms



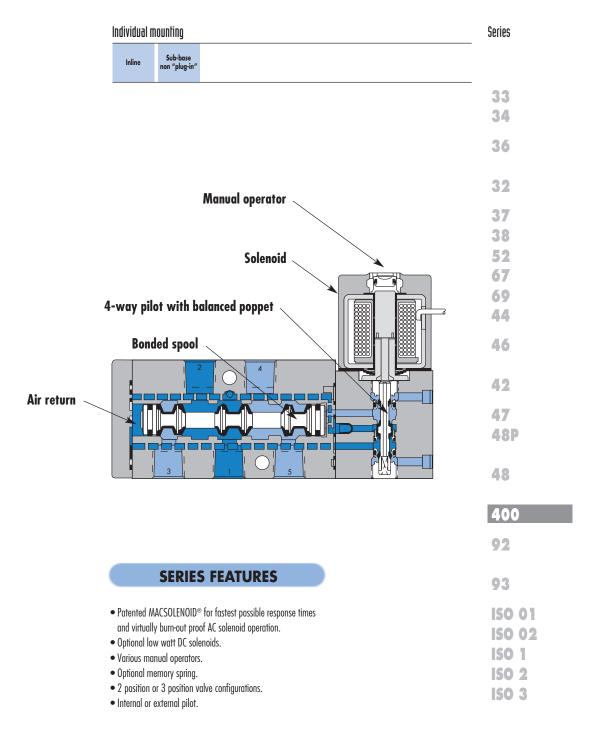




For LED with diode (2 & 3 position double solenoid valves)





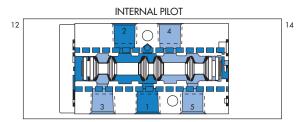




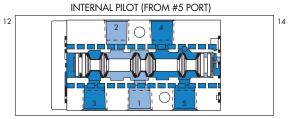




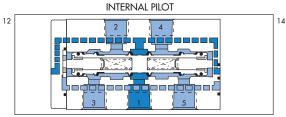
SPOOL CONFIGURATIONS



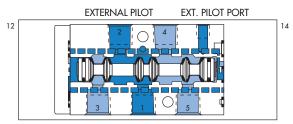
SINGLE OPERATOR - SINGLE INLET SHOWN WITH 12 OPERATOR ENERGIZED



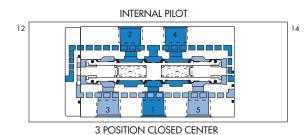
SINGLE OPERATOR - DUAL INLET SHOWN WITH 12 OPERATOR ENERGIZED



3 POSITION OPEN CENTER



SINGLE OPERATOR - SINGLE INLET SHOWN WITH 12 OPERATOR ENERGIZED



INTERNAL PILOT

12

14

15



unction		Port size	Flow (Max)		Individual mounting	Seri	es
5/2, 5/3		1/8" - 1/4"	1.0 C _v		Inline		
PERATIONAL BEN	NEFITS					3	3
The 4-way pilo		ximum shifting				3	
forces both wa							_
 Memory spring Balanced spoo 		variations of				3	6
pressure, also	provides high						
 Short stroke wi Bonded spool 		friction chifting				and	
in a glass-like f					0	3.	2
. Wiping effect		king.			1000	3	7
. Long service lif	te.				Times a		
					100	3	
						5	2
HOW TO ORD	ER					6	7
INGLE PRESSI	URE MODE	LS				6	0
Port size	Pilot air	5/2	5/2	5/3	5/3	5/3	
		Single operator	Double operator	Closed center	Open center	Pressure center	
		12 2 4 14	12 2 4 14			12 2 4 14	6
		315	315	315	3 1 5	3 1 5	
1/8" NPTF	Internal	411A-A0A-XX-X xxx - xxx	421A-A0A-XX-X XXX	451A-A0A-XX-X XXX	461A-A0A-XX-X XXX - XXX	471A-A0A-XX-XXXX-XXX 471A-B0A-XX-XXXX-XXX	2
	-						
1/4" NPTF	- 	411A-BOA-XX-XXXX-XXX	421A-B0A-XX-XXXX	451A-B0A-XX-XXXX-XXX	461A-B0A-XX-XXXX-XXX		
1/8" NPTF	External	411A-A0B-XX-X xxx - xxx	421A-A0B-XX-X xxx-xxx	451A-A0B-XX-X xxx - xxx	461A-A0B-XX-X <i>xxx-xxx</i>	471A-A0B-XX-X xxx-xxx	
	- 					471A-A0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx	7
1/8" NPTF 1/4" NPTF	External	411A-A0B-XX-X xxx - xxx	421A-AOB-XX-X <i>xxx-xxx</i> 421A-BOB-XX-X <i>xxx-xxx</i>	451A-AOB-XX-Xxxx-xxx 451A-BOB-XX-Xxxx-xxx	461A-A0B-XX-X <i>xxx-xxx</i>	471A-A0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx	
1/8" NPTF 1/4" NPTF	External RE MODELS	411A-A0B-XX-Xxxx-xxx 411A-B0B-XX-Xxxx-xxx	421A-A0B-XX-XXXX-XXXX 421A-B0B-XX-XXXXX-XXXX LOT PRESSURE SUPPL	451A-A0B-XX-XXXX-XXX 451A-B0B-XX-XXXX-XXX LY FROM #5 PORT) 5/2	461A-A0B-XX-Xxxx-xxx 461A-B0B-XX-Xxxx-xxx	471A-A0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 4	7 8P
1/8" NPTF 1/4" NPTF DUAL PRESSUR	External RE MODELS	411A-AOB-XX-XXXX-XXX 411A-BOB-XX-XXXX-XXX (INTERNAL PILOT — PI	421A-AOB-XX-XXXX-XXX 421A-BOB-XX-XXXX-XXX LOT PRESSURE SUPPL	451A-A0B-XX-XXXX-XXX 451A-B0B-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator	461A-A0B-XX-Xxxx-xxx 461A-B0B-XX-Xxxx-xxx	471A-A0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 4	7 8P
1/8" NPTF 1/4" NPTF DUAL PRESSUR	External RE MODELS	411A-AOB-XX-XXXX-XXX 411A-BOB-XX-XXXX-XXX (INTERNAL PILOT — PI	421A-A0B-XX-XXXX-XXXX 421A-B0B-XX-XXXXX-XXXX LOT PRESSURE SUPPL	451A-A0B-XX-XXXX-XXX 451A-B0B-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator	461A-A0B-XX-Xxxx-xxx 461A-B0B-XX-Xxxx-xxx	471A-A0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 4	7 8P
1/8" NPTF 1/4" NPTF UAL PRESSUR Port size	External RE MODELS	411A-AOB-XX-XXXX-XXX 411A-BOB-XX-XXXXX-XXX (INTERNAL PILOT – PI Pilot air	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX Y FROM #5 PORT) 5/2 3le operator 2 4 14 37 115	461A-A0B-XX-Xxxx-xxx 461A-B0B-XX-Xxxx-xxx Double	471A-A0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx	7 8P 8
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size	External RE MODELS	411A-AOB-XX-XXXX-XXX 411A-BOB-XX-XXXX-XXX (INTERNAL PILOT — PI	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 12 431A-A	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX Y FROM #5 PORT) 5/2 gle operator 2 4 14 37 14 37 15 15 15 15 15 15 15 15 15 15 15 15 15	461A-A0B-XX-Xxxx-xxx 461A-B0B-XX-Xxxx-xxx Double 12 2 17 17 17 17 17 17 17 17 17 17 17 17 17	471A-A0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx	7 8P 8
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT	External RE MODELS	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPL Sing 12 431A-A 431A-A	451A-A0B-XX-XXXX-XXX 451A-B0B-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 14 17 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	461A-A0B-XX-Xxxx-xxx 461A-B0B-XX-Xxxx-xxx Double 12 2 1775 31 441A-A0A 441A-B0A	471A-A0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4	7 8P 8
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size	External RE MODELS IF	411A-AOB-XX-XXXX-XXX 411A-BOB-XX-XXXXX-XXX (INTERNAL PILOT – PI Pilot air	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPL Sing 12 431A-A 431A-A 431A-A	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX Y FROM #5 PORT) 5/2 gle operator 2 4 14 37 14 37 15 15 15 15 15 15 15 15 15 15 15 15 15	### ##################################	471A-A0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx	7 8P 8
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT	External RE MODELS FIF	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A-B 431A-B	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 11 12 11 15 10A-XX-XXXX-XXX 10B-XX-XXXX-XXX 10B-XX-XXXX-XXX 10B-XX-XXXX-XXX	### ##################################	471A-A0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 4	7 8P 8
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT	External RE MODELS FIF	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPL Sing 12 431A-A 431A-A 431A-A	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 11 12 11 15 10A-XX-XXXX-XXX 10B-XX-XXXX-XXX 10B-XX-XXXX-XXX 10B-XX-XXXX-XXX	### ##################################	471A-A0B-XX-Xxxx-xxx 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 471A-B0B-XX-Xxxx-xxx 4 4	7 8P 8
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT	External RE MODELS FIF	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A-B 431A-B	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 11 12 11 15 10A-XX-XXXX-XXX 10B-XX-XXXX-XXX 10B-XX-XXXX-XXX 10B-XX-XXXX-XXX	### ##################################	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXXX-XXXX 471A-B0B-XX-XX	7 8P 8
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT	External RE MODELS FIF FIF FIF FIF FIF FIF FIF F	411A-AOB-XX-XXXX-XXX 411A-BOB-XX-XXXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A-B 431A-B	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 11 12 11 15 10A-XX-XXXX-XXX 10B-XX-XXXX-XXX 10B-XX-XXXX-XXX 10B-XX-XXXX-XXX	### ##################################	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A-B0B-XX-XXXX-XXXX 471A	7 8P 8 00 2 3
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT 1/4" NPT SOLENOID OF	External RE MODELS FIF FF FF FF FF FF FF FF FF	411A-AOB-XX-XXXX-XXX 411A-BOB-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External X Wire 9W) A 18" (F	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI 431A-A 431A-B 431A-B DM-D XXX Length Plying leads)	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 14 327 315 30A-XX-XXXX-XXX 30B-XX-XXXX-XXX 30B-XX-XXXX-XXX XXX XXX XXX XXX XXX XXX XX	461A-AOB-XX-XXXX-XXX 461A-BOB-XX-XXXX-XXX Double 12 2 441A-AOB 441A-BOB 441A-BOB 441A-BOB 441A-BOB	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-X	7 8P 8 00 2 3
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/8" NPT 1/4" NPT 5OLENOID OF XX Voit JA 110/5 JB 220/5	External RE MODELS FIF FIF PERATOR > age 50, 120/60 (2.9 50, 240/60 (2.9	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External X Wire 9W) A 18" (F 9W) B 24" (F	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A-B DM-D XXX Plength Tying leads) Tying leads)	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX Y FROM #5 PORT) 5/2 gle operator 2 4 14 37 115 10A-XX-XXXX-XXX 10A-XX-XXXX-XXX 10B-XX-XXXX-XXX 10B-XX-XXXX-XXX 10B-XX-XXXX-XXX 10B-XX-XXXX-XXX	### ##################################	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-X	7 8P 8 00 2 3 60 01 60 02
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT 1/4" NPT 5OLENOID OP XX Voit/5 JB 220/5 JC 24/60 FB 24 VD	External RE MODELS RE MODELS REFERENCE	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External X Wire 9W) A 18" (F 9W) B 24" (F	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A-B DM-D XXX Plength Tying leads) Tying leads)	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 14 327 315 30A-XX-XXXX-XXX 30B-XX-XXXX-XXX 30B-XX-XXXX-XXX XXX XXX XXX XXX XXX XXX XX	### ##################################	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 471A-	7 8P 8 00 2 3 0 01 0 02 0 1
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT 1/4" NPT 1/4" NPT 5OLENOID OF XX Volt. JA 110/5 JB 220/5 JC 24/60 DA 24 VD	External External RE MODELS FIF FIF PERATOR > GGE GGO GGO GGO GGO GGO GGO GG	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External X Wire 9W) A 18" (F 9W) B 24" (F	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A-B DM-D XXX Plength Tying leads) Tying leads)	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 14 327 315 30A-XX-XXXX-XXX 30B-XX-XXXX-XXX 30B-XX-XXXX-XXX XXX XXX XXX XXX XXX XXX XX	### ##################################	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 471A-	7 8P 8 00 2 3 60 01 60 02
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT 1/4" NPT 1/4" NPT 5OLENOID OF XX Voit JA 110/5 JB 220/5 JC 24/60 FB 24 VD DA 24 VD DF 24 VD	External RE MODELS RE MODELS REFERENCE	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External X Wire 9W) A 18" (F 9W) B 24" (F J Conne	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A-B DM-D XXX- Plength Hying leads) Hying leads Hying leads	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 14 371 371 371 371 371 371 371 371 371 371	### ##################################	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 4 4 4 4 4 4 4 4 4 4 4	7 8P 8 00 2 3 0 01 0 02 0 1
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT 1/4" NPT 5OLENOID OF XX Volt. JA 110/5 JB 220/5 JC 24/60 DA 24 VD	External RE MODELS RE MODELS REFERENCE	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External X Wire 9W) A 18" (F 9W) B 24" (F J Conne	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A-B DM-D XXX Plength Tying leads) Tying leads)	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 14 371 371 371 371 371 371 371 371 371 371	### ##################################	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 4 4 4 4 4 4 4 4 4 4 4	7 8P 8 00 2 3 0 01 0 02 0 1
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT 1/4" NPT 1/4" NPT 5OLENOID OF XX Voit JA 110/5 JB 220/5 JC 24/60 FB 24 VD DA 24 VD DF 24 VD	External RE MODELS RE MODELS REFERENCE	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External X Wire 9W) A 18" (F 9W) B 24" (F J Conne	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A-B DM-D XXX- Plength Hying leads) Hying leads Hying leads	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 14 371 371 371 371 371 371 371 371 371 371	### ##################################	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 4 4 4 4 4 4 4 4 4 4 4	7 8P 8 00 2 3 0 01 0 02 0 1
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT 1/4" NPT 1/4" NPT 5OLENOID OF XX Voit JA 110/5 JB 220/5 JC 24/60 FB 24 VD DA 24 VD DF 24 VD	External RE MODELS RE MODELS REFERENCE R	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External X Wire 9W) A 18" (F 9W) B 24" (F J Conne	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A-B DM-D XXX- Plength Hying leads) Hying leads Hying leads	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 14 371 371 371 371 371 371 371 371 371 371	461A-A0B-XX-XXXX-XXX 461A-B0B-XX-XXXX-XXX Double 12 2 31 441A-A0A 441A-B0B 441A-B0B XX E XX E XB S JB R JD R II BA F	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 4 4 4 4 4 4 4 4 4 4 4	7 8P 8 00 2 3 0 01 0 02 0 1
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT 1/4" NPT 1/4" NPT 5OLENOID OP XX Volt/5 JB 220/5 JC 24/50 PF 24 VD DA 24 VD DF 24 VD SOLENOID OP XX Volt/5 COLENOID OP	External RE MODELS RE MODELS REFERENCE R	Alla-AOB-XX-XXXX-XXX Alla-BOB-XX-XXXX-XXX Alla-BOB-XX-XXXX-XX Alla-BOB-XX-XXXX Alla-BO	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX LY FROM #5 PORT) 5/2 gle operator 2 4 14 371 300-XX-XXXX-XXX 300-XX-XXXX-XXX 300-XX-XXXX-XX	### ### ### ### ### ### ### ### ### ##	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 4 471A-B0B-XX-XXXX-XXX 4 4 4 4 4 4 4 4 4 4 4 4	7 8P 8 00 2 3 0 01 0 02 0 1
1/8" NPTF 1/4" NPTF DUAL PRESSUR Port size 1/8" NPT 1/4" NPT 1/4" NPT 1/4" NPT 1/4" NPT 5OLENOID OP XX Volte JA 110/5 JC 24/00 DF 24 VD DF 24 VD SOLENOID OP XX Volte DC 24/DC DD 24/DC DD 24/DC	External RE MODELS RE MODELS REF REF REF REF REF REF REF RE	411A-A0B-XX-XXXX-XXX 411A-B0B-XX-XXXX-XXX (INTERNAL PILOT – PI Pilot air Internal External X Wire 9W) A 18" (F 9W) B 24" (F J Conne	421A-A0B-XX-XXXX-XXX 421A-B0B-XX-XXXX-XXX LOT PRESSURE SUPPI Sing 431A-A 431A-B 431A	451A-AOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX 451A-BOB-XX-XXXX-XXX Y FROM #5 PORT) 5/2 gle operator 2 4 14 371 300-XX-XXXX-XXX 300-XX-XXXX-XXX 300-XX-XXXX-XX	A61A-A0B-XX-XXXX-XXX	471A-A0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 471A-B0B-XX-XXXX-XXX 4	7 8P 8 00 2 3 0 01 0 02 0 1







Fluid: Compressed air, vacuum, inert gases Pressure range: 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 Pilot pressure: 2 position: 20 to 120 PSI (with memory spring: 30 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: 1.0 C_v Coil: Class A continuous duty, #22 AWG x 12 leads wires Voltage range: -15% to +10% of nominal voltage Protection: Consult factory Power: ~Inrush : 10.9 VA Holding: 7.7 VA = 1.8 to 12.7 W24 V=/5.4W Response times: Energize: 7.3 ms De-energize: 5.3 ms

De-energize: 7-11 ms

Options :

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

Energize: 8-12 ms

411A-A0A-XX-XXXX-XXX

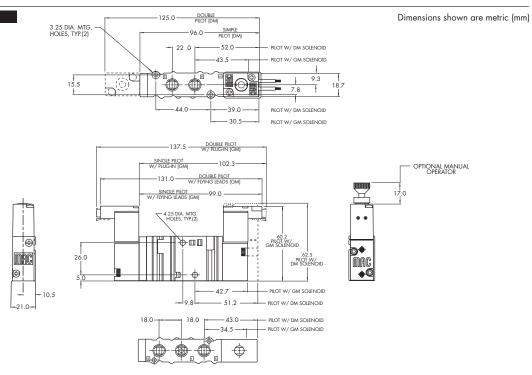
120/60

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





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

Direct solenoid and solenoid pilot operated valves

Function		Port size	Flow (Max)		Individual mounting	Serie:	ì
5/2, 5/3		1/8" - 1/4"	1.0 C _v		Sub-base non "plug-in"		
PERATIONAL BEI	NEFITS					33	}
The 4-way pilo		aximum shifting				34	
forces both wo Memory spring						1000	
Balanced spoo	ol, immune to					36)
pressure, also Short stroke w		flow.					
. Bonded spool	with minimum	friction, shifting				32)
in a glass-like Wiping effect		king.					
. Long service li		·				37	
					The state of	38	,
						52)
HOW TO ORD	ER					67	ŗ
INGLE PRESS	URE MODE	LS				69)
Port size	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center	
		12 2 4 14 D	12 2 4 14	12 2 4 14 	12 2 4 14	12 2 4 14 T T T T T T T T T T T T T T T T T T T	,
Value enla		315	315	3 1 5	315	315)
Valve only	Internal External	413A-00A-XX-XXXX-XXX 413A-00D-XX-XXXX-XXX	423A-00A-XX-XXXX-XXX 423A-00D-XX-XXXXX-XXX	453A-00A-XX-XXXX-XXX 453A-00D-XX-XXXX-XXX	463A-00A-XX-X xxx-xxx 463A-00D-XX-X xxx-xxx	473A-00A-XX-XXXX-XXX 473A-00D-XX-XXXX-XXX	
1/8" NPTF	Internal	413A-AAA-XX-X xxx-xxx	423A-AAA-XX-X xxx-xxx	453A-AAA-XX-X xxx-xxx	463A-AAA-XX-X xxx-xxx	473A-AAA-XX-X xxx-xxx 42	1
1/4" NPTF 1/8" NPTF	External	413A-BAA-XX-XXXX-XXX 413A-AAD-XX-XXXXXXXXXXXX	423A-BAA-XX-XXXX-XXX 423A-AAD-XX-XXXXX-XXX	453A-BAA-XX-X XXX-XXX 453A-AAD-XX-X XXXX-XXX	463A-BAA-XX-X XXX - XXX 463A-AAD-XX-X XXX - XXX	473A-BAA-XX-XXXX-XXX 473A-AAD-XX-XXXX-XXX	,
1/4" NPTF	- Exicition	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	
UAL PRESSUR	RE MODELS	(INTERNAL PILOT – PI	LOT PRESSURE SUPPI	LY FROM #5 PORT)		48	P
Port size		Pilot air		ingle operator	5/2 Dou	ble operator	
			12 2	14 14 14 14	12 2	48)
				15			
Valve onl		Internal External		00A-XX-X xxx - xxx 00D-XX-X xxx - xxx		A-XX-Xxxx-xxx D-XX-Xxxx-xxx	0
1/8" NP1	rF	Internal		AA-XX-XXXX		Δ-XX-X xxx-xxx	
1/4" NP1		F. 1		AA-XX-XXXX		A-XX-Xxxx-xxx	1
1/8" NP1 1/4" NP1		External		AD-XX-XXXX-XXX AD-XX-XXXXX-XXX		D-XX-Xxxx-xxx D-XX-Xxxx-xxx	
OLENOID OF	DED ATOD >		DM-D XXX-	VVV*		93	,
OLLINOID OI	LKATOK			<u> </u>		ISC) (
				ነ		164	
XX Volt			length	X Manual ope		lectrical connection	
JB 220/5	50, 120/60 (2.9 50, 240/60 (2.9		lying leads) lying leads)	Non-locking recesLocking recessed		quare connector grant light	
) (2.9W))C (1.8W)	J Conne	ector			Rectangular connector Rectangular connector with) 1
DA 24 VD	C (5.4W)				li	ght SC) (
	OC (12.7W)			**	BA	lying leads	
SOLENOID OF	'ERATOR ➤		GM-G <u>xxx</u> -	XXX			
VV W		w yest	Louish	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		destricul company	
DC 24VD0	age C (1.8W)	X Wire A 18"	elength	X Manual ope 1 Non-locking reces		lectrical connection lying leads	
DD 24VD0	C (2.5W) C (4.0W)	B 24"		2 Locking recessed	BT F	lying leads with light	
		c 36"			KA P	lug-in wire assy.	

143

Consult "Precautions" page 327 before use, installation or service of MAC Valves..







Fluid: Compressed air, vacuum, inert gases

Pressure range: 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

Pilot pressure: 2 position: 20 to 120 PSI (with memory spring: 30 to 120 PSI) 3 position: 35 to 120 PSI

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: 1.0 C_v

Class A continuous duty, #22 AWG x 12 leads wires

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

Protection: Consult factory

Power: ~Inrush: 10.9 VA Holding: 7.7 VA

= 1.8 to 12.7 W

Response times: 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-XXXX

Dual pressure models, replace by **C** for pilot supply from #3 port

For flow control, replace by **B**

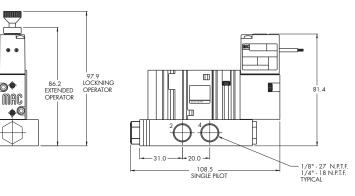
For memory spring, replace by **6**

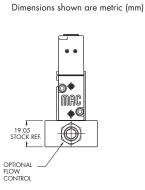
400A-XXX (i.e. 400A-AAA)

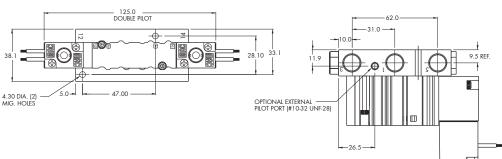
Base only :

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

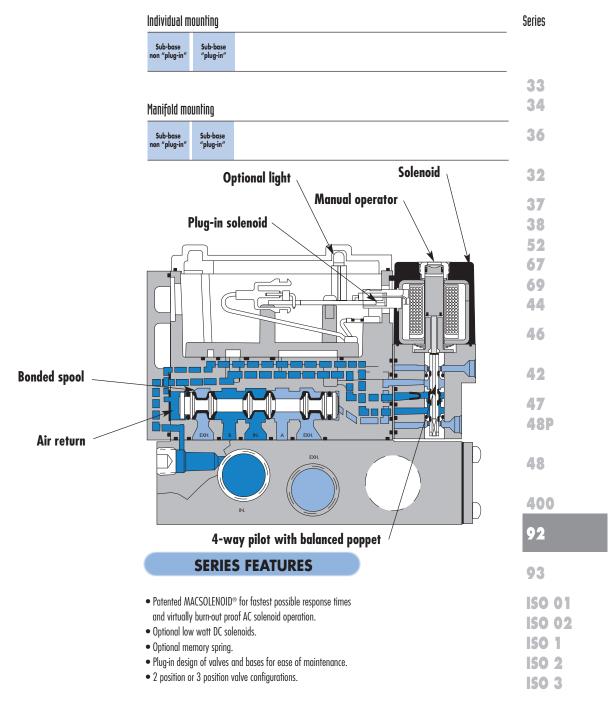
DIMENSIONS









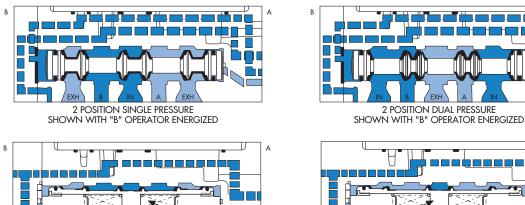


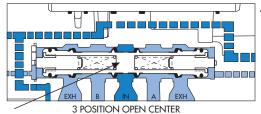


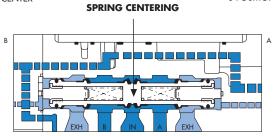




SPOOL CONFIGURATIONS







3 POSITION SINGLE PRESSURE, PRESSURE CENTER

REGULATOR CONFIGURATIONS

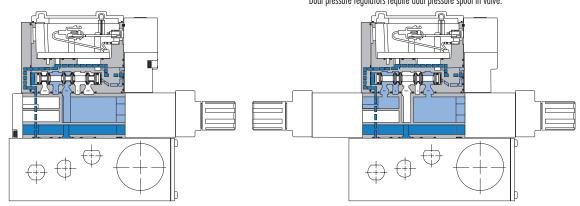
SINGLE REGULATOR - SINGLE PRESSURE

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

3 POSITION CLOSED CENTER

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



DF 24 VDC (12.7W)

* Other options available, see page 309.

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

Direct solenoid and solenoid pilot operated valves

Function		Port size	Flow (Max)		Individual mounting		Series
5/2, 5/3		1/8" - 1/4" -	3/8" 1.2 C _v		Sub-base non "plug-in"		
OPERATIONAL BEN	EFITS					_	33
1. The 4-way pilo		aximum shifting				and the second	34
forces both wa 2. Memory spring 3. Balanced spoo pressure, also	, available. , immune to provides high					TI	36
 Short stroke with Bonded seal spanishifting in a global 	oool with mini ass-like finishe	ed bore.				1	32
 Pilot with balar and consistent 					100		37
						0.0	38
					6	/	52
HOW TO ORD	ER						67
SINGLE PRESSU							69
Port size	Pilot air	5/ 2	5/2	5/3	5/3	5/3	
PORT SIZE	Pilot air	Single operator	Double operator	Closed center	Open center	Pressure center	44
		B B A A A A A A B B IN EA	B B A A A A A A A A A A A A A A A A A A	B A A A A A A A A A A A A A A A A A A A	B B A GMM TD	B A A B MM A B M M B M B M M B M M B M M B M M B M M B M M B M M B M M B M B M M B	46
Valve less base		92B-ABA-000-DM-Dxxx-xxx	92B-BBA-000-DM-Dxxx-xxx	92B-EBA-000-DM-Dxxx-xxx	92B-FBA-000-DM-D xxx-xxx	92B-GBA-000-DM-Dxxx-xxx	42
1/8" NPTF	Internal	92B-ABA-AAG-DM-Dxxx-xxx	92B-BBA-AAG-DM-Dxxx-xxx 92B-BBA-BAG-DM-Dxxx-xxx	92B-EBA-AAG-DM-DXXX-XXX	92B-FBA-AAG-DM-Dxxx-xxx 92B-FBA-BAG-DM-Dxxx-xxx	92B-GBA-AAG-DM-DXXX-XXX	74
1/4" NPTF 3/8" NPTF	Internal	92B-ABA-BAG-DM-Dxxx-xxx 92B-ABA-CAG-DM-Dxxx-xxx	92B-BBA-CAG-DM-DXXX-XXX	92B-EBA-BAG-DM-Dxxx-xxx 92B-EBA-CAG-DM-Dxxx-xxx	92B-FBA-CAG-DM-DXXX-XXX	92B-GBA-BAG-DM-Dxxx-xxx 92B-GBA-CAG-DM-Dxxx-xxx	47
1/8" NPTF		928-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	48P
1/4" NPTF	External	92B-ABA-BAH-DM-Dxxx-xxx	92B-BBA-BAH-DM-D xxx-xxx	92B-EBA-BAH-DM-Dxxx-xxx	92B-FBA-BAH-DM-Dxxx-xxx	92B-GBA-BAH-DM-Dxxx-xxx	401
3/8" NPTF		92B-ABA-CAH-DM-D xxx-xxx	92B-BBA-CAH-DM-D xxx-xxx	92B-EBA-CAH-DM-D xxx-xxx	92B-FBA-CAH-DM-Dxxx-xxx	92B-GBA-CAH-DM-D <i>xxx-xxx</i>	48
OUAL PRESSUR	E MODELS	(REQUIRE SANDWIC	h regulator – See	"REGULATORS" SEC	TION)		40
Port size		Pilot air	Sing	5/2 gle operator		5/2 e operator	400
			B D	B A A A A A A A A A A A A A A A A A A A	B B B INB E	THE	92
Valve less be				A-000-DM-Dxxx-xxx	<u> </u>	0-DM-Dxxx-xxx	
1/8" NPT 1/4" NPT		Internal		-AAG-DM-Dxxx-xxx -BAG-DM-Dxxx-xxx		G-DM-Dxxx-xxx G-DM-Dxxx-xxx	93
3/8" NPT		memai		-CAG-DM-Dxxx-xxx		G-DM-DXXX-XXX	ISO 01
1/8" NPT				-AAH-DM-Dxxx-xxx		AH-DM-Dxxx-xxx	
1/4" NPT			92B-DBA-BA	.H-DM-Dxxx-xxx	ISO 02		
3/8" NPT	F	92B-CBA-CAH-DM-Dxxx-xxx 92B-DBA-CAH-DM-Dxxx-xxx		.H-DM-D xxx-xxx	ISO 1		
SOLENOID OP	FRATOR 🕿		DM-D xxx-	YYY'	Above models are	shown with side ports.	ISO 2
JOLLI NOID OI	LIVATOR		7 AVY	^^			ISO 3
				ጎ			
XX Volto	~		length	X Manual oper		lectrical connection	
	50, 120/60 (2. 0, 240/60 (2.9		lying leads) lying leads)	 Non-locking reces Locking recessed 		ying leads ying leads with diode	
JC 24/60	(2.9W) C (1.8W)	J Conne			BP F	ying leads with M.O.V.	
	1 1 × \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					ying leads with ground	

147

Rectangular connector with light Square connector

Consult "Precautions" page 327 before use, installation or service of MAC Valves..





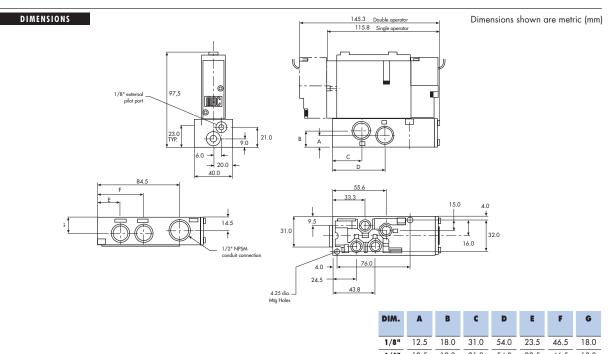


Compressed air, vacuum, inert gases Fluid: Pressure range: Internal pilot: 20 to 120 PSI 3 position: 35 to 120 PSI External pilot : vacuum to 120 PSI 3 position: 35 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: Temperature range : 0° F to 120° F (- 18° C to + 50° C) Flow: 1/8": $(1.0 C_v) - 1/4$ ": $(1.1 C_v) - 3/8$ ": $(1.2 C_v)$ Coil: Class A continuous duty, #22 AWG x 18 lead wire Voltage range: -15% to +10% of nominal voltage Protection: Consult factory ~Inrush 7.6 VA Power: Holding: 4.8 VA = 1.8 to 12.7 W24V=/5.4W Response times: 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.





Function		Port size	Flow (Max)		Individual r	nounting	Series
5/2, 5/3		1/8" - 1/4" -	3/8" 1.2 C _v		Sub-base "plug-in"		
PERATIONAL BE	ENEFITS						33
. The 4-way pil		aximum shifting				-	34
forces both w 2. Memory sprin 3. Balanced spo pressure, also 4. Short stroke w	ng available. ool, immune to o provides high					10	36
5. Bonded seal s							32
o. Pilot with balo		high flow; short					37
							38
						23	52
HOW TO ORI	DER						67
SINGIF PRESS	SLIRE MODE	IS					69
Port size	Pilot air	5/2	5/2	5/3		5/3	5/3 44
1 011 3120	i noi un	Single operator	Double operator	Closed center			re center
		B B A A A A A B B IN EA	B B A A A A A A A A A A A A A A A A A A	B B A A A A A A A A A A A A A A A A A A		B A A A A A A A A A A A A A A A A A A A	B A BOWN TO THE RENE BE RENE BE A BOWN TO THE BOWN TO THE BE A BOWN TO THE BOWN TO THE BE A BOWN TO THE BOWN TO T
/alve less base	e	92B-AAA-000-DM-D <i>xx</i> P- <i>xxx</i>	92B-BAA-000-DM-D xx P- xxx	92B-EAA-000-DM-DxxP-xxx	92B-FAA-0		00-DM-DxxP-xxx
1/8"	_	92B-AAA-AAA-DM-D xx P- xxx	92B-BAA-AAA-DM-DxxP-xxx	92B-EAA-AAA-DM-D xx P- xxx			AA-DM-DxxP-xxx 42
1/4"	Internal	92B-AAA-BAA-DM-DxxP-xxx	92B-BAA-BAA-DM-DxxP-xxx	92B-EAA-BAA-DM-DxxP-xxx			ΔA-DM-DxxP-xxx ΔΔ-DM-DxxP-xxx
3/8"		92B-AAA-CAA-DM-DxxP-xxx	92B-BAA-CAA-DM-DxxP-xxx	92B-EAA-CAA-DM-DxxP-xxx			TOTAL DIGITAL
1/8"		92B-AAA-AAD-DM-DxxP-xxx	92B-BAA-AAD-DM-DxxP-xxx	92B-EAA-AAD-DM-DxxP-xxx			AD-DM-DxxP-xxx 48P
1/4"	External	92B-AAA-BAD-DM-DxxP-xxx	92B-BAA-BAD-DM-DxxP-xxx	92B-EAA-BAD-DM-DxxP-xxx			AD-DM-DxxP-xxx
3/8"		92B-AAA-CAD-DM-DxxP-xxx	92B-BAA-CAD-DM-DxxP-xxx	92B-EAA-CAD-DM-DxxP-xxx	92B-FAA-C/	AD-DM-DxxP-xxx 92B-GAA-C	AD-DM-DxxP-xxx 48
DUAL PRESSU	IRE MODELS	(require sandwic	H REGULATOR – SEE	"REGULATORS" SEC	CTION)		
Port siz	e	Pilot air	Sin	5/2 gle operator		5/2 Double operator	400
			B ID:	B A A A		B B A A A	92
Valve less	base			A-000-DM-DxxP-xxx		92B-DAA-000-DM-DxxP-)	XXX
1/8"			92B-CAA	A-AAA-DM-D xx P- xxx		92B-DAA-AAA-DM-DxxP-	xxx 93
1/4"		Internal	92B-CA	A-BAA-DM-D xx P- xxx		92B-DAA-BAA-DM-DxxP-)	
3/8"			92B-CAA	A-CAA-DM-DxxP-xxx		92B-DAA-CAA-DM-DxxP-	iso o1
1/8"			92B-CAA	A-AAD-DM-D xx P- xxx		92B-DAA-AAD-DM-DxxP-	
1/4"		External		A-BAD-DM-D xx P- xxx		92B-DAA-BAD-DM-DxxP-)	
3/8"			92B-CA/	A-CAD-DM-DxxP-xxx		92B-DAA-CAD-DM-DxxP-2	
SOLENOID O	PERATOR >		DM-D XX P	-X <u>XX</u> *	Above	models are shown wi	150 4
				J			ISO 3
XX Vol	tage		X Manual oper	ator	XX	Electrical connection	
JA 110,	/50, 120/60 (2.		 Non-locking recess 		DM	Plug-in	
	⁷ 50, 240/60 (2.9 50 (2.9W)	9W)	2 Locking recessed		DN DP	Plug-in with diode	
	DC (1.8W)			-	DG	Plug-in with M.O.V. Plug-in with ground	
	DC (5.4W)			-	DJ	Plug-in with M.O.V. & ground	1

DA

24 VDC (5.4W)

24 VDC (12.7W)

Plug-in with M.O.V. & ground

Plug-in with diode & ground

DJ







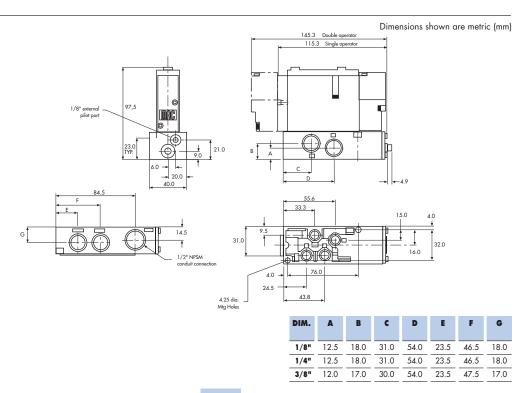
Fluid: Compressed air, vacuum, inert gases Pressure range: Internal pilot: 20 to 120 PSI 3 position: 35 to 120 PSI External pilot : vacuum to 120 PSI 3 position: 35 to 120 PSI Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Filtration: Temperature range : 0° F to 120° F (- 18° C to + 50° C) Flow: 1/8": $(1.0 C_v) - 1/4$ ": $(1.1 C_v) - 3/8$ ": $(1.2 C_v)$ Coil: Class A continuous duty, #22 AWG x 18 lead wire Voltage range: -15% to +10% of nominal voltage Protection: Consult factory ~Inrush 7.6 VA Power: Holding: 4.8 VA = 1.8 to 12.7 W24V=/5.4W Response times: 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-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





24 VDC (12.7W)

* Other options available, see page 309. End plate kit required (port size 3/8"):

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.

Daak a:---

Direct solenoid and solenoid pilot operated valves

0--:--

Function		Port size	Flow (Max)		Manifold mounting	Series
5/2, 5/3		1/4" - 3/8"	1.2 C _v		Sub-base non "plug-in"	
OPERATIONAL BEN	IEFITS					33
1. The 4-way pilo		aximum shifting				34
forces both wa 2. Memory spring 3. Balanced spoo pressure, also	g available. ol, immune to provides high					36
 Short stroke wi Bonded seal sp shifting in a glo 	oool with mini ass-like finishe	ed bore.				32
 Pilot with balar and consistent 					300	37
 Wiping effect Long service life 		cking.			1 5 3 0 V	38
20119 0011100 111						52
HOW TO ORD	ER					67
SINGLE PRESSI	URE MODE	LS				69
Port size	Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 5/3 Open center Pressure	
		B B A A A A B B IN EA	B B A A A A A B B IN EA	B B A A A A A A A A A A A A A A A A A A	B A S A S A S A S A S A S A S A S A S A	46
Valve less base		92B-ABA-000-DM-D xxx-xxx	92B-BBA-000-DM-D xxx-xxx	92B-EBA-000-DM-D xxx-xxx	92B-FBA-000-DM-D xxx-xxx 92B-GBA-000-DM	A-Dxxx-xxx
1/4" NPTF 3/8" NPTF	Internal	92B-ABA-BJG-DM-Dxxx-xxx 92B-ABA-CJG-DM-Dxxx-xxx	92B-BBA-BJG-DM-Dxxx-xxx 92B-BBA-CJG-DM-Dxxx-xxx	92B-EBA-BJG-DM-Dxxx-xxx 92B-EBA-CJG-DM-Dxxx-xxx	92B-FBA-BJG-DM-Dxxx-xxx 92B-GBA-BJG-DM 92B-FBA-CJG-DM-Dxxx-xxx 92B-GBA-CJG-DM	
				·		47
		•	H REGULATOR – SE	"REGULATORS" SEC	<u> </u>	48P
Port size	•	Pilot air	Sin	5/2 gle operator	5/2 Double operator	
			B ID	B EAH INA	B B A A A A A A A A A A A A A A A A A A	48
Valve less b				A-000-DM-D xxx-xxx	92B-DBA-000-DM-D <i>xxx-xxx</i>	400
1/4" NP1		Internal		A-BJG-DM-DXXX-XXX	92B-DBA-BJG-DM-D xxx-xxx 92B-DBA-CJG-DM-D xxx-xxx	
3/8" NP1	<u> </u>		92B-CB	A-CJG-DM-Dxxx-xxx	Above models are shown with s	ide ports. 92
SOLENOID OP	PERATOR >		DM-D XXX	XXX [*]		
				<u>_</u>		93
XX Volte	age	X Wire	e length	X Manual oper	ator XX Electrical con	
JA 110/	50, 120/60 (2.	9W) A 18" (f	ying leads)	Non-locking recess		ISO 01
JC 24/60	60, 240/60 (2.9 (2.9W)	9W) J Conne	ctor	2 Locking recessed	JB Rectangular connector	tor ISO 02
	C (1.8W) C (5.4W)				JD Rect. connector w BA Flying leads	ith light SO 1
	C (3.477)				RK Flying leads with die	uda ICO O

CI ---- [M----]

Flying leads with diode

ISO 2

ISO 3







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: Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: 1/4": (1.1 C_V) – 3/8": (1.2 C_V) Class A continuous duty, #22 AWG x 18 leads Coil: 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 WResponse times: 24V=/5.4W Energize: 8 ms De-energize: 7 ms 120/60 Energize: 7-13 ms De-energize: 12-20 ms

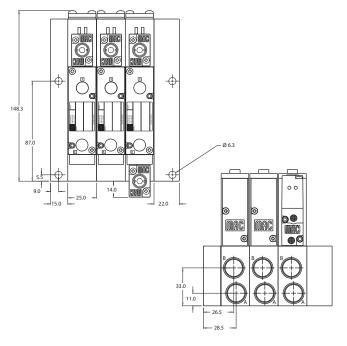
Options: • BSPP threads • Sandwich flow controls: FC92B-CA

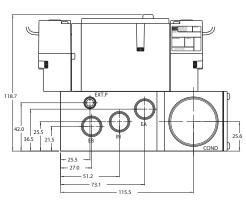
• Pilot valve: DM-Dxxx-xxx • Valve blanking plate: M-92002 • Pressure seal, valve to base 16543 Spare parts:

• Inlet/Exhaust isolator disc: N-92018.

DIMENSIONS

Dimensions shown are metric (mm)





152



unction		Port size	Flow (Max)	M	lanifold mounting	Series	
5/2, 5/3		1/4" - 3/8"	1.2 C _v		Sub-base "plug-in"		
OPERATIONAL BEI	NEFITS				1000	33	
1. The 4-way pilo		aximum shifting			- 60	34	
forces both wo 2. Memory spring					-		
3. Balanced spoo	ol, immune to					36	
pressure, also 4. Short stroke w		flow.				4	
5. Bonded seal s _l	pool with mini				3	32	
shifting in a gl 6. Pilot with bala							
and consistent	response time	es.			20	37	
 Wiping effect Long service li 		king.			200	38	
3					-	52	
HOW TO ORD	ER					67	
SINGLE PRESS	URE MODE	LS				69	
Port size	Pilot air	5/2	5/2	5/3	5/3	5/3 44	
		Single operator	Double operator	Closed center	Open center	Pressure center	

Valve less base	. ——	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	
1/4" NPTF	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 42	
3/8" NPTF	-	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	
		-				47	
DITAL DDESCIE	DE MODELS	IDECLUDE SANDWIC	H DECLILATOR SEE	"DECLII ATODS" SECT	IONI		
			TH REGULATOR – SEE	"REGULATORS" SECT		481	
DUAL PRESSUR Port size		(REQUIRE SANDWIC		"REGULATORS" SECT 5/2 gle operator	1	5/2 operator	
				5/2	1	5/2	
Port size			Sing B D	5/2 gle operator	Double B B B INB EI	5/2 e operator A A A A A A A A A A A A A A A A A A A	
Port size	pase	Pilot air	Sing BE INB 92B-CAA	5/2 gle operator A AZZI EXH INA 000-DM-DxxP-xxx	Double	5/2 • operator A A A A A A A A A A A A A A A A A A A	
Port size Valve less b	pase TF		Sing B IL INB 92B-CAA 92B-CAA	5/2 gle operator B A A AZZI EXH INA A-000-DM-DxxP-xxx A-BJA-DM-DxxP-xxx	Double	5/2 • operator 48 0-DM-DxxP-xxx 4-DM-DxxP-xxx	
Valve less b	oase TF	Pilot air	92B-CAA	5/2 gle operator B A A A A A A A A A A A A A A A A A A	Pouble I	5/2 • operator A A A A A A A A A A A A A A A A A A A	
Valve less b	oase TF	Pilot air	Sing B IL INB 92B-CAA 92B-CAA	5/2 gle operator B A A A A A A A A A A A A A A A A A A	Pouble I	48 A-DM-DxxP-xxx A-DM-DxxP-xxx side ports and no lights.	
Valve less b 1/4" NP1 3/8" NP1 SOLENOID OF	pase TF TF PERATOR >	Pilot air	92B-CAA 92B-CAA 92B-CAA 92B-CAA	5/2 gle operator B A A A A A A A A A A A A A A A A A A	Pouble PSE-DAA-O(928-DAA-B) 928-DAA-CI models are shown with	48 A-DM-DxxP-xxx A-DM-DxxP-xxx side ports and no lights.	
Valve less b 1/4" NP1 3/8" NP1 SOLENOID OF	pase TF TF PERATOR >	Pilot air Internal	Sing 8 92B-CAA 92B-CAA 92B-CAA 92B-CAA 92B-CAA 1 Manual opera Non-locking recesse	5/2 gle operator B A A A A A A A A A A A A A A A A A A	Pouble P2B-DAA-O 92B-DAA-O 92B-DAA-O 92B-DAA-O models are shown with	48 H NA O-DM-DXXP-XXX A-DM-DXXP-XXX side ports and no lights. 93 nnection	
Valve less b 1/4" NP1 3/8" NP1 SOLENOID OF XX Voit JA 110/ JB 220/5	pase TF TF PERATOR > rage (50, 120/60 (2.50, 240/60 (2.50, 240/60 (2.50) (2.50) (2.50) (2.50)	Pilot air Internal	928-CAA 928-CAA 928-CAA 928-CAA 928-CAA 928-CAA 928-CAA	5/2 gle operator B A A A A A A A A A A A A A A A A A A	Pouble PZD NIN B D 92B-DAA-O 92B-DAA-C 92B-DAA-C models are shown with XX Electrical co DM Plug-in DN Plug-in with diod	48 A-DM-DxxP-xxx A-DM-DxxP-xxx side ports and no lights. 93 mnection	01
Valve less b 1/4" NP1 3/8" NP1 SOLENOID OF XX Voit JA 110/ JB 220/5 JC 24/66 FB 24 VD	pase TF TF PERATOR ➤ Rage (50, 120/60 (2.50, 240/60 (2.50, 240/60 (2.50) (2.9W)) DC (1.8W)	Pilot air Internal	Sing B P P P P P P P MB P P P P MB P P MB P P MB P MB P MB P MB P MB MB	5/2 gle operator B A A A A A A A A A A A A A A A A A A	928-DAA-O 928-DAA-O 928-DAA-O 928-DAA-O models are shown with XX Electrical co DM Plug-in with diod DP Plug-in with M.O DG Plug-in with grou	48 A-DM-DxxP-xxx A-DM-DxxP-xxx side ports and no lights. 93 nnection B.V. Ind	01
Valve less b 1/4" NP1 3/8" NP1 SOLENOID OF XX Volt JA 110 / JB 220/5 JC 24/60 FB 24 VD DA 24 VD	pase TF TF PERATOR ➤ 150, 120/60 (2.50, 240/60 (2.9W)	Pilot air Internal	Sing B P P P P P P P MB P P P P MB P P MB P P MB P MB P MB P MB P MB MB	5/2 gle operator B A A A A A A A A A A A A A A A A A A	Pouble ### Pouble	48 A-DM-DxxP-xxx A-DM-DxxP-xxx side ports and no lights. 93 mnection ISO B. W. aground B. & ground B. & ground	01
Valve less b 1/4" NP1 3/8" NP1 SOLENOID OF XX Volt JA 110 / JB 220/5 JC 24/60 FB 24 VD DA 24 VD	PERATOR > Rage (50, 120/60 [2.50, 240/60 [2.50, 240/60 [2.50] (2.9W) DC (1.8W) DC (12.7W)	Pilot air Internal 9W) 9W)	Sing B P P P P P P P MB P P P P MB P P MB P P MB P MB P MB P MB P MB MB	5/2 gle operator B A A A A A A A A A A A A A A A A A A	Pouble P2B-DAA-O 92B-DAA-O 92B-DAA-O 92B-DAA-O 92B-DAA-O 92B-DAA-O models are shown with XX Electrical co DM Plug-in with diod DP Plug-in with M.O DG Plug-in with grou DJ Plug-in with M.O DJ Plug-in with M.O	48 H MA O-DM-DxxP-xxx A-DM-DxxP-xxx side ports and no lights. 93 mnection E V. Iso Iso Iso Iso Iso Iso	01







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: Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: 1/4": (1.1 C_V) – 3/8": (1.2 C_V) Coil: Class A continuous duty, #22 AWG x 12 base leads Voltage range : -15% to +10% of nominal voltage Protection: Consult factory Power: ~Inrush 7.6 VA Holding: 4.8 VA = 1.8 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

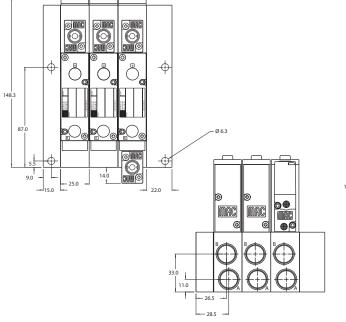
Options : • BSPP threads • Sandwich flow controls: FC92B-AA (sgl. operator), FC92B-BA (dbl. operator)

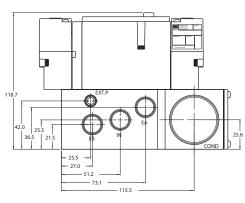
Spare parts : • Pilot valve: DM-DxxP-xxx • Valve blanking plate: M-92002 • Pressure seal, valve to base: 16543

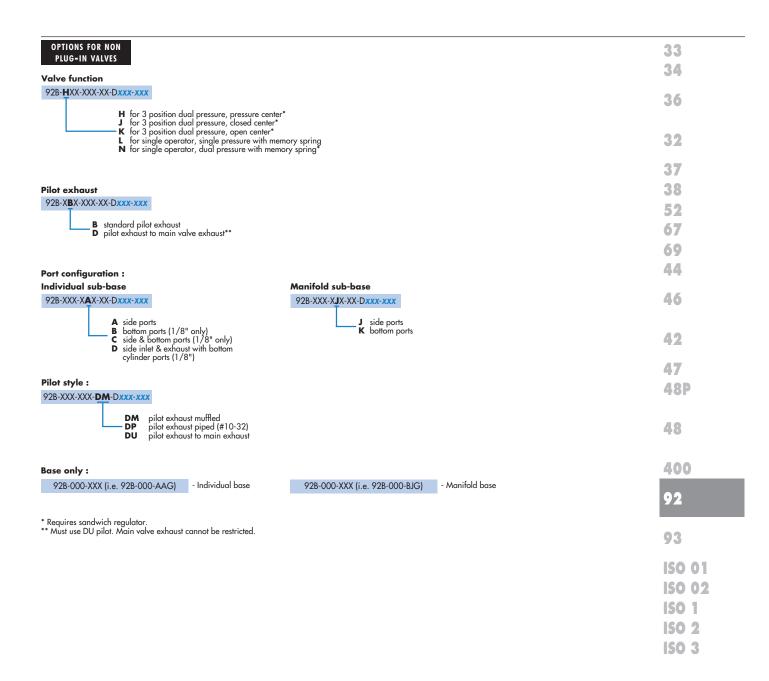
 $\bullet \ \text{Mounting screws valve to base (x2): 35050} \bullet Inlet/Exhaust isolator \ disc: N-92018.$

DIMENSIONS

Dimensions shown are metric (mm)







OPTIONS FOR PLUG-IN VALVES Valve function 92B-**H**XX-XXX-XX-D**xx**P-**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-XAX-XXX-XX-DxxP-xxx A standard pilot exhaust C pilot exhaust to main valve exhaust** **Body** electrical 92B-XXA-XXX-XX-DxxP-xxx no light light(s) F suppression and blocking diode with light(s) H M.O.V. with light(s) Port configuration: Manifold sub-base Individual sub-base 92B-XXX-XAX-XX-DxxP-xxx 92B-XXX-XJX-XX-DxxP-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") J side ports K bottom ports Individual & Manifold sub-base Int. pilot Individual sub-base Ext. pilot 92B-XXX-XXA-XX-DxxP-xxx 92B-XXX-XX**D**-XX-DxxP-xxx A internal pilot no light B internal pilot single light C internal pilot double light external pilot no light external pilot single light external pilot double light Pilot style: 92B-XXX-XXX-DM-DxxP-xxx pilot exhaust muffled pilot exhaust piped (#10-32) pilot exhaust to main exhaust Lead Wire Lengths: (manifold sub-base only) 92B-XXX-XXX-DM-DxxP-xxx P 12" leads 1 18" leads 2 24" leads 3 36" leads 4 48" leads 5 72" leads

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

Base only:

(Note: bases are wired for double solenoid valves)

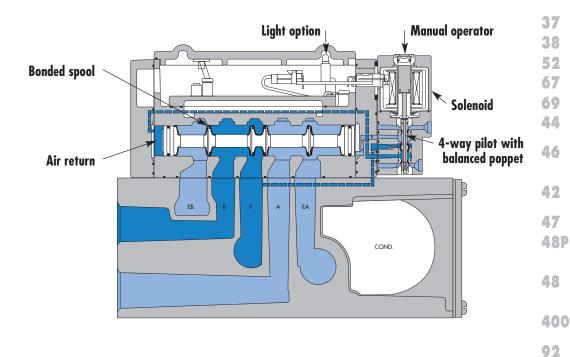
92B-000-XXX (i.e. 92B-000-AAA) - Individual base

^{*} Requires sandwich regulator.
** Must use DU pilot. Main valve exhaust cannot be restricted.



Inline Sub-base Sub-base "plug-in" Manifold mounting





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

Series

33 34

32

ISO 01

ISO 02

ISO 1

ISO 2

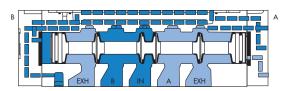
ISO 3



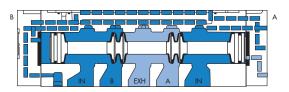




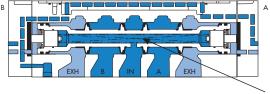
SPOOL CONFIGURATIONS



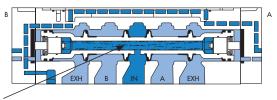
2 POSITION SINGLE PRESSURE SHOWN WITH "B" OPERATOR ENERGIZED



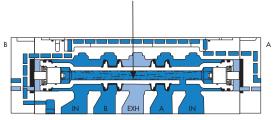
2 POSITION DUAL PRESSURE SHOWN WITH "B" OPERATOR ENERGIZED



3 POSITION CLOSED CENTER



3 POSITION OPEN CENTER



SPRING CENTERING

3 POSITION DUAL PRESSURE, PRESSURE CENTER

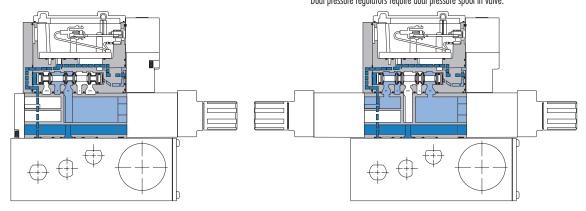
REGULATOR CONFIGURATIONS

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.

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

 $\textbf{Note} \hbox{: For both single and dual pressure, air supply to the pilot system is never regulated.} \\$

MANIFOLD WITH REGULATOR - DUAL PRESSURE



unction		Port size	Flou	(Max)	Individual moun	ting	Series
/2, 5/3		3/8" - 1	/2" 3.8	c _v	Inline		
PERATIONAL BEI	NEFITS						33
Unique patent							34
possible respo burn-out proof Balanced pop maximum shift repeatability c	solenoid oper pet 4-way pilot ting forces, pre	ation. t valve provides cise					36
 Air only return also available 		mory spring is			0	TAV.	32
. Optional low v 1 watt.	wattage DC so	lenoid down to			0	9/1	37
i. MAC spool ar		nation wipes ites sticking and					38
	on non-lube se					0	52
HOW TO ORD	DER						67
SINGLE PRESS	URE MODEL	_S					69
Port size	Pilot air	5/2		5/2	5/3	5/3	44
		Single ope	rator Dou	ble operator	Closed center	Open center	
		T\ ₹ ₹ /T	14 17 17 17 18	2 4 14 T	12 24 14 14 17 17 17 17 17 17 17 17 17 17 17 17 17		46
3/8" NPTF	Internal	3 1 5 93A-AJ0-B0J-DM-E	D xxx-xxx 93A-BJ0	3 1 5)-B0J-DM-D <i>xxx-xxx</i>	93A-EJO-BOJ-DM-D XXX-XXX	93A-FJO-BOJ-DM-D XXX-XXX	
1/2" NPTF	=	93A-AJ0-C0J-DM-[-C0J-DM-Dxxx-xxx	93A-EJO-COJ-DM-Dxxx-xxx	93A-FJO-COJ-DM-Dxxx-xxx	42
3/8" NPTF	External	93A-AJ0-B0K-DM-I	DXXX-XXX 93A-BJ0	-BOK-DM-Dxxx-xxx	93A-EJ0-B0K-DM-Dxxx-xxx	93A-FJO-BOK-DM-Dxxx-xxx	
1/2" NPTF		93A-AJ0-C0K-DM-	D xxx-xxx 93A-BJC	-COK-DM-Dxxx-xxx	93A-EJ0-C0K-DM-D <i>xxx-xxx</i>	93A-FJ0-C0K-DM-Dxxx-xxx	47
UAL PRESSU	RE MODELS						48P
Port size	Ð	Pilot air	5/2		5/2	5/3	
			Single oper	itor	Double operator	Pressure center	48
				<u> </u>			
3/8" NP	TF	Internal	93A-CJ0-B0J-DM-D <i>x</i>	XX-XXX	93A-DJ0-B0J-DM-D xxx-xxx	93A-HJO-BOJ-DM-Dxxx-xxx	400
1/2" NP	TF		93A-CJ0-C0J-DM-D <i>x</i>	xx-xxx	93A-DJ0-C0J-DM-Dxxx-xxx	93A-HJ0-C0J-DM-Dxxx-xxx	00
3/8" NP	TF	External	93A-CJ0-B0K-DM-Dx	XX-XXX	93A-DJ0-B0K-DM-Dxxx-xxx	93A-HJ0-B0K-DM-D xxx-xxx	92
1/2" NP	TF		93A-CJ0-C0K-DM-D	XX-XXX	93A-DJ0-C0K-DM-Dxxx-xxx	93A-HJO-COK-DM-Dxxx-xxx	
OLENOID OF	PERATOR >		DM-D	XXX-XXX			93
							ISO O
XX Volt	age	X	Wire length	X	lanual operator	XX Electrical connection	ISO O
JA 110/5	50, 120/60	Α	18" (Flying leads)	1 1	on-locking recessed	KA Square connector	- ISO 1
	50, 240/60	<u>B</u> 	24" (Flying leads) Connector	<u>2</u>	ocking recessed	JB Rectangular connector	ISO 2
JB 220/5 JC 24/50	J, 24/60				_	JD Rectangular connector with ligh	- 134 4
JC 24/50 FB 24 VD	D, 24/60 DC (1.8W) DC (5.4W)				_	BA Flying leads	ISO 3

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

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





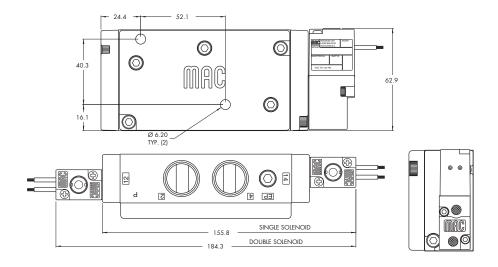


Fluid :	Compressed air, vacuum, inert gases
Pressure range :	Internal Pilot: 20 to 120 PSI
	External Pilot: Vacuum to 120 PSI
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)
Filtration:	40 μ
Temperature range :	0°F to 120°F (-18°C to +50°C)
Flow:	3.8 C _v
Coil:	Class A continuous duty, #22 AWG x 18 leads
Voltage range :	-15% to +10% of nominal voltage
Protection:	Consult factory
Power:	~ Inrush 7.6 VA Holding: 4.8 VA
	= 1.8 to 12.7 W
Response times :	Energize : 13 ms
(with 5.4 W coil)	De-energize : 10 ms

Option : • BSPP threads

DIMENSIONS

Dimensions shown are metric (mm)





Function	Port size	Flow (Max)	Individual mounting	Series
5/2, 5/3	1/4" - 3/8" - 1/2"	3.4 C _v	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 $\ \ \, \text{maximum shifting forces, precise}$ 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.



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34

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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

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 B A A A A A A A A A A A A A A A A A A	B B A A A A A A A A A A A A A A A A A A	B B A B A A A A A A A A A A A A A A A A	B A A SIMM
Valve less base		93A-ABA-000-DM-D xxx-xxx	93A-BBA-000-DM-D xxx-xxx	93A-EBA-000-DM-D xxx-xxx	93A-FBA-000-DM-D xxx-xxx
1/4" NPTF		93A-ABA-ABG-DM-Dxxx-xxx	93A-BBA-ABG-DM-Dxxx-xxx	93A-EBA-ABG-DM-Dxxx-xxx	93A-FBA-ABG-DM-Dxxx-xxx
3/8" NPTF	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
1/2" NPTF		93A-ABA-CAG-DM-Dxxx-xxx	93A-BBA-CAG-DM-Dxxx-xxx	93A-EBA-CAG-DM-Dxxx-xxx	93A-FBA-CAG-DM-Dxxx-xxx
1/4" NPTF		93A-ABA-ABH-DM-Dxxx-xxx	93A-BBA-ABH-DM-Dxxx-xxx	93A-EBA-ABH-DM-Dxxx-xxx	93A-FBA-ABH-DM-D xxx-xxx
3/8" NPTF	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
1/2" NPTF		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 A A A A A A A A A A A A A A A A A A A	B B A A A	B A A M A A A A A A A A A A A A A A A A
Valve less base		93A-CBA-000-DM-D xxx-xxx	93A-DBA-000-DM-D xxx-xxx	93A-HBA-000-DM-D xxx-xxx
1/4" NPTF		93A-CBA-ABG-DM-Dxxx-xxx	93A-DBA-ABG-DM-Dxxx-xxx	93A-HBA-ABG-DM-Dxxx-xxx
3/8" NPTF	Internal	93A-CBA-BAG-DM-Dxxx-xxx	93A-DBA-BAG-DM-Dxxx-xxx	93A-HBA-BAG-DM-D <i>xxx-xxx</i>
1/2" NPTF		93A-CBA-CAG-DM-Dxxx-xxx	93A-DBA-CAG-DM-Dxxx-xxx	93A-HBA-CAG-DM-D <i>xxx-xxx</i>
1/4" NPTF		93A-CBA-ABH-DM-Dxxx-xxx	93A-DBA-ABH-DM-Dxxx-xxx	93A-HBA-ABH-DM-Dxxx-xxx
3/8" NPTF	External	93A-CBA-BAH-DM-Dxxx-xxx	93A-DBA-BAH-DM-Dxxx-xxx	93A-HBA-BAH-DM-Dxxx-xxx
1/2" NPTF		93A-CBA-CAH-DM-Dxxx-xxx	93A-DBA-CAH-DM-Dxxx-xxx	93A-HBA-CAH-DM-Dxxx-xxx

SOLENOID OPERATOR	_

SOLEN	OID OPERATOR >		DM-D	<u>xx</u> x- <u>x</u> xx	<u><</u> *		
				- \			
XX	Voltage	X	Wire length	X	Manual operator	XX	Electrical connection
JA	110/50, 120/60	A	18" (Flying leads)	1	Non-locking recessed	ВМ	Flying leads
JB	220/50, 240/60	В	24" (Flying leads)	2	Locking recessed	BN	Flying leads with diode
JC	24/50, 24/60	J	Connector			BP	Flying leads with M.O.V.
FB	24 VDC (1.8W)					BG	Flying leads with ground
DA	24 VDC (5.4W)					JB	Rectangular connector
DF	24 VDC (12.7W)					JD	Rectangular connector with light

^{*} Other options available, see page 309.

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







Fluid: Compressed air, vacuum, inert gases

Pressure range: Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI

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

Filtration:

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

Flow: 1/4", 3/8": (3.0 C_v) - 1/2": (3.4 C_v)

Coil: Class A continuous duty, #22 AWG x 18 leads

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

Protection: Consult factory

~ Inrush 7.6 VA Power:

Holding: 4.8 VA

= 1 to 12.7 W

Response times: Energize: 13 ms (with 5.4 W coil) De-energize: 10 ms

Options : • BSPP thread • Sandwich regulator (see ,regulators' section)

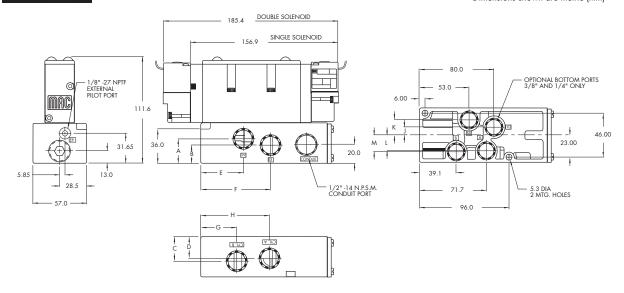
• Sandwich flow controls FC93A-BA (screwdriver slot adjustment) FC93A-BB (locking knob adjustment)

• Pilot valve: DM-Dxxx-xxx • Valve to base pressure seal: 16622 Spare parts :

• Pilot valve pressure seal: 16542 • Mounting screws valve to base (x4): 35249

• Pilot valve mounting screws (x2): 35069

DIMENSIONS Dimensions shown are metric (mm)



unction		Port size	Flow	(Max)	Individual mountin	9	Series
5/2, 5/3		1/4" - 3/8"	- 1/2" 3.4	c _v	Sub-base "plug-in"		
PERATIONAL BEN	NEFITS					III Managari	33
. Unique patente	ed Macsolenoi	d® for fastest				The same	34
possible respondent proof burn-out proof Balanced popper maximum shifti	nse times and solenoid oper pet 4-way pilot	virtually ation. valve provides					36
repeatability a Air only return also available.	. Optional mer	mory spring is					32
Optional low v	wattage DC so	lenoid down to				400	37
MAC spool an	d bore combir	nation wipes			6		38
away contamir	nation, elimina	ites sticking and				*	
allows for use		rvice.					52
HOW TO ORD	ER						67
INGLE PRESSI	URE MODEL	.S (1/4" MODELS	ARE BOTTOM PO	RTED)			69
Port size	Pilot air	5/2 Single opera	or Doul	5/2 ble operator	5/3 Closed center	5/3 Open center	44
		B B A	В	B A A A	B BA A	B B A A	46
			<u> </u>	ER IN EA			40
alve less base		93A-AAA-000-DM-DX	(P- xxx 93A-BAA	-000-DM-DxxP-xxx	93A-EAA-000-DM-DxxP-xxx	93A-FAA-000-DM-DxxP-xxx	
1/4" NPTF	·	93A-AAA-ABA-DM-DX	(P- xxx 93A-BAA	-ABA-DM-D xx P- xxx	93A-EAA-ABA-DM-D xx P- xxx	93A-FAA-ABA-DM-DxxP-xxx	42
3/8" NPTF	Internal	93A-AAA-BAA-DM-D <i>x</i>	(P- xxx 93A-BAA	-BAA-DM-D xx P- xxx	93A-EAA-BAA-DM-DxxP-xxx	93A-FAA-BAA-DM-DxxP-xxx	
1/2" NPTF	•	93A-AAA-CAA-DM-Dx	xP-xxx 93A-BAA	-CAA-DM-DxxP-xxx	93A-EAA-CAA-DM-DxxP-xxx	93A-FAA-CAA-DM-DxxP-xxx	47
1/4" NPTF		93A-AAA-ABD-DM-DX	P-XXX 93A-BAA	-ABD-DM-DxxP-xxx	93A-EAA-ABD-DM-DxxP-xxx	93A-FAA-ABD-DM-DxxP-xxx	48P
3/8" NPTF	External	93A-AAA-BAD-DM-DX	P-XXX 93A-BAA	-BAD-DM-D xx P- xxx	93A-EAA-BAD-DM-DxxP-xxx	93A-FAA-BAD-DM-DxxP-xxx	
1/2" NPTF		93A-AAA-CAD-DM-Dx	KP-XXX 93A-BAA	-CAD-DM-DxxP-xxx	93A-EAA-CAD-DM-DxxP-xxx	93A-FAA-CAD-DM-DxxP-xxx	40
UAL PRESSUR	RE MODELS	REQUIRE SANDW	CH REGULATOR,	SEE "REGULATO	RS" SECTION (1/4" MOD	ELS ARE BOTTOM PORTED)	48
Port size	•	Pilot air	5/2 Single opera	tor	5/2 Double operator	5/3 Pressure Center	400
			B B A IND	<u>\$</u> 71	B B A A A A A A A A A A A A A A A A A A	B A A	92
Valve less b	ase		93A-CAA-000-DM-D	xP-xxx	93A-DAA-000-DM-DxxP-xxx	93A-HAA-000-DM-DxxP-xxx	
1/4" NP1	i F		93A-CAA-ABA-DM-D	xxP-xxx 9	P3A-DAA-ABA-DM-DxxP-xxx	93A-HAA-ABA-DM-D xx P- xxx	93
	-	Internal	93A-CAA-BAA-DM-D	xxP-xxx 9	P3A-DAA-BAA-DM-D xx P- xxx	93A-HAA-BAA-DM-D xx P- xxx	
3/8" NP1		iniernai		(VD VVV		004 III4 C44 D14 DD	100.01
3/8" NP1 1/2" NP1		internal _	93A-CAA-CAA-DM-D	WF-XXX 9	² 3A-DAA-CAA-DM-D xx P- xxx	93A-HAA-CAA-DM-D <i>xx</i> P- <i>xxx</i>	120 0
1/2" NP1 1/4" NP1	if		93A-CAA-ABD-DM-D	xxP-xxx S	P3A-DAA-ABD-DM-DxxP-xxx	93A-HAA-ABD-DM-DxxP-xxx	
1/2" NP1 1/4" NP1 3/8" NP1	TF	External	93A-CAA-ABD-DM-D) 93A-CAA-BAD-DM-D)	CXP-XXX S	P3A-DAA-ABD-DM-DxxP-xxx P3A-DAA-BAD-DM-DxxP-xxx	93A-HAA-ABD-DM-D xxP-xxx 93A-HAA-BAD-DM-D xxP-xxx	ISO 02
1/2" NP1 1/4" NP1	TF		93A-CAA-ABD-DM-D	CXP-XXX S	P3A-DAA-ABD-DM-DxxP-xxx P3A-DAA-BAD-DM-DxxP-xxx P3A-DAA-CAD-DM-DxxP-xxx	93A-HAA-ABD-DM-DxxP-xxx 93A-HAA-BAD-DM-DxxP-xxx 93A-HAA-CAD-DM-DxxP-xxx	ISO 02
1/2" NP1 1/4" NP1 3/8" NP1 1/2" NP1	F		93A-CAA-ABD-DM-D 93A-CAA-BAD-DM-D 93A-CAA-CAD-DM-D	CXP-XXX 5 CXP-XXX 5 CXP-XXX 5	P3A-DAA-ABD-DM-DxxP-xxx P3A-DAA-BAD-DM-DxxP-xxx P3A-DAA-CAD-DM-DxxP-xxx	93A-HAA-ABD-DM-D xxP-xxx 93A-HAA-BAD-DM-D xxP-xxx	ISO 01 ISO 02 ISO 1 ISO 2
1/2" NP1 1/4" NP1 3/8" NP1 1/2" NP1	F		93A-CAA-ABD-DM-D 93A-CAA-BAD-DM-D 93A-CAA-CAD-DM-D	CXP-XXX S	P3A-DAA-ABD-DM-DxxP-xxx P3A-DAA-BAD-DM-DxxP-xxx P3A-DAA-CAD-DM-DxxP-xxx	93A-HAA-ABD-DM-DxxP-xxx 93A-HAA-BAD-DM-DxxP-xxx 93A-HAA-CAD-DM-DxxP-xxx	ISO 02
1/2" NP1 1/4" NP1 3/8" NP1 1/2" NP1	FFFFERATOR >		93A-CAA-ABD-DM-D) 93A-CAA-BAD-DM-D) 93A-CAA-CAD-DM-D)	XP-XXX	P3A-DAA-ABD-DM-DxxP-xxx P3A-DAA-BAD-DM-DxxP-xxx P3A-DAA-CAD-DM-DxxP-xxx Above mo	93A-HAA-ABD-DM-DxxP-xxx 93A-HAA-BAD-DM-DxxP-xxx 93A-HAA-CAD-DM-DxxP-xxx dels are shown without light.	ISO 02 ISO 1 ISO 2
1/2" NP1 1/4" NP1 3/8" NP1 1/2" NP1 SOLENOID OF	IF IF IF PERATOR >	External	93A-CAA-ABD-DM-D) 93A-CAA-BAD-DM-D) 93A-CAA-CAD-DM-D) DM-D Manual	CXP-XXX CXP-XX	P3A-DAA-ABD-DM-DxxP-xxx P3A-DAA-BAD-DM-DxxP-xxx P3A-DAA-CAD-DM-DxxP-xxx Above mo	93A-HAA-ABD-DM-DxxP-xxx 93A-HAA-BAD-DM-DxxP-xxx 93A-HAA-CAD-DM-DxxP-xxx	ISO 02 ISO 1 ISO 2
1/2" NP1 1/4" NP1 3/8" NP1 1/2" NP1 SOLENOID OF XX Voit JA 110/5 JB 220/5	TF PERATOR ➤ age 10, 120/60 (2.9, 120/60) (2.9, 120/60) (2.9, 120/60) (2.9, 120/60)	External	93A-CAA-ABD-DM-D) 93A-CAA-BAD-DM-D) 93A-CAA-CAD-DM-D)	CXP-XXX CXP-XXX CXP-XXX S CXP-XXX S Operator g recessed	23A-DAA-ABD-DM-DxxP-xxx 23A-DAA-BAD-DM-DxxP-xxx 23A-DAA-CAD-DM-DxxP-xxx Above mo	93A-HAA-ABD-DM-DxxP-xxx 93A-HAA-BAD-DM-DxxP-xxx 93A-HAA-CAD-DM-DxxP-xxx dels are shown without light.	ISO 02 ISO 1 ISO 2
1/2" NP1 1/4" NP1 3/8" NP1 1/2" NP1 6OLENOID OF XX Voit JA 110/5 JB 220/5 JC 24/50	rif rif rif rif PERATOR > age 60, 120/60 (2.9	External	93A-CAA-ABD-DM-D) 93A-CAA-BAD-DM-D) 93A-CAA-CAD-DM-D) DM-D X Manual 1 Non-lockin	CXP-XXX CXP-XXX CXP-XXX S CXP-XXX S Operator g recessed	### ##################################	93A-HAA-ABD-DM-DxxP-xxx 93A-HAA-BAD-DM-DxxP-xxx 93A-HAA-CAD-DM-DxxP-xxx dels are shown without light.	ISO 02 ISO 1 ISO 2







Fluid: Compressed air, vacuum, inert gases

Pressure range: Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI

Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)

Lubrication:

Filtration:

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

Flow: 1/4", 3/8": (3.0 C_v) - 1/2": (3.4 C_v)

Coil: Class A continuous duty, #22 AWG x 18 base leads

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

Protection: Consult factory

~ Inrush 7.6 VA Power: Holding: 4.8 VA

= 1 to 12.7 W

Response times: Energize: 13 ms (with 5.4 W coil) De-energize: 10 ms

Options : • BSPP thread • Sandwich regulator (see ,regulators' section)

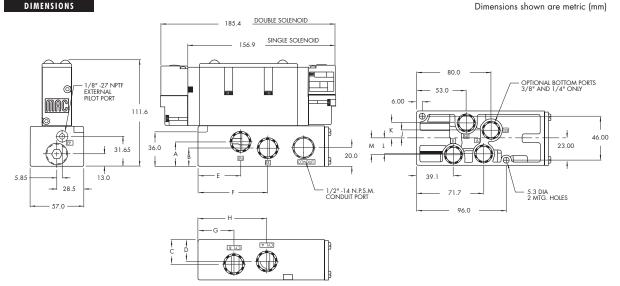
• Sandwich flow controls FC93A-AA (screwdriver slot adjustment) FC93A-AB (locking knob adjustment)

• Pilot valve: DM-DxxP-xxx • Valve to base pressure seal: 16622 Spare parts :

• Pilot valve pressure seal: 16542 • Mounting screws valve to base (x4): 35249

• Pilot valve mounting screws (x2): 35069

DIMENSIONS



15.0

16.5

unction		Port size		Flow (Max)	Manifold mo	unting 9	eries
5/2, 5/3		3/8" - 1,	/2"	3.8 C _v	Sub-base non "plug-in"		
PERATIONAL BEN	EFITS						33
Unique patente possible respon burn-out proof s	se times and	l virtually				100	34
Balanced popp maximum shiftin repeatability an	et 4-way pilong forces, pre	ot valve provides ecise			9		36
. Air only return. also available. . Optional low w	Optional me	emory spring is					32
1 watt.	-					S S Y V Y	37
. MAC spool and		ination wipes ates sticking and				331	38
allows for use o							52
HOW TO ORDE	R						67
INGLE PRESSU	IRE MODE	TS.					69
Port size	Pilot air	5/2		5/2	5/3	5/3	44
		Single oper	ator	Double operator	r Closed center	Open center	
		B B A F T EB IN EA	<u> </u>	B IN EA	B B A B A B A B A B A B A B A B A B A B	A B B A SIMA NO. 17 TO THE IN EA	46
/alve less base		93A-ABA-000-DM-D		93A-BBA-000-DM-Dxxx-)			42
3/8" NPTF	Internal	93A-ABA-BJG-DM-D		93A-BBA-BJG-DM-Dxxx-x			44
1/2" NPTF		93A-ABA-CJG-DM-D		93A-BBA-CJG-DM-DXXX-)			47
3/8" NPTF 1/2" NPTF	External	93A-ABA-BJH-DM-D 93A-ABA-CJH-DM-D		93A-BBA-BJH-DM-D XXX- X		7071107103110711070017001	48P
							401
	E MODELS	•	WICH REC	Gulator, see "regu	·		4.6
Port size		Pilot air	Si	5/2 ngle operator	5/2 Double operator	5/3 Pressure center	48
				B A A A A A A A A A A A A A A A A A A A	INB EXH INA	B A A A A A A A A A A A A A A A A A A A	400
Valve less bo	ise		93A-C	BA-000-DM-Dxxx-xxx	93A-DBA-000-DM-D xxx-xxx	93A-HBA-000-DM-D xxx-xxx	92
3/8" NPT		Internal		BA-BJG-DM-Dxxx-xxx	93A-DBA-BJG-DM-D xxx-xxx	Y3A-RBA-BJG-DM-DXXX-XXX	74
1/2" NPT				BA-CJG-DM-Dxxx-xxx	93A-DBA-CJG-DM-DXXX-XXX	93A-HBA-CJG-DM-DXXX-XXX	
3/8" NPT	F	External	93A-C	BA-BJH-DM-Dxxx-xxx	93A-DBA-BJH-DM-D xxx-xxx	93A-HBA-BJH-DM-Dxxx-xxx	93

93A-DBA-CJH-DM-Dxxx-xxx

Manual operator

Non-locking recessed

Locking recessed

1/2" NPTF

JC

FR

DA

DF

SOLENOID OPERATOR ➤

Voltage

110/50, 120/60 220/50, 240/60

24/50, 24/60 24 VDC (1.8W)

* 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.

93A-CBA-CJH-DM-Dxxx-xxx

Wire length

18" (Flying leads) 24" (Flying leads)

Connector

DM-D <u>XXX-XXX</u>

93A-HBA-CJH-DM-Dxxx-xxx

Electrical connection

Square connector with light

Flying leads with diode

Square connector

ISO 01

ISO 02 **ISO** 1

ISO 2

ISO 3

Above models are shown with side ports.

Flying leads

XX

ВМ

RN

ΚΔ

KD

²⁴ VDC (5.4W) 24 VDC (12.7W)







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

Options : • BSPP thread • Sandwich regulator (see ,regulators' section)

Energize: 13 ms

De-energize: 10 ms

• 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

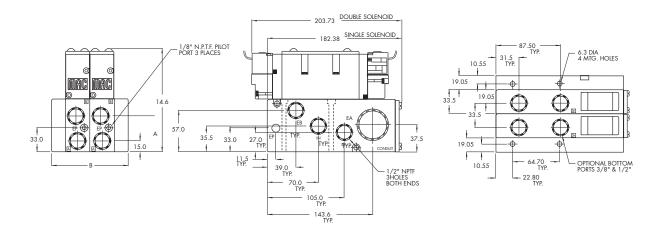
• Inlet/exh. Isolator disc: N-93008 • Valve blanking plate: M-93002

DIMENSIONS

Response times:

(with 5.4 W coil)

Dimensions shown are metric (mm)



Function		Port size		Flow (Max)	Manifold mount	ing	Series
5/2, 5/3		3/8" - 1	/ 2 "	3.8 C _V	Sub-base "plug-in"		
OPERATIONAL BEN	EFITS					77 ST. 100 ST.	33
1. Unique patente						1000	34
possible responder burn-out proof 2. Balanced poppos maximum shifti repeatability and possible responder.	solenoid opera bet 4-way pilot ng forces, pre	ation. valve provides cise			-		36
 Air only return. also available. 	Optional mer						32
4. Optional low v		lenoid down to				3000	37
5. MAC spool an					0	6	38
away contamir allows for use		tes sticking and			1	2	52
HOW TO ORD							_
							67
SINGLE PRESSU		-					69
Port size	Pilot air	5/2 Single oper	rator	5/2 Double operator	5/3 Closed center	5/3 Open center	44
		B B A EB IN EA	A Z	B B A A A	B A A GOVERNMENT OF THE PROPERTY OF THE PROPER	B A SIM	46
Valve less base		93A-AAA-000-DM-		93A-BAA-000-DM-DxxP-xxx			42
3/8" NPTF	Internal	93A-AAA-BJA-DM-I 93A-AAA-CJA-DM-		93A-BAA-BJA-DM-DxxP-xxx 93A-BAA-CJA-DM-DxxP-xxx			74
1/2" NPTF 3/8" NPTF	External	93A-AAA-BJD-DM-I		93A-BAA-BJD-DM-DxxP-xxx			47
1/2" NPTF	EXICITIO	93A-AAA-CJD-DM-		93A-BAA-CJD-DM-DxxP-xxx			48P
DUAL PRESSUR	E MODELS	(require sand	WICH REG	ULATOR, SEE "REGULA	ATORS" SECTION)	-	101
Port size		Pilot air		5/2 gle operator	5/2 Double operator	5/3 Pressure Center	48
			B D	B EXH INA	B B A G	B A A G	400
Valve less b	ase		93A-CA	A-000-DM-DxxP-xxx	93A-DAA-000-DM-D xx P- xxx	93A-HAA-000-DM-DxxP-xxx	92
3/8" NPT		Internal		A-BJA-DM-DxxP-xxx	93A-DAA-BJA-DM-DxxP-xxx	93A-HAA-BJA-DM-DxxP-xxx	7 4
1/2" NPT 3/8" NPT		Evtornel		A-CJA-DM-DxxP-xxx	93A-DAA-CJA-DM-DXXP-XXX	93A-HAA-CJA-DM-DXXP-XXX	
3/8" NPI 1/2" NPT		External		A-BJD-DM-DxxP-xxx A-CJD-DM-DxxP-xxx	93A-DAA-BJD-DM-DxxP-xxx 93A-DAA-CJD-DM-DxxP-xxx	93A-HAA-BJD-DM-D <i>xx</i> P- <i>xxx</i> 93A-HAA-CJD-DM-D <i>xx</i> P- <i>xxx</i>	93
-, 2 HFI	-				Above model numbers are s	shown with side ports without light.	ISO 01
SOLENOID OP	ERATOR ➤		DI	М-D <u>хх</u> Р- <u>ххх</u>	*		ISO 01
							ISO 1
XX Volte	age		Х	Manual operator	XX Ele	ctrical connection	
	0, 120/60 (2.9		1	Non-locking recessed	DM Plug		ISO 2
	0, 240/60 (2.9° , 24/60 (2.9W)		2	Locking recessed		-in with diode -in with M.O.V.	ISO 3
			_			-in with ground	•
	C (1.8W) C (5.4W)		_			III WIIII GIOONA	-

* 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.







Fluid: Compressed air, vacuum, inert gases

Pressure range: Internal Pilot: 20 to 120 PSI External Pilot: Vacuum to 120 PSI

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

Filtration:

Temperature range : 0° F to 120° F (- 18° C to $+50^{\circ}$ C)

Flow: 3/8": (3.4 C_v) - 1/2": (3.8 C_v)

Coil: Class A continuous duty, #22 AWG x 18 base leads

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

Protection: Consult factory

~ Inrush 7.6 VA Holding: 4.8 VA Power:

= 1 to 12.7 W

Response times: Energize: 13 ms (with 5.4 W coil) 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)

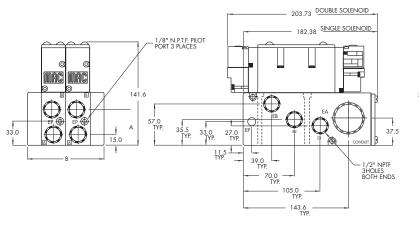
Spare parts: • Pilot valve: DM-DxxP-xxx • Valve to base pressure seal: 16622

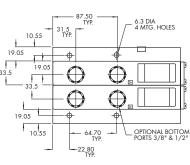
• Pilot valve pressure seal: 16542 • Mounting screws valve to base (x4): 35249

• Inlet/exh. Isolator disc: N-93008 • Valve blanking plate: M-93002

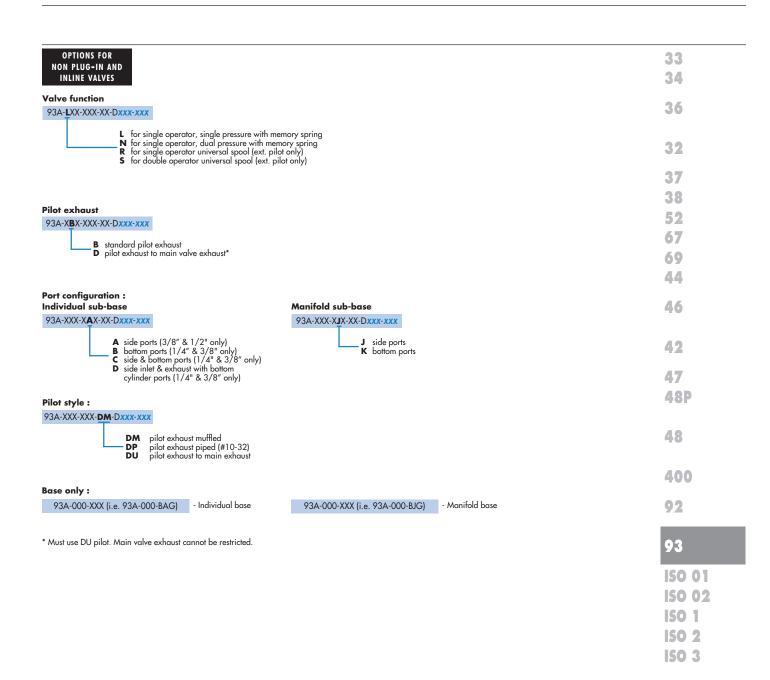
DIMENSIONS

Dimensions shown are metric (mm)



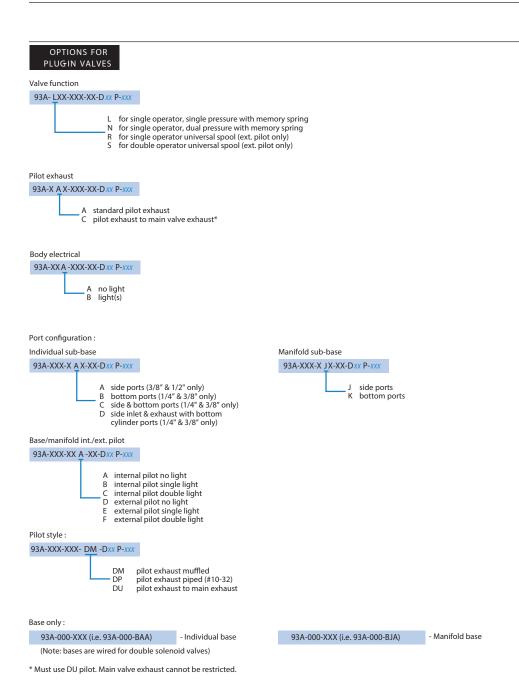


#	1	2	3	4	5	6	7	8	9	10
В	71.6	105.1	138.6	172.1	205.6	239.1	272.6	306.1	339.6	373.1

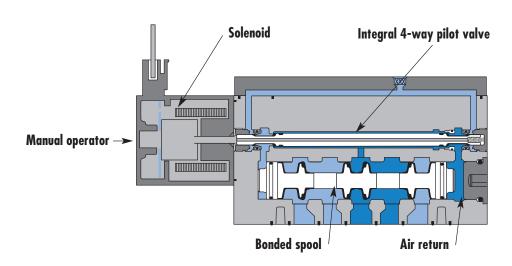




Direct solenoid and solenoid pilot oper



Individual mounting Valve only - No base non "plug-in" Sign 15407/1 Manifold mounting Valve only - No base non "plug-in" Sign 15407/1 33 Walve only - No base non "plug-in" Sign 15407/1 33 34 36 37



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

44

46

42

47

48P

48

400

92

93

ISO 02

ISO 1

ISO 2

ISO 3



Function	Port size	Flow (Max)	Individual/Manifold mounting	Series
5/2, 5/3	1/4"	1.0 C _v	Valve only – No base non "plug-in" Conform to ISO 13407/1	
OPERATIONAL BENEFITS				33
 Unique patented MACs shaped armature for far times. 		Internal or external pilot operation. Air only return Optional low wattage DC solenoid down to		34
 Balanced poppet 4-way maximum shifting force and consistent operatio 	s, precise repeatability	1.0 Watt.		36
3. MAC spool and bore co			9	32

HOW TO ORDER

SINGLE PRESSURE MODELS

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.

SINOLL I KLOSOKL MODEL	10			
Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
	14 4 2 12 5 \$\vert 1 \vert 3	14 4 2 12 17	14 4 2 12 34 34 12 12 12 12 12 12 12 12 12 12 12 12 12	14 4 2 34w 17
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-J xxx-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

DUAL PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center
	14 4 2 12 		14 12 5 0 7 0 3
Internal from port #3	MV-A01A-ACMB-Jxxx-xxx	MV-A01A-ADMB-J xxx-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-J xxx-xxx
External from "14" end	MV-A01A-ACME-Jxxx-xxx	MV-A01A-ADME-Jxxx-xxx	MV-A01A-AHME-J xxx-xxx

SOLENOID OPERATOR ➤

				1 1 5			
				J ካ			
XX	Voltage	X	Lead wire length	X	Manual operator	XX	Electrical connection
DA	24 VDC (5.4W)	0	No lead wire/ connector	1	Non-locking	BA	Flying leads
DB	12 VDC (5.4W)	Α	18"	2	Locking	JA	Square connector
DC	24 VDC (2.4W)	В	24"			JC	Square connector with light
DD	12 VDC (2.4W)	С	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

Other options available, see page 317.

ote: - 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.

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

37

38

52

67

69 44

46

42

47

48P

48

400

92

93

ISO 1 **ISO 2 ISO 3**







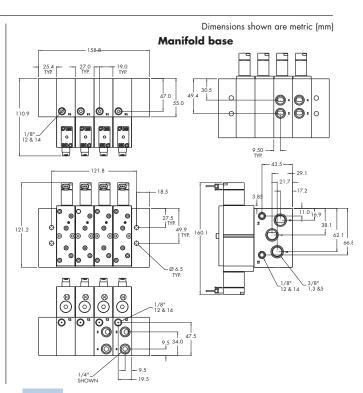
Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot - 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External Pilot: Vacuum to 120 PSI Pilot pressure: 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Lubrication: Filtration: 40 µ Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: 2 pos.: Cv 1.0 - 3 pos.: Cv 0.8 Coil: Class A wires continuous duty, #22 AWG x 18 Voltage range: -15% to +10% of nominal voltage 1,0 to 5,4 W Power:

Options :

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

DIMENSIONS

Individual base





Individual mounting Series Valve only – No base non "plug-in" Conform to ISO 15407/1 33 34 Manifold mounting 36

32

44

46

42

47

48P

48

400

92

93

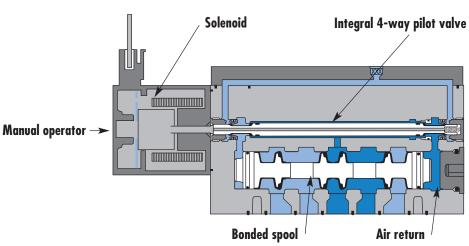
ISO 01

ISO 02

ISO 1

ISO 2

ISO 3



- 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.

SERIES FEATURES



Function	Port size	Floш (Max)	Individual/Manifold mounting	Series
5/2, 5/3	1/8"	0.43 C _v	Valve only - No base non "plug-in" Conform to ISO 154007/1	
OPERATIONAL BENEFITS				33

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.



36 32

37

52 67

69

44

46

42 47

48P

48

400

92

93

ISO 01

ISO 1

ISO 2

ISO 3

HOW TO ORDER

SINGLE PRESSURE MODELS

Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center
	14 4 2 12 5 \(\vert_1\) \(\vert_2\) \(\vert_3\)	14 4 2 12 17	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
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-J xxx-xxx	MV-A02A-AEME-Jxxx-xxx	MV-A02A-AFME-Jxxx-xxx

DUAL PRESSURE MODELS

DOALTRESSORE MODELS				
Pilot air	5/2 Single operator	5/2 Double operator	5/3 Pressure center	
	14 4 2 12 12 5 5 0 1 5 3		14	
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-J xxx-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 ➤

Voltage Lead wire length **Manual operator** Electrical connection 24V=/5,4W 12V=/5,4W DA 0 No lead wire/connector Non-locking ВΔ Flying leads 45 cm Locking Square connector 24V=/2,4W 12V=/2,4W DC 60 cm JC Square connector with light DD 90 cm IR Rectangular connector 24V=/1,8W 24V=/1,0W Rectangular connector with light DE JD DU ΚΔ Mini square connector

Other options available, see page 317.
ote: - 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-J**xxx-xxx**

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

KD

Mini square connector with light







Fluid: Compressed air, vacuum, inert gases Pressure range: Internal Pilot - 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI External Pilot: Vacuum to 120 PSI Pilot pressure: 2 pos.: 20 to 120 PSI - 3 pos.: 35 to 120 PSI Not required, if used select a medium aniline point lubricant (between 180°F and 210°F) Lubrication: Filtration: 40 µ Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: 2 pos.: Cv 0.43 - 3 pos.: Cv 0.28 Coil: Class A wires continuous duty, #22 AWG x 18 Voltage range: -15% to +10% of nominal voltage 1,0 to 5,4 W Power:

Options :

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

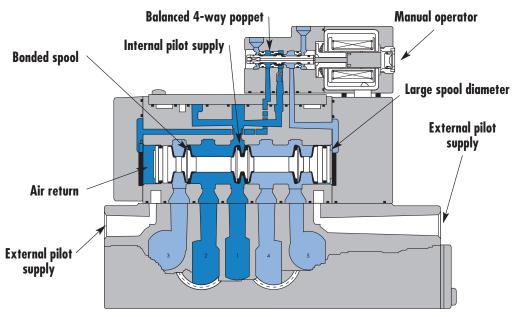
DIMENSIONS

Individual base

Dimensions shown are metric (mm) **Manifold base** 22.7 TYP. 19.0 TYP. ⊕∙⊜∙ ю **@**2**@**20 Ö Ö 17.5 1/4" 1, 3 & 5 PORTS 0 0 0 0 0 0 0 O^t O' Ь







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.

ISO 01

ISO 02

38

52

67 69

44

46

42

47 48P

48

400

92

93

ISO 3



Function	Port size	Flow (Max)	Individual/Manifold	mounting	Series
5/2, 5/3	1/4" - 3/8"	1.8 C _v	Valve only – No base non "plug-in" Conform to ISO 5599/1		
OPERATIONAL BENEFITS				-	33
 Unique patented Macsoleno possible response times and 		design of valves, bases and ors for modular assembly and	nare of		34
out proof AC solenoid oper 2. Balanced poppet 4-way pil maximum shifting forces, pr repeatability and consistent	ration. mainte ot valve provides 7. Interna recise Manifo	•			36
 MAC spool and bore comb away contamination, elimir 	oination wipes 8. Air onl	y return. Optional memory spri railable.	ng is		32
allows for use on non-lube s 4. Large spool area for maxim		al low wattage DC solenoid do	own to		37
even at minimum operating	pressure.				38
5. Very high flow in a compac	ct package.				52
HOW TO ORDER					67
SINGLE PRESSURE MODE	-IS				69
Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	44
	14 4 2 12 14 5 5 5 1 7 3	14 4 2 12 15 12 12 12 12 12 12 12 12 12 12 12 12 12	14 4 2 12 12 12 12 12 12 12 12 12 12 12 12 1	14 4 2 12 12 12 12 12 12 12 12 12 12 12 12 1	46
Internal	MV-B1A-AAAA-DM-Dxxx-xxx	MV-B1A-ABAA-DM-Dxxx-xxx	MV-B1A-AEAA-DM-Dxxx-xxx	MV-B1A-AFAA-DM-D xxx-xxx	40
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	42
DUAL PRESSURE MODELS	S				47
Pilot air		5/2 ingle operator	5/2 Double operator	5/3 Pressure center	48P
		14 4 2 12 12 TW	14 4 2 12	14 12 12 12 14 17 14 17 17 17 17 17 17 17 17 17 17 17 17 17	48
Internal pilot From	port #3 MV-B	1A-ACAD-DM-Dxxx-xxx	MV-B1A-ADAD-DM-Dxxx-xxx	MV-B1A-AGAD-DM-Dxxx-xxx	70
Internal pilot From	port #5 MV-B	1A-ACAE-DM-Dxxx-xxx	MV-B1A-ADAE-DM-Dxxx-xxx	MV-B1A-AGAE-DM-Dxxx-xxx	400
External pilot From	"12" end MV-B	1A-ACAB-DM-Dxxx-xxx	MV-B1A-ADAB-DM-Dxxx-xxx	MV-B1A-AGAB-DM-Dxxx-xxx	-100
SOLENOID OPERATOR >	·	OM-D <u>xxx-xxx</u>			92
XX Voltage	X Lead wi	re length X	Manual operator XX	C Electrical connection	93
JA 110/50, 120/60 JB 220/50, 240/60	A 18" (Flying B 24" (Flying		Non-locking recessed Kill		ISO OT
JC 24/50, 24/60	J Connector		JE	Rectangular connector	ISO OF
FB 24 VDC (1.8W) DA 24 VDC (5.4W)			JD BA		ISO 1
DF 24 VDC (12.7W)					150 1
 Other options available, see p Note: ISO series, valve and base 	page 309. e are ordered separately, see page	231 for base code.			150 2
OPTIONS					150 3
Valve function :		Spo	ol return :		
MV-B1A-A X XX-XX-D xxx-xxx		<u> </u>	V-B1A-AX A X-XX-D xxx-xxx		

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

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

Pilot style :

MV-B1A-AXXX-**DM**-Dxxx-xxx

A Standard return
B Memory spring return







Fluid: Compressed air, vacuum, inert gases

Pressure range: Internal pilot: 20 to 120 PSI External pilot : vacuum to 120 PSI

Pilot pressure: Single/double operator: 20 to 120 PSI, 3 positions: 30 to 120 PSI

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

40 µ Filtration:

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

Flow:

3/8": (1.8 C_v) - 1/4": (1.6 C_v)

Coil: Class A continuous duty, #22 AWG x 18 leads

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

Protection: Consult factory

Holding: 4.8 VA Power: ~ Inrush 7.6 VA

= 1 to 12.7 W

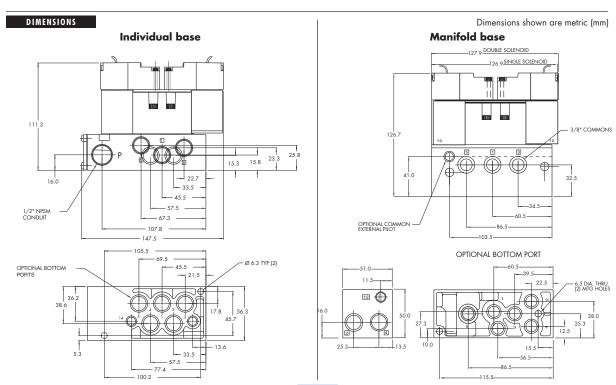
Response times: Energize:11.3 ms (with 5,4 W coil) De-energize: 7.8 ms

FCP1A-BA (screwdriver slot adjustment) Options : • Sandwich flow controls:

FCP1A-BB (locking knob adjustment)

• Sandwich regulator, see ,Regulators' section

Spare parts : • Pilot valve: DMB-Dxxx-xxx • Valve to base pressure seal: 16661





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

Direct solenoid and solenoid pilot operated valves

unction	Port size	Flow (Max)	Individual/Manif	old mounting	Series
5/2, 5/3	1/4" - 3/8'	7 1.8 C _v	Valve only – No base "plug-in" Conform to ISO 5599/2		
OPERATIONAL BENEFITS					33
. Unique patented Macso possible response times		Plug-in design of valves, bases an regulators for modular assembly o			34
out proof AC solenoid of 2. Balanced poppet 4-way maximum shifting force	operation. y pilot valve provides 7. s, precise	maintenance. Internal or external pilot operation Manifolds supplied with common	n.	We	36
repeatability and consists. MAC spool and bore or away contamination, el allows for use on non-lu	ombination wipes 8 liminates sticking and	pilot. Air only return. Optional memory also available. Optional low wattage DC solenoi			32
4. Large spool area for mo	aximum shifting forces	1.0 watt.	la down to		37
even at minimum opera 5. Very high flow in a con			0	•	38
			-		52
HOW TO ORDER					67
SINGLE PRESSURE MO	ODELS				69
Pilot air	5/2 Single operato	5/2 r Double operato	5/3 r Closed center	5/3 Open center	44
	14 4 2 1 17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 14 4 2 12 	<u>₩</u> ₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	14 4 2 12 12 12 12 15 5 0 0 0 3	46
Internal	MV-P1A-AAAA-DM-DxxF			MV-P1A-AFAA-DM-DxxP-xxx	42
External "12" end	MV-P1A-AAAB-DM-DxxP		MV-P1A-AEAB-DM-DxxP-xxx	MV-P1A-AFAB-DM-DxxP-xxx	- 74
DUAL PRESSURE MOD					47
Pilot	air	5/2 Single operator	5/2 Double operator	5/3 Pressure center	48P
		14 4 2 12	14 4 2 12	14 12 12 12 14 14 14 14 14 14 14 14 14 14 14 14 14	48
Internal pilot F	rom port #3	MV-P1A-ACAD-DM-DxxP-xxx	MV-P1A-ADAD-DM-DxxP-xxx	MV-P1A-AGAD-DM-DxxP-xxx	_
Internal pilot F	rom port #5	MV-P1A-ACAE-DM-DxxP-xxx	MV-P1A-ADAE-DM-DxxP-xxx	400	
External pilot Fr	rom "12" end	MV-P1A-ACAB-DM-DxxP-xxx	MV-P1A-ADAB-DM-DxxP-xxx	MV-P1A-AGAB-DM-DxxP-xxx	-
SOLENOID OPERATO	PR >	DM-D <u>xx</u> P- <u>xx</u>	<u> </u>		92
					93
XX Voltage	0 (2 0)(/)	X Manual operator		rical connection	73
JA 110/50, 120/6 JB 220/50, 240/6	0 (2.9W)	Non-locking recessed Locking recessed		n with diode	ISO 01
JC 24/50, 24/60 (FB 24 VDC (1.8W)	2.9W)			n with M.O.V. n with ground	ISO 02
DA 24 VDC (5.4W) DF 24 VDC (12.7W)	/)				ISO 1
					ISO 2
Note: - ISO series, valve a - Ground wire requi	see page 309. nd base are ordered separately red for 30 volts or higher.	, see page 233 for base codes.			ISO 3
OPTIONS					
Valve function :			Spool return :		
MV-P1A-A X XX-XX-D xx P- xxx	t -		MV-P1A-AXAX-DxxP-xxx		
J for sin	ngle operator universal spool (ex puble operator universal spool (e	ct. pilot only)	A Standard return B Memory spring	return	
Pilot style :	operator offiversal spool (6	AL PROFOLITY	D Standard return E Memory spring	with light	
MV-P1A-AXXX- DM -DxxP-xx	х		■ Memory spring		







Fluid: Compressed air, vacuum, inert gases

Pressure range: Internal pilot: 20 to 120 PSI External pilot : vacuum to 120 PSI

Pilot pressure: Single/double operator: 20 to 120 PSI, 3 positions: 30 to 120 PSI

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

40 µ Filtration:

Temperature range : 0° F to 120° F (- 18° C to $+50^{\circ}$ C)

Flow: 3/8": (1.8 C_v) - 1/4": (1.6 C_v)

Coil: Class A continuous duty, #22 AWG x 12 base leads

-15% to +10% of nominal voltage

Voltage range:

Consult factory Protection:

Holding: 4.8 VA Power: ~ Inrush 7.6 VA

= 1 to 12.7 W

Response times: Energize :10 ms (with 5,4 W coil) De-energize: 9 ms

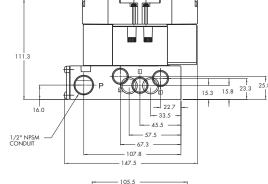
FCP1A-AA (screwdriver slot adjustment) Options: • Sandwich flow controls:

FCP1A-AB (locking knob adjustment)

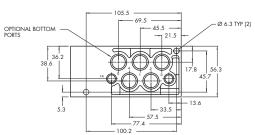
 \bullet Sandwich regulator, see <code>,Regulators'</code> section

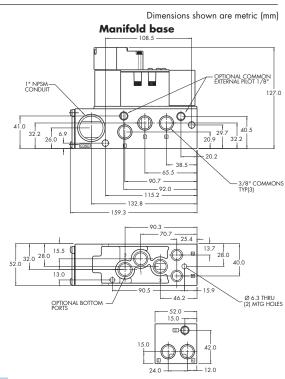
• Pilot valve: DMB-DxxP-xxx • Valve to base pressure seal: 16661 Spare parts:

DIMENSIONS

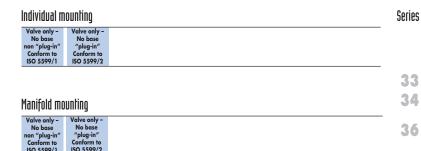


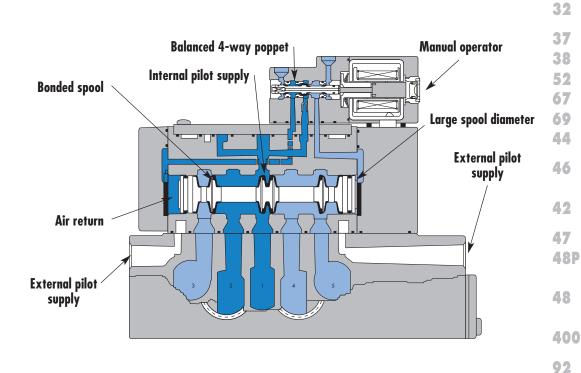
Individual base











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.

93

ISO 01

ISO 02



Pilot style :

MV-B2A-AXXX-**DM**-D*xxx-xxx*

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

Direct solenoid and solenoid pilot operated valves

unction	Port size	size Flow (Max)		Individual/Manifold mounting		Series	
5/2, 5/3	3/8" - 1	/2" 3.0 C,	,	Valve only - No base non "plug-in" Conform to ISO 5599/1			
PERATIONAL BENEFITS						33	
. Unique patented Macso		6. Plug-in design of valves,			230	34	
possible response times out proof AC solenoid of Balanced poppet 4-way maximum shifting force	operation. y pilot valve provides s, precise	regulators for modular of maintenance. 7. Internal or external pilot Manifolds supplied with	operation.			36	
repeatability and consist MAC spool and bore caway contamination, e	ombination wipes	pilot. 8. Air only return. Optiona also available.	l memory spring	g is	9	32	
allows for use on non-lu Large spool area for mo		Optional low wattage D 1.0 watt.	C solenoid dow	n to		37	
even at minimum opera	iting pressure.				e lange	38	
Very high flow in a con	праст раскаде.					52	
HOW TO ORDER						67	
NGLE PRESSURE MO	ODELS					69	
Pilot air	5/2 Single ope		/2 operator	5/3 Closed center	5/3 Open center	44	
	14 4 5 VO 1	2 12 14	4 2 12	14 4 2 11 39W 37 37 5 \$\frac{1}{5}\frac{1}{5	14 4 2 12 17D 1 3 3 7 3 7 3 7 3 7 3 7 3 7 3 7 3 7 3 7	46	
Internal	MV-B2A-AAAA-DM		A-DM-D xxx-xxx	MV-B2A-AEAA-DM-Dxxx-x	XX MV-B2A-AFAA-DM-DXXX-XXX	40	
External "12" end	MV-B2A-AAAB-DM	-Dxxx-xxx MV-B2A-ABAI	3-DM-Dxxx-xxx	MV-B2A-AEAB-DM-Dxxx-x	MV-B2A-AFAB-DM-Dxxx-xxx	42	
UAL PRESSURE MOD	DELS					47	
Pilot	air	5/2 Single operator		5/2 Double operator	5/3 Pressure center	48P	
		14 4 2 12 TD T T T T T T T T T T T T T T T T T T		14 4 2 12 	14 175 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	48	
Internal pilot F	rom port #3	MV-B2A-ACAD-DM-Dxxx-	ACAD-DM-DXXX-XXX MV-B2A-ADAD-DM-DXXX-XXX		MV-B2A-AGAD-DM-Dxxx-xxx		
Internal pilot F	<u> </u>	MV-B2A-ACAE-DM-Dxxx-		MV-B2A-ADAE-DM-Dxxx-xxx	MV-B2A-AGAE-DM-Dxxx-xxx	400	
External pilot F	rom "12" end	MV-B2A-ACAB-DM-Dxxx-	CXX	MV-B2A-ADAB-DM-Dxxx-xxx	MV-B2A-AGAB-DM-Dxxx-xxx		
OLENOID OPERATO	R ➤	DM-D XX	X - XXX *			92	
W. W. H.		tandarin land	J 5		W Plant and a support of	93	
XX Voltage JA 110/50, 120/6	X 0 A	Lead wire length 18" (Flying leads)		anual operator	XX Electrical connection KA Square connector		
JB 220/50, 240/6 JC 24/50, 24/60	0 B	24" (Flying leads) Connector	2 Lo	cking recessed	KD Square connector with light JB Rectangular connector	ISO 01	
FB 24 VDC (1.8W) DA 24 VDC (5.4W)			-	-	JD Rectangular connector with light BA Flying leads	ISO 02	
DF 24 VDC (3.4W)	()			-	DA Trying leads	ISO 1	
Other options available, s lote: ISO series, valve and l	see page 309. base are ordered separatel	ly, see page 235 for base code).			ISO 2	
OPTIONS	,	, , ,				ISO 3	
alve function :			Spool	return :			
MV-B2A-AXXX-XX-Dxxx-xxx	1		MV-	B2A-AXAX-XX-Dxxx-xxx			
J for sin	ngle operator universal spo uble operator universal spo	ol (ext. pilot only)		A Standard retu	rn		







Fluid:

Compressed air, vacuum, inert gases

Pressure range: Internal pilot: 20 to 120 PSI

External pilot : vacuum to 120 PSI

Pilot pressure: Single/double operator: 20 to 120 PSI, 3 positions: 30 to 120 PSI

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

Filtration: 40 µ

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

Flow: 3/8": (2.8 C_v) - 1/2": (3.0 C_v)

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

= 12.7 to 1.0 W

Response times: 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

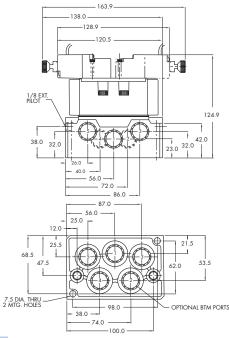
• Valve mounting screws (x4): 35413

DIMENSIONS

Individual base -139.0 SINGLE & DOUBLE 1/8" EXT. PILOT 39.0 20.0 36.0 1/2" SIDE PORTS (3) EACH SIDE 70.0 - 104.0 -OPTIONAL BTM.
PORTS 26.0 7.0 34.0 14.5 52.0 64.0 6.5 DIA. __ 2 MTG. HOLES -132.0

Dimensions shown are metric (mm)

Manifold base





Direct solenoid and solenoid pilot operated valves

unction	Port size	Floш (Max)	Individual/Manifo	old mounting	Series
5/2, 5/3	3/8" - 1/2"	3.0 C _v	Valve only – No base "plug-in" Conform to ISO 5599/2		
PERATIONAL BENEFITS				22	33
Unique patented Macsolenoi possible response times and	id® for fastest 6. Plug-in	design of valves, bases and tors for modular assembly an	d ease of		34
out proof AC solenoid opera Balanced poppet 4-way pilor maximum shifting forces, pre repeatability and consistent of	tion. mainte t valve provides 7. Interno ecise Manife	nance. If or external pilot operation. It is supplied with common ex			36
 MAC spool and bore combin away contamination, elimina 	nation wipes 8. Air on ates sticking and also a	ly return. Optional memory sp vailable.			32
allows for use on non-lube se Large spool area for maximu		nal low wattage DC solenoid att.	down to	in a	37
even at minimum operating p . Very high flow in a compact			•		38
,	F				52
HOW TO ORDER					67
INGLE PRESSURE MODE	LS	_			69
Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	44
	14 4 2 12 	14 4 2 12 75 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	14 4 2 12 12 12 12 12 13 12 13 12 13 12 13 13 12 13 13 12 13 13 12 13 13 13 13 13 13 13 13 13 13 13 13 13	14 4 2 12 12 12 12 12 12 12 12 12 12 12 12 1	46
Internal	MV-P2A-AAAA-DM-DxxP-xxx	MV-P2A-ABAA-DM-DxxP-xx		MV-P2A-AFAA-DM-DxxP-xxx	42
External "12" end	MV-P2A-AAAB-DM-DxxP-xxx	MV-P2A-ABAB-DM-DxxP-xx	MV-P2A-AEAB-DM-DxxP-xxx	MV-P2A-AFAB-DM-DxxP-xxx	- 74
OUAL PRESSURE MODELS					47
Pilot air	9	5/2 Single operator	5/2 Double operator	5/3 Pressure center	48P
		14 4 2 12 14 5 0 1 0 3	14 4 2 12 14 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	14 14 15 10 10 10 10 10 10 10 10 10 10	48
Internal pilot From p		P2A-ACAD-DM-DxxP-xxx	MV-P2A-ADAD-DM-DxxP-xxx	MV-P2A-AGAD-DM-DxxP-xxx	_
Internal pilot From p External pilot From "		P2A-ACAE-DM-DxxP-xxx P2A-ACAB-DM-DxxP-xxx	MV-P2A-ADAE-DM-DxxP-xxx MV-P2A-ADAB-DM-DxxP-xxx	MV-P2A-AGAE-DM-DxxP-xxx MV-P2A-AGAB-DM-DxxP-xxx	400
SOLENOID OPERATOR >	-	OM-D <u>xx</u> P- <u>xx</u>			92
XX Voltage	X	Manual operator	XX Elect	rical connection	93
JA 110/50, 120/60	1	Non-locking recessed		1	- 160 01
JB 220/50, 240/60 JC 24/50, 24/60		Locking recessed	DP Plug-ir	n with diode n with M.O.V.	_ 120 01
FB 24 VDC (1.8W) DA 24 VDC (5.4W)			DG Plug-in	n with ground	_ 150 02
DF 24 VDC (12.7W)	200				150 1
Other options available, see po Note: - ISO series, valve and ba - Ground wire required fo	nge 30Y. Ise are ordered separately, see p In 30 volts or higher	age 237 for base codes.			150 2
OPTIONS	o volis of higher.				150 3
/alve function :		S	ipool return :		
			MV-P2A-AXAX-XX-DxxP-xxx		

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

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

Pilot style :

MV-P2A-AXXX-**DM**-DxxP-xxx

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







DIMENSIONS

Fluid: Compressed air, vacuum, inert gases

Pressure range: Internal pilot: 20 to 120 PSI
External pilot: vacuum to 120 PSI

External pilor : vacuum to 120 F31

Pilot pressure: Single/double operator : 20 to 120 PSI, 3 positions : 30 to 120 PSI

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

Filtration: 40 µ

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

7/8": (2.8 C_v) - 1/2": (3.0 C_v)

Class A continuous duty, #18 AWG x 12 base leads

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

Protection: Consult factory

Power: ~ Inrush 14.8 VA Holding: 10.9 VA

= 12.7 to 1.0 W

Response times: 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)

= 1/2" N.P.S.M. CONDUIT

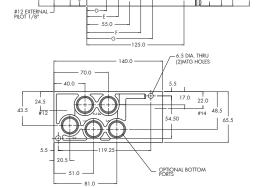
#14 EXTERNAL PILOT 1/8"

 \bullet Sandwich regulator, see <code>,Regulators'</code> section

Spare parts : • Pilot valve: DMB-DxxP-xxx • Valve to base pressure seal: 16576

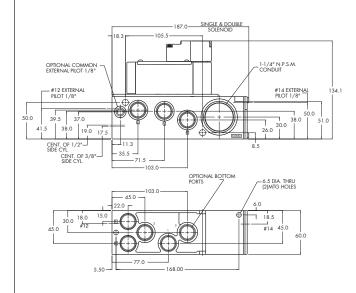
• Valve mounting screws (x4): 35413

Individual base 173.8 156.1 DOUBLE SOLENOID 146.8 SINGLE SOLENOID

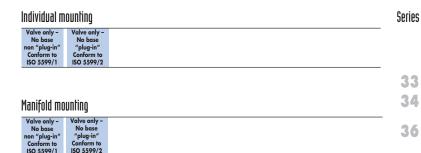


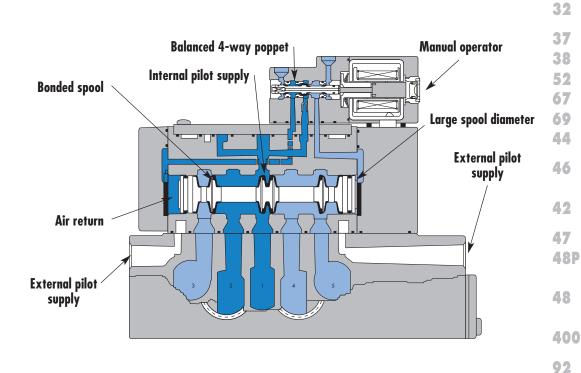
DIM. A B C D E F G 3/8" 25.2 22.7 20.6 26.7 40.5 69.4 83.3 1/2" 24.0 21.0 19.0 25.5 40.0 70.0 84.5

Manifold base









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.

93

ISO 01

ISO 02

ISO 1

ISO 2



Direct solenoid and solenoid pilot operated valves

unction	Port size	Floш (Max)	Individual/Ma	nifold mounting	Series
5/2, 5/3	1/2" - 3/4"	6.1 C _v	Valve only – No base "non plug-in" Conform to ISO 5599/1		
PERATIONAL BENEFITS				_	33
. Unique patented Macsolenoid possible response times and v		design of valves, bases and ors for modular assembly a			34
out proof AC solenoid operat 2. Balanced poppet 4-way pilot maximum shifting forces, prec	ion. mainter valve provides 7. Interna cise Manifo	•			36
repeatability and consistent o 3. MAC spool and bore combin away contamination, eliminat	ation wipes 8. Air only	y return. Optional memory ailable.	spring is		32
allows for use on non-lube ser Large spool area for maximur		al low wattage DC solenoid	d down to		37
even at minimum operating p	ressure.			. 0	38
5. Very high flow in a compact _l	рискаде.			· v	52
HOW TO ORDER					67
SINGLE PRESSURE MODEL	S				69
Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	44
	14 4 2 12 14 7 7 7 12 5 10 1 1 3	14 4 2 12 	14 4 2 12 30 30 30 30 30 30 30 30 30 30 30 30 30	14 4 2 12 14 4 2 12 15 0 0 0 3	46
Internal	MV-B3A-AAAA-DM-D xxx-xxx	MV-B3A-ABAA-DM-Dxxx-			- - 42
External "12" end	MV-B3A-AAAB-DM-Dxxx-xxx	MV-B3A-ABAB-DM-Dxxx-	MV-B3A-AEAB-DM-Dxxx-x	MV-B3A-AFAB-DM-Dxxx-xxx	- 44
DUAL PRESSURE MODELS					47
Pilot air	s	5/2 ingle operator	5/2 Double operator	5/3 Pressure center	48P
	1	4 4 2 12	14 4 2 12 ZD		48
Internal pilot From p	ort #3 MV-B	3A-ACAD-DM-Dxxx-xxx	MV-B3A-ADAD-DM-Dxxx-xxx	MV-B3A-AGAD-DM-Dxxx-xxx	_ 40
Internal pilot From p		3A-ACAE-DM-D xxx-xxx	MV-B3A-ADAE-DM-D xxx-xxx	MV-B3A-AGAE-DM-D xxx-xxx	- - 400
External pilot From "1	2" end MV-B	3A-ACAB-DM-Dxxx-xxx	MV-B3A-ADAB-DM-Dxxx-xxx	MV-B3A-AGAB-DM-Dxxx-xxx	_
SOLENOID OPERATOR >		M-D <u>xxx</u> - <u>xx</u>	<u>X</u> *		92
					93
XX Voltage		re length X	Manual operator	XX Electrical connection	70
JA 110/50, 120/60 JB 220/50, 240/60	A 18" (Flying B 24" (Flying		Non-locking recessed Locking recessed	KA Square connector KD Square connector with light	ISO 01
JC 24/50, 24/60 FB 24 VDC (1.8W)	J Connector			JB Rectangular connector JD Rectangular connector with light	SO 02
DA 24 VDC (5.4W)	<u> </u>			BA Flying leads	- ISO 1
DF 24 VDC (12.7W) Other options available, see pag					150 2
Note: ISO series, valve and base a	re ordered separately, see page	239 for base code.			150 2
OPTIONS					<u>ISO 3</u>
Valve function :		5	Spool return :		
MV-B3A-A X XX-XX-D <i>xxx-xxx</i>			MV-B3A-AX A X-XX-Dxxx-xxx		

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

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

Pilot style :

MV-B3A-AXXX-**DM**-Dxxx-xxx

A Standard return
B Memory spring return







Fluid: Compressed air, vacuum, inert gases

Pressure range: Internal pilot: 20 to 120 PSI

External pilot: vacuum to 120 PSI

Pilot pressure: Single/double operator: 20 to 120 PSI, 3 positions: 30 to 120 PSI

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: 1/2": $(5.4 \text{ C}_{\text{v}}) - 3/4$ ": $(6.1 \text{ C}_{\text{v}})$

Class A continuous duty, #22 AWG leads

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

Protection: Consult factory

Power: ~ Inrush 7.6 VA Holding: 4.8 VA

= 12.7 to 1.0 W

Response times : Energize : 16.2 ms (5.4 W coil) 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

DOUBLE SOLENOID W/

Individual base

DIMENSIONS

64.0

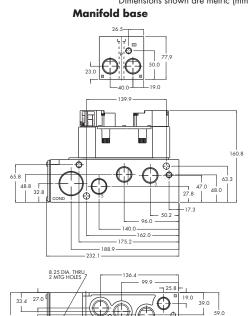
SINGLE SOLENOID W/ EXTENDED OVERBIDE 160.0 175.0 188.5 44.5 23.5 77.0 126.0 18.5 44.5 27.0 33.0 18.5 44.5 44.5 27.0 33.0 18.5 44.5 4 MTG. HOLES

⊕

140.0

OPTIONAL BTM PORTS

Dimensions shown are metric (mm)





Direct solenoid and solenoid pilot operated valves

-unction	Port size	Flow (Max)	Individual/Manifo	ld mounting	Series
5/2, 5/3	1/2" - 3/4"	6.1 C _V	Valve only – No base "plug-in" Conform to ISO 5599/2		
OPERATIONAL BENEFITS					33
 Unique patented Macsoleno possible response times and out proof AC solenoid opera 	virtually burn- regula	design of valves, bases and tors for modular assembly and e	ease of		34
 Balanced poppet 4-way pilo maximum shifting forces, pre repeatability and consistent 	t valve provides 7. Interno ecise Manifo	enance. Il or external pilot operation. olds supplied with common exte	rnal		36
 MAC spool and bore combined away contamination, elimination. 	nation wipes 8. Air on atso atso at also at all also at all all also at all all also at all all also at all all also at all all also at all also at all all all all all all all all all	ly return. Optional memory sprii vailable.			32
allows for use on non-lube se 4. Large spool area for maximu		nal low wattage DC solenoid do att.	own to		37
even at minimum operating p 5. Very high flow in a compact					38
5. Very high now in a compact	package.			· ·	52
HOW TO ORDER					67
SINGLE PRESSURE MODE	LS				69
Pilot air	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	44
	14 4 2 12 T T T T T T T T T T T T T T T T T T T	14 4 2 12 T V V T 5 VOI V 3	14 4 2 12 12 12 12 12 12 12 12 12 12 12 12 1	14 4 2 12 12 12 12 12 12 12 12 12 12 12 12 1	46
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	42
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	7.4
DUAL PRESSURE MODELS					47
Pilot air	•	5/2 Single operator	5/2 Double operator	5/3 Pressure center	48P
		14 4 2 12	14 4 2 12 . 75 \		
L. Ld.s		550163	5 0 V 1 0 3	50 ¥ 03	48
Internal pilot From p		P3A-ACAD-DM-DxxP-xxx P3A-ACAE-DM-DxxP-xxx	MV-P3A-ADAD-DM-DxxP-xxx MV-P3A-ADAE-DM-DxxP-xxx	MV-P3A-AGAD-DM-DxxP-xxx MV-P3A-AGAE-DM-DxxP-xxx	
External pilot From "		P3A-ACAB-DM-DxxP-xxx	MV-P3A-ADAB-DM-DxxP-xxx MV-P3A-AGAB-DM-DxxP-xxx		400
SOLENOID OPERATOR >		DM-D <u>xx</u> P- <u>xxx</u>	•		92
					0.0
XX Voltage	X	Manual operator		rical connection	93
JA 110/50, 120/60 (2.9 JB 220/50, 240/60 (2.9		Non-locking recessed Locking recessed	DM Plug-in DN Plug-in	with diode	ISO 01
JC 24/50, 24/60 (2.9W)		DP Plug-in with M.O.V.			ISO 02
FB 24 VDC (1.8W) DA 24 VDC (5.4W)			DG Plug-in	with ground	150 02
DF 24 VDC (12.7W)					ISO 1
					150 7
Other options available, see po Note: - ISO series, valve and ba	age 309. Ise are ordered separately, see p	age 241 for base codes.			150 2
Other options available, see po Note: - ISO series, valve and ba - Ground wire required fo	age 309. se are ordered separately, see p or 30 volts or higher.	age 241 for base codes.			ISO 3

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

Pilot style :

MV-P3A-A**X**XX-XX-D**xx**P-**xxx**

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

MV-P3A-AXAX-XX-DxxP-xxx

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







Fluid: Compressed air, vacuum, inert gases

Pressure range: Internal pilot: 20 to 120 PSI

External pilot : vacuum to 120 PSI

Pilot pressure: Single/double operator: 20 to 120 PSI, 3 positions: 30 to 120 PSI

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

Filtration: 40 µ

Temperature range : $0^{\circ}F$ to $120^{\circ}F$ (- $18^{\circ}C$ to $+50^{\circ}C$)

Flow: 1/2": $(5.4 \, \text{C}_{\text{y}}) - 3/4$ ": $(6.1 \, \text{C}_{\text{y}})$

Class A continuous duty, #22 AWG leads

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

Voltage range:

-15% to +10% of nomina

Consult factory

Power: ~ Inrush 7.6 VA Holding: 4.8 VA

= 12.7 to 1.0 W Energize : 16.2 ms

Response times: Energize: 16.2 ms (5.4 W coil) De-energize: 13.6 ms

Options : • Sandwich regulator, see ,Regulators' section

Spare parts : • Pilot valve: DMB-DxxP-xxx • Valve to base pressure seal: 16614

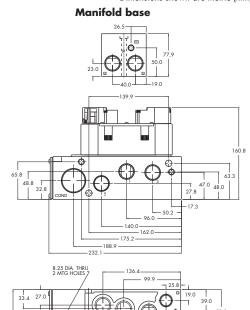
• Valve mounting screws (x4): 35451

Individual base

DIMENSIONS

29.0 29.0 20.0

Dimensions shown are metric (mm)





Section 2

Remote air valves

Function	Port size	Floш (Max) Cv	Individual m	Individual mounting		Manifold r	nounting	Series
			Inline	Sub-base non "plug-in"	Valve only – no base	Valve only no base		
5/2 - 5/3	1/8" - 1/4"	1.0	P. 203	P. 205				400
3/2	3/4" - 1"	20.0	P. 209				_	67
3/2 - 2/2	1 1/2" - 2" - 2 1/2"	60.0	P. 213				_	69
5/2 - 5/3	3/8" - 1/2"	3.1			P. 217	P. 217		ISO 2
5/2 - 5/3	1/2" - 3/4"	6.2			P. 221	P. 221		ISO 3

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

400

67

69

ISO 2

ISO 3

Function	Port size	Flow (Max)	Individual m	nounting	Series
5/2 - 5/3	1/8" - 1/4"	1.0 C _v	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
	12 2 4 14 II	12 2 4 14 14 14 13 15 15 15 15 15 15 15 15 15 15 15 15 15	12 2 4 14 D T T T T T T T T		
1/8" NPTF	411A-A0H-RA Mod 1493	421A-A0H-RA	451A-A0H-RA	461A-A0H-RA	471A-A0H-RA
1/4" NPTF	411A-B0H-RA Mod 1493	421 A-BOH-RA	451A-BOH-RA	461A-B0H-RA	471 A-B0H-RA

DUAL PRESSURE VALVES

Port size	5/2 Double operator
1/8" NPTF	441A-A0H-RA
1/4" NPTF	441A-B0H-RA







Fluid: Compressed air, vacuum, inert gases

Pressure range: Single operator: vacuum to 100 PSI Double operator: vacuum to 150 PSI

Air signal pressure: Single oper.: 40 to 150 PSI Double oper., 2 pos.: 20 to 150 PSI, 3 pos.: 35 to 150 PSI

Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)

Filtration: 40

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

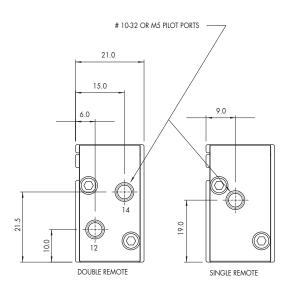
Flow: 1.0

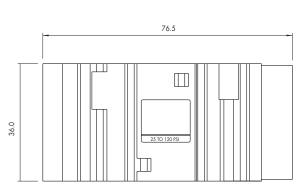
Note: Air signal must be ≥ main valve pressure

Option : • BSPP threads

DIMENSIONS

Dimensions shown are metric (mm)





Function	Port size	Flow (Max)	Individual mounting	Series
5/2 - 5/3	1/8" - 1/4"	1.0 C _v	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

on total reasonal triatal								
Port size	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	5/3 Pressure center			
	12 2 4 14 3 15 3 15	12 2 4 14 14 3 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1	12 2 4 14 D T T T T T T T T T T T T T T T T T T		12 2 4 14 14 14 15 15 15 15 15 15 15 15 15 15 15 15 15			
Valve less base	413A-00H-RA	423A-00H-RA	453A-00H-RA	463A-00H-RA	473A-00H-RA			
1/8" NPTF	413A-AAH-RA Mod 1493	423A-AAH-RA	453A-AAH-RA	463A-AAH-RA	473A-AAH-RA			
1/4" NPTF	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
	$ \begin{array}{c c} 12 & 4 \\ \hline 14 \\ \hline 3 & 15 \end{array} $
1/8" NPTF	443A-AAH-RA
1/4" NPTF	443A-BAH-RA

OPTIONS

423A-A**A**H-RA

-B for base with flow controls







Fluid: Compressed air, vacuum, inert gases

Pressure range: Single operator: vacuum to 100 PSI Double operator: vacuum to 150 PSI

Air signal pressure : Single oper.: 40 to 150 PSI Double oper., 2 pos.: 20 to 150 PSI, 3 pos.: 35 to 150 PSI

Lubrication: Not required, if used select a medium aniline point lubricant (between $180^{\circ}F$ and $210^{\circ}F$)

Filtration:

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

Flow:

Note: Air signal must be ≥ main valve pressure

• BSPP threads Options:

• Valve to base pressure seal: 16525 • Valve mounting screw (x2): 35043 Spare parts:

• Flow control assembly (x2): N-04001

DIMENSIONS Dimensions shown are metric (mm) #10-32 pilot port 55.0 19.05 STOCK REF DOUBLE REMOTE SINGLE REMOTE 1/8" - 27 N.P.T.F. 1/4" - 18 N.P.T.F. TYPICAL 31.0-OPTIONAL FLOW CONTROLS Ħ 9.5 REF. 28.10 33.1 38.1 **(** 4.30 DIA. (2) MIG. HOLES 53.00

Individual mounting Series

400

67

69

ISO 2

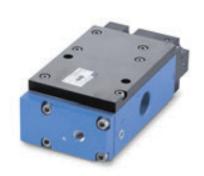
ISO 3

Function	Port size	Flow (Max)	Individual mounting	Series
3/2	3/4" - 1"	20.0 C _v	Inline	

OPERATIONAL BENEFITS

Balanced spool, immune to variations of pressure.

- 2. Powerful return forces thanks to the combination of mechanical and air springs.
- 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
		10 2 12 MD 73 01	10 2 12 MD 7 1 12 V3 01		
3/4" NPTF	Internal	67A-C3-ARA-RA	67A-A3-ARA-RA	67A-D4-ARA-RA	67A-B4-ARA-RA
1" NPTF		67A-C3-BRA-RA	67A-A3-BRA-RA	67A-D4-BRA-RA	67A-B4-BRA-RA
3/4" NPTF	External	67A-C3-ARB-RE	67A-A3-ARB-RE	-	-
1" NPTF		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.







Fluid: Compressed air, vacuum, inert gases

Pressure range: Vacuum to 150 PSI

Air signal pressure: 20 to 150 PSI (must be ≥ main valve pressure)

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

Filtration: 40

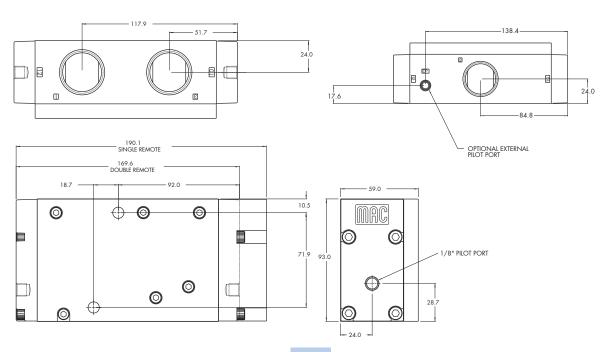
Temperature range: 0°F to 120°F (-18°C to 50°C)

Flow: 3/4": (14.5 C_v) - 1": (20.0 C_v)

Options : • BSPP threads

DIMENSIONS

Dimensions shown are metric (mm)





Remote air valves

Individual mounting Series

400

67

69

ISO 2

ISO 3

Function	Port size	Flow (Max)	Individual mo	ounting	Series
3/2 NO-NC, 2/2 NO-NC	1 1/2" - 2" - 2 1/2"	60.0 C _V	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

ISO 2

ISO 3

HOW TO ORDER

SINGLE OPERATOR

Port size	Air Spring	Single Operator NO valve	Single Operator NC valve
		10 2 12 dl	10 2 12 Gl
1 1/2"		69A-C3-ARA-RA	69A-A3-ARA-RA
2"	Internal	69A-C3-BRA-RA	69A-A3-BRA-RA
2 1/2"		69A-C3-CRA-RA	69A-A3-CRA-RA
1 1/2"		69A-C3-ARB-RE	69A-A3-ARB-RE
2"	External	69A-C3-BRB-RE	69A-A3-BRB-RE
2 1/2"		69A-C3-CRB-RE	69A-A3-CRB-RE

DOUBLE OPERATOR

Port size	Double Operator NO valve	Double Operator NC valve
	$ \frac{10}{10} \left[\begin{array}{c} 2 \\ \hline \\$	$-\frac{10}{10} \underbrace{\begin{array}{c} 2 \\ \sqrt{1} \\ \sqrt{3} \\ \sqrt{3} \\ \sqrt{3} \end{array}}_{1} \underbrace{\begin{array}{c} 12 \\ \sqrt{3} \\ -1 \end{array}}_{2}$
1 1/2"	69A-D4-ARB-RA	69A-B4-ARB-RA
2"	69A-D4-BRB-RA	69A-B4-BRB-RA
2 1/2"	69A-D4-CRB-RA	69A-B4-CRB-RA







Fluid: Compressed air, vacuum, inert gases

Pressure range: Vacuum to 150 PSI

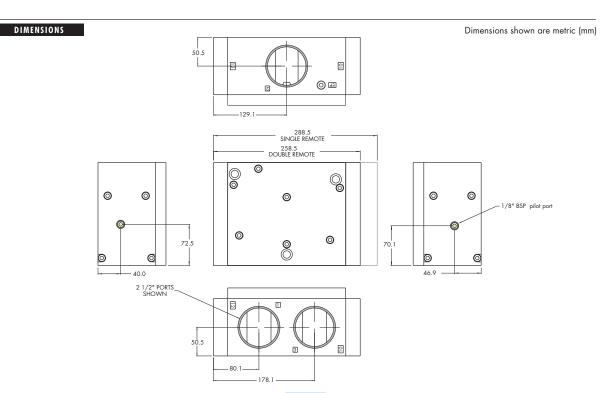
Air signal pressure: 20 to 150 PSI (must be ≥ main valve pressure)

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: Cv 60.0



Individual mounting	Series
Valve only – no base	
	400
Manifold mounting	67
Valve only - no base	69
	ISO 2

ISO 3



emote air valves

Function	Port size	Flow (Max)	Individual/Manifold mounting	Series
5/2 - 5/3	3/8" - 1/2"	3.1 C _V	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.
- 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 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	
	14 4 2 12 	14 4 2 12 	14 4 2 12 D 34 4	14 4 2 12 	
Internal	MV-R2A-BACF	MV-R2A-BBAK	MV-R2A-BEAK	MANA DEAL	
External	MV-R2A-BACG	MV-KZA-DDAN	MV-KZA-DEAN	MV-R2A-BFAK	
DUAL PRESSURE MODELS					
Air spring	5/2 Single operator	5/2 Double operator	5/3 Open center	5/3 Pressure center	
Air spring		•	· ·	· · · · · · · · · · · · · · · · · · ·	
Air spring	Single operator	14 4 2 12	Open center 14 4 2 12	Pressure center	
	Single operator 14	14 4 2 12	Open center 14 4 2 12	Pressure center	

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







Fluid: Compressed air, vacuum, inert gases

Pressure range: Vacuum to 150 PSI

Air signal pressure: Single/double operator: 20 to 150 PSI 3 position: 30 to 150 PSI

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

Filtration: 40

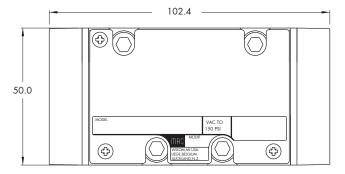
Temperature range: 0°F to 120°F (-18°C to 50°C)

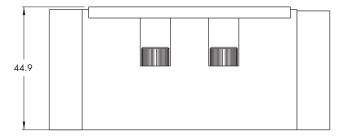
Flow: 3/8": (2.8 Cv) - 1/2": (3.1 Cv)

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

DIMENSIONS

Dimensions shown are metric (mm)





Individual mounting	Series
Valve only – no base	
	400
Manifold mounting	67
Valve only – no base	69
	ISO 2

Function	Port size	Flow (Max)	Individual/Manifold mounting	Series
5/2 - 5/3	1/2" - 3/4"	6.2 C _V	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.
- Bonded spool with minimum friction, shifting in a glass-like finished bore.
- 4. Wiping effect eliminates sticking.5. Long service life.



400

67

ISO 2

HOW TO ORDER

SINGLE PRESSURE MODELS

Air spring	5/2 Single operator	5/2 Double operator	5/3 Closed center	5/3 Open center	
	14 4 2 12 	14 4 2 12 	14 4 2 12 	14 4 2 12 12 D T V V T V T G T 5 V O V 3	
Internal	MV-R3A-BACF	ANA DO A DD ANA	ANA DOA DEAK	ANA DOA DEAK	
External	MV-R3A-BACG	MV-R3A-BBAK	MV-R3A-BEAK	MV-R3A-BFAK	

DUAL PRESSURE MODELS

Air spring	5/2 Single operator	5/2 Double operator	5/3 Pressure center
	14 	$ \begin{array}{c c} 14 \\ - \cdot \cdot \boxed{2} \\ \hline $	$ \begin{array}{c c} 14 & 4 & 2 \\ -12 & 12 & 12 \\ \hline -12 & 1$
Internal port #3	MV-R3A-BCCH		
Internal port #5	MV-R3A-BCCJ	MV-R3A-BDAK	MV-R3A-BGAK
External	MV-R3A-BCCG		

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







Flow:

Fluid:
Compressed air, vacuum, inert gases

Pressure range:
Vacuum to 150 PSI

Air signal pressure:
Single/double operator: 20 to 150 PSI 3 position: 30 to 150 PSI

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

Filtration:
40 µ

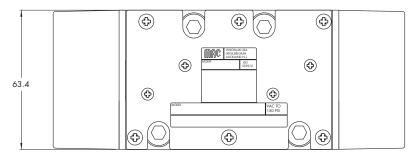
Temperature range:
0°F to 120°F (-18°C to 50°C)

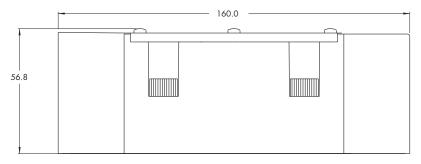
Spare parts : • Valve to base pressure seal: 16614 • Valve mounting screws (x4): 35451

1/2" : (5.4 C_v) - 3/4" : (6.2 C_v)

DIMENSIONS

Dimensions shown are metric (mm)







Section 3

Bases according to ISO standards



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



Series

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



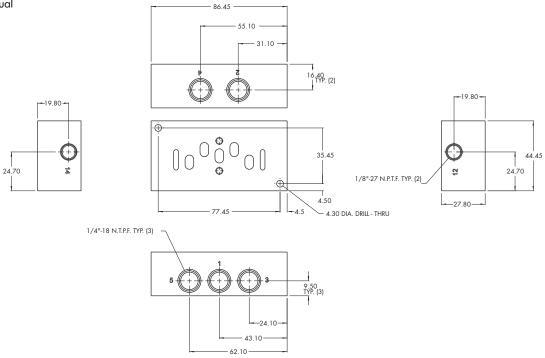




DIMENSIONS

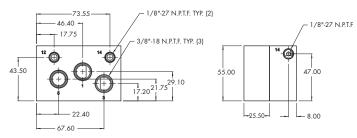
Dimensions shown are metric (mm)

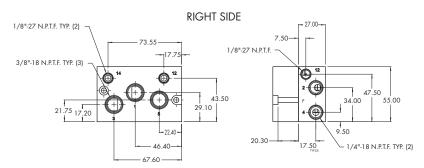




Manifold

LEFT SIDE







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 43.00-42.00 -- 28.00 -- 27.00-1/8"-27 N.P.T.F. TYP. (7) PLACES 15.00 26.50 33.50 17.75 17.75 \oplus 3.50 15.00 -15.00 - - 61.35 -– 4.25 DIA. DRILL - THRU L **—** 23.00-- 20.45 -8.00 TYP. (3) Manifold LEFT SIDE 1/8"-27 N.P.T.F. TYP. (2) -33.75 1/8"-27 N.P.T.F. 11.75-1/4"-18 N.P.T.F. TYP. (3) ٠ 42.00 50.00 42.00 35.00 17.70 -18.30 - 9.50 -50.65-19.00 RIGHT SIDE -55.65 1/8"-27 N.P.T.F TYP. (2) -12.80 -33.75-22.70 1/8"-27 N.P.T.F. 1/4"-18 N.P.T.F TYP. (3) -11.75 7.50-42.00 TYP.(2) 35.00 17.70 27.60 18.30

-50.65



Non plug-in base / manifold



ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

HOW TO ORDER

INDIVIDUAL BASE

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

MANIFOLD BASE

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

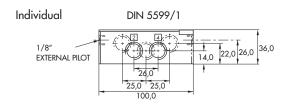
Manifold fastening kit: N-63002-01. Valve blanking plate: MA1003. Inlet/exhaust isolator plug: 32835.

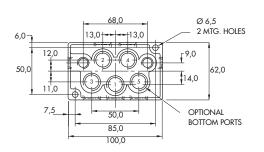


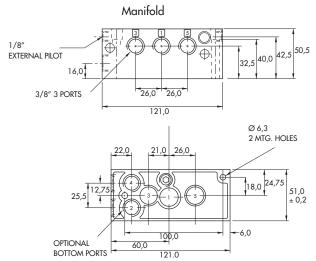




DIMENSIONS









Plug-in base / manifold



ISO 01

ISO 1

ISO 2

ISO 3

HOW TO ORDER

INDIVIDUAL BASE

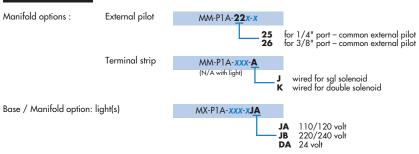
Port size	Wired for	Side ports	Side ports w/ bottom 2 & 4 ports	All side & bottom ports
1/4" NPTF	Single solenoid	MB-P1A-221-A	MB-P1A-222-A	MB-P1A-223-A
1/ 4 NPIF	Double solenoid	MB-P1A-221-B	MB-P1A-222-B	MB-P1A-223-B
3/8" NPTF	Single solenoid	MB-P1A-231-A	MB-P1A-232-A	MB-P1A-233-A
	Double solenoid	MB-P1A-231-B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



Accessories: M-P1001 Valve blanking plate.

N-P1007-01 Manifold fastening kit. 32835 Inlet/exhaust isolator plug.



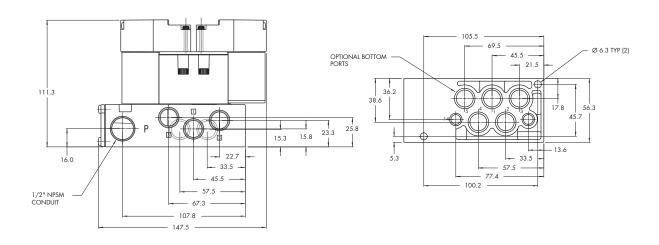


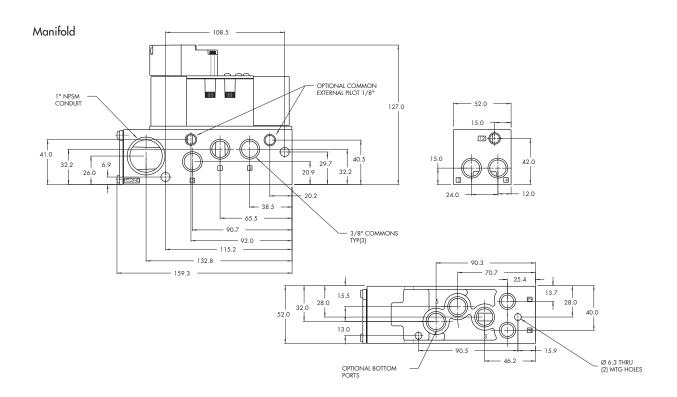


DIMENSIONS

Dimensions shown are metric (mm)

Individual







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
3/8" NPTF	MB-A2B-221	MB-A2B-223	MB-A2B-222	MB-A2B-224
1/2" NPTF	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
3/8" NPTF	MM-A2B-221	MM-A2B-223	MM-A2B-222	MM-A2B-224
1/2" NPTF	MM-A2B-231	MM-A2B-233	MM-A2B-232	MM-A2B-234

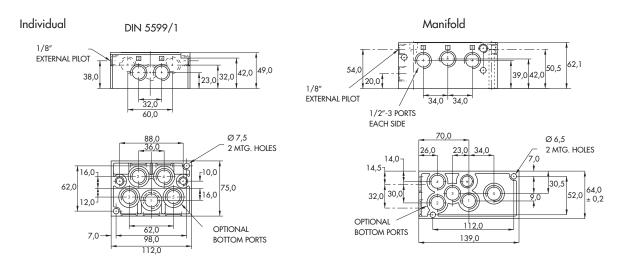
Manifold fastening kit: N-63002-01. Valve blanking plate: MA2003. Inlet/exhaust isolator plug: 32839.







DIMENSIONS





Plug-in base / manifold



ISO 01

ISO 02

ISO 1

ISO 2

ISO 3

HOW TO ORDER

INDIVIDUAL BASE

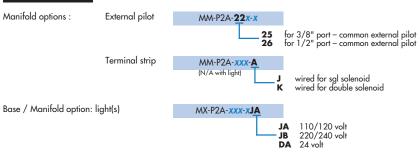
Port size	Wired for	Side ports	Side ports w/ bottom 2 & 4 ports	All side & bottom ports
3/8" NPTF	Single solenoid	MB-P2A-221-A	MB-P2A-222-A	MB-P2A-223-A
3/6 NPIF	Double solenoid	MB-P2A-221-B	MB-P2A-222-B	MB-P2A-223-B
1/2" NPTF	Single solenoid	MB-P2A-231-A	MB-P2A-232-A	MB-P2A-233-A
	Double solenoid	MB-P2A-231-B	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)
3/8" NPTF	Single solenoid	MM-P2A-221-A	MM-P2A-222-A	MM-P2A-223-A
3/0" NPIF	Double solenoid	MM-P2A-221-B	MM-P2A-222-B	MM-P2A-223-B
1/2" NPTF	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



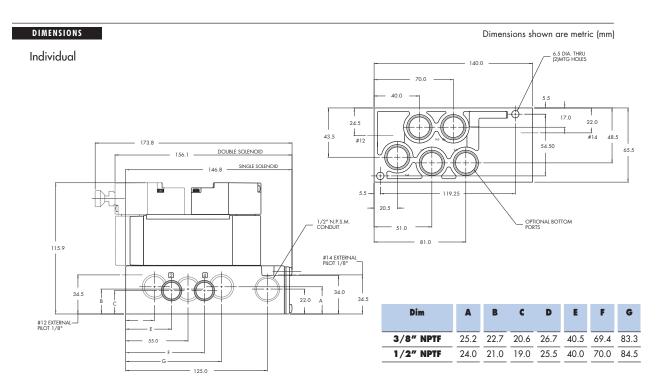
Accessories: M-P2001 Valve blanking plate.

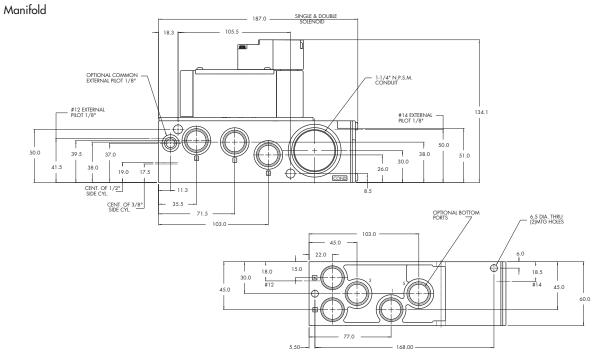
N-P2004-01 Manifold fastening kit. 32839 Inlet/exhaust isolator plug.













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

Coptional Integral Flow Controls





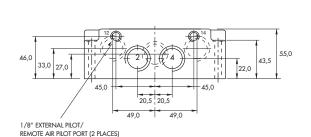


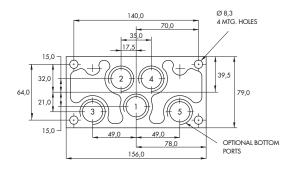
DIMENSIONS

Dimensions shown are metric (mm)

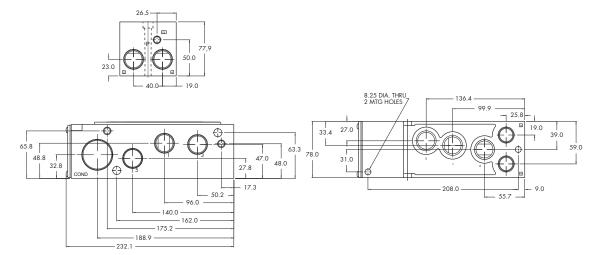
Individual

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)
1/2" NPTF	Single solenoid	MM-P3A-221-A	MM-P3A-222-A	MM-P3A-223-A
1/2" NPIF	Double solenoid	MM-P3A-221-B	MM-P3A-222-B	MM-P3A-223-B
2 /4// NIDTF	Single solenoid	MM-P3A-231-A	MM-P3A-232-A	MM-P3A-233-A
3/4" NPTF	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-22x-x

25 for 1/2" port – common external pilot for 3/4" port – common external pilot

Terminal strip

MM-P3A-xxx-A

Wired for sgl solenoid

K wired for double solenoid

Iight(s)

MM-P3A-xxx-XJA

JA 110/120 volt

JB 220/240 volt

DA 24 volt

Accessories: M-P3001

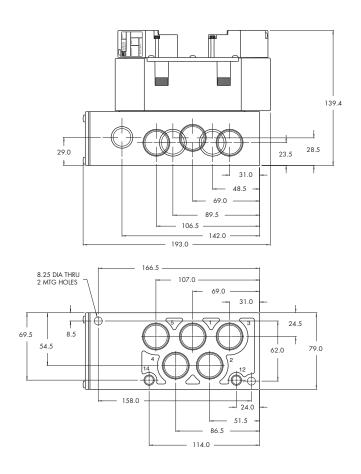
N-P3003-01 32845 Valve blanking plate. Manifold fastening kit. Inlet/exhaust isolator plug.







DIMENSIONS





Section 4

Pressure regulators



Sandwich pressure regulator with manual adjust knob	P. 247	PR37A
Sandwich pressure regulator with manual adjust knob	P. 249	PR42B
Sandwich pressure regulator	P. 251	PR46A
Sandwich pressure regulator with manual adjust knob	P. 253	PR47A
Sandwich pressure regulator with manual adjust knob	P. 255	PR48B
Sandwich pressure regulator with air pilot adjust	P. 257	-
Sandwich pressure regulator with manual adjust knob	P. 259	PR92C
Sandwich pressure regulator with manual adjust knob	P. 261	
Sandwich pressure regulator with air pilot adjust	P. 263	
Sandwich pressure regulator with manual adjust knob	P. 265	PR93A
Sandwich pressure regulator with manual adjust knob	P. 267	
Non plug-in sandwich pressure regulator with manual adjust	P. 269	PRAO1A
Plug-in sandwich pressure regulator with air pilot adjust	P. 271	PRACIA
Non plug-in sandwich pressure regulator with manual adjust	P. 273	PRA02A
Non plug-in sandwich pressure regulator with manual adjust knob	P. 275	DDAIA
Non plug-in sandwich pressure regulator with air pilot adjust	P. 277	PRA 1 A
Plug-in sandwich pressure regulator with manual adjust knob	P. 279	
Plug-in sandwich pressure regulator with air pilot adjust	P. 281	PRP1A
Non plug-in sandwich pressure regulator with manual adjust knob	P. 283	
Non plug-in sandwich pressure regulator with air pilot adjust	P. 285	PRA2D
Plug-in sandwich pressure regulator with manual adjust knob	P. 287	
Plug-in sandwich pressure regulator with air pilot adjust	P. 289	PRP2B
Non plug-in sandwich pressure regulator with manual adjust knob	P. 291	
Non plug-in sandwich pressure regulator with air pilot adjust	P. 293	PRA3C
Plug-in sandwich pressure regulator with manual adjust knob	P. 295	
Plug-in sandwich pressure regulator with air pilot adjust	P. 297	PRP3B

Sandwich pressure regulator with manual adjust knob

OPERATIONAL BENEFITS

Series **PR37**

- 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
No gage port	PR37A-FAAA
With gage Port (plugged)	PR37A-FABA

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

OPTIONS

Adjustment :

PR37A-**F**xxx **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

PRA01A

PR93A

PRA02A

PRA 1 A

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

Pressure range: 0 to 120 PSI

Regulating range: 0 to 120 PSI

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

Filtration: 40

Temperature range : $0^{\circ}F$ to $120^{\circ}F$ (- $18^{\circ}C$ to $+50^{\circ}C$)

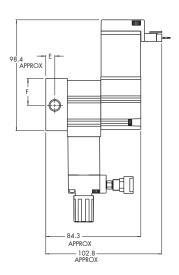
Flow: 0.4 C_v

Spare parts: Pressure regulator (less sandwich block): PR37A-GOAA (knob), PR37A-COAA (slotted stem), PR37A-LOAA (slotted stem), P

• 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



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 "12" end Internal pilot	Regulator "12" end External pilot
No gage port	PR42B-BAAA	PR42B-BBAA
With gage Port	PR42B-BABA	PR42B-BBBA

PLUG-IN SANDWICH REGULATORS

Gage	Regulator "12" end Internal pilot	Regulator "12" end External pilot	
No gage port	PR42B-AAAA	PR42B-ABAA	
With gage Port	PR42B-AABA	PR42B-ABBA	

- 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.







193A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

0 to 120 PSI Pressure range:

0 to 120 PSI Regulating range:

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

Filtration:

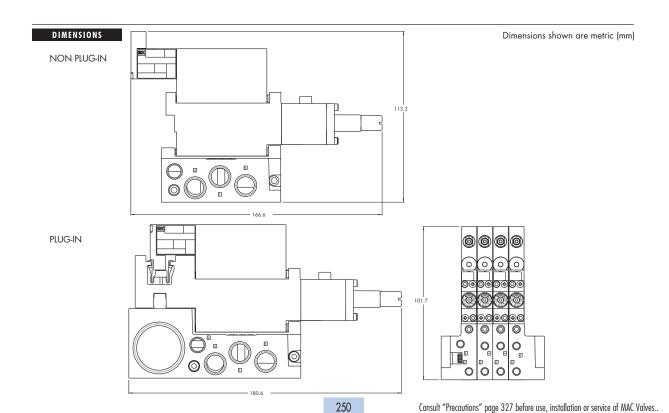
Temperature range: 0° F to 120° F (- 18° C to $+50^{\circ}$ C)

Flow: 0.25 C_v

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) 24177-060 (0 to 60 PSI, 23 mm)



Sandwich-pressure regulator

OPERATIONAL BENEFITS

- 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

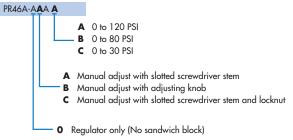
PR92C

HOW TO ORDER

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

OPTIONS

Pressure range :



Notes: gadges must be ordered separately, not included with regulator.

Recommended gage : 24165-150 (15 mm)

PRA01A

PRA02A

PRA 1 A

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

Pressure range: 0 to 120 PSI

Regulating range: 0 to 120 PSI

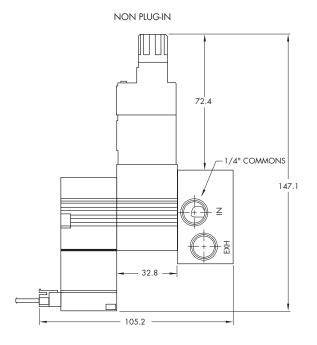
Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)

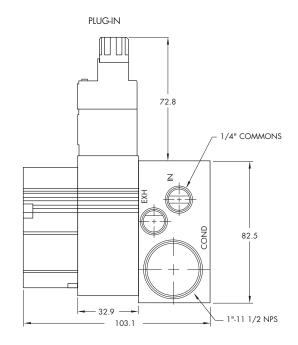
Filtration: 40

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

Flow: Cv 0,21

DIMENSIONS





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

PR48B

HOW TO ORDER

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

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

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

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

OPTIONS

Pressure range :

PR47A-xxxA **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-Fxxx F Knob

B Screwdriver slot K Screwdriver slot with locknut PR47A

PR92C

PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

Pressure range: 0 to 120 PSI

Regulating range: 0 to 120 PSI

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

Filtration: 40

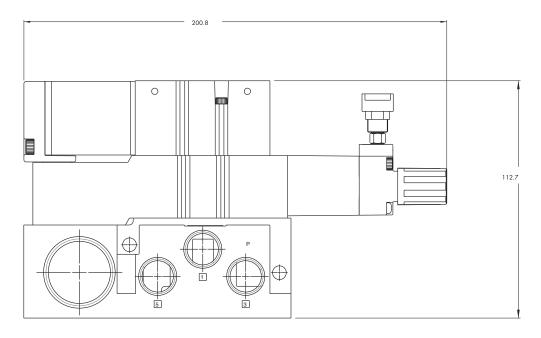
Temperature range : $0^{\circ}F$ to $120^{\circ}F$ (- $18^{\circ}C$ to $+50^{\circ}C$)

Flow: 0.4 C_v

Spare parts: Pressure regulator (less sandwich block): PR47A-GOAA (knob), PR47A-COAA (screwdriver slot), PR47A-LOAA (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





Sandwich pressure regulator with manual adjust knob

OPERATIONAL BENEFITS

- 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 (KNOB ADJUSTMENT)

Gage	Regulator "12" end Internal pilot	Regulator "12" end External pilot	
Gage port	PR48B-BAAA	PR48B-BBAA	PR93

PLUG-IN SANDWICH REGULATORS (KNOB ADJUSTMENT)

Gage	Regulator "12" end Internal pilot	Regulator "12" end External pilot	PRAO
Gage port	PR 18R- A A A A	PR 18R-ΔBΔΔ	1 11110

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

Internal pilot option in base
External pilot option in valve

PRP1A

PRA02A

PRA1A

PRA2D

PRP2B

PRA3C

PRP3B

OPTIONS

Pressure range :

PR48B-XXXA

A 0 to 120 PSI

B 0 to 80 PSI

C 0 to 30 PSI

Adjustment for: Plug-in regulator
PR48B-AXXX

A Knob

D Screwdriver slot

G Screwdriver slot with locknut

Non plug-in regulator PR48B-**B**xxx

B Knob
E Screwdriver slot
H Screwdriver slot

H Screwdriver slot with locknut







Fluid: Compressed air, inert gases

Pressure range: 0 to 120 PSI

Regulating range: 0 to 120 PSI

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

Filtration: 40 µ

Temperature range : $0^{\circ}F$ to $120^{\circ}F$ (- $18^{\circ}C$ to $+50^{\circ}C$)

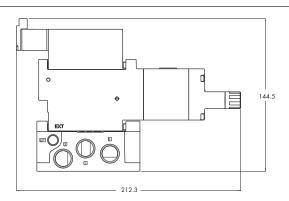
Flow: 0.8

Spare parts: Pressure regulator (less sandwich block): PR48B-COAA (knob), PR48B-FOAA (screwdriver slot), PR48B-JOAA (screwdr

 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)

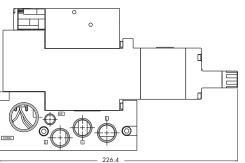
DIMENSIONS

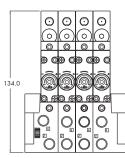
NON PLUG-IN



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 "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
Gage port only (plugged)	PR92C-EAAA	PR92C-EBAA	PR92C-ECAA	PR92C-EDAA	PR92C-EEAA
Gage with face perpendicular to manual operator	PR92C-EABA	PR92C-EBBA	PR92C-ECBA	PR92C-EDBA	PR92C-EEBA
Gage with face parallel to manual operator	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
Gage port only (plugged)	PR92C-GAAA	PR92C-GBAA	PR92C-GCAA	PR92C-GDAA	PR92C-GEAA
Gage with face perpendicular to manual operator	PR92C-GABA	PR92C-GBBA	PR92C-GCBA	PR92C-GDBA	PR92C-GEBA
Gage with face parallel to manual operator	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

PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

0 to 120 PSI Pressure range: 0 to 120 PSI Regulating range:

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

Filtration:

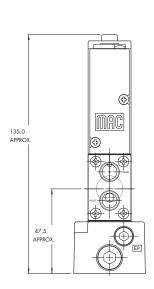
Temperature range: 0° F to 120° F (- 18° C to $+50^{\circ}$ C)

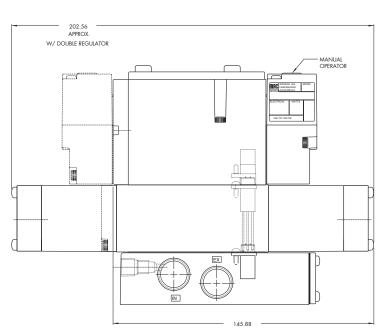
Flow:

• R-92003 : regulator end plate kit • Gage kit 0 - 160 PSI: N-92006-01 Spare parts :

R-92003-01: regulator by-pass end plate kit
 Pressure regulator (less sandwich block): PR92C-H0AA

DIMENSIONS





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
No Gage	PR92C-JAAA	PR92C-JBAA	PR92C-JCAA	PR92C-JDAA	PR92C-JEAA
Gage with face perpendicular to manual operator	PR92C-JABA	PR92C-JBBA	PR92C-JCBA	PR92C-JDBA	PR92C-JEBA
Gage with face parallel to manual operator	PR92C-JACA	PR92C-JBCA	PR92C-JCCA	PR92C-JDCA	PR92C-JECA

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
No Gage	PR92C-LAAA	PR92C-LBAA	PR92C-LCAA	PR92C-LDAA	PR92C-LEAA
Gage with face perpendicular to manual operator	PR92C-LABA	PR92C-LBBA	PR92C-LCBA	PR92C-LDBA	PR92C-LEBA
Gage with face parallel to manual operator	PR92C-LACA	PR92C-LBCA	PR92C-LCCA	PR92C-LDCA	PR92C-LECA

^{*} For use with dual pressure valves.

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

OPTIONS

Regulator less sandwich block

PR92C-x0xx

M Knob

D Slotted stem

Slotted stem with locknut

Other adjustment

PR92C-XXXX

Slotted stem, single solenoid Slotted stem, double solenoid

Ν

Slotted stem, non plug-in
Knob, double solenoid
Slotted stem w/ locknut, single solenoid
Slotted stem w/ locknut, double solenoid Slotted stem w/ locknut, non plug-in

PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

Pressure range: 0 to 120 PSI 0 to 120 PSI Regulating range:

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

Filtration:

 0° F to 120° F (- 18° C to $+50^{\circ}$ C)

Temperature range: Flow: $0.8 C_v$

• R-92003 : end plate kit • R-92003-01: by-pass end plate kit Spare parts:

• Gage kit 0 - 160 PSI: N-92006-01 • Gage kit 0 - 100 PSI: N-92006-02

• Gage kit 0 – 60 PSI : N-92006-03

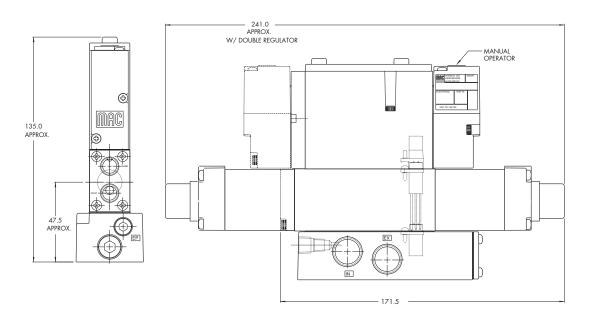
Options: • Pressure range: PR92C-xxxA (A 0 to 120 PSI)

> 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 O to 80 PSI "A" end, 0 to 30 PSI "B" end - J O to 80 PSI "B" end, 0 to 30 PSI "A" end

DIMENSIONS





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

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

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

	The second secon			
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

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 Slotted stem

> > Slotted stem with locknut

Other adjustment

PR92C-xxxx

Slotted stem, single solenoid Slotted stem, double solenoid

Slotted stem, non plug-in Knob, double solenoid

Slotted stem w/ locknut, single solenoid Slotted stem w/ locknut, double solenoid Slotted stem w/ locknut, non plug-in

PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

Pressure range: 0 to 120 PSI 0 to 120 PSI Regulating range:

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

Filtration:

 0° F to 120° F (- 18° C to $+50^{\circ}$ C) Temperature range:

Flow: $0.8 C_v$

• R-92003 : end plate kit • R-92003-01: by-pass end plate kit Spare parts:

• Gage kit 0 - 160 PSI: N-92006-01 • Gage kit 0 - 100 PSI: N-92006-02

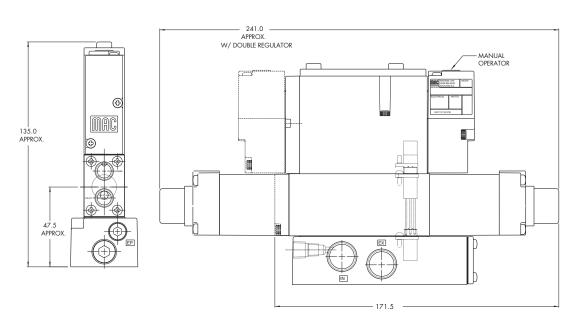
• Gage kit 0 – 60 PSI : N-92006-03

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 O to 80 PSI "A" end, 0 to 30 PSI "B" end - J O to 80 PSI "B" end, 0 to 30 PSI "A" end

DIMENSIONS



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
Gage port only (plugged)	PR93A-DAAA	PR93A-DBAA	PR93A-DCAA	PR93A-DDAA	PR93A-DEAA
Gage with face perpendicular to manual operator	PR93A-DABA	PR93A-DBBA	PR93A-DCBA	PR93A-DDBA	PR93A-DEBA
Gage with face parallel to manual operator	PR93A-DACA	PR93A-DBCA	PR93A-DCCA	PR93A-DDCA	PR93A-DECA

PR93A

PRA01A

PRA02A

REGULATORS FOR "NON PLUG-IN" VALVES PRA1A

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
Gage port only (plugged)	PR93A-EAAA	PR93A-EBAA	PR93A-ECAA	PR93A-EDAA	PR93A-EEAA
Gage with face perpendicular to manual operator	PR93A-EABA	PR93A-EBBA	PR93A-ECBA	PR93A-EDBA	PR93A-EEBA
Gage with face parallel to manual operator	PR93A-EACA	PR93A-EBCA	PR93A-ECCA	PR93A-EDCA	PR93A-EECA

PRP1A

PRA2D

PRP2B

PRA3C

PRP3B

Note: Above models may be used with either single or double solenoid valves.

* For use with dual pressure valves.







Fluid: Compressed air, inert gases

Pressure range: 0 to 120 PSI

Regulating range: 0 to 120 PSI

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)

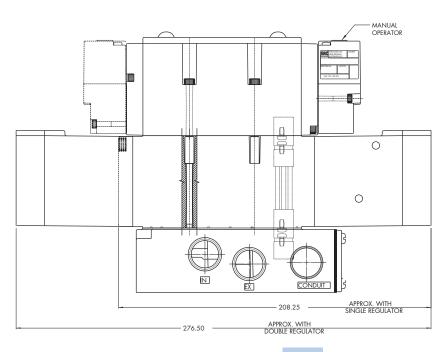
Flow: 2.4 C_v

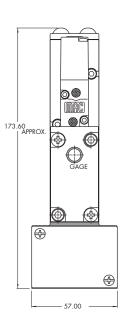
Spare parts : • Regulator end plate kit: R-93004 • Regulator by-pass end plate kit: R-93004-01

• Gage kit: N-92006-01 (0 to 160 PSI)

• Pressure regulator (less sandwich block): PR93A-F0AA

DIMENSIONS







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
Gage port only (plugged)	PR93A-GAAA	PR93A-GBAA	PR93A-GCAA	PR93A-GDAA	PR93A-GEAA
Gage with face perpendicular to manual operator	PR93A-GABA	PR93A-GBBA	PR93A-GCBA	PR93A-GDBA	PR93A-GEBA
Gage with face parallel to manual operator	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
Gage port only (plugged)	PR93A-HAAA	PR93A-HBAA	PR93A-HCAA	PR93A-HDAA	PR93A-HEAA
Gage with face perpendicular to manual operator	PR93A-HABA	PR93A-HBBA	PR93A-HCBA	PR93A-HDBA	PR93A-HEBA
Gage with face parallel to manual operator	PR93A-HACA	PR93A-HBCA	PR93A-HCCA	PR93A-HDCA	PR93A-HECA

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C

PRP3B

* For use with dual pressure valves. Note: Regulating range for above models is 0 to 120 PSI. For other ranges, see technical data page.

Regulator less sandwich block Other adjustment PR93A-<u>x</u>0xx PR93A-xxxx Slotted stem, plug-in Slotted stem, non plug-in Slotted stem w/ locknut, plug-in Slotted stem w/ locknut, non plug-in Knob В Slotted stem M Slotted stem with locknut

Note: Above models may be used with either single or double solenoid valves.







Fluid: Compressed air, inert gases

Pressure range: 0 to 120 PSI

Regulating range: 0 to 120 PSI

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

Filtration: 40

Temperature range : $0^{\circ}F$ to $120^{\circ}F$ (- $18^{\circ}C$ to $+50^{\circ}C$)

Flow: 2.4 C_v

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

C 0 to 30 PSI

D 0 to 120 PSI "A" end, 0 to 80 PSI "B" end

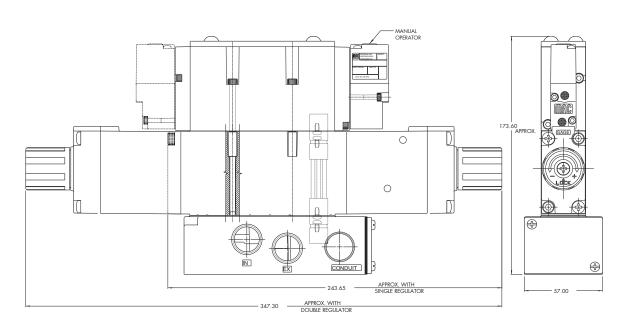
E 0 to 120 PSI "B" end, 0 to 80 PSI "A" end

F 0 to 120 PSI "A" end, 0 to 30 PSI "B" end

G 0 to 120 PSI "A" end, 0 to 30 PSI "B" end

— H O to 80 PSI "A" end, O to 30 PSI "B" end — J O to 80 PSI "B" end, O to 30 PSI "A" end

DIMENSIONS



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.
Gage port only (plugged)	PR93A-GPAA	PR93A-GRAA	PR93A-GSAA	PR93A-GTAA
Gage with face perpendicular to manual operator	PR93A-GPBA	PR93A-GRBA	PR93A-GSBA	PR93A-GTBA
Gage with face parallel to manual operator	PR93A-GPCA	PR93A-GRCA	PR93A-GSCA	PR93A-GTCA

PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

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.
Gage port only (plugged)	PR93A-HPAA	PR93A-HRAA	PR93A-HSAA	PR93A-HTAA
Gage with face perpendicular to manual operator	PR93A-HPBA	PR93A-HRBA	PR93A-HSBA	PR93A-HTBA
Gage with face parallel to manual operator	PR93A-HPCA	PR93A-HRCA	PR93A-HSCA	PR93A-HTCA

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

PRA3C

OPTIONS

Regulator less sandwich block

PR93A-<u>x</u>0xx

J Knob C Slotted stem M Slotted stem with locknut Other adjustment PR93A-xxxx

Slotted stem, plug-in Slotted stem, non plug-in Slotted stem w/ locknut, plug-in Slotted stem w/ locknut, non plug-in

PRP3B

Note: Above models may be used with either single or double solenoid valves.







Fluid: Compressed air, inert gases

Pressure range: 0 to 120 PSI 0 to 120 PSI Regulating range:

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

Filtration:

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

 $2.4 C_v$

• Regulator end plate kit :R-93004 • Regulator by-pass end plate kit : R-93004-01. Spare parts:

• Gage kit 0 - 160 PSI: N-92006-01 • Gage kit 0 - 100 PSI: N-92006-02

• Gage kit 0 – 60 PSI : N-92006-03

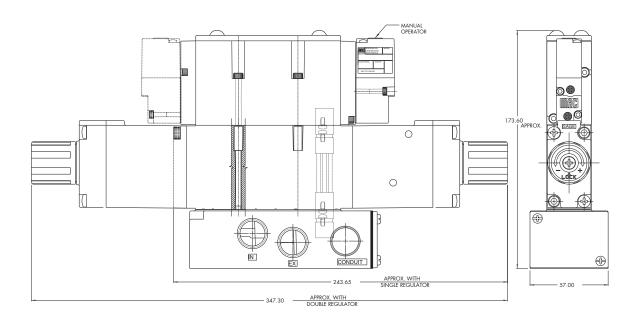
Option: • Pressure range: PR93A-xxx<u>A</u> (A 0 to 120 PSI)

> ·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



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
Internal	PRA01A-AAAA	PRA01A-ABAA	PRA01A-ADAA	PRA01A-AEAA
External	PRA01A-BAAA	PRA01A-BBAA	PRA01A-BDAA	PRA01A-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.

OPTIONS

Adjustments:

PRA01A - xxxx

A Manual adjust with knob - Internal pilot

Manual adjust with knob - External pilot В

G Manual adjust with screwdriver slot – Internal pilot

H Manual adjust with screwdriver slot - External pilot

Manual adjust with screwdriver slot with locknut- Internal pilot

Manual adjust with screwdriver slot with locknut - External pilot

Regulated Pressure range :

PRA01A - xxxx

A 0 to 120 PSI

В 0 to 80 PSI

0 to 30 PSI

0 to 120 PSI "14" end - 0 to 80 PSI "12" end 0 to 120 PSI "12" end - 0 to 80 PSI "14" end 0 to 120 PSI "14" end - 0 to 30 PSI "14" end 0 to 120 PSI "14" end - 0 to 30 PSI "12" end 0 to 120 PSI "12" end - 0 to 30 PSI "14" end

G

0 to 80 PSI "14" end - 0 to 30 PSI "12" end

0 to 80 PSI "12" end - 0 to 30 PSI "14" end

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C

^{*} To be used with dual pressure valves.







Temperature range :

Fluid: Compressed air, inert gases

Pressure supply: Higher than maximum regulated pressure (max. 8,5 bar)

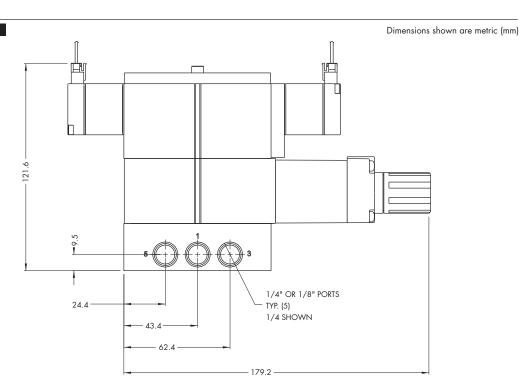
Regulating range: 0 to 120 PSI

Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)

Filtration: 40

0°F to 120°F (-18°C to +50°C)

DIMENSIONS



Non plug-in sandwich pressure regulator with air pilot adjust

OPERATIONAL BENEFITS

- 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	PR
Internal	PRA01A-DAAA	PRA01A-DBAA	PRA01A-DDAA	PRA01A-DEAA	PIN
External	PRA01A-EAAA	PRA01A-EBAA	PRA01A-EDAA	PRA01A-EEAA	

Note: Only pressure range available for air adjust regulator is 0-120 PSI.

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C

^{*} To be used with dual pressure valves.







Temperature range :

Fluid: Compressed air, inert gases

Pressure range: Higher than maximum regulated pressure

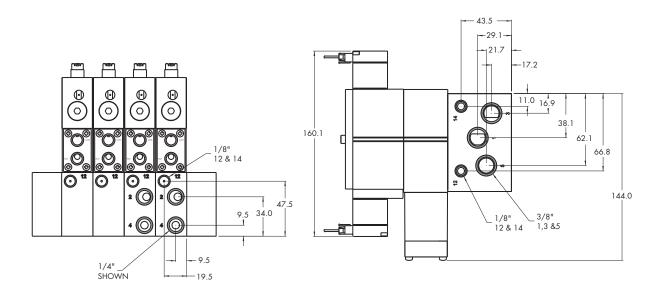
Regulating range: 0 to 120 PSI

Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)

Filtration: 40

0°F to 120°F (-18°C to +50°C)

DIMENSIONS





IJ 6 6 Ш a 1 0

Series

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



PR42B PR46A PR47A PR48B

PR37A

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	PR93A
Internal	PRA02A-AAAA	PRA02A-ABAA	PRA02A-ADAA	PRA02A-AEAA	FRYUE
External	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.

OPTIONS

Adjustments:

PRA02A	 <u>xxxx</u>
--------	---------------------------------

- 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 Manual adjust with screwdriver slot with locknut- Internal pilot
- Manual adjust with screwdriver slot with locknut External pilot

Regulated Pressure range :

PRA02A - xxxx

- **A** 0 to 120 PSI
 - В 0 to 80 PSI
 - 0 to 30 PSI

 - 0 to 120 PSI "14" end 0 to 80 PSI "12" end 0 to 120 PSI "12" end 0 to 80 PSI "14" end 0 to 120 PSI "14" end 0 to 30 PSI "12" end 0 to 120 PSI "12" end 0 to 30 PSI "12" end
 - G
 - 0 to 80 PSI "14" end 0 to 30 PSI "12" end
 - 0 to 80 PSI "12" end 0 to 30 PSI "14" end

PRA01A

PRAO2A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C

^{*} To be used with dual pressure valves.







Temperature range :

Fluid: Compressed air, inert gases

Pressure supply: Higher than maximum regulated pressure

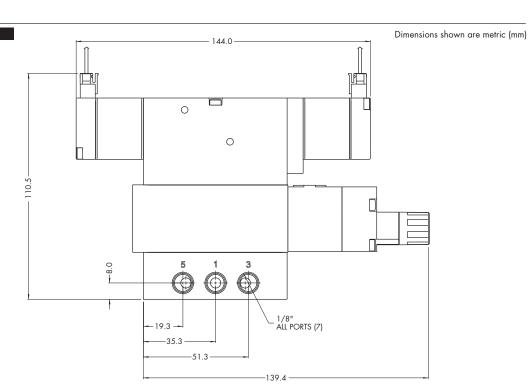
Regulating range: 0 to 120 PSI

Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)

Filtration: 40

0°F to 120°F (-18°C to +50°C)

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

PR93A

PRA01A

PRA02A

PRA 1 A

PRP1A

PRA2D

PRP2B

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

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 1 4 end Regulated pressure to port 4	Dual pressure * Regulator 12 end Regulated pressure to port 2	Dual pressure Pual 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

^{* -} 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

for slotted stem adjustment (internal pilot)

for slotted stem adjustment (external/remote air)

for slotted stem with locknut (internal pilot)

for slotted stem with locknut (external/remote air)

PRP3B

PRA3C







 Fluid:
 Compressed air, inert gases

 Pressure range:
 0 to 150 PSI

 Regulating range:
 0 to 120 PSI (other ranges see below)

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

Filtration: 40 µ

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

Flow: 1.0 C_v

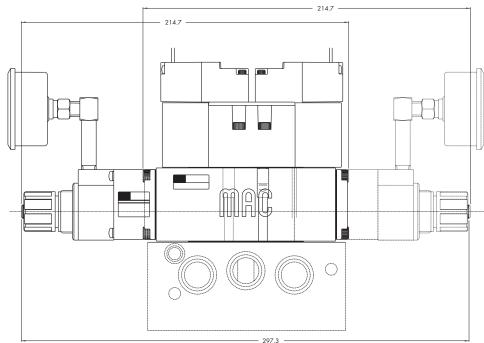
Spare parts: Pressure regulator (less sandwich block): PRA1A-JOAA (KNOB), PRA1A-COAA (SLOTTED STEM), PRA1A-MOAA (SLOTTED STEM WITH LOCKNUT).

Gage: N-82016-01 (0-120 PSI perpendicular) N-82016-02 (0-120 PSI perpendicular) N-82016-03 (0-80 PSI perpendicular) N-82016-04 (0-80 PSI perpendicular) N-82016-05 (0-30 PSI perpendicular) N-82016-06 (0-30 PSI perpendicular) N-82016-06 (0-30 PSI perpendicular)

Regulating range options : PRA1A-XXXA

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

DIMENSIONS





Non plug-in sandwich pressure regulator with air pilot adjust

OPERATIONAL BENEFITS

- 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

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 1 4 end Regulated pressure to port 4	Dual pressure * Regulator 12 end Regulated pressure to port 2	Dual pressure Pual 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

st - 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.

PR93A

PRAO1A

PRA02A

PRA1A

PRP 1 A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

Pressure range: 0 to 150 PSI

Regulating range: 0 to 120 PSI

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

Filtration: 40

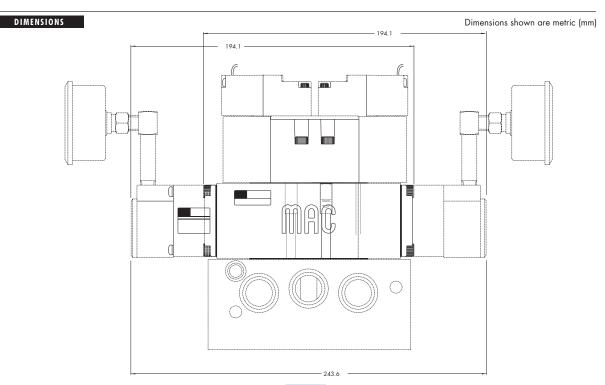
Temperature range: 0°F to 120°F (-18°C to +50°C)

Flow: 1.0

_

Spare parts : • Pressure regulator (less sandwich block) : PRA1A-FOAA.

• Gage : N-82016-01 (0-120 PSI perpendicular) N-82016-02 (0-120 PSI parallel)



Plug-in sandwich pressure regulator with manual adjust knob

OPERATIONAL BENEFITS

Series **PRP** 1

- 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)

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

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

Gage	Single pressure Regulator 14 end Same regulated pressure to ports 2 and 4	Single pressure Regulator 12 end Same regulated pressure to ports 2 and 4	Dual pressure * Regulator 14 end Regulated pressure to port 4	Dual pressure * Regulator 12 end Regulated pressure to port 2	Dual pressure * Dual regulator Two regulated pressures to ports 2 and 4
No gage	PRP1A-HAKA	PRP1A-HCKA	PRP1A-HBKA	PRP1A-HDKA	PRP1A-HEKA
Gage perpendicular to manual operator	PRP1A-HABA	PRP1A-HCBA	PRP1A-HBBA	PRP1A-HDBA	PRP1A-HECA
Gage parallel to manual operator	PRP1 A-HADA	PRP1A-HCDA	PRP1A-HBDA	PRP1A-HDDA	PRP1A-HEEA

^{*} 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

for slotted stem adjustment (internal pilot)
for slotted stem adjustment (external/remote air)
for slotted stem with locknut (internal pilot)
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.



PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

Pressure range: 0 to 150 PSI

Regulating range: 0 to 120 PSI (other ranges see below)

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

Filtration: 40

Temperature range : $0^{\circ}F$ to $120^{\circ}F$ (- $18^{\circ}C$ to $+50^{\circ}C$)

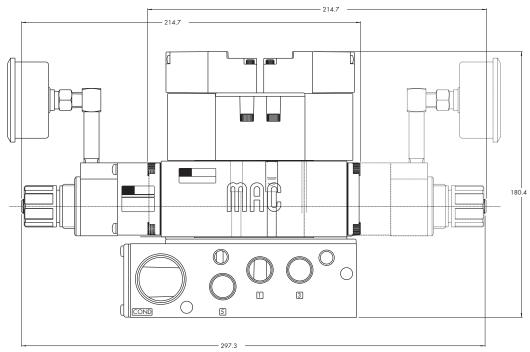
Flow: 1.1 C_v

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

Regulating range options : PRP1A-XXXA

- Replace by B - 0 to 80 PSI - 0 to 30 PSI - 0 to 30 PSI - 0 to 30 PSI - 0 to 120 PSI on "12" end - 0 to 80 PSI on "12" end - 0 to 80 PSI on "14" end - 0 to 30 PSI on "12" end - 0 to 120 PSI on "14" end - 0 to 30 PSI on "12" end - 0 to 30 PSI on "12" end - 0 to 30 PSI on "14" end

DIMENSIONS



Plug-in sandwich pressure regulator with air pilot adjust

OPERATIONAL BENEFITS

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



PR37A PR42B PR46A PR47A PR48B

PR92C

HOW TO ORDER

REGULATORS FOR INTERNAL PILOT

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

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	PRP1 A-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.

- 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.

PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

Pressure range: 0 to 150 PSI

Regulating range: 0 to 120 PSI

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

Filtration: 40

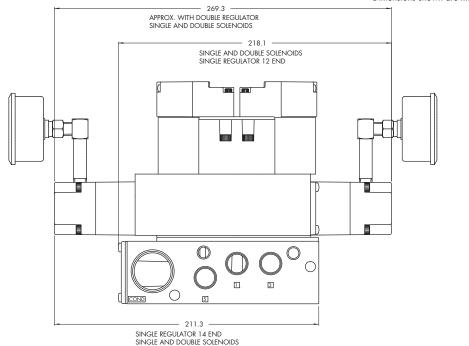
Temperature range : $0^{\circ}F$ to $120^{\circ}F$ (- $18^{\circ}C$ to $+50^{\circ}C$)

Flow: 1.1 C_v

Spare parts : • Pressure regulator (less sandwich block): PRP1A-F0KA

• 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

PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

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	

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	

* - To be used with dual pressure valves. Note: regulating range for above models is 0-150 PSI. For other ranges see technical data page.

ADJUSTMENT OPTIONS

PRA2D-xxxx

for slotted stem adjustment (internal pilot) for slotted stem adjustment (external pilot) for slotted stem with locknut (internal pilot) 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.

PRA3C







Fluid: Compressed air, inert gases

0 to 150 PSI Pressure range:

Regulating range: 0 to 150 PSI (other ranges see below)

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

Filtration:

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

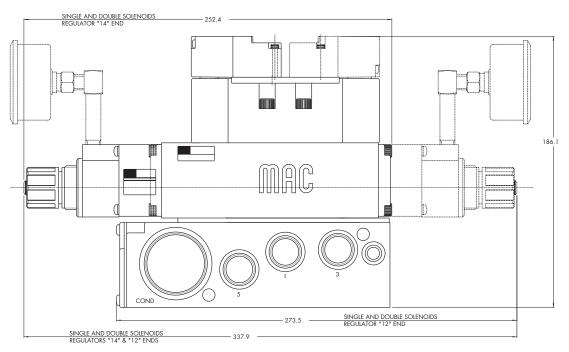
Flow: $2.3 \, C_v$

 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 Spare parts:

Regulating range options: PRA2D-XXXA

- 0 to 100 PSI - 0 to 45 PSI - Replace by B - Replace by C

DIMENSIONS





Non plug-in sandwich pressure regulator with air pilot adjust

OPERATIONAL BENEFITS

- 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

PR93A

PRA01A

PRA02A

HOW TO ORDER

INTERNAL PILOT

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
PRA2D-4AAA	PRA2D-4EAA	PRA2D-4BAA	PRA2D-4FAA	PRA2D-4JAA
PRA2D-4ADA	PRA2D-4EDA	PRA2D-4BDA	PRA2D-4FDA	PRA2D-4JEA
PRA2D-4CDA	PRA2D-4GDA	PRA2D-4DDA	PRA2D-4HDA	
PRA2D-4ABA	PRA2D-4EBA	PRA2D-4BBA	PRA2D-4FBA	PRA2D-4JCA
PRA2D-4CBA	PRA2D-4GBA	PRA2D-4DBA	PRA2D-4HBA	
	Regulator 14 end Same regulated pressure to ports 2 and 4 PRA2D-4AAA PRA2D-4ADA PRA2D-4CDA PRA2D-4ABA	Regulator 14 end Same regulated pressure to ports 2 and 4 Regulator 12 end PRA2D-4AAA PRA2D-4EAA PRA2D-4ADA PRA2D-4EDA PRA2D-4CDA PRA2D-4GDA PRA2D-4ABA PRA2D-4EBA	Regulator 14 end Regulator 12 end Regulator 14 end Same regulated pressure to ports 2 and 4 PRA2D-4AAA PRA2D-4EAA PRA2D-4BAA PRA2D-4AAA PRA2D-4EAA PRA2D-4BAA PRA2D-4BAA PRA2D-4ADA PRA2D-4EDA PRA2D-4BDA PRA2D-4CDA PRA2D-4GDA PRA2D-4DDA PRA2D-4ABA PRA2D-4EBA PRA2D-4BBA	Regulator 14 end Regulator 12 end Regulator 14 end Regulator 12 end Same regulated pressure to ports 2 and 4 PRA2D-4AAA PRA2D-4EAA PRA2D-4BAA PRA2D-4FAA PRA2D-4AAA PRA2D-4EAA PRA2D-4BAA PRA2D-4FAA PRA2D-4ADA PRA2D-4EDA PRA2D-4BDA PRA2D-4FDA PRA2D-4CDA PRA2D-4GDA PRA2D-4DDA PRA2D-4HDA PRA2D-4ABA PRA2D-4EBA PRA2D-4BBA PRA2D-4FBA

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

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.

st - To be used with dual pressure valves.







Fluid: Compressed air, inert gases

Pressure range: 0 to 150 PSI 0 to 150 PSI Regulating range:

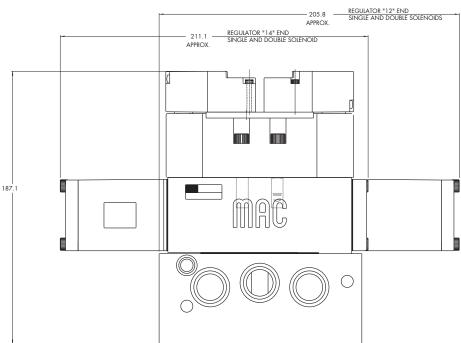
Lubrication: Not required, if used select a medium aniline point lubricant (between 180°F to 210°F)

Filtration:

Temperature range : 0°F to 120°F (-18°C to +50°C) Flow: $2.3 \, \mathrm{C_v}$

 Pressure regulator (less sandwich block) : PRA2D-60AA.
 Gage : • Glycerine filled : N-62015-01
 Non filled : N-62016-01 Spare parts :

DIMENSIONS



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

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

^{*} 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)
- 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.

PR93A

PRA01A

PRA02A

PRA 1 A

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

Pressure range: 0 to 150 PSI

Regulating range: 0 to 150 PSI (other ranges see below)

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

Filtration:

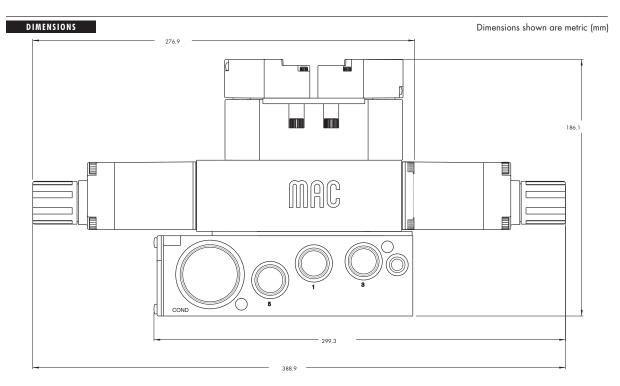
Temperature range : 0° F to 120° F (- 18° C to + 50° C)

Flow: $3.1 \, C_{\rm v}$

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





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
Glycerine gage PRP2B-DABA PRP2B-DEBA PRP2B-DBBA PRP2B-DFBA PRP2B-L	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-D	Non-filled gage	PRP2B-DADA	PRP2B-DEDA	PRP2B-DBDA	PRP2B-DFDA	PRP2B-DJEA

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

PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C

^{* -} To be used with dual pressure valves.

^{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.







Fluid: Compressed air, inert gases

Pressure range: 0 to 150 PSI
Regulating range: 0 to 150 PSI

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

Filtration:

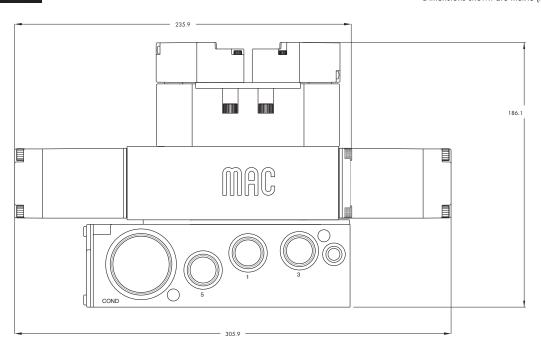
Temperature range: 0°F to 120°F (-18°C to +50°C)

Flow: 3.1 C_v

Spare parts : • Pressure regulator (less sandwich block): PRP2B-F0AA

• Body/block to base mounting screw: 19177

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.



PR42B PR46A PR47A PR48B

PR37A

PR92C

PR93A

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

HOW TO ORDER

INTERNAL PILOT

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
PRA3C-1AAA	PRA3C-1EAA	PRA3C-1BAA	PRA3C-1FAA	PRA3C-1JAA
PRA3C-1ADA	PRA3C-1EDA	PRA3C-1BDA	PRA3C-1FDA	PRA3C-1JEA
PRA3C-1CDA	PRA3C-1GDA	PRA3C-1DDA	PRA3C-1HDA	
PRA3C-1ABA	PRA3C-1EBA	PRA3C-1BBA	PRA3C-1FBA	PRA3C-1JCA
PRA3C-1CBA	PRA3C-1GBA	PRA3C-1DBA	PRA3C-1HBA	
	Regulator 14 end Same regulated pressure to ports 2 and 4 PRA3C-1AAA PRA3C-1ADA PRA3C-1CDA PRA3C-1ABA	Regulator 14 end Same regulated pressure Regulator 12 end 5ame regulated pressure 5ame regulated pressure to ports 2 and 4 PRA3C-1EAA PRA3C-1ADA PRA3C-1EDA PRA3C-1CDA PRA3C-1GDA PRA3C-1ABA PRA3C-1EBA	Regulator 14 end Same regulated pressure to ports 2 and 4 Regulator 12 end Same regulated pressure to ports 2 and 4 Regulator 14 end Regulated pressure to ports 2 and 4 PRA3C-1AAA PRA3C-1EAA PRA3C-1BAA PRA3C-1ADA PRA3C-1EDA PRA3C-1BDA PRA3C-1CDA PRA3C-1GDA PRA3C-1DDA PRA3C-1ABA PRA3C-1EBA PRA3C-1BBA	Regulator 14 end Same regulated pressure to ports 2 and 4 Regulator 12 end Same regulated pressure to ports 2 and 4 Regulated pressure to ports 2 and 4 Regulated pressure to port 4 Regulated pressure to port 2 PRA3C-1AAA PRA3C-1EAA PRA3C-1BAA PRA3C-1FAA PRA3C-1ADA PRA3C-1EDA PRA3C-1BDA PRA3C-1FDA PRA3C-1CDA PRA3C-1GDA PRA3C-1DDA PRA3C-1HDA PRA3C-1ABA PRA3C-1EBA PRA3C-1BBA PRA3C-1FBA

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	

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

ADJUSTMENT OPTIONS

PRA3C-xxxx

* - To be used with dual pressure valves.

For other ranges see technical data page.

Note: regulating range for above models is 0-150 PSI.

A for slotted stem adjustment (internal pilot)

- **B** for slotted stem adjustment (external pilot)
- **D** for slotted stem with locknut (internal pilot)
 - for slotted stem with locknut (external pilot)







Fluid: Compressed air, inert gases

0 to 150 PSI Pressure range:

Regulating range: 0 to 150 PSI (other ranges see below)

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

Filtration:

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

Flow: 5.4 C_v

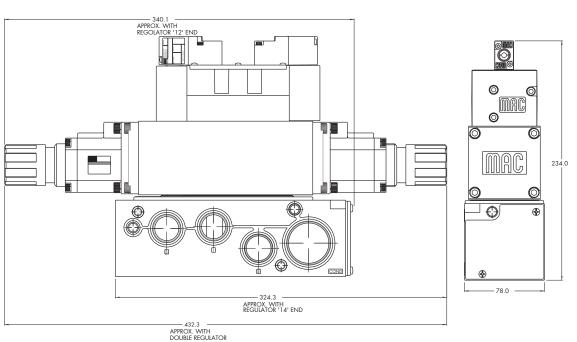
• Pressure regulator (less sandwich block): PRA3C-30AA (KNOB), PRA3C-C0AA (SLOTTED STEM), PRA3C-F0AA (SLOTTED STEM WITH LOCKNUT). Spare parts:

• Gage : • Glycerine filled : N-62015-01 • Non filled : N-62016-01

Regulating range options: PRA3C-XXXA

Replace by B Replace by C - 0 to 100 PSI - 0 to 45 PSI

DIMENSIONS





Non plug-in sandwich pressure regulator with air pilot adjust

OPERATIONAL BENEFITS

- 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

PR93A

PRA01A

PRA02A

PRA1A

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	

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	

^{* -} 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.

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

0 to 150 PSI Pressure range: 0 to 150 PSI Regulating range:

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

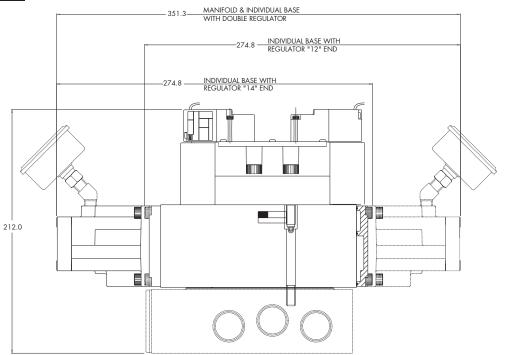
Filtration:

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

Flow: $5.4 \, C_{\rm v}$

Pressure regulator (less sandwich block): PRA3C-60AA.
Gage: Glycerine filled: N-62015-01
Non filled: N-62016-01 Spare parts :

DIMENSIONS



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 ADILISTMENT)

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

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

^{*} 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:

- 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.

PR93A

PRAO1A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C







Fluid: Compressed air, inert gases

Pressure range: 0 to 150 PSI

Regulating range: 0 to 150 PSI (other ranges see below)

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

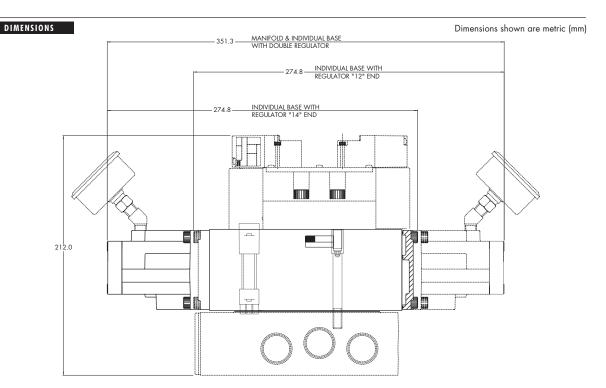
Filtration:

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

Flow: $5.4\,\mathrm{C_v}$

 Pressure regulator (less sandwich block): PRP3B-COAA (knob), PRP3B-JOAA (slotted stem), PRP3B-MOAA (slotted stem with locknut)
 Regulating block to base mounting screw: 19457
 Regulating range options: PRP3B-xxxA Spare parts:

Replace by B for 0 to 100 PSI Replace by C for 0 to 45 PSI





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

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

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

- 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.

PRA01A

PRA02A

PRA1A

PRP1A

PRA2D

PRP2B

PRA3C

^{* -} To be used with dual pressure valves.







Fluid: Compressed air, inert gases

Pressure range: 0 to 150 PSI
Regulating range: 0 to 150 PSI

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

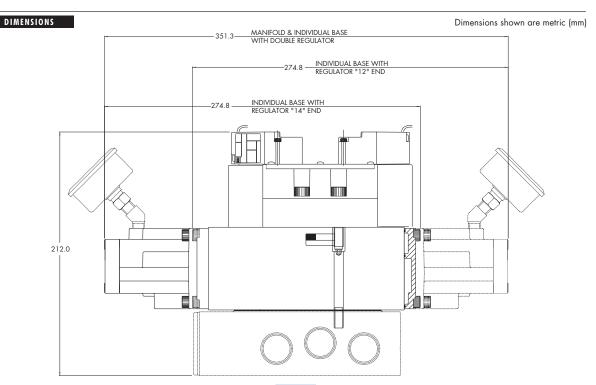
Filtration: 40 µ

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

Flow: 5.4 C_v

Spare parts : • Pressure regulator (less sandwich block): PRP3B-F0AA

• Regulator block to base mounting screw: 19457





Section 5

Intrinsically Safe Valves

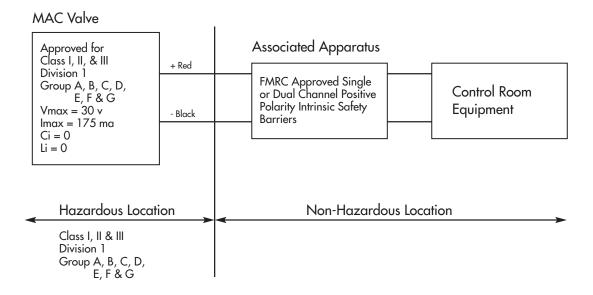


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INTRINSICALLY SAFE CIRCUIT

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 lmax : 175 ma Ci : 0 Li : 0

Intrinsically Safe Valves

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 lsc of the barrier.
- lsc = 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

Imax : 175 ma Ci : 0 Li : 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 Vmax greater than or equal to Voc ?
- Is Imax greater than or equal to Isc?
- Is Ci less than Ca ?
- Is Li less than La ?
- 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:

 $Voltage \ at \ Solenoid = I_{TOTAL} \ x \ 250 \ ohms = \underline{\hspace{1cm}} volts$

Manufacturer	Model #	Barrier Res.	Voltage w/o Light	Voltage w/Light	Groups	Туре
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



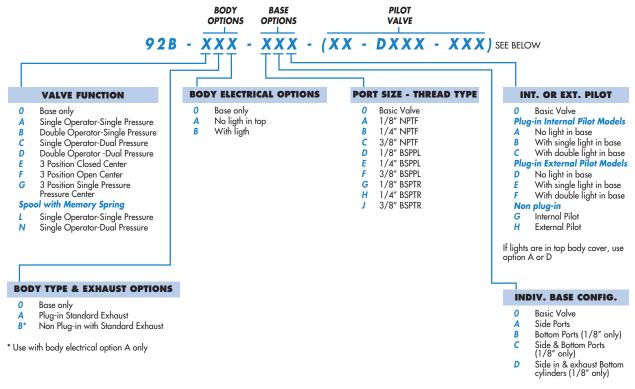
*Use this lead wire length for plug-in connectors.

HOW TO ORDER **BODY** PILOT BASE **OPTIONS OPTIONS** VALVE XXX - (XX - DXXX - XXX) SEE BELOW 52A - XX -INT. OR EXT. PILOT **SPOOL TYPE BODY OPTIONS PORT SIZE - THREAD TYPE** Inline 3 port Manifold body Manifold body Internal Pilot Single Operator N.C. Main 1 Double Operator N.C. Main 3 1/8" NPTF External Pilot-For inline Inline 3 port with memory spring Manifold body with memory spring Single Operator N.O. Main bodies only 1/4" NPTF Common External Pilot for manifold bodies only \boldsymbol{c} Double Operator N.O. Main 6 1/8" BSPPL C 1/4" BSPPL 1/8" BSPTR 1/4" BSPTR BASE CONFIGURATION Inline/Manifold Body 4XXA - XXX - XX - DXXX - XXXPILOT VALVE SEE BELOW **REVISION LEVEL** SPOOL TYPE **BODY OPTIONS PORT SIZE - THREAD TYPE** INT. OR EXT. PILOT Internal Pilot (on dual press. 0 0 Base only Base only Manifold body models pilot pressure is from port #5 Inline 5 port 1/8" NPTF Single Operator-Single Pressure Manifold body (base mount body) 1/4" NPTF Double Operator-Single Pressure 3 В External Pilot (inline body) Internal Pilot (on dual press. models pilot pressure is from port #3 Single Operator-Dual Pressure Inline 5 port with memory* 1/8" BSPPL C Manifold body with memory* Double Operator -Dual Pressure 1/4" BSPPL D 3 Position Closed Center 1/8" BSPTR 3 Position Open Center External & common external pilot (individual D 1/4" BSPTR 3 Position Single Pressure Pressure Center base & bar manifold) *Does not apply to 3 positions valves **Accepts manifold body only BASE CONFIGURATION Inline/Manifold Body Base standard ports** **SOLENOID PILOT VALVE OPTIONS** Base standard ports with flow controls** XX - DXXX - XXX XX PILOT EXHAUST XX DC VOLTAGE MANUAL OPERATOR LEAD WIRE LENGTH XX ELECTRICAL CONN. Х X **BA** Grommet **DM** Muffled exhaust FR 12 VDC (0.6 W) 18 No operator CA Conduit 1/2" NPS Non-locking Recessed (std.) В 24" CM Metal Conduit 1/2" NPS Locking Recessed C 36" CN Metal Conduit with Non-locking Extended D 48" ground1/2" NPS Locking Extended 72" --External Plug-in--JB Rectangular plug-in F 96 JM Rectangular male only J 6″* KA Mini plug-in KJ Mini plug-in male only TA Dual tabs (.110) w/receptables TD Dual tabs w/light

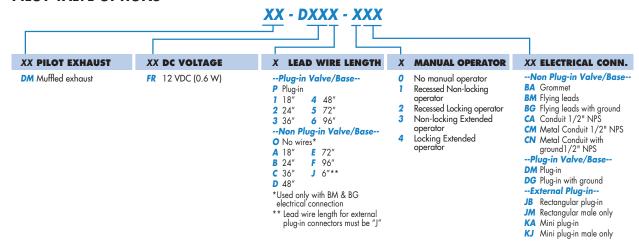
w/receptables TJ Dual tabs (.110) plain TM Dual tabs w/light without receptables



HOW TO ORDER



PILOT VALVE OPTIONS



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



OPTIONS AVAILABLE FOR

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



1

2

3

4

Non-locking recessed

Non-locking extended

Locking recessed

Locking extended

	1. VOLTAGE		4. ELECTRICAL CONNECTION
D-XX X-X XX	VOLTAGE	D-XX X-X XX	ELECTRICAL CONNECTION
DA	24 VDC (5.4W)	BA*	Flying leads (grommet)
DB	12 VDC (5.4W)	BK*	BA with protection diode
DC	12 VDC (7.5W)	BL*	BA with protection varistor
DD	24 VDC (7.3W)	BM**	Flying leads (solenoid plug-in)
DE	12 VDC (12.7W)	BN**	BM with protection diode
DF	24 VDC (12.7W)	BP**	BM with protection varistor
DK	110 VDC (4.7W)	BG**	BM with ground
DJ	28 VDC (5.2W)	BH**	BM with protection diode & ground
DL	64 VDC (6.0W)	BJ**	BM with protection varistor & ground
DM	36 VDC (5.3W)	CA*	1/2" NPS conduit with flying leads
DN	6 VDC (6.0W)	CM*	1/2" NPS metal conduit with flying leads
DR	90 VDC (6.6W)	CN*	1/2" NPS metal conduit with flying leads & ground
DS	110 VDC (7.3W)	JB	Rectangular connector
DT	75 VDC (5.6W)	JD	JB with light
DP	48 VDC (5.8W)	JM	Rectangular connector (male only)
FA	12 VDC (1.8W)	KA	Mini square connector
FB	24 VDC (1.8W)	КВ	KA with protection diode
FE	12 VDC (2.4W)	КС	KA with protection varistor
FF	24 VDC (2.4W)	KD	KA with light
JA	120/60, 110/50 (2.9W)	KE	KA with light and protection diode
JB	240/60, 220/50 (2.9W)	KF	KA with light and protection varistor
JC	24/60, 24/50 (3.7W)	KG	KA with light & diode
JD	100/60, 100/50, 110/60 (3.9W)	KJ	Mini square connector (male only)
JE	220/60 (3.4W)	KK	KJ with protection diode (male only)
JF	240/50 (2.8W)	KL	KJ with protection varistor (male only)
JG	200/60, 200/50 (3.9W)	TA	Dual tabs with receptacles
		ТВ	TA with protection diode
	2. WIRE LENGTH	TD	TA with light
		TE	TA with light and protection diode
D-XX X-X XX	WIRE LENGTH	TJ	Dual tabs (male only)
0	No wires	TK	TJ with protection diode
A	18"	TM	TJ with light
В	24"	TN	TJ with light and protection diode
С	36"	* From Lead wire len	gth options choose A through F
D	48"		gth options choose 0 through F
E	72"		ove 30 volts, a ground wire is required. Applies to optic
F	96"	with flying leads.	
	3. MANUAL OPERATOR		
D-XX X-X XX	MANUAL OPERATOR		
0	No operator		
	NI I I: I		



VALVE CODE ➤

 $G \frac{XX}{1} \frac{X-X}{2} \frac{XX}{3}$

OPTIONS AVAILABLE FOR

- Solenoid valves 32, 34, 38, 42, 44 & 48 Series



	1. VOLTAGE		4. ELECTRICAL CONNECTION
G-XX X-X XX	VOLTAGE	G-XX X-X XX	ELECTRICAL CONNECTION
AA	120 VAC (2.5W) Requires electrical connector with rectifier	BA	Flying leads
AC	24 VAC (4.0W) Requires electrical connector with rectifier	BB	BA with ground wire
DA	24 VDC (1.0W)	ВС	BA with light
DC	24 VDC (1.8W)	BD	BA with light and ground wire
DD	24 VDC (2.5W)	BE	BA with suppression diode
DE	24 VDC (3.0W)	BF	BA with suppression diode and ground wire
DF	24 VDC (4.0W)	BG	BA with suppression diode and light
DG	12 VDC (1.0W)	ВН	BA with suppression diode, light and ground wire
DJ	12 VDC (1.8W)	BN	BA with suppression diode and blocking diode
DK	12 VDC (2.5W)	BP	BA with suppression diode, blocking diode and ground wire
DM	12 VDC (3.0W)	BR	BA with suppresion diode, blocking diode and light
DN	12 VDC (4.0W)	BS	BA with suppression diode, blocking diode, light and ground
DR	6 VDC (1.8W)		wire
DS	6 VDC (3.0W)	GA	MAC JAC Solenoid plug-in
EB	48 VDC (1.8W)	GB	MAC JAC Solenoid plug-in w/Diode
EC	48 VDC (3.0W)	GC	MAC JAC Solenoid plug-in w/MOV
ED	120 VDC (2.5W)	GD	MAC JAC Solenoid plug-in w/LED
GD	12 VDC (0.5W) 34 series only	GE	MAC JAC Solenoid plug-in w/Diode & LED
GE	24 VDC (0.5W) 34 series only	GF	MAC JAC Solenoid plug-in w/MOV & LED
	·	GG	MAC JAC Solenoid plug-in w/Rectifier
	2. WIRE LENGTH	GH	MAC JAC Solenoid plug-in w/Rectifier & LED
		KA	Solenoid plug-in wire assembly
G-XX X-X XX	WIRE LENGTH	КВ	KA with ground
0	No lead wires (used only with "KJ" & "KM" connectors)	КС	KA with rectifier and light
Α	18" coil leads	KD	KA with rectifier, light and ground
В	24" coil leads	KE	KA with suppression diode
С	36" coil leads	KF	KA with suppression diode and ground
D	48" coil leads	KJ	Solenoid plug-in housing without wire assembly
E	72" coil leads	KM	Solenoid plug-in housing with ground pin without wire
F	96" coil leads		assembly
G	120" coil leads	KN	KA with suppression diode and blocking diode
Н	144" coil leads	KP	KA with suppression diode, blocking diode and ground
1	18" base leads	KT	KA with light
2	24" base leads	KU	KA with light and ground
3	36" base leads	KV	KA with suppression diode and light
4	48" base leads	KW	KA with suppression diode, light and ground
5	72" base leads	KX	KA with suppression diode, blocking diode and light
6	96" base leads	KY	KA with suppression diode, blocking diode, light & ground
7	120" base leads		
	3. MANUAL OPERATOR	ELEC	TRICAL CONNECTION FOR PLUG-IN VALVES
		G-XX X-X XX	PLUG-IN OPTIONS
G-XX X-X XX	MANUAL OPERATOR	SB	Base plug-in with ground
1	Non-locking recessed	SC	Base plug-in with suppression and blocking diode
2	Locking recessed	SD	Base plug-in with suppression and blocking diode and groun
3	Non-locking extended	SE	Base plug-in with MOV
4	Locking extended	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
		CN	D 1 : :/ MOV 11: 1 :
		SN	Base plug-in with MOV and light
		SP	Base plug-in with MOV and light with ground



OPTIONS AVAILABLE FOR

- Solenoid valves 52 & 400 Series



	1. VOLTAGE		4. ELECTRICAL CONNECTION
G-XX X-X XX	VOLTAGE	G-XX X-X XX	ELECTRICAL CONNECTION
DC	24 VDC (1.8 W)	BA	Flying leads
DD	24 VDC (2.5 W)	ВВ	BA with ground wire
DE	24 VDC (3.0 W)	ВС	BA with light parallel to leads
DF	24 VDC (4.0 W)	BD	BA with light parallel to leads & ground wire
DJ	12 VDC (1.8 W)	BE	BA with suppression diode
DK	12 VDC (2.5 W)	BF	BA with suppression diode & ground wire
DM	12 VDC (3.0 W)	BG	BA with suppression diode plus light parallel to leads
DN	12 VDC (4.0 W)	ВН	BA with suppression diode plus light parallel to leads & ground wire
	2. WIRE LENGTH	*BN	BA with suppression diode plus blocking diode
G-XX X-X XX	WIRE LENGTH	*BP	BA with suppression diode plus blocking diode & ground wire
0	No lead wire (use only with "KJ" & "KM" elecrical connectors)	*BR	BA with suppression diode plus blocking diode & light parallel to leads
A B	18" 24"	*BS	BA with suppression diode plus blocking diode & light parallel to leads & ground wire
С	36"	ВТ	BA with light on top
D	48"	BU	BA with light on top & ground wire
E	72"	BV	BA with suppression diode plus light on top
F	96"	BW	BA with suppression diode plus light on top & ground w
G	120"	*BX	BA with suppression diode plus blocking diode & light on to
Н	144"	*BY	BA with suppression diode plus blocking diode & light o top & ground wire
G-XX X-X XX	3. MANUAL OPERATOR MANUAL OPERATOR		
		G-YY Y-Y YY	COLENOID DILIG-IN CONNECTOR WITH LEADS
		G-XX X-X XX	MAC IAC Solenoid plug-in
1	Non-locking recessed	GA	MAC JAC Solenoid plug-in
1 2	Non-locking recessed Locking recessed	GA GB	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV
1 2	Non-locking recessed Locking recessed	GA GB GC GD	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GD GE	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GD GE GF	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GD GE GF GG	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/MOV & LED
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GD GE GF GG GH	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GD GE GF GG GH KA	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GD GE GF GG GH KA	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly KA with ground wire
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GD GE GF GG GH KA KB	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly KA with ground wire KA with suppression diode
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GD GE GF GG GH KA	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly KA with ground wire
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GD GE GF GG GH KA KB KE	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly KA with ground wire KA with suppression diode KA with suppression diode & ground wire Plug-in housing without wire assembly
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GD GE GF GG GH KA KB KE	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly KA with ground wire KA with suppression diode KA with suppression diode & ground wire Plug-in housing without wire assembly Plug-in housing without wire assembly
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GC GD GE GF GG GH KA KB KE KF	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly KA with ground wire KA with suppression diode & ground wire Plug-in housing without wire assembly ('KA' without wire assembly) Plug-in housing without wire assembly ('KB' without wire assembly) KA with suppression diode plus blocking diode
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GC GD GE GF GG GH KA KB KE KF KJ	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly KA with ground wire KA with suppression diode & ground wire Plug-in housing without wire assembly ('KA' without wire assembly) Plug-in housing without wire assembly ('KB' without wire assembly) KA with suppression diode plus blocking diode
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GC GC GD GE GF GG GH KA KB KE KF KJ	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly KA with ground wire KA with suppression diode KA with suppression diode & ground wire Plug-in housing without wire assembly ('KA' without wire assembly) Plug-in housing without wire assembly ('KB' without wire assembly) KA with suppression diode plus blocking diode KA with suppression diode plus blocking diode & ground wi
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GB GC GD GE GF GG GH KA KB KE KF KJ	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly KA with ground wire KA with suppression diode KA with suppression diode & ground wire Plug-in housing without wire assembly ('KA' without wire assembly) Plug-in housing without wire assembly ('KB' without wire assembly) KA with suppression diode plus blocking diode KA with suppression diode plus blocking diode & ground wi KA with light on top KA with light on top
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GB GC GD GE GF GG GH KA KB KE KF KJ KM	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly KA with ground wire KA with suppression diode KA with suppression diode & ground wire Plug-in housing without wire assembly ('KA' without wire assembly) Plug-in housing without wire assembly ('KB' without wire assembly) KA with suppression diode plus blocking diode KA with suppression diode plus blocking diode & ground wi KA with light on top KA with light on top
1 2 3	Non-locking recessed Locking recessed Non-locking extended	GA GB GB GC GD GE GF GG GH KA KB KE KF KJ KM	MAC JAC Solenoid plug-in MAC JAC Solenoid plug-in w/Diode MAC JAC Solenoid plug-in w/MOV MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/LED MAC JAC Solenoid plug-in w/Diode & LED MAC JAC Solenoid plug-in w/MOV & LED MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier MAC JAC Solenoid plug-in w/Rectifier & LED Plug-in wire assembly KA with ground wire KA with suppression diode KA with suppression diode & ground wire Plug-in housing without wire assembly ('KA' without wire assembly) Plug-in housing without wire assembly ('KB' without wire assembly) KA with suppression diode plus blocking diode KA with suppression diode plus blocking diode & ground wire KA with light on top KA with light on top



VALVE CODE ➤

 $H \frac{XX}{1} \frac{X-X}{2} \frac{XX}{3}$

OPTIONS AVAILABLE FOR

- Solenoid valves 37 & 47 Series



	1. VOLTAGE	H-XX X-X XX	
		BL	BA with full wave rectifier & ground wire
H-XX X-X XX	VOLTAGE	ВТ	BA with full wave rectifier plus light
AA	120/50, 120/60 (6.7 W) (use connector with rectifier)	BU	BA with full wave rectifier plus light & ground wire
AB	220/50, 220/60 (5.6 W)	H-XX X-X XX	PLUG-IN CONNECTOR
	(use connector with rectifier)	FA	Base plug-in
AC	240/50, 240/60 (5.8 W)	FB	FA with ground wire
	(use connector with rectifier)	FC	FA with light
AD	24/50, 24/60 (7.8 W)	FD	FA with light & ground wire
	(use connector with rectifier)	FE	FA with suppression diode
DA	24 VDC (5.2 W)	FF	FA with suppression diode & ground wire
DB	24 VDC (2.4 W)	FG	FA with suppression diode & light
DC	24 VDC (1.8 W)	FH	FA with suppression diode plus light & ground wire
DD	24 VDC (1.0 W)	FK	FA with full wave rectifier
DF	12 VDC (5.2 W)	FL	FA with full wave rectifier & ground wire
DG	12 VDC (2.4 W)	*FN	FA with suppression diode plus blocking diode
DH	12 VDC (1.8 W)	*FP	FA with suppression diode plus blocking diode & ground w
DJ	12 VDC (1.0 W)	*FR	FA with suppression diode plus blocking diode plus light
DL	120 VDC (6.3 W)	*FS	FA with suppression diode plus blocking diode & light 8 ground wire
	2. WIRE LENGTH	FT	FA with full wave rectifier plus light
		FU	FA with full wave rectifier plus light & ground wire
H-XX X-X XX	WIRE LENGTH	MA	Solenoid plug-in wire assembly
0	No lead wire (use with "MJ, MM & K Type connectors)	МВ	MA with ground wire
Α	18"	МС	MA with light
В	24"	MD	MA with light & ground wire
С	36"	ME	MA with suppression diode
D	48"	MF	MA with suppression diode & ground wire
E	72"	MG	MA with suppression diode plus light
F	96"	МН	MA with suppression diode plus light & ground wire
G	120"	MK	MA with full wave rectifier
Н	144"	ML	MA with full wave rectifier & ground wire
		*MN	MA with suppression diode plus blocking diode
	3. MANUAL OPERATOR	*MP	MA with suppression diode plus blocking diode & ground w
		*MR	MA with suppression diode plus blocking diode & light
H-XX X-X XX 0	MANUAL OPERATOR No operator	*MS	MA with suppression diode plus blocking diode & light of ground wire
1	Non-locking recessed	МТ	MA with full wave rectifier plus light
2	Locking recessed	MU	MA with full wave rectifier plus light & ground wire
3	Non-locking extended	MJ	Plug-in housing without wire assembly ('MA' option
4	Locking extended		without wire assembly)
	·	MM	Plug-in housing without wire assembly ('MB' option
	4. ELECTRICAL CONNECTION		without wire assembly)
		KA	Mini square connector
H-XX X-X XX	ELECTRICAL CONNECTION	КВ	KA with suppression diode
BA	Flying leads	КС	KA with M.O.V.
ВВ	BA with ground wire	KD	KA with light
ВС	BA with light	KE	KA with light & suppression diode
BD	BA with light & ground wire	KF	KA with light & M.O.V.
BE	BA with suppression diode	KJ	Mini square connector – male only
BF	BA with suppression diode & ground wire	KK	KJ with suppression diode
BG	BA with suppression diode plus light	KL	KJ with M.O.V.
ВН	BA with suppression diode plus light & ground wire	KM	KA with full wave rectifier
*BN	BA with suppression diode plus blocking diode	KN	KA with full wave rectifier & M.O.V.
*BP	BA with suppression diode plus blocking diode & ground wire	KP	KA with full wave rectifier & light
	BA with suppression diode plus blocking diode & light	KR	KA with full wave rectifier plus light & M.O.V.
*BR	bA will suppression alode plus blocking alode & light	1414	
*BR *BS	BBA with suppression diode plus blocking diode & light & ground wire	KS * Blocking diode is loc	KJ with full wave rectifier



VALVE CODE ➤

 $J \frac{XX}{1} \frac{X-X}{2} \frac{XX}{3} \frac{X}{4}$

OPTIONS AVAILABLE FOR

- Solenoid valves 36, 46, ISO 01 and ISO 02 Series



		J-XX X-X XX	
	1. VOLTAGE	*JL	Square Connector with Rectifier with light
	1. VOLINGE	*,,,	Square Connector Male only (Plain)
I-XX X-X XX	VOLTAGE	*JB	Rectangular Connector
AA	120VAC (5.4W)	*JD	Rectangular Connector with light
AC	24VAC (5.4W)	*JN	Rectangular Connector with diode
DE	24VDC (1.8W)	*JP	Rectangular Connector with MOV
DF		*JR	Rectangular Connector with diode/light
	12VDC (1.8W)	*JS	Rectangular Connector with MOV /light
DJ	24VDC (1.3W)	*JT	Rectangular Connector with Rectifier
DL	12VDC (1.3W)	*JU	· ·
DR	12VDC (1.0W)*		Rectangular Connector with Rectifier with light
DU	24VDC (1.0W)*	*JM	Rectangular Connector Male only (Plain)
lot available on 3	6 series universal valve	* Not available on ma	anifold or stacking valves
			CONNECTORS FOR NON PLUG-IN VALVES
	A 14405 I 5145711	J-XX X-X XX	MINI SOUARE PLUG-IN CONNECTORS
	2. WIRE LENGTH	3 700 X X XXX	9.4 MM SPACING BETWEEN PINS
		KA	Mini plug-in
-XX X-X XX	WIRE LENGTH	KB	Mini plug-in with diode
Α	18" coil leads	KC	Mini plug-in with MOV
В	24" coil leads	KD	
С	36" coil leads		Mini plug-in with light
D	48" coil leads	KE	Mini plug-in with diode and light
Е	72" coil leads	KF	Mini plug-in with MOV and light
F	96" coil leads	KG	Mini plug-in with rectifier
Р	Base plug-in	KH	Mini plug-in with rectifier and light
0	No leads (use with J, K & L type connectors)	KJ	Mini plug-in – Male only
		KK	Mini plug-in with diode - Male only
	3. MANUAL OPERATOR	KL	Mini plug-in with MOV - Male only
	S. MINITORE OF EIGHT ON	KM	Mini plug-in with light - Male only
vvvvvv	MANUAL OPERATOR	KN	Mini plug-in with diode and light – Male only
0 -XX X-X XX		KP	Mini plug-in with MOV and light – Male only
	No operator	KR	Mini plug-in with rectifier – Male only
1	Non-locking recessed	KS	Mini plug-in with rectifier and light – Male only
2	Locking recessed		
3	Non-locking extended		CONNECTORS FOR NON PLUG-IN VALVES
4	Locking extended	J-XX X-X XX	MINI SQUARE PLUG-IN CONNECTORS
			8.0 MM SPACING BETWEEN PINS
	4. ELECTRICAL CONNECTION		ISO SPECIFICATION 15217
		LA	Mini plug-in
	CONNECTORS FOR NON PLUG-IN VALVES	LB	Mini plug-in with diode
-XX X-X XX	ELECTRICAL CONNECTION	LC	Mini plug-in with MOV
BA	Flying leads	LD	Mini plug-in with light
GA	MAC JAC solenoid plug-in	LE	Mini plug-in with diode and light
GB	MAC JAC solenoid plug-in with diode	LF	
GC	MAC JAC solenoid plug-in with MOV		Mini plug-in with MOV and light
GD	MAC JAC solenoid plug-in with light	LG	Mini plug-in with rectifier
GE	MAC JAC solenoid plug-in with light MAC JAC solenoid plug-in with diode and light	LH	Mini plug-in with rectifier and light
GF	MAC JAC solenoid plug-in with diode and light MAC JAC solenoid plug-in with MOV and light	LJ	Mini plug-in – Male only
GF GG	MAC JAC solenoid plug-in with mov and light MAC JAC solenoid plug-in with rectifier	LK	Mini plug-in with diode - Male only
	1 3	LL	Mini plug-in with MOV - Male only
GH	MAC JAC solenoid plug-in with rectifier and light	LM	Mini plug-in with light - Male only
GJ	MAC JAC solenoid plug-in – Male only	LN	Mini plug-in with diode and light – Male only
GK	MAC JAC solenoid plug-in with diode – Male only	LP	Mini plug-in with MOV and light – Male only
GL	MAC JAC solenoid plug-in with MOV – Male only	LR	Mini plug-in with rectifier – Male only
GM	MAC JAC solenoid plug-in with light – Male only	LS	Mini plug-in with rectifier and 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	J-XX X-X XX	CONNECTORS FOR PLUG-IN VALVES
GR	MAC JAC solenoid plug-in with rectifier – Male only	FA	Base plug-in
GS	MAC JAC solenoid plug-in with rectifier and light – Male only	FB	Base plug-in with diode
*JA	Square Connector	FC	Base plug-in with MOV
*JC	Square Connector with light	FD	Base plug-in with light
*JE	Square Connector with diode	FE	Base plug-in with diode and light
*JF	Square Connector with MOV	FF	Base plug-in with MOV and light
		FG	Base plug-in with MOV and light Base plug-in with rectifier
*JG	Square Connector with diode/light		1 3
*JH	Square Connector with MOV /light	FH	Base plug-in with rectifier and light
*JK	Square Connector with Rectifier		



VALVE CODE ➤

 $R \frac{XX}{1} \frac{X-X}{2} \frac{XX}{3}$

OPTIONS AVAILABLE FOR

- Solenoid valves 33 Series



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

	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)
	21133(2331)
	2. WIRE LENGTH (all series)
R-XX X-X XX	WIRE LENGTH
0**	No lead wire
A	18"
В	24"
	36"
D	48"
E	72"
F	96"
G	120"
— н	144"
	3. MANUAL OPERATOR
R-XX X-X XX	MANUAL OPERATOR
0	No operator
1	Non-locking recessed
3	Non-locking extended
	V
	4. ELECTRICAL CONNECTOR
R-XX X-X XX	NON PLUG-IN
BA	Flying leads
ВВ	Flying leads with LED
ВС	Flying leads with MOV
BD	Flying leads with LED and MOV
RA RB	Mini JAC solenoid plug-in Mini JAC solenoid plug-in with LED
RC	Mini JAC solenoid plug-in with LED Mini JAC solenoid plug-in with MOV
RD	Mini JAC solenoid plug-in with LED and MOV
TA	JST solenoid plug-in
ТВ	JST solenoid plug-in with LED
TC	JST solenoid plua-in with MOV



Section 7

Supplemental technical information



MAC's PATENDED 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 verus 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.

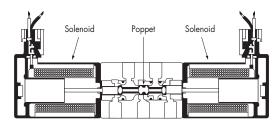


Figure 1 : Double Solenoid Poppet

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.

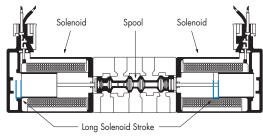


Figure 2 : Double Solenoid Spool Design

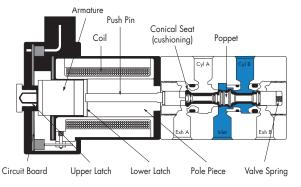
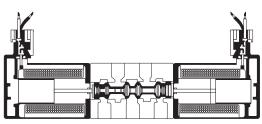


Figure 3 : Latching Solenoid Design



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.



SOLENOID "A" SOLENOID "B" WIRING SCHEMATIC FOR DOUBLE SOLENOID

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.

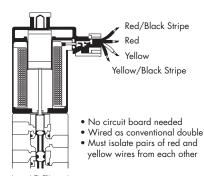


Figure 5: Four Wire Latching (+) POS IN→A - Yellov (+) POS IN→B - Rec (-) NEG IN→A ellow/W/Black Stripe (-) NEG IN→B Red/W/Black Stripe 4 WIRE SCHEMATIC FOR LATCHING

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.

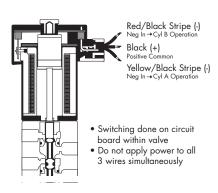
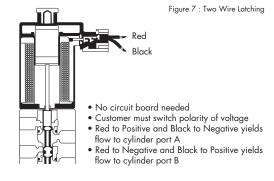


Figure 6: Three Wire Latching YFLLOW W/BLACK STRIPE RED W/BLACK STRIPE (+) COMMON BLACK 3 WIRE SCHEMATIC FOR LATCHING



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".



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.

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

MAC VALVES Warranty, Warranty Limitations

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. 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.



Notes

