

MAC GUIDE TO ORDERING VALVES

If you know the series you require, consult the index overleaf to find the series you have selected. For easy reference, page numbers are in the middle of the outside edge of the page. The catalog is laid out so that the most commonly used valves are coded and illustrated on the LEFT hand pages and all the options displayed in tables on the RIGHT hand pages.

If you do not know which series you require, first decide whether you need a 2, 3 or 4-way valve (see note 1 at the foot of this page); next decide the flow and port size required. Then consult the Index overleaf and the three page introductory fold outs (pages A1-3, B1-3, C1-3, and D1-3) which precede each major section of this catalog. **IN EITHER CASE** the check list below will help you determine the exact model code you require.

	SELECTION ASSISTANCE
	STEP 1. 2 OR 3 WAY VALVES. (A MAC 2 Way is a 3 Way with one port plugged)
П	Normally Closed or Normally Open?
	Pressure range: 25 to 150 psi or below 25 psi? (below 25 psi an external pilot connection is required for pilot operated valves) (see note 2 below)
	Single operator, spring return? (see note 3 below) OR
	STEP 1. 4 WAY VALVES.
	Single operator, spring return or double operator?
	Pressure range: 25 to 150 psi (single operator)? (see note 2) 10 to 150 psi (double operator)? (see note 4)
	(below these minimum an external pilot connection is required for pilot operated valves)
	2 position or 3 position? If 3 position: which center position?
	open closed or pressure center ? STEP 2. WHAT KIND OF OPERATOR? SOLENOID, REMOTE AIR OR MECHANICAL? If remote air or mechanical, go to step 3 If solenoid, AC or DC? If AC, what voltage and cycle (hz)? If DC, what voltage and power (watts)?
	Manual operators? All MAC solenoid valves are supplied with non-locking recessed manual operators as standard (Other operators are also available - see page T2 in Technical Section)
	Indicator lights? These are optional and may be supplied in the base, body or electrical connector depending on the series.
	Electrical Connections? Choose from those illustrated on pages T2 & T3 in the Technical Section. STEP 3. FLOW ? WHAT IS THE Cv REQUIRED?
	Port size? NPTF or BSPP threads?
	Valve mounting: inline? stacking? base? manifold base? circuit bar™?
	Integral pressure regulators? { note
	Integral flow controls?

NOTE 1. All MAC 4 Ways can be used as 3 Ways or 2 Ways by simply plugging the appropriate port or ports; however in certain applications where considerations of size, speed, flow or cost are important, it may be preferable to select a 3 Way valve for a 3 Way application.

NOTE 2. Minimum pressure for the internally piloted 55 series valves is 30 psi. Maximum pressure for the 35 and 45 series is 120 psi.

NOTE 3. MAC 3 ways are all single operated spring return. For double operated 3 ways use a 4 Way and plug the appropriate cylinder port.

NOTE 4. For 3 position valves, minimum operating pressure is 25 psi.

NOTE 5. Check series for availability

TO CONSULT INDEX TURN THIS PAGE OVER THE CATALOG TO THE LEFT

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

- **2 WAY VALVES** Valves with 2 ports, an inlet and an outlet. Typical applications are cleaning or ejection systems and the operation of air motors.
- **3 WAY VALVES** Valves with 3 ports, inlet, outlet (cylinder) and exhaust. They are generally used to operate spring return cylinders or operated valves.
- **NORMALLY CLOSED** (N.C.) In the de-energized position the passage between the valve inlet and the outlet (cylinder) port is closed and therefore there is no flow through the valve.
- NORMALLY OPEN (N.O.) In the de-energized position inlet pressure flows through the valve to the outlet (cylinder) port.
- **4 WAY VALVES** Valves with 4 ports; inlet, a common exhaust and two cylinder ports, one normally open the other normally closed. Their most common application is to operate double acting cylinders.
- 5 WAY VALVES Valves with 5 ports (usually with two exhaust ports.) These valves perform the same function as 4 Way valves. Size for size, 4 Ways are smaller than 5 Ways since they only have 4 ports, the exhaust port being common to both cylinder ports. 5 Ways can also have dual inlets; this function can be duplicated by a 4 Way with "sandwich" pressure regulator either with dual regulators or a single regulator with by-pass. (see page D7)
- **POSITION** Most valves have 2 positions: a 2 way valve is on or off, the cylinder port of a 3 Way valve is open to either the inlet or the exhaust. In the case of a 4 Way valve one cylinder port is N.C. and the other N.O. This means that when a 4 Way valve is connected to a double acting cylinder, the cylinder is either fully extended or fully retracted. Some applications require that the cylinder be stopped in mid stroke. These applications call for a 3 position valve. For an explanation of the different types of 3 position valves, and the necessary precautions in applying them, see inside of back cover.
- **DIRECT OPERATED** A valve where the operator acts directly on the valve poppet or spool.
- **PILOT OPERATED** A valve which uses air to shift the valve spool or poppet. This pilot air is controlled by a 3 Way valve which can be solenoid, air or mechanically operated and may be integral to or separate from the main valve it controls.
- **INTERNAL PILOT** Air from the main inlet is supplied through internal passages to the pilot valve which controls the air to shift the main valve spool.
- **EXTERNAL PILOT** A provision for connecting a separate pilot air supply to the valve independent of the main inlet, for the purposes of providing the air to shift the main valve spool. External pilot connections are only required for low pressure and vacuum (or applications from 150-200 psi 800 series only).
- **REMOTE AIR OPERATED VALVE** A valve which is operated by an air signal from a remote source.
- **REMOTE AIR PILOT, PILOT OPERATED VALVE** A valve where an air signal from a remote source operates the valve pilot which in turn operates the main valve spool. The advantages of this MAC option is that the pilot valve requires very low shifting forces and the remote air signal pressure can therefore be substantially lower than the main inlet pressure.
- POPPET A valve element which blocks an orifice by covering that orifice.
- **SPOOL** A valve element which blocks an orifice by moving in a bore that contains that orifice.
- Cv Cv is a means of rating the flow capacity of a valve. A valve with a Cv of 10 has ten times more flow than a valve with a Cv of 1. Before air can flow through a system there must be (1) pressure and (2) a pressure drop (ΔP) across the system. If a valve has a Cv of 1, and given a primary pressure of 80 psi and a pressure drop of 10 psi then the flow through the valve will be approximately 28.4 scfm.
- **INLINE** Porting configuration that requires pipe connections to be made directly to the valve body.
- STACKING Modular, add-a-unit inline valves, with common inlet and exhaust.
- **BASE MOUNTED** Valve is mounted on a base which contains all the piping and, in the case of Plug-In valves, the appropriate electrical connections.
- **MANIFOLD** Modular, add-a-unit base mounted valves with common inlet and exhaust. Piping and electrical connections (in the case of Plug-In valves) are made in the base.
- CIRCUIT BAR® A single block of extruded anodized aluminum which can be machined to customers' individual specifications.
- **PLUG-IN** Quick disconnect electrical connections between the valve and base and the valve and solenoid.
- **EXTERNAL PLUG-INS** Quick disconnect electrical connections generally attached to the solenoid. Electrical connections are made directly to the plug-in connectors.
- MANUAL OPERATOR A device provided to permit the manual operation of the valve independent of the normal operator (solenoid or remote air signal)
- **SANDWICH REGULATORS** A pressure regulator, complete with electrical Plug-Ins, which is mounted between the valve and the base or manifold.
- MUFFLER (SILENCER) A device installed in the valve exhaust to reduce noise.
- **FLOW CONTROLS** A means of controlling the rate of flow of a fluid. MAC's patented flow controls permit the individual control of the exhaust of each cylinder port while retaining the compact size and convenience (only one muffler) of a 4 ported valve.
- **SANDWICH FLOW CONTROLS** Dual flow controls, in a single block complete with electrical Plug-Ins, which is mounted between the valve and the base or manifold.



MAC Valve's purpose is to provide air valves which meet the changing require by continually advancing air valve technology through design. This catalog c "Designs of the Times" in a broad line of air valves which provide:

	PAGES	CV FLOW (UP TO)	PORT SIZES	VALVE SERIES
	V, VI & VII		MAC GUARANTEE	, REBUILD PROGRAM & DES
	A1 - A4			DESIGN PRINCIPLES & O
	A5 - A8	0.1	#10-32 or M5	34 Direct Solenoid Inline
SMALL	A9 - A10	0.18	#10-32, or M5 & 1/8"	35 Direct Solenoid and Rema
3 WAY	A11 - A12	0.18	1/8" & 1/4"	100 Direct Solenoid
VALVES	A13 - A14	0.18	1/8" & 1/4"	1100 Manual, Mechanical a
	A15 - A17	0.50	1/8" & 1/4"	200 Direct Solenoid
	A18 - A20			DIMENSIONS
W. Sales and the second	B1 - B4			DESIGN PRINCIPLES & O
	B5 - B8	1.5	1/8" & 1/4"	52 Solenoid Pilot
LARGE	B9 - B10	2.5	1/4" & 3/8"	55 Solenoid Pilot and Remote
3 WAY	B9 - B10	6.2	3/8", 1/2" & 3/4"	56 Solenoid Pllot and Remote
VALVES	B11 - B12	19.9	1/2", 3/4" & 1"	57 Solenoid Pilot and Remote
	B11 - B12	33.5	1", 1-1/4" & 1-1/2"	58 Solenoid Pilot and Remot
	B11 - B12	65.0	2" & 2-1/2"	59 Solenoid Pilot and Remote
	B13 - B14			DIMENSIONS
	C1 - C4			DESIGN PRINCIPLES & O
	C5 - C8	0.1	#10-32 or M5	44 Direct Solenoid (2-POS) I
SMALL	C9 - C10	0.18	#10-32, M5 & 1/8"	45 Direct Solenoid (2-Pos.) a
4 WAY	C11-C12	0.8	1/8" & 1/4"	700 Solenoid, Pilot and Rem
VALVES	C13 - C16	1.0	1/8" & 1/4"	400 Solenoid Pilot (2 & 3 Po
	C17 - C20	1.4	1/4" & 3/8"	800 Solenoid Pilot (2 & 3 Pc
in the second	C21 - C22	1.1	1/4" & 3/8"	1800 Manual, Mechanical &
	C23 - C24	1.4	1/8" & 1/4" (3/8" Stacking)	900 Solenoid Pilot and Remo
	C25 - C32			DIMENSIONS
G.	D1 - D4			DESIGN PRINCIPLES & C
	D5 - D10	1.2	1/8", 1/4" & 3/8"	92 Solenoid Pilot
	D11-D16	1.35	1/8", 1/4" & 3/8"	82 Solenoid Pilot and Remot
	D17 - D20	1.6	1/4", 3/8"	6200 Solenoid Pilot and Rer
	D21 - D24	3.0	1/4", 3/8" & 1/2"	6300 Solenoid Pilot and Ren
LARGE	D25 - D28	5.1	3/8", 1/2" & 3/4"	6500 Solenoid Pilot and Ren
4 WAY VALVES	D29 - D30	9.6	3/4" & 1" (1-1/4" Manifold)	6600 Solenoid Pilot and Ren
VA	D31 - D32	15.9	3/4", 1", 1-1/4" & 1-1/2"	1300 Solenoid Pilot (2 & 3 F
	D31 - D32	15.9	3/4", 1", 1-1/4" & 1-1/2"	2700 Remote Pilot (2 & 3
	D33 - D34	6.3	1/4", 3/8", 1/2", 3/4"	ISO 1, 2 & 3 Solenoid Pilot a
	D35 - D38	1.0 to 5.4		ISO Series with single and
	D39 - D46			DIMENSIONS
	E			INDEX PAGE FOR E, F & (
	E1 - E37	0.08 to 1.3		Circuit Bar® Configurations
	F1 - F17	125/250/500 (2.5/7.0/11.2) - 82 (1.35)	MAC Specialty Valves: 125/:
	G1 - G6			MAC Special Assemblies:
	T1 - T21			INDEX/TECHNICAL SEC
	INICIDE DACK C	OVED		DDECAUTIONS Donal

PRECAUTIONS -- Read

INSIDE BACK COVER

ments of industry ontains our latest • Extremely fast response

Long and reliable service life
 Reasonable cost

• High flows in small light packages

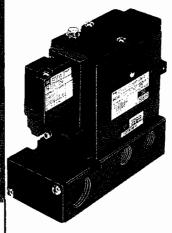


	(CUBIC OVERALL DIMENSIONS INCHES)	WT. LBS.	PAGES	
GN FEATURES			V, VI & VII	
PERATING DATA			A1 - A4	
	1.24 x .39 x 1.98 = .95	0.13	A5 - A8	
te Air Pilot	$1.10 \times .95 \times 1.91 = 2.1$	0.18	A9 - A10	SMALL
	$1.30 \times 1.12 \times 2.31 = 3.4$	0.31	A11 - A12	3 WAY
nd Remote Air Pilot	$1.30 \times 1.12 \times 2.31 = 3.4$	0.31	A13 - A14	VALVES
	1.75 x 1.78 x 3.87 = 12.1	1.06	A15 - A17	
			A18 - A20	
PERATING DATA			B1 - B4	
	$3.78 \times 2.46 \times .83 = 7.72$	0.44	B5 - B8	
Air Pilot	$2.20 \times 1.81 \times 4.37 = 17.4$	0.75	B9 - B10	LARGE
Air Pilot	$2.99 \times 2.89 \times 5.11 = 44.2$	1.50	B9 - B10	3 WAY
Air Pilot	4.38 x 3.81 x 6.72 = 112.1	4.25	B11 - B12	VALVES
Air Pilot	$5.50 \times 4.62 \times 8.10 = 205.8$	6.25	B11 - B12	
Air Pilot	7.90 x 6.20 x 10.69= 523.6	12.50	B11 - B12	
			B13-B14	
PERATING DATA			C1 - C4	
line	2.36 × 1.24 × .39 = 1.14	0.10	C5 - C8	
nd Remote Air Pilot	$2.44 \times 1.18 \times .96 = 2.8$	0.25	C9 - C10	SMALL
ote Air Pllot (2-Pos.)	4.52 x 1.63 x 1.61 = 11.9	0.81	C11 - C12	4 WAY
s.)	$3.78 \times 2.46 \times .83 = 7.72$	0.41	C13 - C16	VALVES
s.)	$5.33 \times 1.04 \times 2.44 = 13.5$	1.00	C17 - C20	
Remote Air Pilot (2 & 3 Pos.)	$5.33 \times 1.04 \times 2.44 = 13.5$	1.00	C21 - C22	
te Air Pilot (2-Pos.)	2.98 x 1.77 x 2.86 = 15.07	0.91	C23 - C24	
			C25 - C32	
PERATING DATA			D1 - D4	
	$4.54 \times 3.80 \times 1.57 = 27.0$	1.10	D5 - D10	
e Air Pilot (2 & 3 Pos.)	4.74 x 1.97 x 3.28 = 30.6	1.25	D11-D16	
note Air Pilot (2 & 3 Pos.)	$5.09 \times 2.13 \times 3.71 = 40.2$	1.56	D17 - D20	
note Air Pilot (2 & 3 Pos.)	$5.32 \times 2.36 \times 3.56 = 44.7$	2.19	D21 - D24	
note Air Pilot (2 & 3 Pos.)	$6.18 \times 2.74 \times 3.55 = 60.1$	2.87	D25 - D28	LARGE
note Air Pilot (2 & 3 Pos.)	8.03 x 4.17 x 5.41 = 181.2	6.50	D29 - D30	4 WAY VALVES
os.)	$9.22 \times 5.77 \times 4.50 = 239.4$	7.75	D31 - D32	
Pos.)	8.12 × 5.77 × 4.50 = 210.8	7.0	D31 - D32	
nd Remote Air Pilot (2 & 3 Pos.)	51.6in. ³ 92.4 in. ³ 122.4in. ³	2.5 4.0 5.3	D33 - D34	
dual pressure regulators			D35 - D38	
	The figures above are for single	solenoid	D39 - D46	
SECTIONS	valves (inline, individual body or		Ε	









Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

E1 - E37

F1 - F17

G1 - G6

T1 - T21

sub-base mounted as applicable)

250/500 Series, 82 Series & Proportional Pressure Controller

before use, installation or service of MAC valves

MAC Multi-Pressure Pak® & MAC Press Feed

TION

The MAC® 18 Month Guarantee Plus Lifetime Coil Guarantee . . .

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. Therefore, all valves appearing in this catalog are guaranteed for a period of eighteen months from the original date of shipment from our factory. In addition to this eighteen month Guarantee, MAC Valves, Inc. guarantees the electrical coils on every one of the valves listed in this catalog for life.

LIMITATION OF GUARANTEE

This Guarantee is limited to the replacement or rebuilding of any valve which should fail to operate properly. Valves, under the MAC Guarantee, must be returned (with or without bases) transportation prepaid and received at our factory within the Guarantee period. They will be returned to the customer at the expense of MAC Valves, Inc., and will carry the same guarantee as provided under the Flat Rate Rebuild Program.

DISCLAIMER OF GUARANTEE

No claims for labor, material, time, damage, or transportation are allowable nor will any valve be replaced or rebuilt under this guarantee which has been damaged by the purchaser not in the normal course of its use and maintenance during the warranty period. The guarantee 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. MAC Valves, Inc. shall in no event be liable for remote, special or consequential damages under the MAC Guarantee, nor under any implied warranties, including the implied warranty of merchantability.

The above Guarantee is our manner of extending the engineering and service resources of the MAC Valves, Inc. organization to assure our customer long, and continued satisfaction.

The MAC Flat Rate Rebuild Program . . .

Valves no longer covered by the MAC Guarantee can be rebuilt under the Flat Rate Rebuild program. Our constant research and testing program is dedicated to extending the life of our valves and making them even more reliable under the most adverse operating conditions. Valves returned under this program are completely disassembled, inspected, rebuilt to current operating standards wherever possible, tested and returned within a few weeks for a nominal flat rate charge. All rebuilt valves carry for 90 days from date of shipment from our factory the same guarantee as provided for new valves.

V

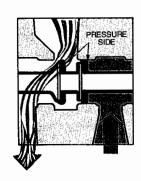
MAC DESIGN FEATURES

SPOOLS/BODIES

MAC flow seals are bonded to an aluminum spool, machine ground to a very close tolerance, and chemically surface hardened. The bore of the bodies is finished to a close tolerance, work hardened and polished. The result of these processes on the spool and bore keeps friction to a minimum and provides wiping action thus assuring long, stick-free consistent operation and making the spools relatively unaffected by air line contaminates.

MAC spools are of a balanced design; therefore, they are not affected by back pressure or restrictions in the exhaust, permitting 3-ways to be plugged for 2-way operation and 4-ways to be plugged for 3-way or 2-way operation.

Further, the use of two seals, as illustrated, one for the exhaust and one for inlet, provides for a short stroke and high flow in a small envelope size.



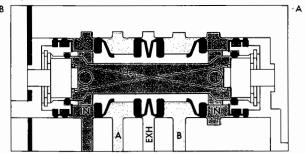
All valves utilize one piece aluminum bodies. On almost all Series valves, the bodies are die cast. The die casting technique used provides large, smooth and direct flow paths for low pressure drop.

PILOT SYSTEM

On most pilot operated valves a large checked accumulator, housed in the main valve body, supplies both pilots on double solenoid valves as well as the air/spring return on single solenoid pilot or single remote air pilot valves. The checked accumulator assures positive, consistent shifting in both directions even with inlet pressure fluctuations and/or restrictions, and even at very low minimum pilot pressures. On internal pilot models the accumulator is supplied from the main valve inlet and protected from inlet pressure fluctuations by a check valve. The check valve is designed to bleed off the accumulator when the main supply pressure is removed. On external pilot models, the accumulator is supplied from an external pilot port. Pilot operation ensures maximum energization shifting force. An air spring ensures maximum deenergization shifting force.

3-POSITION CENTERING

MAC 3-position solenoid and remote air pilot valves are centered by a patented spring centering device or patented combination spring and pressure assisted spool design which reduces side load potential and resultant wear, and assures fast, positive return of the main spool when the pilots are de-energized due to a high shifting force.

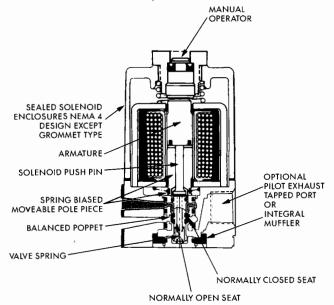


3 POS. CLOSED CENTER - CENTER POSITION

SOLENOID PILOT VALVES

Most MAC valves in this catalog are pilot operated by a patented high flow, fast response Normally Closed Only version of the compact MAC 100 Series solenoid valve (shown below). Similarly on solenoid pilot 3-way valves, another version of the 100 or 200 series is used as the pilot. These patented burnout proof solenoid pilots provide extremely fast response times to an extent not equaled in other valves.

Because air pressure does the work in shifting the main spool, minimal energy is consumed by the solenoid with no limitation in size of the main valve. On 120/60 AC service the inrush current is down to .12 Amps. On DC service wattages are available down to 1.0 Watts across almost the entire product line. (The 82 Series is piloted by a version of the 35 Series. On DC service, wattages are available down to 1.8 watts.)



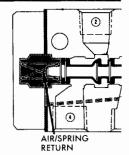
VIRTUALLY— BURN-OUT PROOF MACSOLENOID®

patented spring pole biased floating MACSOLENOID® used on all 3-ways and 4-ways in this catalog is independent and isolated from the valve body (100 Series shown above). When voltage is applied to the coil, the pole piece is held down by the bias spring so that the magnetic attraction between the pole piece and armature results in the armature moving down against the push pin, moving the poppet from the Normally Closed (N.C.) seat to the Normally Open (N.O.) seat. After the poppet has shifted completely, the pole piece then moves upward, compressing the bias spring, until the pole piece magnetically seals with the armature. If the poppet sticks and fails to move initially, preventing the armature from moving down, the pole piece is magnetically drawn upward, compressing the bias spring, allowing the pole piece and armature to magnetically seal and subjecting the valve to maximum shifting forces. Thus the two most common causes of solenoid valve failure-failure to shift when energized, and coil burnout on AC service-are practically eliminated. The bias spring also reduces de-energized response time since it is exerting a separation force (downward force on the pole piece) between the armature and pole piece.

MAC DESIGN FEATURES

AIR/SPRING RETURN

Single solenoid pilot or single remote air pilot models contain a unique combination spring and air assisted differential return. Supplied from the accumulator, inlet or external pilot; it maximizes and balances the shifting forces for consistent operation and positive spool return.



NON-LUBE SERVICE

All valves in this catalog can be operated with or without air line lubrication. This is made possible through the use of the unique solenoid pilot operator, the pilot system, the spool and bore design, close tolerances and MAC's prelubrication procedures. In either case, air line filters are recommended and will extend cycle life of the valves.

COILS

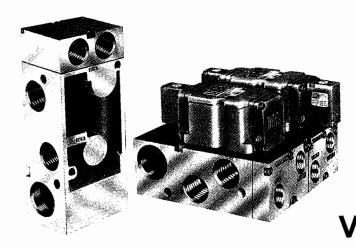
MAC makes its own coils permitting flexibility in voltage requirements. If the voltage required is not listed with the valve Series desired or in Section **T-2**, consult the factory, we may be able to produce it. Two types of special coils are described below.

LOW WATTAGE DC – MAC provides optional low wattage DC solenoids for all the valves of this catalog down to 1.0 watts, (except for the 600 Series and 1300 Series which are 6.0 watts, and the 35 & 45 Series which is 1.8 watts). These low wattage options can significantly reduce power consumption, power supply capacity, control amplifier capacity and cost of all the above.

CLASS F—High temperature AC and DC coil option. Available on all AC and DC coils. On some high wattage coils listed in the catalog, Class F is required and is so noted. These higher wattage coils are specified as MOD CLSF (Class F Option). Higher wattage coils will provide extremely fast response times.

ADD-A-UNIT MANIFOLDS

Pioneered by MAC, Add-A-Unit die cast manifold bodies and bases are available. The common inlet, exhaust, and on many models the electrical conduit channel, enables bodies and bases to be added as desired. A valve gang can contain both 2- and 3-position valves, as well as solenoid, remote air pilot and manual or mechanical valves. Sections of a gang or individual valves in a gang may be isolated permitting different pressures to be fed to either end of the gang.



ELECTRICAL PLUG-IN CONNECTIONS

4-way plug-in models incorporate recessed, shrouded connectors in both body and base with an integral ground pin that makes connection first and breaks last. Plug-Ins permit easy and fast replacement of the valve without disturbing either the electrical wiring or air plumbing.



REMOTE AIR PILOT, PILOT OPERATORS

A 100 Series type remote air pilot, pilot operator is available on all valves using the 100 Series type solenoid (except 1300 Series). Any 100 Series type solenoid can be replaced with this air pilot operator. When utilizing this operator the airpilot signal can be a minimum of 20 psig regardless of main valve pressures. Air pilot signal pressure only shifts the pilot valve poppet while internal (main valve) or External pilot pressure shifts the main spool. A manual operator and pilot poppet indicator is standard.

For how to order see section T-4 of this catalog

SPECIAL MODIFICATIONS

MAC Valves are designed to control air or inert gases as well as handle ambient temperatures up to 120°F. However, due to extreme environmental conditions, modified or special designs are sometimes required depending upon the application. Washdown and high temperature applications are two such conditions for which MAC has successfully developed modifications. Thousands of other modifications are available for the entire valve line. For further information, consult factory or your local distributor.



SMALL 3 WAY SOLENOID, AIR AND MECHANICALLY OPERATED VALVES

All MAC small 3 way valves are direct operated poppet valves. The four series of solenoid valves that fall in this section (34 35, 100, 200) all operate on the same design principle: a push type solenoid acting on a balanced poppet. The fifth series (1100) is a range of mechanically operated valves using the 100 series body assemblies.

34 SERIES (Cv 0.1)







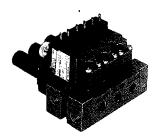
The 34 series is a direct operated 10mm valve that is available as an inline or manifold type valve. Each valve may be mounted to a circuit bar[®]. It has an all molded encapsulated coil for which multiple electrical connector options are available.

35 SERIES (Cv 0.18)

A1









The 35 series is the most versatile solenoid valve in this group. It has an all molded encapsulated coil and can be supplied as an individual inline, stacking or manifold base mounted valve. It is also available mounted on an extruded circuit bar® which can be machined to customers' specifications. Other options include integral pressure regulators and exhaust flow controls. This valve is also used as the pilot valve for the 4 way 82 Series.

100 SERIES (Cv 0.18)





The 100 series has the same flow as the 35 series. It is also available as an individual inline, stacking or manifold base mounted valve. The solenoid for the 100 series is the solenoid for the majority of the 4 way, and the 55 and 56 series 3 way

mounted valve. The solenoid for the 100 series is the solenoid for the majority of the 4 way, and the 55 and 56 series 3 way solenoid pilot operated valves.

200 SERIES (Cv 0.5)

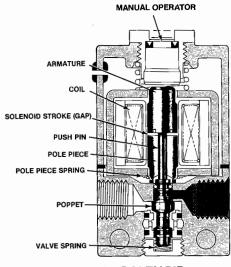


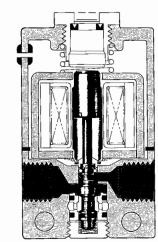




The 200 series is the largest of these four series of valves. It has the greatest flow and is available as an individual inline or manifold base mounted valve. The manifold base can be supplied with integral pressure regulators.

OPERATIONAL BENEFITS





(A) SOLENOID DE-ENERGIZED

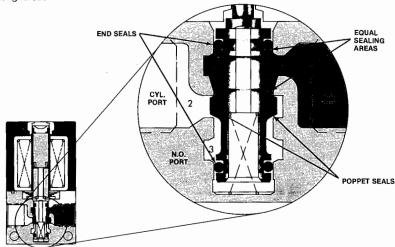
(B) SOLENOID ENERGIZED

Sequence of Events

- (A) · Solenoid is de-energized
- (B) Solenoid is energized
 - Armature is attracted magnetically downwards, extending push pin which shifts poppet from upper to lower seat
- Moving pole piece is attracted magnetically upwards to meet the armature which compensates for difference between longer solenoid stroke and shorter valve stroke. Armature and pole piece therefore close regardless of valve position

Fldvantages

- Short stroke solenoid produces high energization shifting force
- High force return spring due to high force solenoid, maximizes both energization and de-energization shifting forces
- Built-in wear compensation valve stroke is shorter than solenoid stroke
- Solenoid closes regardless of position of valve, virtually eliminating coil burnout on AC service



Balanced Poppet = Consistent High Shifting Forces

Exhaust Contaminants Isolated From Solenoid Parts = Clean Solenoid

- · Sealing areas are equal.
- End seals balance poppet seals
- Forces created by air pressure are equal in both directions
- Changing pressure therefore has no effect on shifting forces

Advantages

- Valve shifting forces are consistent and independent of pressure fluctuations
- High solenoid and return spring forces ensure high speed and precise repeatability
- Exhaust contaminants are isolated from the solenoid
- Manual override standard
- Constant high flow maintained throughout the pressure range - including pilot valves
- Full flow exhaust
- Universal porting 6 functions in one valve

A2

OPERATIONAL BENEFITS

- Six valve functions with one individual valve. (See "Valve Configurations Available" on the back of this page.)
- Constant high flow is maintained throughout the pressure range. (Up to 0.5 Cv)
- Full flow exhaust, piped in valve body, isolates exhaust contaminants from the solenoid.
- Balanced poppet provides high flow, precise repeatability and consistent operation and is immune to variations of pressure at any port.
- The short stroke, high force MACSOLENOID® with its non-burnout feature on AC service.
- Extremely rapid response and cycle rate. (Up to 250 cycles per second on certain DC solenoids.)
- Use on lubricated or non-lubricated service.
- Extremely long service life. (see MAC Guarantee in front of the catalog.)
- Non locking manual operators standard on all solenoid valves; other types of manual operators available.
- NEMA 4 solenoid enclosures except for grommet type (100 & 200 series only). Other types of electrical enclosures, including external plug-in connectors, can also be supplied.
- Optional low wattage DC solenoids down to 1 watt (100 & 200 series) or 1.8 watt (34 & 35 series)
- A triple rated coil for 120/60, 110/50 & 24 volts DC (6 watt) 200 series only.
- Optional models for hazardous locations designed to meet UL & CSA standards for Division 1 Class I, Groups B, C, D, and Class II Groups E, F, and G. (NEMA equivalent of Class I is NEMA 7; Class II is NEMA 9) - 200 series only.
- Optional surge supression available.
- Optional common conduit stacking valves with integral wiring space and indicator lights (100 & 35 series).
- Indicator lights available on certain types of electrical enclosures.
- Optional remote air pilot, pilot operated models. This pilot replaces the standard solenoid and is provided with a manual operator and position indicator. A minimum pilot pressure can operate the main valve regardless of the main valve pressure. (35, 100 series)

AVAILABILITY TABLE

SERIES FEATURES	34	35	100	200
universal porting	✓	√	✓	√
#10-32 OR M5 PORTS	√	✓	N/A	N/A
1/4" PORTS	N/A	N/A	INLINE	√
1/8" PORTS	N/A	√	√	✓
INLINE	√	✓	√	✓
STACKING	N/A	√	√	N/A
ADD-A-UNIT MANIFOLD	N/A	√	√	✓
CIRCUIT BAR®	√	√	N/A	N/A
PRESSURE REGULATOR	N/A	√	N/A	√
FLOW (Cv)	0.1	0.18 *	0.18	0.5

^{√ =} Available

N/A = Not Available

^{* =} Higher flows available with higher wattages. See page A10



OPERATING SPECIFICATIONS

FLUIDS:

Air or inert gases.

LUBRICATION: Not required, but if used a medium aniline point oil (180°F to 210°F) is recommended.

SAFE OPERATING	34 SERIES	35 SERIES	100 SERIES	200 SERIES
AMBIENT TEMPERATURE RANGE For UL & CSA purpose 104°F (40°C) max.	0° to 120°F (-18°C to 50°C)	0° to 120°F (-18°C to 50°C)	0° to 140°F (-18°C to 60°C)	0° to 140°F (-18°C to 60°C)
FLOW RATING: C _v (AVERAGE)	0.10	0.18	0.18	0.5
ORIFICE IN MM (ALL PORTS)	1.8	2.0	2.0	4.8
PRESSURE RANGE (PSI) (Pressures shown are min. and max. safe working pressures)	VAC – 120	VAC – 120	VAC -150	VAC – 150
ELECTRICAL				
120/60 – INRUSH	AC VOLTAGE AVAILABLE	10.9 VOLT-AMPS (0.09 AMPS)	14.8 VOLT-AMPS (0.12 AMPS)	33.0 VOLT-AMPS (0.27 AMPS)
120/60 - HOLDING	BY RECTIFIED DC SUPPLY	7.7 VOLT-AMPS (0.06 AMPS)	10.9 VOLT-AMPS (0.09 AMPS)	19.7 VOLT-AMPS (0.16 AMPS)
24 VOLT DC	40 to 18 W	12.7 to 18 W	17.1 to 10 W	24.0 to 1.0 W

ABOVE COILS: General purpose Class A, continuous duty, encapsulated coils. Class F coils on request.

COIL LEADS:

#18 AWG X 18" (100, 200); #22 AWG X 18" (34 & 35 series). Other lead lengths available on request.

VALVE CONFIGURATIONS AVAILABLE

INLINE MODELS

The balanced poppet design enables the same valve to be used for 6 functions with any port being connected to vacuum or pressure or simply plugged. Piping is shown in the chart below.

STACKING BODY MODELS (100 Series)

The reversible function plate between the valve bodies permits selection of either 3-Way Normally Closed or 3-Way Normally Open operation.

STACKING BODY MODELS (35 Series)

A different valve body assembly provides 3-way Normally Closed or 3-way Normally Open operation.

MANIFOLD BASE MOUNTED VALVES (35 Series)

A different base assembly provides 3-way Normally Closed or 3-way Normally Open operation.

MANIFOLD BASE MOUNTED **VALVES (100 & 200)**

The appropriate function plate between the valve body and base allows selection for 3-way or 2-way Normally Closed or Normally Open operation. On 3-way applications, one function plate is used for both N.C. and N.O. When "3-NC" is visible on the plate, the function will be N.C. When "3-NO "is visible, the function is N.O. On 2-way applications, a reversible plate is used for the 200 series, two separate plates for the 100 and 1100 series. In each case when "2-N C " is visible the function is 2-way Normally Closed, when "2-N.O." is visible, 2-way Normally Open. The 2-way plates block the exhaust at the valve, permitting the combination of 3-way and 2-way valves in the same manifold. Changes of function within the manifold can be made as desired with the same valve assembly, without disturbing the piping.

EXTRUDED CIRCUIT BARS® (34 Series) (35 Series)*

These are machined to provide 3-way or 2-way, Normally Closed to Normally Open operation. The 35 series Circuit Bar[™] can be supplied with optional regulators or flow controls.

SPECIAL APPLICATIONS

N.C. Only Models A single purpose Normally Closed Only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired.

VALVES FOR HAZARDOUS LOCATIONS (200 Series Only)

These models are designed to meet U.L. and C.S.A. standards for Division 1, Class 1, Groups B, C, D and Class II Groups E, F and G (NEMA equivalent to Class 1 is NEMA 7: Class II is NEMA 9). Valves for hazardous locations are available in either inline or manifold versions. They are supplied without manual operators.

INTEGRAL PRESSURE **REGULATORS**

Available for 200 & 35 Series

* Common conduit with or without electrical plug-in option is also available.

PIPING CHART FOR INDIVIDUAL MODELS

Supply

Operator De-Energized Operator Energized



2 Way Normally Closed 3 Way Normally Closed







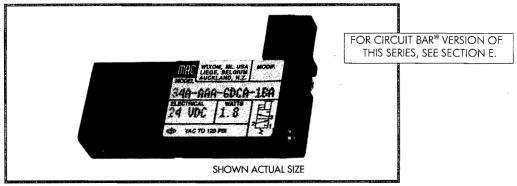






2 & 3 WAY, DIRECT SOLENOID
OPERATED INLINE VALVES
#10-32 OR M5 PORTS, C_v UP TO 0.12
PRESSURE RANGE: VACUUM TO 120 PSI

A NEW DIMENSION TO THE MAC PATENTED BALANCED POPPET DESIGN



The MAC 34 series is a high flow, direct operated 10MM poppet valve. No small pistons with low shifting forces and high minimum operating pressures. The MAC short stroke direct operated balanced poppet provides consistent operation. The shifting forces are consistently high, regardless of inlet pressure fluctuations. The balanced, high shifting forces provide very fast and repeatable response times.

OPERATING DATA

FLUIDS:

Air or inert gases

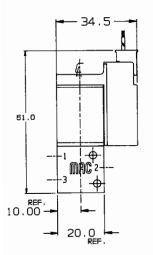
LUBRICATION: Not required, but if used, a medium aniline point oil (180°F to 210°F) is recommended.

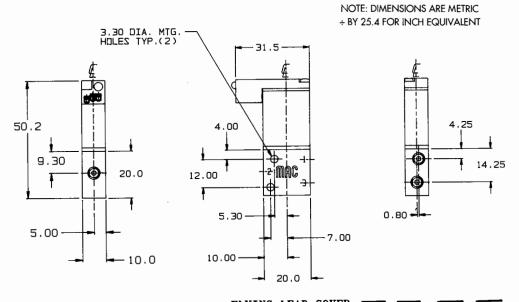
AMBIENT TEMPERATURE RANGE: 0°F to 120°F (-18°C to 50°C)

FLOW RATING: See below

ELECTRICAL: General purpose Class A, continuous duty, encapsulated. Coil leads #22 AWG.

WATTAGE	1.8w	2.5w	4.0w
FLOW	.063c _v	.097c _v	.121c _v





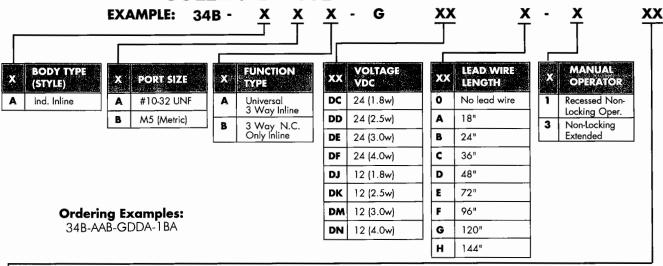
CIRCUIT BOARD COVER

FLYING LEAD COVER

MAC 10MM 34 SERIES

HOW TO ORDER

SOLENOID ASSEMBLY NUMBERING



XX ELECTRICAL CONNECTION

Use "0" with KJ & KM options

Note:

See page A8 for illustrations.

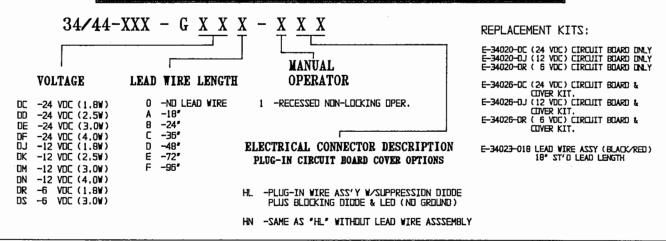
- BA Flying Leads w/o Ground Wire
- BB Flying Leads w/Ground Wire
- BC Flying Leads w/LED Light Parallel To Leads (No Ground Wire)
- BD Flying Leads w/LED Light Parallel To Leads & Ground Wire
- BE Flying Leads w/Suppression Diode (No Ground Wire)
- BF Flying Leads w/Suppression Diode & Ground Wire
- BG Flying Leads w/Suppression Diode Plus LED Light Parallel To Leads (No Ground Wire)
- BH Flying Leads w/Suppression Diode Plus LED Light Parallel To Leads & Ground Wire
- * BN Flying Leads w/Suppression Diode Plus Blocking Diode (No Ground Wire)
- * BP Flying Leads w/Suppression Diode Plus Blocking Diode & Ground Wire
- * BR Flying Leads w/Suppression Diode Plus Blocking Diode & LED Light Parallel To Leads (No Ground Wire)
- * BS Flying Leads w/Suppression Diode Plus Blocking Diode & LED Light Parallel To Leads & Ground Wire
 - BT Flying Leads w/LED Light On Top (No Ground Wire)
 - BU Flying Leads w/LED Light On Top & Ground Wire
 - BV Flying Leads w/Suppression Diode Plus LED Light On Top (No Ground Wire)
 - BW Flying Leads w/Suppression Diode Plus LED Light On Top & Ground Wire
- * BX Flying Leads w/Suppression Diode Plus Blocking Diode & LED Light On Top (No Ground Wire)
- * BY Flying Leads w/Suppression Diode Plus Blocking Diode & LED Light On Top & Ground Wire
 - KA Plug-In Wire Ass'y (No Ground Wire)
 - KB Plug-In Wire Ass'y w/Ground Wire
 - KE Plug-In Wire Ass'y w/Suppression Diode (No Ground Wire)
 - KF Plug-In Wire Ass'y w/Suppression Diode & Ground Wire
 - KJ Plug-In Housing Without Wire Ass'y For KA Option
 - KM Plug-In Housing Without Wire Ass'y For KB Option
- * KN Plug-In Wire Ass'y w/Suppression Diode Plus Blocking Diode (No Ground Wire)
- * KP Plug-In Wire Ass'y w/Suppression Diode Plus Blocking Diode & Ground Wire
 - KT Plug-In Wire Ass'y w/LED Light On Top (No Ground Wire)
 - KU Plug-In Wire Ass'y w/LED Light On Top & Ground Wire
 - KV Plug-In Wire Ass'y w/Suppression Diode Plus LED Light On Top (No Ground Wire)
 - KW Plug-In Wire Ass'y w/Suppression Diode Plus LED Light On Top & Ground Wire
- * KX Plug-In Wire Ass'y w/Suppression Diode Plus Blocking Diode & LED Light On Top (No Ground Wire)
- * KY Plug-In Wire Ass'y w/Suppression Diode Plus Blocking Diode & LED Light On Top & Ground Wire

FOR CIRCUIT BOARD COVER OPTIONS SEE PAGE A7.

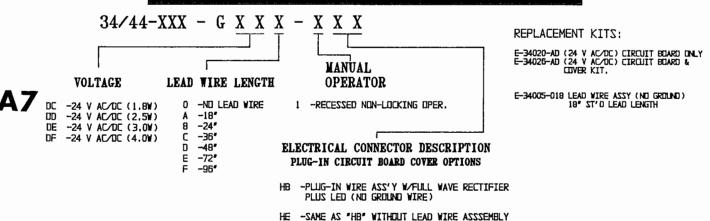
^{*}Blocking Diode Is In Lead Wire

HOW TO ORDER 34/44 SERIES CIRCUIT BOARD COVER OPTIONS

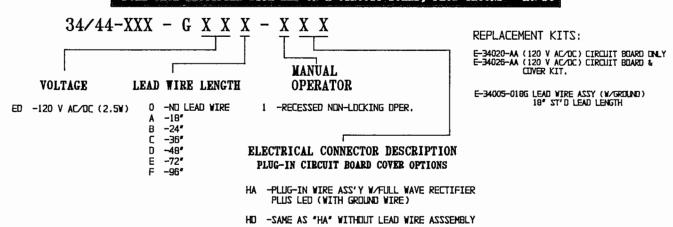
SUPPRESSION DIODE & BLOCKING DIODE WITH LED ON A CIRCUIT BOARD - DC ONLY



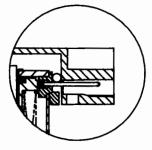
FULL WAVE RECTIFIER WITH LED ON A CIRCUIT BOARD, NO GROUND - AC/DC



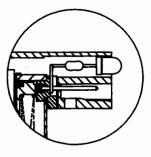
FULL WAVE RECTIFIER WITH LED ON A CIRCUIT BOARD, PLUS GROUND - AC/DC



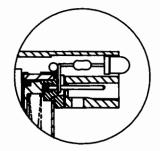
FLYING LEAD COVER OPTIONS, DIODE & WITH LIGHT PARALLEL TO LEADS & ON TOP



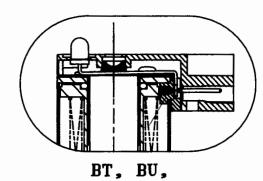
BE, BF, BN, BP



BC, BD



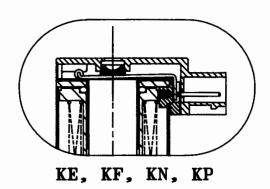
BG, BH, BR, BS

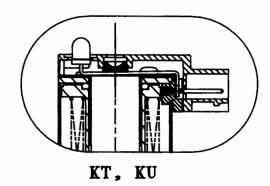


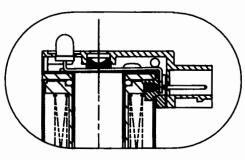
BV, BW, BX, BY

8A

PLUG-IN COVER OPTIONS, DIODE & WITH LIGHT ON TOP







KV, KW, KX, KY

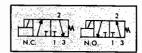


2 & 3 WAY, DIRECT SOLENOID OR REMOTE AIR PILOT OPERATED, INDIVIDUAL INLINE, STACKING BODY OR MANIFOLD BASE MOUNTED WITH OPTIONAL PRESSURE REGULATOR

#10-32, M5 & 1/8" PORTS - C_y UP TO 0.18
PRESSURE RANGE: VACUUM TO 120 PSI



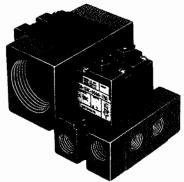
FOR CIRCUIT BAR® VERSION OF THIS SERIES, SEE SECTION E. INDIVIDUAL INLINE VALVES



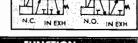
PORT SIZE	2 OR 3 WAY	FUNCTION
1/8"NPTF	35A-AAA-DAAA-IBA	Universal (N.C. & N.O.)

Valve code shown is for 120/60, 110/50 coil, non-locking recessed manual operator and grommet type electrical connection.

For other options see opposite page.



* STACKING VALVES



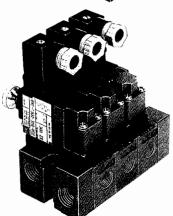
CYL

PORT SIZE	3 WAY	FUNCTION
%″NPTF	35A-SAC-DDAA-2MA	Normally Closed (N.C.)
¼″NPTF	35A-SAD-DDAA-2MA	Normally Open (N.O.)

Valve codes shown are for 24 volt DC (5.4 watt) coils, locking recessed manual operators and common conduit type electrical connections.

For other options see opposite page.





* MANIFOLD BASE MOUNTED VALVES

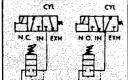
	CYL CYL	ı
		1
N.C. IN EXH N.O. IN EXH	TATA LIVE	۱.

PORT SIZE	2 OR 3 WAY	FUNCTION
⅓"NPTF	35A-BAE-DDEJ-3KA	Normally Closed (N.C.)
₩₩ 1/8″NPTF	35A-BAF-DDEJ-3KA	Normally Open (N.O.)

Valve codes shown are for 12 volt DC (12.7 watt) coils, non locking extended manual operators with Mini Plug-In external electrical connections.

For other options see opposite page





* MANIFOLD BASE MOUNTED VALVES WITH PRESSURE REGULATORS

PORT SIZE	2 OR 3 WAY	FUNCTION
⅓″NPTF	35A-BAJ-DFAJ-4TJ	Normally Closed (N.C.)
⅓″NPTF	35A-BAK-DFAJ-4TJ	Normally Open (N.O.)

Valve codes shown are for 12 volt DC (1.8 watt) coils, locking extended manual operators with dual tab electrical connections.

For other options see opposite page

*One End Plate Kit per gang required. To order see opposite page.

CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN

Individual inline valves can be changed from normally closed to normally open by merely changing the inlet connection from port 1 to port 3. In the case of stacking body valves, the body assembly is different and in the case of manifold base mounted valves the base assembly is different for normally closed and normally open operation.

NORMALLY CLOSED ONLY MODELS

A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired.

FOR CIRCUIT BAR® VERSION OF THIS SERIES, SEE SECTION E.

Patents and Patents Pending

OPTIONS RAIX - REMOTE PILOT AIR OPERATOR (SEE T-4) X - (DXXX - XXX) - SOLENOID OPTIONS

SEE BELOW

BODY TYPE

- NO VALVE BODY
- INLINE -
- INDIVIDUAL INLINE
- -INDIV. INLINE W/2 #10-32 PORTS IN BACK
- INDIV. INLINE W/2 MANIFOLD MOUNT PORTS

MANIFOLD -

- -MANIFOLD VALVE (UNIVERSAL POPPET)
- -MANIFOLD VALVE (N.C. ONLY POPPET)
- -MAN. VALVE W/GAGE PORT (UNIVERSAL POPPET)
- MAN, VALVE W/GAGE PORT (N.C. ONLY POPPET)
- -NO BODY BLANK STATION

- STACKING -

- -STACKING BODY
- STACKING BODY W/ **BOTTOM INLET**

PORT SIZE

- MANIFOLD BODY ONLY OR REGULATOR ONLY
- -1/8" NPT
- #10-32 UNF (STACKING & MANIFOLD)
- C -1/8" BSPPL
- M5 (METRIC) (STACKING & MANIFOLD)
- -1/8" BSPTR

MANIFOLD WITH BOTTOM CYL. PORT

- -1/8" NPT
- -#10-32 UNF
- -1/8" BSPPL
- -M5 (METRIC)
- -1/8" BSPTR

SOLENOID OPTIONS

BODY

XX X-X XX

VALVE FUNCTION/MANIFOLD TYPE

- -NO MANIFOLD BASE
- -UNIVERSAL 3-WAY INLINE
- -3 WAY N.C. ONLY INLINE/STACKING
- -N.C. STACKING UNIVERSAL POPPET
- -N.O. STACKING UNIVERSAL POPPET
- -N.C. MANIFOLD
- -N.O. MANIFOLD
- -N.C. MANIFOLD W/ REGULATOR SLOTTED STEM
- -N.O. MANIFOLD W/ REGULATOR SLOTTED STEM
- -N.C. MANIFOLD W/ REGULATOR & ADJ-KNOB
- -N.O. MANIFOLD W/ REGULATOR & ADJ-KNOB
- -REGULATOR ONLY SLOTTED STEM
- -REGULATOR ONLY W/ ADJ-KNOB
- -N.C. MANIFOLD CASCADE TYPE
- -N.C. MANIFOLD W/ REGULATOR CASCADE TYPE
- -N.C. MANIFOLD W/ REGULATOR-ADJ/KNOB (CASCADE)
- -N.C. MANIFOLD W/ REGULATOR LOCKING STEM
- -N.O. MANIFOLD W/ REGULATOR LOCKING STEM
- -REGULATOR ONLY W/LOCKING STEM

For regulator options & dimensions, see page C-28.

COIL AA 120/60, 110/50 AB 240/60, 220/50 AC 24/50-60 AF 240/50 DA 24VDC(5.4w) DB | 12VDC(5.4w) DE 12VDC (12.7w) 24VDC (12.7w) DF 12VDC (1.8w) FB 24VDC (1.8w)

FE | 12VDC (2.4w)

FF 24VDC (2.4w)

LEAD LENGTH

Α	18" Leads
В	24" Leads
С	36" Leads
D	48" Leads
E	72" Leads
J	External Plug-In

Other AC & DC Voltages & Wattages Available - Consult Factory

*NOTE: These wattages available as Mod. CLSF only

CV - FLOW

35 SERIES	INUNE	STACKING	MANIFOLD BASE	CIRCUIT BAR™
Low watt DC 1.8 - 2.4 watts	0.08	0.12	0.09	0.08
Std. watt DC 5.4 watts	0.15	0.16	0.10	0.09
All Std. Ac & Hi-flow DC 5.4 - 7.2 watts	0.17	0.17	0.14	0.14
Hi-flow DC 7.3 - 9.2 watts MOD 1125	0.21	0.21	0.17	0.16
Hi-flow DC 9.3-24 watts & all AC MOD 1125	0.25	0.25	0.18	0.17

MANUAL OPERATOR

0	No Operator
1	Non-Locking Recessed
2	Locking Recessed
3	Non-Locking Extended
4	Locking Extended
5	No Operator w/Indicator Light (Stacking MA Cover)
6	Non-Locking Recessed w/Light on MA Cover
7	Locking Recessed w/Light on MA Cover
8	Non-Locking Extended w/Light on MA Cover
9	Locking Extended w/Light on MA Cover

t Available on individual valves and Circuit Bars[®] only.

ELECTRICAL CONNECTION

- Grommet BA
- Grommet w/Diode
- BL Grommet w/M.O.V. †CA Conduit 1/2" NPS
- †CM Metal conduit 1/2" NPS
- †CN Metal conduit w/grd. 1/2" NPS -EXTERNAL PLUG-IN VALVE-

- FM Plug-in (For ECD & ECE Bar)
 FN Plug-in w/Diode (For ECD & ECE Bar)
 FP Plug-in w/M.O.V. (For ECD & ECE Bar)

 †JB Rectangular Plug-in (Inline Only)
 †JD Rectangular Male Only (Inline Only)

 †JM Rectangular Male Only (Inline Only)

 - KA Mini Plug-in
 - KB Mini Plug-in w/Diode
 - Mini Plug-in w/M.O.V.
- KD - Mini Plug-in w/Light
- Mini Plug-in w/Light & Diode
- KF - Mini Plug-in w/Light & M.O.V.
- KG Mini Plug-in w/LED Light & Diode
- Mini Plug-in Male Only
- Mini Plug-in Male Only w/Diode
- Mini Plug-in Male Only w/M.O.V.
- Dual Tabs (.110) w/ReceptaclesDual Tabs with Diode with Receptacles
- Dual Tabs with Light with Receptacles
- Dual Tabs with Light with Diode with Receptacles
 Dual Tabs (.110) Plain
- Dual Tabs with Diode without Receptacles
- TM Dual Tabs with Light without Receptacles
- TN Dual Tabs with Light with Diode without Receptacles
- MA Common Conduit (Stacking)

STACKING BODY **ACCESSORIES**

MANIFOLD END PLATE KIT -

For each gang, one kit is required.

ISOLATORS-Sections of a gang may be isolated permitting different pressures to be fed to either end of the gang, or to optional bottom inlet port.

END PLATE KITS

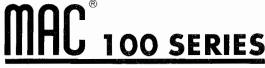
Stacking Valves	w/o common conduit
M-35001-01	1/4" NPTF
M-35001-01P	1/4" BSPPL
Stacking Valves	w/common conduit (MA)
M-35002-01	1/4" NPTF
M-35002-01P	1/4" BSPPL

ĺ	Manifold Valves		
	M-35003-01	1/4" NPTF	
	M-35003-01P	1/4" BSPPL	

ISOLATORS - When using isolators with common conduit, M-45004 spacer is required between conduit boxes

Stacking Valves	
N-35001	Inlet & Exhaust
N-35002	Inlet Only
N-35003	Exhaust Only
production are consistent and a second order to the second order t	

Manifold Valve	·5
N-35006	Inlet & Exhaust
N-35007	Inlet Only
N-35008	Exhaust Only

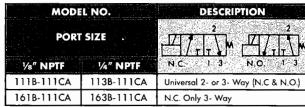


2 & 3 WAY, DIRECT SOLENOID OPERATED, INDIVIDUAL INLINE, STACKING BODY AND MANIFOLD BASE MOUNTED 1/8", 1/4" PORTS - C_V UP TO 0.18

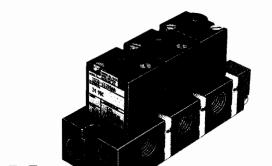
98", 94" PORTS - C_V UP TO 0.18

PRESSURE RANGE: VACUUM TO 150 PSI





Valve codes shown are for 120/60, 110/50 coils, non locking recessed manual operators and ½" NPS electrical conduit connections. For other options see opposite page.

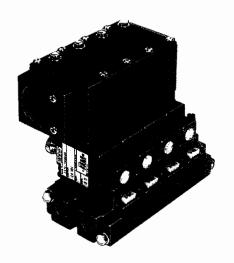


* STACKING VALVES

MODE	L NO.	DESCRIPTION
PORT	SIZE	CYL CYL
1/8" NPTF	¼" NPTF	N.C. IN EXH NO IN EXH
181B-612BA	183B-612BA	3-Way (N.C or N.O.)
184B-612BA	185B-612BA	3-Way N.C. Only

Valve codes shown are for 24 volt DC (8.5 watt) coils, locking recessed manual operators and grommet type electrical connections. For other options see opposite page.

* MANIFOLD BASE MOUNTED VALVES



T/	CYL TIT M	CYL LTTTM N.O. IN EXH
VALVE LESS BASE	FUNCTION	VALVE WITH 1/8" NPTF BASE
120B - 598MA	2-Way N.C.	122B - 598MA
130B - 598MA	Universal 3-Way (N.C. & N.O.)	132B - 598MA
140B - 598MA	2-Way N.O.	142B - 598MA
170B - 598MA	N.C. Only 3-Way	172B - 598MA

Valve codes shown are for 24 volt DC (2.5 watt) coils, non locking extended manual operators and 1" NPS common conduit electrical connections with lights. For other options see opposite page.

CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN

Individual inline valves can be changed from normally closed to normally open by connecting the inlet to port 3 instead of port 1. In the case of stacking valves a reversible plate, complete with indicator, is placed between each valve body assembly. This determines whether the valve is N.C. or N.O. For manifold base mounted valves a similar plate is provided between the valve and the base. Three plates are available; a reversible plate for 3 Way valves (N.C. & N.O.), one plate for 2 Way N.C. and one for 2 Way N.O. Appropriate plates, determined by the valve model number, are supplied automatically with the valve.

NORMALLY CLOSED ONLY MODELS

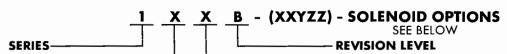
A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

^{*} One End Plate Kit per gang required. To order see opposite page.



BODY OPTIONS

HOW TO ORDER



VALVE FUNCTION

- 1-UNIVERSAL IND. INLINE
- 2-2 WAY N.C. MANIFOLD 3-3 WAY UNIVERSAL MANIFOLD
- 4-2 WAY N.O. MANIFOLD
- 6-N.C. ONLY IND. INLINE
- 7-N.C. ONLY MANIFOLD
- 8-STACKING MODELS

0-MANIFOLD VALVE LESS BASE

1-1/8" NPTF IND. INLINE OR UNIVERSAL STACKING

PORT SIZE/BODY STYLE

- 2-%" NPTF MANIFOLD
- 3-1/4" NPTF INLINE OR UNIVERSAL STACKING
- 4-1/8" NPTF STACKING, 3 WAY N.C. ONLY
- 5-1/4" NPTF STACKING, 3 WAY N.C. ONLY
- 6-1/8" BSPP INLINE OR UNIVERSAL STACKING OR MANIFOLD

ZZ ENCLOSURE

Grommet

Conduit 1/2" NPS

Conduit ½" NPT (CSA Threads)

JIC w/1/2" NPS Conduit

- 7-1/4" BSPP INLINE OR UNIVERSAL STACKING
- 8-1/8" BSPP STACKING, 3 WAY N.C. ONLY
- 9-1/4" BSPP STACKING, 3 WAY N.C. ONLY

SOLENOID OPTIONS **EXAMPLE:** XX

ХX	AC VOLTAGE	X	X	DC VOLTAGE
11	120/60, 110/50	5	0	24 VDC (6W)
12	240/60, 220/50	5.	5	12 VDC (6W)
22	24/50-60	5	7	12 VDC (2.5W)
39	240/50	5	9	24 VDC (2.5W)
		6	0	12 VDC (8.5W)
		6	1	24 VDC (8.5W)

Other AC & DC Voltages Available. DC Wattages from 1.0 to 17 Watts. See Page **T-2** or Consult Factory.

Ì	MANUAL OPERATOR INDICATOR LIGHTS
0	No Operator
-	Non-Locking Recessed (Std.)
2	Locking Recessed
3	Non-Locking Extended
4	Locking Extended
5	No Operator with Light
6	Non-Locking Recessed w/Lgt.
7	Locking Recessed w/Lgt.
8	Non-Locking Extended w/Lgt.

Locking Extended w/Lgt.

Conduit 1/2" NPS w/Ground Wire Conduit 3/8" NPS-for Manifold Models Com. Conduit 1" NPS (Manifold Models) Common Conduit 1" NPS (Stacking Models)

(MA & MB Common Conduit Covers require 1 #M-01002-01 conduit end plate kit per stock)

Lights are available for 120/60, 110/50 or 240/60, 220/50 or 24 VDC with JIC enclosure (AA) or MA or MB

100 SERIES-SUPPLEMENTAL TECHNICAL DATA

MOD. NO.	DESCRIPTION	MODEL AVAILABILITY
CLSF	Class F Coil	All voltages
0004	All bottom and side ports	Manifold models only
0009	Bottom and side cylinder ports with side only Inlet and Exhaust ports	Manifold models only
0210	Additional Bottom Inlet	Manifold & stacking models
313P	For isolating the common Inlet passage between monifold bases	Manifold models only
313E	For isolating the common Exhaust passage between manifold bases	Manifold models only
T65C	For Ambient Temperatures up to 65°C (150°F)	All models
0449	For long extended energization applications	Solenoid models

STACKING BODY ACCESSORIES: STACKING END PLATE KIT-

External Plug-Ins

available. See page T-3 or Consult Factory.

For each gang one kit is required. TO ORDER-Specify number M-01001-01 (1/4" NPTF)

or M-01001-01P (1/4" BSPP).

INLET ISOLATOR PLATE N-01003 EXHAUST ISOLATOR PLATE N-01004

MANIFOLD ACCESSORIES: MANIFOLD END PLATE KIT-

For each gang one kit is required. TO ORDER-Specify number A2-5004-01 (1/4" NPTF)

or A2-5004-01P (1/4" BSPP).

MODIFICATIONS: For additional modifications see Technical Section

TO ORDER-Add the appropriate modification number from the table above after the valve number,

EXAMPLE: 132B-111BA MOD 0004.

Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section. Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

MAC 1100 SERIES

Patents and Patents Pending

HOW TO ORDER

1100A SERIES

To order complete valve requires selection of a body type followed by an operator, e.g., 1111A-011

BODY TYPE—OPERATOR

11<u>XXA</u> - <u>></u>

INDIVIDUAL BODY MODELS

	MODEL NO.①	DESCRIPTION
_	1111A-	1/8" NPTF Universal 2 or
		3-Way (N.C. or N.O.)
	1113A-	1/4" NPTF Universal 2 or
		3-Way (N.C. or N.O.)
	1161A-	1/8" NPTF N.C. Only 3-Way
	1163A-	1/4" NPTF N.C. Only 3-Way

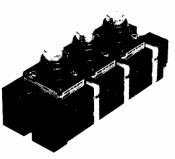
①For BSPP Porting, the 4th digit is **6** instead of **1** or **7** instead of **3**; e.g., 1116A-.

A13

STACKING BODY MODELS

MODEL NO.2	DESCRIPTION
1181A-	1/8" NPTF 3-Way (N.C. or N.O.)
1183A-	1/4" NPTF 3-Way (N.C. or N.O.)
1184A-	1/8" NPTF 3-Way N.C. Only
1185A-	1/4" NPTF 3-Way N.C. Only

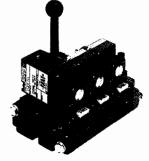
② For BSPP Porting, the 4th digit is 6 instead af 1, or 7 instead of 3, or 8 instead af 4, ar 9 instead of 5; e.g., 1186A-.



MANIFOLD BASE MODELS

MODEL NO.		MODEL NO.
VALVE LESS BASE	DESCRIPTION	VALVE WITH BASE NPTF® 1/8"
1120A-	2-Way N.C.	1122A-
1130A-	Universal 3-Way (N.C. & N.O.)	1132A-
1140A-	2-Way N.O.	1142A-
1170.A-	N.C. Only 3-Way	1172A-

3 For BSPP Porting, the 4th digit is 6 instead of 2; e.g., 1126A-.



OPERATORS

	→ OPERATORS	
XXX	DESCRIPTION	
-011	Straight Cam Roller—Parallel to Ports 1 & 2	1
-012	Straight Cam Roller—Perpendicular to Ports 1 & 2	
-013	Lever Cam Perpendicular to Ports 1 & 2	_
-014	Lever Cam Parallel to Ports 1 & 2	
-015	Lever Cam Parallel to Ports 1 & 2 (Override Right)	٦
-016	Lever Cam Parallel to Ports 1 & 2 (Override Left)	
-01 <i>7</i>	Lever Cam Perpendicular to Ports 1 & 2 (Override Forward)	
-018	Lever Cam Perpendicular to Ports 1 & 2 (Override Backward)	
-021	Laver Locking Push—Perpendicular to Ports 1 & 2	
-022	Lever Non-Locking Push—Perpendicular to Ports 1 & 2	
-023	Lever Locking Pull—Perpendicular to Ports 1 & 2	
-024	Lever Non-Locking Pull—Perpendicular to Ports 1 & 2	
-025	Lever Locking Push—Parallel to Ports 1 & 2	
-026	Lever Non-Locking Push—Parallel to Ports 1 & 2	
-027	Lever Locking Pull—Parallel to Ports 1 & 2	
-028	Lever Non-Locking Pull—Parallel to Ports 1 & 2	
-031	Push Button*	_
-032	Push Button, Panel Mount*	
-033	Push Button with Guard*	
-036	Palm Button*	
-037	Palm Button, Panel Mount*	
-038	Palm Button with Guard*	_
•	Palm & Push Buttons are White (Standard). Available are Black, Blue, Green, Red or Yellow. Specify Color.	
-111	Air Pilot (1/8" NPTF Pilot Port)	_
-112	Air Pilot (#10-32 Pilot Port)	_
-113	Air Pilot (M5x0.8 Pilot Port)	_
-114	Air Pilot (1/8" BSPP Pilot Port)	
-115	Air Pilot (1/8" BSPT Pilot Port)	
	STACKING RODY ACCESSORIES	_

STACKING BODY ACCESSORIES

END PLATE KIT—For each gang one kit is required.

TO ORDER—Specify #M-01001-01 (1/4" NPTF)

#M-01001-01P (1/4" BSPP)

MANIFOLD BASE ACCESSORIES

MANIFOLD END PLATE KIT—For each gang one kit is

TO ORDER—Specify #A2-5004-01 (1/4" NPTF) #A2-5004-01P (1/4" BSPP)

MODIFICATIONS

Mod. No.	DESCRIPTION	AVAILABILITY
004	All Battom and Side Ports	Manifold Models Only
009	Battom and Side Cylinder Ports With Side Only Inlet and Exhaust Ports	Manifold Madels Only
210	Additional Bottam Inlet	Manifold & Stacking Bodies
313P	For Isolating the Cammon Inlet Passage Between Valves	Manifold Models Only
313E	For Isalating Common Exhaust Passage Between Bases	Manifold Models Only

_All MAC Valves available with BSPP threads: to order see above. -

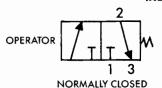
Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

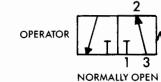
DIMENSIONS 1100 SERIES

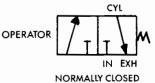
ANSI TYPE SYMBOLS





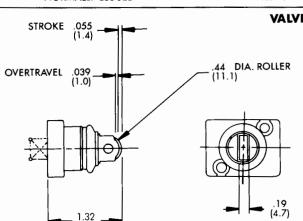






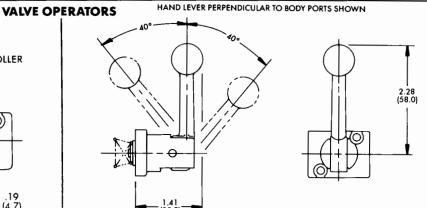


NORMALLY OPEN



MAXIMUM CAM RISE 30°

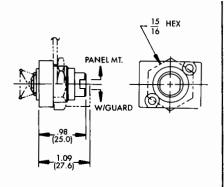
Straight Cam Parallel to Ports 1 & 2 -012 Straight Cam Perpendicular to Ports 1 & 2 (Shown)



- -021 Lever Locking Push-Perpendiculor to Ports 1 & 2 Lever Non-Locking Push-Perpendicular to Ports 1 & 2
- Lever Locking Pull—Perpendicular to Parts 1 & 2 Lever Non-Locking Pull-Perpendicular to Ports 1 & 2
- Lever Locking Push-Porallel to Ports 1 & 2 Lever Non-Locking Push-Parollel to Ports 1 & 2
- Lever Locking Pull-Porallel to Ports 1 & 2 -028

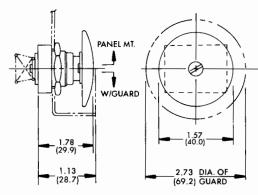
Lever Non-Locking Pull—Parallel to Parts 1 & 2

DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)



(33.6)

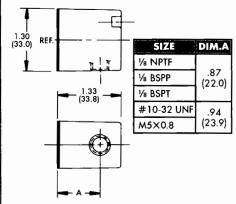
- Push Button
- Push Button, Panel Mount Push button with Guard
- *25/32 (20mm) Hole required in panel.



- -036 *-037 Palm Button
- Palm Button, Panel Mount -038
 - Palm Button with Guard. Palm & Push Buttons are White (Standard) Black, Blue, Green, Red or Yellow. Specify Color.

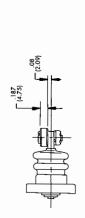
PARALLEL TO PORTS 1 & 2

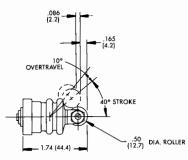
*25/32 (20mm) Hole required in panel.



- Pilot 1/8" NPTF Pilot Port
- Pilot #10-32 Pilot Port
- -112 -113 Pilot M5x0.8 Pilot Port
- Pilot 1/8" BSPP Pilot Port
- Pilot 1/8" BSPT Pilot Port

ARROWS INDICATE DIRECTION OF OPERATION







- -014 Lever Cam Parallel to ports
- -015 Lever Cam Porallel to ports (Override right) -016 Lever Cam Parallel to ports (Override left)
- -017 Lever Cam Perpendicular to ports (Override Forward)
- -018 Lever Cam Perpendicular to ports (Override Backward) Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.







2 & 3 WAY, DIRECT SOLENOID OPERATED, INDIVIDUAL INLINE & MANIFOLD BASE MOUNTED

1/8", 1/4" PORTS - C, UP TO 0.5

PRESSURE RANGE: VACUUM TO 150 PSI



INLINE MODELS

MODE	L NO.	DESCRIPTION
PORT NE ½"		
224B-111CA	225B-111CA	Universal 2- or 3- Way (N.C. & N.O.)
274B-111CA	275B-111CA	N.C. Only 3- Way

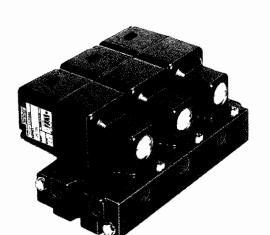
Valve codes shown in **both tables** are for 120/60, 110/50, 24 VDC (6.0 watt) triple rated coils, non-locking recessed manual operators. For electrical enclosures (CA & BA) see photos. For other options see opposite page.



The special version of the 200 Series designed for hazardous locations has been approved by CSA for Class I, Groups B, C & D; Class II, Groups E, F & G. Maximum rated fluid and ambient temperature is 40°C; maximum pressure is 150 p.s.i. Approval is limited to certain common AC & DC voltages which are those designated in the table on the opposite page by the suffixes -11, -12, -22, -50, -55, -60, -61.

These valves are supplied without manual operators. This version of the 200 Series can be supplied on the standard individual inline or the manifold valve body assemblies. It can also be supplied as a pilot for the 57, 58 and 59 Series (with special adapter plate #M-00012). **ORDERING EXAMPLE:** 225B-110EA





MODEL NO.	DESC	CRIPTION	MODE	L NO.
VALVE LESS BASE	CVL	CTL IN EXH		TITH BASE PTF 1/4"
250B-111BA	Universal 3-Way	Std. Sol.	256B-111BA	257B-111BA
2506-1116A	(N.C. & N.O.)	Sol./Hazardous/Location	258B-110EA	259B-110EA
240P 111PA	Universal 2-Way	Std. Sol.	266B-111BA	267B-111BA
260B-111BA	(N.C. & N.O.)	Sol./Hazardous/Location	268B-110EA	269B-110EA
2000 11104	N.C. Only	Std. Sol.	286B-111BA	287B-111BA
280B-111BA	3-Way	Sol./Hazardous/Location	288B-110EA	289B-110EA

NORMALLY CLOSED ONLY MODELS

A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers ore indicated above.

^{*}One End Plate Kit per gang required. To order see opposite page.



BODY OPTIONS

B - (XXYZZ) - SOLENOID OPTIONS SEE BELOW **SERIES REVISION LEVEL**

VALVE FUNCTION

2-UNIVERSAL 2 OR 3 WAY INDIVIDUAL INLINE 5-UNIVERSAL 3 WAY MANIFOLD BASE MOUNTED 6-UNIVERSAL 2 WAY MANIFOLD BASE MOUNTED 7-N.C. ONLY 2 OR 3 WAY INDIVIDUAL INLINE 8-N.C. ONLY 2 OR 3 WAY MANIFOLD BASE MOUNTED

PORT SIZE/BODY STYLE

0-UNIVERSAL MANIFOLD LESS BASE 1-N.C. ONLY MANIFOLD WITH 1/4" NPTF MANIFOLD BASE, INTEGRAL PRESSURE REGULATOR, COMMON OUTLET (CASCADE) 2-UNIVERSAL OR N.C. ONLY MANIFOLD WITH 1/4" NPTF MANIFOLD BASE, INTEGRAL PRESSURE REGULATOR, INDIVIDUAL OUTLET 4-INDIVIDUAL INLINE , 1/8" NPTF PORTS 5-INDIVIDUAL INLINE, 1/4" NPTF PORTS

6-MANIFOLD BASE MOUNTED, 1/8" NPTF 7-MANIFOLD BASE MOUNTED, 1/4" NPTF 8-MANIFOLD BASE MOUNTED, 1/8" NPTF

(SOLENOID FOR HAZARDOUS LOCATIONS) 9-MANIFOLD BASE MOUNTED, 1/4" NPTF

(SOLENOID FOR HAZARDOUS LOCATIONS)

For BSPP ports, add **MOD 0005** after valve model code, e.g. 225B-111BA MOD 0005

SOLENOID OPTIONS EXAMPLE:

Γ			Т		_	_	
хх	AC VOLTAGE		XX	DC VOLTAGE		Ú	MANUAL OPERATOR
11	120/60, 110/50 24 VDC (6W)		50	24 VDC (6.0W)		0	No Operator
12	240/60, 220/50		52	24 VDC (2.5W)		1	Non-Locking Recessed (Std.)
22	24/50-60		5 3	24 VDC (1.0W)		2	Locking Recessed
25	240/50		55	12 VDC (6.0W)		3	Non-Locking Extended
			60	12 VDC (8.5W)		4	Locking Extended
			1	24 VDC (8.5W)		5	No Operator with Light
		t	69	220-250 VDC (11.3W)		6	Non-Locking Recessed w/Lgt.
4	· Must be Class F coils	†	78	24 VDC (24.0W)] [7	Locking Recessed w/Lgt.
Other AC & DC Voltages Available.				8	Non-Locking Extended w/Lgt.0		
C	OC Wattage from 1.0 to see Page T-2 or Consu	to 2	4 W	otts.		9	Locking Extended w/Lgt.

777	ENCLOSURE	
AA	JIC w/½" NPS Conduit	Lights are available for 120/60,
ВА	Grommet	110/50 or 240/60, 220/50 or 24 VDC with JIC enclosure only
CA	Conduit 1/2" NPS	(AA). If -11 coil is used for 24VD specify MOD 0472 for 24V light
CC	Conduit ½" NPT (CSA Threads)	2 Hazardous locations enclosure
EΑ	Hazardous Locations ②	supplied with No Operator only (

110/50 or 240/60, 220/50 or 24 VDC with JIC enclosure only (AA). If -11 coil is used for 24VDC, specify MOD 0472 for 24V light.

Hazardous locations enclosure supplied with No Operator only ("O").

External Plug-Ins available. See Page T-3 or Consult Factory.

MODIFICATIONS For additional modifications see Technical Section

MOD. NO.	DESCRIPTION	MODEL AVAILABILITY
CLSF	Class F Coil	All voltages
0004	All bottom and side parts	Manifold (except Regulator Type) only
0009	Bottom and side cylinder parts with side only Inlet and Exhaust ports	Manifold (except Regulator Type) only
313P	For isolating the cammon Inlet passage between manifold bases	Manifold (except Regulator Type) only
313E	For isalating the common Exhaust passage between manifold bases	Manifold (except Regulator Type) only
T65C	For Ambient Temperatures up to 65°C (150°F)	All models
0449	For long extended energization applications	All models

MANIFOLD ACCESSORIES: MANIFOLD END PLATE KIT-

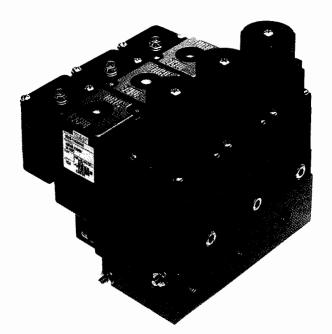
For each gang one kit is required. TO ORDER-Specify number A2-5003-O1 (1/4" NPTF)

or A2-5003 01P (1/4" BSPP).

TO ORDER-Add the appropriate modification number from the table below after the valve number, **EXAMPLE:** 225B-111BA MOD CLSF.

MAC 200 SERIES

Patents and Patents Pending



3-WAY, DIRECT SOLENOID OPERATED, SPRING RETURN. MANIFOLD BASE MOUNTED VALVES WITH INTEGRAL PRESSURE REGULATORS.

1/4" PORTS - C, UP TO 0.5

PRESSURE RANGE: 0-120 PSI (STANDARD)

0-80 PSI (MOD PR 80)

0-30 PSI (MOD PR 30)

MANIFOLD MODELS WITH REGULATOR

MODEL NO. VALVE LESS BASE		SCHEMATIC BELOW IPTION	MODEL NO. VALVE WITH BASE NPTF '4"
250B-619AA	2.14	Selected Pressure Single Outlet-NC. only	251B-619AA
2500-017704	3-Way	Individual Pressure (N.C. & N.O.)	252B-619AA
260B-619AA	Universo (N.C. d Individual P	262B-619AA	
280B-619AA	3-Way N Individual P	282B-619AA	

Valve codes shown in the above table are for 24 Volt DC (8.5 watt) coils, locking extended manual operators with light and JIC wiring box with 1/2" NPS electrical conduit connection. For other options see page A16

A17

MODEL 251B-

3-Way Normally Closed

SELECTED PRESSURE CONTROL TO A SINGLE OUTLET

This version permits the alternate selection of any of the regulated pressures in the stack to one common outlet. With all valves de-energized the regulated pressure supplied to the Normally Open pressure port passes through the valves and out the corresponding port at the other end of the stack (Common Outlet Port). Pressure supplied to the common inlet port is regulated at each valve and blocked by the poppet of each valve. When a valve is shifted in the stack the Normally Open pressure is blocked and the regulated normally closed pressure of that valve is open to the common outlet. If two valves are energized at the same time the pressure at the common outlet would be that of the energized valve nearest the outlet. If the normally open pressure port is not used it is open to exhaust from the common outlet. The individual cylinder port in each base is non-operative. (See schematic diagram below)

MODEL 252B-

3-Way N.C. or N.O. 262B-

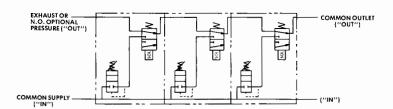
2-Way N.C. or N.O. 282B-3-Way N.C. only

INDIVIDUAL PRESSURE CONTROL TO EACH CYLINDER PORT

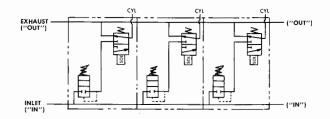
In this version the common inlet pressure supplies each individual valve in the stack. This common pressure passes through a relieving type regulator mounted on the same base as the valve and is supplied through the function plate to the Normally Closed or Normally Open poppet position. Through use of the appropriate function plate on the 200 Series basic valve, the operation can be Normally Closed or Normally Open, 3-way or 2-way except for 282B models which are Normally Closed only. The exhaust ("out") port is common. Operation of the valves then opens or closes the cylinder port. (See schematic diagram below)

Schematic 3-Valve Stack Schematic 3-Valve Stack

#251B SELECTED PRESSURE CONTROL OF A SINGLE OUTLET



#252B INDIVIDUAL PRESSURE CONTROL OF EACH CYLINDER PORT



 $[^]ullet$ No manifold end plates required but a manifold fastening kit is needed. **TO ORDER -**Specify number N-02003

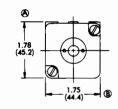
200 SERIES

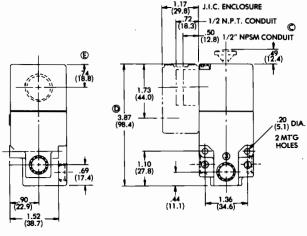
INLINE

NOTE: Dimension "D" for 2.5 and 1.0 watt solenoids is 4.24" (107.8 MM)

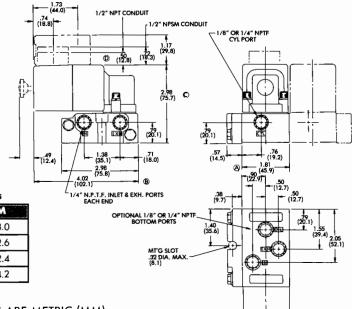
Hazardous Location Models

DIM.	INCHES	MM
Α	2.00	50.8
В	2.28	57.9
С	.56	14.2
D	5.46	138.8
[] (E (E (E (E (E (E (E (E (E (.69	17.6





MANIFOLD



A18

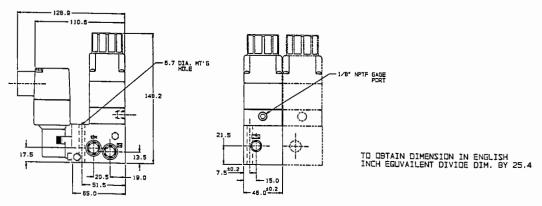
NOTE: Dimension "B" for 2.5 and 1.0 watt solenoids is 4.39" (111.5 MM)

Hazardous Location Models

DIM.	INCHES	MM
A	2.09	53.0
В	5.61	142.6
С	3.24	82.4
D	.56	14.2

DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

MANIFOLD MODELS WITH REGULATOR 200 SERIES WITH INTEGRAL REGULATORS

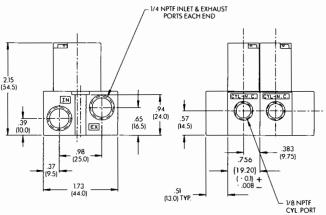


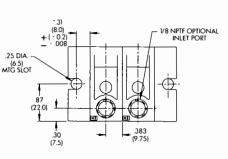
Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

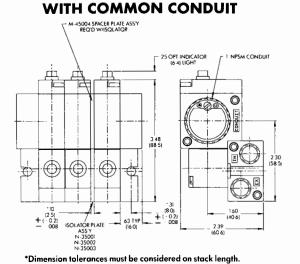
35 SERIES

STACKING VALVES WITH GROMMET COVER

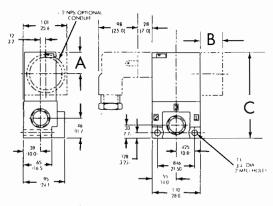




STACKING VALVES



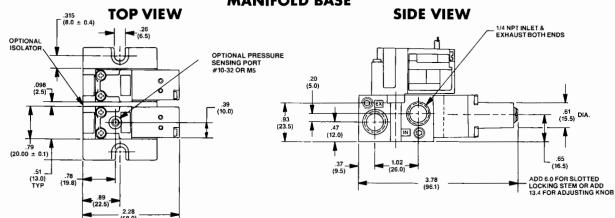
INDIVIDUAL BODY DIMENSIONS

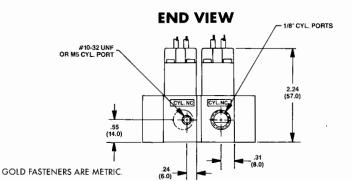


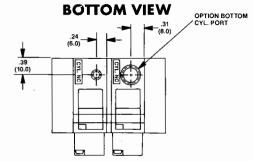
Dim.	Α	В	С
CA/CC	.49	.51	1.97
	(12.4)	(13.0)	(50.0)
CM/CN	.57	.67	2.18
	(14.5)	(17.1)	(55.3)

A19

MANIFOLD BASE



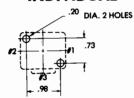




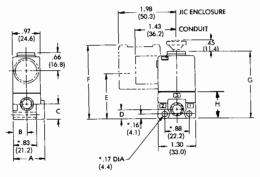
DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

100 & 1100 SERIES

INDIVIDUAL



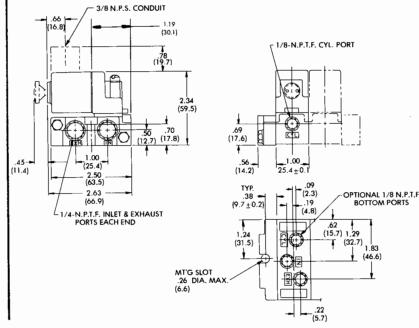
HOLE PATTERN FOR MTG 100 SERIES 1/4" NPTF INLINE MODELS—USE #10-32 MTG SCREW 1/4" BSPP INLINE MODELS—USE M5 x 0.8 MTG SCREW



*DIMENSIONS APPLY ONLY TO 1/8" MODELS

DIMENSIONS IN () ARE IN MM.

MANIFOLD



PORT SIZE	UNITS	A	В	С	D	E	F	G	н
L/ NIPTE	INCHES	1.12	.50	.55	.31	1.58	2.56	2.37	.91
⅓ NPTF	MM	28.4	12.7	14.0	8.0	40.1	64.9	60.1	23.2
1/ NIDTE	INCHES	1.17	.52	.50	.39	1.61	2.59	2.40	.95
1/4 NPTF	мм	29.8	13.3	12.7	9.9	40.9	65.8	60.9	24.1

NOTE: For electrical enclasures not shown, see Section T-2

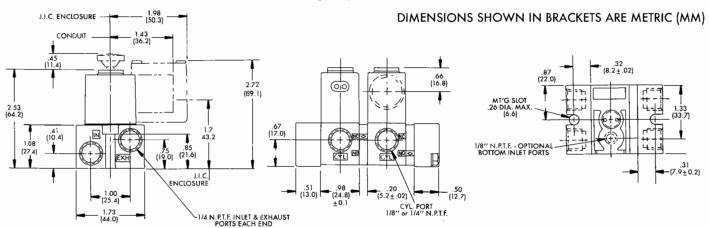
•JIC Enclosure On

STACKING BODY

MB ENCLOSURE

A20

STACKING

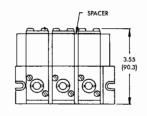


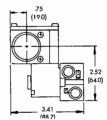
DIMENSION TOLERANCES MUST BE CONSIDERED ON STACK LENGTH

MANIFOLD VALVES MA ENCLOSURE

© © © © © 3.52 (87.4) 75

4.38 (111.3) (19.0) 3.75 (85.0)





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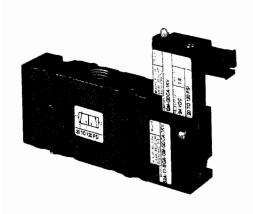
SOLENOID & AIR OPERATED VALVES

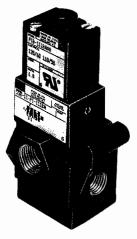
All MAC large solenoid 3 way valves are solenoid pilot operated. The pilot of these valves is a balanced poppet, the main valve a balanced spool. Additionally, the pilot for the 52 series is a 4 way pilot design that maximizes the shifting forces in both directions.

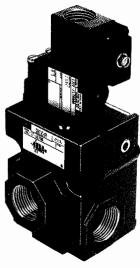
The valves can be divided into two groups:

- 52, 55, 56 series
- 57, 58 and 59 series

1. The 52, 55 and 56 series (Cv 1.1 to 6.2)







B1

52 SERIES

55 SERIES

56 SERIES

The pilot of the 52 series is identical to the pilots of the 400 series (44 and 45 series).

The pilot of the 55 series is identical to the pilot of the 700 series.

The pilot of the 56 series is identical to the 100 series manifold base mounted valve less the base.

The solenoids, electrical options and enclosures for the 55 and 56 series are identical to the 100 series. These valves can also be supplied with remote air, remote air pilot or mechanical operators. The electrical options and enclosures for the 52 series are the same as the 44 and 45 series.

2. The 57, 58 and 59 series (Cv 9.0 to 65.0)







58 SERIES



59 SERIES

The same pilot operates all three series and is identical to the 200 series manifold base mounted valve less the base. The solenoids, electrical options and enclosures are identical to the 200 series. These valves can be supplied with a remote air pilot block.



58 NORMALLY CLOSED.

58 NORMALLY OPEN.

Patents and Patents Pending OPERATING SPECIFICATIONS PRESSURE RANGE (PSI)

	11	pressures	shown c	re mini	mum and r	naximum	safe work	ina pressu	resl		
SOLEN	NOID PILOT					SERIES	56 SE			58, 5º	9 SERII
Internal		_		20-120	3	80-150	25-1	50	•••	25-	-150
Externo	al Pilot (Main \	Valve)	V	AC-120	V	4C-150	VAC-	150		VAC	C-150
Externo	ıl Pilot (Pilot Pre	essure)		20-120	3	80-150	25-1				150*
* Not t	o exceed ma	in valve į	pressure	e by mo	re than 5	O PSI.					
† For v	raives with m TE AIR OPI	nemory s	pring m	inimum	operating	g pressur	e is 30 PS	il.			
Air Pilo	ot Pressure			N/A		25-150	25-1	50		25-	-150
(Must b	e at least equa	al to main v	alve pre	ssure)							
provide series). FLUID	: Designation es an external p Since the exte S: CATION: 1	pilot and s rnal pilot s Air or Inert	hould ha supplies t Gases	ve a pre he air sp	ssure rang oring, it mus	e of 25-10 st not exce	0 PSI (55, ed the rem	56 series) o note air pilo	or 25-7 t signa	5 PSI (I pressi	57, 58, ure.
SAFE	OPERATIN & CSA purpo	G AMBI	ENT T	EMPER	ATURE	RANGE:	0°	F - 120° F	(-18°	C to 5	50°C)
ELECT	RICAL:	52 (W)	/45 PIL	OT) 5	2 (W/44	PILOT)	55 & 5	6 SERIES			9 SER
120/6	• INRUSH		OLT-AM 9 AMPS		AC VOL	BLE		OLT-AMPS (AMPS)			LT-AMP AMPS)
34	HOLDING		OLT-AMI 6 AMPS		BY RECT DC SUI			OLT-AMPS PAMPS)	19	.7 VOL (0.16 A	T-AMP: AMPS)
24 V	OLT D.C.	12.7 TC	1.8 WA	TTS	4.0 TO 1.8	WATTS	17 1 TO	1.0 WATTS	24	0.10.1	O WAT
the time	e to dump air	50 series	valves o	are desig	gned to giv	ve maximi	ım flow fro	om cylinder	to exh	aust to	the tab
the time	e to dump air	: 50 series to atmosp	valves o here Flo	are desig	gned to giv	ve maximi liven for b	oth inlet to	om cylinder	to exh	aust to	o minim
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59 NORMALLY CLOSED 60.0 Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

32.5

__30.2.

31.2

29.4

33.5

- 32.5.

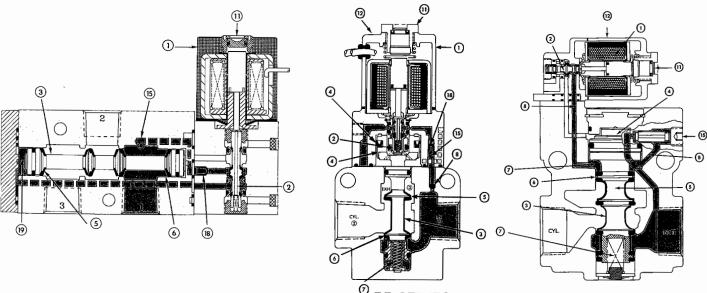
.65.0.

= EXHAUST = PRESSURE

OPERATIONAL BENEFITS

- 1. Unique patented MACSOLENOID® for fastest possible response times with its non-burnout feature on AC service.
- Balanced poppet pilot valve for high flow, precise repeatability and consistent operation.
- 3. Balanced spool main valve unaffected by back pressure in the exhaust or by inlet restriction. May be plugged for 2-way operation.
- 4. Large spool or piston for maximum shifting forces even at minimum operating pressure
- 5. One piece bonded seal spool for extended life and ease of maintenance.
- 6. MAC spool and bore combination for wiping away contamination, eliminating sticking and for use on lubricated or non-lubricated service.
- Air/spring return for reliable consistent shifting.
- A large checked accumulator which supplies the pilot and air/spring return for reliable, consistent shifting even in the event of inlet pressure
- 9. Seven valve functions in one valve (see "Valve Configurations Available" on next page).

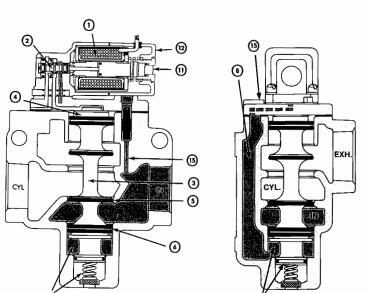
- 10. A triple rated coil for 120/60, 110/50 & 24 VDC 6 watt (57, 58 & 59 series)
- 11. Non-locking manual operators standard on all solenoid valves; other types of manual operators available.
- 12. NEMA 4 solenoid enclosures except for grommet type. Other types of electrical enclosures, including external plug-in connectors, can also be
- 13. Optional low wattage DC solenoids down to 1 watt. (52 series is 1.8 w)
- Optional solenoid pilot valves for hazardous locations designed to meet UL & CSA standards for Division 1, Class I, Groups B, C, D and Class II, Groups E, F, and G. (NEMA equivalent for Class 1 is NEMA 7; Class II is NEMA 9) (57, 58 & 59 series)
- 15. Internal or external pilot available in all series.
- 16. Optional surge suppression available.
- 17. Indicator lights available on certain types of electrical enclosures.
- 18. Filter for internal pilot.
- 19. Air only return. 4 way pilot design to maximize shifting forces in both directions (memory spring available).



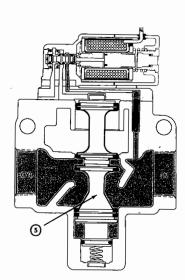
52 SERIES

55 SERIES (Normally closed spools shown)

56 SERIES



57, 58, 59 SERIES (Normally closed spool shown)



57, 58 SERIES (Normally open spool shown)

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

B2

VALVE CONFIGURATIONS AVAILABLE

- 3-WAY, NORMALLY CLOSED
- 3-WAY, NORMALLY OPEN
- 2-WAY, NORMALLY CLOSED (plug exhaust port)
- 2-WAY, NORMALLY OPEN (plug exhaust port)
- SELECTOR VALVE (pipe higher pressure to inlet and lower pressure to exhaust)
- INTERNAL PILOT
- EXTERNAL PILOT

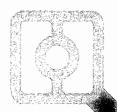
CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN

All series except the 52 and 55 are supplied with a function plate that is placed between the solenoid pilot and the main valve. When this function plate is placed so that the marking '3-C' is visible the solenoid pilot is normally closed. Turning the plate 180 degrees so that the marking '3-0' is visible changes the solenoid pilot valve to normally open. This means that when the solenoid is de-energized the pilot pressure will shift the normally closed master spool into its open position. If the application calls for a normally open master spool, these can be provided for all valves except the 59 series. In this case the function plate should be installed in the '3-C' (normally closed) position.

FUNCTION PLATES



57, 58, 59 SERIES NORMALLY CLOSED



57, 58, 59 SERIES NORMALLY OPEN



56 SERIES NORMALLY CLOSED



56 SERIES NORMALLY OPEN

B3

To change a 52 series and a 55 series valve from normally closed to normally open, simply change the master spool.

INTERNAL/EXTERNAL PILOT

Internal pilot is used for main valve pressures of 20 to 120 PSI for the 52 series, 25 to 150 PSI for the 56, 57, 58, & 59 series and 30 to 150 PSI for the 55 series. External pilot is used when pressures are lower than the above.

CHANGING FROM INTERNAL TO EXTERNAL PILOT

52 SERIES. Cannot be field converted. Different bodies are required for internal pilot and external pilot. **55 SERIES.** Rotate pilot adaptor 180 degrees and connect external pilot line to designated #10-32 or M5 connection provided. The internal pilot passages are blocked by the pilot adaptor.

56, 57, 58, 59 SERIES. Remove plug from external pilot connection. Remove check valve. Insert pipe plug in internal pilot supply orifice. 1/8" tapped orifice is provided as standard on all valves except 56 series (1/16"). Connect external pilot to designated 1/4" external supply port (1/8" in case of the 56 & 59 series).

VACUUM APPLICATIONS

Use external pilot (see above) and connect vacuum source to exhaust port. Inlet may be left open to atmosphere or connected to pressure to provide a selector application (vacuum/pressure).

CHANGING FROM SOLENOID TO REMOTE AIR OPERATORS

55 SERIES. Replace solenoid pilot adaptor with remote air pilot operator (part number R-55001-01). **56 SERIES.** Two options available:

(a) Remove solenoid and replace with remote air pilot, pilot operator (see page **T 4**). This permits a minimum pilot pressure of 20 PSI regardless of main inlet pressure. This option also available for 55 series. For the 52 series, consult the factory for this option.

(b) Remove solenoid and replace with plate number R-56001. Connect air pilot to the 1/8" pilot port on the side of the body. This port serves as a pilot exhaust port for solenoid models.

57, 58, 59 SERIES. Remove solenoid and replace with R-59003 pilot block.

Note: Mechanical operators are available for the 55 & 56 series (see 1100 series).



OPERATING SPECIFICATIONS

PRESSURE RANGE (PSI)

(pressures shown are minimum and maximum safe working pressures)								
SOLENOID PILOT OPERATED	52 SERIES†	55 SERIES	56 SERIES	57, 58, 59 SERIES				
Internal Pilot	20-120	30-150	25-150	25-150				
External Pilot (Main Valve)	VAC-120	VAC-150	VAC-150	VAC-150				
External Pilot (Pilot Pressure)	20-120	30-150	25-150	25-150*				
* Not to exceed main valve pre	ssure by more t	han 50 PSI.						
† For valves with memory spri	ng minimum ope	rating pressure	is 30 PSI.					
REMOTE AIR OPERATED								
Air Pilot Pressure	N/Ą	25-150	25-150	25-150				
(Must be at least equal to main val				_				
NOTE: Designation 'RE' required on remote air pilot models with main valve pressures of vacuum to 25 PSI. 'RE'								
provides an external pilot and sho	uld have a pressur	e range of 25-10(DPSI (55, 56 series	s) or 25-75 PSI (57, 58, 59				
series). Since the external pilot sup		, it must not excee	ed the remote air p	ilot signal pressure.				
FLUIDS: Air or lnert G	ases							

LUBRICATION: Not required, but if used, a medium aniline point oil (180° F - 210° F) is recommended. **SAFE OPERATING AMBIENT TEMPERATURE RANGE:** 0°F - 120° F (-18° C to 5°)

0°F - 120° F (-18° C to 50° C)

For U.L. & CSA purposes 104° F (40° C) max.

ELE	CTRICAL:	52 (W/45 PILOT)	52 (W/44 PILOT)	55 & 56 SERIES	57, 58, 59 SERIES
120		10.9 VOLT-AMPS (0.09 AMPS)	AC VOLTAGE AVAILABLE	14.8 VOLT-AMPS (0.12 AMPS)	33.0 VOLT-AMPS (0.27 AMPS)
B4	HOLDING	7.7 VOLT-AMPS (0.06 AMPS)	BY RECTIFIED DC SUPPLY	10.9 VOLT-AMPS (0.09 AMPS)	19.7 VOLT-AMPS (0.16 AMPS)
24	VOLT D.C.	12.7 TO 1.8 WATTS	4.0 TO 1.8 WATTS	17.1 TO 1.0 WATTS	24.0 TO 1.0 WATTS

ABOVE COILS: General purpose class 'A' continuous duty encapsulated, except for 57, 58, 59 series 2.5 and 1.0 watt coils which are varnished. Class F leads available on request.

LEADS: # 18 AWG x 18" standard. # 22 AWG x 18" (44 pilot). Other lengths available on request.

FLOW: The Cv factors for the different series, and the port sizes within those series, are given in the tables below. In general the 50 series valves are designed to give maximum flow from cylinder to exhaust to minimize the time to dump air to atmosphere. Flow constants are given for both inlet to cylinder and cylinder to exhaust.

CV - INLEI TO CT LINDER										
SERIES	1/8	1/4	3/8	1/2	3/4	1	1 1/4	11/2	2	2 ¹ /2
52 NORMALLY CLOSED_	1.1	1.5								
52 NORMALLY OPEN	1.1									
55 NORMALLY CLOSED_		1.4								
55 NORMALLY OPEN		1.8	2.2							
56 NORMALLY CLOSED_			4.4_	5.0_	5.4_					
56 NORMALLY OPEN			<u>4.6</u> _	5.1 _	5.7_					
57 NORMALLY CLOSED				9.0_	12.7_	15.9_				
57 NORMALLY OPEN				10.0	13.7_	17.4_				
58 NORMALLY CLOSED_						18. <i>7</i>	_23.0_	_24.9_		
58 NORMALLY OPEN						_20.8_	_23.8_	23.0		
59 NORMALLY CLOSED_									_55.0_	60.0

Cv - CYLINDER to EXHAUST										
SERIES	1/8	1/4	3/8	1/2	3/4	1	11/4	1 ¹ /2	2	2 ¹ /2
52 NORMALLY CLOSED	1.2	1.4								
52 NORMALLY OPEN	1.2	1.4								
55 NORMALLY CLOSED		2.5	2.5							
55 NORMALLY OPEN		1.6	1.6							
56 NORMALLY CLOSED			6.0_	6.1 _	6.2_					
56 NORMALLY OPEN			5.6	5.6	5.7_					
57 NORMALLY CLOSED				11.0	18.2_	19.9 _				
57 NORMALLY OPEN				11.0	15.3 _	17.2_				
58 NORMALLY CLOSED						31.2 _	_32.5_	_ 33.5_		
58 NORMALLY OPEN						_29.4_	_30.2_	_32.5_		
59 NORMALLY CLOSED									_60.0_	_65.0

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.



3-WAY SOLENOID PILOT OPERATED (4 WAY PILOT), INDIVIDUAL INLINE OR MANIFOLD MOUNTED BODIES

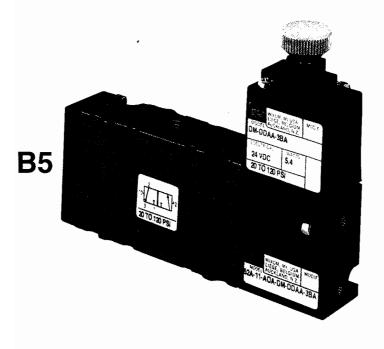
1/8", 1/4", PORTS - C_V UP TO 1.5 PRESSURE RANGE: VACUUM TO 120 PSI

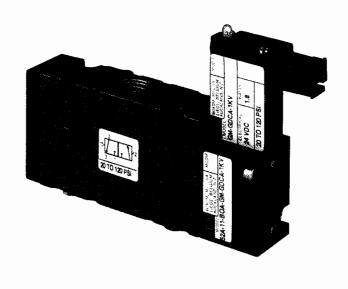
FOR CIRCUIT BAR® VERSION OF THIS SERIES, SEE SECTION E.

52 SERIES - SOLENOID PILOT OPERATED VALVES WITH 45 SERIES PILOT

SINGLE OPERATOR AIR RETURN NORMALLY CLOSED	SINGLE OPERATOR W/MEMORY SPRING NORMALLY CLOSED	MOUNTING INTERNAL PILOT	SINGLE OPERATOR AIR RETURN NORMALLY OPEN	SINGLE OPERATOR W/MEMORY SPRING NORMALLY OPEN
10 - 12	10 T T T 12	VALVES NPTF PORTS	10 - 12	10 - 7 12
52A-13-00A-DM-DJAJ-1KD	52A-16-00A-DM-DJAJ-1KD	Valve Only Manifold Mount	52A-33-00A-DM-DJAJ-1KD	52A-36-00A-DM-DJAJ-1KD
52A-11-A0A-DM-DJAJ-1KD	52A-14-A0A-DM-DJAJ-IKD	1/8" In Line	52A-31-A0A-DM-DJAJ-1KD	52A-34-A0A-DM-DJAJ-1KD
52A-11-BOA-DM-DJAJ-1KD	52A-14-BOA-DM-DJAJ-1KD	1/4" In Line	52A-31-BOA-DM-DJAJ-1KD	52A-34-BOA-DM-DJAJ-1KD

Valve codes shown are for 120/60, 110/50 coils, non-locking recessed manual operators, with mini plug-in with light. For other options see opposite page.





52A-11-A0A-DM-DDAA-3BA

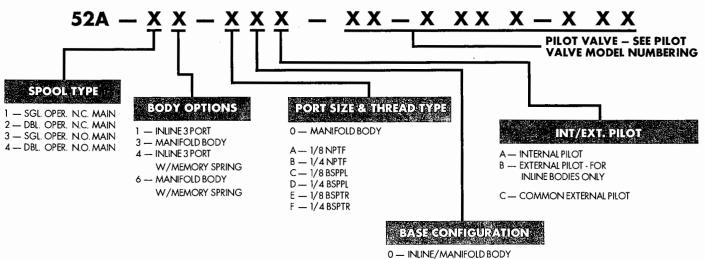
52A-11-B0A-GM-GDCA-1KV

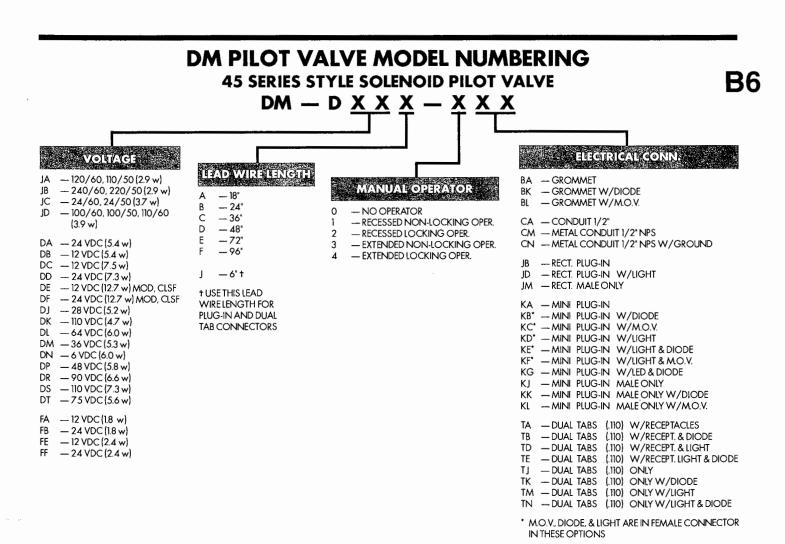
52 SERIES - SOLENOID PILOT OPERATED VALVES WITH 44 SERIES PILOT

SINGLE OPERATOR AIR RETURN NORMALLY CLOSED	R RETURN W/MEMORY SPRING IN ALLY CLOSED NORMALLY CLOSED		SINGLE OPERATOR AIR RETURN NORMALLY OPEN	SINGLE OPERATOR W/MEMORY SPRING NORMALLY OPEN
10 - T T 12	10 N T T T 12	VALVES NPTF PORTS	10 - 12	10 1 1 1 12
52A-13-00A-GM-DDCA-1BA	52A-16-00A-GM-DDCA-1BA	Valve Only Manifold Mount	52A-33-00A-GM-DDCA-1BA	52A-36-00A-GM-DDCA-1BA
52A-11-A0A-GM-DDCA-1BA	52A-14-A0A-GM-DDCA-1BA	1/8" In Line	52A-31-A0A-GM-DDCA-1BA	52A-34-A0A-GM-DDCA-1P
52A-11-BOA-GM-DDCA-1BA	52A-14-BOA-GM-DDCA-1BA	1/4" In Line	52A-31-B0A-GM-DDCA-IBA	52A-34-BOA-GM-DDCA-1L

 $Valve\ codes\ shown\ are\ for\ 24\ VDC\ \{1.8\ w\}\ coils, non-locking\ recessed\ manual\ operators\ with\ grommet\ style\ enclosures.$

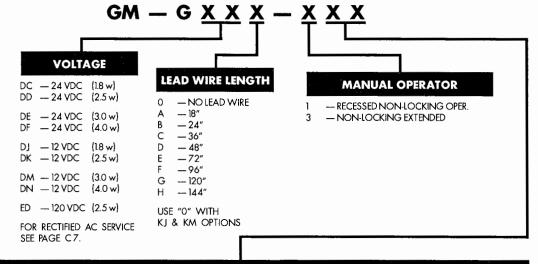
MAC 52 SERIES HOW TO ORDER







GM PILOT VALVE MODEL NUMBERING 44 SERIES STYLE SOLENOID PILOT VALVE



ELECTRICAL CONNECTOR DESCRIPTION

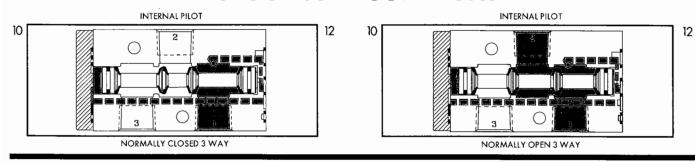
- BA FLYING LEADS W/O GROUND WIRE
- BB FLYING LEADS W/GROUND WIRE
- BC FLYING LEADS W/LED LIGHT PARALLEL TO LEADS (NO GROUND WIRE)
- BD FLYING LEADS W/LED LIGHT PARALLEL TO LEADS & GROUND WIRE
- BE FLYING LEADS W/SUPPRESSION DIODE (NO GROUND WIRE)
- BF FLYING LEADS W/SUPPRESSION DIODE & GROUND WIRE
- BG FLYING LEADS W/SUPPRESSION DIODE PLUS LED LIGHT PARALLEL TO LEADS (NO GROUND WIRE)
- BH $\,-$ FLYING LEADS W/SUPPRESSION DIODE PLUS LED LIGHT PARALLEL TO LEADS AND GROUND WIRE
- BN FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE (NO GROUND WIRE)
- BP FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE & GROUND WIRE
- BR FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT PARALLEL TO LEADS (NO GROUND)
- BS FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT PARALLEL TO LEADS & GROUND WIRE
- BT FLYING LEADS W/LED LIGHT ON TOP (NO GROUND WIRE)
- BU FLYING LEADS W/LED LIGHT ON TOP & GROUND WIRE
- BV FLYING LEADS W/SUPPRESSION DIODE PLUS LED LIGHT ON TOP (NO GROUND WIRE)
- BW FLYING LEADS W/SUPPRESSION DIODE PLUS LED LIGHT ON TOP & GROUND WIRE
- BX FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT ON TOP (NO GROUND WIRE)
- BY FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT ON TOP & GROUND WIRE
- KA PLUG-IN WIRE ASS'Y (NO GROUND WIRE)
- KB PLUG-IN WIRE ASS'Y W/GROUND WIRE
- KE PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE (NO GROUND WIRE)
- KF PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE & GROUND WIRE
- KJ PLUG-IN HOUSING WITHOUT WIRE ASS'Y ("KA" OPT. WITHOUT WIRE ASSY)
- KM PLUG-IN HOUSING WITHOUT WIRE ASS'Y ("KB" OPT. WITHOUT WIRE ASSY)
- \bullet KN $\,-$ PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS BLOCKING DIODE (NO GROUND WIRE)
- KP PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS BLOCKING DIODE & GROUND WIRE
- KT PLUG-IN WIRE ASS'Y W/LED LIGHT ON TOP (NO GROUND WIRE)
- KU PLUG-IN WIRE ASS'Y W/LED LIGHT ON TOP & GROUND WIRE
- KV PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS LED LIGHT ON TOP (NO GROUND WIRE)
- KW PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS LED LIGHT ON TOP & GROUND WIRE
- KX PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT ON TOP (NO GROUND WIRE)
- KY PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT ON TOP & GROUND WIRE

· BLOCKING DIODE IS IN LEAD WIRE

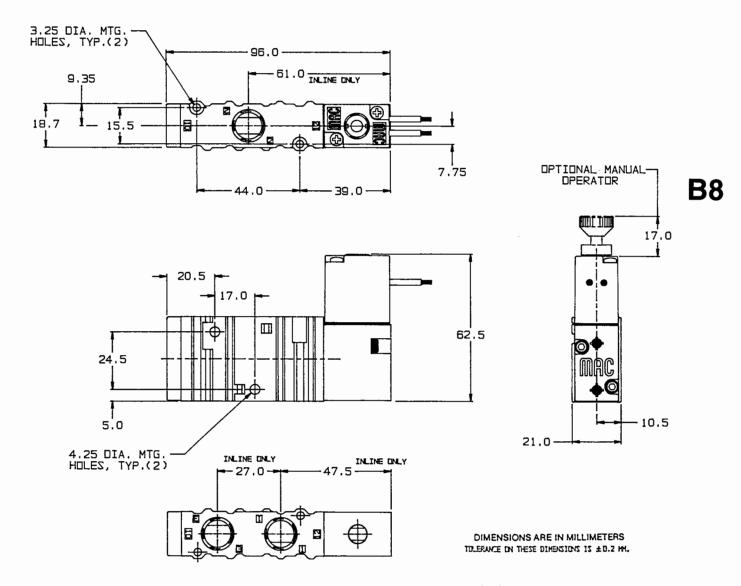
FOR CIRCUIT BOARD COVER OPTIONS SEE PAGE C7.



SPOOL CONFIGURATIONS



DIMENSIONS



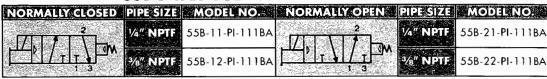
52 SERIES INLINE/MANIFOLD DIMENSIONS



Patents and Patents Pending

55 SERIES: 2 & 3 WAY, SOLENOID PILOT & REMOTE AIR OPERATED, INLINE 1/4", 3/8" PORTS - C, UP TO 2.5 PRESSURE RANGE: VACUUM TO 150 PSI





Valve codes shown are for 120/60, 110/50 coils, non-locking recessed manual operators and grommet type electrical connections. For other options see opposite page.

Note: Exhaust port always 3/4".

55B SERIES-REMOTE AIR PILOT OPERATED

NORMALLY CLOSED PIPE SIZ	E MODEL NO.	NORMALLY OPEN PIPE SIZE	MODELNO
2 1/4" NP	IF 55B-11-RA	z 1/4" NPTF	55B-21-RA
3/4" NP	55B-12-RA		55B-22-RA

For vacuum to 25 PSI main valve pressure, change RA to RE, External pilot port left open to supply air/spring return function. Note: Exhaust port always %".

56 SERIES: 2 & 3 WAY, SOLENOID PILOT & REMOTE AIR OPERATED, INLINE 3/8", 1/2", 3/4" PORTS - C, UP TO 6.2 PRESSURE RANGE: VACUUM TO 150 PSI

56C SERIES-SOLENOID PILOT OPERATED

	N G MAIN VAI	VE FUNCTION		N.O. MAIN VA	LVE FUNCTION	
	N.C. PIL N.C. MAII	OT AND N SPOOL	N.O. PIL N.C. MAII	OT AND N SPOOL		OT AND N SPOOL
:		Z T 3 3M		2 1 3 M		2 / _ 4 M 3
PIPE SIZE	INTERNAL PILOT	FXIERNAL PILOT			INTERNAL PILOT	EXTERNAL PILOT
%" NPTF	56C-12-617AA	56C-32-617AA	56C-22-617AA	56C-42-617AA	56C-62-617AA	56C-72-617AA
√2″ NPTF	56C-13-617AA	56C-33-617AA	56C-23-617AA	56C-43-617AA	56C-63-617AA	56C-73-617AA
½" NPTF	56C-17-617AA	56C-37-617AA	-56C-27-617AA	56C-47-617AA	56C-67-617AA	56C-77-617AA

Valve codes shown are 24 volt DC (8.5 watt) locking recessed manual operators, JIC wiring box with ½" NPS electrical conduit connections and indicator light.

For other options see opposite page. Note: Exhaust port always 3/4".

56C SERIES-REMOTE AIR PILOT OPERATED

	N.c.	N.O.
Dips <17F		
%" NPTF	56C-52-RA	56C-82-RA
½″ NPTF	56C-53-RA	56C-83-RA
¾" NPTF	56C-57-RA	56C-87-RA

For vacuum to 25 PSI main valve pressure, change RA to RE. External pilot port left open to supply air/spring return function.

Note: Exhaust port always 34".

• To order see Page **T-4**

standard

following advantages:

55B & 56C REMOTE AIR PILOT, PILOT OPERATED VALVES

These valves have the same features as the remote air pilot operated models, but in addition have the

Ability ta use a pilot signal pressure different from the main valve pressure. Pilot signal can be from 30 to 150 PSI, regardless of main valve pressure.
A manual operator and position indicator-

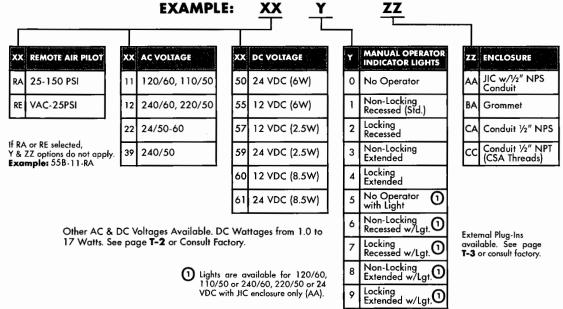
All MAC Valves available with BSPP threads: to order see opposite page.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

MAC 55 SERIES

55 **HOW TO ORDER** VALVE BODY ASSEMBLY 55 YY - (XXYZZ) - SOLENOID OPTIONS SEE BELOW **REVISION LEVEL** SERIES -**VALVE FUNCTION PORT SIZE PILOT AIR** 1-NORMALLY CLOSED 1-1/4" NPTF PI-INTERNAL PILOT 2-NORMALLY OPEN 2-3/8" NPTF PE-EXTERNAL PILOT 3-1/4" BSPP 4-3/8" BSPP 56 VALVE BODY ASSEMBLY X X - (XXYZZ) - SOLENOID OPTIONS 56 SEE BELOW REVISION LEVEL SERIES . VALVE FUNCTION **PORT SIZE** 1-INTERNAL PILOT 2-3/8" NPTF N.C. PILOT, N.C. MAIN SPOOL 3-1/2" NPTF 5-3/8" BSPP 2-INTERNAL PILOT 6-1/2" BSPP N.O. PILOT, N.C. MAIN SPOOL 3-EXTERNAL PILOT 7-3/4" NPTF N.C. PILOT, N.C. MAIN SPOOL 8-3/4" BSPP 4-EXTERNAL PILOT N.O. PILOT, N.C. MAIN SPOOL 5-REMOTE AIR PILOT OPERATED N.C. MAIN SPOOL B10 6-INTERNAL PILOT

REMOTE AIR PILOT & SOLENOID OPTIONS (SAME FOR THE 55 AND 56 SERIES)



N.C. PILOT, N.O. MAIN SPOOL

N.C. PILOT, N.O. MAIN SPOOL

7-EXTERNAL PILOT

8-REMOTE AIR PILOT N.O. MAIN SPOOL

MODIFICATIONS

CLASS F - High Temperature AC and DC coil option.

TO ORDER - Add the appropriate modification number after the valve model number, **EXAMPLE:** 56C-12-111BA MOD CLSF For additional modifications see Technical Section.

MAC 58 SERIES

Patents and Patents Pending

2 & 3 WAY, SOLENOID PILOT AND REMOTE AIR PILOT OPERATED, INLINE

½" TO 2½" - C_y UP TO 65.0 PRESSURE RANGE: VACUUM TO 150 PSI

SOLENOID PILOT OPERATED







	N.C. MAIN VA	LVE FUNCTION	L	N.O. MAIN VA	LVE FUNCTION				
N.C. PILOT AND N.C. MAIN SPOOL			N.O. PIL N.C. MAII						
57 SERIES	CYL IN EXH			CYL IN EXH	CYU D TO EXH				
PIPE SIZE	INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	INTERNAL	EXTERNAL			
1/2" NPTF	57C-11-111BA	57C-31-111BA	57C-21-111BA	57C-41-111BA	57C-61-111BA	57C-71-111BA			
3/4" NPTF	57C-12-111BA	57C-32-111BA	57C-22-111BA	57C-42-111BA	57C-62-111BA	57C-72-111BA			
1" NPTF	57C-13-111BA	57C-33-111BA	57C-23-111BA	57C-43-111BA	57C-63-111BA	57C-73-111BA			

Valve codes shown are for 120/60, 110/50, 24 volt DC (6 wait) triple rated coils, non-locking recessed manual operators and grommet type electrical connections. For other options see opposite page.

Note: Exhaust port always 1".

58 SERIES

PIPE SIZE	INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	INTERNAL	EXTERNAL
1" NPTF	58C-11-222CA	58C-31-222CA	58C-21-222CA	58C-41-222CA	58C-61-222CA	58C-71-222CA
11/4" NPTF	58C-12-222CA	58C-32-222CA	58C-22-222CA	58C-42-222CA	58C-62-222CA	58C-72-222CA
11/2" NPTF	58C-13-222CA	58C-33-222CA	58C-23-222CA	58C-43-222CA	58C-63-222CA	58C-73-222CA

Valve codes shown are for 24/60, 24/50 coils, locking recessed manual operators with ½" NPS electrical conduit connections. For other options see opposite page.

Note: Exhaust port always 1½".

59 SERIES

PIPE SIZE	INTERNAL	EXTERNAL	INTERNAL	EXTERNAL
2" NPTF	59B-12-619AA	59B-32-619AA	59B-22-619AA	59B-42-619AA
21/2" NPTF	59B-13-619AA	59B-33-619AA	59B-23-619AA	59B-43-619AA

N.O. Main Spool not available on 59 series

Valve codes shown are for 24 volt DC (8.5 watt) coils, locking extended manual operators with light and JIC wiring box with ½" NPS electrical conduit connections. For other options see opposite page.

Note: Exhaust port always 2½".

REMOTE AIR OPERATED



	N.C. MAIN VALVE	N.O. MAIN VALVE
57	on.	en.
SERIES		
PIPE SIZE	IN EXH	in and
½" NPTF	57C-51 RA	57C-81 RA
3/4" NPTF	57C-52 RA	57C-82 RA
1" NPTF	57C-53 RA	57C-83 RA

Note: Exhaust port always 1".

58 SERIES

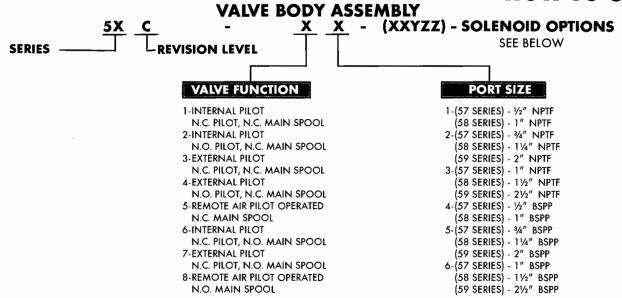
1" NPTF	58C-51 RA	58C-81 RA
11/4" NPTF	58C-52 RA	58C-82 RA
11/2" NPTF	58C-53 RA	58C-83 RA

Note: Exhaust port always 11/2".

59 SERIES PIPE SIZE	N.C. MAIN VALVE
2" NPTF	59B-52 RA
21/2" NPTF	59B-53 RA

N.O. MAIN SPOOL NOT AVAILABLE ON 59 SERIES Note: Exhaust port always $2\frac{1}{2}$ ".

HOW TO ORDER



REMOTE AIR PILOT & SOLENOID OPTIONS (SAME FOR THE 57,58 & 59 SERIES) EXAMPLE: XX Y ZZ

ХX	REMOTE AIR PILOT	ХX	AC VOLTAGE	ХX	DC VOLTAGE
RA	25-150 PSI	11	120/60, 110/50 24 VDC (6W)	50	24 VDC (6.0W)
RE	VAC-25PSI	12	240/60, 220/50	52	24 VDC (2.5W)
If RA or RE selected, Y & ZZ options do not apply. Example: 57C-51-RA			24/50-60	55	12 VDC (6.0W)
			240/50	60	12 VDC (8.5W)
		_		61	24 VDC (8.5W)

Other AC & DC Voltages Available. DC Wattages from 1.0 to 17 Watts. See page **T-2** or Consult Factory.

External Plug-Ins available. See page **T-3** or consult factory.

Y	MANUAL OPERATOR INDICATOR LIGHTS
0	No Operator
ī	Non-Locking Recessed (Std.)
2	Locking Recessed
3	Non-Locking Extended
4	Locking Extended
5	No Operator (2) with Light
6	Non-Locking Recessed w/Lgt. 2
7	Locking Recessed w/Lgt. 2
8	Non-Locking Extended w/Lgt.
9	Locking Extended w/Lgt.

AA JIC w/½" NPS
Conduit
BA Grommet
CA Conduit ½" NPS
CC Conduit ½" NPT
(CSA Threads)
EA Hazardous
Location

 Hazardous Location enclosure supplied with no operator only ("O"). DC not available below 6 watts.

2 Lights are available for 120/60, 110/50 or 240/60, 220/50 or 24 VDC with JIC enclosure only (AA) If 11 Coil is used for 24 VDC. Specify Mod. 0472 for 24V Light.

MODIFICATIONS - To order, include MOD after valve model number; e.g. 58C-11-111 BA **MOD CLSF MOD CLSF** - High Temperature AC or DC class F coil option.
For additional list of modifications see Technical Section.

R-59003 PILOT BLOCK



Any 57, 58 or 59 Series Solenoid Operated valve can be converted to remote air operation by replacing the solenoid pilot valve with the R-59003 pilot block. This pilot block plus an external pilot supply are used for vacuum and low pressure applications.

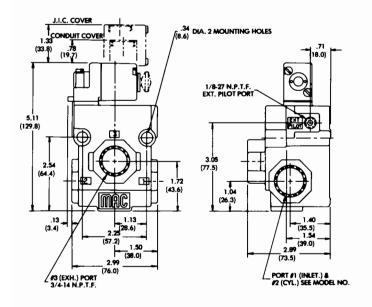
DIMENSIONS 55 & 56 SERIES

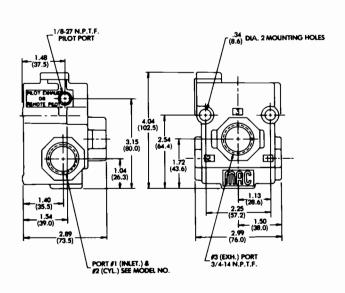
DIMENSIONS - 55 SERIES

SOLENOID & REMOTE AIR PILOT, PILOT OPERATED

B13

DIMENSIONS - 56 SERIES

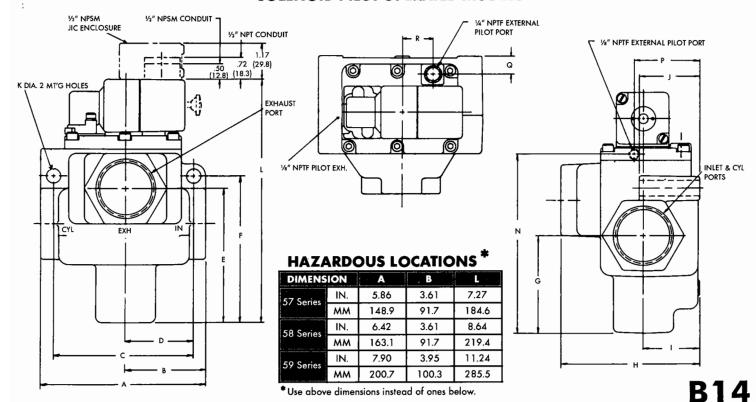




DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

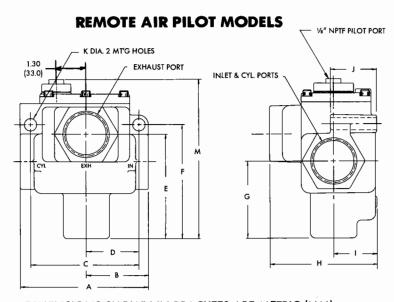
GOLD FASTENERS ARE METRIC.

SOLENOID PILOT OPERATED MODELS



DIMENS	ION	Α	В	C	D	E	F	G	Н		J	K	L	M	N	P	Q	R
57 Series	INCHES	4.42	2.13	3.25	1.56	3.56	3.56	2.43	3.81	1.68	1.80	.34	6.88	5.67	4.78	2.19	.40	1.03
J/ Jelles	мм	112.3	54.1	82.6	39.7	90.4	90.4	61.7	96.8	42.7	45.7	8.6	174.9	143.9	121.5	55.7	10.2	26.2
58 Series	INCHES	5.66	2.77	4.66	2.27	4.50	4.91	3.31	4.57	1.88	2.00	.53	8.25	7.04	6.15	2.39	.60	1.03
38 Series	MM	143.7	70.3	118.4	57.7	114.3	124.7	84.1	116.1	47.8	50.8	13.5	209.7	178.7	156.3	60.8	15.3	26.2
59 Series	INCHES	7.90	3.95	6.13	3.06	6.12	6.87	4.37	6.20	2.65	3.34	.53	10.69	9.46	8.46	2.20	-	
37 delles	MM	200.7	100.3	155.6	77.8	155.4	174.5	111.0	157.5	67.3	84.8	13.5	271.6	240.3	215.0	55.8	1	_

57 Series w/2.5 watt & 1.0 watt solenoids Dim "A" is 4.64" (117.8MM) & "B" is 2.39" (60.6MM) Note: Exhaust port is always maximum available port size for any given series.



DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.



SMALL 4 WAY SOLENOID, AIR AND MECHANICALLY OPERATED VALVES

MAC small 4 way valves divide into three groups:

- Direct solenoid operated valves
- --- Solenoid pilot operated valves
- Air and mechanically operated valves (1800 Series not pictured)

1. Direct solenoid operated valves (Cv 0.1 to 0.30) - 44, 45 series





45 SERIES

The 44 series is a direct operated 10mm valve available as an inline or manifold type valve. Each valve type may be mounted to a circuit bar[®]. Multiple electrical connector or options are available.

The 45 series, a direct solenoid poppet valve, is an extremely versatile solenoid valve of the first group. It is available in individual inline, individual base mounted, stacking, manifold base mounted or circuit bar® and circuit bar® with plug-in options. Options include integral exhaust flow controls, integral pressure regulators and plug-in type solenoids (see page C3).

2. Solenoid pilot operated valves (Cv 0.8 to 1.4) 700, 400, 800, and 900 Series

C1





400 SERIES

The 700 series is a 4 ported solenoid pilot operated spool valve. It is available in inline or stacking versions with optional exhaust flow controls.

The 400 series is a 5 ported solenoid pilot operated spool valve. This valve utilizes a 4 way pilot design (44 Series or 45 Series) that maximizes the shifting forces in both directions. Optional memory spring is also available. It is available in inline, individual base mounted and circuit bar® versions, 2 or 3 position internal or external pilot.





800 SERIES

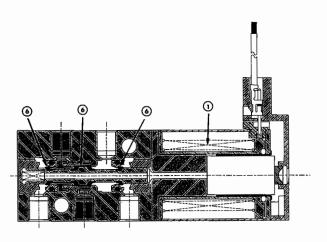
900 SERIES

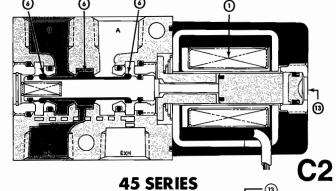
The 800 series, a 5 ported solenoid pilot operated spool valve, has more options and features than any other valve in this group. It is available in inline, stacking, or circuit bar® versions, with integral exhaust flow controls, 2 or 3 position, internal or external pilot (see page C3).

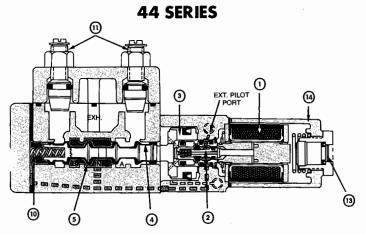
= EXHAUST

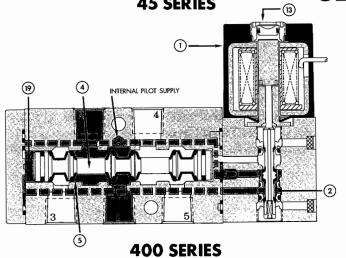
= PRESSURE

OPERATIONAL BENEFITS

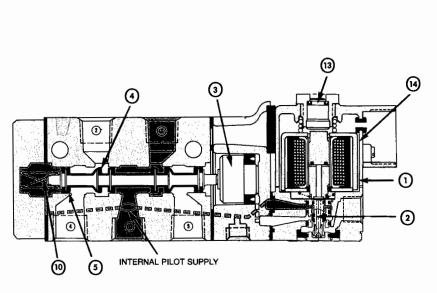


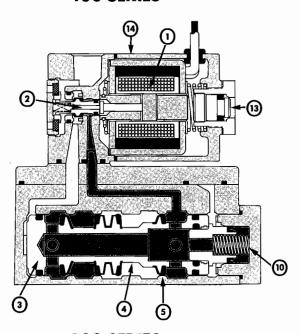






700 SERIES





800 SERIES

900 SERIES



OPERATIONAL BENEFITS

- Unique patented MACSOLENOID[®] for fastest possible response time with its non burn out feature on AC service.
- 2. Balanced poppet pilot valve for high flow, precise repeatability and consistent operation. (700, 400, 800 & 900)
- 3. Large spool or piston for maximum shifting forces even at minimum operating pressure. (700, 800 & 900)
- 4. One piece bonded seal spool for extended life and ease of maintenance. (700, 400, 800 & 900)
- 5. MAC spool and bore combination for wiping away contamination, eliminating sticking and for use on lubricated or non lubricated service. (700, 400, 800 & 900)
- 6. Bonded balanced poppets for high flow, repeatability and consistent operation. Extremely long service life due to unique poppet cushions. (44 & 45 series)
- 7. Extremely high cycle rates (up to 250 cycles per second with certain DC solenoids).
- 8. Extremely long service life (see MAC guarantee in front of catalog).
- 9. Versatility in piping. Valves can be piped as 4-way, 3-way or 2-way, normally closed or normally open or can be used for vacuum, diverter or selector applications.
- 10. Air/spring return for consistent shifting on single solenoid internal pilot, solenoid pilot operated valves. (700, 800, 900 series)
- 11. Optional integral individual exhaust flow controls with a single common exhaust port (45, 700 series).
- 12. Optional individual exhaust flow controls with dual exhaust. (400, 800 & 1800 series)
- 13. Non-locking manual operators standard on all solenoid valves; other types of manual operators available.
- 14. NEMA 4 solenoid enclosures except for grommet type (700, 800, 900 series only). Other types of electrical enclosures, including external plug-in connectors, can also be supplied.
- 15. Optional wattage DC coils down to 1.8 watt (44, 45, 400 series) or 1.0 watt (700, 800, 900 series).
- 16. Optional surge suppression available.
- 17. Optional common conduit stacking valves with integral wiring space and indicator lights. (45, 700, 800, 900 series)
- 18. Optional remote air pilot, pilot operated models. This pilot replaces the standard solenoid and is provided with a manual operator and position indicator. A minimum pilot pressure can operate the main valve regardless of the main valve pressure.
- 19. Air only return. 4 way pilot design to maximize shifting forces in both directions. Optional memory spring is also available. (400 series)
- 20. Circuit bar® available with integral flow controls (45, 400, 800 series).
- 21. Circuit bar® available with individual regulators (45 series).

egulators (45 series). AVAILABILITY TABLE

	AVAILAD		DLE			
SERIES FEATURES	44	45	700	400	800	900
SINGLE SOLENOID	1	1	1	V	1	V
DOUBLE SOLENOID	Х	1	1	1	√	V
INLINE	V	1	1	1	1	1
BASE MOUNTED	1	1	Х	V	X	Х
STACKING	Х	1	7	Х	1	√ ·
ADD-A-UNIT MANIFOLD	X	√	Х	X	X	Х
CIRCUIT BAR®	1	1	Х	√	1	Х
INTERNAL PILOT OPERATED	N/A	N/A	1	V	1	V
EXTERNAL PILOT OPERATED	N/A	N/A	V	1	1	X
3-POSITION	Х	X	Х	1	1	Х
REMOTE AIR OPERATED	X	1	V	Х	1	√
REMOTE AIR, PILOT OPERATED	N/A	N/A	1	√**	1	√
FLOW CONTROLS	N/A	1	1	Χ	1	Х
PRESSURE REGULATOR	Х	1	Х	Х	Х	Х
FLOW (Cv)	0.1	0.18 *	0.8	1.0	1.4	1.4

LEGEND:

√ = Available

N/A = Not Applicable X = Not Available

- * Higher flows available with higher wattages. See page C10.
- * Consult Factory



Patents and Patents Pending

FLUIDS: Air or inert gases

OPERATING SPECIFICATIONS

LUBRICATION: Not required, but if used, a medium aniline point oil (180° F to 210° F) is recommended. SAFE OPERATING AMBIENT TEMPERATURE RANGE: 0°F - 120° F (-18° C to 50° C)

FLOW (Average All Ports)	44	45*	700	400†	800**	900	1800
#10-32 1/8"	0.1 N/A	0.12 0.14	N/A 0.6	N/A 1.0	N/A N/A	N/A 0.8	N/A N/A
1/4" #10-32 STACKING BODY 1/8"	N/A N/A N/A	N/A 0.15 0.18	0.7 N/A 0.7	1.0 N/A N/A	1.4 N/A N/A	1.2 N/A 1.2	N/A N/A
1/4" 3/8"	N/A N/A	N/A N/A	0.8 N/A	N/A N/A	1.4 1.4	1.4 1.4	1.1 1.1
BAR MANIFOLD	0.08	0.17	N/A	1.0	1.3	N/A	1.1

^{** 800 3} Position Cv=1.1

PRESSURE RANGE

45 Series (1.8 w or lower)

Cv =approximately 75% of values indicated.

(Pressures shown are minimum and maximum safe working pressures.)

SERIES	MAIN VALVE	INTERNAL	SOL. PILOT	REMO	OTE AIR
		Single	Double	Single	Double
44	VAC - 120	not ap	plicable	not ap	plicable
45	VAC - 120	not ap	plicable	30 - 120	30 - 120
700	VAC - 150	20 - 150	10 - 150	20 - 150	10 - 150
400	VAC - 120	20 - 120†	20 - 120**	not ap	plicable
800	VAC - 200	20 - 150 [°]	10 - 150*		00 series)
1800	VAC - 200			20 - 150	10 - 150*
9 00	VAC - 150 (RA)			25 - 150	10 - 150
900	25 - 150 (Sgl)	25 - 150			
900	10 - 150 (DBI)		10 - 150**		
* For 3 position	valvas: 20 - 150 psi				

For 3 position valves: 20 - 150 psi

- 1. For main valve pressures of vacuum to 25 PSI, MOD 158 (heavy duty spring) and a minimum of 35 PSI external pilot or air pilot signal are required (700 Series & 900 Remote Air).
- 2. For remote air pilot, pilot signal pressure must be equal or greater than the main valve pressure. (700, 900 Series)
- 3. An external pilot supply is required when main valve pressure is between 150 & 200 psi (800 Series only) or below the minimum solenoid pilot pressure listed above (700, 400, 800 Series).
- 4. On 1800 pilot sequence valves, a minimum pressure of 25 psi is required on the end opposite to the pilot sequence operator.
- 5. A remote air pilot, pilot operator is available for the 700, 800 & 900 Series. Valves supplied with these operators only require a minimum pilot pressure of 20 psi regardless of the main valve pressure. (See page T 4)

ELECTRICAL:	44 SERIES	45 SERIES	400 SERIES	700, 800, 900 SERIES
120/60 INRUSH	AC VOLTAGE AVAILABLE	10.9 VOLT-AMPS (0.09 AMPS)	USE INFORMATION	14.8 VOLT-AMPS (0.12 AMPS)
120/60 HOLDING	BY RECTIFIED DC SUPPLY	7.7 VOLT-AMPS (0.06 AMPS)	FROM 44 OR 45 SERIES WHERE	10.9 VOLT-AMPS (0.09 AMPS)
24 VOLT D.C.	4.0 TO 1.8 W	12.7 to 1.8 W	APPLICABLE.	17.0 TO 1.0 W

ABOVE COILS: General purpose Class A, continuous duty, encapsulated.

Class F coils available on request.

#18 AWG x 18" (700, 800, 900) **COIL LEADS:**

Other lead lengths available on request. #22 AWG x 18" (44, 45, 400)

SPECIAL APPLICATION INSTRUCTIONS

Energizing the "A" operator (solenoid or remote air) supplies pressure to Cylinder Port "A" and energizing the "B" operator supplies pressure to Cylinder Port "B".

For the following applications, additional piping considerations are required.

EXTERNAL PILOT APPLICATIONS (700, 400, 800 series) - An External Pilot supply is only required when the main valve is less than 25 psi on single operators (solenoid or remote air) or 3 position valves and 10 psi (700, 800 series) or 20 psi (400 series) on 2 position double operated valves. External pilot not available on 900 series.

VACUUM APPLICATIONS (2 Pos. Valves Only) - Use an External Pilot model as described above and also connect the vacuum source to the Exhaust Port and leave the Inlet Port open to atmosphere. (The inlet port may also be connected to a pressure source to provide a selector application (vacuum/pressure).

SELECTOR APPLICATIONS - Use an External Pilot model as described above if both pressures are below the minimum, otherwise use an Internal Pilot model. In either case connect the higher pressure to the Inlet Port and the lower pressure to the Exhaust Port.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

⁴⁵ Manifold Cv=0.11(1/8"), 0.10 (#10-32)

^{† 400 3} Position Cv=0.80

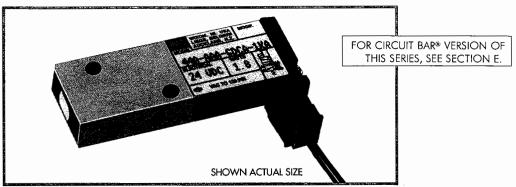
^{**} For 3 position valves: 35 - 120 psi

[†] For valve with memory spring: 30 - 120 psi

4 WAY, DIRECT SOLENOID OPERATED INLINE VALVES

#10-32 OR M5 PORTS, C_V UP TO 0.1 PRESSURE RANGE: VACUUM TO 120 PSI

A NEW DIMENSION TO THE MAC PATENTED BALANCED POPPET DESIGN



The MAC 44 Series is a high flow, direct operated 10MM poppet valve. No small pistons with low shifting forces and high minimum operating pressures. The MAC short stroke direct operated balanced poppet provides consistent operation. The shifting forces are consistently high, regardless of inlet pressure fluctuations. The balanced, high shifting forces provide very fast and repeatable response times.

OPERATING DATA

FLUIDS:

Air or inert gases

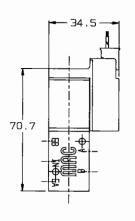
LUBRICATION: Not required, but if used, a medium aniline point oil (180°F to 210°F) is recommended.

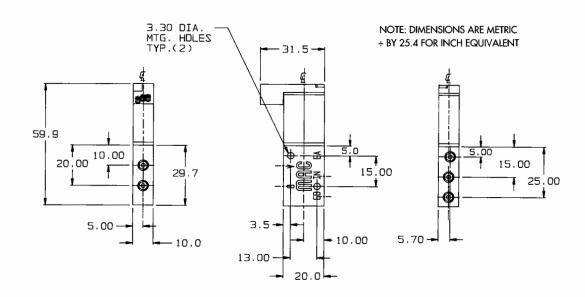
AMBIENT TEMPERATURE RANGE: 0°F to 120°F (-18°C to 50°C)

FLOW RATING: See below

ELECTRICAL: General purpose Class A, continuous duty, encapsulated. Coil leads #22 AWG.

WATTAGE	1.8w	2.5w	4.0w
FLOW	0.06c _v	0.08c _v	0.10c _v





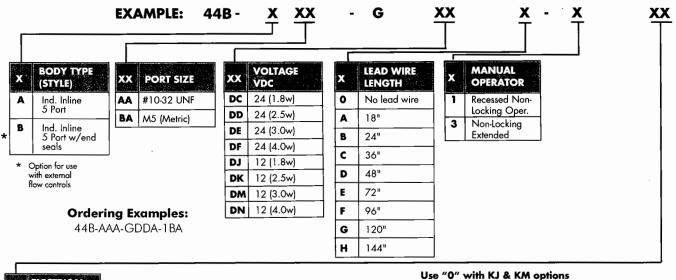
CIRCUIT BOARD COVER

FLYING LEAD COVER



HOW TO ORDER

SOLENOID ASSEMBLY NUMBERING



XX ELECTRICAL CONNECTION

Note:

BA Flying Leads w/o Ground Wire

BB Flying Leads w/Ground Wire

See page C8 for illustrations.

BC Flying Leads w/LED Light Parallel To Leads (No Ground Wire)
BD Flying Leads w/LED Light Parallel To Leads & Ground Wire

BD Flying Leads w/LED Light Parallel To Leads & Ground Wire BE Flying Leads w/Suppression Diode (No Ground Wire)

BF Flying Leads w/Suppression Diode & Ground Wire

BG Flying Leads w/Suppression Diode Plus LED Light Parallel To Leads (No Ground Wire)

BH Flying Leads w/Suppression Diode Plus LED Light Parallel To Leads & Ground Wire

* BN Flying Leads w/Suppression Diode Plus Blocking Diode (No Ground Wire)

* BP Flying Leads w/Suppression Diode Plus Blocking Diode & Ground Wire

* BR Flying Leads w/Suppression Diode Plus Blocking Diode & LED Light Parallel To Leads (No Ground Wire)

* BS Flying Leads w/Suppression Diode Plus Blocking Diode & LED Light Parallel To Leads & Ground Wire

BT Flying Leads w/LED Light On Top (No Ground Wire)

BU Flying Leads w/LED Light On Top & Ground Wire

BV Flying Leads w/Suppression Diode Plus LED Light On Top (No Ground Wire)

BW Flying Leads w/Suppression Diode Plus LED Light On Top & Ground Wire

* BX Flying Leads w/Suppression Diode Plus Blocking Diode & LED Light On Top (No Ground Wire)

* BY Flying Leads w/Suppression Diode Plus Blocking Diode & LED Light On Top & Ground Wire

KA Plug-In Wire Ass'y (No Ground Wire)

KB Plug-In Wire Ass'y w/Ground Wire

KE Plug-In Wire Ass'y w/Suppression Diode (No Ground Wire)

KF Plug-In Wire Ass'y w/Suppression Diode & Ground Wire

KJ Plug-In Housing Without Wire Ass'y For KA Option

KM Plug-In Housing Without Wire Ass'y For KB Option

* KN Plug-In Wire Ass'y w/Suppression Diode Plus Blocking Diode (No Ground Wire)

* KP Plug-In Wire Ass'y w/Suppression Diode Plus Blocking Diode & Ground Wire

KT Plug-In Wire Ass'y w/LED Light On Top (No Ground Wire)

KU Plug-In Wire Ass'y w/LED Light On Top & Ground Wire

KV Plug-In Wire Ass'y w/Suppression Diode Plus LED Light On Top (No Ground Wire)

KW Plug-In Wire Ass'y w/Suppression Diode Plus LED Light On Top & Ground Wire

* KX Plug-In Wire Ass'y w/Suppression Diode Plus Blocking Diode & LED Light On Top (No Ground Wire)

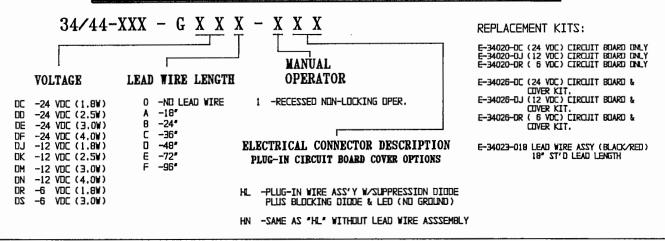
* KY Plug-In Wire Ass'y w/Suppression Diode Plus Blocking Diode & LED Light On Top & Ground Wire

*Blocking Diode Is In Leod Wire

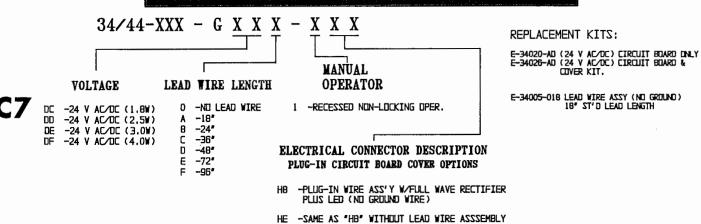
FOR CIRCUIT BOARD COVER OPTIONS SEE PAGE C7.

HOW TO ORDER 34/44 SERIES CIRCUIT BOARD COVER OPTIONS

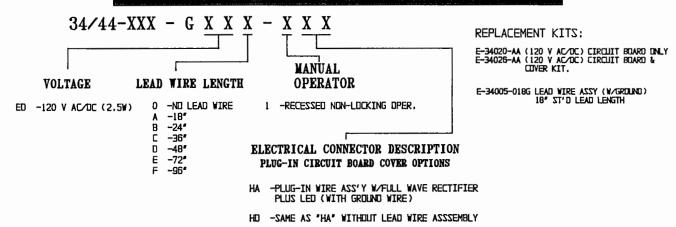
SUPPRESSION DIODE & BLOCKING DIODE WITH LED ON A CIRCUIT BOARD - DC ONLY



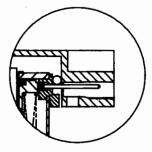
FULL WAVE RECTIFIER WITH LED ON A CIRCUIT BOARD, NO GROUND - AC/DC



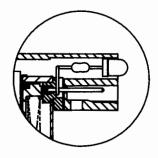
FULL WAVE RECTIFIER WITH LED ON A CIRCUIT BOARD, PLUS GROUND - AC/DC



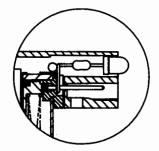
FLYING LEAD COVER OPTIONS, DIODE & WITH LIGHT PARALLEL TO LEADS & ON TOP



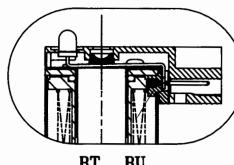
BE, BF, BN, BP



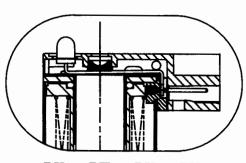
BC, BD



BG, BH, BR, BS

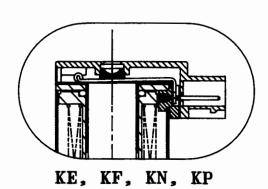


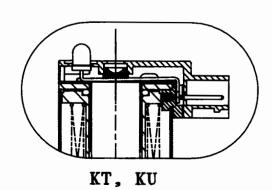
BT, BU,

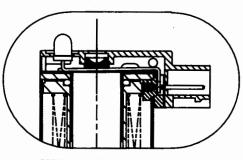


BV, BW, BX, BY

PLUG-IN COVER OPTIONS, DIODE & WITH LIGHT ON TOP







KV, KW, KX, KY

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

C8



Patents and Patents Pending

4-WAY, DIRECT SOLENOID AND REMOTE AIR OPERATED, INDIVIDUAL INLINE, INDIVIDUAL BASE MOUNTED, STACKING BODY, MANIFOLD BASE MOUNTED WITH OPTIONAL PRESSURE REGULATORS.

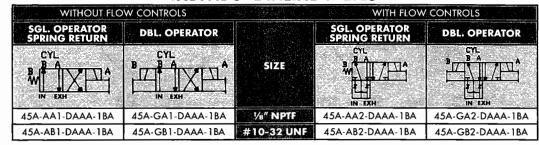
M5, #10-32 & 1/8" PORTS - C, UP TO 0.18 PRESSURE RANGE: VACUUM TO 120 PSI

Photographs illustrate model numbers in white.

C9

FOR CIRCUIT BAR® VERSION OF THIS SERIES, SEE SECTION E.

INDIVIDUAL INLINE VALVES



INDIVIDUAL BASE MOUNTED VALVES

WITHOUT FLOW CONTROLS			WITH FLOW CONTROLS		
SGL. OPERATOR SPRING RETURN	DBL. OPERATOR		SGL. OPERATOR SPRING RETURN	DBL. OPERATOR	
CYL B A A A A A A A A A A A A A A A A A A A	B CYL A	SIZE	W IN EXH	B A A A A A A A A A A A A A A A A A A A	
45A-LAA-DDFJ-2TJ	45A-NAA-DDFJ-2TJ	⅓″ NPTF	45A-LAB-DDFJ-2TJ	45A-NAB-DDFJ-2TJ	
45A-LBA-DDFJ-2TJ	45A-NBA-DDFJ-2TJ	#10-32 UNF	45A-LBB-DDFJ-2TJ	45A-NBB-DDFJ-2TJ	

* STACKING VALVES

WITHOUT FLO	w controls		WITH FLOW	CONTROLS'
SGL. OPERATOR SPRING RETURN	DBL. OPERATOR		SGL. OPERATOR SPRING RETURN	DBL. OPERATOR
BW N EXH	B CYL A A A A A A A A A A A A A A A A A A A	SIZE	BW TO EXH	3 A A
45A-SA1-DDAA-3MA		⅓8″ NPTF	45A-SA2-DDAA-3MA	
45A-SB1-DDAA-3MA		#10-32 UNF	45A-SB2-DDAA-3MA	

* MANIFOLD BASE MOUNTED VALVES

WITHOUT FLO	W CONTROLS		WITH FLOW	CONTROLS
SGL. OPERATOR SPRING RETURN	DBL. OPERATOR		SGL. OPERATOR SPRING RETURN	DBL. OPERATOR
BW N EXH	B CYL B A A	SIZE	W THE SAME	BYA A
45A-LAC-DAAA-1BA	45A-NAC-DAAA-1BA	1/8" NPTF	45A-LAD-DAAA-1BA	45A-NAD-DAAA-1BA
45A-LBC-DAAA-1BA	45A-NBC-DAAA-1BA	#10-32 UNF	45A-LBD-DAAA-1BA	45A-NBD-DAAA-1BA

* MANIFOLD BASE MOUNTED VALVES WITH PRESSURE REGULATORS

WITHOUT FLC	W CONTROLS		WITH FLOW	CONTROLS
SGL. OPERATOR SPRING RETURN	DBL. OPERATOR		SGL. OPERATOR SPRING RETURN	DBL. OPERATOR
	N EXH	SIZE		
45A-LAJ DDBJ-4KA	45A-NAJ-DDBJ-4KA	√8" NPTF	45A-LAK-DDBJ-4KA	45A-NAK-DDBJ-4KA
45A-LBJ-DDBJ-4KA	45A-NBJ-DDBJ-4KA	#10-32 UNF	45A-LBK-DDBJ-4KA	45A-NBK-DDBJ-4KA



^{*}One End Plate Kit per gang required. To order see opposite page.

All MAC Valves available with BSPP threads: to order see opposite page.



FOR CIRCUIT BAR® VERSION OF THIS SERIES, SEE SECTION E.

RAIX - REMOTE AIR PILOT OPERATOR (SEE P. T-4) 45A - X X X - (DXXX - XXX) (SOLENOID OPTIONS - SEE BELOW)

BODY TYPE

-Inline-

4 port body

5 port body

4 port body "O" ring mount-all bottom ports

5 port body "O" ring mount-3 bottom ports inlet and cylinders

4 port body "O" ring mount-bottom cylinder ports only

4 port body - double 4 port body - double

"O" ring mount-all bottom ports

4 port body - double - "O" ring mount bottom cylinder ports only

-Stacking-

Stacking body

Stacking body - double

-Base Mount-

0-For base only-no valve

Base mount body

Base mount body with gage port

Base mount body - double

Base mount body with gage port - double

PORT SIZE

Bose mount body only

or regulator only 1/8" NPT

#10-32 UNF 1/8" BSPPL R -

M5 (Metric) D-

#10-32 UNF Bottom Ports

G-

M5 Bottom ports
"O" ring mount ports Н-

1/8" NPT Bottom Ports

1/8" BSPPL Bottom Ports

FLOW CONTROLS-REGULATORS BASE STYLES

-Inline Or Stacking Body-

No flow controls '

With flow controls

-Bases-Flow Controls-Regulators-

Valve only-no base

Individual base

Individual base with flow controls

Manifold Base

Manifald w/Flow Control

Monifold w/Regulator w/Slotted Stem

Manifold w/Flow Control & Regulator w/Slotted Stem

Manifold w/Regulator w/Locking Slotted Stem

Manifold w/Flow Controls & Regulator w/Locking Slotted Stem

Manifold w/Regulator w/Locking Knob
Manifold w/Regulator w/Locking Knob w/Flow Controls

Regulator Only w/Slotted Stem
Regulator Only w/Slotted Stem W/Flow Controls
Regulator Only w/Slotted Stem w/Flow Controls
Regulator Only w/Locking Slotted Stem w/Flow Controls

Regulator Only w/Locking Knob
Regulator Only w/Locking Knob w/Flow Controls

For regulator options & dimensions, see page C-28

SOLENOID OPTIONS

Non-Locking Recessed

Locking Recessed

MANUAL OPERATOR

No Operator

Non-Locking

No Operator

w/Indicator Light (Stacking MA Cover)

Non-Locking Recessed

w/Light on MA Cover

w/Light on MA Cover Non-Locking Extended w/Light on MA Cover

Locking Recessed

Locking Extended

w/Light on MA Cover

Extended Locking Extended

0

1

2

3

7

8

9

VOLTAGE

AA - 120/60, 110/50 AB - 240/60, 220/50 AC - 24/60, 24/50 AF - 240/50 DA - 24 VDC (5.4w) DB - 12 VDC (7.5w) DD - 24 VDC [7.5w) DF - 12 VDC (12.7w)* DF - 24 VDC (12.7w)* DF - 24 VDC (12.7w)*

FA - 12 VDC (1.8w) FB - 24 VDC (1.8w) FE - 12 VDC (2.4w) FF - 24 VDC (2.4w)

Note: These wattages ovailable as Mod. CLSF only.

LEAD-WIRE LENGTH

18" B - 24"

C - 36" D - 48"

E - 72"

J - Externol Plug-In

DOUBLE SOLENOID VALVES

Min DC wattage 5.4 w (nitrile seals)

Min DC wattage 7.3 w (viton seals)

All AC voltages acceptable

CV - FLOW

45 SERIES SINGLE SOLENOID	4-PORT	5-PORT	STACKING	BASE A IND. A		BAR MANF.
Low watt DC 1.8 - 2.4 watts	0.10	0.10	0.14	0.11	0.09	0.08
All Std. AC Std. 5,4 watt DC	0.15	0.17	0.20	0.13	0.11	0.10
Hi-flow AC MOD 1115 DC 7.3 watts & above MOD 1115	0.23	0.30	0.30	0.20	0.18	0.17
Hi-flow 2-way DC 60psi 5.4 watts & above MOD 1052	0.32	N/A	0.38	N/A	N/A	N/A

STACKING BODY ACCESSORIES

M-45001-01 End Plate Kit M-45005-01 Common Conduit End Plate Kit N-45005 Isolator Kit-Inlet and Exhaust N-45006 Isolator Kit-Inlet Only N-45007 Isolator Kit-Exhaust Only *When using isolators with common conduit M-45004 spacer is required between boxes.

Tie Rod

M-45004 Spacer N-45004 Flaw Control Assembly Pressure Seal-Between Valves 16422

19813

MANIFOLD MOUNT ACCESSORIES

M-45008-01 End Plate Kit 16455 Pressure Seal-Between Manifold 19753 Tie Rods N-45008 Isolator Kit-Inlet and Exhaust N-45009 Isolator Kit-Inlet Only N-45010 Isolator Kit-Exhaust Only N-45015. End Cover Plate-Plain End Cover Plate w/Flow Controls N-45016 N-45017 Flow Control Needle Ass'y.

ELECTRICAL CONNECTION BA - Grommet

* BK - Grommet w/Diode

BL - Grommet w/M.O.V. † CA - Conduit 1/2" NPS

† CA – Conduit 1/2" NPS
† CM – Metal conduit 1/2" NPS
† CN – Metal conduit 1/2" NPS
† CN – Metal conduit w/grd. 1/2" NPS
-EXTERNAL PLUG-IN VALVEFM – Plug-in (For ECD & ECE Bar)
FN – Plug-in w/Diode (For ECD & ECE Bor)
FP – Plug-in w/M.O.V. (For ECD & ECE Bor)
† JB – Rectangular Plug-in w/Light*
† JM – Rectangular Plug-in w/Light*
† JM – Rectangular Male Only
KA – Mini Plug-in w/Diode*
KC – Mini Plug-in w/Diode*
KC – Mini Plug-in w/Light & Diode*
KE – Mini Plug-in w/Light & Diode*
KF – Mini Plug-in w/Light & M.O.V.*

- Mini Plug-in w/Light & M.O.V.*
- Mini Plug-in w/LED Light & Diode*

Mini Plug-in Male Only

Mini Plug-in Male Only w/Diode

Mini Plug-in Mole Only w/M.O.V.
 Common Conduit (Single Sol.)- Stacking Valves Only
 Dual Tabs (.110) w/Receptacles
 Dual Tabs (.110) with Diode with Receptacles
 2-Pin w/Light w/Receptacles

2-Pin w/Light w/Diode w/Receptacles
 Dual Tabs (.110) w/o Receptacles

- Dual Tabs (110) w/o Receptocles w/Diode

- 2-Pin w/Light w/o Receptacles

 TN - 2-Pin w/Light w/Diode w/o Receptocles
 M.O.V. Diode & Light are in female connector in these options † Available on Individual Valves and Bar Manifolds Only.

INDIV. INLINE VALVE ACCESSORIES

N-45002-01 Flow Control Plate Assembly

INDIVIDUAL BASE ACCESSORIES

N-45018 Flow Control Assembly



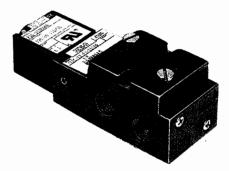
4-WAY, SOLENOID PILOT AND REMOTE AIR PILOT OPERATED, INDIVIDUAL INLINE OR STACKING BODY

1/8", 1/4" PORTS - C_y UP TO 0.8

PRESSURE RANGE: VACUUM TO 150 PSI

Patents and Patents Pending

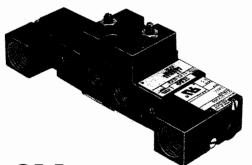
Photographs illustrate model numbers in white.



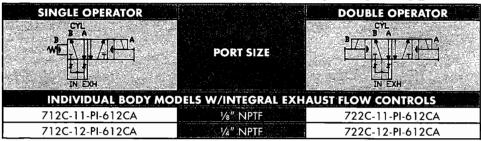
INDIVIDUAL INLINE VALVES WITHOUT FLOW CONTROLS

SINGLE OPERATOR		DOUBLE OPERATOR
CTL B A	PORT CLTF	B A
₩ EX	PORT SIZE	
EXH IN	I IDIVIDUAL BODY MODELS	EXH IN
711C-11-PI-111BA	⅓″ NPTF	721C-11-PI-111BA
711C-12-PI-111BA	1/4" NPTF	721C-12-PI-111BA

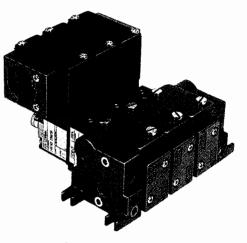
Valve codes shown are for 120/60, 110/50 coils, non-locking recessed manual operators and grommet style electrical connections.



INDIVIDUAL INLINE VALVES WITH FLOW CONTROLS



Valve codes shown are for 24 volt DC (8.5 watt) coils, locking recessed manual operators and ½" N.P.S. electrical conduit connections.



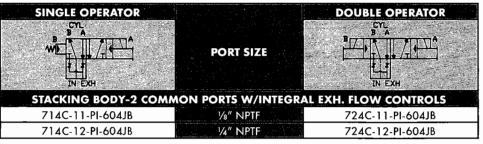
* STACKING BODY WITHOUT FLOW CONTROLS

SINGLE OPERATOR		DOUBLE OPERATOR
ME THE PARTY A	PORT SIZE	B POH IN
STACE	(ING BODY-2 COMMON	I PORTS
713C-11-PI-123MB	1/8" NPTF	723C-11-PI-123MB
713C-12-PI-123MB	1/4" NPTF	723C-12-PI-123MB

Valve codes shown are for 240/60, 220/50 coils, non-locking extended manual operators and 1" N.P.S. common conduit electrical connections.



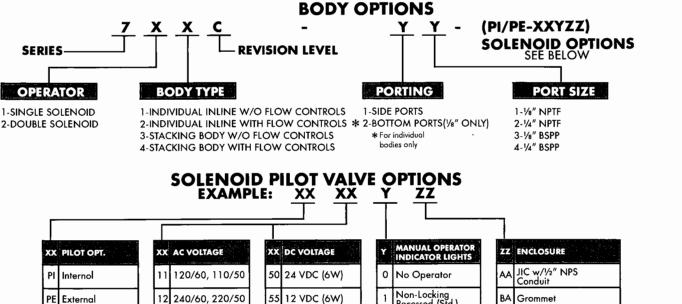
* STACKING BODY WITH FLOW CONTROLS



Valve codes shown are for 12 volt DC (8.5 watt) coils, locking extended manual operators and rectangular external plug-in electrical connections.

^{*}One End Plate Kit required per gang. To order see opposite page.





Other AC & DC Voltages Available. DC wattages from 1.0 to 17 watts. See page **T-2** or Consult Factory.

57

12 VDC (2.5W)

24 VDC (2.5W)

12 VDC (8.5W)

24 VDC (8.5W)

22 24/50-60

240/50

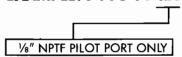
Lights are available for 120/60, 110/50 or 240/60, 220/50 or 24 VDC with JIC enclosure (AA) or MB common conduit.

Y	MANUAL OPERATOR INDICATOR LIGHTS
0	No Operator
1	Non-Locking Recessed (Std.)
2	Locking Recessed
3	Non-Locking Extended
4	Locking Extended
5	No Operator with Light
6	Non-Locking Recessed w/Lgt.
7	Locking Recessed w/Lgt.
8	Non-Locking Extended w/Lgt.
9	Locking Extended w/Lgt.

AA JIC w/½" NPS
Conduit
BA Grommet
CA Conduit ½" NPS
CC Conduit ½" NPT
(CSA Threads)
NA Conduit ½" NPS
w/Ground Wire
MB Com. Conduit 1" NPS
Stacking Models
(Requires 1 M-01002-01
conduit plate per stack

External Plug-Ins available. See page **T-3** ar consult factory.

REMOTE AIR PILOT OPERATED EXAMPLE: 711C-11-RA



REMOTE AIR PILOT, PILOT OPERATED VALVES

These special air versions have the same features as the remote air pilot operated models, but additionally feature:

- Ability to use a pilot signal pressure different from the main valve pressure. Pilot signal can be from 20-150 PSI, regardless of main valve pressure.
- A manual operator/position indicator. See page T-4 to order.

MANIFOLD ACCESSORIES

MANIFOLD END PLATE KITS - For each gang, one kit is required. **ISOLATORS** - Sections of a gang may be isolated permitting different pressures to be fed to either end of the gang.

TO ORDER - Select the appropriate part number from the table.

PART NO.	DESCRIPTION
M-07001-01-01	(NPTF) Manifold End Plate Kit - 2 Common Ports - Int. Pilot
M-07001-01-01P	(BSPP) Manifold End Plate Kit - 2 Common Ports - Int. Pilot
M-07001-02-01	(NPTF) Manifold End Plate Kit - 2 Common Ports - Ext. Pilot
M-07001-02-01P	(BSPP) Manifold End Plate Kit - 2 Common Ports - Ext. Pilot
N-07005	Isolator Kit - Inlet and Exhaust
N-07006	Isolator Kit - Inlet Only
N-07007	Isolator Kit - Exhaust Only
#28303	½" Muffler Plug for Manifold Common Pilot Exhaust Ports

MODIFICATIONS:

TO ORDER - include MOD after valve model number EXAMPLE, 711C-11-PI- 111BA MOD CLSF MOD CLSF - High temperature AC or DC Class F coil option

For additional modifications see Technical Section.

Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.
Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.



Patents and Patents Pending

4-WAY SOLENOID PILOT OPERATED (4 WAY PILOT), INDIVIDUAL INLINE, INDIVIDUAL BASE MOUNTED, OR MANIFOLD MOUNTED BODIES

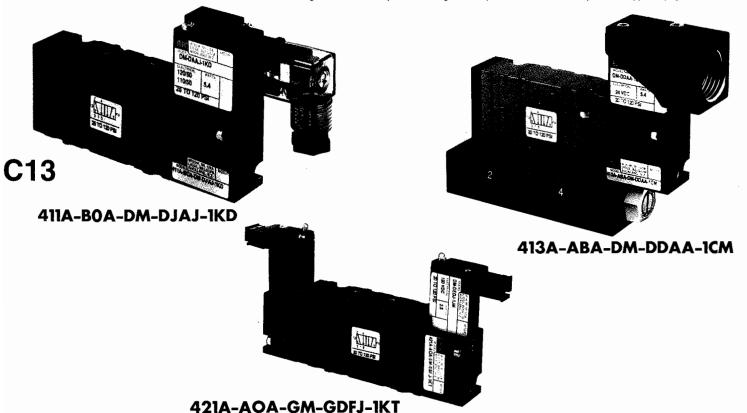
1/8", 1/4", PORTS - C_V UP TO 1.0 PRESSURE RANGE: VACUUM TO 120 PSI

FOR CIRCUIT BAR® VERSION
OF THIS SERIES, SEE SECTION E.

400 SERIES - SOLENOID PILOT OPERATED VALVES WITH 45 SERIES PILOT

SGL. SOLENOID 2-POSITION	DBL. SOLENOID 2-POSITION	MOUNTING/ SINGLE	DBL. SOL. 3-POS. CLOSED CENTER	DBL. SOL. 3-POS. OPEN CENTER	DBL. SOL. 3-POS. PRESSURE CENTER
12 - 14	12 - 14	PRESSURE INTERNAL PILOT VALVES NPTF PORTS	2 4 12 14 MDT TTTT T M 3 1 5	12 - 14 MD T 1 1 T 3 M	12 - 14 MDT 1 T T T M
413A-00A-DM-DJAA-1BA	423A-00A-DM-DJAA-1BA	Valve Only Manifold Mount	453A-00A-DM-DJAA-1BA	463A-00A-DM-DJAA-1BA	473A-00A-DM-DJAA-1BA
411A-AOA-DM-DJAA-1BA	421A-AOA-DM-DJAA-1BA	1/8" In Line	451A-AOA-DM-DJAA-1BA	461A-A0A-DM-DJAA-1BA	471A-A0A-DM-DJAA-1BA
411A-BOA-DM-DJAA-1BA	421A-BOA-DM-DJAA-1BA	1/4" In Line	451A-BOA-DM-DJAA-1BA	461A-BOA-DM-DJAA-1BA	471A-BOA-DM-DJAA-1BA
413A-AAA-DM-DJAA-1BA	423A-AAA-DM-DJAA-1BA	1/8" Individual Sub-Base	453A-AAA-DM-DJAA-1BA	463A-AAA-DM-DJAA-1BA	473A-AAA-DM-DJAA-IBA
413A-BAA-DM-DJAA-1BA	423A-BAA-DM-DJAA-IBA	1/4" Individual Sub-Base	453A-BAA-DM-DJAA-1BA	463A-BAA-DM-DJAA-1BA	473A-BAA-DM-DJAA-IBA

Valve codes shown are for 120/60, 110/50 coils, non-locking recessed manual operators, with grommet style enclosures. For other options see opposite page.



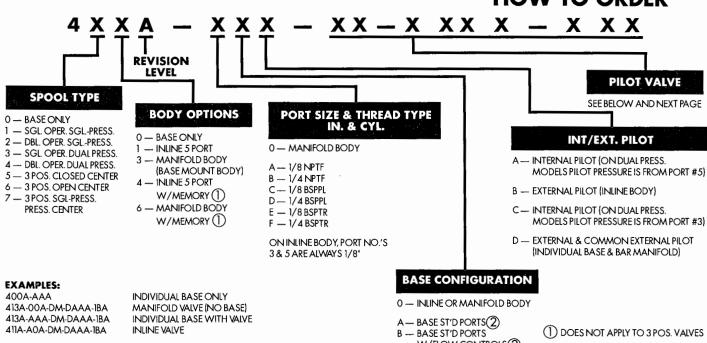
400 SERIES - SOLENOID PILOT OPERATED VALVES WITH 44 SERIES PILOT

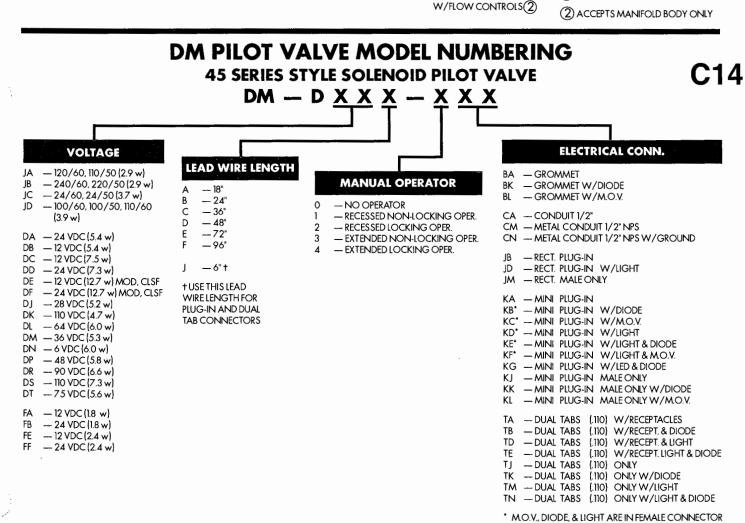
SGL. SOLENOID 2-POSITION	DBL. SOLENOID 2-POSITION	2-POSITION SINGLE CLO		DBL. SOL. 3-POS. OPEN CENTER	DBL. SOL. 3-POS. PRESSURE CENTER
12 - 14	12 - 14	PRESSURE INTERNAL PILOT VALVES NPTF PORTS	2 4 12 14 MDT TTTT T M 3 1 5	2 4 MD T 11 T M 3 1 5	12 2 4 14 14 MD T T T T T M
413A-00A-GM-GDFJ-1KA	423A-00A-GM-GDFJ-iKA	Valve Only Manifold Mount	453A-00A-GM-GDFJ-IKA	463A-00A-GM-GDFJ-1KA	473A-00A-GM-GDFJ-IKA
411A-A0A-GM-GDFJ-1KA	421A-A0A-GM-GDFJ-1KA	1/8" In Line	451A-A0A-GM-GDFJ-1KA	461A-A0A-GM-GDFJ-1KA	471A-A0A-GM-GDFJ-1KA
411A-BOA-GM-GDFJ-1KA	421A-BOA-GM-GDFJ-1KA	1/4" In Line	451A-B0A-GM-GDFJ-1KA	461A-BOA-GM-GDFJ-1KA	471A-BOA-GM-GDFJ-1KA
413A-AAA-GM-GDFJ-1KA	423A-AAA-GM-GDFJ-1KA	1/8" Individual Sub-Base	453A-AAA-GM-GDFJ-1KA	463A-AAA-GM-GDFJ-1KA	473A-AAA-GM-GDFJ-IKA
413A-BAA-GM-GDFJ-IKA	423A-BAA-GM-GDFJ-IKA	1/4" Individual Sub-Base	453A-BAA-GM-GDFJ-1KA	463A-BAA-GM-GDFJ-1KA	473A-BAA-GM-GDFJ-1KA

Valve codes shown are for 24 VDC (4.0 w), non-locking recessed manual operators, with mini plug-in connectors. For other options see opposite page



Production of the second





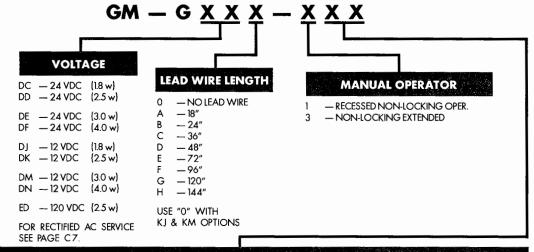
IN THESE OPTIONS



OF THIS SERIES, SEE SECTION E.

Patents and Patents Pending

GM PILOT VALVE MODEL NUMBERING 44 SERIES STYLE SOLENOID PILOT VALVE



ELECTRICAL CONNECTOR DESCRIPTION

- FLYING LEADS W/O GROUND WIRE
- FLYING LEADS W/GROUND WIRE

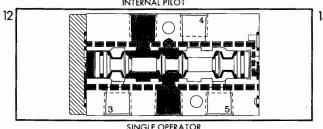
C15

- FLYING LEADS W/LED LIGHT PARALLEL TO LEADS (NO GROUND WIRE)
- FLYING LEADS W/LED LIGHT PARALLEL TO LEADS & GROUND WIRE
- FLYING LEADS W/SUPPRESSION DIODE (NO GROUND WIRE)
- FLYING LEADS W/SUPPRESSION DIODE & GROUND WIRE
- FLYING LEADS W/SUPPRESSION DIODE PLUS LED LIGHT PARALLEL TO LEADS (NO GROUND WIRE) BG.
- FLYING LEADS W/SUPPRESSION DIODE PLUS LED LIGHT PARALLEL TO LEADS AND GROUND WIRE
- FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE (NO GROUND WIRE)
- --- FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE & GROUND WIRE
- FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT PARALLEL TO LEADS (NO GROUND)
- FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT PARALLEL TO LEADS & GROUND WIRE
- FLYING LEADS W/LED LIGHT ON TOP (NO GROUND WIRE)
- FLYING LEADS W/LED LIGHT ON TOP & GROUND WIRE
- FLYING LEADS W/SUPPRESSION DIODE PLUS LED LIGHT ON TOP (NO GROUND WIRE)
- FLYING LEADS W/SUPPRESSION DIODE PLUS LED LIGHT ON TOP & GROUND WIRE
- BX FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT ON TOP (NO GROUND WIRE)
- BY FLYING LEADS W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT ON TOP & GROUND WIRE
- PLUG-IN WIRE ASS'Y (NO GROUND WIRE)
- PLUG-IN WIRE ASS'Y W/GROUND WIRE
- PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE (NO GROUND WIRE)
- KF PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE & GROUND WIRE
- KJ PLUG-IN HOUSING WITHOUT WIRE ASS'Y ("KA" OPT. WITHOUT WIRE ASSY)
- KM PLUG-IN HOUSING WITHOUT WIRE ASS'Y ("KB" OPT. WITHOUT WIRE ASSY)
- KN PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS BLOCKING DIODE (NO GROUND WIRE)
- KP PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS BLOCKING DIODE & GROUND WIRE
- KT PLUG-IN WIRE ASS'Y W/LED LIGHT ON TOP (NO GROUND WIRE)
 KU PLUG-IN WIRE ASS'Y W/LED LIGHT ON TOP & GROUND WIRE
- PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS LED LIGHT ON TOP (NO GROUND WIRE)
- KW PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS LED LIGHT ON TOP & GROUND WIRE
- KX PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT ON TOP (NO GROUND WIRE)
- KY PLUG-IN WIRE ASS'Y W/SUPPRESSION DIODE PLUS BLOCKING DIODE & LED LIGHT ON TOP & GROUND WIRE

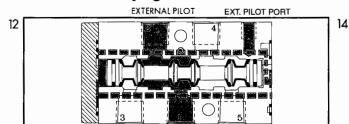
· BLOCKING DIODE IS IN LEAD WIRE

FOR CIRCUIT BOARD COVER OPTIONS SEE PAGE C7.

SPOOL CONFIGURATIONS (cont'd next page)



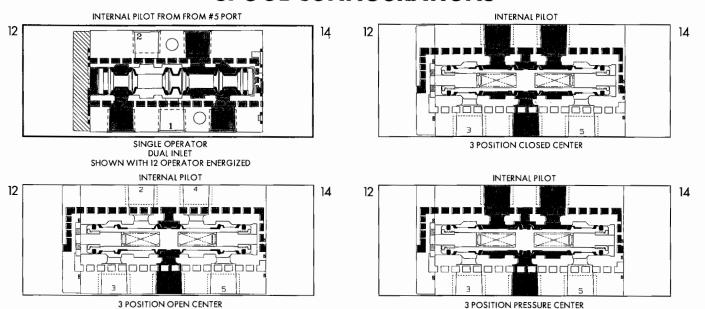
SINGLE INLET SHOWN WITH 12 OPERATOR ENERGIZED



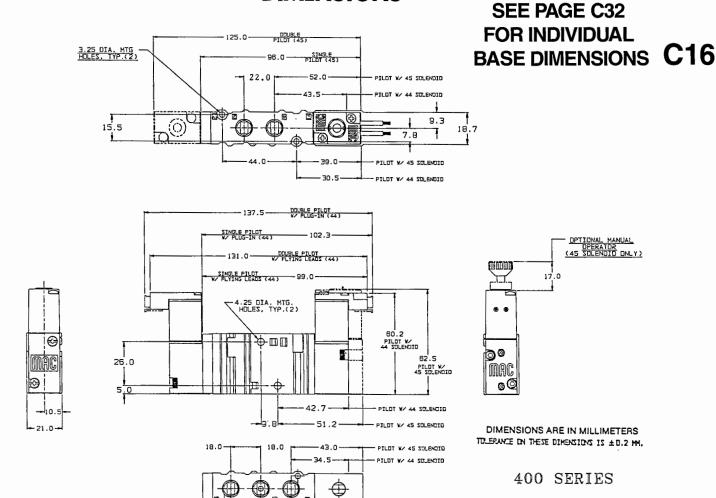
SINGLE OPERATOR SHOWN WITH 12 OPERATOR ENERGIZED



SPOOL CONFIGURATIONS



DIMENSIONS





4-WAY, SOLENOID PILOT OPERATED, INDIVIDUAL INLINE AND STACKING BODIES

1/4", 3/8" - C_V UP TO 1.4

PRESSURE RANGE: VACUUM TO 200 PSI (SEE OPERATING DATA)

Patents and Patents Pending

	SINGLE	DOUBLE SOLENOID	De	UBLE SOLENOID 3 P	OS.
NPTF	2 POS.	2 POS.	CLOSED CENTER	OPEN CENTER	PRESSURE CENTER
PORT SIZE & DESCRIPTION	B NE 2 3 4 15 EXH IN EXH	2 3 4 1 5 EXH IN EXH	B T T T T T T T T T T T T T T T T T T T	B W Z S W A S S X W A	B A SEXH IN EXH





INDIVIDUAL BODY MODELS

1/4" INT. PILOT SGL INLET	811C-PM-111BA-152	821C-PM-111BA-152	825C-PM-111BA-552	825C-PM-111BA-652	825C-PM-111BA-852
1/4" EXT. PILOT SGL INLET	812C-PM-111BA-112	822C-PM-111BA-112	826C-PM-111BA-512	826C-PM-111BA-612	826C-PM-111BA-812





STACKING BODY - 3 COMMON PORTS W/COMMON CONDUIT

1/4" 4 WAY SGL INLET	811C-PM-111DA-142	821C-PM-111DA-142	825C-PM-111DA-542	825C-PM-111DA-642	825C-PM-111DA-842
3/8" 4 WAY SGL INLET	811C-PM-111DA-143	821C-PM-111DA-143	825C-PM-111DA-543	825C-PM-111DA-643	825C-PM-111DA-843

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STACKING BODY - 3 COMMON PORTS W/COMMON CONDUIT W/INTEGRAL EXH. FLOW CONTROLS

	1/4" 4-WAY, SGL INLET	811C-PM-111DA-162	821C-PM-111DA-162	825C-PM-111DA-562	825C-PM-111DA-662	825C-PM-111DA-862
Г	3/8" 4-WAY, SGL INLET	811C-PM-111DA-163	821C-PM-111DA-163	825C-PM-111DA-563	825C-PM-111DA-663	825C-PM-111DA-863





STACKING BODY - 3 COMMON PORTS (INLET & EXHAUSTS)

1/4" 4-WAY, SGL INLET	811C-PM-111BA-122	821C-PM-111BA-122	825C-PM-111BA-522	825C-PM-111BA-622	825C-PM-111BA-822
3/8" 4-WAY, SGL INLET	811C-PM-111BA-123	821C-PM-111BA-123	825C-PM-111BA-523	825C-PM-111BA-623	825C-PM-111BA-823





STACKING BODY - 3 COMMON PORTS W/INTEGRAL EXH. FLOW CONTROLS

ı	1/4" 4-WAY, SGL INLET	811C-PM-111BA-192	821C-PM-111BA-192	825C-PM-111BA-592	825C-PM-111BA-692	825C-PM-111BA-892
ı	3/8" 4-WAY, SGL INLET	811C-PM-111BA-193	821C-PM-111BA-193	825C-PM-111BA-593	825C-PM-111BA-693	825C-PM-111BA-893





STACKING BODY - 1 COMMON PORT (INLET)

1/4" 4-WAY, SGL INLET 811C-PM-111BA-132 8210	C-PM-111BA-132 825C-PM-111BA-532	825C-PM-111BA-632 825C-PM-1	11BA-832
--	------------------------------------	-------------------------------	----------

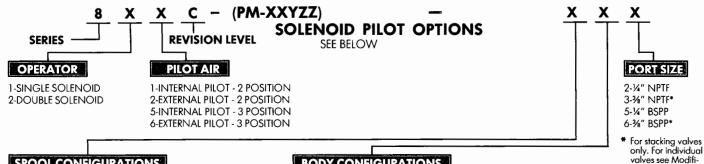
Valve codes shown are for 120/60, 110/50 coils, non-locking recessed manual operators and grommet type electrical connections.

FOR CIRCUIT BAR® VERSION OF THIS SERIES, SEE SECTION E.

MHC 800 SERIES



HOW TO ORDER



SPOOL CONFIGURATIONS

1-SINGLE PRESSURE 2 POSITION 2-DUAL PRESSURE 2 POSITION * 5-SINGLE PRESSURE 3 POSITION CLOSED CENTER 6-SINGLE PRESSURE 3 POSITION OPEN CENTER 7-DUAL PRESSURE 3 POSITION PRESSURE CENTER* 8-SINGLE PRESSURE 3 POSITION PRESSURE CENTER

* Not available on models with integral flow controls

BODY CONFIGURATIONS

1-INDIVIDUAL BODY, EXTERNAL PILOT

2-STACKING BODY, 3 COMMON PORTS (INLET & EXHAUSTS)

3-STACKING BODY, 1 COMMON PORT (INLET)

4-STACKING BODY, 3 COMMON PORTS (WITH COMMON ELECTRICAL CONDUIT)

5-INDIVIDUAL BODY, INTERNAL PILOT

6-STACKING BODY, 3 COMMON PORTS (WITH COMMON ELECTRICAL CONDUIT AND INTEGRAL EXHAUST FLOW CONTROLS)

7-BASE MOUNTED BODY FOR CIRCUIT BAR®. See pages **E26 & E27**

9-STACKING BODY, 3 COMMON PORTS (WITH INTEGRAL EXHAUST FLOW CONTROLS

SOLENOID PILOT OPTIONS XX-XX Y ZZ

cation Table.

					¬ ••••
XX PILOT EXHAUST	XX AC VOLTAGE	XX DC VOLTAGE	Y MANUAL OPERATORS	Y MANUAL OPERATOR W/INDICATOR LIGHT	ZZ ENCLOSURE
PM Pilot ExhMuffled	11 120/60, 110/50	50 24 VDC (6W)	0 No Operator	5 No Operator with Light	AA JIC w/½" NPS Conduit
PP Pilot ExhPiped	12 240/60, 220/50	55 12 VDC (6W)	Non-Locking Recessed (Std.)	6 Non-Locking Recessed w/Lgt.	BA Grommet
Other AC & DC Voltages	22 24/50-60	57 12 VDC (2.5W)	2 Locking Recessed	7 Locking Recessed w/Lgt.	CA Conduit ½" NPS
Available. DC Wottoges from 1.0 to 17 wotts. See Page T-2 or	39 240/50	59 24 VDC (2.5W)	3 Non-Locking Extended	8 Non-Locking. Extended w/Lgt.	CC Conduit ½" NPT (CSA Threads)
Consult Foctory.		60 12 VDC (8.5W)	4 Locking Extended	9 Locking Extended w/Lgt.	DA Com. Conduit Stacking Only
		61 24 VDC (8.5W)]	DLights are ovailable for	RA Conduit %" NPS (Stacking)

ISOLATORS — Sections of a gang may be isolated permitting different pressures to be fed to either end of the gang. Part # N-08001 (inlet), N-08002 (exhaust).

FLOW CONTROL & MUFFLER — 1/4" unit for installing in individual Exhaust ports. Part #10951

DUAL INLET PRESSURE BLOCK—For 3 common ports or 1 common port stacking valves. Provides 2 additional inlet pressure ports to a stack.

Part #M-08003 For Common Conduit Valves Part #M-00014

120/60, 110/50 or 240/60 220/50 or 24VDC with JIC enclosure only (AA). **ACCESSORIES**

External plug-ins available. See Page **T-3** ar Consult Foctory.

MANIFOLD END PLATE KITS (NPTF)*			
INT. PILOT PART NO.	EXT. PILOT PART NO.	MODELS USED WITH	
M-08001-01-01	M-08001-02-01	3 com. port or 1 com. port models, stacks of 1 thru 16 volves.	
M-08002-01-01	M-08002-02-01	Com. conduit models, stocks of 1 thru 16 volves.	
M-00005-01-01	M-00005-02-01	3 com. port or 1 com. port models, stocks of 17 or more valves.	
M-00007-01-01	M-00007-02-01	Cam. conduit models, stocks of 17 or more valves.	

* Add letter P at end of part No. for BSPP Threads; EXAMPLE: M-08001-01-01P

MODIFICATIONS

MOD. NO.	DESCRIPTION	MODEL AVAILABILITY	
0387	Indicator light 24VDC		
0295	Indicator light 120V/60/50	Single & double solenoid common conduit only	
0296	Indicator light 240V/60/50	Common Condon Only	
0358	¾" inlet and cylinder ports	Individual valves	

TO ORDER — Add the appropriate modification number after the valve number; **EXAMPLE** 811C-PM-111DA-142 MOD 0295.

For additional modifications see Technical Section.

Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section. Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

IHU 800 SERIES

Patents and Patents Pending

SPECIAL APPLICATIONS:

On all single pressure models, energizing the operator closest to port #5 supplies pressure to cylinder port "2" and energizing the operator closest to port #4 supplies pressure to cylinder port "3". For the following special applications, additional piping considerations are required.

EXTERNAL PILOT APPLICATIONS: An External Pilot is only required when the main valve pressure is less than 20 PSIG on single solenoid or 10 PSIG on double solenoid valves in 2-position models, or less than 20 PSIG on 3-position double solenoid models. Also an External Pilot is required when main valve pressure is in excess of 150 PSIG.

- * INDIVIDUAL VALVES: The External Pilot supply is connected to the External Pilot port in the piston adapter. The valve must be an External Pilot model.
- * STACKING VALVES: The External Pilot supply is connected to the External Pilot ports in the end plates. The valve is the same valve for either Internal or External Pilot. The end plates must be the external pilot type.

SUPPLEMENTAL TECHNICAL DATA

PRESSURE (TWO INLET) **APPLICATIONS:** When two pressures are required within a valve, a Dual Pressure (Inlet) model must be used. Additionally the following must be adhered to:

INDIVIDUAL VALVES: If both pressures are below the minimum, use an External Pilot supply as described above for Individual valves and connect the two pressures to ports #4 and #5. Otherwise, use an Internal Pilot model and connect the higher pressure to port #5 and the lower pressure to port #4.

STACKING VALVES: Use an External Pilot Manifold End Plate Kit, as described above for Stacking Valves and connect the two pressures to the two Exhaust ports in the end plate.

MULTIPLE PRESSURES TO A STACK: By isolating, different pressure can be supplied to each end of a stack to provide two pressures. If more than two pressures are required, a Dual Inlet Pressure Block can be installed providing 2 more inlet pressures to a stack. With the use of 1 or more of these Pressure Blocks, a stack can have virtually

unlimited inlet pressures (See "Accessories" 'How to Order'' for ordering informaunder "

VACUUM APPLICATIONS: Use an External Pilot model as described above under "External Pilot Applications", (Individual valve or Stacking).

For single pressure, dual exhaust type valves, ports #4 & #5 (Exhausts) should be connected to the vacuum supply and port #1 (Inlet) to atmosphere.

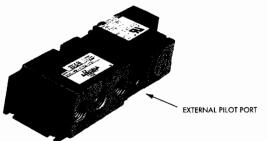
For dual pressure, single exhaust type valves. vacuum should be connected to port #1 (Inlet) and ports #4 & #5 (Exhausts) to atmosphere.

SELECTOR APPLICATIONS: Use an External Pilot model as described above, if both pressures are below the minimum pilot pressure; otherwise use an Internal Pilot model. In either case, use a single pressure model and connect the higher pressure to port #1 (Inlet) and the lower pressure to port #4 (Exhaust) if using cylinder port #2 or to port #5 (Exhaust) if using cylinder port #3.

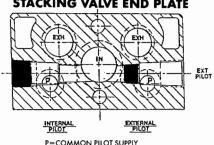
C19

INDIVIDUAL VALVES

EXTERNAL PILOT APPLICATIONS

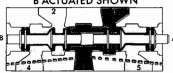


STACKING VALVE END PLATE

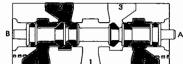


SPOOL CONFIGURATIONS

2-POSITION SGL. PRESSURE (SPOOL #12184) **B ACTUATED SHOWN**



2-POSITION DUAL PRESSURE (SPOOL ASSY, #10266) **B ACTUATED SHOWN**

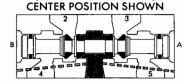


3-POSITION SGL. PRESS. CLOSED CENTER (SPOOL ASSY. #S-00004) CENTER POSITION SHOWN



3-POSITION SGL. PRESS OPEN CENTER (SPOOL ASSY. #S-00003)

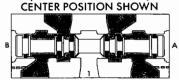
EXT PILOT



3-POSITION SGL. PRESS. PRESSURE CENTER (SPOOL ASSY, #S-08003) CENTER POSITION SHOWN



3-POSITION DUAL PRESS. PRESSURE CENTER (SPOOL ASSY. #S-08002)



NOTE: **BODIES SHOWN** ARE INTERNAL PILOT

45 & 800 SERIES

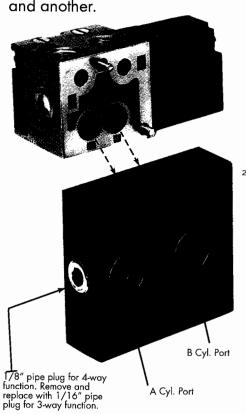
Patents and Patents Pending

NAMUR Interface

45 SERIES

The 45 Series inline valve utilizes a Namur Intertace Adapter Plate. This Adapter Plate enables a 45 Series inline body with bottom O-ring mount cylinder ports (45A-FA1 body) to mount to the Namur Interface. To attach this assembly to an actuator, the Adapter Plate must first be mounted to the actuator, then the valve to the plate. Two types of interface plates are available, one for 3-way use and another for 4-way applications. These plates can be converted from 3-way to 4-way or vice-versa by simply installing the correct pipe plug.

NAMUR ADAPTER KIT N-45028-03 for 3-way operation N-45028-04 for 4-way operation



The Namur Interface is a general

working standard for measurement & control techniques in the

The Namur Standard is an inter-

face for a 3-way or 4-way, single

or double solénoid air control

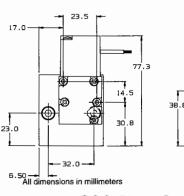
valve. It consists of two drilled orifices to correspond to the valve cylinder ports, and four mounting holes. Two of the holes are used

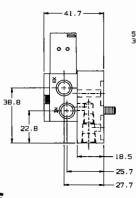
to mount the valve to the actuator,

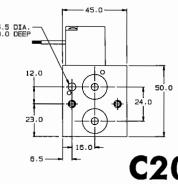
while one of the remaining two holes is for a locating pin. Like other interfaces, (i.e. ISO Series),

it permits interchangability between one make of air valve

process control industry.

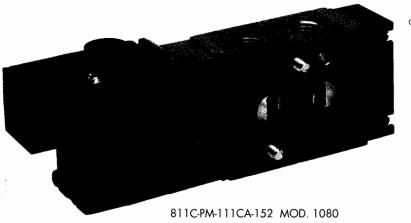


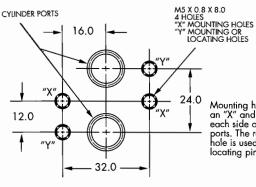




800 SERIES

The 800 Series individual body can be modified to match the Namur Interface by specifying MOD.1080 after the valve model number. This modification consists of a special machined body with standard cylinder ports plugged and two drilled countersunk holes on the side of the body and a machined hole for a locating pin. Two O-ring seals and the locating pin are supplied with the valve. The locating pin can be installed in one of two places depending on the orientation of the valve. The pin is designed to prevent the valve from being mounted 180 degrees from its correct position..





Mounting holes consist of an "X" and "Y" hole on each side of the cylinder ports. The remaining "Y" hole is used to install the locating pin.

NAMUR Interface

HOW TO ORDER

To order a complete valve requires the selection of an Operator B, followed by the selected body, followed by the selected Operator A. The operator numbers for both "A" and "B" are listed below in the left hand table. The 3 digit body numbers are selected from the right hand table, by selecting one digit from each of the 3 columns.

Oper. B	Body	Oper. A
18XXXX	-YYY	-XXXX

	OPERATOR '	'A" AF	ND "B"
XXXX	DESCRIPTION	XXXX	The second secon
0001	Spring (Use 02 on Push Pull)	* 0025	Lever, Locking, Push; Parallel
	Retainer (Used with 0034, 0035,		to bady
	& 0039)	* 0026	Lever, Non-Locking, Push;
0003	Pilot (2-Pos.)		Parallel to body
	Pilot Sequence	* 0027	Lever, Locking, Pull; Parallel
	Spring Retainer End Mount		to body
	Side Pilot (2-Pos.)	* 0028	Lever, Non-Locking, Pull;
	Side Pilot w/Manual Operator	1	Parallel to body
	& Indicator (2-Pos.)	0031	Push Button
0012	Side Pilot Sequence	0032	Push Button, Panel Mount
0013	Lever Cam Roller,	0033	Push Buttan, w/Guard
	Perpendicular to Ports	0034	Push Pull*
0014	Lever Cam Roller, Parallel	0035	Push Pull, Panel Mount*
	to Ports	0036	Palm Button
0015	Override Cam, Parallel;	0037	Palm Button, Panel Mount
i !	Override left	0038	Palm Button, w/Guard
0016	Override Cam, Parallel;	0039	Palm Button, Push Pull*
	Override right	0045	Whisker, Vertical; Perpendicular
0017	Override Cam, Perpendicular;		to Ports
	Override Up	0046	Whisker, Vertical; Parallel to Ports
0018	Override Cam, Perpendicular;	0047	
	Override Down		to Ports
* 0021	Lever, Locking, Push;	0048	
	Perpendicular to body		to Ports
0022	Lever, Non-Lacking, Push;	1110	Straight Cam Roller, Parallel
	Perpendicular to bady		to Ports
* 0023	Lever, Locking, Pull;	0112	Straight Cam Roller, Perpendicular
	Perpendicular to body		to Ports
* 0024	Lever, Non-Locking, Pull;	0304	Pilot (3 Position)
	Perpendicular to body	*Pusł	pull operators have the spool per

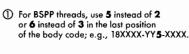
Palm and push buttons are furnished in white. Also available at no additional charge in black, blue, green, red or yellow. Please specify color.

substitute 2 for 0 in second digit, i.e., -221.

manently attached. When ordering an operator only, you must specify the opera-tor and spool assembly #10268 for use with a single pressure valve or #10269 for use with a dual pressure valve. * To order Lever Operators with boot,

BODY SPOOL TYPE **BODY TYPE** Individual Ext. Pilot 2-POSITION (1/4" Ports Only) Single pressure: Port 1 = InletStacking: Common Ports Ports 4 & 5=Exhaust 1, 4, and 5 (1/4" or 3/8' Cylinder Ports) or vacuum Dual Pressure: Stacking: Common Port Ports 4 & 5=Inlet 1 & Individual Ports 4 Port 1 = Exhaust or and 5 (1/4" Cylinder vacuum Ports Only) Stacking: Comman Ports 3-POSITION † † 1, 4, and 5 with Indi-Closed Center vidual Integral Exhaust All Ports Blocked Flaw Controls (1/4" or Port 1 = Inlet. 3/8" Cylinder Ports) Ports 4 & 5 = Exhaust Open Center Inlet Blocked Cvl. Ports to Exhaust Port 1 = Inlet. Ports 4 & 5 = Exhaust Pressure Center Dual Pressure Ports 4 & 5=Inlets Port 1 = Exhaust Pressure Center Single Pressure Port 1=Inlet Ports 4 & 5 = Exhaust

ttuse 3-Position pilot operator 0304 only, for both operators.



ACCESSORIES

MANIFOLD END PLATE KIT—For each gang one kit is required. Style B provides for mounting down through the end plate block, permitting valves to be positioned with cylinder ports either up or down— Style A mounting requires cylinder ports to be positioned down.

ISOLATORS—Sections of a gang may be isolated permitting different pressures to be fed to either end of the gang.

DUAL INLET PRESSURE BLOCK—Available for 3 common port stacks or 1 common port stacks, these blocks provide 2 additional inlet ports. With the use of multiple blocks an unlimited number of pressures within a stack are available.

FLOW CONTROL & MUFFLER—1/4" unit for installing in individual exhaust ports.

TO ORDER—Select the appropriate part number from the tables below.

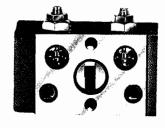
MANIFOLD END PLATE KITS (%"NPTF)				
TYPE EXTERNAL PILOT				
	1 thru 16 Valves	17 Valves or More		
Style A	M-08001-03-01	M-00005-03-01		
Style B	M-18001-02-01	N/A		

ISOLATORS		
DESCRIPTION	PART NO.	
For Port #1	N-08001	
For Ports 4 & 5	N-08002	
For Pilot Ports	28280	

DUAL INLET PRESS	URE BLOCK
DESCRIPTION	PART NO. ②
3 Common Ports or 1 Common Port	M-08003

FLOW CONTROL & MU	FFLER
AVAILABLE FOR:	PART NO.
All Models with Individual 1/4" Exhaust Ports(NPTF only)	10951

For BSPP threads, add letter "P" at the end of the part No. e.g., M-08001-03-01P.



PORT SIZE

1/4" ①

NPTF

3/8" ①

NPTF

NOTE: Parts #2 & 3 are

ports.

always cylinde

1800 SERIES—SUPPLEMENTAL TECHNICAL DATA

ANSI TYPE SYMBOLS

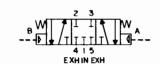
SGL. PRESSURE

DUAL PRESSURE

3-POS. C.C.

3-POS. O.C.

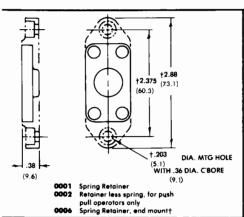


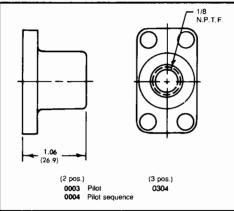


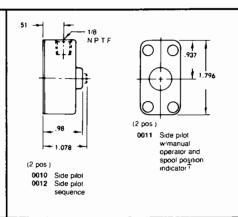


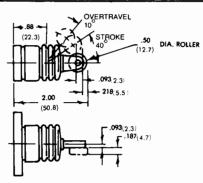


VALVE OPERATORS

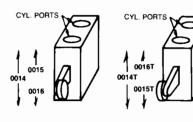








Operators 0013 thru 0018 cam operators



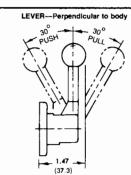


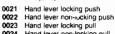


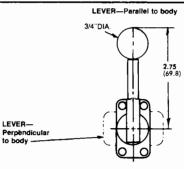
C22

DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

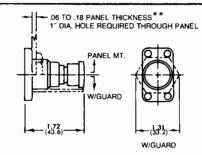
Lever cam operators 0013 and 0014 operate the valve in either direction. Operators 0015 thru 0018 are averriding cams. Arrows indicate direction of operation. Operator numbers apply regardless of whether operator is nearest cylinder Part 2 or 3. Letter 1 immediately after operator indicates that operator is turned through 180°.







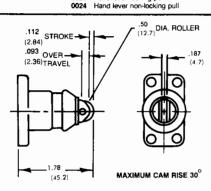
0025 Hand lever locking push 0026 Hand lever non-locking push 0027 Hand lever locking pull 0028 Hand lever non-locking pull



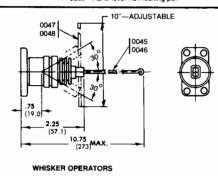
0031 Push button

**0032 Push button panel mount
0033 Push button with guard
0034 Push pull

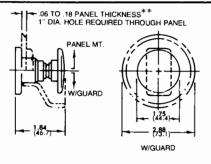
**0035 Push pull panel mount



0111 Straight cam parallel to body 0112 Straight cam perpendicular to body



0045 Vertical—Operation perpendicular to body 0046 Vertical—Operation parallel to body 0047 Horizontal—Operation perpendicular to body 0048 Horizontal—Operation parallel to body



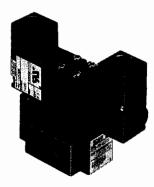
0036	Palm button
** 0037	Palm button panel mount
0038	Palm button with guard
0039	Palm button push pull

MAC 900 SERIES

Patents and Patents Pending

Photographs illustrate model numbers in white.





4-WAY, SOLENOID PILOT AND REMOTE AIR PILOT, INDIVIDUAL INLINE OR STACKING BODY

1/8" & 1/4" (3/8" STACKING) PORTS - C, UP TO 1.4

PRESSURE RANGE: VACUUM TO 150 PSI (REMOTE AIR)

10 PSI TO 150 PSI (DOUBLE SOLENOID)

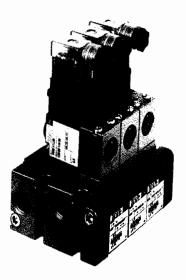
25 PSI TO 150 PSI (SINGLE SOLENOID)

SOLENOID - INDIVIDUAL INLINE

	SINGLE OPERATOR	DOUBLE OPERATOR	
BODY STYLE & PORT SIZE NPTF	B B A B A B A B A B A B A B A B A B A B		
1/8" Individual Body	911B-PM-111BA	921B-PM-111BA	
1/4" Individual Body	912B-PM-111BA	922B-PM-111CA	

Valve codes shown are for 120/60, 110/50 coils, non-locking recessed manual operators. Electrical enclosure as shown in photographs.

C23





SOLENOID - STACKING BODY

	SINGLE OPERATOR	DOUBLE OPERATOR	
BODY STYLE & PORT SIZE NPTF	EXH IN	EXH IN	
⅓" Stacking Body *	913B-PM-593JB	923B-PM-593JB	
1/4" Stacking Body *	914B-PM-593JB	924B-PM-593JB	
3/4" Stacking Body *	919B-PM-593JB	Single Operator Only	

Valve codes shown are for 24 volt DC (2.5 watt) coils, non-locking extended manual operators and rectangular external plug-in electrical connections.

REMOTE AIR OPERATED - INLINE & STACKING

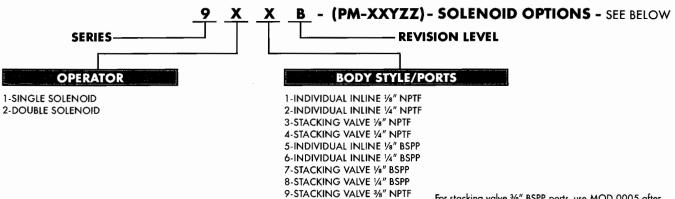
	SINGLE OPERATOR	DOUBLE OPERATOR
BODY STYLE & PORT SIZE NPTF	B A A A A A A A A A A A A A A A A A A A	B A A A A A A A A
⅓″ Individual Body	911B-RA	921B-RA
1/4" Individual Body	912B-RA	922B-RA
1/8" Stacking Body *	913B-RA	923B-RA
1/4" Stacking Body *	914B-RA	924B-RA

Valve codes shown are for remote air operators. A remote air pilot, pilot operator is also available. Valves supplied with these operators only require a minimum pilot pressure of 20 p.s.i. regardless of main valve pressure (see page **T-4**).

^{*} One End Plate Kit required per gang. To order see opposite page.



BODY OPTIONS



For stacking valve 3/4" BSPP ports, use MOD 0005 after complete valve code 919B-PM-111BA MOD 0005.



ı				
хх	PILOT TYPE	XX AC VOLTAGE	хх	DC VOLTAGE
PM	Sol. w/Muffled Exh.	11 120/60, 110/50	50	24 VDC (6W)
PP	Sol. w/Piped Exh.	12 240/60, 220/50	55	12 VDC (6W)
RA	Remote Air	22 24/50-60	57	12 VDC (2.5W)
	selected XX, Y & ZZ	39 240/50	59	24 VDC (2.5W)
•	3-RA		60	12 VDC (8.5W)
			61	24 VDC (8.5W)

Other AC & DC Voltages Available. DC wattages from 1.0 to 17 watts. See page **1-2** or cansult factory.

Lights are available for 120/60, 110/50 or 240/60, 220/50 or 24 VDC with JIC enclosure (AA) or MA common conduit.

Y	MANUAL OPERATOR INDICATOR LIGHTS
0	No Operator
ī	Non-Locking Recessed (Std.)
2	Locking Recessed
3	Non-Locking Extended
4	Locking Extended
5	No Operator ①
6	Non-Locking Recessed w/Lgt.
7	Locking Recessed w/Lgt.
8	Non-Locking Extended w/Lgt.
9	Locking Extended w/Lgt.

ENCLOSURE
JIC w/½" NPS Conduit
Grommet
Conduit ½" NPS
Conduit ½" NPT (CSA Threads)
Conduit ¾" NPS (Stacking)
Com. Conduit 1" NPS Requires (1) M-01002-01 conduit plate per stack

External Plug-Ins available. See page **T-3** ar cansult factory.

MODIFICATIONS AND ACCESSORIES

PART NO. DESCRIPTION M-09001-01 Manifald End Plate Kit (3%" NPTF) M-09001-01P Manifald End Plate Kit (3%" BSPP) N-09002 Isalatar Plate Kit - Inlet & Exhaust N-09003 Isalator Plate Kit - Exhaust only N-09004A Isolator Plate Kit - Inlet only

MANIFOLD ACCESSORIES

MANIFOLD END PLATE KIT - For each gang one kit is required. **ISOLATORS** - Sections of a gang may be isolated permitting different pressures to be fed to either end of the gang.

TO ORDER - Select the appropriate part number from the adjacent table.

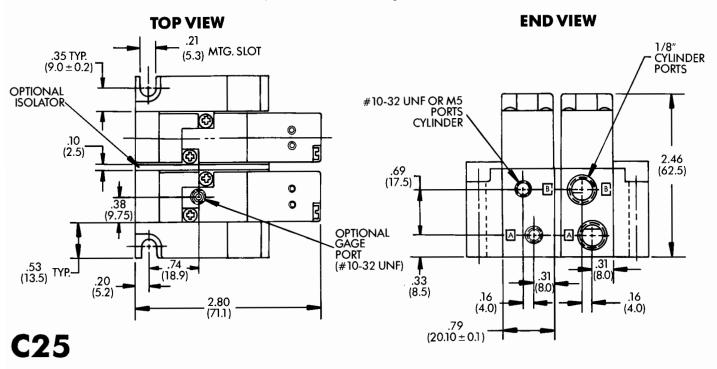
MODIFICATIONS

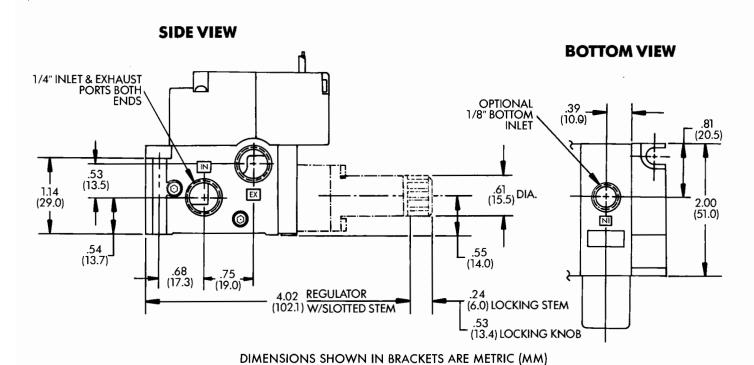
CLASS F - High Temperature AC and DC coil option.

TO ORDER - Add the appropriate modification number after the valve model number, **EXAMPLE:** 911B-PM-111BA MOD CLSF For additional modifications, see Technical Section.

MANIFOLD BASE MODEL

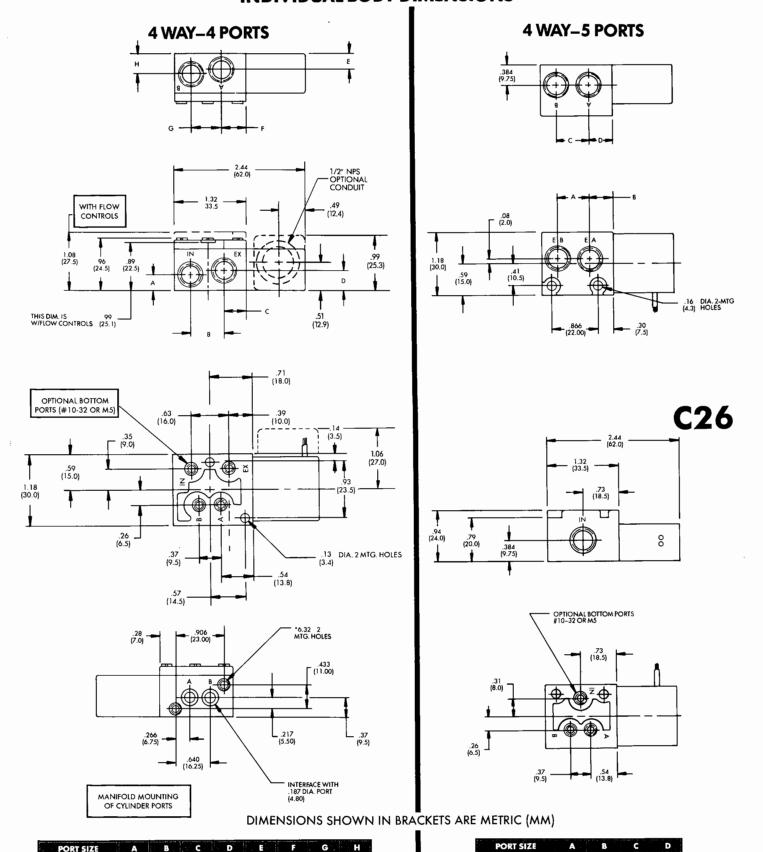
See page C26 for additional regulator dimensions.





DIMENSIONS 45 SERIES

INDIVIDUAL BODY DIMENSIONS



Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.
Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

.590 (15.0)

.748 (19.0)

1/8" NPTF

#10-32 M5

.433 (11.0)

.356 (9.05)

.59 (15.0)

.43 (11.0)

.435 (11.05)

.51 (13.0)

PORT SIZE

1/8" NPTF

#10-32 M5

.30

.38

.63

(16.0)

.55 (14.0)

Ç .39 (10.0)

.**41** (10.5)

.30 (7.5)

.38 (9.75)

(9.5)

.38 (9.75)

.45 (11.5)

.51 (13.0)

.57 (14.5)

.43 (11.0)

(9.5)

.38 (9.75)

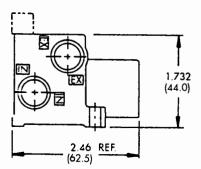
DIMENSIONS 45 SERIES

STACKING BODY DIMENSIONS

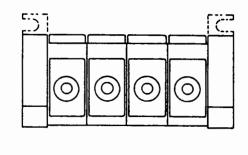
.98 TYPICAL VALVE STACK (25.0) .28 1/4" INLET & EXHAUST (7.0).276 (7.0 ± 0.2) TYP. .209 MOUNTING SLOT (5.3) 4 PLACES \bullet (5.3)2.46 62.5 1.535 .728 N .610 (39.0).392 (18.5)(9.95) .630 (16.0).314 .374 (8.0).630 (9.5)(7.5)(16.0).472 .756 (12.0 ± 0.2) TYP. .669 (4.0) (19.20)(17.0)(± 0.1) TYP. 1/8" 1.929 CYLINDER PORTS (49.0)#10-32 OR M5 2.126 CYLINDER PORTS

MOUNTING FOR CYLINDER PORTS TO THE SIDE

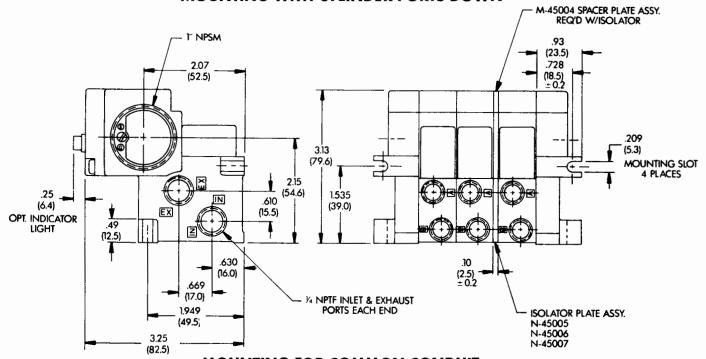
C27



(54.0)



MOUNTING WITH CYLINDER PORTS DOWN

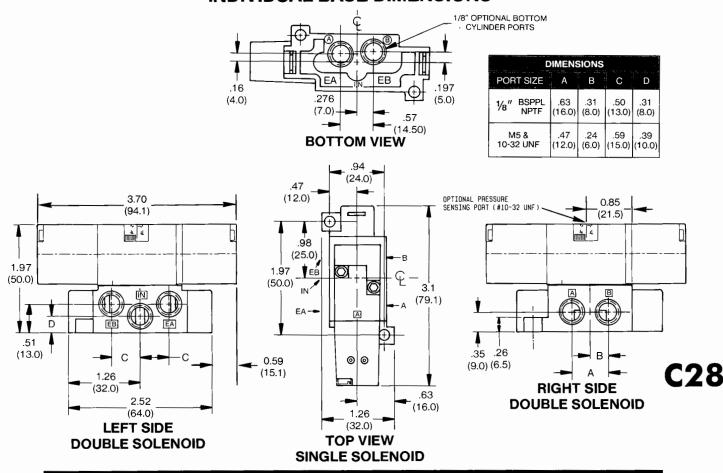


MOUNTING FOR COMMON CONDUIT

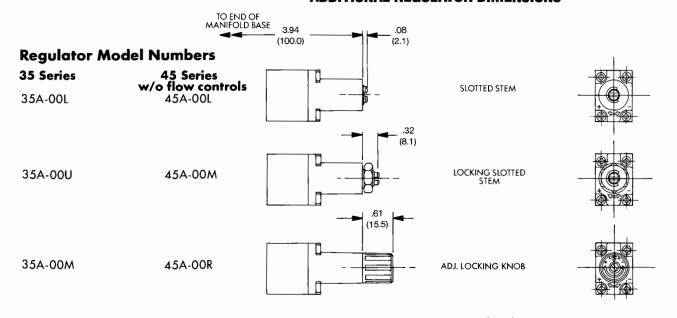
DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

45 SERIES

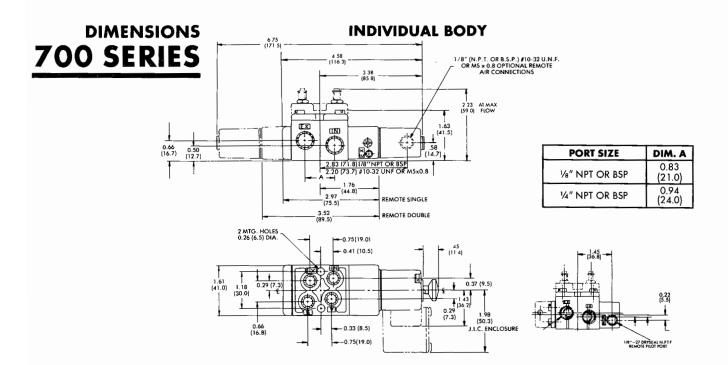
INDIVIDUAL BASE DIMENSIONS



ADDITIONAL REGULATOR DIMENSIONS



DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

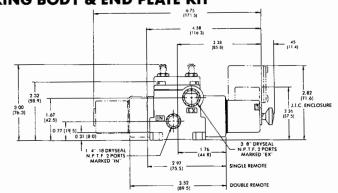


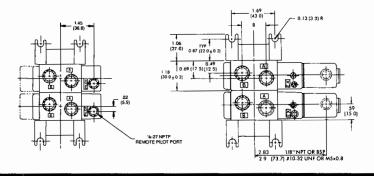
STACKING BODY & END PLATE KIT

PORT SIZE DIM. B

%" NPT OR BSP 0.83
(21.0)

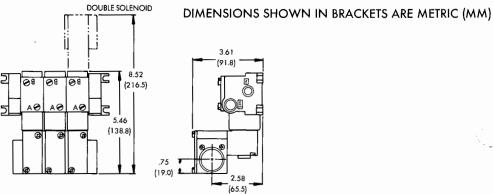
1/4" NPT OR BSP 0.94
(24.0)





COMMON CONDUIT MODELS

GOLD FASTENERS ARE METRIC.

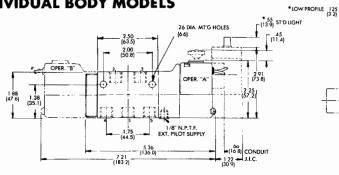


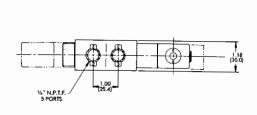
Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

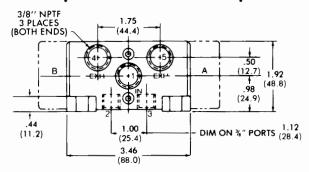
DIMENSIONS 800 & 1800 SERIES

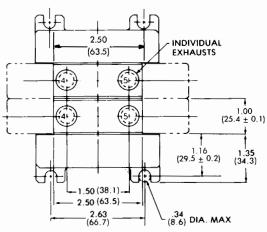
INDIVIDUAL BODY MODELS





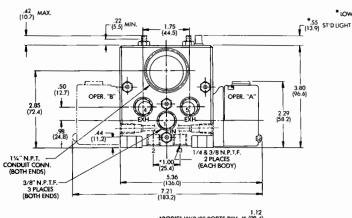
STACKING (STYLE A END PLATE KIT)

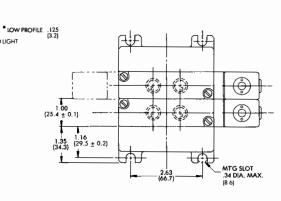




C30

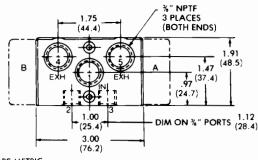
STACKING VALVES — COMMON CONDUIT





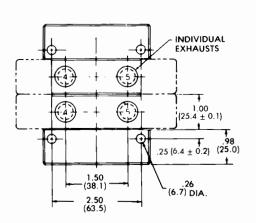
*BODIES W/3/8" PORTS DIM. IS (28.4)

STACKING (STYLE B END PLATE KIT)



GOLD FASTENERS ARE METRIC.

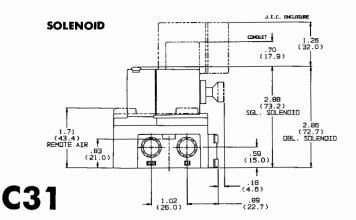
DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

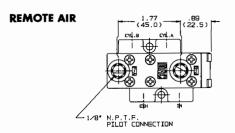


900 SERIES

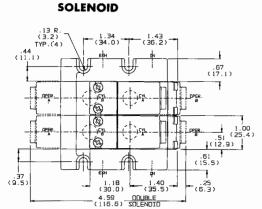
INDIVIDUAL VALVES

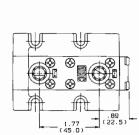
SOLENOID .98 (25.0) .33 (8.5) .20 (5.2) DIA. MTG. HDLES (2) PILUT EXHAUST DPER.A .1.38 .1.77 .2.98 .3.3.40 .2.98 .3.3.40 .3.5.0) (45.0)



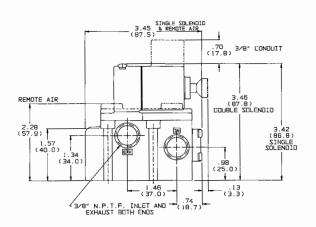


STACKING VALVES

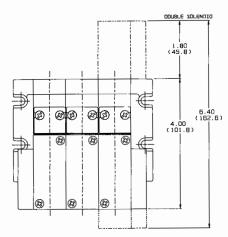


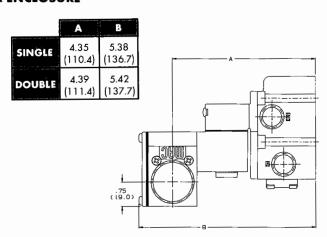


REMOTE AIR



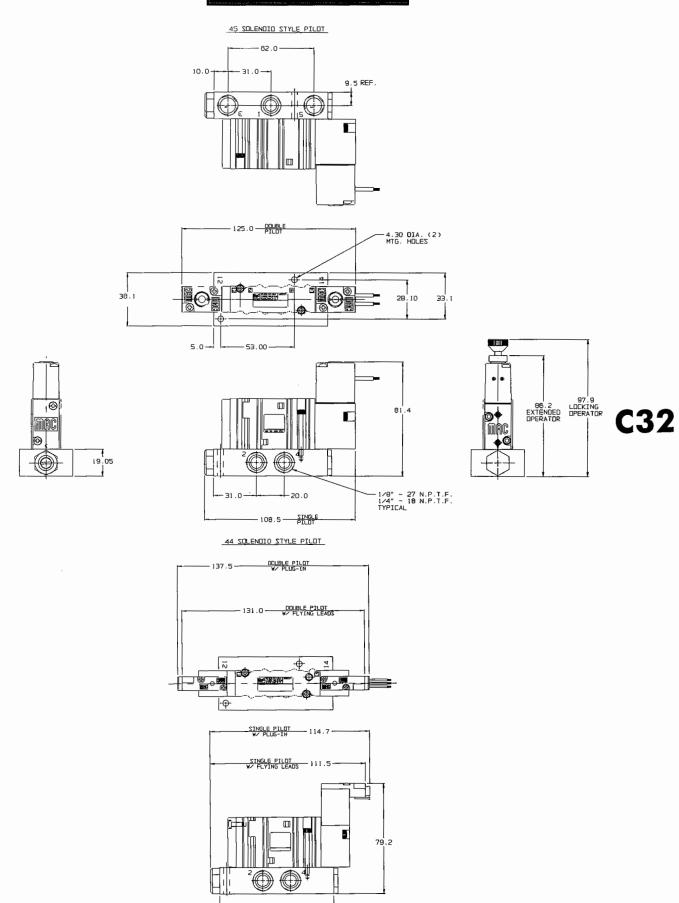
900 SERIES STACKING BODY MA ENCLOSURE





DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

400 SERIES INDIVIDUAL BASE



Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

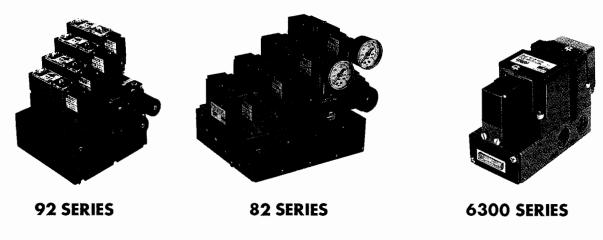


LARGE 4 WAY SOLENOID, AIR & MECHANICALLY OPERATED VALVES

All MAC large 4 way valves are solenoid pilot operated. The pilot of these valves is a balanced poppet, the main valve a balanced spool. Additionally, the pilot for the 92 series is a 4 way pilot that maximizes the shifting forces in both directions. These valves can be divided into two groups:

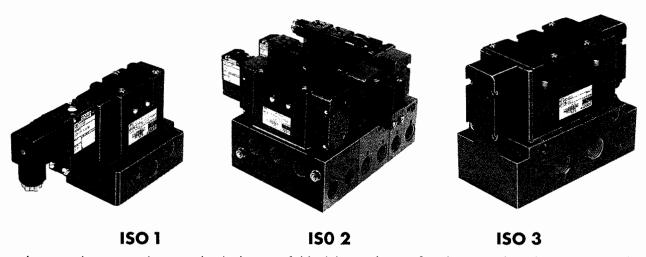
- Plug-In valves
- ISO valves

1. PLUG-IN VALVES (Cv 0.8 to 15.9) (92, 82, 6200, 6300, 6500, 6600, 1300)



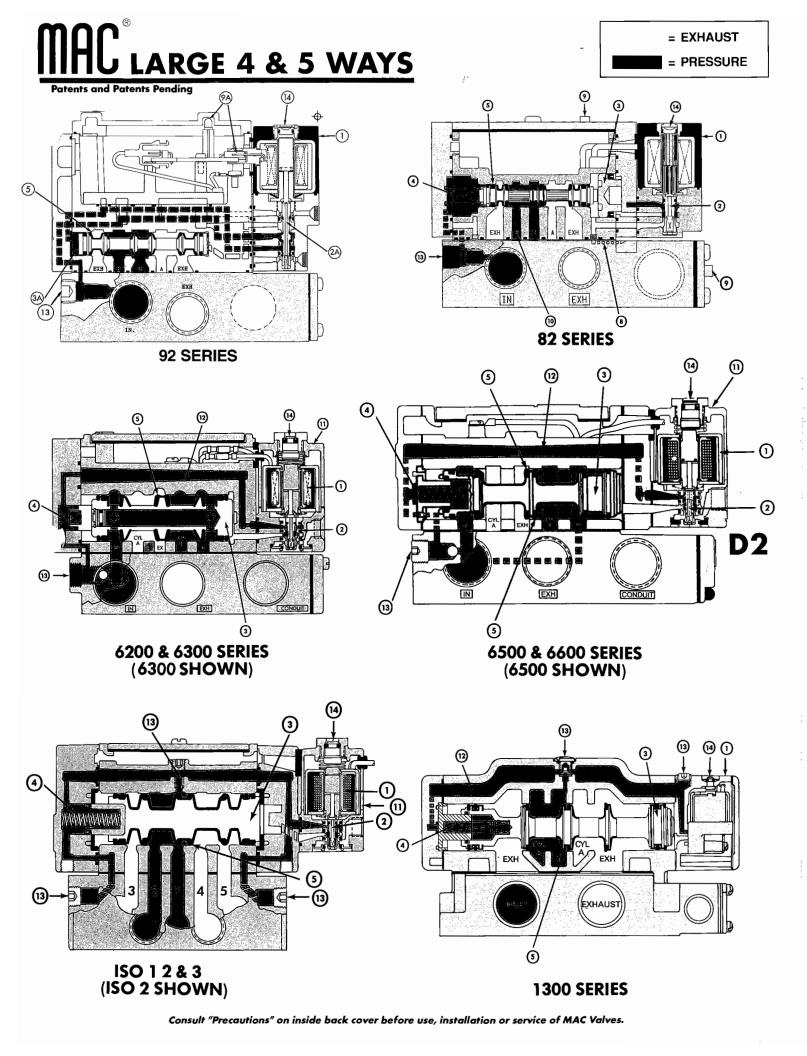
These valves are mounted on an individual or manifold sub base. All the electrical wiring and the pneumatic piping is made in the base which is provided with a large integral junction box. Indicator lights can be supplied in the conduit plate or on the tortof the valve. Optional terminal strips are also available on the conduit plate for both the individual and manifold base.

2. ISO VALVES (ISO STANDARD 5599/1) (Cv 1.4 to 6.3) ISO 1, ISO 2, ISO 3.



These valves are also mounted on an individual or manifold sub base. The interface between the valve and base is designed to ISO standard 5599/1. Electrical connections are usually made through external plug-in connections to DIN standard 43650. Grommet or conduit type connections (with or without J.I.C. wiring box) are also available. Pilot valves can also be supplied to the European C.N.O.M.O. Standard interface.

Both groups of valves (with the exception of the 82 series and 92 series) use the same 100 series solenoid assembly which can be removed and replaced by either mechanical or remote air pilot, pilot operators. Non plug-in bases can also be provided for the first group. The 82 series is also available with a remote air pilot, pilot operator.



Patents and Patents Pending

OPERATIONAL BENEFITS

- Unique patented MACSOLENOID® for fastest possible response times.
- Balanced poppet pilot valve for high flow, precise repeatability and consistent operation.
- 2A. Balanced poppet 4-way pilot valve provides maximum shifting forces, precise repeatability, and consistent operation.
- Large spool or piston for maximum shifting forces even at minimum operating pressure.
- 3A. Air only return. Optional memory spring is also available.
- Air/spring return for consistent shifting on single solenoid valves.
- MAC spool and bore combination for wiping away contamination, eliminating sticking and for use on lubricated or nonlubricated service.
- Patented, virtually burnout proof AC solenoid.
- Optional low wattage DC solenoids down to 1.8 W (82 series) or 1.0 W (92, 6000, 1300 & ISO series)
- Plug-in design of valves, bases, flow controls and regulators for modular assembly and ease of maintenance.
- Indicator lights in valve body, base or external plug-in connector.
- 9A. Plug-in solenoid and optional circuit board to allow for lights, diodes, MOV's and AC rectification.
- Very high flow in a very compact package.
- 11. NEMA 4 solenoid enclosure (6000 & ISO series)
- A large checked accumulator for consistent shifting on single and double solenoid models (6300, 6500, 6600, 1300 &ISO 3) Internal or external pilot operation: manifolds supplied with optional common external pilot.
- Non-locking manual operators standard on all valves; other types of manual operators available.
- Add-on style circuit bar® manifolds provide for additional stations to be added to existing manifold.

AVAILABILITY TABLE

SERIES FEATURES	92	82	6200	6300	6500	6600	1300	ISO 1	ISO 2	ISO 3
SGL DBL SOL 2 POSN. ————————————————————————————————————	-/- -//- -//- -//-	- / - - / - - / - - / - - / -	/	/ / / / X	//	/ / / / / / / / -	// / X X	///	/ / / / /	/////////

LEGEND:

- = available on 6300 manifold only.
- = available on 6300 manifold only with sandwich pressure regulator.
- / = available
- X = not available

PORTING - INDIVIDUAL BASES

PORT SIZE	92	82	6200	6300	6500	6600	1300	ISO 1	ISO 2	ISO 3
1/8" ————	/•	/•	/-	/_				/_		
3/8"	-	_ / • _	/•	/• — /• —	/•			/• —	/• —	,
3/4" ————				_ / _	/•	/ •	_ /• _		<u></u>	/• — /• —
1 1/4"						/ / -	_ / _			
1 1/2"							<u> </u>			

LEGEND:

/ = side ports

bottom ports available (no side ports)

PORTING — MANIFOLD BASES

PORT SIZE	92	82	6200	6300	6500	6600	ISO 1	ISO 2
1/4"	/• — /• —	/•+ /•	/• - /• +	/• — /• —	/• -		/•+- /•+-	/•+— /•+
3/4" 1" 1 1/4"				7.01	/•+	/• — /• — /+ —		

LEGEND:

/ = side ports

- = bottom cylinder ports
- + = bottom inlet (92 series consult factory)



Patents and Patents Pending

OPERATING SPECIFICATIONS

FLUIDS: Air or inert gases

LUBRICATION: Not required, but if used, a medium aniline point (180° F to 210° F) oil is recommended. SAFE OPERATING AMBIENT TEMPERATURE RANGE: 0°F - 120°F (-18° C to 50° C)

For U.L. & CSA purposes 104° F (40° C) max.

PRESSURE RANGE (PSI)

(pressures shown are maximum and minimum safe working pressures)

	SOLENOID P	ILOT OPERATED	REMOTE AIR	R PILOT SIGNAL
MAIN VALVE	SINGLE	DOUBLE	SINGLE	DOUBLE
VACUUM - 150 82, 6000, 1300 & ISO SERIES	25 – 150	10 – 150	25 – 150	10 – 150
VACUUM - 120 (92 SERIES)	20 – 120	20 – 120	N/A	N/A

- 1. Minimum pilot pressure for 3 position valves is 25 PSI except for the 92 series which is 35 PSI. Minimum pilot pressure for memory spring (92 series) is 30 PSI.
- Remote air signal pressure must be at least equal to main valve pressure.
- 3. External pilot pressure for air/spring must be equal to or less than remote pilot signal pressure.

ELECTRICAL	92 SERIES	82 SERIES	6000, 1300 and ISO SERIES
120/60 INRUSH	7.6 VOLT-AMPS	10.9 VOLT-AMPS	14.8 VOLT-AMPS
	.063 AMPS	0.09 AMPS	0.12 AMPS
120/60 HOLDING	4.8 VOLT AMPS	7. 7 VOLT-AMPS	10.9 VOLT-AMPS
	.04 AMPS	0.06 AMPS	0.09 AMPS
24 VOLT D.C.	12.7 to 1.0W	12.7 to 1.8 W	17.1 to 1.0 W

ABOVE COILS: General purpose Class A continuous duty, encapsulated. Class F coils available on request. COIL LEADS: #18 AWG X 18" (6000, 1300, ISO). Other lead lengths available on request.

FLOW: Cv (average all ports: individual base & manifold)

		92	82	6200	6300	6500	6600	1300	ISO 1	150 2	ISO 3
			- 0.9 -		2.0				1.6		
2	3/8" —	— 1.2 —	<u> </u>	1.6	2.6	— 4.5 — — 5.0 —			1.6 —	3.0 —	63
POSITION	3/4"						9.0	11.5 — 13.7 —	1	3.0	6.3
	1 1/4" — 1 1/2" —						7.0	15.4 —			
	1/8" —	- 0.8 -	- 0.9 -								
					1.7				1.4	2.7 —	
3 POSITION	1/2" — 3/4" —				2.4	2.9 3.0	7.0	10.8 —	1	2.7 —	5.8 — 5.8 —
	1" — 1 1/4" —						7.2	12.8 — 14.3 —			
	1 1/2" —							14.3 —			

SPECIAL APPLICATION INSTRUCTIONS

On all valves except ISO, energizing the "A" operator (solenoid or remote air) supplies pressure to Cylinder Port "A" and energizing the "B" operator supplies pressure to Cylinder Port "B". On ISO valves energizing the "14" operator connects the inlet port #1 to cylinder port #4 and energizing the "12" operator connects the inlet port #1 to cylinder port #2.

For the following applications, additional piping considerations are required.

model and connect the higher pressure to the Inlet Port and the lower pressure to the Exhaust Port.

EXTERNAL PILOT APPLICATIONS (82, 6000, 1300, ISO) — An External Pilot Supply is only required when the main valve is less than 25 psi on single operators (solenoid or remote air) or 3 position valves and 10 psi on 2 position double operated valves. Pipe the External Pilot supply to the External Pilot Port supplied in the valve base or manifold.

EXTERNAL PILOT APPLICATIONS (92 SERIES) - Required for all solenoid pilot operated models when main valve pressures are below 20 psi on single solenoid or double solenoid 2-position models. For memory spring, external pilot is required when main valve pressures are below 30 psi. For 3-position, external pilot is required when main valve pressures are below 35 psi.

VACUUM APPLICATIONS - (2-Pos. Valves Only) - Use an External Pilot model as described above and also connect the vacuum source to the Exhaust Port and leave the Inlet Port open to atmosphere. (The inlet port may also be connected to a pressure source to provide a selector application (vacuum/pressure). SELECTOR APPLICATIONS - Use an External Pilot model as described above if both pressures are below the minimum, otherwise use an Internal Pilot

SELECTOR MANIFOLDS - Pressure selector manifolds with sandwich type regulators are available for 82, 6300 and 6500 Series. Either of two pressures from this manifold is supplied to connecting manifolds. See schematic in each series section. For the 92 series a special circuit bar[®] is required—consult factory.



4-WAY SOLENOID PILOT OPERATED (4-WAY PILOT),
PLUG-IN SUB-BASE MOUNTED
1/8", 1/4" and 3/8", C_v UP TO 1.2
Pressure Range vacuum to 120 PSI

92 SERIES - SOLENOID PILOT OPERATED VALVES

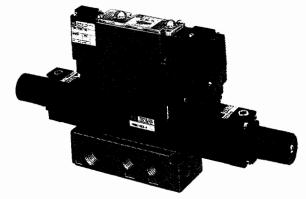
SINGLE SOLENOID 2-POSITION	DOUBLE SOLENOID 2-POSITION	SINGLE PRESSURE	DBL. SOL. 3-POS. CLOSED CENTER	DBL. SOL. 3-POS. OPEN CENTER	DBL. SOL. 3-POS. PRESSURE CENTER
B S A A A A	Crt. B A A	INTERNAL PILOT NPTF PORTS	B A D A D EN	B A B A	E A B A INEX
92B-AAF-000-DM-DDAP-1DM	92B-BAF-000-DM-DDAP-1DM	Valve Only	92B-EAF-000-DM-DDAP-1DM	92B-FAF-000-DM-DDAP-1DM	92B-GAF-000-DM-DDAP-1DM
92B-AAF-AAA-DM-DDAP-1DM	92B-BAF-AAA-DM-DDAP-1DM	1/8" Base	92B-EAF-AAA-DM-DDAP-1DM	92B-FAF-AAA-DM-DDAP-1DM	92B-GAF-AAA-DM-DDAP-1DM
92B-AAF-BAA-DM-DDAP-1DM	92B-BAF-BAA-DM-DDAP-1DM	1/4" Base	92B-EAF-BAA-DM-DDAP-1DM	92B-FAF-BAA-DM-DDAP-1DM	92B-GAF-BAA-DM-DDAP-1DM
92B-AAF-CAA-DM-DDAP-1DM	92B-BAF-CAA-DM-DDAP-1DM	3/8" Base	92B-EAF-CAA-DM-DDAP-1DM	92B-FAF-CAA-DM-DDAP-1DM	92B-GAF-CAA-DM-DDAP-1DM
92B-AAF-BKA-DM-DDAP-1DM	928-BAF-BKA-DM-DDAP-1DM	1/4" Manifold	92B-EAF-BKA-DM-DDAP-1DM	92B-FAF-BKA-DM-DDAP-1DM	92B-GAF-BKA DM-DDAP-1DM
92B-AAF-CKA-DM-DDAP-1DM	92B-BAF-CKA-DM-DDAP-1DM	3/8" Manifold	92B-EAF-CKA-DM-DDAP-1DM	92B-FAF-CKA-DM-DDAP-1DM	92B-GAF-CKA-DM-DDAP-1DM

- Valve codes shown are for 24 VDC (5.4w), with suppression diode and light located in body of valve.
- Cades also indicate a non-locking recessed manual operator with a muffled pilot.
- Valve codes shown are for single pressure internal pilot with NPTF ports.

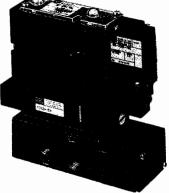




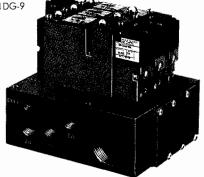
D5



92B-DAB-CAA-DM-DJAP-1DG-9 PR92B-KEAA-9



92B-AAB-CAA-DM-DJAP-1DG-9 FC92B-AA-9



2 X 92B-AAB-CKA-DM-DJAP-1DG 1 X 92B-BAB-CKA-DM-DJAP-1DG 1 X M-92004-01

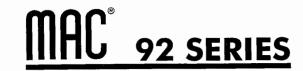
HOW TO ORDER 92 SERIES FLOW CONTROL MODULE*

FC 92B-AA	PLUG-IN FLOW CONTROL ASSY. SGL.SOL.
FC 92B-BA	PLUG-IN FLOW CONTROL ASSY. DBL. SOL.
FC 92B-CA	NON PLUG-IN FLOW CONTROL ASSY.

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.)

^{*} 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., FC92B-AA-9. The flow control model numbers should follow the valve model number on which is to be installed.

FOR CIRCUIT BAR® VERSION OF THIS SERIES, SEE SECTION E.



HOW TO ORDER



Valve Function

- Base only
- Sgl. oper. sgl-press. В Dbl. oper. sql-press.
- Sgl. oper. duol press.
- Dbl. oper. dual press.
- 3 pos. closed center
- 3 pos. open center G - 3 pos. sgl-press. press, center
- Spools With Memory Spring -
- Sgl. oper. sgl-press. Dbl. oper. sgl-press. М --
- Sgl. oper. dual press. Dbl. oper. dual press.

- Base only
- Plug-in st'd exh. Non plug-in

Body Type & Exhaust Options

- w/st'd exh.
- Plug-in w/pilot exh, to main exh.
- Non plug-in w/pilot exh. to main exh.
- * Use with body electrical option "A" only
- Must use "DU" pilot body. Main valve exhaust cannot be restricted. Available on single pressure valve only.

Body Electrical Options

- 0 Base only
- No light in top
- В W/light
- W/supp. blocking diode & light
- W/M,O.V. & light
- K W/A.C. rectification & light

Port Size & Thread Type

- 0 Valve only 1/8 NPTF Α
- 1/4 NPTF В _ 3/8 NPTF
- 1/8 BSPPL Ε 1/4 BSPPL
- 3/8 BSPPL G -
- 1/8 BSPTR H - 1/4 BSPTR 3/8 BSPTR

0 - Valve only – Individual Base –

Indiv. Base

& Manifold

Configurations

- A Side ports
- Bottom ports (1/8" only)
- Side & Bottom ports (1/8")
- Side IN & EXH **Bottom Cylinders** (1/8" only)

- Manifold Base -

J - Side cyl. ports K - Bottom cyl. ports only (no side cyls.)

Note: Manifold bases available in 1/4" & 3/8". Must be internal pilot models

- Valve only 0

Plug-In Internal Pilot Models -

Int/Ext Pilot

- No light in base
- W/sgl. light in
- base
- C W/dbl. light in base
- Plug-In External Pilot Models -
- No light in base W/sgl. light in
- base
 - W/dbl. light in base

Non Plug-in -G - Internal pilot

- H External pilot
- If lights ore in top body cover, use option "A" or

D6

PILOT VALVE OPTIONS: XX - DXX

Pilot Style

DM - Muffled

Exhaust

* Mad. clsf. anly.

wire is required

Voltage

- JA 120/60, 110/50 (2.9 w) JB - 240/60, 220/50 (2.9 w)
- Piped - 24/60, 24/50 (3.7 w) Exhaust JD - 100/50/60, 110/60(3.9 w)
- DU Universal JE - 220/60(3.4 w)Pilat, Pilot exhaust JF - 240/50 (2.8 w)
 - aut main exhaust. IG - 200/60, 200/50 (3.9 w) DA - 24 VDC (5.4 w)
 - DB 12 VDC (5.4 w)
 - DC- 12 VDC (7.5 w)
 - DD 24 VDC (7.3 w)
 - *DE 12 VDC (12.7 w)
 - *DF 24 VDC (12.7 w) FA - 12 VDC (1.8 w)
- Nate: Far solenoids 30 volts FB - 24 VDC (1.8 w)or obove, a ground FE - 12 VDC (2.4 w)
 - FF 24 VDC (2.4 w)

- Plug-in Valve/Base -

Lead Wire Length

- P Plug-in
- 1 18" 2 - 24''
- 3 36"
- 4 48''5 - 72"
- 6 96"

- Non Plug-In Valve Base -

- 0 Na wires
- A 18''B - 24''
- C 36''D - 48" E - 72''

F - 96"

••J - 6"

••Lead wire length for external plug-in

electrical cannectian.

connectars must be "J".

Used only w/BM, BN, BP, BG, BH & BJ

MANIFOLD ACCESSORIES

MANIFOLD END PLATE KITS - For each gang, one kit is required.

ISOLATORS - Sections of a gang may be isolated permitting different pressures to be fed to either end of the gang.

TO ORDER - Select the appropriate part number from the table.

PART NO.	DESCRIPTION
M-92004-01	(NPTF) Manifold End Plate Kit - Internal Pilot
M-92004-01P	(BSPP) Manifold End Plate Kit - Internal Pilot
M-92004-02	(NPTF) Manifold End Plate Kit - External Pilot
M-92004-02P	(BSPP) Manifold End Plate Kit - External Pilot
28413	Inlet and Exhaust Isolator Disc
M-92002	Blank Station Cover Plate
M-92002-01	Blank Station Cover Plate Single Pressure Inlet to "B" Port
M-92002-02	Blank Station Cover Plate Dual Pressure Inlet to "A" and "B" Ports

Electrical Connection

- Non plug-In Valve/Base -0 - No operator
- Recessed non-locking oper.

Manual Operator

- Recessed lacking oper.
- Extended non-locking oper.
- Extended locking aper.

BA Grommet

- Grommet w/diode
- BL Grommet w/M.O.V.
- BM Flying leads
- BN Flying leads w/diade
- BP Flying leads w/M.O.V.
- Flying leads w/ground
- BH Flying leads w/diode & ground
- BJ Flying leads w/M.O.V. & graund
- CA Canduit 1/2" NPS
- CM Metal canduit 1/2" NPS
- CN Metal conduit w/grd. 1/2" NPS

- Plug-In Valve/Base -

- DM Plug-in
- DN Plug-in w/diade
- DP Plug-in w/M.O.V.
- Plug-in w/ground
- DH Plug-in w/diade & ground
- DJ Plug-in w/M.O.V. & ground

- External Plug-In Valve -

- IB. Rect. plug-in
- JD Rect. plug-in w/light
- Rect. male only IM
- KA Mini plug-in
- *KB Mini plug-in w/diode
- *****KC - Mini plug-in w/MO.V.
- *KD Mini plug-in w/light
- Mini plug-in w/light & diade
- *****KF - Mini plug-in w/light & M.O.V.
- KG Mini plug-in w/led & diode
- ΚI - Mini plug-in male only - Mini plug-in male only w/diode
- Mini plug-in male only w/M.O.V.
- * M.O.V., diode & light are in female connector in these options.

MAC 92 SERIES

HOW TO ORDER SANDWICH REGULATORS

PR92B - X X X X - X

ADJUSTMENT METHOD

Manual Adjust W/Screw Driver Slot -

- A Plug-in sgl. solenoid
- B Plug-in dbl. solenoid
- C Non plug-in
- D Regulator only

- Air Pilot Adjust -

- E Plug-in sgl. solenoid
- F Plug-in dbl. solenoid
- G Non plug-in
- H Regulator only

Manual Adjust W/Knob –

- J Plug-in sgl. solenoid
- K Plug-in dbl. solenoid
- L Non plug-in
- M Regulator only

Manual Adjust W/Scr. Driver Slot W/Lock Nut –

- N Plug-in sgl. solenoid
- P Plug-in dbl. solenoid
- R Non plug-in
- S Regulator only

CONFIGURATION

- 0 Regulator only
- A Regulotor "A" end single pressure
- B Regulator "B" end single pressure
- C Regulator "A" end
 ② with by-pass end
 plate "B" end
- D Regulator "B" end
- ② with by-pass end plate "A" end
- E − Regulators both ends
 ②
- P Select to "A" port 3 regulator A end
- by-pass B end R — Select ta "B" port
- 3 regulator B end by-pass A end
- S Select to "A" port
- 3 regulators both ends A end low pressure B end high pressure
- T Select to "B" port
- regulators both ends
 A end high pressure
 B end low pressure

GAGES

- A Gage port only (plugged)
- B Gage w/face

 perpendicular to manual operator
- C Goge w/face parollel
- ① to manual operator

PRESSURE RANGE

ASSEMBLED

block is

to valve

assembled

9 - Regulator

- A 0 to 120 PSI
- B 0 to 80 PSI
- C 0 to 30 PSI
- D 0 to 120 PSI on "A" end 0 to 80 PSI on "B" end
- E 0 to 120 PSI on "B" end
- 0 to 80 PSI on "A" end
- F 0 to 120 PSI on "A" end 0 to 30 PSI on "B" end
- G 0 to 120 PSI on "B" end 0 to 30 PSI on "A" end
- H 0 to 80 PSI on "A" end 0 to 30 PSI on "B" end
- J O to 80 PSI on "B" end O to 30 PSI on "A" end

Notes:

- N-92006-01 Gage kit, option "A" above 0-120 PSI N-92006-02 Gage kit, option "B" above 0-80 PSI N-92006-03 Gage kit, option "C" above 0-30 PSI
- ② Must be used with dual pressure valves.
- 3 Must be used with single pressure valves.

REPLACEMENT PARTS:

R-92003 Regulator end plate kit.
R-92003-01 Regulator by-pass end plate kit.

ORDERING EXAMPLE: PR92A-JEAA Plug-in single solenoid with knob adjustment, regulators on both ends, plugged gage port and pressure range 0-120 PSI.

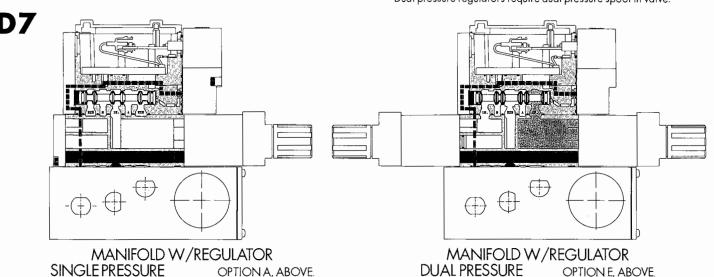
CONFIGURATION EXAMPLES

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.

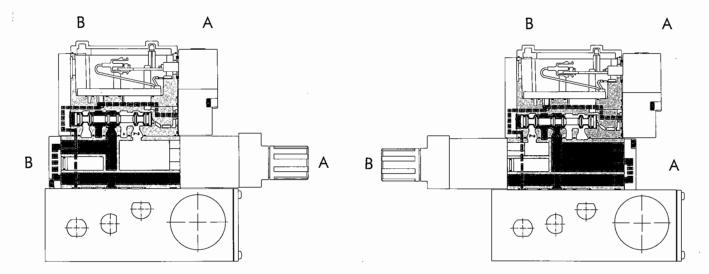
DUAL REGULATOR - DUAL PRESSURE

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.



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





SINGLE REGULATOR DUAL PRESSURE SELECT TO THE "A" CYL. PORT OPTION P, OPPOSITE PAGE

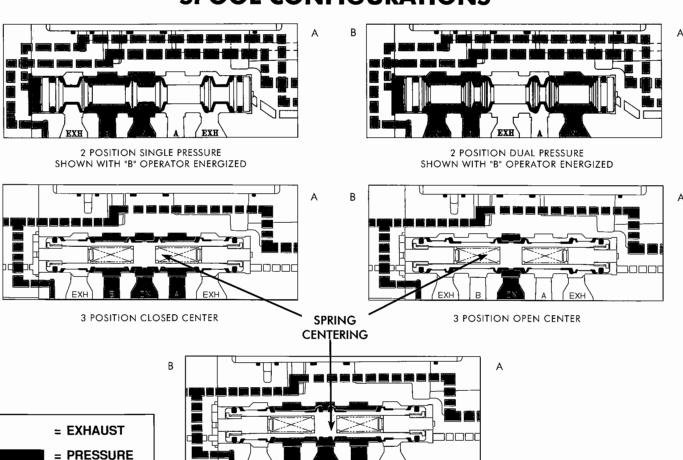
β

В

SINGLE REGULATOR DUAL PRESSURE SELECT TO THE "B" CYL. PORT OPTION R, OPPOSITE PAGE

D8

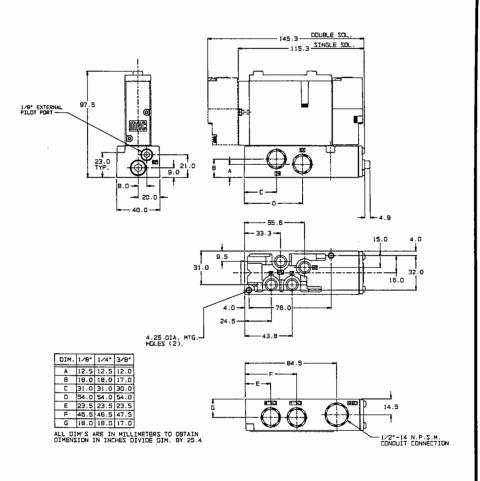
SPOOL CONFIGURATIONS



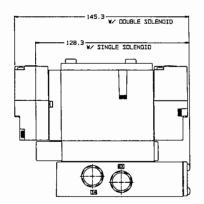
3 POSITION SINGLE PRESSURE, PRESSURE CENTER

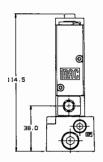
PERIORS 92 SERIES

INDIVIDUAL BASE

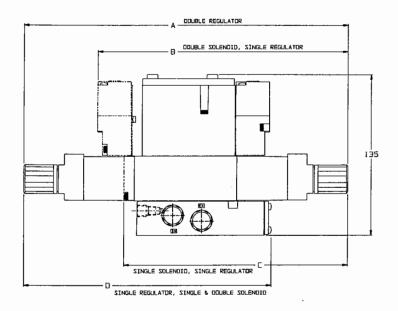


WITH FLOW CONTROLS

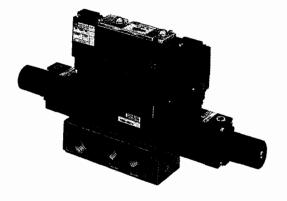


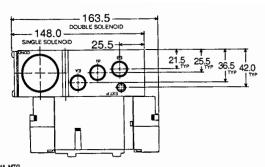


D9 WITH REGULATORS



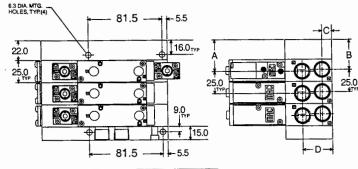
DOHTAM THAMTZULDA									
DIMENSION A B C D									
LOCKING KNOB	268.0	206.8	185.0	205.1					
LOCKING SLOTTED STEM	262.8	201.6	179.8	200.0					
SLOTTED STEM	258.4	197.2	175.4	195.6					

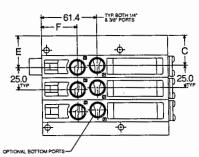


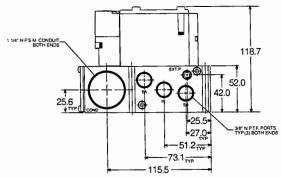


1/4"	3/8"
32.0	35.5
36.9	33.5
10.0	11.0
33.9	33.0
35.0	35.5
40.4	39.4
32.0	35.5
	32.0 36.9 10.0 33.9 35.0 40.4

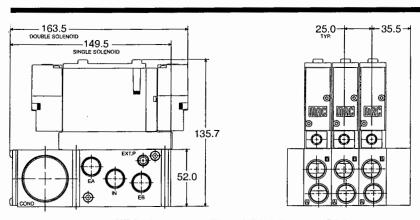
92 SERIES MANIFOLD BASE

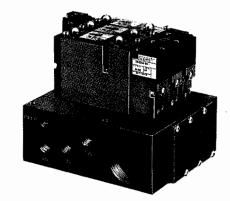






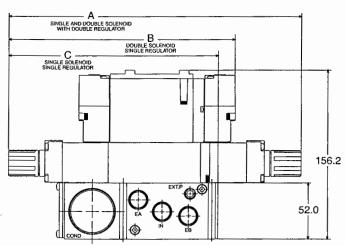
MANIFOLD BASE





D10

MANIFOLD BASE WITH FLOW CONTROLS



DESCRIPTION	Α	В	С
LOCKING KNOB	268.0	208.0	192.5
SLOTTED STEM	249.0	198.5	183.0
LOCKING SLOTTED STEM	257.8	202.9	187.4

MANIFOLD BASE WITH REGULATORS



4-WAY SOLENOID PILOT & REMOTE AIR PILOT OPERATED,

PLUG-IN SUB-BASE MOUNTED

1/8", 1/4", & 3/8" PORTS - C, UP TO 1.35 PRESSURE RANGE: VACUUM TO 150 PSI

82 SERIES - SOLENOID PILOT OPERATED VALVES

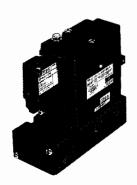
SGL. SOLENOID SPRING RETURN	DBL. SOLENOID 2-POSITION	MOUNTING/ SINGLE	DBL. SOL. 3-POS. CLOSED CENTER	DBL. SOL. 3-POS. OPEN CENTER	DBL. SOL. 3-POS. PRESSURE CENTER
D B A WE NO EXH	B A S A S A S A S A S A S A S A S A S A	PRESSURE INTERNAL PILOT VALVES NPTF PORTS		MIN EXT	P WP IN EXH
82A-AA-000-TM-DAAP-1DA	82A-BA-000-TM-DAAP-1DA	Valve Less Base	82A-EA-000-TM-DAAP-1DA	82A-FA-000-TM-DAAP-1DA	82A-GA-000-TM-DAAP-1DA
82A-AA-AAA-TM-DAAP-1DA	82A-BA-AAA-TM-DAAP-1DA	1/8" Base	82A-EA-AAA-TM-DAAP-1DA	82A-FA-AAA-TM-DAAP-1DA	82A-GA-AAA-TM-DAAP-1DA
82A-AA-BAA-TM-DAAP-1DA	82A-BA-BAA-TM-DAAP-1DA	1/4" Base	82A-EA-BAA-TM-DAAP-1DA	82A-FA-BAA-TM-DAAP-1DA	82A-GA-BAA-TM-DAAP-1DA
82A-AA-CAA-TM-DAAP-1DA	82A-BA-CAA-TM-DAAP-1DA	3/8" Base	82A-EA-CAA-TM-DAAP-1DA	82A-FA-CAA-TM-DAAP-1DA	82A-GA-CAA-TM-DAAP-1DA
82A-AA-BKA-TM-DAAP-1DA	82A-BA-BKA-TM-DAAP-1DA	1⁄4" Manifold	82A-EA-BKA-TM-DAAP-1DA	82A-FA-BKA-TM-DAAP-1DA	82A-GA-BKA-TM-DAAP-1DA
82A-AA-CKA-TM-DAAP-1DA	82A-BA-CKA-TM-DAAP-1DA	¾″ Manifold	82A-EA-CKA-TM-DAAP-1DA	82A-FA-CKA-TM-DAAP-1DA	82A-GA-CKA-TM-DAAP-1DA

Valve codes shown are for 120/60, 110/50 coils, non-locking recessed manual operators and muffled pilot. For other options see opposite page.



82A-AA-BAB-TM-DAAP-1DA

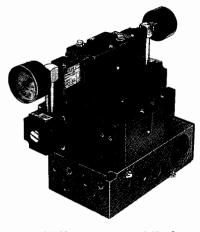
Valve series is available as a MULTI-PRESSURE PAK®



82A-AC-BAA-TM-DAAP-1DA-9 FC82A-AA-9 (FLOW CONTROL)



82A-AC-BAA-TM-DAAP-1DA-9 PR82A-AACA-9 (REGULATOR) N-82016-02 (GAGE & FITTING)



1 X 82A-AC-BKA-TM-DAAP-1DA-9

1 X 82A-DC-BKA-TM-DAAP-1DA-9

1 X PR82A-ADBA-8 (REGULATOR)

1 X FC82A-AA-9 (FLOW CONTROL)

2 X N82016-01 (GAGE & FITTING)

* 1 X N82005-01 (FASTENING KIT)

* No end plates required for 82 Series

manifolds. Use #N-82005-01

fastening kit.

assembly. See Section G. **82 SERIES - REMOTE AIR PILOT OPERATED VALVES**

02 SERIES - REMOTE AIR FIEST OF ERAILD VALVES						
SGL. PILOT SPRING RETURN	DBL. PILOT 2-POSITION	MOUNTING/ SINGLE	DBL. PILOT 3-POS. CLOSED CENTER	DBL. PILOT 3-POS. OPEN CENTER	DBL. PILOT 3-POS. PRESSURE CENTER	
D B A A A A A A A A A A A A A A A A A A	B B A A -	PRESSURE VALVES NPTF PORTS	PW A A A A A A A A A A A A A A A A A A A	9 M 9 M 6 M 6	SW SXH W A	
82A-AB-000-RA	82A-BB-000-RA	Valve Less Base	82A-EB-000-RA	82A-FB-000-RA	82A-GB-000-RA	
82A-AB-AAA-RA	82A-BB-AAD-RA	1/8" Base	82A-EB-AAD-RA	82A-FB-AAD-RA	82A-GB-AAD-RA	
82A-AB-BAA-RA	82A-BB-BAD-RA	1/4" Base	82A-EB-BAD-RA	82A-FB-BAD-RA	82A-GB-BAD-RA	
82A-AB-CAA-RA	82A-BB-CAD-RA	3/8" Base	82A-EB-CAD-RA	82A-FB-CAD-RA	82A-GB-CAD-RA	

For manifold bases, use the solenoid manifold base with the remote air pilot, pilot operator (see page T-4) Example: 82A-AB-BKA-TM-RA11.

REMOTE AIR PILOT, PILOT OPERATED VALVES

These valves have the same features as the remote air pilot operated models but in addition have the following advantages: Ability to use a pilot signal pressure different from the main valve pressure. Pilot signal can be from 20 to 150 PSIG, regardless of main valve pressure. See page T-4 to order.



HOW TO ORDER PILOT VALVE <u>X - X X X</u> - (XX - D XX X - X XX)

Spool Type – Valve Function

- 0 Individual base or manifold only
- A Single operator single pressure
- Double operator single pressure
- Single operotor dual pressure²
- Double operator duol
- pressure³ -3-position closed center
- 3-position open center
- G 3-position singlepressure, pressure center
- H 3-position dual-pressure, pressure center
- J Sgl. Sol. Sgl. Pressure Sol. on B end
- K -Sgl. Sol. Dual Pressure Sol. on B end
- L -3-position dual pressure,* open center
- 3-position dual pressure,* closed center
- *NOTE: For dual pressure w/o regulators cansult foctory

Body Type – Lights in Body

- A Plug-in bady
- B Non plug-in body
- C Plug-in w/light in body **D — Plug-in w/pilot exhaust out main exhaust
- Non plug-in solenoid w/pilot exhaust out moin exhoust
- Plug-in w/light in body and pilot exhaust out main exhaust

Port Size — Thread Type

- Valve only no base
- 1/8" NPTF D - 1/8" BSPPL
- B 1/4" NPTF E - 1/4" BSPPL
- C -3/8" NPTF F -3/8" BSPPL

**Body options D, E, and F (pilot exhaust out main exhaust) must use TU (Universal Pilot). Main valve exhaust cannot be restricted.

Avail. on single pressure valve only

Individual & Manifold Base Port Configurations

– Individual Base –

- 0 Valve only no bose
- A Standard side parts (1/8", 1/4" or 3/8")
- B Bottom ports only*
- C Side and bottom parts*
- D Side inlet, side exhaust, bottom cylinder ports*
- * Bottom ports avoiloble in 1/8" & 1/4" only in individual base

- Manifold Base -

- K Standard parts (1/4" or 3/8" only)
- Bottom cylinder ports
- M Bottom inlet port
- N Bottom inlet and cylinder parts*
- Bottom and end cylinder ports*
- R Bottom cylinder and end cylinder ports w/bottom inlet port*
- Selector bose-Std. side ports
- Bottom ports available in $\frac{1}{4}$ % $\frac{3}{4}$ only on manifold.

Bottam inlet available 1/4" only. Far bottom o-ring ports, consult factory.

Internal or External Pilot* – Lights in Base

- Internal Pilot -

- 0 Valve only no bose
- Na light in base
- B Single light in base
- Double light in base

External Pilot –

- 0 Valve only no base
- D No light in bose
- Single light in base
- Double light in bose
- Use internal for main volve pressures of 25-150 PSIG Use external for main valve pressures of 28" Hg vocuum - 25 PSIG

Electrical Connection

DA - Plug In (standord)

DK - Plug In w/Diode

DL - Plug In w/M.O.V.

BK - Grommet w/Diode

BL - Grommet w/M.O.V. CA - Conduit 1/2" NPS

JB — Rectongular Plug-In

KD - Mini plug-in w/light*

CM - Metal conduit 1/2" NPS

External Plug-In Valve -

JD — Rectongular Plug-In w/Light

JM — Rectangulor Male Only KA – Mini Plug-In KB - Mini Plug-In w/Diode* KC - Mini plug-in w/M.O.V.*

CN - Metal conduit w/grd. 1/2" NPS

BA - Grommet

– Plug-In Valve/Base –

Nonplug-In Valve/Base –

D12

PILOT VALVE OPTIONS - (XX - D XX X - X XX)

Pilot Style

- TM Pilot w/muffled exhaust TP - Pilot w/piped exhaust
- **TU Universal Pilot, Pilot Exhaust Out Main Exhaust

Voltage

- AA 120/60 110/50 AB 240/60 220/50 AC 24/60 24/50 AF 240/50 AK 220/60 DA 24 VDC (5.4w) DB –12 VDC (12.7W)* DF 24 VDC (112.7W)* FA 12 VDC (1.8W) FB 24 VDC (1.8) FB 24 VDC (2.4W) FF 24 VDC (2.4W)

- Other AC & DC voltages
- & wattages available -consult factory
- * Note: These wattages available as MOD CLSF only.

Lead Wire Length

- Plug-In Valve/Base -

- P Plug-in 8" standord 1 - 18"4 - 48"
- 2 24' $5 - 72^{\circ}$ 3 - 36'6 - 96"
- Non Plug-In Valve/Base —
- A 18"E - 72"
- B 24"F - 96" C - 36" J -6"*
- D 48"
- *LEAD WIRE LENGTH FOR EXTERNAL PLUG-IN CONNECTORS MUST BE "J"

Manual Operator

- 0-No manual operator
- 2—Locking operator
- Nonlocking
 - Extended operator
- 4— Locking extended operator
- 1 Nonlocking operator

KF — Mini plug-in w/light & M.O.V.* KG — Mini Plug-in w/LED light & diode* KJ - Mini Plug-in male only KK — Mini Plug-in male only w/diode

KL - Mini plug-in male only w/M.O.V. TA — Dual Tabs (.110) w/Receptacles

KE – Mini plug-in w/light & diode

- TB Dual Tabs (.110) w/Receptacles & Diode
- TJ Dual Tabs (.110) w/o Receptacles

* M.O.V., Diode & Light are in female If ordering individual or manifold base only to be used with valve containing diode, please specify to ensure polarity of base leads.

HOW TO ORDER 82 SERIES FLOW CONTROL MODULE*

FC 82A-AA	PLUG-IN FLOW CONTROL ASSEMBLY
FC 82A-BA	NON PLUG-IN FLOW CONTROL ASSEMBLY

Note: If a flow control assembly is used with the dual pressure regulator option, only the flow control on the "A" end is functional. (Controls both cylinder ports.)

^{*}If flow control module is to be installed between valve and base or valve and manifold at the factory, add -9 after the flow control model number, i.e., FC82A-AA-9. The flow control model number should follow the valve model number on which it is to be installed.

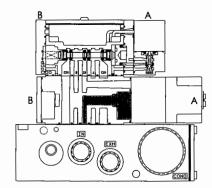
MAC 82 SERIES

HOW TO ORDER

PLUG-IN SANDWICH REGULATORS

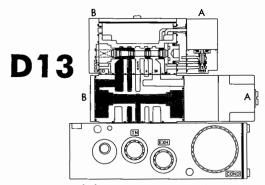
PR82A - X X X X

CONFIGURATION EXAMPLES



(A) REGULATOR "A" END (STANDARD) SINGLE REGULATOR-SINGLE PRESSURE

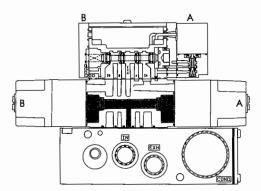
same regulated pressure



(C) REGULATOR "A" END WITH BY PASS "B" END

SINGLE REGULATOR-DUAL PRESSURE

CYL A Regulated Pressure Line Pressure



(D) REGULATORS BOTH END

DUAL REGULATOR-DUAL PRESSURE

CYL A Regulated pressure (A End) CYL B Regulated pressure (B End)

ADJUSTMENT METHOD

Manual Adjust W/ Slotted Stem -

- A -Plug in solenoid
- B -Remote air or non plug-in
- C -Regulator only

- Air Pilot Adjust -

- D -Plug in solenoid
- E -Remote air or non plug-in
- F -Regulator only

– Manual Adjust W/ Locking Knob -

- G -Plug-in solenoid H -Remote air or
- non plug-in
- J -Regulator only

Manual Adjust W/ Locking Slotted Stem -

- K -Plug in solenoid
- L -Remote air or non plug-in
- M -Regulator only

PRESSURE RANGE

ASSEMBLED

supplied w/ extra long

screws to be

conjunction with flow

7 Regulator

block

used in

control

blocks

8 Same as 7

to block

9 Regulator

block is

on valve

assembled

except valve assembled

- A -0 to 120 PSI
- B -0 to 80 PSI
- C -0 to 30 PSI
- D -0 to 120 PSI on "A" end 0 to 80 PSI on "B" end
- E-0 to 120 PSI on "B" end 0 to 80 PSI on "A" end
- F-0 to 120 PSI on "A" end 0 to 30 PSI on "B" end
- G-0 to 120 PSI on "B" end 0 to 30 PSI on "A" end
- H = 0 to 80 PSI on "A" end 0 to 30 PSI on "B" end
- J -0 to 80 PSI on "B" end 0 to 30 PSI on "A" end

CONFIGURATION

- 0 -Regulator only
- A -Regulator "A" end standard
- * B -Regulator "B" end with by pass "A" end
- ***** C −Regulator "A" end with by pass "B" end
- * D -Regulators both ends
- †S -Selector to inlet of next valve - dual regulators
- †T -Selector to inlet of next valve - single regulator w/bypass
- * Requires dual pressure spaols
- † Note: Requires single pressure spool in valve. High pressure must be on inlet side ("A" end).
- ** Gages must be ordered separately as follows:
 - N-82016-01 (0-120 PSI perpendicular)
 - N-82016-02 (0-120 PSI parallel) -
 - N-82016-03 (0-80 PSI perpendicular)
 - N-82016-04 (0-80 PSI parallel)
 - N-82016-05 (0-30 PSI perpendicular) N-82016-06 (0-30 PSI parallel)

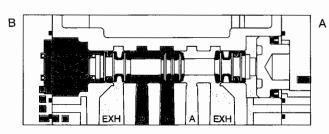
GAGES

- A -No gage port
- B -Gage w/face perpendicular to manual operator**
- C -Gage w/face parallel to manual operator **
- D -Gage port only w/ pula agia

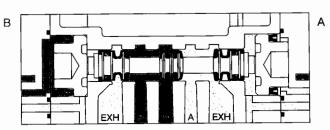


Gage shown is parallel.

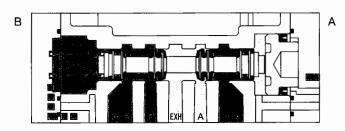
SPOOL CONFIGURATIONS



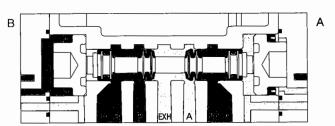
SINGLE OPERATOR
SINGLE INLET -DUAL EXHAUST
SHOWN WITH "B" OPERATOR ENERGIZED



DOUBLE OPERATOR
SINGLE INLET -DUAL EXHAUST
SHOWN WITH "B" OPERATOR ENERGIZED

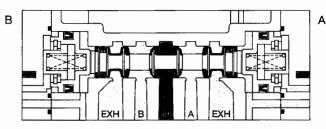


SINGLE OPERATOR
DUAL INLET - SINGLE EXHAUST
SHOWN WITH "B" OPERATOR ENERGIZED

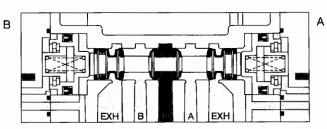


DOUBLE OPERATOR
DUAL INLET - SINGLE EXHAUST
SHOWN WITH "B" OPERATOR ENERGIZED

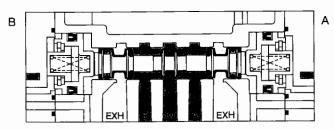
D14



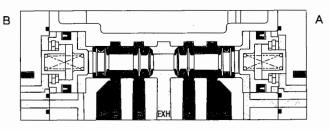
3 POSITION CLOSED CENTER



3 POSITION OPEN CENTER



3 POSITION SINGLE PRESSURE PRESSURE CENTER

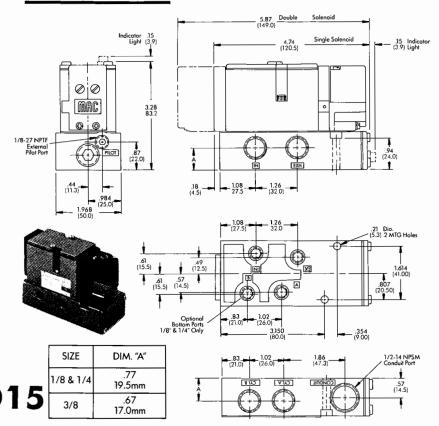


3 POSITION DUAL PRESSURE PRESSURE CENTER

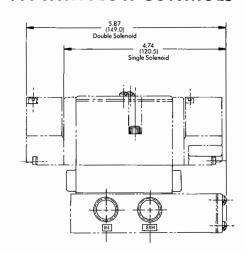
DIMENSIONS

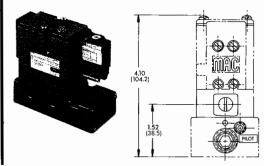
82 SERIES

INDIVIDUAL BASE



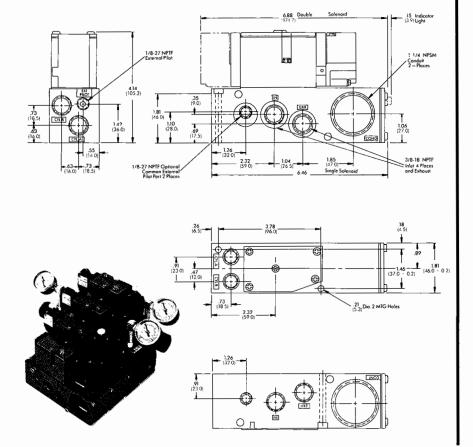
... WITH FLOW CONTROLS



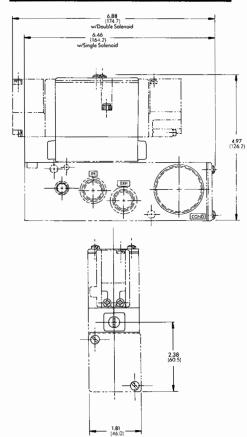


DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

MANIFOLD BASE



... WITH FLOW CONTROLS



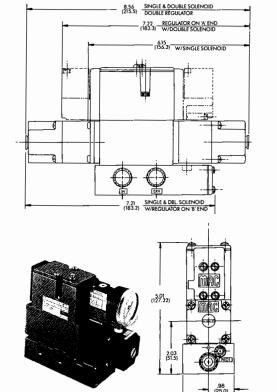
Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

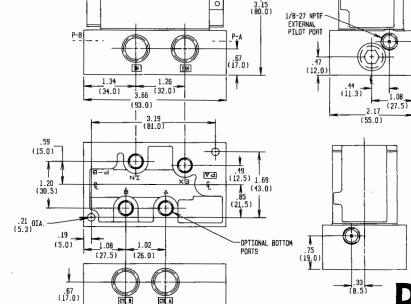
WITH REGULATORS



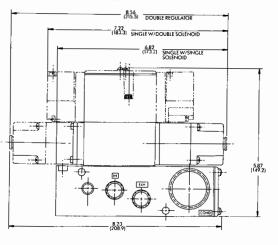
Patents and Patents Pending

REMOTE AIR OPERATED NON PLUG-IN INDIVIDUAL BASE

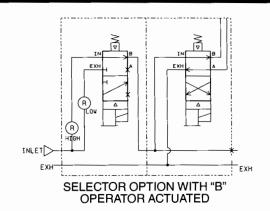


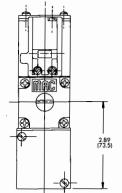


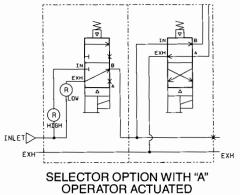
WITH REGULATORS



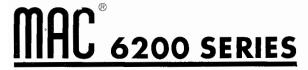
82 SERIES-SELECTOR MANIFOLD SCHEMATIC







DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)



4-WAY, SOLENOID PILOT AND REMOTE AIR PILOT OPERATED, PLUG-IN SUB-BASE MOUNTED $\frac{1}{4}$ " & $\frac{3}{8}$ "-C_V UP TO 1.6

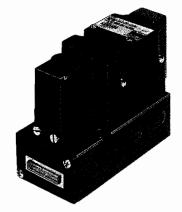
PRESSURE RANGE-VACUUM TO 150 PSI

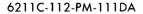
Patents and Patents Pending

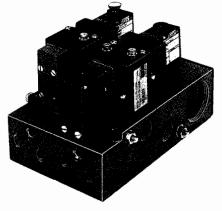
6200 SERIES-SOLENOID PILOT OPERATED VALVES

SGL. OPERATOR SPRING RETURN	DBL. OPERATOR 2-POSITION	MOUNTING/ SINGLE PRESSURE	DBL. OPER. 3-POS. CLOSED CENTER	DBL. OPER. 3-POS. OPEN CENTER
CYL A B WE N EAR	CYL A B IN EXH	INTERNAL PILOT VALVES NPTF PORTS	CYL.	N EXH
6211C-000-PM-111DA	6221C-000-PM-111DA	Valve Less Base	6231C-000-PM-111DA	6241C-000-PM-111DA
6211C-111-PM-111DA	6221C-111-PM-111DA	1/4" Base	6231C-111-PM-111DA	6241C-111-PM-111DA
6211C-211-PM-111DA	6221C-211-PM-111DA	3/4" Base	6231C-211-PM-111DA	6241C-211-PM-111DA
6211C-411-PM-111DA	6221C-411-PM-111DA	1/4" Manifald	6231C-411-PM-111DA	6241C-411-PM-111DA
6211C-511-PM-111DA	6221C-511-PM-111DA	¾″ Manifald	6231C-511-PM-111DA	6241C-511-PM-111DA

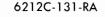
Valve cades shawn in abave table are for 120/60, 110/50 coils, non-locking recessed manual operators and muffled pilot. For other options see opposite page







1 X 6223C-411-PM-111DA 1 X 6213C-411-PM-113DA *1 X N-63002-01 (FASTENING KIT)



*No end plates required. Use #N-63002-01 fastening kit.

6200 SERIES-REMOTE AIR PILOT OPERATED VALVES

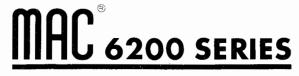
SGL. PILOT SPRING RETURN	DBL. PILOT 2-POSITION		DBL. PILOT 3-POS. CLOSED CENTER	DBL. PILOT 3-POS. OPEN CENTER
A 3 A A A A A A A A A A A A A A A A A A	CYL.	MOUNTING/ NPTF PORTS	SWE CYL A B - D IN EXH	3, W A 3 W A
6212C-000-RA	6222C-000-RA	Valve Less Base	6232C-000-RA	6242C-000-RA
6212C-131-RA	6222C-141-RA	1/4" Base	6232C-141-RA	6242C-141-RA
6212C-231-RA	6222C-241-RA	3/8″ Base ●	6232C-241-RA	6242C-241-RA
6212C-431-RA	6222C-441-RA	† ¼″ Manifold	6232C-441-RA	6242C-441-RA
6212C-531-RA	6222C-541-RA	† %" Manifold	6232C-541-RA	6242C-541-RA

Denotes bottom ports not available.

REMOTE AIR PILOT, PILOT OPERATED VALVES

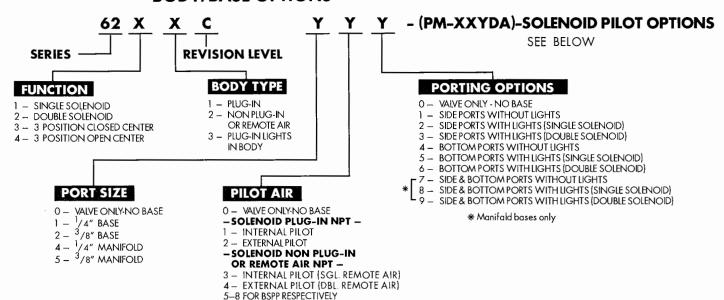
These valves have the same features as the remote air pilot operated models but in addition have the following advantages: Ability to use a pilot signal pressure different from the main valve pressure. Pilot signal can be from 20 to 150 PSIG, regardless of the main valve pressure. See Page **T-4** to order.

[†] Requires end plate kit M-62001A-01.

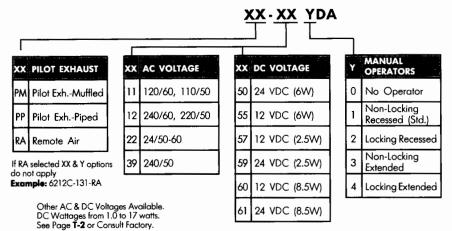


BODY/BASE OPTIONS

HOW TO ORDER







MODIFICATIONS

MOD 0210 Bottom inlet port in addition to side inlet port (manifolds only)

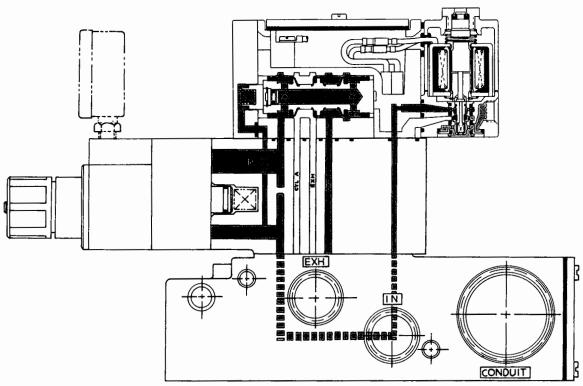
TO ORDER: 6211C-411-PM-111DA MOD 0210

For additional modifications see Technical Section.

- NOTE: 1. The valve less base is always the same for internal or external pilot. These options are effected in the base or manifold.
 - 2. To order bases or manifolds without the valve, choose the base or manifold from the above table and options, then add 6200C as a prefix. **Example** 6200C-112-00-11 (base with single light for 120/60, 110/50.)
 - 3. When ordering an external pilot connection for manifold bases, a common external pilot port is standard. One connection only is required for all the valves in the manifold whether single or double solenoid.
 - 4. Manifolds for solenoid and remote air operated valves must be ganged separately.
 - Manifold Accessories: Inlet & Exhaust Isolators #32839

D18

6200 SERIES REGULATORS



D19

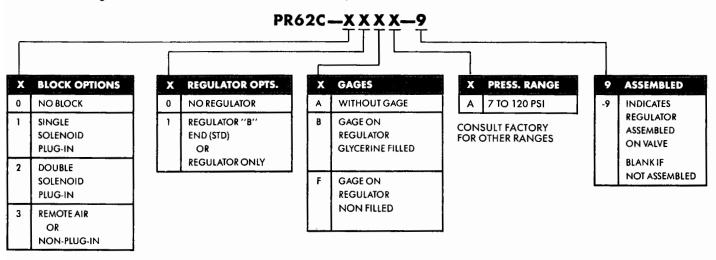
REGULATOR RANGE: 7 to 120 PSI

SINGLE REGULATOR—SINGLE PRESSURE

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

HOW TO ORDER:

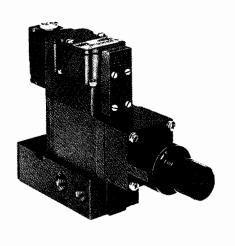
Use standard 6200 Series model numbers from page D11 followed by regulator model number from the table below. (Specify assembled or use -9 after regulator number to indicate assembled on valve.)

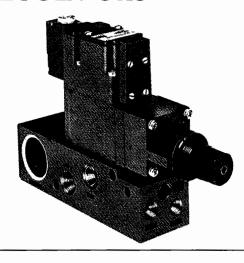


ORDER EXAMPLES: PR62C-01AA Regulator Only-Without Gage

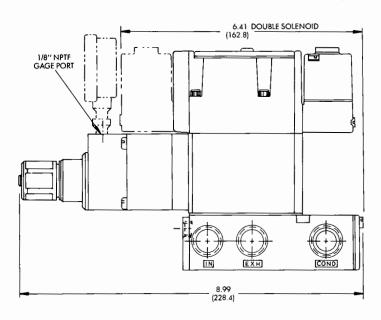
ORDER EXAMPLES: PR62C-11BA-9 Single Solenoid Plug-in/Regulator on B End/2' Glycerine Filled Gage/Installed on Valve

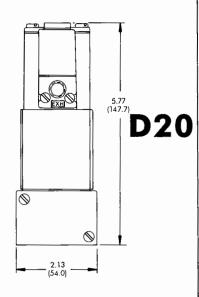
6200 SERIES REGULATORS

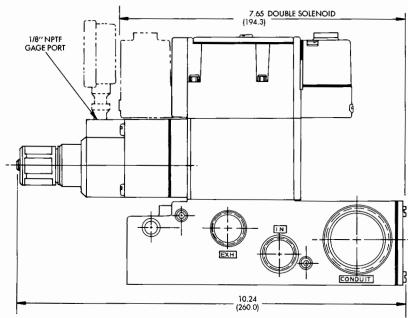


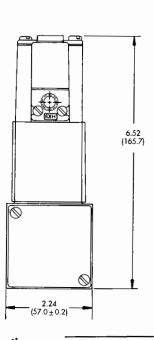


DIMENSIONS 6200 SERIES WITH "SANDWICH" REGULATORS









DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.



4-WAY, SOLENOID PILOT AND REMOTE AIR PILOT **OPERATED, PLUG-IN SUB-BASE MOUNTED**

1/4", 3/8", & 1/2" - C, UP TO 3.0 PRESSURE RANGE: VACUUM TO 150 PSI

6322D-241-RA

Patents and Patents Pending

6300 SERIES - SOLENOID PILOT OPERATED VALVES

SGL. OPERATOR SPRING RETURN	DBL. OPERATOR 2-POSITION	MOUNTING/ SINGLE	DBL. OPER. 3-POS. CLOSED CENTER	DBL. OPER. 3-POS. OPEN CENTER	DBL. OPER. 3-POS. PRESSURE CENTER
CYL A B WE XIII	CYL A B	PRESSURE INTERNAL PILOT VALVES NPTF PORTS	N EXH	CYL.	S AN A B AN A A
6311D-000-PM-111DA	6321D-000-PM-111DA	Valve Less Base	6331D-000-PM-111DA	6341D-000-PM-111DA	6351D-000-PM-111DA
6311D-111-PM-111DA	6321D-111-PM-111DA	1/4" Base	6331D-111-PM-111DA	6341D-111-PM-111DA	NOT
6311D-211-PM-111DA	6321D-211-PM-111DA	¾" Base	6331D-211-PM-111DA	6341D-211-PM-111DA	AVAILABLE
6311D-311-PM-111DA	6321D-311-PM-111DA	1⁄2" Base ●	6331D-311-PM-111DA	6341D-311-PM-111DA	AVAILABLE
6311D-511-PM-111DA	6321D-511-PM-111DA	3/8" Manifold	6331D-511-PM-111DA	6341D-511-PM-111DA	6351D-511-PM-111DA
6311D-611-PM-111DA	6321D-611-PM-111DA	1/2" Manifold	6331D-611-PM-111DA	6341D-611-PM-111DA	6351D-611-PM-111DA

Valve codes shown are for 120/60, 110/50 coils, non-locking recessed manual operators and muffled pilot. For other options see opposite page.

[•] Denotes models not available with bottom ports.



6311D-312-PM-111DA

Valve series is available as a MULTI-PRESSURE PAK®

assembly. See Section G.

- 1 X N-63002-01 (FASTENING KIT)



* No end plates required for 6300 manifolds. Use #N-63002-01 fastening kit.

6300 SERIES - REMOTE AIR PILOT OPERATED VALVES

SGL. PILOT SPRING RETURN	DBL. PILOT 2-POSITION		DBL. PILOT 3-POS. CLOSED CENTER	DBL. PILOT 3-POS. OPEN CENTER
B A B A B A A A A A A A A A A A A A A A	CYL. B A B A IN EXH	MOUNTING NPTF PORTS	CYL A B IN EXH	CYL A B B WD IN EXH
6312D-000-RA	6322D-000-RA	Volve Less Base	6332D-000-RA	6342D-000-RA
6312D-131-RA	6322D-141-RA	¼" Base	6332D-141-RA	6342D-141-RA
6312D-231-RA	6322D-241-RA	¾" Base	6332D-241-RA	6342D-241-RA
6312D-331-RA	6322D-341-RA	1/2" Base ●	6332D-341-RA	6342D-341-RA
6312D-431-RA	6322D-441-RA	1/4" Manifold	6332D-441-RA	6342D-441-RA
6312D-531-RA	6322D-541-RA	¾" Manifold	6332D-541-RA	6342D-541-RA
6312D-631-RA	6322D-641-RA	1/2" Manifold	6332D-641-RA	6342D-641-RA

[•] Denotes models not available with bottom ports.

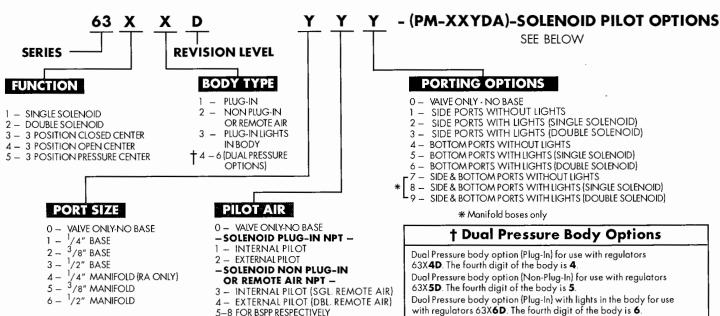
REMOTE AIR PILOT, PILOT OPERATED VALVES

These valves have the same features as the remote air pilot operated models but in addition have the following advantages: Ability to use a pilot signal pressure different from the main valve pressure. Pilot signal can be from 20 to 150 PSIG, regardless of main valve pressure. See Page T-4 to order.

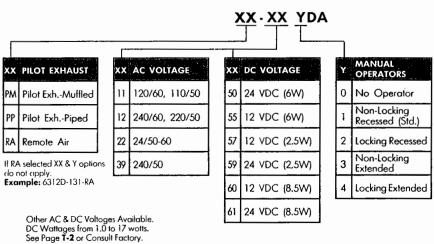




BODY/BASE OPTIONS



PILOT VALVE OPTIONS SOLENOID — PLUG-IN



5-8 FOR BSPP RESPECTIVELY

MODIFICATIONS

MOD 0210 Bottom inlet port in addition to side inlet port (manifolds only)

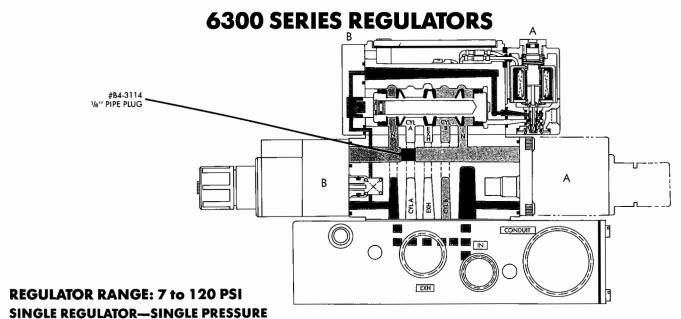
TO ORDER: 6311D-511-PM-111DA MOD 0210

For additional modifications see Technical Section.

Manifold Accessories: Inlet Isolators #32839. Exhaust Isolator #28309. Blank Station Cover Plate #M63014.

- NOTE: 1. The valve less base is always the same for internal or external pilot. These options are effected in the base or manifold.
 - 2. To order bases or manifolds without the valve, choose the base or manifold from the above table and options, then add 6300D as a prefix. **Example** 6300D-112-00-11 (base with single light for 120/60, 110/50.)

 3. When ordering an external pilot connection for manifold bases, a common external pilot port is standard. One connection only is
 - required for all the valves in the manifold whether single or double solenoid.
 - 4. Manifolds for solenoid and remote air operated valves must be ganged separately.



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

SINGLE REGULATOR—DUAL PRESSURE*

Pressure supplied to the manifold is separated in the regulator block by a 1/8" pipe plug, allowing line pressure to flow through a bypass plate mounted opposite the regulator. This mode permits line pressure to one cylinder port and regulated pressure to the other.

DUAL REGULATOR—DUAL PRESSURE*

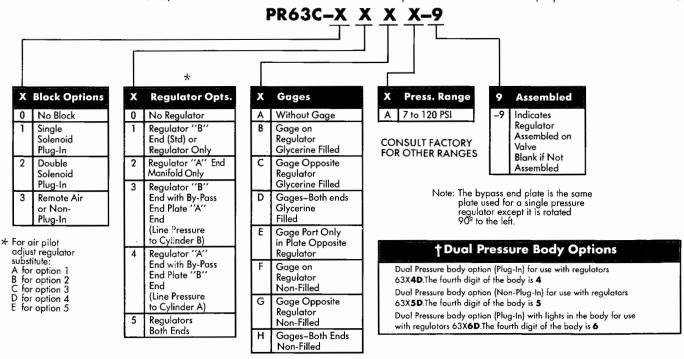
ORDER EXAMPLES: PR63C-01AA = Regulator Only-Without Gage

Pressure supplied from each regulator is isolated in the block by a 1/8" pipe plug. Regulated pressure from "A" regulator supplies cylinder port "B". Regulated pressure from "B" regulator supplies cylinder port "A". It should be noted that energizing valve operator A directs flow to cylinder A and energizing valve operator B directs flow to cylinder B.

HOW TO ORDER:

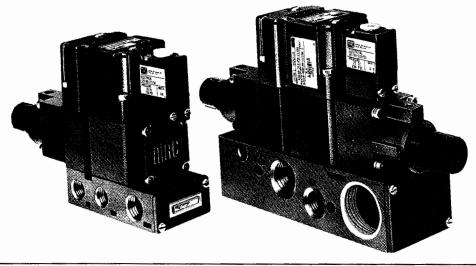
SINGLE PRESSURE: Use standard 6300 Series numbers from page D21 of catalog, followed by single regulator model numbers from the table below. (Specify assembled or use -9 after valve model and regulator model to indicate assembled on valve.)

† DUAL PRESSURE: (Manifold Base Models Only). Use standard 6300 Series numbers from page D21 of catalog, incorporating DUAL PRESSURE BODY OPTIONS shown below, followed by dual pressure regulator model from the table below. (Specify assembled or use -9 after valve model and regulator model to indicate assembled on *Requires Dual Pressure body option and manifold base. valve).

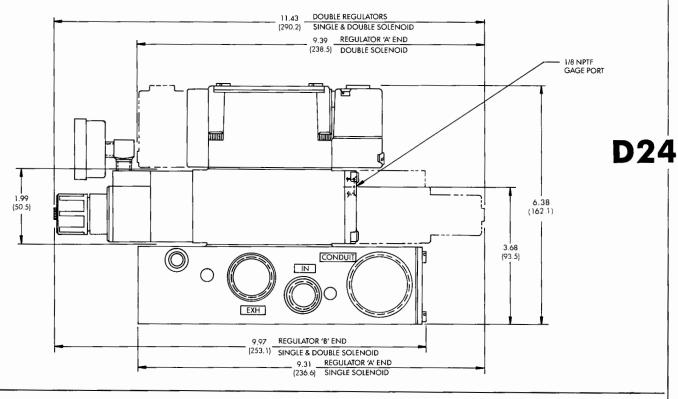


PR63C-IAAA = Single Solenoid plug-in, air pilot adjust regulator on "B" End without gage, 7-120 PSI PR63C-21BA = Double Soler.oid plug-in Regulator on "B" End Glycerine Filled Gage on Regulator, 7-120 PSI

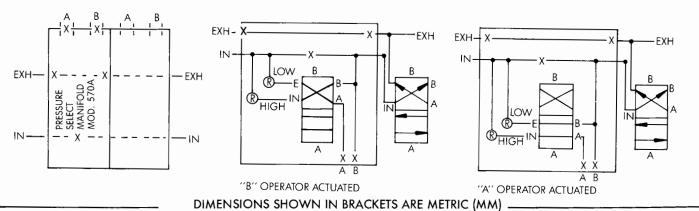
6300 SERIES REGULATORS



DIMENSIONS 6300 SERIES WITH "SANDWICH" REGULATORS



SELECTOR MANIFOLD SCHEMATIC (MOD. 570A)



Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.



4-WAY, SOLENOID PILOT AND REMOTE AIR PILOT OPERATED, PLUG-IN SUB-BASE MOUNTED

3/8", 1/2" & 3/4" - C, UP TO 5.1 PRESSURE RANGE: VACUUM TO 150 PSI

Patents and Patents Pending

6500 SERIES - SOLENOID PILOT OPERATED VALVES

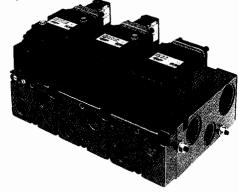
SGL. OPERATOR SPRING RETURN	DBL. OPERATOR 2-POSITION	MOUNTING/ SINGLE	DBL. OPER. 3-POS. CLOSED CENTER	DBL. OPER. 3-POS. OPEN CENTER	DBL. OPER. 3-POS. PRESSURE CENTER
CYL A B IN EXH	B A B A B	PRESSURE INTERNAL PILOT VALVES NPTF PORTS	CYL A B IT TI	CTL A B IN EXH	CYL A B IN EXH
6511B-000-PM-111DA	6521B-000-PM-111DA	Valve Less Base	6531B-000-PM-111DA	6541B-000-PM-111DA	6551B-000-PM-111DA
6511B-111-PM-111DA	6521B-111-PM-111DA	¾" Base	6531B-111-PM-111DA	6541B-111-PM-111DA	6551B-111-PM-111DA
6511B-211-PM-111DA	6521B-211-PM-111DA	1/2" Base	6531B-211-PM-111DA	6541B-211-PM-111DA	6551B-211-PM-111DA
6511B-311-PM-111DA	6521B-311-PM-111DA	¾" Base •	6531B-311-PM-111DA	6541B-311-PM-111DA	6551B-311-PM-111DA
6511B-411-PM-111DA	6521B-411-PM-111DA	¾" Manifold	6531B-411-PM-111DA	6541B-411-PM-111DA	6551B-411-PM-111DA
6511B-511-PM-111DA	6521B-511-PM-111DA	1∕2" Manifold	6531B-511-PM-111DA	6541B-511-PM-111DA	6551B-511-PM-111DA
6511B-611-PM-111DA	6521B-611-PM-111DA	¾" Manifold	6531B-611-PM-111DA	6541B-611-PM-111DA	6551B-611-PM-111DA

Valve codes shown are for 120/60, 110/50 coils, non-locking manual operators and muffled pilot. For other options see opposite page.

Denotes models not available for two pressure or bottom ports.



6511B-112-PM-111DA



1 X 6512B-631-RA 1 X 6513B-611-PM-111DA 1 X 6523B-611-PM-111DA

- * 1 X N-65002-01 (FASTENING KIT)
- * No end plates required for 6500 manifolds. Use #N-65002-01 fastening kit.



6522B-241-RA

Valve series is available as a MULTI-PRESSURE PAK® assembly. See Section G.

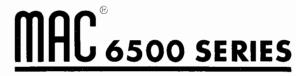
6500 SERIES - REMOTE AIR PILOT OPERATED VALVES

SGL. OPERATOR SPRING RETURN	DBL. OPERATOR 2-POSITION	MOUNTING/ SINGLE	DBL. OPER. 3-POS. CLOSED CENTER	DBL. OPER. 3-POS. OPEN CENTER	DBL. OPER. 3-POS. PRESSURE CENTER
B A B A A B IN EXH	CYL B A B IN EXH	PRESSURE INTERNAL PILOT VALVES NPTF PORTS	CYL B WD A B IN EXH	B WB A B A B A B A B A B A B A B A B A B	B WE A B A A B A A B A A B A A B A A B A A B A A A B A A A B A A B A A B A A B
6512B-000-RA	6522B-000-RA	Valve Less Base	6532B-000-RA	6542B-000-RA	6552B-000-RA
6512B-131-RA	6522B-141-RA	¾" Base	6532B-141-RA	6542B-141-RA	6552B-141-RA
6512B-231-RA	6522B-241-RA	1/2" Base	6532B-241-RA	6542B-241-RA	6552B-241-RA
6512B-331-RA	6522B-341-RA	¾" Base •	6532B-341-RA	6542B-341-RA	6552B-341-RA
6512B-431-RA	6522B-441-RA	¾" Manifold	6532B-441-RA	6542B-441-RA	6552B-441-RA
6512B-531-RA	6522B-541-RA	1∕2″ Manifold	6532B-541-RA	6542B-541-RA	6552B-541-RA
6512B-631-RA	6522B-641-RA	¾" Manifold	6532B-641-RA	6542B-641-RA	6552B-641-RA

Denotes models not available for two pressure or bottom ports.

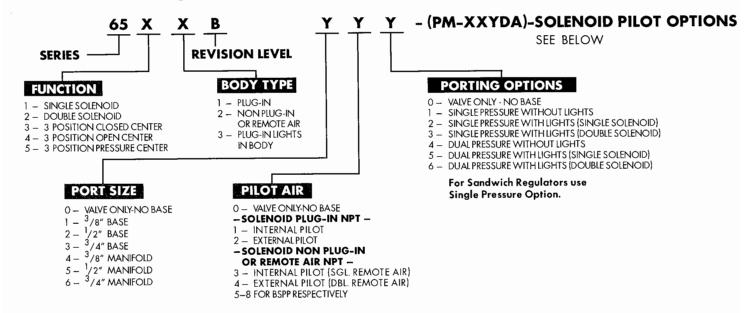
REMOTE AIR PILOT, PILOT OPERATED VALVES

These valves have the same features as the remote air pilot operated models but in addition have the following advantages: Ability to use a pilot signal pressure different from the main valve pressure. Pilot signal can be from 20 to 150 PSIG, regardless of main valve pressure. See Poge T-4 to order.

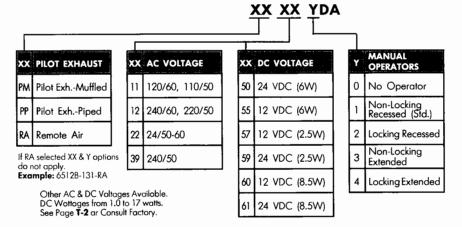


BODY/BASE OPTIONS

HOW TO ORDER



PILOT VALVE OPTIONS SOLENOID — PLUG-IN



NOTE: 1. The valve less base is always the same for internal or external pilot. These options are effected in the base or manifold.

2. Bottom ports: Refer to modification table below

3. To order bases or manifolds without the valve, choose the base or manifold from the above table and options, then add 6500B as a prefix. **Example** 6500B-112-00-11 (base with single light for 120/60, 110/50.)

4. Manifold Accessories: Inlet Isolator #28309. Exhaust Isolator #28310. Blank Station Cover Plate #N65009.

MODIFICATIONS

MOD. NO.	DESCRIPTION	MODEL AVAILABILITY
0002	Bottom Inlet, Exh, & Cyl. Ports (No Side Ports)	Available an Individual Bose 3/8" & 1/2" only.
0004	Full Side Porting and Additional Bottom Inlet, Exh, & Cyl. Ports.	Available on Individual Bose 3/8" only.
0112	Side Inlet & Exhaust with Bottom Cyl. Ports. (No End Cyl Ports)	Available on All Monifold Models.
0210	Porting os Ordered in Model Number Plus an Additional Bottom Inlet	Available on All Manifold Models.
0364	SGL. PRESSURE—Side Inlet & Exh. and Additional Bottom Inlet with Bottom Cyl. Parts (No End Cyl. Parts) DUAL PRESSURE—Same as Sgl. Pressure except with Two Bottom Inlets.	Available on All Monifold Models.

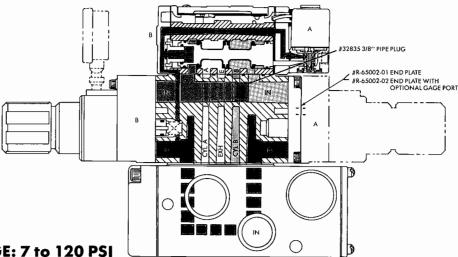
For additional modifications see Technical Section.

Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

D26

6500 SERIES REGULATORS



REGULATOR RANGE: 7 to 120 PSI

SINGLE REGULATOR—SINGLE PRESSURE

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

SINGLE REGULATOR—DUAL PRESSURE

Pressure supplied to the base or manifold is separated in the regulator block by a 3/8" pipe plug, allowing line pressure to flow through a by-pass plate mounted opposite the regulator. This mode permits line pressure to one cylinder port and regulated pressure to the other.

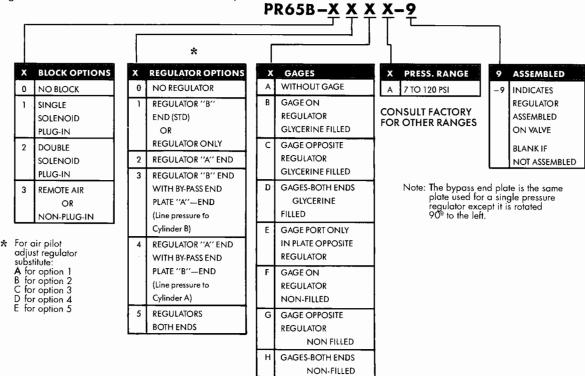
DUAL REGULATOR—DUAL PRESSURE

Pressure supplied from each regulator is isolated in the block by a 3/8" pipe plug. Regulated pressure from "A" regulator supplies cylinder port "B". Regulated pressure from "B" regulator supplies cylinder port "A". It should be noted that energizing valve operator A directs flow to cylinder A and energizing valve operator B directs flow to cylinder B.

HOW TO ORDER

Use standard 6500 Series numbers from page D25 followed by regulator model number from the table below. (Specify assembled or use -9 after regulator number to indicate assembled on valve.)

D27

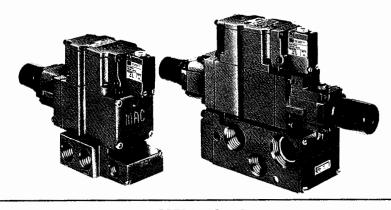


ORDER EXAMPLES: PR65B-01AA = Regulator Only-Without Gage

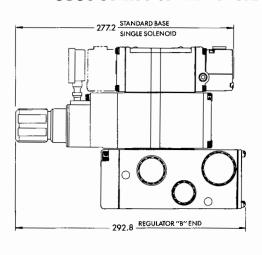
PR65B-1AAA = Single Solenoid plug-in, air pilot adjust regulator on "B" End without gage, 7-120 PSI

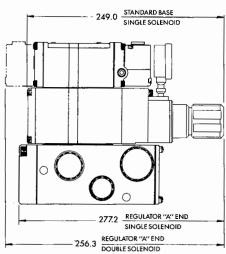
PR65B-21BA = Double Solenoid plug-in Regulator on "B" End Glycerine Filled Gage on Regulator, 7-120 PSI

6500 SERIES REGULATORS

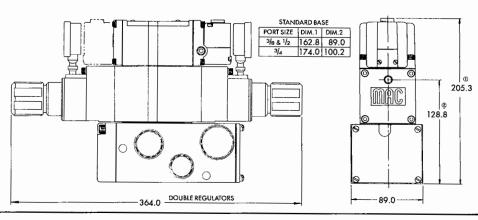


DIMENSIONS 6500 SERIES WITH "SANDWICH" REGULATORS

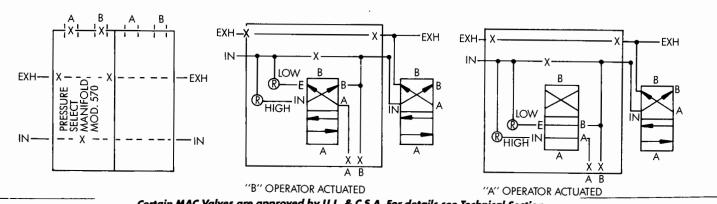




D28



SELECTOR MANIFOLD SCHEMATIC (MOD. 570A)



Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.



Patents and Patents Pending

4-WAY, SOLENOID PILOT AND REMOTE AIR PILOT OPERATED, PLUG-IN SUB-BASE MOUNTED 3/4"-1" INDIVIDUAL BASE 3/4"-1" - 1 1/4" MANIFOLD BASE C_y UP TO 9.6

PRESSURE RANGE: VACUUM TO 150 PSI

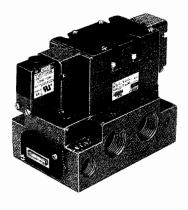
6600 SERIES - SOLENOID PILOT OPERATED VALVES

SGL. OPERATOR SPRING RETURN	DBL. OPERATOR 2-POSITION	SINGLE	DBL. OPER. 3-POS. CLOSED CENTER	DBL. OPER. 3-POS. OPEN CENTER	DBL, OPER. 3-POS. PRESSURE CENTER
NI EXH	CYL.	PRESSURE INTERNAL PILOT VALVES NPTF PORTS	CYL WEST		
6611A-000-PM-111DA	6621A-000-PM-111DA	Valve Less Base	6631A-000-PM-111DA	6641A-000-PM-111DA	6651A-000-PM-111DA
6611A-211-PM-111DA	6621A-211-PM-111DA	3/4" Base	6631A-211-PM-111DA	6641A-211-PM-11DA	6651A-211-PM-111DA
6611A-311-PM-111DA	6621A-311-PM-111DA	1" Base ●	6631A-311-PM-111DA	6641A-311-PM-111DA	6651A-311-PM-111DA
6611A-411-PM-111DA	6621A-411-PM-111DA	3/4" Manifold	6631A-411-PM-111DA	6641A-411-PM-111DA	6651A-411-PM-111DA
6611A-511-PM-111DA	6621A-511-PM-111DA	1" Manifold	6631A-511-PM-111DA	6641A-511-PM-111DA	6651A-511-PM-111DA
6611A-611-PM-111DA	6621A-611-PM-111DA	1¼" Manifold	6631A-611-PM-111DA	6641A-611-PM-111DA	6651A-611-PM-111DA

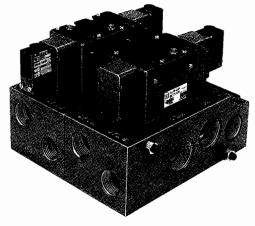
Valve codes shown are for 120/60, 110/50 coils, non-locking manual operators and muffled pilot. For other options see opposite page.

Denotes models not available for bottom ports.

D29

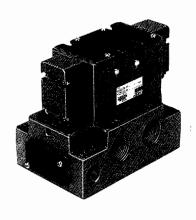


6611A-312-PM-111DA



1 X 6613A-511-PM-111DA 1 X 6623A-511-PM-111DA

- * 1 X N-66002-01 (FASTENING KIT)
- * No end plates required for 6600 manifolds. Use #N-66002-01 fastening kit.



6622A-341-RA

6600 SERIES - REMOTE AIR PILOT OPERATED VALVES

SGL. PILOT SPRING RETURN	DBL, PILOT 2-POSITION	MOUNTING/ SINGLE	DBL. PILOT 3-POS. CLOSED CENTER	DBL. PILOT 3-POS. OPEN CENTER	DBL. OPER. 3-POS. PRESSURE CENTER
		PRESSURE VALVES NPTF PORTS	A WE THE THE THE THE THE THE THE THE THE TH	CYL B A AWD W B IN EXH	AWE THE TWO IN EXH
6612A-000-RA	6622A-000-RA	Valve Less Base	6632A-000-RA	6642A-000-RA	6652A-000-RA
6612A-231-RA	6622A-241-RA	¾" Base	6632A-241-RA	6642A-241-RA	6652A-241-RA
6612A-331-RA	6622A-341-RA	1″ Base ●	6632A-341-RA	6642A-341-RA	6652A-341-RA

For manifold bases, use the solenoid manifold base with the remote air pilot, pilot operator (see page **T-4**) Example: 6622A-531-PM-RA11.

REMOTE AIR PILOT, PILOT OPERATED VALVES

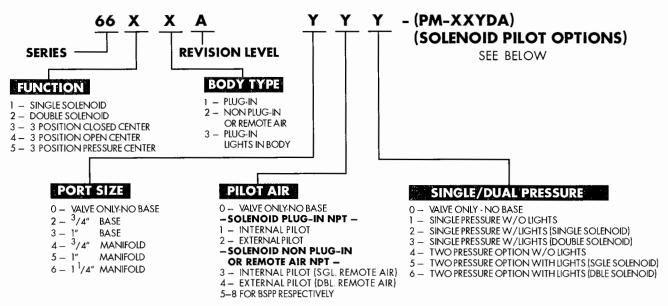
These valves have the same features as the remote air pilot operated models but in addition have the following advantages: Ability to use a pilot signal pressure different from the main valve pressure. Pilot signal can be from 20 to 150 PSIG, regardless of main valve pressure. See Page **T-4** to order.

Denotes models not available for bottom ports.



BODY/BASE OPTIONS

HOW TO ORDER

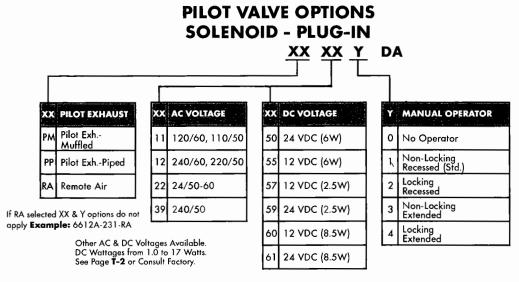


NOTE:

- The valve less base is always the same for internal or external pilot. These options are effected in the base or the manifold. 1
- Bottom ports: Refer to modification table below.
- To order bases or manifolds without the valve, choose the base or manifold from the above table and options, then add 6600A as a prefix. 3. **EXAMPLE** 6600A-212-00-11 (base with single light for 120/60 110/50).
- When ordering an external pilot connection for manifold bases, a common external pilot port is standard. One connection only is required for all the valves in the manifold whether single or double solenoid
- MANIFOLD ACCESSORIES: Inlet & Exhaust Isolator #28367. 5
- 2 position and 3 position valve bodies are not interchangeable.

		MODIFIC	CATIONS		
MOD. NO.	DESCRIPTION	MODEL AVAILABILITY	MOD. NO.	DESCRIPTION	MODEL AVAILABILITY
0002	Bottom Inlet, Exh. & Cyl. Ports (Side Ports Plugged)	³¼" only Individual Base	0210	1 ¼" Bottom Inlet	Manifold Base
0004	Full Side Porting and Additional Bottom Inlet, Exh. & Cyl. Ports	3/4" only Individual Base	0364	1 1/4" Bottom Inlet 3/4" or 1" Bottom Cyl.	Manifold Base
0112	Side Inlet & Exhaust with Bottom Cyl. Ports (Side Cyl. Ports Plugged)	34" Individual Base & 34" & 1" Manifold Base	CLSF	Class F coil option	All Voltages

TO ORDER - Add the appropriate modification number after the valve number; EXAMPLE: 6611A-211-PM-111DA MOD 0002. For additional modifications see Technical Section.





4 WAY, SOLENOID PILOT AND REMOTE AIR PILOT OPERATED PLUG-IN SUB-BASE MOUNTED

3/4", 1", 11/4", 11/2" - C_V UP TO 15.9

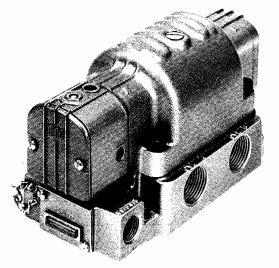
PRESSURE RANGE - VACUUM TO 150 PSI

Patents and Patents Pending

1300 SERIES-SOLENOID PILOT OPERATED VALVES

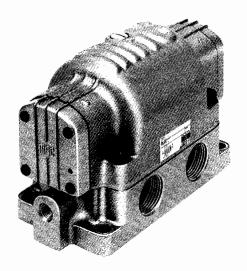
SGL. OPERATOR SPRING RETURN	DBL. OPERATOR 2-POSITION		DBL. OPER. 3-POS. CLOSED CENTER	DBL. OPER. 3-POS. OPEN CENTER
**************************************		MOUNTING PORT SIZES		
1301G-111D-1	1303G-111D-1	Valve Less Base	1307G-111D-1	1308G-111D-1
1321G-111D-1	1323G-111D-1	3⁄4″ Base ●	1327G-111D-1	1328G-111D-1
1331G-111D-1	1333G-111D-1	1" Base	1337G-111D-1	1338G-111D-1
1351G-111D-1	1353G-111D-1	1¼" Base	1357G-111D-1	1358G-111D-1
1361G-111D-1	1363G-111D-1	1½" Base	1367G-111D-1	1368G-111D-1

Valve codes shown are for 120/60, 110/50 coils, non-locking recessed manual operators. For other options see opposite page.



D31

1331G-111D-15



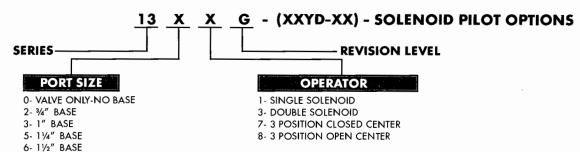
2733G-2

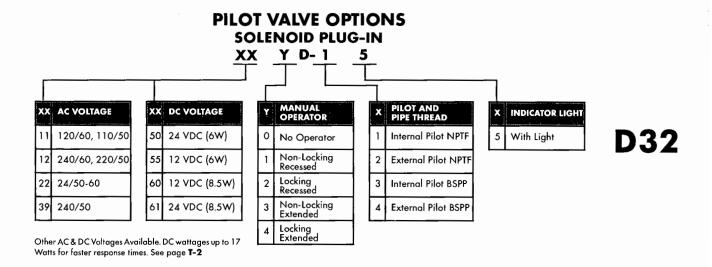
2700 SERIES-REMOTE AIR PILOT OPERATED VALVES

SGL. OPERATOR SPRING RETURN	DBL. OPERATOR 2-POSITION		DBL. OPER. 3-POS. CLOSED CENTER	DBL. OPER. 3-POS. OPEN CENTER
Me N IN	EXIL D	PORT SIZES	MI XI I W	**************************************
2701G-1	2703G-2	Valve Less Base	2707G-2	2708G-2
2721G-1	2723G-2	3⁄4″ Base ●	2727G-2	2728G-2
2731G-1	2733G-2	1" Base	2737G-2	2738G-2
2751G-1	2753G-2	1 1/4" Base	2757G-2	2758G-2
2761G-1	2763G-2	1½" Base	2767G-2	2768G-2

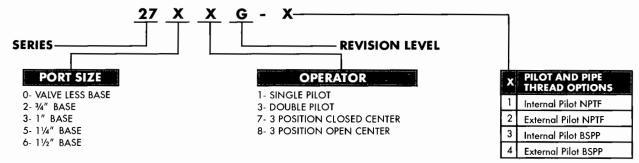
Denotes models available with optional bottom ports.

BODY/BASE OPTIONS





VALVE BODY & BASE ASSEMBLY



BOTTOM PORTS (1300 & 2700 SERIES) available only on 3/4" valves

For bottom ports only specify MOD 0002
For side and bottom ports specify MOD 0004

EXAMPLE: 1321G-111D-1 **MOD 0002**

For additional modifications see Technical Section.

Joy 183 539K



4-WAY SOLENOID PILOT AND REMOTE AIR PILOT **OPERATED, SUB BASE MOUNTED**

1/4", 3/8", 1/2", 3/4" PORTS - C_v UP TO 6.3 PRESSURE RANGE: VACUUM TO 150 PSI

Patents and Patents Pending

MV-A1C ISO 1 MV-A2B ISO 2 MV-A3B ISO 3

MAC ISO valves are built to International Standards Organization (ISO) Std. 5599/1. They are available in 3 sizes; ISO 1, 2 & 3. To select the ISO size required, insert the appropriate ISO number in 5th position of the model code; **EXAMPLE** MV-A1C for ISO 1, MV-A2B for ISO 2 or MV-A3B for ISO 3.

Use same procedure for bases and manifolds which must be ordered separately from the table on the opposite page.

	SIN	GLE PRESSURE VA	LVES		
SGL. OPERATOR AIR/SPRING RETURN	DBL. OPERATOR 2-POSITION		DBL. OPER. 3-POS. CLOSED CENTER	DBL. OPER. 3-POS. OPEN CENTER	
14	14 4 2 12	PILOT SUPPLY	14 WE 1 2 12 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1	14 W 12 W 12 W 15 13 T 14 W 15 13 T 14 W 15 13 T 14 W 15 13 T 15 T 15	
MV-AXB-A111-PM-111JA	MV-AXB-A211-PM-111JA	Internal Pilot	MV-AXB-A312-PM-111JA	MV-AXB-A311-PM-111JA	
MV-AXB-A121-PM-111JA	MV-AXB-A221-PM-111JA	External Pilot	MV-AXB-A322-PM-111JA	MV-AXB-A321-PM-111JA	
	DU	AL PRESSURE VAL	VES		
SGL. OPERATOR AIR/SPRING RETURN	DBL. OPERATOR 2-POSITION		DBL. OPER. 3-POS. PRESSURE CENTER		
14 7 12 12 5 1 3	14 7 12 12 12 513	PILOT SUPPLY	14 WD		
MV-AXB-A131-PM-111JA	MV-AXB-A231-PM-111JA	Int. Pilot-From Port 3	MV-AXB-A331-PM-111JA	MV.A1C	-A111-PM-111JA VAL
AV-AXB-A135-PM-111JA	MV-AXB-A232-PM-111JA	Int. Pilot-From Port 5	MV-AXB-A332-PM-111JA		231 BASE
AV-AXB-A141-PM-111JA	MV-AXB-A241-PM-111JA	External Pilot	MV-AXB-A341-PM-111JA		
4 — T 12 12	14 — T 12 12 14 15 13 15 15 15 15 15 15 15 15 15 15 15 15 15				
MV-AXB-A161-PM-111JA	MV-AXB-A261-PM-111JA	Universal Spaol External Pilot			

D33

manual operators mulfled pilot and square DIN connectors.

Valve series is available as a MULTI-PRESSURE PAK® assembly. See Section G.



1 X MV-A2B-B221 VALVE

1 X MV-A2B-A211-PM-111JE VALVE

1 X MV-A2B-A111-PM-111JE VALVE

3 X MM-A2B-231-MANIFOLD

1 X N-63002 FASTENING KIT

REMOTE AIR PILOT OPERATED VALVES LESS BASE (FOR BASES SEE OPPOSITE PAGE)

	SIN	IGLE PRESSURE VAI	VES	
SGL. OPERATOR AIR/SPRING RETURN	DBL. OPERATOR 2-POSITION		DBL. OPER. 3-POS. CLOSED CENTER	DBL. OPER. 3-POS. OPEN CENTER
14 12 5 1 3	14 	PILOT SUPPLY	14 W 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	14 4 2 12
MV-AXB-B111	_	Int. Pilot-For Air/Spg.	_	_
MV-AXB-B121	MV-AXB-B221	External Pilot	MV-AXB-B322	MV-AXB-B321
	DU	IAL PRESSURE VAL	/ES	
SGL. OPERATOR AIR/SPRING RETURN	DBL. OPERATOR 2-POSITION		DBL. OPER. 3-POS. PRESSURE CENTER	
14 12 12 12 12 5 1 3	14 2 12 513	PILOT SUPPLY	14 W 12 W	
MV-AXB-B131	_	Int. Pilot-For Air/SpgPort 3	-	
MV-AXB-B135		Int. Pilot-For Air/SpgPort 5		MV-A3B-B1
MV-AXB-B141	MV-AXB-B241	Externol Pilot	MV-AXB-B341	MB-A3B-22



HOW TO ORDER

SOLENOID PILOT VALVE OPTIONS:

<u>XX - XX Y ZZ</u>

MV-A1C ISO 1 MV-A2B ISO 2 MV-A3B ISO 3

						Ц	$\overline{}$		٦	141 A - W
XX PILOT EXHAUST	x	X AC VOLTAGE		Y	MANUAL OPERATORS			EXTERNAL PLUG-IN	77	ENCLOSURE
PM Pilot ExhMuffled	ī	1 120/60, 110/50]	0	No Operator		JA	Square without Light (on Sol.)	AA	JIC w/½" NPS Conduit
PP Pilot ExhPiped	ī	2 240/60, 220/50		1	Non-Locking Recessed (Std.)		JB	Rectangular without Light (on Sol.)	ва	Grommet
CM CNOMO Pilot Exh. Muffled	3	9 240/50		2	Locking Recessed		JC	Square with Light (on Sol.)	CA	Conduit 1/2" NPS
CP CNOMO Pilot Exh. Piped	×	X DC VOLTAGE		3	Non-Locking Extended		JD	Rectangular with Light (on Sol.)	CC	Conduit 1/2" NPT (CSA Threads)
The C.N.O.M.O. pilot is built to the European	5	0 24 VDC (6W)]	4	Locking Extended		JE	Square without Light (on body)	_	
C.N.O.M.O. pilot nterface standard.	5	5 12 VDC (6W)					JF	Rectangular without Light (on body)		
	5	7 12 VDC (2.5W)					JG	Square with Light (on body)		
	5	9 24 VDC (2.5W)					JH	Rectangular with Light (on body)		
	6	0 12 VDC (8.5W)	ı	DCV	ir AC & DC Avoilable. Vottage from 1.0 to 17 Watts Catalog Poge T-2 or					
	6	1 24 VDC (8.5W)			sult Factory.					

BASE TABLE

ISO TYPE	PORT SIZE	INDIVIDI	UAL BASE	MANIFO	LD BASE
		BSPP	NPTF	BSPP	NPTF
ISO 1	1/4"	MB-A1C-121	MB-A1C-221	MM-A1C-121	MM-A1C-221
	3/8″	MB-A1C-131	MB-A1C-231	MM-A1C-131	MM-A1C-231
ISO 2	3/8″	MB-A2B-121	MB-A2B-221	MM-A2B-121	MM-A2B-221
	1/2"	MB-A2B-131	MB-A2B-231	MM-A2B-131	MM-A2B-231
ISO 3	1/2"	MB-A3B-121	MB-A3B-221	MM-A3B-121	N/A
	3/4"	MB-A3B-131	MB-A3B-231	MM-A3B-131	N/A

For manifold bases a common external pilot port is available. One connection only is required for all valves in the manifold whether single or double solenoid. Bottom ports are also available; consult factory for ordering information for these options.

MANIFOLD FASTENING KIT — For each gang, one kit is required. To order specify part number **N-63002.**

MODIFICATIONS:

CLASS F — High temperature AC and DC coil option.

TO ORDER — Add MOD CLSF after the valve number; EXAMPLE: MV-A1C-A111-PM-111CA MOD CLSF.

For additional modifications see Technical Section.

Manifold Accessories: Inlet & Exhaust Isolators - (ISO 1) #32835 (ISO 2) #32839

SPECIAL APPLICATION INSTRUCTIONS:

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

EXTERNAL PILOT APPLICATIONS — An External Pilot Supply is only required when the main valve pressure is less than 25 PSI on single operator or 3 position (solenoid or remote air) or 10 PSI on double solenoid 2 position valves only. In these cases, use an External Pilot model and pipe to either the "14" or "12" External Pilot Port of the valve base.

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

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

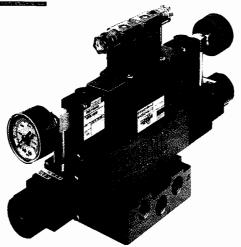
TWO PRESSURE APPLICATIONS — For Internal Pilot models specify the model number for connecting either port #3 or 5; whichever is to be the higher pressure to the Internal Pilot supply. For External Pilot models, pipe as described above for "External Pilot Application."

Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

D34

WITH SINGLE AND DUAL PRESSURE REGULATORS ISO 1 C_V up to 1.0



DUAL PRESSURE REGULATOR

OPERATING DATA

REGULATOR RANGE: 0 to 120 PSI

SINGLE REGULATOR—SINGLE PRESSURE

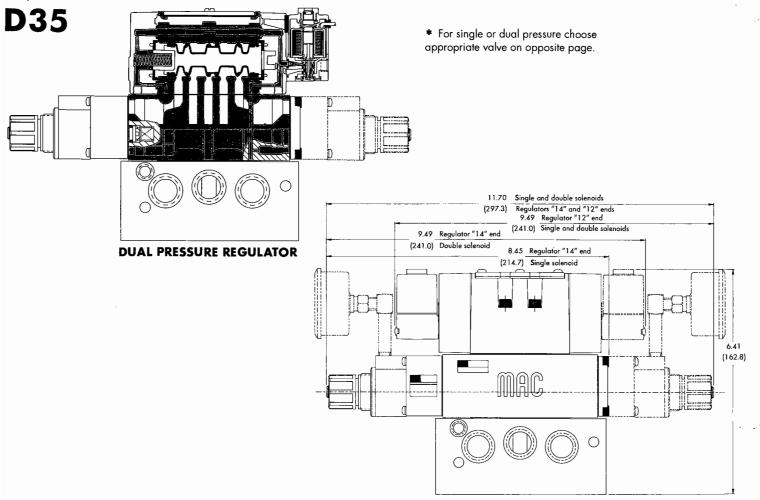
Pressure supplied to the base or manifold passes through the regulator. Regulated pressure is supplied to both cylinder ports 2 and 4.

SINGLE REGULATOR—DUAL PRESSURE *

A by-pass plate opposite the regulator permits line pressure to one cylinder port and regulated pressure to the other.

DUAL REGULATOR—DUAL PRESSURE *

Regulated pressure from "12" end regulator supplies cylinder port 2. Regulated pressure from "14" end regulator supplies cylinder port 4.

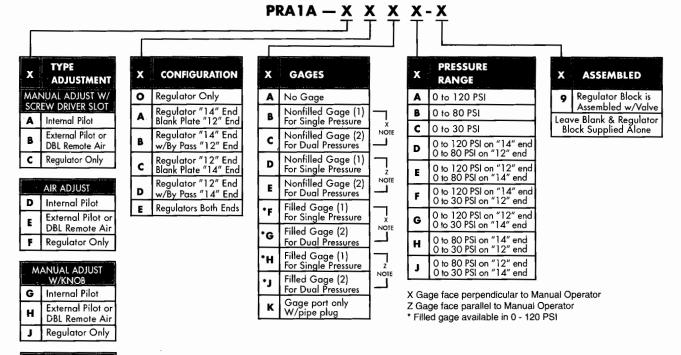


WITH SINGLE AND DUAL PRESSURE REGULATORS



Patents and Patents Pending

HOW TO ORDER



Main valve body assembly must be external pilot model. Pilots are supplied internally from primary pressure in regulator block.

Dual pressure valve must be used with dual regulator or by-pass option. Cannot field convert regulator block from Single Pressure to dual pressure. Body/Block to base mounting screw #35336.

D36

VALVE NO. SYSTEM APPLICABLE TO ISO 1, 2 & 3. FOR USE ONLY WITH PRESSURE REGULATOR

(A2B)
(A3B)

MV-A1C-X

Revision Letter

Operator

A : Solenoid B : Remote Air

manual adjust w/

SCREW DRIVER SLOT W/LOCK NUT

Internal Pilot

External Pilot or

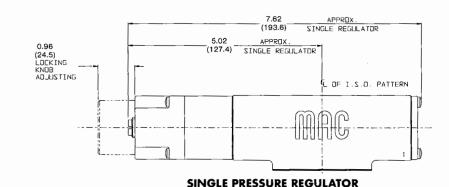
DBL Remote Air Regulator Only

- 1 -	B - Remote Air
2 F	os. Single Operator, Single Pressure
151	With air spring return, external pilot
152	With air only return, external pilot
154	With remate air return, external pilat
2 -F	os. Single Operator, Dual Pressure
141	With air spring return, external pilot
142	With air anly return, external pilot
144	With remate air return, external pilot
2 -F	os. Double Operator, Single Pressure
251	External pilat
2 -F	os. Double Operator, Dual Pressure
241	External pilat
3 -F	os. Double Operator, Single Pressure
351	Open center, external pilat
352	Closed center, external pilot
3 -F	os. Double Operator, Two Pressure
341	Pressure center, external pilat

EXAMPLE: MV-A1C-A151-PM111JA-9 (Valve) PRA1A-AABA-9 (Regulator block)

MM-A1C-231-9 (Manifold base)
Single operator, Single pressure, external pilot with single

Single operator, Single pressure, external pilot with single regulator on 3/8" manifold base.



0.45
(11.5)
EXTENDED LOCKING

0.14
(3.5)

10.03
APPROX.

10.03
APPROX.

254.7)
DOUBLE REGULATOR

DUAL PRESSURE REGULATOR

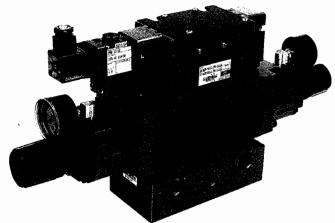
MAC ISO SERIES 2 & 3

Patents and Patents Pending



SINGLE PRESSURE REGULATOR

WITH SINGLE AND DUAL PRESSURE REGULATORS ISO 2 C_V up to 2.3 ISO 3 C_V up to 5.4



DUAL PRESSURE REGULATOR

OPERATING DATA

REGULATOR RANGE: 7 to 120 PSI

SINGLE REGULATOR—SINGLE PRESSURE *

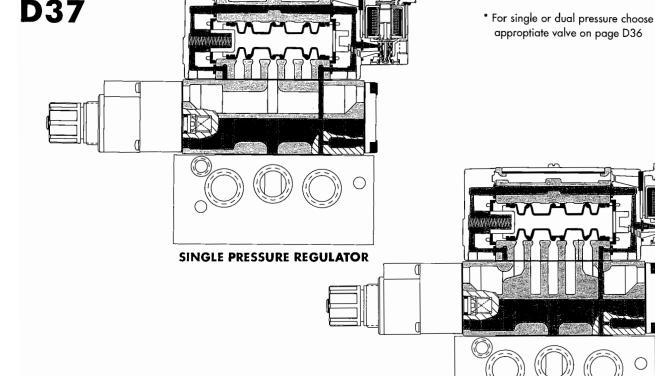
Pressure supplied to the base or manifold passes through the regulator. Regulated pressure is supplied to both cylinder ports 2 and 4.

SINGLE REGULATOR—DUAL PRESSURE*

A by-pass plate opposite the regulator permits line pressure to one cylinder port and regulated pressure to the other.

DUAL REGULATOR—DUAL PRESSURE*

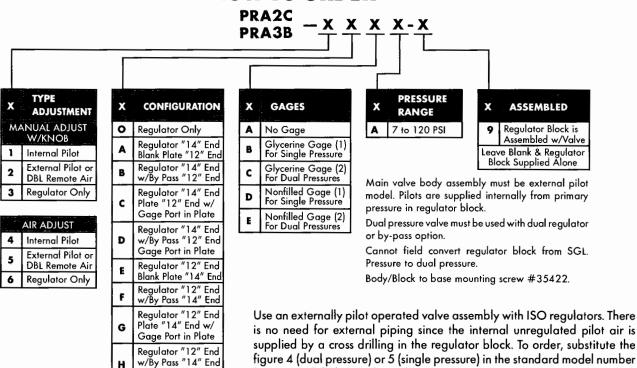
Regulated pressure from "12" end regulator supplies cylinder port 2. Regulated pressure from "14" end regulator supplies cylinc port 4.



DUAL PRESSURE REGULATOR

WITH SINGLE AND DUAL PRESSURE REGULATORS

HOW TO ORDER



(see page D36) as indicated below:

MV-AXB-XX4X-XX-XXXZZ

5

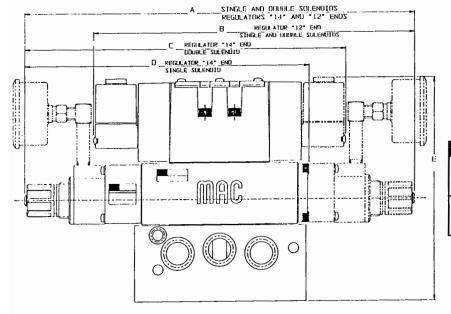
EXAMPLE: MV-A2B-A141-PM-111JA (Sgl. operator, dual

pressure, extnl. pilot)

D38

EXAMPLE: MV-A2B-A151-PM-111JA

(Sgl. operator, sgl. pressure, extnl. pilot)



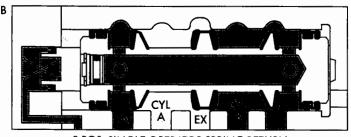
Gage Port in Plate

Regulators Both Ends

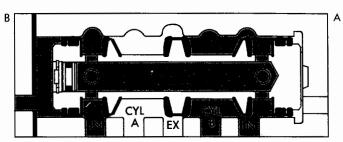
	A	В	C	D	E
ISO 2	12.40	10.27	10.27	9.06	7.24
	(315.4)	(260.8)	(260.8)	(230.1)	(183.9)
ISO 3	16.06	12.74	12.74	11.46	CONSULT
	(408.0)	(323.6)	(323.6)	(291.0)	FACTORY

SPOOL CONFIGURATIONS

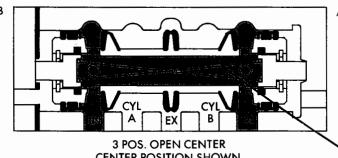
Α



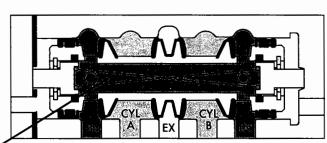
2 POS. SINGLE OPERATOR SPRING RETURN **B ACTUATED SHOWN**



2 POS. DOUBLE OPERATOR **B ACTUATED SHOWN**



CENTER POSITION SHOWN



3 POS. CLOSED CENTER CENTER POSITION SHOWN

AIR/SPRING CENTERING

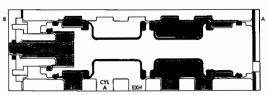
D39

6200 & 6300 SERIES

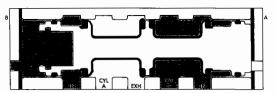
Pressure center spool available for 6300 series. Spool configurations similar to 6500 & 6600 series shown below.

= EXHAUST

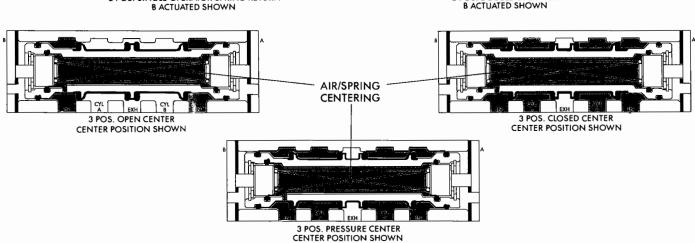
= PRESSURE



2 POS. SINGLE OPERATOR SPRING RETURN



2 POS. DOUBLE OPERATOR B ACTUATED SHOWN

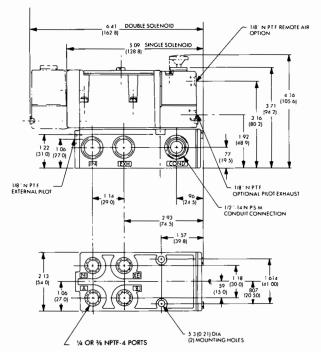


6500 & 6600 SERIES

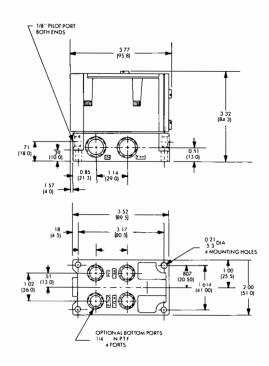
6200 SERIES

INDIVIDUAL BASES

SOLENOID PILOT OPERATED OR REMOTE AIR PILOT, PILOT OPERATED

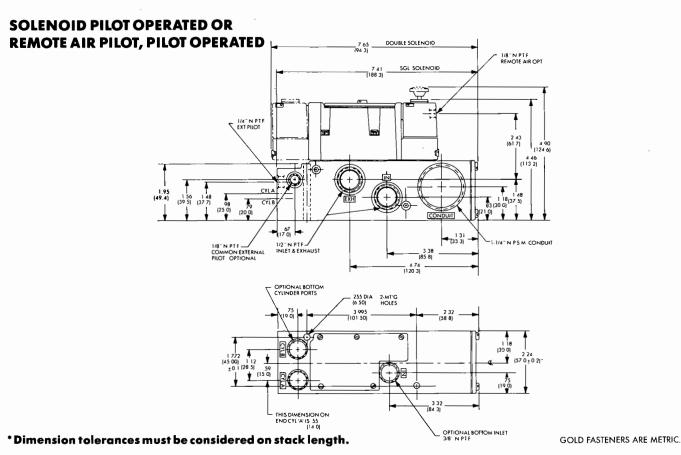


REMOTE AIR PILOT



MANIFOLD BASE

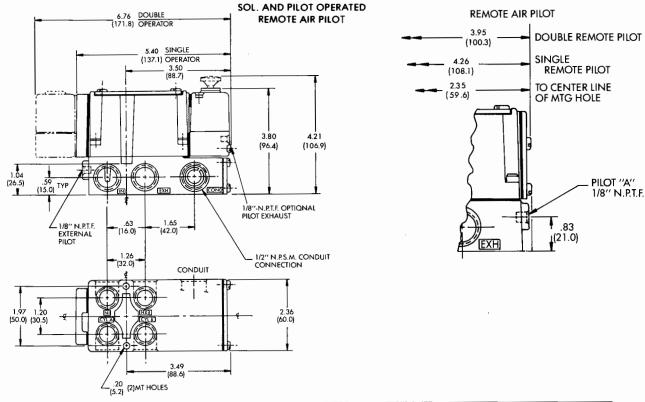
D40



DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

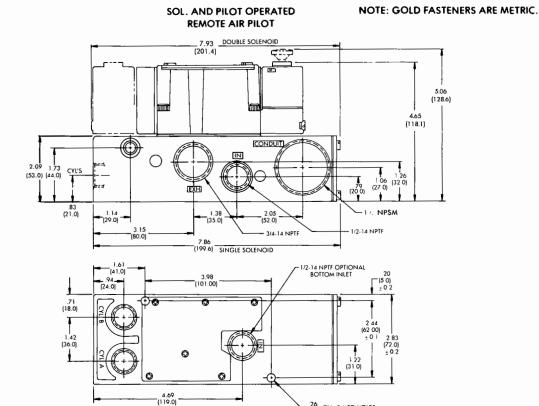
6300 SERIES

INDIVIDUAL BASE



D41

MANIFOLD BASE



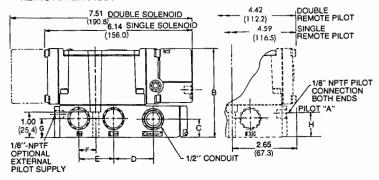
DIMENSION TOLERANCES MUST BE CONSIDERED ON STACK LENGTH.
DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

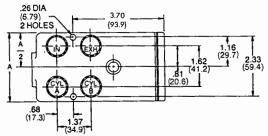
Individual Base

6500 SERIES

SOL. OR PILOT OPERATED REMOTE AIR PILOT

REMOTE AIR PILOT





STANDARD BASE

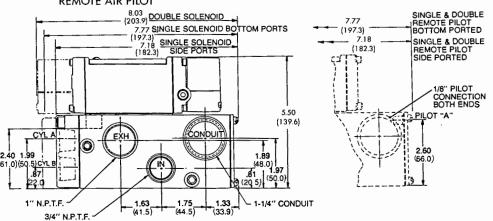
			,,,,,,,,,							
PORT		DIMENSIONS								
SIZE	Α	В	С	D	E	F	G	н	J	
3/8" & 1/2"	2.74 (69.6)	3.83 (97.4)	.72 (18.3)	1.60 (40.6)	1.42 (36.0)	.70 (17.9)	.75 (19.0)	.93 (23.6)	1.00 (25.4)	
3/4"	3.72 (94.5)	4.30 (109.3)	.68 (1 <i>7.</i> 3)	1.84 (46.7)	1.58 (40.1)	.76 (19.2)	.82 (20.8)	1.41 (35.9)	1.44 (36.6)	

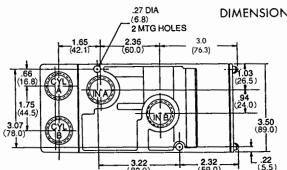
D42

Manifold Base

SOL. OR PILOT OPERATED REMOTE AIR PILOT

REMOTE AIR PILOT





DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

GOLD FASTENERS ARE METRIC

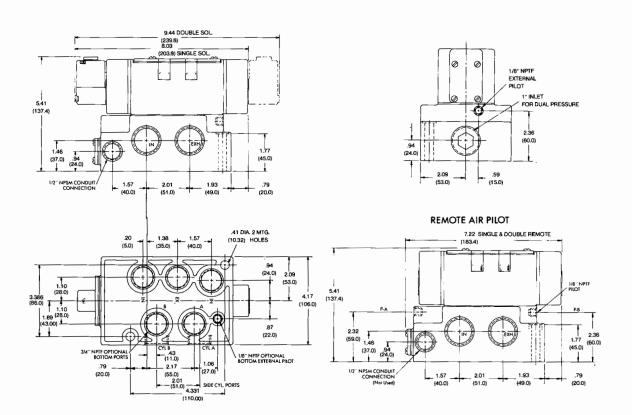
DIMENSION TOLERANCES MUST BE CONSIDERED ON STACK LENGTH.

Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

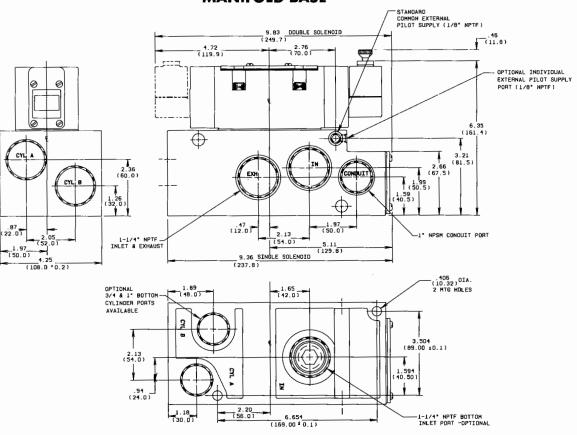
6600 SERIES

INDIVIDUAL BASE



D43

MANIFOLD BASE

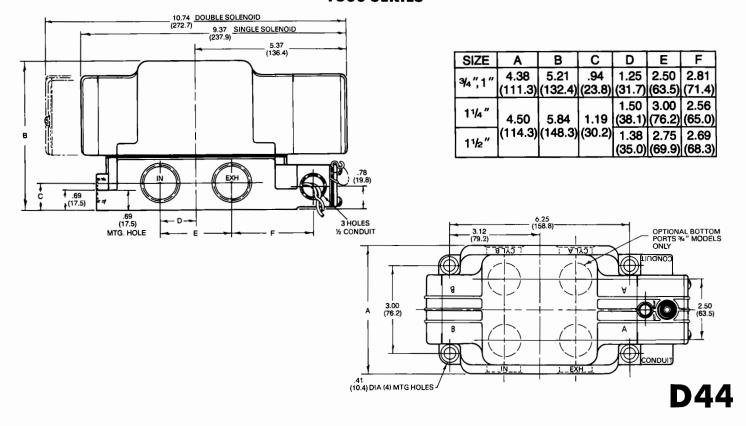


DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM) BOTTOM VIEW

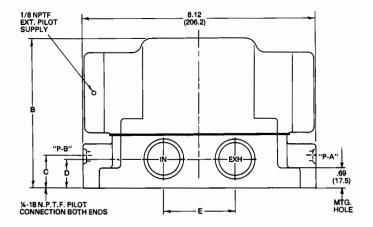
DIMENSIONS

1300 & 2700 SERIES

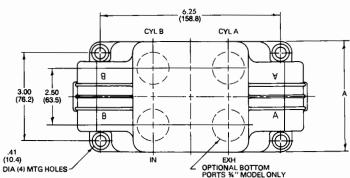
1300 SERIES



2700 SERIES



SIZE	Α	В	C	D	E
3/4" 1"	3.75 (95.3)	5.21 (132.3)	1.12 (28.4)	1.00 (25.4)	2.50 (63.5)
11/4"	4.50	5.84	.94	1.19	3.00 (76.2)
11/2"	(114.3)	(148.3)	(23.9)	(30.2)	2.75 69.9

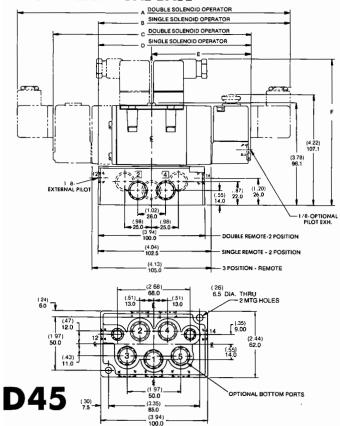


DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

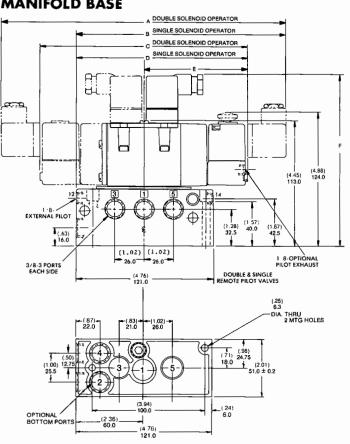
DIMENSIONS

ISO SERIES 1, 2 & 3

ISO 1 INDIVIDUAL BASE

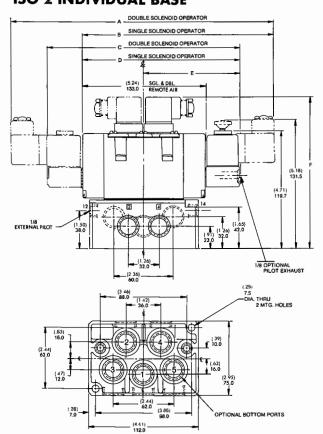


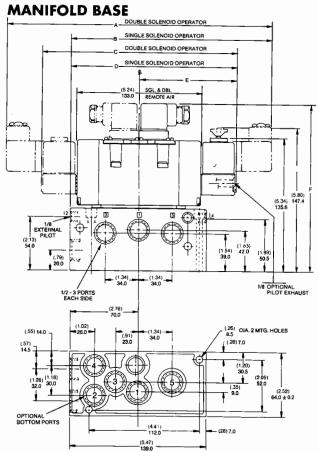
MANIFOLD BASE



DIMENSIONS SHOWN IN BRACKETS ARE INCHES

ISO 2 INDIVIDUAL BASE

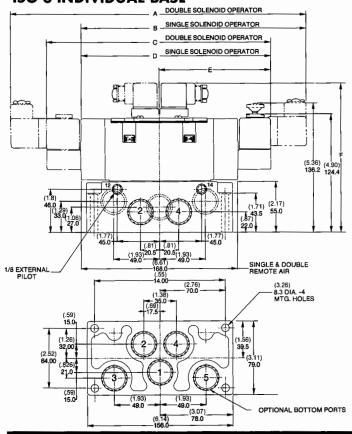




Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

ISO SERIES 1, 2 & 3

ISO 3 INDIVIDUAL BASE



ISO 3 INDIVIDUAL BASE

TYPE		A	В	C	D	3	F
PLUG-II	SQUARE PLUG-IN (JA & JC)		(9.74) 247.3	_	-	-	1
PLUG-II	RECTANGULAR PLUG-IN (JB & JD)		(10.19) 258.8	,	-	_	-
SQUARE	트딩	-	ı	(9.44) 239.8	(8.03) 203.9	(4.72) 119.9	(6.32) 160.5
RECT.	JF JH	1	ı	(9.44) 239.8	(8.03) 203.9	(4.72) 119.9	(6.55) 166.3
GROMM BA	ET	ı	ı	(9.44) 239.8	(8.03) 203.9	(4.72) 119.9	ı
½ CONDUIT CA & CC		(10.85) 275.6	(8.73) 221.8	-	-	- 1	_
JIC ENCLOSU AA	JRE	(11.96) 303.8	(9.29) 235.9		ı	_	(5.55) 141.0

DIMENSIONS SHOWN IN BRACKETS ARE INCHES

D46

ISO 1 MANIFOLD BASE

TYPE	A	В	С	D	E	
SQUARE PLUG-IN (JA & JC)	(10.69) 271.6	(7.71) 195.8	-	-	1	_
RECTANGULAR PLUG-IN (JB & JD)	(1 1.60) 294.6	(8.16) 207.3	1	- 1	-	
RECTANGULAR PLUG-IN (JF & JH)	-	-	(7.28) 184.8	(6.00) 1 <i>5</i> 2.4	(3.64) 92.4	(6.10) 154.9
GROMMET BA	1	1	(7.28) 184.8	(6.00) 152.4	(3.64) 92.4	-
½ CONDUIT CA & CC	(8.69) 220.6	(6.70) 1 <i>7</i> 0.3			1	-
JIC ENCLOSURE AA	(9.80) 248.8	(7.26) 184.4	_	-	_	(5.10) 129.6

ISO 2 INDIVIDUAL BASE

TYPE		A		C	D	E	F
SQUAR PLUG-II (JA & JC	٧	(11.48) 291.6	(8.36) 212.3	1	1	ı	ı
RECTANGULAR PLUG-IN (JB & JD)		(12.39) 314.6	(8.81) 223.8	ı	. I	ı	ı
SQUARE PLUG-IN-	JE JG	ı	1	(8.06) 204.8	(6.65) 168.9	(4.03) 102.4	(6.13) 155.8
RECT.	JF JH	-	-	(8.06) 204.8	(6.65) 168.9	(4.03) 102.4	(6.36) 161.6
GROMM BA	ET	-	-	(8.06) 204.8	(6.65) 168.9	(4.03) 102.4	1
½ COND CA & C		(9.47) 240.6	(7.35) 186.8	1	ı	1	1
JIC ENCLOSI AA	JRE	(10.58) 268.8	(7.91) 200.9	ı		ı	(5.36) 136.3

ISO 1 INDIVIDUAL BASE

TYPE	A	В	C	D		F
SQUARE PLUG-IN (JA & JC)	(10.69) 271.6	(7.31) 185.8		_	ı	-
RECTANGULAR PLUG-IN (JB & JD)	(11.60) 294.6	(7.77) 197.3	_	_	1	-
RECTANGULAR PLUG-IN (JF & JH)	. 1	_	(7.28) 184.8	(5.60) 1 42.4	(3.64) 92.4	(5.44) 138.1
GROMMET BA	ı	1	(7.28) 184.8	(5.60) 142.4	(3.64) 92.4	1
½ CONDUIT CA & CC	(8.69) 220.6	(6.31) 160.3	ı	ı	ı	ı
JIC ENCLOSURE AA	(9.80) 248.8	(6.87) 174.4	_	_	_	(4.44) 112.7

ISO 2 MANIFOLD BASE

				-	A		
TYPE		Α	В	C	D	Ξ	F
PLUG-II	SQUARE PLUG-IN (JA & JC)		(8.46) 214.8	ı	١	1	-
PLUG-II	RECTANGULAR PLUG-IN (JB & JD)		(8.91) 226.3	1	1	ı	ı
SQUARE PLUG-IN-	JE JG	1		(8.06) 204.8	(6.75) 171.4	(4.03) 102.4	(6.76) 171.6
RECT.	JF JH	-	ı	(8.06) 204.8	(6.75) 171.4	(4.03) 102.4	(6.98) 177.4
GROMM BA	ET		-	(8.06) 204.8	(6.75) 171.4	(4.03) 102.4	
½ COND CA & C		(9.47) 240.6	(7.45) 189.3	_	_	_	_
JIC ENCLOSURE AA		(10.58) 268.8	(8.01) 203.4	_	_	_	(5.96) 151.4



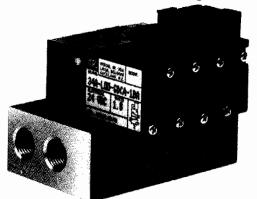
INDEX TO SECTIONS "E", "F" AND "G"

CIRCUIT BAR® CONFIGURATIONS PAGE 10MM 34 SERIES E1 - E6 10MM 44 SERIES E7 - E12 35 SERIES E13 - E14 45 SERIES E15 - E16 35/45 SERIES WITH COMMON CONDUIT (ECC) E17 - E18 DIMENSIONS FOR ECC & ECD E19 - E20 35/45 SERIES WITH COMMON CONDUIT (ECD & ECE) E21 - E22 DIMENSIONS FOR ECE E23 - E24 52 SERIES E25 - E26 DIMENSIONS FOR CBM & CBP E27 - E28 400 SERIES E29 - E33 800 SERIES COMMON INLET BAR WITH INLET SHUT-OFF E34 800 SERIES WITH 3 COMMON PORTS E35 92 SERIES E36 - E37
MAC SPECIALTY VALVES
125/250/500 SERIES
MAC CRECIAL ACCEMBLIES
MAC SPECIAL ASSEMBLIES MULTI-PRESSURE PAK® (82, 6300, 6500, ISO 1 & 2) G1 -G4 PRESS FEED ASSEMBLY
CIRCUIT BAR®
CIRCUIT BAR® IS AN EXTRUDED BLOCK OF ALUMINUM WITH PNEUMATIC CIRCUITS MACHINED RIGHT IN THE BAR. THE DESIGN OF THESE CIRCUITS CAN BE VERY SIMPLE OR COMPLEX DEPENDING UPON THE REQUIREMENTS OF THE APPLICATION. CIRCUIT BARS® ARE A MEANS BY WHICH INDIVIDUAL COMPONENTS (i.e. VALVES, REGULATORS AND FLOW CONTROLS) COMPRISING A CIRCUIT, CAN BE COMBINED INTO ONE EXTRUDED CIRCUIT BAR®. THE CIRCUIT BAR® WILL ELIMINATE EXTRA PIPING AND FITTINGS, AS WELL AS SAVING SPACE AND MONEY.

CONTACT YOUR LOCAL MAC DISTRIBUTOR FOR MORE INFORMATION AS TO HOW MAC'S CIRCUIT BAR® CAN SATISFY YOUR NEEDS.

MAC 10MM 34 SERIES

Patents and Patents Pending



HIGH PROFILE BAR

2 & 3 WAY, DIRECT SOLENOID

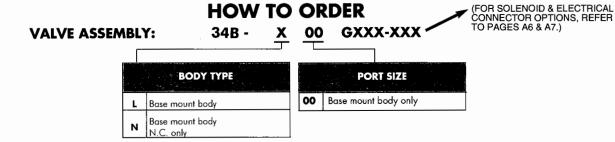
OPERATED VALVE

MOUNTED ON CIRCUIT BAR®

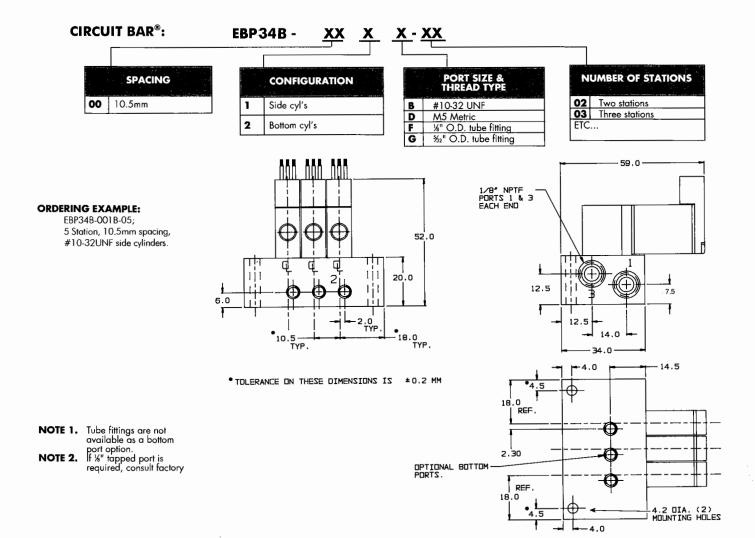
#10-32 OR M5 PORTS, C, UP TO 0.11
PRESSURE RANGE: VACUUM TO 120 PSI

OPERATIONAL BENEFITS

- · Adjustable inlet seat to control poppet stroke; maximizes shifting forces
- Bonded balanced poppet for high flow, repeatability and consistent operation
- New patented MACSOLENOID® with "oval" shaped armature and metal solenoid cover, provides more force through more core iron.
- Short stroke direct operated poppet valve, no small pistons and no minimum operating pressure.
- Strong return spring (true spring return operator).
- Every valve calibrated for flow (for a given wattage).
- Manifold mounted 34 Series valves can be mounted on the high profile bar.
- Cylinder ports are located in the circuit bar[®]. Valves can be replaced without disturbing piping.
- Inlet and exhaust isolation available on request.



E-1



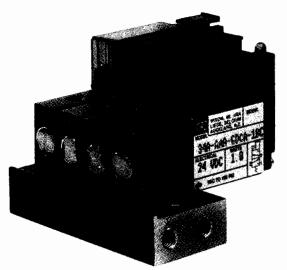
2 & 3 WAY, DIRECT SOLENOID OPERATED VALVE

MOUNTED ON CIRCUIT BAR®

#10-32 or M5 PORTS-C_v UP TO 0.11 PRESSURE RANGE: VACUUM TO 120 PSI



Patents and Patents Pending

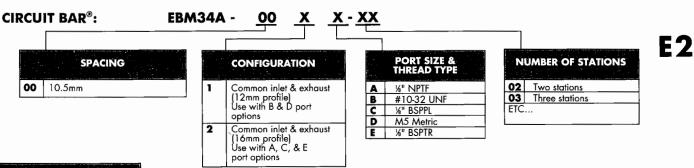


OPERATIONAL BENEFITS

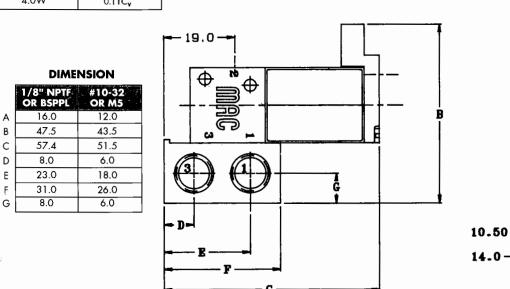
- Adjustable inlet seat to control poppet stroke; maximizes shifting forces
- Bonded balanced poppet for high flow, repeatability and consistent operation
- New patented MACSOLENOID® with "oval" shaped armature and metal solenoid cover, provides more force through more core iron.
- Short stroke direct operated poppet valve, no small pistons and no minimum operating pressure.
- Strong return spring (true spring return operator).
- Every valve calibrated for flow (for a given wattage).
- Standard in-line model 34 Series can be mounted on the low profile bar.
- Inlet and exhaust isolation available on request.
- For complete valve information, refer to pages A6 and A7.

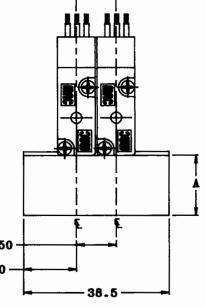
LOW PROFILE BAR

HOW TO ORDER



WATTAGE	FLOW
1.8W	0.06C _v
2.5W	0.08Cv
4.0W	0.11C;





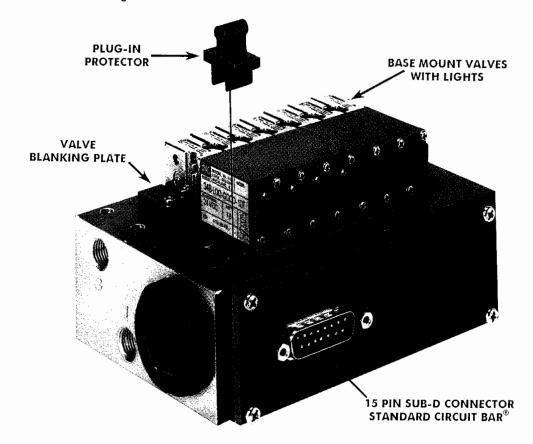
Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.



3-WAY, DIRECT SOLENOID OPERATED VALVE MOUNTED ON COMMON CONDUIT CIRCUIT BAR®

#10-32 OR M5 PORTS - C_v UP TO .10 PRESSURE RANGE: VACUUM TO 120 PSI



E3

PLUG-IN CIRCUIT BAR® WITH COMMON CONDUIT

DESIGN DESCRIPTION GENERAL:

The 34 Series ECD circuit bar [®] is machined from a single block of extruded anodized aluminum to provide a common inlet and common exhaust, as well as a common electrical conduit. This circuit bar [®] is available as a "standard" bar (fixed number of stations) or as an "add-on" style bar. The "add-on" style bar provides a means to attach additional stations as required.

ELECTRICAL:

The 34 Series Valve has a two or three pin male electrical connector that plugs into a female connector located in the circuit bar [®] Lead wires from the female connector are terminated at the optional sub-D style multi-pin connector (see photo). A modification number is required for this option. See next page under "Modifications."

VALVING:

The ECD circuit bar® will only accept a 34 Series base mount style valve. The valve is assembled to the bar with two mounting screws and a pressure seal, producing an effective seal between the valve and the bar.

PORTING:

The ECD bar has 1/8" tapped common inlet and exhaust port. There is also a 1" common conduit port. A side or bottom cylinder port can be provided as #10-32 or M5 (metric) port.

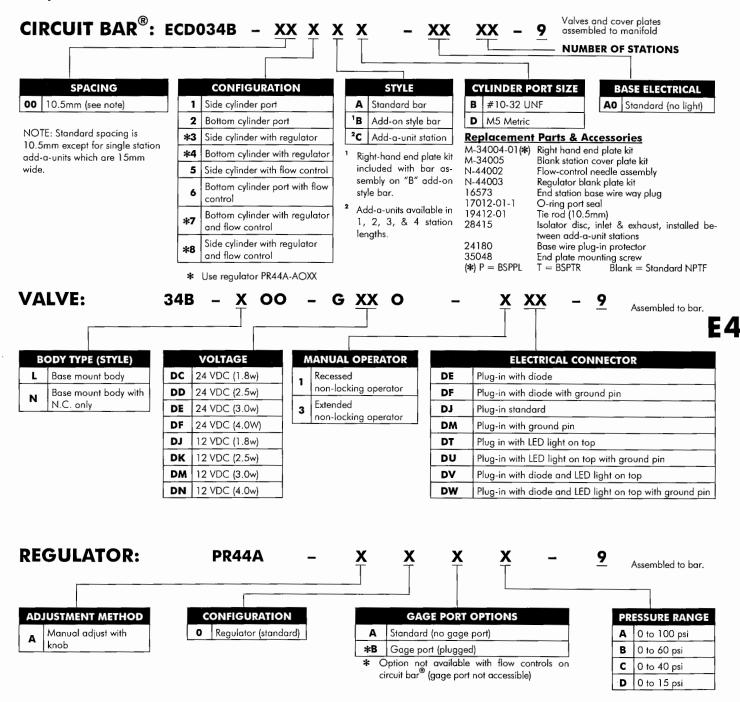
ACCESSORIES:

The 34 Series ECD circuit bar[®] can be provided with regulators, flow controls or a combination of both, whenever regulators are used, a bottom cylinder port is required.

Patents and Patents Pending

HOW TO ORDER

To be used when all stations are identical. When circuit bars [®] do not have identical stations, consult factory for special ECD number.



NOTE: Valves, regulators and circuit bar® must be ordered separately.

Ordering example:

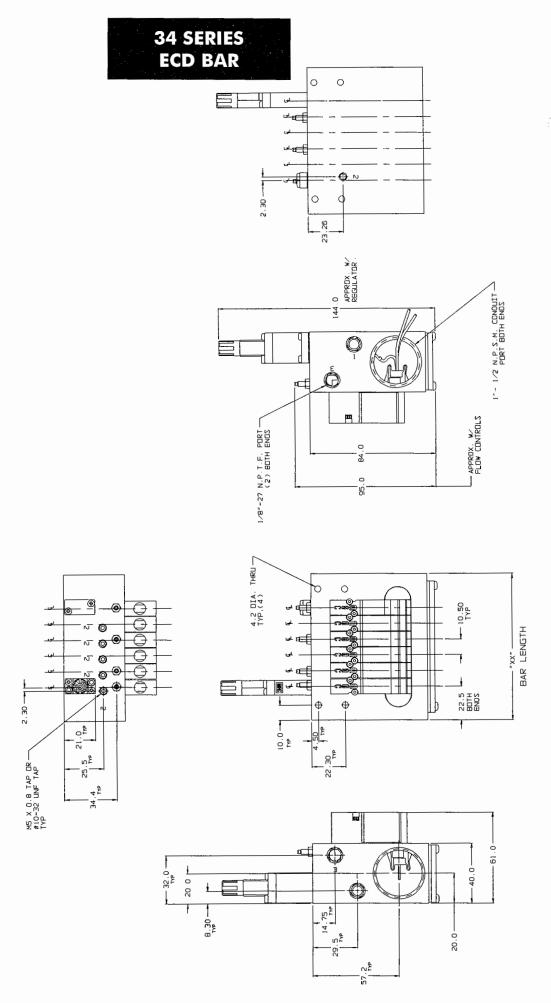
4 X 34B-L00-GDF0-1DM-9

4 X PR44A-A0AA-9

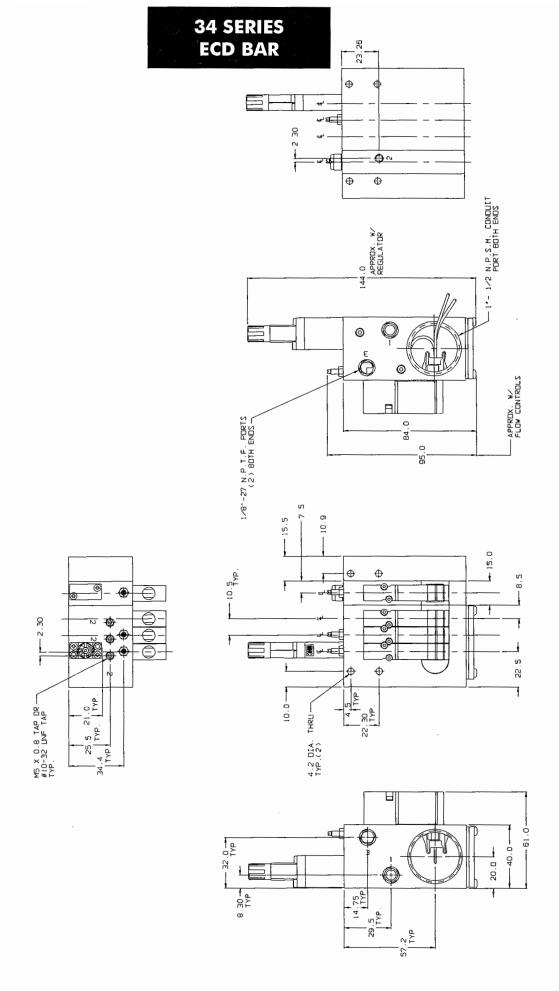
1 X ECD034B-004AB-A004-9 MOD SD09

(valve) (regulator) (circuit bar®)

MODIFICATIONS		
MOD SD09	9 pin sub D connector	
MOD SD15	15 pin sub D connector	
MOD SD25	25 pin sub D connector	





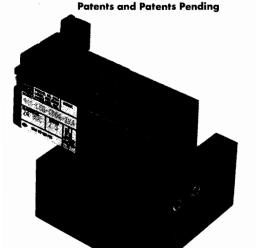


MAC 10 MM 44 SERIES

4 WAY, DIRECT SOLENOID OPERATED VALVE MOUNTED ON CIRCUIT BAR®

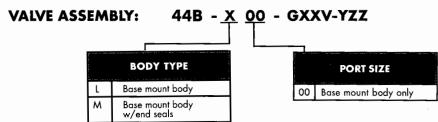
#10-32 OR M5 PORTS, C_v UP TO 0.09 PRESSURE RANGE: 0 TO 120 PSI

OPERATIONAL BENEFITS



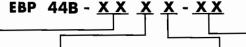
- Patented inlet seat to control poppet stroke.
- Balanced poppets, with no seals of any kind in a bore no resistance to shifting.
- New patented MACSOLENOID® with "oval" shaped armature and metal solenoid cover - provides more force through more core iron.
- Short stroke direct operated poppet valve no small pistons and no minimum operating pressure.
- Strong return spring (true spring return operator).
- Patented conical shaped exhaust retainers act as cushions eliminates cutting.
- Every valve calibrated for flow (for a given coil wattage).
- Manifold model 44 series valves can be mounted on the high profile bar.
- Cylinder ports are located in the circuit bar[®]. Valves can be replaced without disturbing piping.
- * U cup end seals available for use with external flow controls. (For solenoid & electrical connector options, refer to page **C6**)







HIGH PROFILE CIRCUIT BAR®

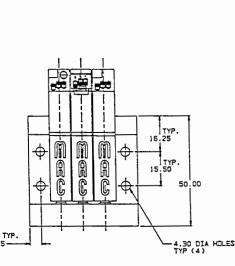


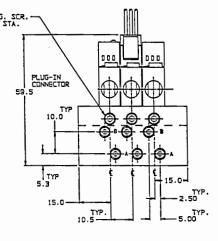


	CONFIGURATION
1	Side cyl's
2	Bottom cyl's

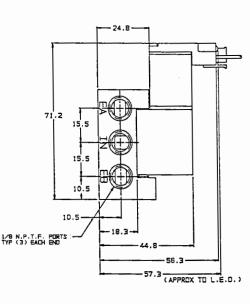
PORT SIZE & THREAD TYPE		
В	#10-32 UNF	
D	M5 Metric	

N	IUMBER OF STATIONS
02	Two stations
03	Three stations
ETC	





WATTAGE	FLOW
1.0 W	0.05 C _v
1.8 W	0.06 C _v
2.5 W	0.08 C _v
4.0 W	0.09 C _v



4 WAY, DIRECT SOLENOID OPERATED INLINE VALVES MOUNTED ON CIRCUIT BAR® #10-32 OR M5 PORTS, C_v UP TO 0.09

PRESSURE RANGE: 0 TO 120 PSI

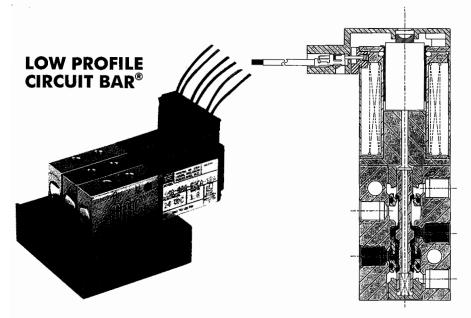


Patents and Patents Pending

OPERATIONAL BENEFITS

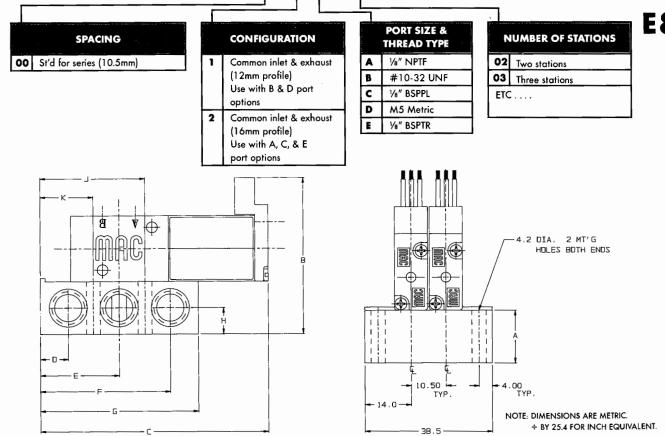
- Patented inlet seat to control poppet stroke.
- Balanced poppets, with no seals of any kind in a bore - no resistance to shifting.
- New patented MACSOLENOID[®] with "oval" shaped armature and metal solenoid cover - provides more force through more core iron.
- Short stroke direct operated poppet valve no small pistons and no minimum operating pressure.
- Strong return spring (true spring return operator).
- Patented conical shaped exhaust retainers act as cushions - eliminates cutting.
- Every valve calibrated for flow (for a given coil wattage).
- Standard in-line model 44 series valves can be mounted on the low profile bar.

For valve information see pages C5 & C6



HOW TO ORDER

EBM44A - 00 X X - XX



PORT SIZE	A		C	D			G			K
1/8" NPTF OR BSPPL	16.0	47.5	69.2	8.5	24.0	39.5	48.0	8.0	31.85	16.15
#10-32 OR M5	12.0	43.5	63.2	5.0	17.0	29.0	34.0	6.0	23.00	11.00

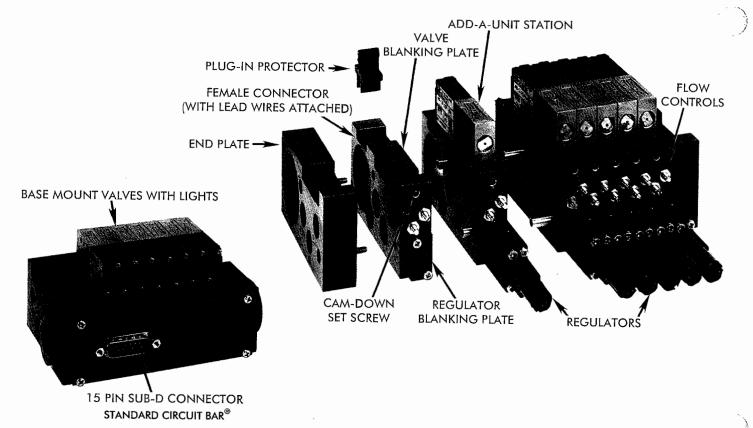
Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.



4-WAY, DIRECT SOLENOID OPERATED VALVE MOUNTED ON COMMON CONDUIT CIRCUIT BAR®

#10-32 OR M5 PORTS - C_v UP TO .093 PRESSURE RANGE: VACUUM TO 120 PSI



E 9

PLUG-IN CIRCUIT BAR® WITH COMMON CONDUIT

DESIGN DESCRIPTION GENERAL:

The 44 Series ECD circuit bar [®] is machined from a single block of extruded anodized aluminum to provide a common inlet and dual common exhaust, as well as a common electrical conduit. This circuit bar [®] is available as a "standard" bar (fixed number of stations) or as an "add-on" style bar. The "add-on" style bar provides a means to attach additional stations as required.

ELECTRICAL:

The 44 Series Valve has a two or three pin male electrical connector that plugs into a female connector located in the circuit bar[®]. Lead wires from the female connector are terminated at the optional sub-D style multi-pin connector (see photo). A modification number is required for this option. See next page under "Modifications."

VALVING:

The ECD circuit bar® will only accept a 44 Series base mount style valve. The valve is assembled to the bar with a set screw which creates a downward camming action, producing an effective seal between the valve and the bar.

PORTING:

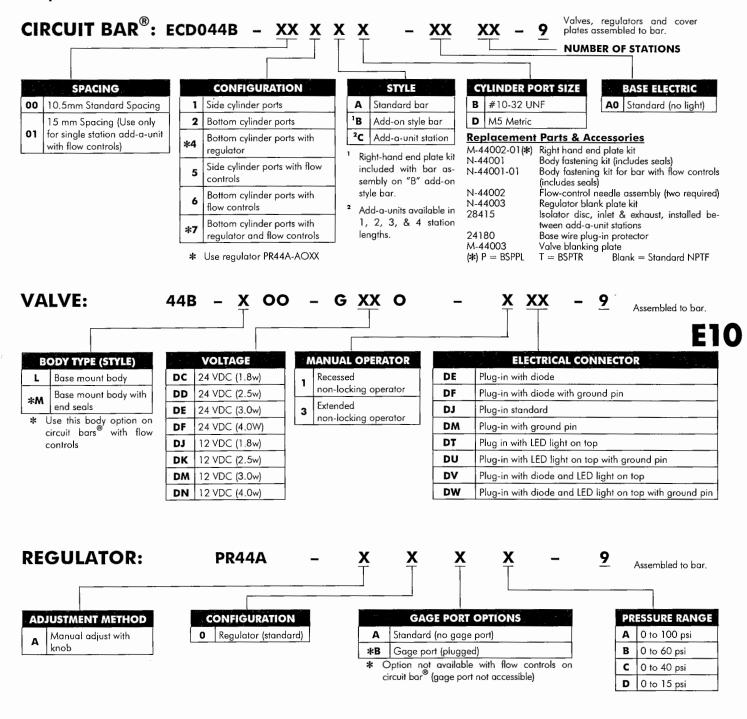
The ECD bar has 1/8" tapped common inlet and exhaust ports. There is also a 1" common conduit port. Side or bottom cylinder ports can be provided as #10-32 or M5 (metric) ports.

ACCESSORIES:

The 44 Series ECD circuit bar[®] can be provided with regulators, flow controls or a combination of both, whenever regulators are used, bottom cylinder ports are required.

HOW TO ORDER

To be used when all stations are identical. When circuit bars [®] do not have identical stations, consult factory for special ECD number.



NOTE: Valves, regulators and circuit bar [®] must be ordered separately. Ordering example:

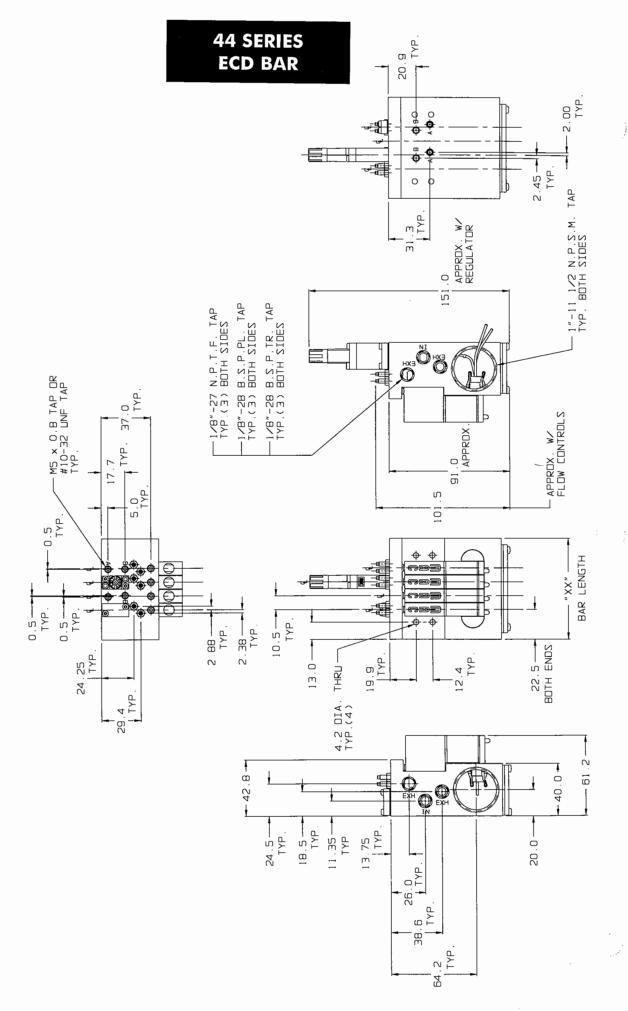
4 X 44B-L00-GDF0-1DM-9

4 X PR44A-A0AA-9

1 X ECD044B-004AB-A004-9 MOD SD09

(valve) (regulator) (circuit bar®)

M	ODIFICATIONS
MOD SD09	9 pin sub D connector
MOD SD15	15 pin sub D connector
MOD SD25	25 pin sub D connectar



E11

44 SERIES PLUG-IN STANDARD CIRCUIT BAR®

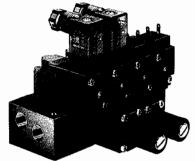
44 SERIES PLUG-IN ADD-ON STYLE CIRCUIT BAR®



2 & 3 WAY DIRECT SOLENOID OR REMOTE AIR PILOT OPERATED, MOUNTED ON CIRCUIT BAR®

#10-32, 1/8" - C_V UP TO 0.1
PRESSURE RANGE: VACUUM TO 120 PSI

Patents and Patents Pending



HIGH PROFILE WITH REGULATORS



LOW PROFILE WITH 1/8" CYLINDER PORTS

Circuit bars® are machined from a single block of extruded anodized aluminum. They are not modular like the 35 Series add-a-unit manifolds but they can however be machined to customers' individual specifications. Port configurations, center distances between valves, optional regulators, multiple inlets, pressure and exhaust isolation can be adapted to the particular requirements of a specific application.

HOW TO ORDER - 3 STEPS

Step 1. Valves, manifolds and optional regulators must be ordered as separate items. Once the specifications of a complete circuit bar[®] assembly have been established, MAC Valves will supply on request, an assembly number (EBA...) To facilitate re-ordering.

Valves must be 35 Series manifold valves without base and the body configurations must be one of the four options given below. (The single pupose N.C. only poppet is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line containinants is desired.)

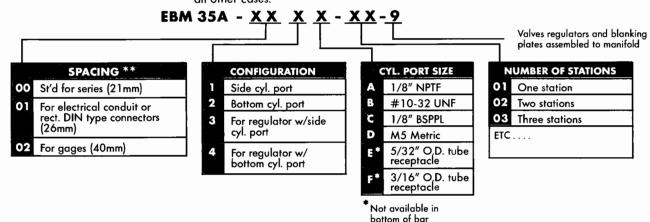
35A-X00-DAAA-1BA

Manifold valve (universal poppet)
Manifold valve (N.C. poppet)
Manifold valve - w/gage port universal poppet
Manifold valve w/gage port N.C. poppet

Valve code shown is for 120/60, 110/50 coil, non-locking manual operator, with grommet type electrical connections. For other options see page A10

STEP 2. Next select the manifold. Note that high profile bars (28mm high) are supplied automatically if optional regulators are selected. Low profile bars will normally be supplied in all other cases.

E13



^{**}To be used when all stations have identical spacing. When circuit bars® do not have identical spacing or identical stations, consult factory for special EBM number.

STEP 3. Finally select any accessories required.

REGULATORS 35A- <u>00X</u>				
00L	Slotted Stem			
00M	00M Adjusting Knob			
00U Locking Stem				

BLANKING PLATES

VALVE M-35004 REGULATOR M-35005 **EXAMPLE** (TOP PHOTO)

2 X 35A-B00-DAAJ-1KD-9 VALVES

2 X 35A-B00-DAAJ-1TJ-9 VALVES

2 X 35A-00L-9 REGULATORS

1 X EBM35A-1006-04-9 CIRCUIT BAR® (SPECIAL EBM NUMBER)

EXAMPLE (LOWER PHOTO)

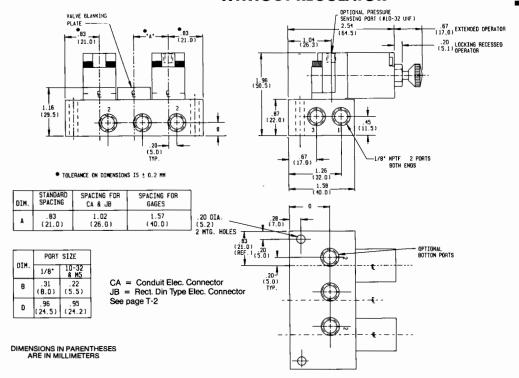
4 X 35A-B00-DAAA-1BA-9 VALVES

1 X EBM35A-001A-04-9 CIRCUIT BAR®

DIMENSIONS CIRCUIT BAR® 35 SERIES

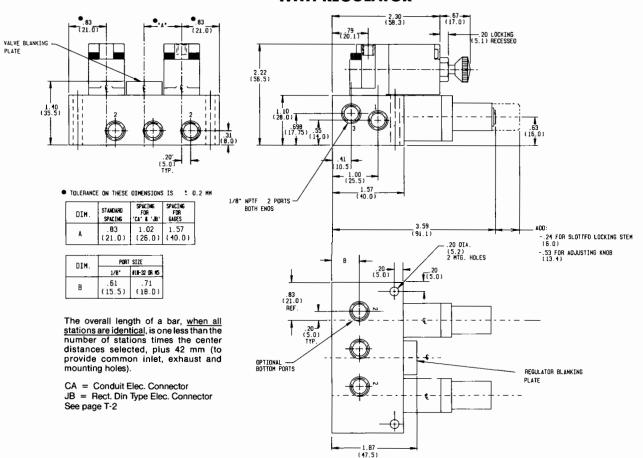
Samuel and Market State of the Secretary

WITHOUT REGULATOR



E14

WITH REGULATOR



Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

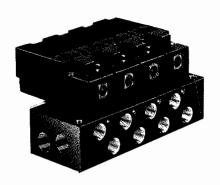
Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.



4-WAY, DIRECT SOLENOID OR REMOTE AIR OPERATED, MOUNTED ON A CIRCUIT BAR®

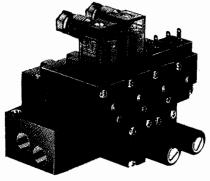
1/8", #10-32 OR M5 PORTS - C_v UP TO 0.1 PRESSURE RANGE: VACUUM TO 120 PSI

Patents and Patents Pending

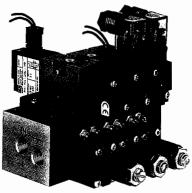


28mm PROFILE BAR

1/8" CYLINDER PORTS



28mm PROFILE BAR WITH REGULATORS OR FLOW CONTROLS



38mm PROFILE BAR WITH REGULATORS AND FLOW CONTROLS

HOW TO ORDER: VALVE

HOW TO ORDER: CIRCUIT BAR®

*SPACING Standard for series (21mm) For electrical conduit or rect. DIN type connectors or flow

controls (26mm) **02** | For gages (40mm)

NOTE:

00

*Configurations 5 and 6 require a minimum of 26mm spacing, all others require a minimum of 21mm spacing. When circuit bars® do not have identical spacing or identical stations, consult factory for special EBM number.

1	Side cylinder ports			
2 Bottom cylinder ports				
3	For regulator w/side cylinder ports			
4	For regulator w/bottom cylinder ports			
5	For flow controls w/side cylinder ports			
6	For flow controls w/ bottom cylinder ports			
7	For regulator and flow controls w/side cylinder ports			
8	For regulator and flow			

controls w/bottom cylin-

*CONFIGURATION

CYLI	NDER PORT SIZE
Α	1/8" NPTF
В	#10-32 UNF
С	1/8" BSPPL
D	M5 Metric
*E	5/32" O.D. tube receptacle
*F	3/16" O.D. tube receptacle
L	Tecepiacie

Valves regulators and blanking

NUMBER OF STATIONS

plates assembled to bar

* Not available in bottom of bar.

BLANKING PLATES

M-45010 VALVE REGULATOR M-35005

45A-X00-DXXX-XXX

SOLENOID OPTIONS (SEE PAGE C10)

LOO	Manifold valve (single solenoid)	
MOO	Manifold valve w/gage port (single solenoid)	
NOO	Manifold valve (double solenoid)	
P00	Manifold valve w/gage port (double solenoid)	

HOW TO ORDER: REGULATORS

35A-00X

45A-00X

_	
<u> </u>	Slotted Stem
M	Adjusting Knob
U	Locking Stem

	1	Slotted Stem	
	2	Adjusting Knob	
	3	Locking Stem	

and 4.

Use above Regulator | Use above Regulator for configurations 3 for configurations 7 and 8.

NOTE:

Valves, circuit bars® and optional regulators (with or without flow controls) must be ordered as separate items.

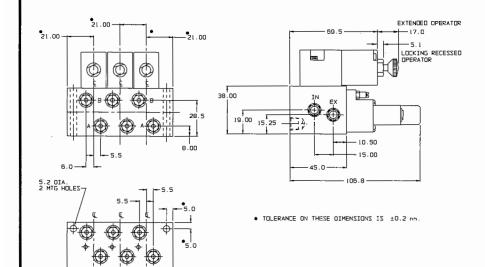
ORDERING EXAMPLE:

3 X 45A-L00-DAAA-1BA (Valve) (Regulator) (Circuit bar®) 3 X 35A-00L 1 X EBM45A-003A-03

ORDERING EXAMPLE:

5 X 45A-M00-DAAA-1BA (Valve) 5 X 45A-001 (Regulator w/flow controls) 1 X EBM45A-027A-05 (Circuit bar

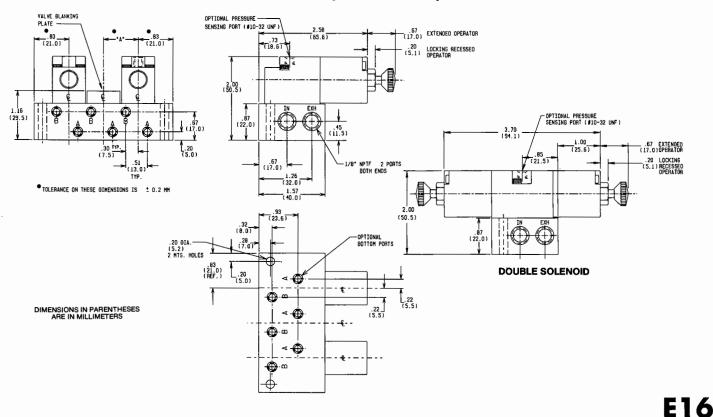
der ports **DIMENSIONS: WITH REGULATOR AND FLOW CONTROLS**



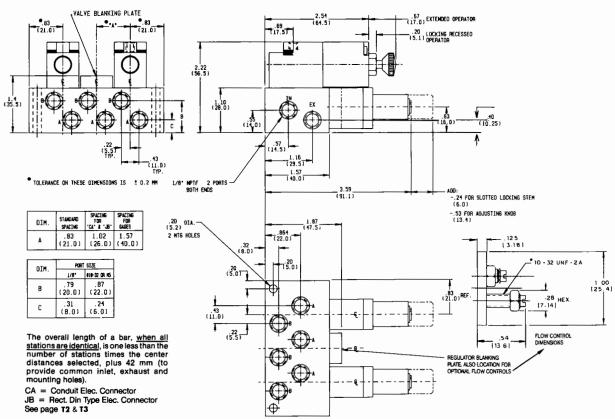
NOTE: Dimensions shown are metric (mm)

45 SERIES

STANDARD (NO OPTIONS)



WITH REGULATOR OR FLOW CONTROL



DIMENSIONS SHOWN IN BRACKETS ARE METRIC (MM)

Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

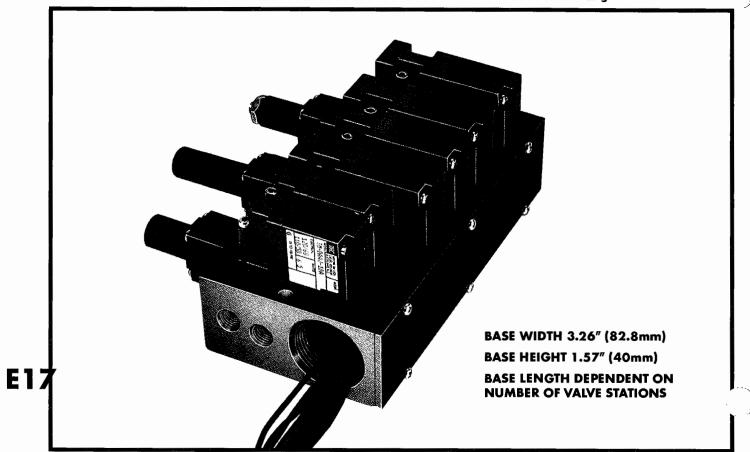


3 & 4 WAY, DIRECT SOLENOID OR REMOTE AIR OPERATED, MOUNTED ON COMMON CONDUIT CIRCUIT BAR®

1/8", #10-32 OR M5 PORTS - C_V UP TO 0.1 1 PRESSURE RANGE: VACUUM TO 120 PSI

* High flow option (C_V up to 0.14) Consult factory

Patents and Patents Pending



35 / 45 CIRCUIT BAR® WITH COMMON CONDUIT

DESIGN DESCRIPTION:

GENERAL:

Circuit bars® are machined from a single block of extruded black anodized aluminum to provide common inlet and exhaust, side or bottom cylinder ports and a common electrical conduit.

ELECTRICAL:

Coil wire leads are fed through a rubber grommet into the common conduit connection. Access to the conduit is provided by a gasketed conduit plate which can be supplied with a terminal strip to facilitate wiring. Indicator lights can also be provided in the conduit plate. The circuit bar® is designed to meet NEMA 4 specifications.

VALVING:

Both 35 and 45 Series can be mounted on the same manifold. The common inlet and exhaust can be isolated to provide different pressures and the 35 series interface can be adapted to provide for 2 way as well as 3 way applications.

PORTING:

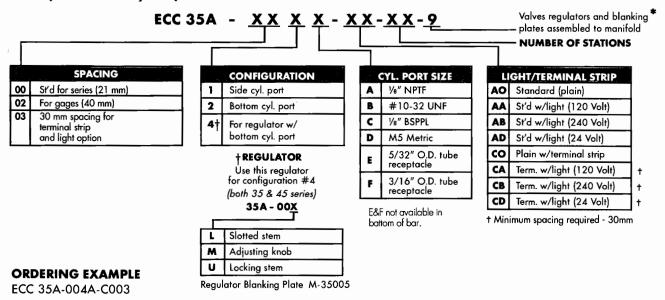
The common inlet and exhaust are tapped 1/8". Side or bottom cylinder ports can be provided with M5, #10-32 or 1/8" ports.

ACCESSORIES:

The 45 Series can be provided with flow controls, pressure regulators or a combination of both. Pressure regulators are available for 35 series stations. When regulators are used bottom ports are obligatory.

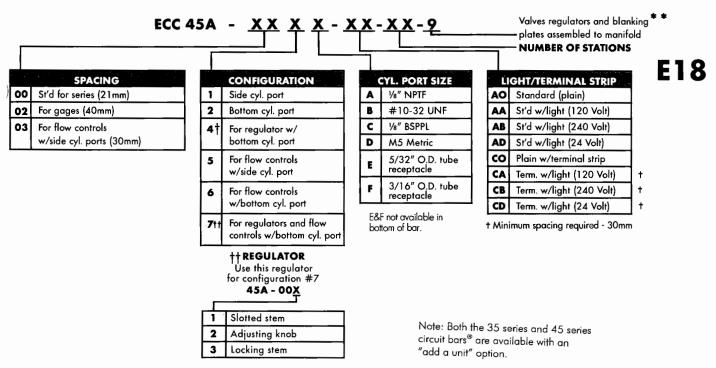
HOW TO ORDER

To be used when all stations have identical spacing. When circuit bars® do not have identical spacing or identical stations, consult factory for special ECC number.



Common conduit circuit bar[®], 21 mm spacing, machined for regulator with bottom cylinder ports, 1/8" NPTF, plain conduit plate with terminal strip, three identical stations.

* To order valves or accessories see page E5



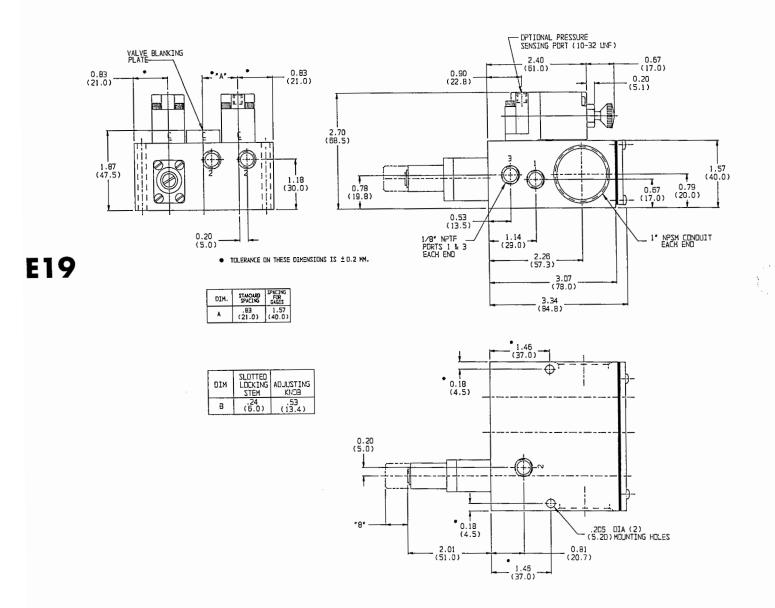
ORDERING EXAMPLE

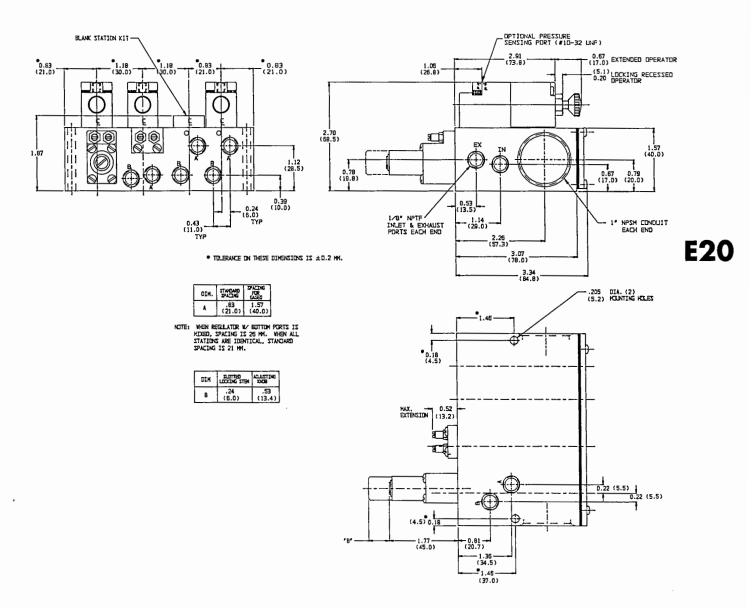
ECC 45A-035E-AA06

Common conduit circuit bar®, 30mm spacing, machined for flow controls with side cylinder ports, 5/32 O.D. tube receptacle, standard conduit plate with light (120 volt), six identical stations.

** To order valves or accessories see page E7

35 SERIES







3 & 4 WAY, DIRECT SOLENOID OR REMOTE AIR OPERATED, MOUNTED ON COMMON CONDUIT CIRCUIT BAR®

1/8", #10-32 OR M5 PORTS - C $_{
m V}$ UP TO 0.1* PRESSURE RANGE: VACUUM TO 120 PSI

*High flow option (C_V up to 0.14) consult factory
Patents and Patents Pending

ECE CIRCUIT BAR®

E21 ECE CIRCUIT BAR®
w/Sandwich Regulator

ECD CIRCUIT BAR®

35 / 45 CIRCUIT BAR® WITH COMMON CONDUIT

w/Side Regulator

DESIGN DESCRIPTION GENERAL:

Both the ECD and ECE circuit bars® are machined from a single block of extruded black anodized aluminum to provide a common inlet and exhaust, as well as a common electrical conduit. The ECE circuit bar® requires an end plate kit to facilitate the integral terminal strip located in the common conduit wireway. The ECD circuit bar® has the terminal strip located on the common conduit cover plate and does not require an end plate kit.

ELECTRICAL:

The 35/45 Series valves have a male three pin electrical connector that plugs into a female connector located in the circuit bar®. Terminal strips are available for both the ECD and ECE manifolds to facilitate wiring. Indicator lights can also be provided.

VALVING:

Both 35 and 45 Series can be mounted on the same manifold. The common inlet and exhaust can be isolated to provide different pressures. The 35 Series interface can be adapted to provide for 2 way as well as 3 way applications. (Normally open or normally closed.)

PORTING:

The ECD circuit bar® has an 1/8" tapped common inlet and exhaust. The ECE circuit bar® utilizes end plates that provide 1/4" tapped inlet and exhaust. Both provide a 1" common conduit. Side or bottom cylinder ports can be provided as M5, #10-32 or 1/8 ports.

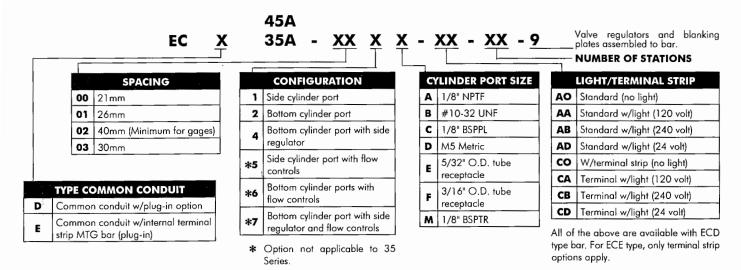
ACCESSORIES:

The 45 Series can be provided with flow controls, pressure regulators or a combination of both. Pressure regulators are available for 35 Series stations. When "side" regulators are used, bottom ports are obligatory. When "sandwich" regulators are used, side or bottom ports may be ordered.

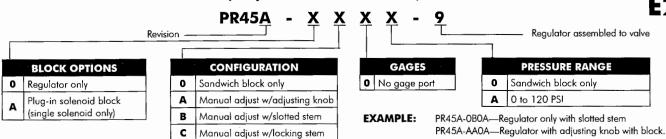


HOW TO ORDER

To be used when all stations have identical spacing. When circuit bars [®] do not have identical spacing or identical stations, consult factory for special ECD or ECE number. Valves used with these circuit bars [®] must be "base mount" type and utilize either the FM, FN or FP electrical connector.



IF ORDERING SANDWICH REGULATOR (Use with configurations 1, 2, 5 and 6)
(Only available for 45 Series)



IF ORDERING SIDE REGULATOR (Use with configurations 4 and 7)

Use this regulator with configuration #4

REGULATOR 35A-00X

	L	Slotted stem	
	M	Adjusting knob	
ĺ	J	With locking stem	

MINIMUM SPACING FOR TYPE D

Use 21m spacing for all options except:
• Side cylinder ports with flow controls

Terminal strip with light
 The above requires 30mm spacing.

MINIMUM SPACING FOR TYPE E

Use 26mm spacing for all options except:
• Side cylinder ports with flow controls
The above requires 30mm spacing.

Use this regulator with configuration #7

REGULATOR W/FLOW CONTROLS 45A-00X

1	Slotted stem
2	Adjusting knob
. 3	With locking stem

*END PLATE KITS:

M-45017 Standard (no deflectors)
M-45017-01 Kit with one deflector
M-45017-02 Kit with two deflectors

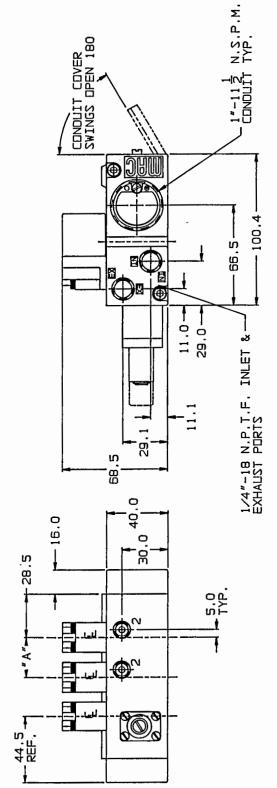
*NOTE: One end plate kit required per Circuit Bar® (ECE type).

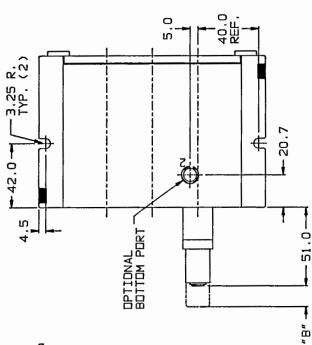
WIRE DEFLECTOR OPTION:

MOD. 1104 Wire deflector supplied on both ends Wire deflector supplied on left end only Wire deflector supplied on right end only

NOTE:

45 series ECD type is available for use with Double Solenoid Valves. An "add-a-unit" option is also available for both the 35 and 45 series ECD types. Consult factory for ordering information.





* TOLERANCE ON THESE DIMENSIONS IS ±0.2nn

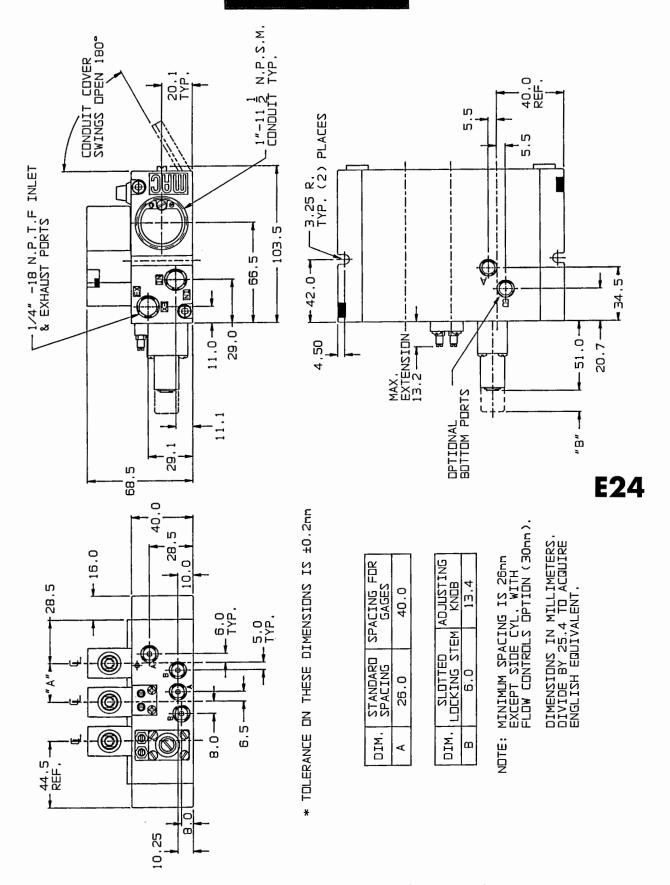
SPACING FOR GAGES	40.0	ADJUSTING KNDB	13.4
STANDARD S	26.0	SLOTTED LOCKING STEM	6.0
DIM.	A	DIM.	m

NDTE: MINIMUM SPACING IS 26nn.

DIMENSIONS IN MILLIMETERS. DIVIDE BY 25.4 TO ACQUIRE ENGLISH EQUIVALENT.

E23

45 SERIES ECE BAR

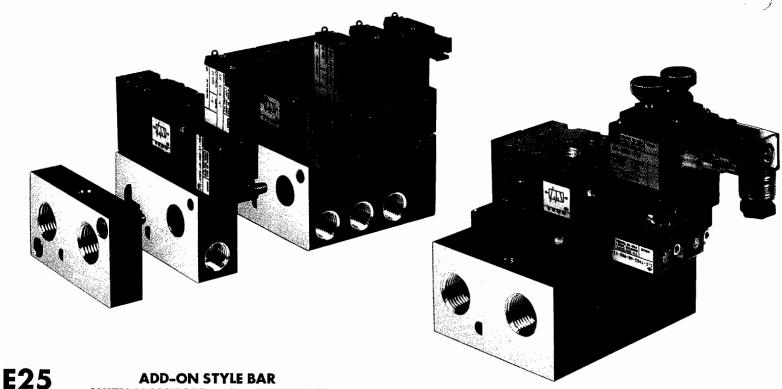


Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section. Consult "Precautions" on inside back cover before use, installation of MAC Valves.



3-WAY SOLENOID PILOT OPERATED VALVE MOUNTED ON A CIRCUIT BAR®

1/8" OR 1/4" PORTS CV UP TO 1.2 PRESSURE RANGE: VAC TO 120 PSI



ADD-ON STYLE BAR
WITH MANIFOLD MOUNT VALVES
(44 SERIES PILOT)
CBP052A TYPE

STANDARD BAR WITH INLINE MOUNTED VALVES (45 SERIES PILOT) CBM052A TYPE

DESIGN DESCRIPTION:

GENERAL:

The 52 Series circuit bar® is machined from a single block of extruded anodized aluminum to provide a common inlet, common exhaust and optional common external pilot. Two (2) different configurations are available, the standard bar (fixed number of stations) and the add-on style bar which provides a means to attach additional stations as needed.

ELECTRICAL:

Both styles are non plug-in circuit bars[®]. All electrical connections are made at the solenoid.

VALVING:

Inline and manifold type valves can be mounted to the appropriate circuit bar[®]. Valves using both style pilot valves (44 and 45 Series) can be mounted on the same circuit bar[®]. Both the inlet and exhaust passages can be isolated.

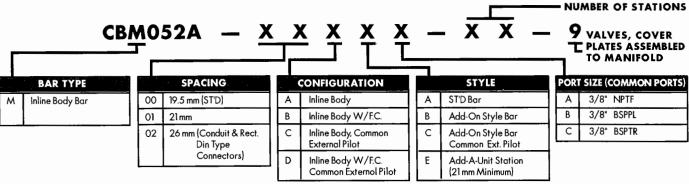
PORTING:

The common inlet and exhaust have a 3/8" tapped port. The optional common external pilot has an 1/8" tapped port. The CBP type bar is available in 1/8" and 1/4", bottom and side ports.

ACCESSORIES:

Both the CBP and CBM style circuit bars[®] are available with an individual exhaust flow control. A blank station valve cover plate is available for both style bars. An end plate kit is supplied with the add-on style circuit bar[®].





Right-hand end plote kit included w/bor ass'y, on "B" & "C" style bar.

REPLACEMENT PARTS & ACCESSORIES:

M-52001-01(*)

R.H. end plate kit

M-52002-01(*) M-04001 R.H. end plate kit, common ext. pilot Blonk station kit for inline body Flow control assembly (1 per station) O-Ring body port seal, (3 per stotion)

N-04001 17015-01 35043

Body to bar body mounting screw (2 per stotion)

(*) P = BSPPL,

T = BSPTR,

Blonk = ST'D NPTF

ORDERING EXAMPLE:

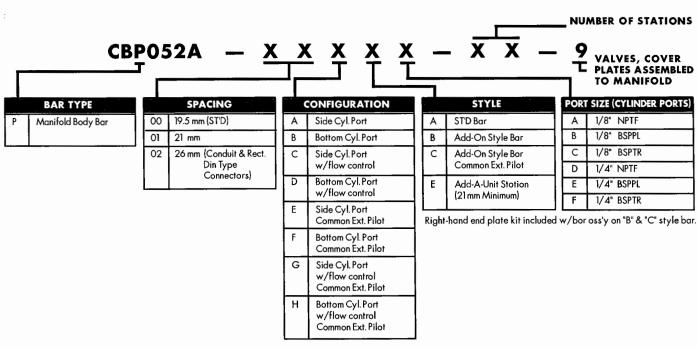
CBM052A-00CCA-06

Inline body bar, 19.5 mm spacing, common external pilot, 3/8" NPTF common ports, add-on style bar, six identical stations.

CBM052A-01CEA-01

Inline body bar, 21 mm spacing, common externol pilot, 3/8" NPTF common ports, one station add-a-unit, con be added to above 6 station bar.

E26



REPLACEMENT PARTS & ACCESSORIES:

M-52001-01(*)

R.H. end plate kit

M-52002-01(*) M-52003 N-04001 R.H. end plate kit, common ext. pilot Blank stotion kit for manifold body Flow-Control Assembly (1 per station) Body to bose seal (3 per station)

17013-01 35043

Body to bar mounting screw (2 per station)

(*) P = BSPPL,

T = BSPTR,

Blank = ST'D NPTF

ORDERING EXAMPLE:

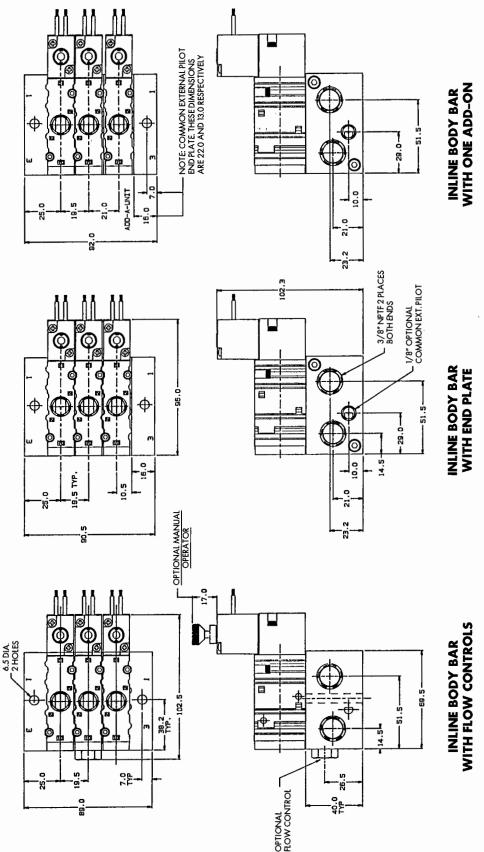
CBP052A-00ABA-06

Manifold body bar, 19.5 mm spacing, side cyl. port 1/8" NPTF, add on style bar, six identical stations.

CBP052A-01AEA-01

Manifold body bor, 21 mm spacing, one station add-a-unit, side cyl. port 1/8" NPTF, can be added to above 6 station bar.

52 SERIES CBM BAR



Note: All dimensions are in millimeters. Tolerance on these dimensions is ±0.2mm

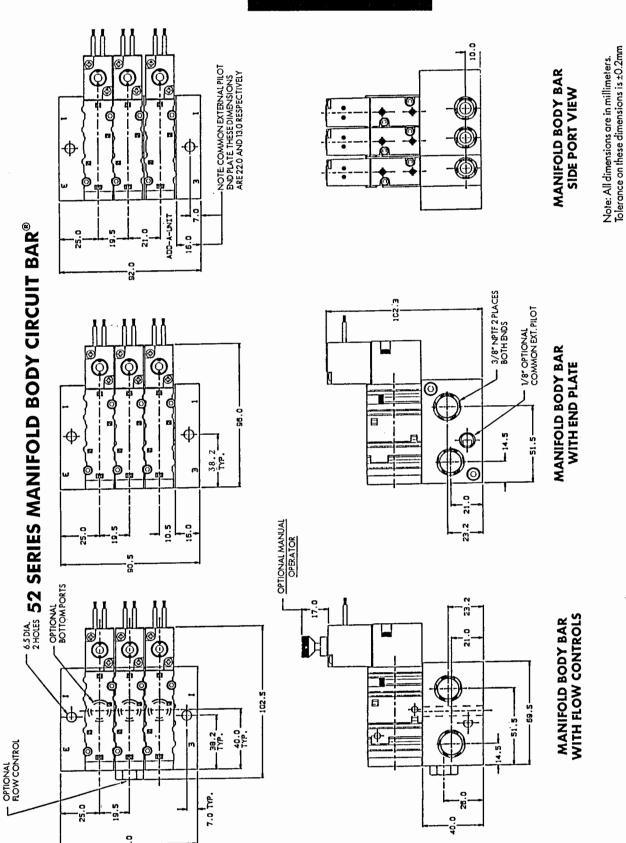
All MAC Valves available with BSPP threads: to order see opposite page.

Consult "Precautions" on inside back cover before use, installation of MAC Valves.

E27

52 SERIES INLINE BODY CIRCUIT BAR®

52 SERIES CBP BAR

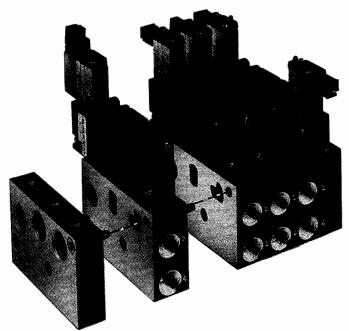


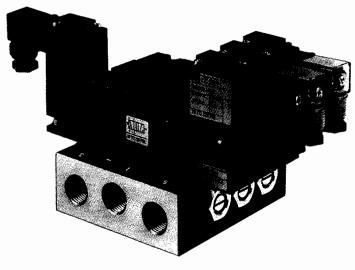
E28



4-WAY SOLENOID PILOT OPERATED. MOUNTED ON A CIRCUIT BAR 1/8" OR 1/4" PORTS Cv UP TO 1.0

PRESSURE RANGE: VAC TO 120 PSI





HIGH PROFILE CIRCUIT BAR® CBM405A ADD-ON VERSION

LOW PROFILE CIRCUIT BAR® CBM401A WITH FLOW CONTROLS

E29

DESIGN DESCRIPTION:

GENERAL:

The 400 Series circuit bar® is available in five (5) different configurations. The Low Profile version (CBM401A & CBM402A), the Mid Profile version (CBM403A & CBM404A), and the High Profile version (CBM405A). Each bar is machined from a single block of extruded black anodized aluminum to provide a common inlet and dual common exhausts. The Mid and High Profile versions offer a common external pilot and an "add-on" version option which provides a means to attach additional stations to the circuit bar®.

ELECTRICAL:

Each circuit bar® is a non plug-in bar. All electrical connections are made at the solenoid. Wire and optional prewired cables are available but are not shown in the above pictures.

VALVING:

Inline and manifold type valves can be mounted to these circuit bars®. The common inlet and exhausts can be isolated to provide different pressures. Valves using both style pilot valves (44 and 45 Series) can be mounted on the same circuit bar®.

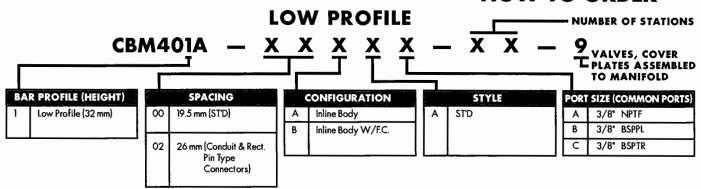
PORTING:

The common inlet and exhausts have a 3/8" tapped port. The Low Profile and Mid Profile bars are available with 1/8" and 1/4" bottom ports only. The High Profile bar is available with 1/8" and 1/4" side ports only.

ACCESSORIES:

The Low Profile and Mid Profile bars are available with individual exhaust flow controls. Flow controls are not available on the High Profile verson. An end plate kit is supplied with the add-on version type bar. A blank station valve cover plate is available for all circuit bars®.

400 SERIES د **HOW TO ORDER**



REPLACEMENT PARTS & ACCESSORIES:

M-04001 Blank station kit for 5-port body N-04001 Flow control assembly (2 per sta.) 17013-01 O-Ring port seal (2 per sta.)

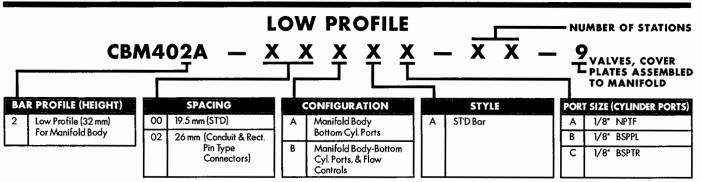
O-Ring port seal (1 per sta.) 17015-01

35043 Body to bar manifold mounting screw (2 per valve)

ORDERING EXAMPLE:

CBM401A-00BAA-06

Low profile bar, 19.5 mm spacing, for 5-port inline body, w/flow controls, 3/8" NPTF common ports, six identical stations.



REPLACEMENT PARTS & ACCESSORIES:

M-04002 Blank station kit for manifold body N-04001 Flow-control assembly (2 per sta.)

16525 Body to base pressure seal, manifold body bar

35043 Body to bar mounting screw (2 per sta.)

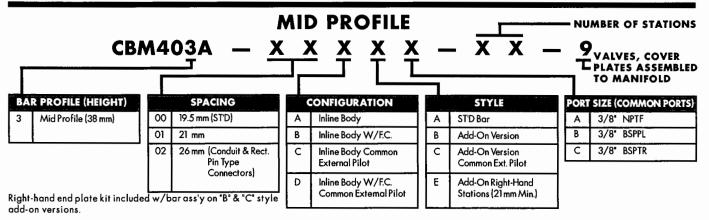
ORDERING EXAMPLE:

CBM402A-00AAB-06

Mid profile bar, 19.5 mm spocing, for manifold bodies, bottom

E30

cyl's 1/8" BSPPL, six identical stations.



REPLACEMENT PARTS & ACCESSORIES:

M-04003-01(*) R.H. end plate kit, for mid profile bars

M-04004-01(*) R.H. end plate kit, mid profile\common ext. pilot

M-04001 Blank station kit for 5-port body N-04001 Flow control assembly (2 per sta.) O-Ring body port seal, (2 per sta.) 17013-01

O-Ring body port seal, (1 per sta.) 17015-01

Body to bar body mounting screw (2 per sta.) 35043

(*) P = BSPPL,

T = BSPTR,Blank = ST'D NPTF

ORDERING EXAMPLE:

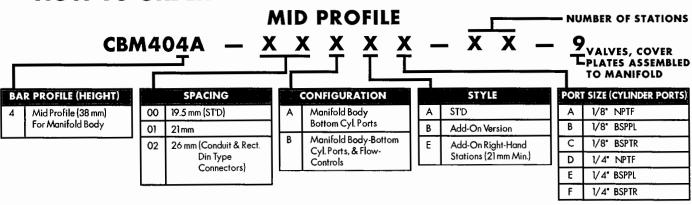
CBM403A-00CCA-06

Mid profile bar, 19.5 mm spacing, for 5-port inline body, common external pilot, 3/8" NPTF common ports add-on version, six identical stations.

CBM403A-01CEA-01

Mid profile bar, 21 mm spacing, for 5-port inline body, common external pilot, 3/8" NPTF common ports, single unit for add-on version, can be added to above example bar.





Right-hand end plote kit included w/bar ass'y, on "B" style add-on version.

REPLACEMENT PARTS & ACCESSORIES:

M-04003-01(*) M-04002 N-04001 16525

35043

R.H. end plate kit, for mid profile bars Blank station kit for manifold body Flow control assembly (2 per sta.) Body to base pressure seal, manifold body Body to bor mounting screw (2 per sta.)

(*) P = BSPPL,

T = BSPTR,

Blank = ST'D NPTF

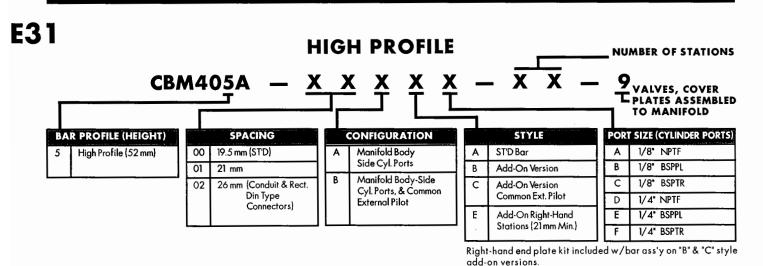
ORDERING EXAMPLE:

CBM404A-00ABA-06

Mid profile bar, 19.5 mm spacing, for manifold bodies, bottom cyl's 1/8" NPTF, add on version, six identical stations.

CBM404A-01AEA-01

Mid profile bar, 21 mm spacing, for manifold body, bottom cyl's 1/8" NPTF, single unit for add-on version, can be added to above example bar.



REPLACEMENT PARTS & ACCESSORIES:

M-04005-01(*)

R.H. end plate kit, for high profile bars

M-04006-01(*)

R.H. end plate kit, high profile/common ext. pilot

M-04002 16525 Blank station kit for manifold body

35043

Body to base pressure seal, manifold body Body to bar mounting screw (2 per sta.)

(*) P = BSPPL,

T = BSPTR,

Blank = ST'D NPTF

ORDERING EXAMPLE:

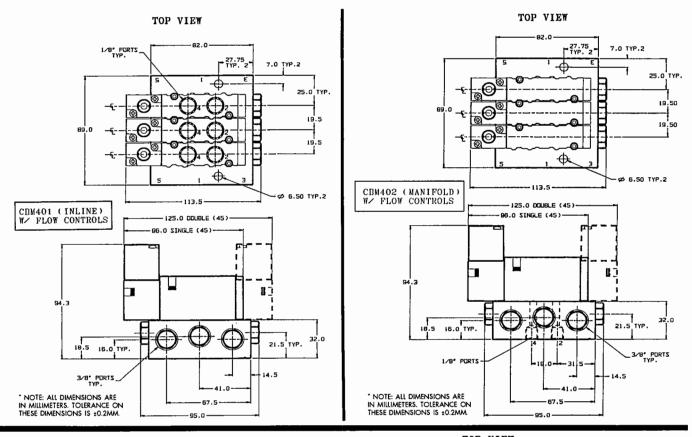
CBM405A-00ABD-06

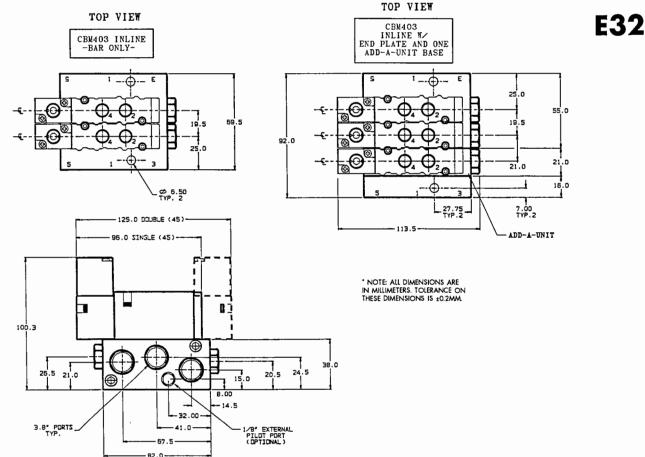
High profile bar, 19.5 mm spacing, for manifold body, side cyl's 1/4" NPTF, add on version, six identical stations.

CBM405A-01AED-01

High profile bar, 21 mm spacing, for manifold body, side cyl's 1/4" NPTF, single unit for add-on version, can be added to above example bar.

MAC 400 SERIES

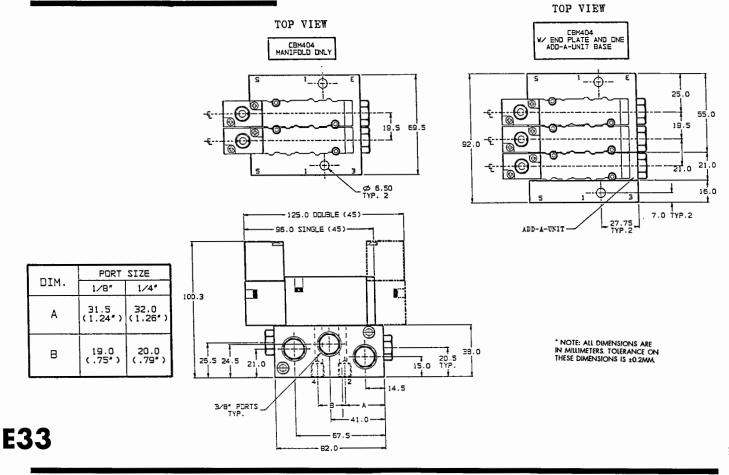


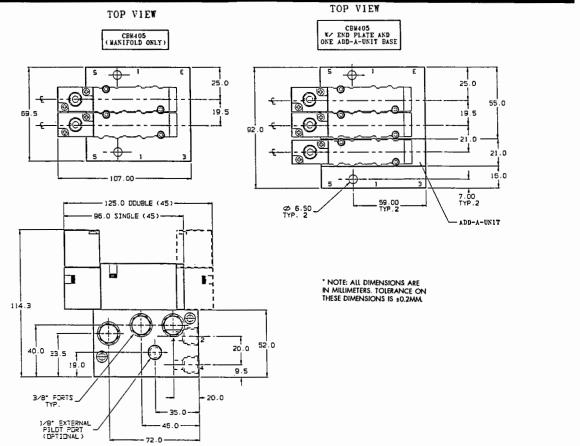


Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

MAC 400 SERIES



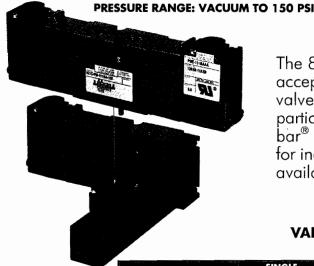


Certain MAC Valves are approved by U.L. & C.S.A. For details see Technical Section.
Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

4-WAY SOLENOID PILOT OPERATED, COMMON INLET CIRCUIT BAR® WITH OPTIONAL INLET SHUT-OFF

¼", %" - C_y UP TO 1.3





The 800 series common inlet circuit bar® is machined to accept a valve only or a valve mounted to an inlet shut-off valve. The inlet shut-off valve shuts off inlet air to that particular station, while the remaining valves on the circuit bar® remain pressurized. Exhaust parts can be accessed for individual control of each station. Inlet port isolation is available. Consult factory for additional information.

VALVE (For other options, see page C 18)

- 1 x 821C-PM-111BA-172
- 1 x 811C-PM-111BA-172
- 1 x M-08010
- 1 x EBI800A-002A-02

	SOLENOID SOLENOID 2 POS. 2 POS.		DOUBLE SOLENOID 3 POS.			
NPTF			CLOSED CENTER	OPEN CENTER	PRESSURE CENTER	
PORT SIZE & DESCRIPTION				**************************************		
1/4" INT. PILOT SGL INLET	811C-PM-111JB-172	821C-PM-111JB-172	825C-PM-111JB-572	825C-PM-111JB-672	825C-PM-111JB-872	

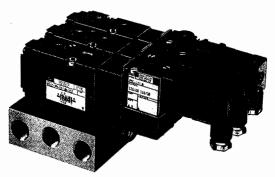
Valve codes shown are for 120/60, 110/50 coils, non-locking recessed manual operators and rectangular DIN type electrical connectors. **ACCESSORIES** CIRCUIT BAR® **EB 1 800A** M-08010 INLET SHUT OFF VALVE: M08011 BLANK STATION COVER PLATE SPACING CONFIGURATION OO - St'd for Series - Valve mount 2 - Inlet shut-off mount (31MM) 3 - Valve mount with inlet plugged 4 - Inlet shut-off mount with inlet plugged 02 - Stations A - 3/8" NPTF 03 - Stations B - 3/8" BSPP 4.30 DIA. (4) MTG HOLES Etc. C - 3/8" BSPT SHOWN IN CLOSED POSITION 102 SHOWN IN OPEN POSITION 13.0 3/8" NPTF OR BSPPL 40.0

26.0



4-WAY SOLENOID PILOT OPERATED, CIRCUIT BAR®

1/4", 3%" - C, UP TO 1.3
PRESSURE RANGE: VACUUM TO 150 PSI



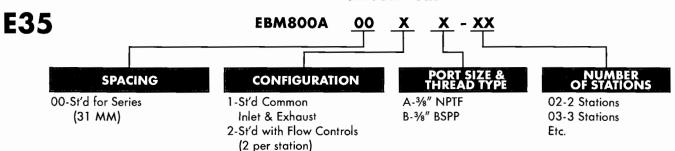
3 X 811C-PM-111JB-172 VALVES 1 X EBM800A-002A-03 CIRCUIT BAR® Circuit bars® are machined from a single block of extruded anodized aluminum. They are not modular like the 800 Series stacking valves but they can however be machined to customers' individual specifications. Port configurations, center distances between valves, pressure and exhaust isolation can be adapted to the particular requirements of a specific application.

VALVE (For other options, see page C18)

	SINGLE DOUBLE		DOUBLE SOLENOID 3 POS.		
NPTF	2 POS.	2 POS.	CLOSED CENTER	OPEN CENTER	PRESSURE CENTER
PORT SIZE & DESCRIPTION	2 5 NO 11 11 11 11 11 11 11 11 11 11 11 11 11	2 - 3 (TAN A DA)	2 3 W	2 3 W	
1/4" INT. PILOT SGL INLET	811C-PM-111JB-172	821C-PM-111JB-172	825C-PM-111JB-572	825C-PM-111JB-672	825C-PM-111JB-872

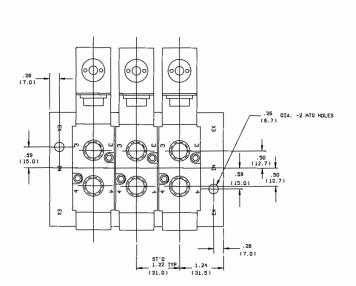
Valve codes shown are for 120/60, 110/50 coils, non-locking recessed manual operators and rectangular DIN type electrical connectors.

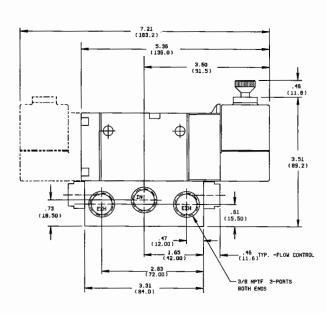




BLANKING PLATE (PART NO. M-08008)

For other options, such as non standard center distances (must be greater than 31 mm), a single flow control per station, external pilot, inlet and exhaust isolation, bottom inlet and exhaust, consult factory.

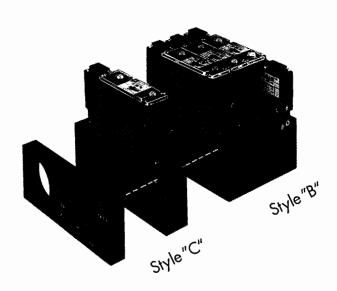






4-WAY SOLENOID PILOT OPERATED, MOUNTED ON A CIRCUIT BAR® 1/8", 1/4" or 3/8", C_v UP TO 1.2 Pressure Range vacuum to 120 PSI

Patents and Patents Pending



between add-a-unit stations.

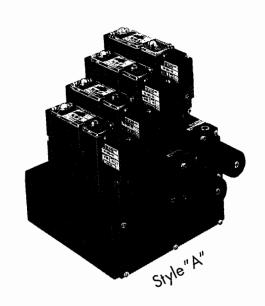
T = BSPTR,

Body to bar mounting screw (2 per sta.)

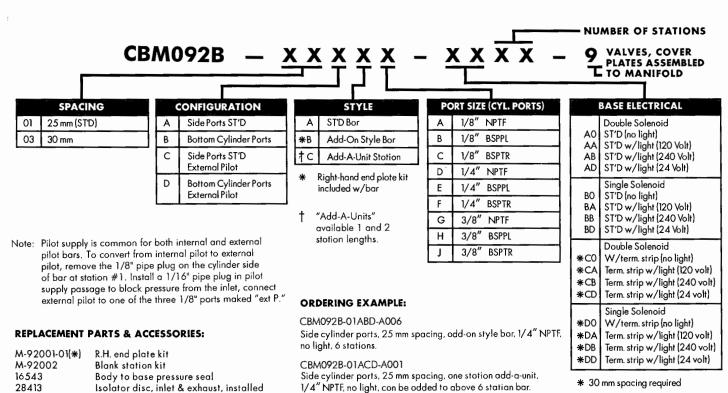
Blank = ST'D NPTF

35050

(*) P = BSPPL,

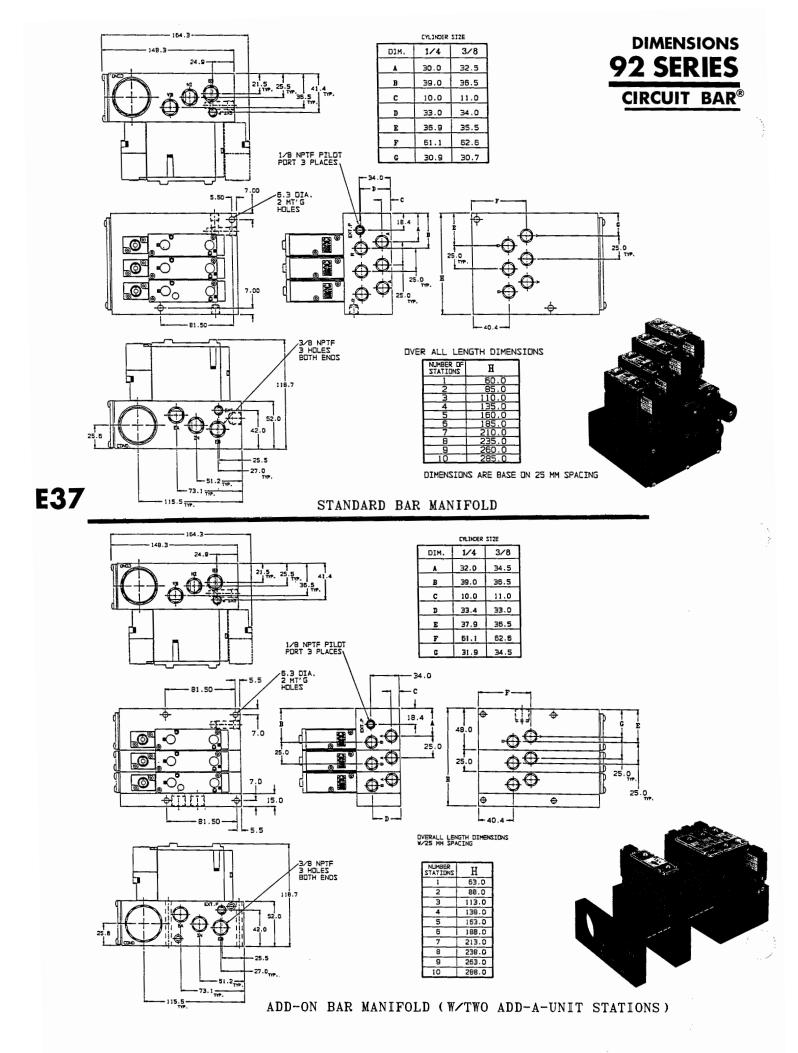


E36



Note: For longer than standard base leads use MOD BXXX

(XXX equals the length in inches) i.e. BO72 for 72 inch Base leods.



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4-WAY SOLENOID PILOT AND REMOTE AIR PILOT, PILOT OPERATED, SUB BASE MOUNTED

1/4", 3%", 1/2", 3/4", 1", 11/4" PORTS - C_V UP TO 11.2 PRESSURE RANGE: VACUUM TO 150 PSI

Patents and Patents Pending

The MAC125, MAC250 and MAC500 series are designed to interface with the Ford/Chrysler standard base. These series are available in the following configurations:

- single or double solenoid
- single or dual pressure
- 2 or 3 position
- with or without indicator lights

various electrical connections and manual operations

Valves and bases must be ordered separately. These may be assembled prior to shipping by adding the suffix -9 after the valve code. **EXAMPLE:** MAC125A-V1B1-PM-111DA-9

MAC125A-B21A-9

SOLENOID PILOT OPERATED VALVES LESS BASE

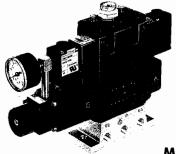
(FOR BASES SEE TABLE BELOW)

MODEL NUMBER EXAMPLES

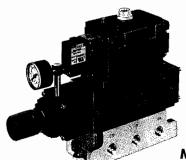
		SINGLE PRESSURE			DUAL PRESSURE
SGL. OPERATOR AIR/SPRING RETURN	DBL. OPERATOR 2-POSITION		DBL. OPER. 3-POS. CLOSED CENTER	DBL. OPER. 3-POS. OPEN CENTER	DBL. OPER. 3-POS. PRESSURE CENTER
° A A A A A A A A A A A A A A A A A A A	B A A A A A A A A A A A A A A A A A A A	PILOT SUPPLY	THE PEAR TO THE PE	*WE THE TANK	a WD THE PEA
MAC125A-V1A2-PM-111DA	MAC125A-V2A2-PM-111DA	Internal Pilot	MAC125A-V5A2-PM-111DA	MAC125A-V6A2-PM-111DA	N/A
MAC125A-V1A4-PM-111DA	MAC125A-V2A4-PM-111DA	External Pilot	MAC125A-V5A4-PM-111DA	MAC125A-V6A4-PM-111DA	MAC125A-V7A4-PM-111DA
MAC250A-V1A1-PM-111DA	MAC250A-V2A1-PM-111DA	Internal Pilot	MAC250A-V5A1-PM-111DA	MAC250A-V6A1-PM-111DA	N/A
MAC250A-V1A3-PM-111DA	MAC250A-V2A3-PM-111DA	External Pilot	MAC250A-V5A3-PM-111DA	MAC250A-V6A3-PM-111DA	MAC250A-V7A3-PM-111DA
MAC500A-V1A2-PM-111DA	MAC500A-V2A2-PM-111DA	Internal Pilot	MAC500A-V5A2-PM-111DA	MAC500A-V6A2-PM-111DA	N/A
MAC500A-V1A4-PM-111DA	MAC500A-V2A4-PM-111DA	External Pilot	MAC500A-V5A4-PM-111DA	MAC500A-V6A4-PM-111DA	N/A

Valve codes are for 120/60, 110/50 coils, non-locking manual operators, muffled pilot, with 5 pin external plug-in connection on top plate wired to Ford specificatio. MAC 125 SERIES and MAC 500 SERIES are coded with lights: MAC 250 SERIES are coded without lights. For other options see reverse of this page.

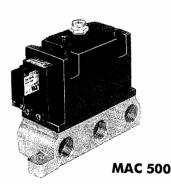




MAC 125



MAC 250



REMOTE AIR PILOT OPERATED VALVES LESS BASE: For remote air operated valves, replace the solenoid assembly with a pilot operatar. In this configuration the remote air signal operates the pilot valve and can therefore be independent of the main-line pressure. Minimum operating pilot pressure is 20 psi. The pilot operator is supplied with a non-locking manual operator.

ORDERING EXAMPLE: MAC250-V2D1-PM-RA11 (SEE PAGE **T4**).

BASE/MANIFOLD TABLE

TYPE	PORT SIZE	INDIVIDUAL BASE	MANIFOLD BASE (btm. cyl. ports)	** MANIFOLD BASE (side & btm. cyl. ports)
MAC125	1/4"	MAC125A-B21A	**MAC125A-M21B	MAC125A-M21C
MAC125	3/8"	MAC125A-B31A	**MAC125A-M31B	MAC125A-M31C
MAC250	1/2"	MAC250A-B21A	†MAC250A-M21B	MAC250A-M21C
MAC250	3/4"	MAC250A-B31A	†MAC250A-M31B	MAC250A-M31C
MAC250]" -	MAC250A-B41A	Consult Factory	Consult Factory
MAC500	1"	MAC500A-B21A	Consult Factory	Consult Factory
MAC500	11/4"	MAC500A-B31A	Consult Factory	Consult Factory

†End Plate Kit not required.

** Requires End Plate Kit M-12001-01 (125 series), M-25001-01 (250 series)

Bases & manifolds coded for internal pilot. For external pilot, last number of code is 2. ORDERING EXAMPLE: MAC125A-B22A.

OPERATING DATA

PRESSURE RANGE (PSI)

Pressures shown are minimum and maximum safe

125/250 500	SINGLE SPG. RET.	DOUBLE 2-POS.	DOUBLE 3-POS.
Internal Pilot			
Main Valve	25-150	10-150	25-150
External Pilot			
Main Valve	Vac-150	Vac-150	25-150
External Pilot	25-150	10-150	25-150

REMOTE AIR PILOT, PILOT OPERATED Pilot Signal pressure: 20-150 PSI (regardless of main valve

pressure).

FLOW CONSTANT: C,

(Average All Ports)

II ADI AIDOVE	D/QL			
PORT	MAC 125			
SIZE	2-POS.	3-POS.		
1/4"	2.2	1.8		
3/8"	2.5	2.0		

PORT	MAC 250		
SIZE	2-POS.	3-POS.	
1/2"	6.3	4.6	
3/4"	6.4	4.7	
1"	7.0	5.0	

PORT	MAC	500
SIZE	2-POS.	3-POS.
1"	11.0	9.0
11/4"	11.2	0.1

FLUIDS:

Air or inert gases.

LUBRICATION:

Not required, but if lubrication is used, a medium aniline range oil (180° - 210°F) is recommended.

AMBIENT TEMPERATURE RANGE:

0° TO 120°F. (-18° TO 50°C.) Consult factory outside this range.

ELECTRICAL:

A.C. 120/60 Inrush 14.7 volt-amps (.12 amps) Seal 10.4 volt-amps (.09 amps).

D.C. 24 Volts 8.5, 6.0, 2.5 and 1 watt.

ABOVE COILS:

General Purpose Class "A," continuous duty, encapsulated. Other coil options available upon request.

HOW TO ORDER



SEE BELOW

X ELECTRICAL CONN.

IN TOP PLATE

5 PIN (CHRYSLER WIRED)

1/2" NPT CONNECTION

FOR REMOTE AIR PILOT, PILOT OPERATED VALVES

5 PIN MICRO (CHRYSLER

3 PIN (FORD WIRED)

5 PIN (FORD WIRED)

SERIES REVISION LEVEL

Х	FUNCTION
1	SINGLE OPERATOR, 2 POSITION, SINGLE PRESSURE
2	DOUBLE OPERATOR, 2 POSITION, SINGLE PRESSURE
3	SINGLE OPERATOR, 2 POSITION, DUAL PRESSURE
4	DOUBLE OPERATOR, 2 POSITION, DUAL PRESSURE
5	3 POSITION, CLOSED CENTER
6	3 POSITION, OPEN CENTER
7	3 POSITION, DUAL PRESSURE, PRESSURE CENTER
	*N/A FOR THE MAC500A

NOTE: Dual pressure valves must be external pilot.

SPECIAL APPLICATION INSTRUCTIONS -

The 'A' cylinder port is normally open. On a spring return valve, the spring is the 'A' operator, the solenoid the 'B' operator. Energizing the 'B' operator pressurizes the 'B' port; energizing the 'A' operator pressurizes the 'A' port.

EXTERNAL PILOT APPLICATIONS - An external pilot supply is only required when the main valve pressure is less than 25 psi on single solenoid or 3 position valves and less than 10 psi on double solenoid 2 position valves. Pipe the external pilot supply to the External Pilot Port supplied in the valve base or manifold.

VACUUM APPLICATIONS - (2-Pos. Valves Only) -Use an External Pilot model as described above and also connect the vacuum source to the Exhaust Port and leave the Inlet Port open to atmosphere. (The inlet port may also be connected to a pressure source to provide a selector application (vacuum/pressure).

SELECTOR APPLICATIONS - Use an External Pilot Model as described above if both pressures are below the minimum, otherwise use an Internal Pilot Model and connect the higher pressure to the Inlet Port and the lower to Port EA or EB depending on which cylinder port is to be active.

SOLENOID PILOT OPTIONS: XX-XX-YDA

PX PILOT EXHAUST

_	
PM	Pilot ExhMuffled
PP	Pilot ExhPiped

XX AC VOLTAGE 11 120/60, 110/50 240/60, 220/50 22 24/60, 24/50 39 240/50

Other AC & DC Voltages Available, DC Wattages from 1.0 to 17 watts.

XX DC VOLTAGE 50 24 VDC (6W)

55	12 VDC (6W)
57	12 VDC (2.5W)
59	24 VDC (2.5W)
60	12 VDC (8.5W)
41	24 VDC (8 5)40

MANUAL **OPERATORS** No Operator 1 Non-Locking Recessed (Std. 2 Locking Recessed Non-Locking Extended 4 Locking Extended

PILOT/LIGHTS

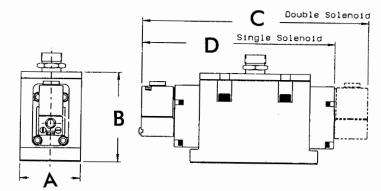
1 INTERNAL PILOT W/O LIGHTS

2 INTERNAL PILOT WITH LIGHTS 3 EXTERNAL PILOT W/O LIGHTS

4 EXTERNAL PILOT WITH LIGHTS

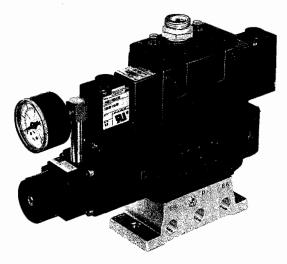
DIMENSIONS (MM) SHOWN IN PARENTHESIS

SERIES	Α	В	C	D
MAC	1.74	2.84	8.02	5.95
125A	(44.2)	(72.2)	(203.8)	(151.2)
MAC	2.52	3.67	9.44	8.03
250A	(64.0)	(93.3)	(239.8)	(203.9)
MAC	3.12	4.51	9.99	8.89
500A	(79.3)	_(114.5)	(253.8)	(225.8)





WITH SINGLE AND DUAL PRESSURE REGULATORS C_v up to 1.8



SINGLE PRESSURE REGULATOR

OPERATING DATA

REGULATOR RANGE: 7 to 120 PSI

SINGLE REGULATOR—SINGLE PRESSURE

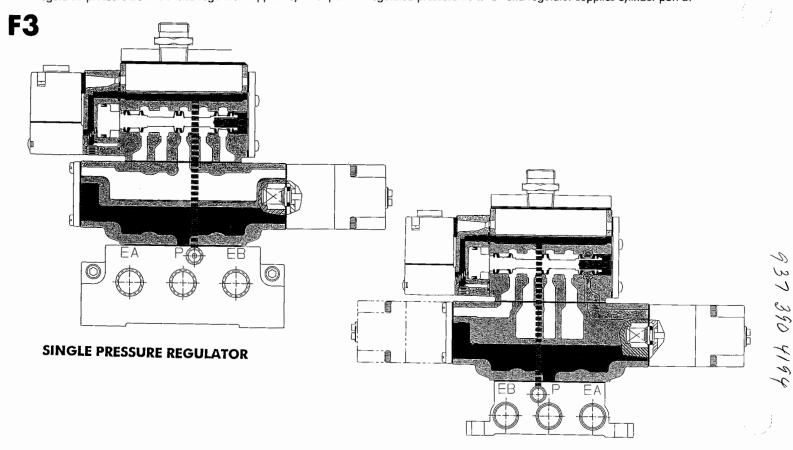
Pressure supplied to the base or manifold passes through the regulator. Regulated pressure is supplied to both cylinder ports A and B.

SINGLE REGULATOR—DUAL PRESSURE

A by-pass plate opposite the regulator permits line pressure to one cylinder port and regulated pressure to the other.

DUAL REGULATOR—DUAL PRESSURE

Regulated pressure from "A" end regulator supplies cylinder port A. Regulated pressure from "B" end regulator supplies cylinder port B.



DUAL PRESSURE REGULATOR

MANUAL ADJUST W/

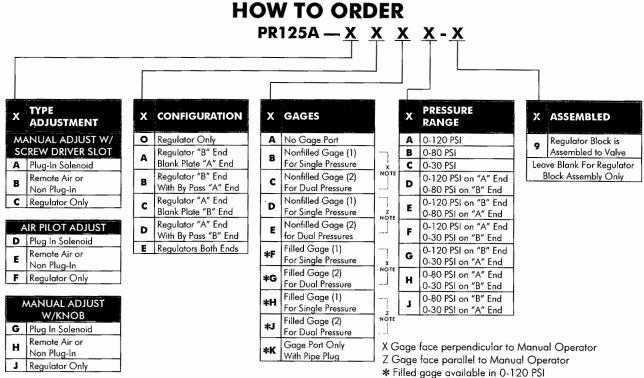
SCREW DRIVER SLOT

W/LOCK NUT

K Plug In Solenoid

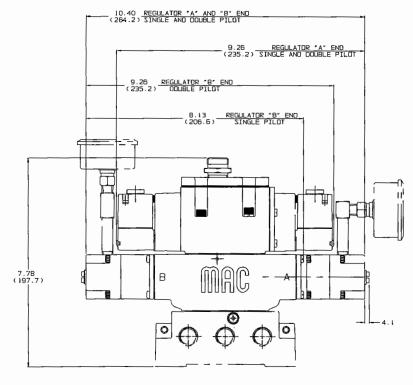
M Regulator Only

Remote Air or Non Plug-In



NOTES:

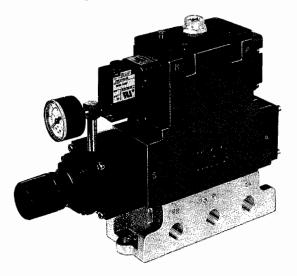
- Main valve body assembly must be external pilot model. Pilots are supplied internally from primary pressure in regulator block.
- 2. Dual pressure valve must be used with dual regulator or by-pass option.
- Cannot field convert regulator block from single pressure to dual pressure.
- 4. Block to base mounting screw #32304.



F4



WITH SINGLE AND DUAL PRESSURE REGULATORS C_v up to 4.7



SINGLE PRESSURE REGULATOR

OPERATING DATA

REGULATOR RANGE: 7 to 120 PSI

SINGLE REGULATOR—SINGLE PRESSURE

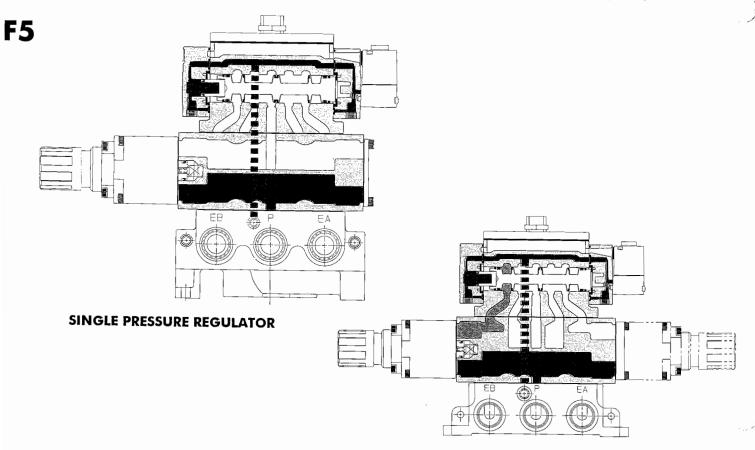
Pressure supplied to the base or manifold passes through the regulator. Regulated pressure is supplied to both cylinder ports A and B.

SINGLE REGULATOR—DUAL PRESSURE

A by-pass plate opposite the regulator permits line pressure to one cylinder port and regulated pressure to the other.

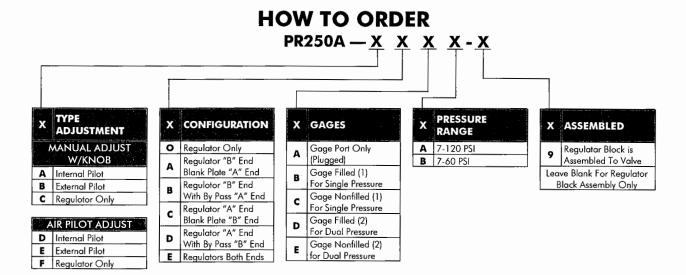
DUAL REGULATOR—DUAL PRESSURE

Regulated pressure from "A" end regulator supplies cylinder port A. Regulated pressure from "B" end regulator supplies cylinder port B.



DUAL PRESSURE REGULATOR





NOTES:

- Main valve body assembly must be external pilot model. Pilots are supplied internally from primary pressure in regulator block.
- 2. Dual pressure valve must be used with dual regulator or by-pass option.
- 3. Cannot field convert regulator block from single pressure to dual pressure.
- 4. Block to base mounting tie rod #19266 (3/16" hex recessed).

17.23 SINGLE AND DOUBLE PILOT
(33B.4) SINGLE AND DOUBLE PILOT
(33B.4) REGULATOR 'B' END

12.43 SINGLE PILOT
(33B.4) REGULATOR 'B' END

13.32 SINGLE AND DOUBLE PILOT
(33B.4) REGULATOR 'B' END

13.32 SINGLE AND DOUBLE PILOT
(33B.4) REGULATOR 'A'
(33B.4) REGULATOR 'A'
(33B.4) REGULATOR 'A'

F6

1/4", 3/8" PORTING

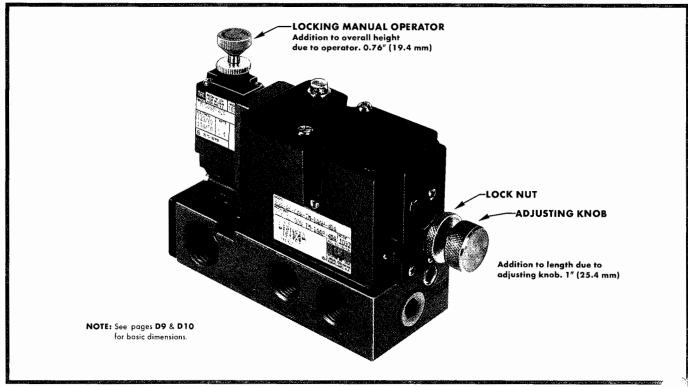
C_V UP TO 1.35

82 SERIES

PRESSURE RANGE: 25-150 PSI

Patents and Patents Pending





82 SERIES "FEATHERING DEVICE"

WHAT IS IT?

A manually operated proportional valve.

WHAT DOES IT DO?

This version of the 82 Series is designed for set up operations. The valve, and therefore the cylinder it controls, can be partially shifted in either direction or blocked in a center position with both cylinder ports closed to exhaust. After set up is completed the valve can be used as a single solenoid 2 position valve.

HOW DOES IT DO IT?

A manually operated adjusting knob, located in the spring retainer, when turned all the way in, blocks the spool in a de-energized position. The valve is supplied with a locking manual operator. Once this operator is energized and the adjusting knob is turned slowly counter clockwise, air is fed slowly into the A port which is normally connected to the blind end of the cylinder. Turning the knob clockwise will stop the cylinder or, if turned far enough, cause it to retract by pressuring the B port. Once the set up is completed, the manual operator is released and the adjusting knob disengaged by turning it fully counter clockwise. The valve can then be used as a single solenoid 2 position valve. A lock nut is provided on the adjusting knob.

APPLICATIONS:

Tube and wire bending machines.

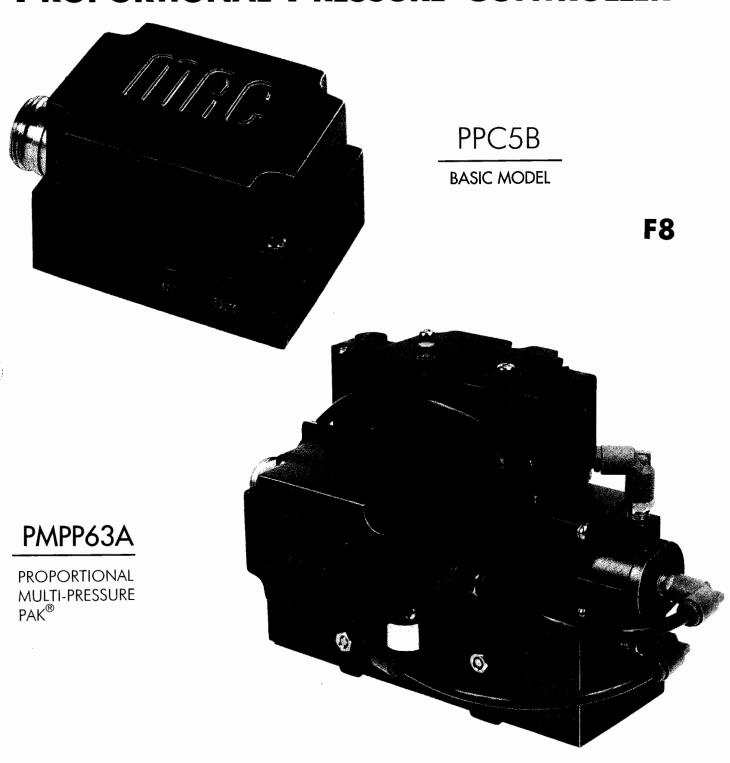
HOW TO ORDER:

Select 82 Series single solenoid 2 position model from pages D5 and D6 Add suffix "MOD 1032"

MAC PPC5B SERIES

Patents and Patents Pending

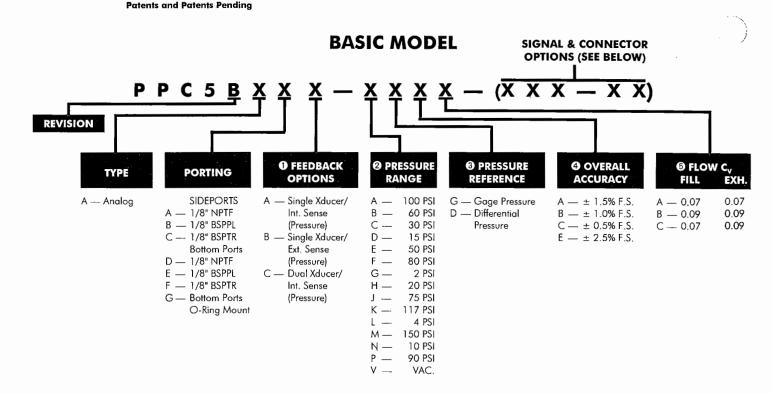
PROPORTIONAL PRESSURE CONTROLLER



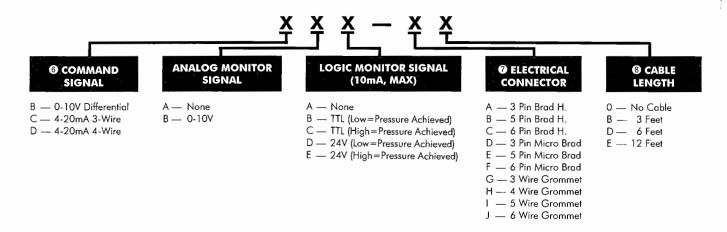
not exceed 25" HG.

Option "B" not ovailable with single (ANALOG)

HOW TO ORDER



SIGNAL & CONNECTOR OPTIONS



IMPORTANT! READ NOTES BEFORE ORDERING-① FEEDBACK ② PRESSURE ③ PRESSURE ⑤ FLOW C_√: **© COMMAND** 7 ELECTRICAL ® CABLE **OPTIONS:** REFERENCE: SIGNAL: RANGE: CONNECTOR: LENGTH: For PMPPs, choose Option "A." For stand alane, choose Option "A." Feedback Option "C" Caution: Differential For other options, See the list of standard For Option "O" (no not available with pressure must not consult the factory. electrical connectors cable), choose For any booster pressure ranges below exceed pressure range before ordering. electrical connector For PMPPS, choose Option "B" and MOD application, choose Option "A." Options "A" through "F" only. 30 PSI. Maximum inlet pressure for Option **4 OVERALL** "D" (15 PSI) is 30 PSI. ACCURACY: For stand alone, "A" is Maximum inlet standard; "B" is For use with Inline pressure for Options "G" (2 PSI) and "L" (4 For PMPPs, choose optional. Boosters, choose Option "C." Option "A" or "E." PSI) is 15 PSI. NOTE: For PMPP ordering information, consult factory. For dual xducers, choose Option "B." Vacuum at inlet should



SPECIFICATIONS (ANALOG)

ELECTRICAL

PNEUMATIC

≭ Inlet Pressure	. 160 PSI Maximum (for 0-150 Output Pressure)
	120 PSI Maximum (for 20-117 Output Pressure)
†Inlet Vacuum	. 25" HG F 1 O
Fluids	
	. Not required. However, if used, a medium aniline point oil is
1	recommended.
Output Pressure	. 0 to 2, 4, 10, 15, 20, 30, 50, 60, 75, 80, 90, 100, 117, 150 PSI
·	(Single Xducer)
	50, 60, 75, 80, 90, 100, 117, 150 PSI (Dual Transducer)
Output Vacuum	
Overall Accuracy	
	± 1.0% full scale (Dual Transducer)
	± 0.5% full scale (Single Transducer, Optional)
	± 2.5% full scale (Single Transducer, Optional)
Flow C _v	
γ	0.09 High Flow
All Ports	•
Minimum Closed End Volume	
The state of the s	2.0 cubic inch ($C_v = 0.07$)
	2.0 cobic from (Cy 0.07)

PHYSICAL

Connector	. Micro or Mini 3, 5 or 6 Pin Plug-In or 3, 4, 5 or 6 Wire Grommet
Enclosure	. Aluminum, Sealed
Mounting	. Any Plane
Vibration	. Not Affected
Ambient Temperature Panas	0 to 50°C (32°E to 120°E)

- * 30 PSI maximum inlet for 15 PSI output pressure.
- * 15 PSI maximum inlet for 2 PSI and 4 PSI output pressure.
- † Vacuum inlet should not exceed 25" HG.

PPC5B ANALOG LIST OF AVAILABLE SIGNAL & CONNECTOR OPTIONS

PPC5B-XXX-XXXX (XXX-XX) - SIGNAL & CONNECTOR OPTIONS

PART NO.	COMMAND	COMMAND	ANIALOG	LOCIC	CONNECTOR
PARI NO.	SIGNAL	TYPE	ANALOG MONITOR	LOGIC MONITOR	CONNECTOR DESCRIPTION
-CAA-AX	4-20mA	SINGLE	NONE	NONE	3-PIN
-CAA-DX	4-20mA	SINGLE	NONE	NONE	3-PIN MICRO
-CAA-GX	4-20mA	SINGLE	NONE	NONE	3-WIRE GROMMET
-BAA-HX	0-10V	DIFFERENTIAL	NONE	NONE	4-WIRE GROMMET
-DAA-HX	4-20mA	DIFFERENTIAL	NONE	NONE	4-WIRE GROMMET
-CBB-BX	4-20mA	SINGLE	0-10V	πι	5-PIN
-CBD-BX	4-20mA	SINGLE	0-10V	24V	5-PIN
-BBA-BX	0-10V	DIFFERENTIAL	0-10V	NONE	5-PIN
-BAB-BX	0-10V	DIFFERENTIAL	NONE	ΠL	5-PIN
-BAD-BX	0-10V	DIFFERENTIAL	NONE	24V	5-PIN
-DBA-BX	4-20mA	DIFFERENTIAL	0-10V	NONE	5-PIN
-DAB-BX	4-20mA	DIFFERENTIAL	NONE	ΠL	5-PIN
-DAD-BX	4-20mA	DIFFERENTIAL	NONE	24V	5-PIN
-CBB-EX	4-20mA	SINGLE	0-10V	πι	5-PIN MICRO
-CBD-EX	4-20mA	SINGLE	0-10V	24V	5-PIN MICRO
-BBA-EX	0-10V	DIFFERENTIAL	0-10V	NONE	5-PIN MICRO
-BAB-EX	0-10V	DIFFERENTIAL	NONE	ΠL	5-PIN MICRO
-BAD-EX	0-10V	DIFFERENTIAL	NONE	24V	5-PIN MICRO
-DBA-EX	4-20mA	DIFFERENTIAL	0-10V	NONE	5-PIN MICRO
-DAB-EX	4-20mA	DIFFERENTIAL	NONE	Πί	5-PIN MICRO
-DAD-EX	4-20mA	DIFFERENTIAL	NONE	24V	5-PIN MICRO
-CBB-IX	4-20mA	SINGLE	0-10V	Пι	5-WIRE GROMMET
-CBD-IX	4-20mA	SINGLE	0-10V	24V	5-WIRE GROMMET
-BBA-IX	0-10V	DIFFERENTIAL	0-10V	NONE	5-WIRE GROMMET
-BAB-IX	0-10V	DIFFERENTIAL	NONE	Πί	5-WIRE GROMMET
-BAD-IX	0-10V	DIFFERENTIAL	NONE	247	5-WIRE GROMMET
-DBA-IX	4-20mA	DIFFERENTIAL	0-10V	NONE	5-WIRE GROMMET
-DAB-IX	4-20mA	DIFFERENTIAL	NONE	ΠΙ	5-WIRE GROMMET
-DAD-IX	4-20mA	DIFFERENTIAL	NONE	24V	5-WIRE GROMMET
-BBB-CX	0-10V	DIFFERENTIAL	0-10V	ΠL	6-PIN
-BBD-CX	0-10V 0-10V	DIFFERENTIAL	0-10V 0-10V	24V	6-PIN
-DBB-CX	4-20mA	DIFFERENTIAL	0-10V 0-10V	ΠL 24V	6-PIN
-DBD-CX	4-20mA 4-20mA	DIFFERENTIAL	0-10V 0-10V	24V	6-PIN
-DBD-CX	4-20MA	DIFFERENTIAL	0-104	244	O-PIIN
-BBB-FX	0-10V	DIFFERENTIAL	0-10V	ΠL	6-PIN MICRO
-BBD-FX	0-10V	DIFFERENTIAL	0-10V	24V	6-PIN MICRO
-DBB-FX	4-20mA	DIFFERENTIAL	0-10V	ΠL	6-PIN MICRO
-DBD-FX	4-20mA	DIFFERENTIAL	0-10V	24V	6-PIN MICRO
-BBB-JX	0-10V	DIFFERENTIAL	0-10V	ΠL	6-WIRE GROMMET
-BBD-JX	0-10V	DIFFERENTIAL	0-10V	24V	6-WIRE GROMMET
-DBB-JX	4-20mA	DIFFERENTIAL	0-10V	ΠL	6-WIRE GROMMET
-DBD-JX	4-20mA	DIFFERENTIAL	0-10V	24V	6-WIRE GROMMET
		1	L		

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STANDARD PLUG-IN ELECTRICAL CONNECTIONS ANALOG

PPC5B - XXX - XXXX- (XXX - XX) ELECTRICAL OPTIONS

	PART NO. -(CAA-AX)	3-PIN 1 COMMON 2 POWER +18 TO +28VDC 3 COMMAND	MATING CORD GREEN BLACK WHITE
(*©)	PART NO. -(CAA-DX)	3-PIN MICRO 1 COMMON 2 POWER +18 TO +28VDC 3 COMMAND	MATING CORD GREEN RED WITH BLACK TRACER RED WITH WHITE TRACER
	PART NO. -(CBB-BX)	5-PIN (SINGLE-ENDED) 1 COMMAND 2 ANALOG MONITOR SIGNAL 3 COMMON 4 LOGIC MONITOR SIGNAL 5 POWER +18 TO +28VDC	MATING CORD WHITE RED GREEN ORANGE BLACK
	PART NO. -(BBA-BX) -(BAB-BX) -(DBA-BX) -(DAB-BX)	5-PIN (DIFFERENTIAL) 1 + COMMAND 2 - COMMAND 3 COMMON 4 LMS or AMS 5 POWER +18 TO +28VDC	MATING CORD WHITE RED GREEN ORANGE BLACK F 1
	PART NO. -(CBB-EX)	5-PIN MICRO (SINGLE ENDED) 1 COMMAND 2 ANALOG MONITOR 3 COMMON 4 LOGIC MONITOR SIGNAL 5 POWER +18 TO +28VDC	MATING CORD RED WITH WHITE TRACER RED GREEN RED WITH YELLOW TRACER RED WITH BLACK TRACER
	PART NO. -(BBA-EX) -(BAB-EX) -(DBA-EX) -(DAB-EX)	5-PIN MICRO (DIFFERENTIAL) 1 + COMMAND 2 - COMMAND 3 COMMON 4 LMS or AMS 5 POWER +18 TO +28VDC	MATING CORD RED WITH WHITE TRACER RED GREEN RED WITH YELLOW TRACER RED WITH BLACK TRACER
	PART NO. -(BBB-CX) -(DBB-CX)	6-PIN 1 LOGIC MONITOR SIGNAL 2 - COMMAND 3 POWER +18 TO +28VDC 4 + COMMAND 5 ANALOG MONITOR SIGNAL 6 COMMON	MATING CORD ORANGE BLUE BLACK WHITE RED GREEN
	PART NO. -(BBB-FX) -(DBB-FX)	6-PIN MICRO 1 + COMMAND 2 ANALOG MONITOR SIGNAL 3 COMMON 4 LOGIC MONITOR SIGNAL 5 POWER +18 TO +28VDC 6 - COMMAND	MATING CORD RED WITH WHITE TRACER RED GREEN RED WITH YELLOW TRACER RED WITH BLACK TRACER RED WITH BLUE TRACER

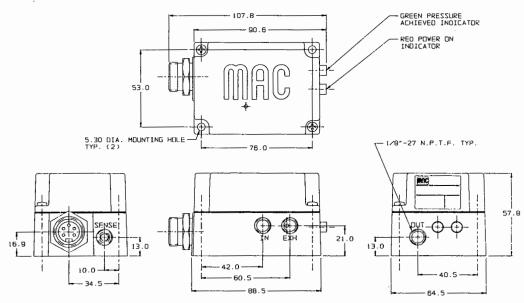
F13

STANDARD WIRE GROMMET ELECTRICAL CONNECTIONS — ANALOG —

PPC5B - XXX - XXXX - (XXX - XX) ELECTRICAL OPTIONS

PART NO. - (CAA-GX)	3-WIRES COMMON POWER +18 TO +28VDC COMMAND	WIRE COLOR GREEN RED WITH BLACK TRACER RED WITH WHITE TRACER
PART NO. - (BAA-HX) - (DAA-HX)	4-WIRES COMMON POWER +18 TO +28VDC +COMMAND -COMMAND	WIRE COLOR GREEN RED WITH BLACK TRACER RED WITH WHITE TRACER RED WITH BLUE TRACER
PART NO. – (CBB–IX)	5-WIRES COMMAND ANALOG MONITOR SIGNAL COMMON LOGIC MONITOR SIGNAL POWER +18 TO +28VDC	WIRE COLOR RED WITH WHITE TRACER RED GREEN RED WITH YELLOW TRACER RED WITH BLACK TRACER
PART NO (BAB-IX) (BBA-IX) (DAB-IX) (DBA-IX)	5-WIRES +COMMAND -COMMAND COMMON LMS or AMS POWER +18 TO +28VDC	WIRE COLOR RED WITH WHITE TRACER RED GREEN RED WITH YELLOW TRACER RED WITH BLACK TRACER
PART NO. - (BBB-JX) - (DBB-JX)	6-WIRES +COMMAND ANALOG MONITOR SIGNAL COMMON LOGIC MONITOR SIGNAL POWER +18 TO +28VDC -COMMAND	WIRE COLOR RED WITH WHITE TRACER RED GREEN RED WITH YELLOW TRACER RED WITH BLACK TRACER RED WITH BLUE TRACER

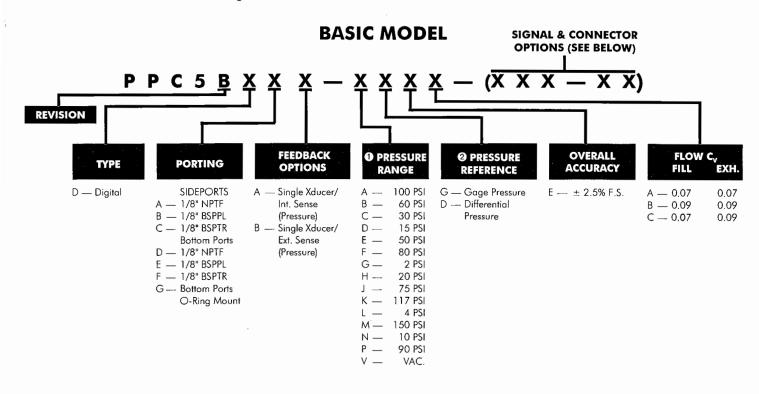
DIMENSIONS (ANALOG AND DIGITAL)





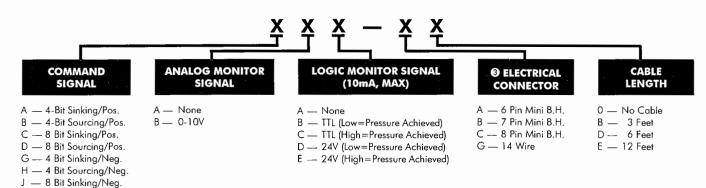
(DIGITAL)

HOW TO ORDER



SIGNAL & CONNECTOR OPTIONS

F14



IMPORTANT! READ NOTES BEFORE ORDERING

① PRESSURE RANGE:

Maximum inlet pressure for Option "D" (15 PSI) is 30 PSI.

K - 8 Bit Sourcing/Neg.

Maximum inlet pressure for Options "G" (2 PSI) and "L" (4 PSI) is 15 PSI.

Vacuum Inlet should not exceed 25" HG.

② PRESSURE REFERENCE:

Caution: Differential pressure must not exceed pressure range.

③ ELECTRICAL CONNECTOR:

All connector options are available with the 4 Bit command signal. Options "A," "B" and "C" can be supplied with or without a cable. Option "G" requires a cable. Select length from table.

The 4 Bit command signal without the analog monitor signal (AMS) or logic monitor signal (LMS) requires a 6 Pin connector. For the AMS or LMS options, add one pin for each.

The 8 BIT command signal can only use Option "G." Select cable length from table. **NOTE:** For PMPP ordering information, consult factory.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.



Patents and Patents Pending

SPECIFICATIONS (DIGITAL)

ELECTRICAL

Supply Voltage18 to 28 VDCSupply Current50 to 275 mA (Single Transducer)Command Signal24V Sinking or 5V Sourcing

EMI/RFI Protection Common Mode and High Frequency Noise Reduction

PNEUMATIC

Fluids Air or inert gases

Lubrication Not required. However, if used, a medium aniline point oil is

recommended.

2.0 cubic inch ($C_v = 0.09$)

F15

PHYSICAL

* 30 PSI maximum inlet for 15 PSI output pressure.

* 15 PSI maximum inlet for 2 PSI and 4 PSI output pressure.

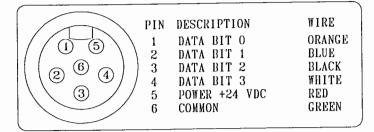
† Vacuum inlet should not exceed 25" HG.



Patents and Patents Pending

PPC5B DIGITAL ELECTRICAL CONNECTOR PIN OUTS

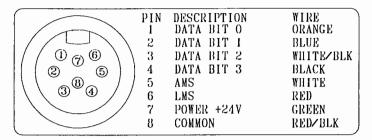
4 BIT COMMAND SIGNAL



4 BIT COMMAND SIGNAL WITH AMS

PIN 1 2 3 4 5 6 7	DESCRIPTION DATA BIT 0 DATA BIT 1 DATA BIT 2 DATA BIT 3 AMS POWER +24V COMMON	WIRE WHITE/BLK BLACK WHITE RED ORANGE BLUE GREEN
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4 BIT COMMAND SIGNAL WITH AMS & LMS



4 BIT COMMAND SIGNAL WITH LMS

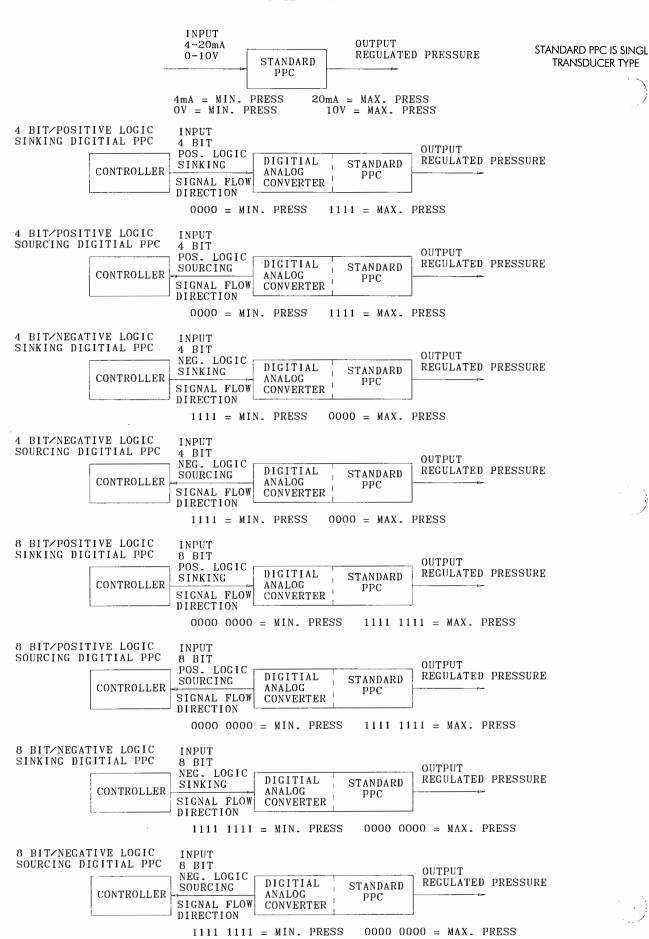
	PIN 1	DESCRIPTION DATA BIT 0	WIRE WHITE/BLK
(0 6 2 7 6 3 4	2 3 4 5 6 7	DATA BIT 1 DATA BIT 2 DATA BIT 3 LMS POWER +24V COMMON	BLACK WHITE RED ORANGE BLUE GREEN

F16

8 BIT COMMAND SIGNAL — 14 WIRE

DESCRIPTION	WIRE	DESCRIPTION	WIRE
+24VDC	RED	DB5	ORANGE
COMMON	BLACK	DB6	BLK/WIIT
DBO	WIIT/BLK	DB7	BLU/BLK
DB1	BLUE	AMS	RED/BLK
DB2	GRN/WHT	LMS	GRN/BLK
DB3	RED/WHT	/AMS	WHITE
DB4	BLU/WIIT	∠LATCH	ORG/BLK
ţ			

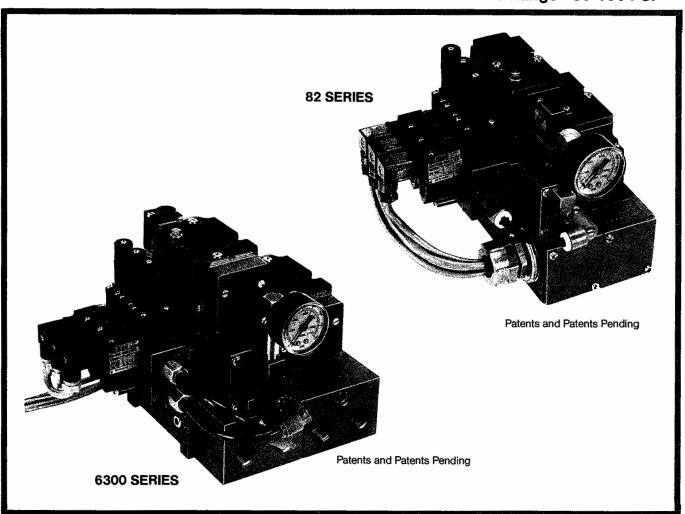
PPC5B DIGITAL PPC OPTIONS



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•					

Patents and Patents Pending

1/4", 3/8", 1/2", 3/4" Porting C_v from 1.0 to 4.1 (82, 6300, 6500, ISO 1 & ISO 2 SERIES) Pressure Range - 30-150 PSI



DESIGN DESCRIPTION

The MAC Multi-Pressure Pak® is designed for applications requiring multiple pressures which can be selected electrically through low powered AC or DC solenoids. The selected pilot pressure is directed to a pilot operated sandwich pressure regulator. The sandwich regulator amplifies the flow of this pre-selected pressure.

The multiple pressures can be manually preset from 30 to 120 p.s.i.

The Multi-Pressure Pak® is prewired, prepiped, lightweight and compact.

APPLICATIONS

Typical uses of the Multi-Pressure Pak® are welding densification packages, press welders, paint systems or any other application where it is desirable to change pressures electrically. The lightweight and compact size of this assembly also makes it ideally suited for robot arm mounting.

MAINTENANCE

The Multi-Pressure Pak® is designed to give millions of trouble free cycles in rugged applications. In addition it is easy to maintain. The main control valve has an electrical plug in to the sandwich regulator which in turn plugs into the manifold base. The pilot valves are mounted on their own manifold bases and are supplied with prewired external plug in connectors. The quick release air fittings to the sandwich regulator are easily disconnected. Any element can therefore be quickly removed for service, without disturbing electrical or piping connections.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

WHAT IS IT?

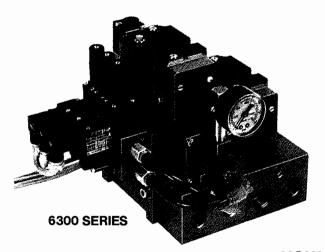
This is electrically controlled air pressure regulation feeding a 4 way solenoid valve. The assembled unit is referred to as a Multi-Pressure Pak.®

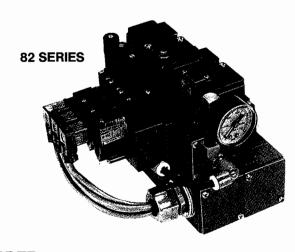
WHAT DOES IT DO?

This Multi-Pressure Pak® provides electrically controlled pre-set air pressures for welding and other applications.

HOW DOES IT DO IT?

A series of solenoid pilot valves, each with their own individual pressure regulators are ganged together in a manifold. This manifold contains an internal cascading circuit to a single common outlet. The pressure regulators are manually pre-set according to the various pressures required by the application. By energizing any one of the pilot valves, the corresponding pre-set regulator supplies the selected air pressure via the common outlet to the air pilot operated sandwich regulator. This air pilot operated regulator in turn amplifies the flow of this pre-selected pressure which is fed to the 4 way solenoid valve.





HOW TO ORDER

First determine the flow or Cv required for the application and then select the appropriate valve series from the table below.

Refer to the MAC® Catalog for valve designation, voltage options and cylinder port configuration or size.

Determine the number of pressures required by the application.

Indicate whether any other valves are to be ganged to the Multi-Pressure Pak® (for example a standard 4 way valve to operate a retract cylinder in a multi-pressure welding application). The Multi-Pressure Pak® can be installed at either end of an assembled gang of manifold valves.

An optional guard is available to protect the pilot valves. If required, this should be specified when ordering.

External electrical conduit connections must be supplied by customer.

MAC® Valves will then provide a MPP (Multi-Pressure Pak®) number to this particular configuration.

PIPE SIZE		PIPE SIZE Cv** HEIGHT		WIDTH	LENGTH	WEIGHT*	
82	1/4 - 3/8"	1.0	6.25*	7.5″	9″	8 lbs.	
6300	3/8 - 1/2"	2.4	6.5"	10"	10"	12.5 lbs.	
6500	1/2 - 3/4"	4.1	8″	10.75"	10"	15 lbs.	
ISO 1	1/4 - 3/8"	1.0	6.4"	7,9"	9″	9.5 lbs.	
ISO 2	3/8 - 1/2"	2.3	7:25"	9.4".	10"	13.5 lbs.	

^{*}With 3 gang 35 Series manifold plus two 4 way valves (see photos).

OPERATING DATA

Min. Operating Pressure: 30 p.s.i

Max Operating Pressure: 150 p.s.i.

NOTE: Pressures shown are minimum and

Pressure Selection Range: 30-120 p.s.i.

maximum safe working pressures.

Voltages available A.C. 120/60, 110/50

D.C. 12 & 24 volt. 1.8 to 12.7 watts Other AC and DC voltages available: consult factory

Air Supply: Filtered

Lubrication: Not required but if lubrication is used, a medium aniline point oil is recommended.

Consult "Precautions" on inside back cover before use, installation or service of MAC Valves.

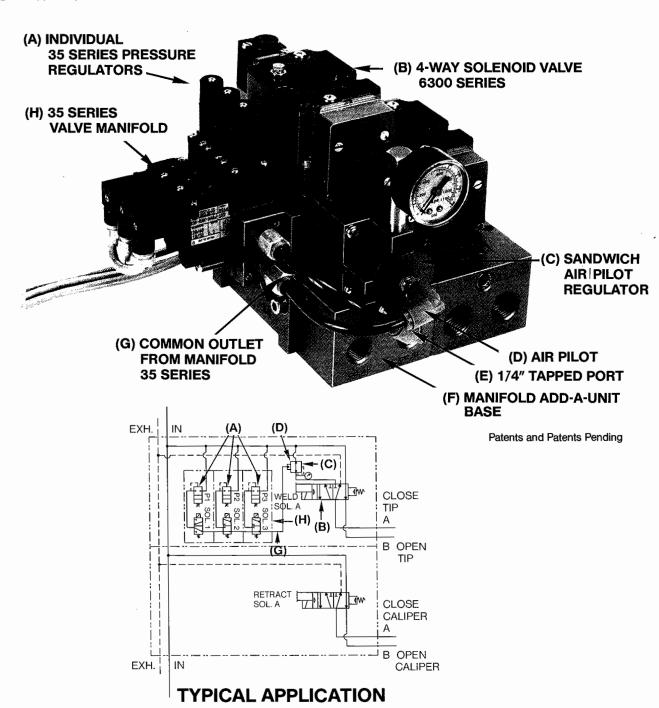
^{**}With regulator: maximum port size: average all flow paths.

The Multi-Pressure Pak® consists of:

- A 4 way solenoid valve (B) (82, 6300 or 6500 Series)
- An air pilot operated sandwich regulator (C) mounted on a manifold add-a-unit base (F).
- A gang of manifolded 35 Series, 1/8" 3 way solenoid valves (H), each with its own individual regulator (A), is bolted to
 the side of the Selector Assembly. The 35 Series manifold (H) has a common outlet (G) connected to the air pilot (D) of
 the sandwich air pilot regulator (C). The inlet pressure to the 35 Series manifold is via a 1/4" tapped port (E) in the
 manifold base.

The number of pressures supplied by this assembly corresponds to the number of regulators in the 35 Series valve manifold (H). NOTE: Up to six regulators is standard for the 6300 and 6500 Series; up to four is standard for the 82 Series. (For more than these quantities, consult factory).

Once the pressure at each individual 35 Series regulator has been manually preset, energizing the corresponding 35 Series solenoid will provide that particular pressure at the common outlet of the manifold. The pre-selected pressure at the common outlet is connected to the air pilot of the sandwich regulator. The sandwich regulator amplifies the flow of this pre-selected pressure either to both cylinder ports of the 4 way valve or to one cylinder port with main line pressure fed through a bypass plate to the other.



G3

PRESSURE SELECTION - THE 35 SERIES MANIFOLD

PRIORITY IN THE CASCADING CIRCUIT

The 35 Series manifold incorporates a cascading circuit with a single common outlet. Energizing any one of the valves at any station in the manifold provides the common outlet with the corresponding preset pressure at that station. In the event that two or more solenoids are energized simultaneously, the station closest to the common outlet has priority and the preset pressure at that station will be the pressure supplied.

SEQUENCE OF PRESSURES: LOW TO HIGH: HIGH TO LOW

Wherever possible the sequence should be so arranged to change from low to high pressure. Where this is not possible, it may be necessary to make provision to remove or reduce the excess pressure downstream from the selector assembly. In certain applications, this may happen automatically; for example if the pressure is changed from high to low when a cylinder is at the start of its outward stroke, the downstream pressure will automatically be reduced. In other cases, when for example a cylinder is already fully extended and the application calls for a reduction in air pressure, the excess pressure will have to be exhausted. It would normally take too long to exhaust this air through the bleed orifice of the regulator.

ENERGIZED QUICK DUMP

To solve the above problem make the first valve in the 35 Series manifold (farthest from the single common outlet) normally open. This valve, when energized will allow the air in the pilot line of the sandwich regulator to dump to exhaust. The appropriate low pressure station should be energized when the air in the pilot line of the sandwich regulator drops to, or below the required low pressure.

OPTIONAL N.O. BLANKING PLATE

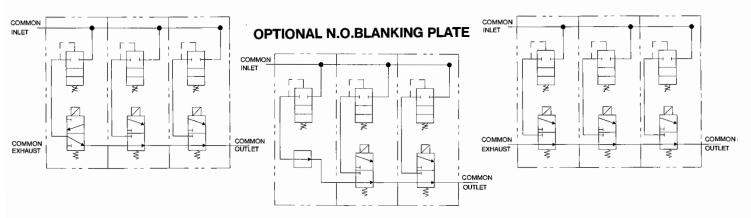
In cases where it is not necessary to have a quick means of exhausting or reducing the pressure in the air pilot of the sandwich regulator, the first station of the 35 Series manifold can be a manifold base with a normally open blanking plate. This station, with or without a regulator, will then control the air pilot of the sandwich regulator when all 35 Series solenoids are de-energized. The number of regulated pressures will therefore be one more than the number of electrical signals required.

DE-ENERGIZED QUICK DUMP

It is also possible to provide the 35 Series manifold with all the valves normally closed. This allows the air pilot of the regulator to be exhausted to atmosphere in the absence of any electrical signal. This option is useful in the case of certain weld cylinders where there must be zero pressure at both cylinder ports of the weld valve in order for the retract portion of the weld cylinder to function.

ENERGIZED QUICK DUMP

DE-ENERGIZED QUICK DUMP



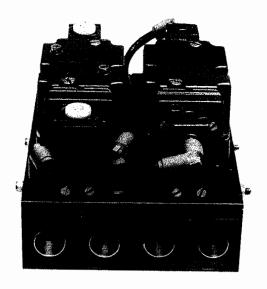
G4

HIGH FLOW - FAST RESPONSE - COMPACT DESIGN

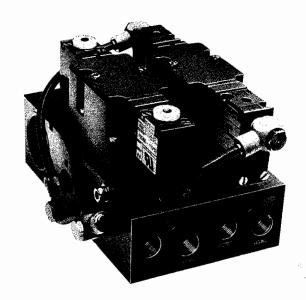
- Positive and consistent sequencing of gripper, retainer and feed cylinders.
- Time delay accomplished by pressure rather than small orifices subject to clogging.
- Standard off-the-shelf valves in simple, proven circuit.
- Time proven MAC no-stick operation.

G5

Plug-in valves assure ease of maintenance.

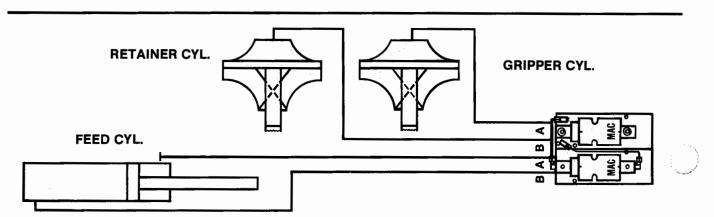


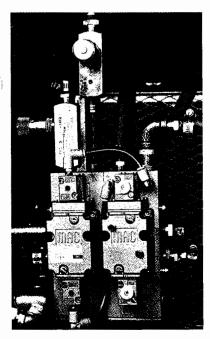
SMA-PF63A

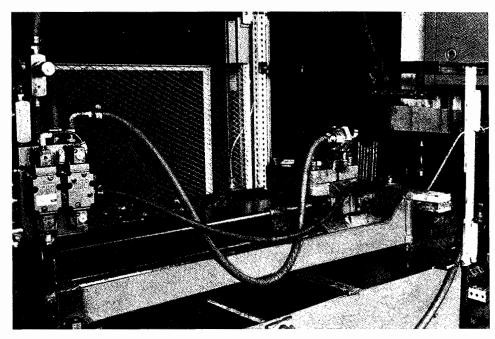


SMA-PF62A

- Eliminates costly downtime associated with other press feed systems.
- Manual operators allow easy set-up and troubleshooting of circuit components.
- True non-lube service without costly high maintenance filtration --- only standard 40 micron required.
- Patented, burn-out proof MACsolenoid.
- 18-month warranty

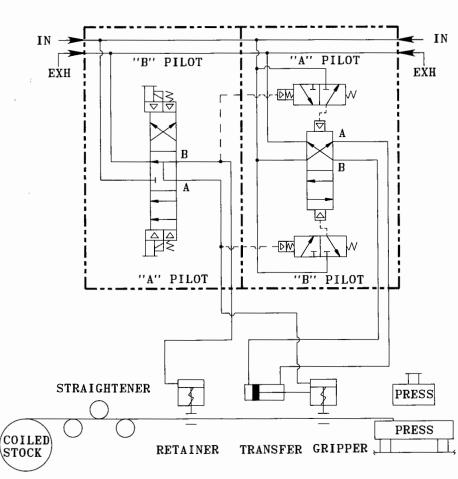






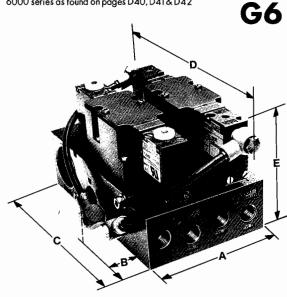
TYPICAL APPLICATION

DIMENSIONS INCHES



Valve Series	A	В	С	D	Ē
PF62	4.5	1.375	7.375	8,75	4.5
PF63	5.75	NA	7.875	9.25	4.75
PF65	7.0	1.375	7.25	10.125	5.25

Note: Dimensions for mounting PF62, 63 & 65 are standard for 6000 series as found on pages D40, D41 & D42



HOW TO ORDER

Part No.	Description
SMA-PF62A SMA-PF62C SMA-PF63A SMA-PF63C SMA-PF65A SMA-PF65C	%", 120 VAC %", 24 VDC 8.5 watt ½", 120 VAC ½", 24 VDC, 8.5 watt %", 120 VAC %", 24 VDC

TECHNICAL SECTION

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	REMOTE AIR PILOT, PILOT OPERATOR OPTIONS	• • • • • • • • • • • • • • • • • • • •	T-4
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	6000 SERIES NON PLUG-IN A EXTERNAL PLUG-IN OPTION		T-5
	U.L. VALVES - RECOGNIZED	100,200 PILOTS	T-5
Γ1	CSA APPROVED VALVES 200 SERIES	82 SERIES 6200, 6300 & 6500 SERIES 56, 57, 58, 800 & 900 SERIES 600, 45 & 55 SERIES ISO 1, 2 & 3 SERIES 700 SERIES MAC 125, 250, 500 35 SERIES 52 SERIES 400 SERIES	T-8 T-9 T-10
	EUROPEAN UNION DIRECTIV	YES (CE MARK)	T-19
	CSA CONDUIT LINERS DIMENSIONAL DATA		T-20
	MANUAL AND MECHANICAL OPERATIONAL OPTIONS		T-21
	6000 SERIES MANIFOLD TRANSITION PLATES		T-21

VOLTAGE, MANUAL OPERATOR, LEAD LENGTH AND ELECTRICAL ENCLOSURE OPTIONS

VOLTAGE AND WATTAGE OPTIONS

MAC makes its own coils permitting flexibility in voltage and wattage requirements. The following is a partial list. If the voltage required is not listed, consult the factory. We may have it available or may be able to produce it. The two digit number under "code" is the "voltage" code to be used when ordering; e.g. 111B-211BA.

AC	Code	DC	Code	DC	Code
12/50-60 (100 type Only)	-21	12 VDC (6Watt)	-55	24 VDC (2.5W) 200 type Only	, -52
12/60 (200 type Only)	-21	12 VDC (2.5W) 100 type Only	-57 ②	24 VDC (2.5W) 100 type Only	
24/50-60	-22	12 VDC (8.5W)	-60	24 VDC (1.0W) 200 type Only	_
32/60	-23	12 VDC (1.0W) 100 type Only	-A2 ②	24 VDC (1.0W) 100 type Only	
48/60, 42/50	-24	24 VDC (24W) 200 type Only	-78 🛈	32 VDC	-65
120/60, 110/50	-11	24 VDC (17W) 100 type Only	-87 ①	48 VDC	-66
120/60, 110/50 (600 type only	y) -17 ③	24 VDC (8.5W)	-61	90 VDC	-75
240/60, 220/50	-12	24 VDC (6W)	-50	100 VDC	-76
440-480/60 380-440/50 (100 type Only) 480/60, 440/50 (200 type Onl	-26 ①	Must also specify MOD CLSFNot available on 600 or 1300) Series	120 VDC 220-250 VDC	-68 -69 ①

100 type coils used on 100, 55, 56, 600, 700, 800, 900, 6600, 6200, 6300, 6500 & 1300 Series valves in this catalog. **200** type coils used on 200, 57, 58 & 59 Series valves in this catalog.

MANUAL OPERATORS (Shown on 100 Series Grommet Cover)

These options of manual operators are available on all series of solenoid valves in this catalog. The numerical code in the box is the "Manual Operator" code to be used when ordering; e.g. 111B-111BA.







(3) For double solenoid valves only-low wattage AC. Must specify MOD 444 also.



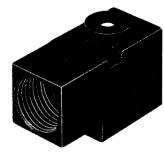
NON PLUG-IN ELECTRICAL ENCLOSURES

(100 Series Shown)

These options are available on all non-plug in Series of solenoid valves in this catalog. The alpha codes in the boxes are the "Enclosure" codes to be used when ordering; e.g. 111B-111BA.



B/A GROMMET



CA CONDUIT, 1/2" NPS THREADS

CC. CONDUIT, 1/2" NPT THREADS (CSA threads)

NA SAME AS "CA", BUT WITH GROUND WIRE

SAME AS "CC", BUT
WITH GROUND WIRE
CONDUIT, 3/8" NPS THREADS
ONLY FOR USE ON 1"

CENTER STACKING VALVES



AA HA

JIC WIRING BOX WITH 1/2" NPS CONDUIT SAME AS "AA" BUT W/GROUND WIRE

COIL LEAD LENGTH OPTIONS

All non plug-in valves are supplied with 18" coil lead wires (AA) unless otherwise specified. If other lengths are required—add appropriate code letters to end of model number; e.g. 111B-111CAAB. For other lengths consult factory.

24" COIL LEADS

AE 48" COIL LEADS

AD

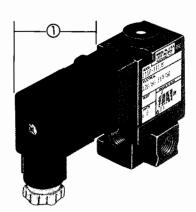
ВА 36" COIL LEADS

60" COIL LEADS

6000 SERIES base mounted plug-in valves utilize coils with leads which are hard wired in the body. The "A" solenoid leads (yellow) in the base include ground wire. The "B" solenoid leads (red) are also in the base. Each set of base leads has about 8" of exposed length. Longer base leads are available—specify length required.

EXTERNAL PLUG-IN ELECTRICAL ENCLOSURES

These options are available on all series of solenoid valves in this catalog except where noted below. The alpha codes in the boxes are "enclosure" codes to be used when ordering; e.g., 111B-111JA.



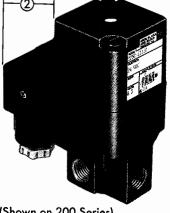
RECTANGULAR CONNECTOR WITHOUT LIGHT

① Adds 2.19" (55.7mm) to grommet cover dimension in catalog

RECTANGULAR CONNECTOR WITH LIGHT

Adds 2.19" (55.7mm) to grommet cover dimension in catalog

(Not available on 200, 57, 58 or 59 Series)



(Shown on 200 Series)

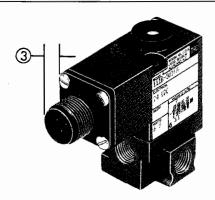
SQUARE DIN CONNECTOR WITHOUT LIGHT

Adds 1.66" (42.2mm) to grommet cover dimension in catalog **SQUARE DIN CONNECTOR WITH LIGHT**

2 Adds 1.66" (42.2mm) to grommet cover dimension in catalog Also used on 100 Series—Add .18" (4.4mm) to dimension "A" in catalog on page A18

Available all series except stacking valves with 1" centers.

ABOVE DIN CONNECTORS AVAILABLE PREWIRED WITH 6 FOOT SJO-3 YELLOW CORD -SPECIFY MOD 416Y AFTER COMPLETE MODEL NUMBER



MILITARY TYPE MS CONNECTOR

2 PIN MS-3102A-10SL-4P Male Only

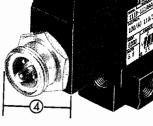
FA

GA

3 PIN MS-3102A-10SL-3P Male Only

(Does not include mating female plug)

3 Adds .69" (17mm) to conduit cover dimension in catalog



THREAD IN TYPE PLUG-IN CONNECTOR Available with

3 PIN—Specify AA Enclosure and
5 PIN—Specify AA Enclosure and
3 PIN—90° elbow Specify AA Enclosure and MOD. 300C
(Does not include mating female plug)

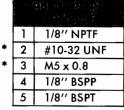
Adds .64" (16.3mm) to JIC enclosure (AA) dimension in catalog

REMOTE AIR PILOT, PILOT OPERATED OPTIONS

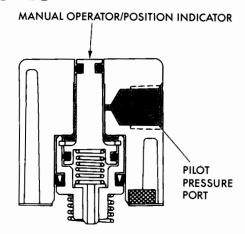
A 100 type remote air pilot, pilot operator (shown on the right) is available on all valves using the 100 Series solenoid (All series in this catalog except 200, 57, 58, 59, or 1300). Any 100 Series solenoid can be replaced with this air pilot operator. When utilizing this operator the air pilot signal can be a minimum of 20 psig regardless of main valve pressures. The air pilot signal pressure shifts only the pilot valve poppet while internal (main valve) or external pilot pressure shifts the main valve spool. A manual operator and pilot spool position indicator is standard.

TO ORDER: Substitute the voltage, manual operator and enclosure options given in the catalog under each series with RA1X, X equaling the desired pilot port thread options shown on the right examples, 55B-12-PI-RA11, 56C12-RA11, 711C-11-PI-RA11, 811C-PM-RA11-52, 911B-PM-RA11.
On 6000Series (6200-6300-6500) for both

single and double operated models use the Remote Air Pilot Model numbers given in the catalog and add 1X (X equaling desired port thread) after the RA e.g. 6212C-131-PM-RA11, 6312D-131-PM-RA11 or 6512B-131-PM-RA11. To order a solenoid operated valve with air pilot return, use the standard double solenoid valve model numbers and add MOD 410A to replace the "A" solenoid with the remote air pilot, pilot operator or MOD 410B to replace the "B" solenoid.



^{*}Not available for the 35, 45 & 82 Series



A similar remote air pilot is available for the 35, 45 & 82 Series. Use same code for pilot port options.

Examples: 35A-AAA-RA11

45A-AA1-RA11

82A-AB-BAA-TM-RA11

PARTIAL LIST OF MODIFICATIONS

Т4

MAC Valves is committed to designing and producing valves to our customers' specifications wherever practical and possible. Below is an abbreviated list of some of the more common modifications in general use. There are currently over 1,000 MOD numbers issued; if you do not find what you require in the list below, please consult the factory.

- **DD01** Replace standard coil with a coil containing a spike suppressing diode. For D.C. voltages only (polarity sensitive).
- MOV1 Replace standard coil with a coil containing a spike suppressing M.O.V. For both AC & DC voltages (not polarity sensitive).
- DRA1 Assemble single solenoid valves with a base or manifold wired to accommodate a double solenoid valve.
- CLSF Replace standard coil with a Class F rated coil.
- Assemble valve or base assembly with special length lead wire (xxx = lead length in inches).
- **T65C** For ambient temperatures up to 150° F (65° C). Includes CLSF coil.
- **TSA1** Provide a terminal strip mounted on junction box cover plate.
- TSA2 As TSA1 but with the base leads prewired to terminal strip.
- **0158** Replace standard spring with heavy duty spring.
- 0233 Assemble valve with solenoid operator on B end of valve instead of A end.
- *300B Install Brad Harrison 3 pin connector.
- 0300 Install Brad Harrison 5 pin connector.
- 0389 Rotate solenoid cover or mechanical operator 180 degrees from standard position.
- **408B** Install filter screen in port 3 instead of port 1. (35, 100 or 200 series)
- 416Y DIN connectors prewired with 6 feet of SJO-3 yellow cord.
- **0446** Replace standard spools and seals with viton spools and seals.
- 471L Coil wires to be 22 AWG.
- 0532 Valves supplied with solenoid cover(s) and corrosion resistant parts for wash down applications.
- **0575** Modify 55, 58 and 59 series for diverter application.
- O650 Grease all valve parts with FDA approved grease.
- **736A** 100 series modified for higher flow, high speed 2 Way applications.
- **0819** Extended meter in/out flow controls (45 series).
- 0850 Lubricate valve with Dow Corning no.4 grease.

6000 SERIES – NON PLUG-IN OR EXTERNAL PLUG-IN

The 6000 Series (6200-6300-6500) as shown in the catalog are base mounted plug-in valves. Electrical wiring connections are made at the base. These valves can also be ordered as non plug-in or external plug-in models.

On non-plug-in versions electrical connections are made directly to the solenoid at the cover. Solenoid cover options are shown on page **T-2**. These valves are also available with external plug-in electrical enclosures shown on page **T-3**.

To order 6000 Series non plug-in or external plug-in models use the remote air pilot model numbers given in the catalog and substitute the RA (remote air) designation at the end with the desired pilot option, voltage, manual operator and solenoid enclosure options.

EXAMPLES:

6311D-111-PM-111DA (Solenoid Pilot Operated) Base Plug-In Model

6312D-131-RA (Remote Air Operated Model)

6312D-131-PM-111CA (Solenoid Pilot Operated) (Non Plug-In) Solenoid with (CA) 1/2" NPS Conduit Cover

6312D-131-PM-111JB (Solenoid Pilot Operated) (Ext. Plug-In) Solenoid with (JB) Rectangular Ext. Plug-In

U.L. VALVES - LISTED File No. MH 9465

The following valve model number combinations are U.L. listed for general purpose use.

100 B Series

Model No.	Voltage	Manual Operators	Enclosure	Lead Lengths
111B	-11	0	CA	AA
113B	-12	i	NA	AB
1	-22	2	CC	AD
İ	-50	3	NC	AE
	-55	4		AF
	-60			AU
Modifications	-61			BA
MOD-0449	-A1			
MOD-0449 MOD-2039	-A2			
MOD-2039				
		200 B Series		
224B	-11	0	CA	AA
225B	-12	1	NA	AB
	-22	2	HA	AD
	-50	3	CC	AE
	-55	4	NC	AF
Modifications	-60		AA	AU
MOD-0449	-61			BA
MOD-2039	-A1			
}	-A2			

U.L. VALVES – RECOGNIZED COMPONENTS

The following valve model number combinations are U.L. "Recognized Components" and are eligible to bear the U.L. recognized component label.

44 Series

Model No.	Body Style	Port Size	Voltage	Lead Lengths	Manual Oper.	Electrical Conn.
44A	Α	AA	DA	A	1	BA
	В	BA	DC	В		KA
	L	00	DD	С		HL
	M		DE	D		НВ
			DF	E		
MODIFICATIO	NS		DG	F		
MOD-0389			DJ	G		-
MOD-1194			DK			
MOD-1446			DM			
			DN			

Consult "Precautions" on inside back cover before use, installation of MAC Valves.

100 SERIES

Model Number 111B 113B	Voltage -11 -12 -22 -50 -55 -57 -60 -61 -A1	Manual Operators 0 1 2 3 4	BA *JA *JB JJ JM	Lead Lengths AA AB AD AE AF AU BA AG
120B 130B 140B 170B Modifications MOD-0449 MOD-2431 MOD-2039 *MOD-C007 required	-11 -12 -22 -50 -55 -60 -61 -A1 -A2 -57	0 1 2 3 4	BA CA CC NA NC	AA AB AD AE AF AG AU BA
224B 225B	-11 -12 -22 -50 -55 -60 -61	0 1 2 3 4	BA JJ	AA AB AD AE AF AU BA
250B 260B 280B Modifications MOD-0449 MOD-2039 *MOD-C007 required MOD-390R MOD-390L	-11 -12 -22 -50 -55 -60 -61	PILOTS	BA CA CC NA NC AA HA	AA AB AD AE AF AU BA
PMC PPC PMD PPD PME PPE	-11 -12 -22 -50 -55 -57 -61 -A1	0 1 2 3 4	CA *JA CC *JB NA JJ NC JM DA BA	AA AB AD AE AF AU BA BE AG
PIB PEB PID PED	-11 -12 -22 -50 -55 -60 -61 -A1	0 1 2 3 4	CA CC NA NC BA *JA *JB JJ JM	AA AB AD AE AF AU BA AG
TM TP Modifications MOD-0449 MOD-2431 MOD-2039 *MOD-C007 required MOD-C013	-AA -AB -AD -DA -DB -DG -DH -FA -FB -FE	0 1 2 3 4	DA BA JM KJ TJ * JB KA BK	A B C D E P J

U.L. VALVES - RECOGNIZED COMPONENTS

Model Number 35A	Body Style	Port Size O	Valve Type	Voltage AA	Lead Length A	Manual Operator	Electrical Connections BA
03/1	В	Ä	Ä	AB	В	1	KJ
	F	Ĉ	/ \	AD	Č	2	T.J
	F	C		DA	D	3	JM
	Ġ			DB	F	4	* JB
	O			DG	Ī	·	KA
				DH	· ·		DA
Modifications				FA			BK
MOD-0449	MOD-2431	MOD-2509		, FB			
MOD-2039	MOD-1260			FE			
*MOD-C007 required	MOD-1125			FF			
45A	A L	0	1	AA	Α	0	ВА
	в м	Α	2	AB	В	1	KJ
	G N	В	0	AD	С	2	TJ
	H P	С		DA	D	3	JM
	J	D		DB	E	4	∗ JB
		F		DG	J		KA
		G		DH	K		DA
Modifications				FA			BK
MOD-0449	MOD-1038	SMA-0777		FB			
MOD-2039	MOD-2876	SMA-0790		FE			
*MOD-C007 required	MOD-532B	EBA-45058		FF			

T7

MOD-408A

CSA VALVES File No. LR 27603

The following valve model numbers and modifications are CSA approved and must bear the CSA label.

100 SERIES

Series	Туре	Size	Revision Level	Voltage	Operator	Enclosure	Lead Lengths
1	1	0	В	11	0	BA	AA
(100)	2	1		12	1	CC	AB
	3	2		22	2	NC	AD
	4	3		60	3	*HA	AE
	8	4		61	4	*AA	AF
		5		50	5	†JA	AU
		6		55	6	†JB	BA
		7		57	7	JJ	AG
Modifications		8		59	8		AR
MOD-0004	*MOD-C004 required			A1	9		
MOD-0009	† MOD-C007 required			A2			
MOD-313P and 3 MOD-1076	13E						

200 SERIES

Series	Туре	Size	Revision Level	Voltage	Operator	Enclosure	Lead Lengths
2	2	0	В	11	0	BA	AA
(200)	5	4		12	1	CC	AB
, ,	6	5		22	2	NC	· AD
		6		60	3	*HA	AE
		7		61	4	*AA	AF
				50	5	†JA	AU
				55	6	†JB	BA
AA I'.C' 1'				6T	7	JJ	AG
Modifications	110D 0700				8		
MOD-0004	MOD-2739				9		
MOD-0009	MOD-0005	* MOD-C004 r€			•		
MOD-313P	MOD-1076	† MOD-C007 re	equired				
MOD-313E	MOD-390R	·	•				
	MOD-390L						

200 SERIES

Hazardous Locations

Class I Groups B, C & D Class II Groups E, F & G File No. LR 85902-1

Series	Туре	Size	Revision Level	Voltage	Operator	Enclosure	Lead Lengths
2	2	0	В	11	0	EA	AA
(200)	5	4		12			AB
	6	5		22			AD
Mod	ifications	8		60			AE
	0-0004	9		61			AF
MOD	-0005			50			AU
MOD	0-0009			55			BA
MOD)-313P						
)-313E						
)-390L						
MOD)-390R						

82 SERIES

Model No.	Valve Function	Lights in Body	Thread Type	Base Port Configur.	Lights in Base
82A	0	Α	0	0	0
	Α	С	Α	Α	Α
	В		В	В	В
	С		С	С	С
	D		D	К	D
	E		E	Ĺ	E
	F		F	Р	f
				S	T8
				R	
Pilot Style	Voltage		ad Wire ngth	Manual Operator	Electrical Connection
TM	AA	Р		0	DA
TP	AB	1		1	DL
	AC	2		2	JW
	AF	3		3	
	DA	4		4	
	DB	5			
	FA	6			
	FB				
	FE				
	ee				

REGULATOR

Adjustment Method	Configuration	Gages	Pressure Range	Assembled
Α	Α	Α	Α	7
D	В	В	В	8
G	С	С	С	9
K	D	D		

FLOW CONTROL MODULE

FC 82A-AA

Modifications

*MOD-C001, C002 or C003 (required)

MOD-2281 MOD-1076 MOD-2282 MOD-IT04 MOD-2283 MOD-IT05 MOD-IT01 MOD-IT06

6200 SERIES *+

Basic Model No.	Operator & Spool Type	Revision Level	Base Type	Pilot Type	Voltage	Manual Operator	Coil Lead Wire	MOD
62	11	С	000	PM	11	0	DA	C001
	21		111	PP	12	1		C002
	31		211		22	2		C003
	41		411		50	3		2110
			511		55	4	EGULATOR	
			114		57			
			214		59	PR 6	2C - X X X X-9)
			414		60			
Base Option	ns:		514		61			
			417		A1	ı	1 1	
		of base type is "2".	517		A2	1	1 A A	
* MOD C00	01, C002 or C000	3 required				ż	' ÊÊ	
† For light o	ptions see below.	•				-	F	

6300 SERIES

Basic Model No.	Operator & Spool Type	Revision Level	Base Type	Pilot Type	Voltage	Manual Operator	Coil Lead Wire	MOD
63	11 21 31 41	D	000 111 211 311 511 611	PM PP	11 12 22 50 55		DA	C001 C002 C003 2110
* MOD CO	ns: ilot: Second digit o 01, C002 or C003 ptions see below.		114 214 514 614 517 617		59 60 61 A1 A2	1 2	1 A A B B 3 C	,
9							4 D 5 E F G	

*+ 6500 SERIES

Basic Model No.	Operator & Spool Type	Revision Level	Base Type	Pilot Type	Voltage	Manual Operator	Coil Lead Wire	MOD
65	11	В	000	PM	13	0	DA	C001
	21		111	PP	12	1		C002
	31 41		211 311		22 50	2		C003
	51		411		55	³ ₄ REC	SULATOR	2083
			511		57			2110
			611		59	PR 65B	- X X X X X -9	2300
Base Option	ons:				60 61		╤╧╜╢┦	2301
	Pilot: Second digit o	f base type is ":	2".		A1	İ		2302
	001, C002 or C003		- '		A2	1	1 A A	2110
	options see below.	70401100				2	2 B	1241
i ioi iigiii	opiiona ace below.						3 C	2704
							4 D 5 E	300A
							F	2773
							Ģ	2774

6200, 6300, 6500 SERIES - Light Options

Lights in base:

Third digit of base type is:

- "2" for single solenoid.
- "3" for double solenoid.

Lights in base with side and bottom ports:

Third digit of base type is:

- "8" for single solenoid.
- "9" for double solenoid.

Lights in body:

Second digit of operator and spool type is: "3"

Consult "Precautions" on inside back cover before use, installation of MAC Valves.

56 SERIES

Basic Model Num		dy pe		noid age	Manual Operators	Enclosures	MOD
56C	-12	-42	-11	-A1	0	* AA	C004
	-13	-43	-12	-A2	1	BA	C007
}	-17	-47	-22		2	CC	390L
	-22	-62	-50		3	NC	390R
	-23	-63	-55		4	*HA	0449
	-27	-67	-57		5	† JA	2967
	-32	-72	-59		6	† JB	
	-33	-73	-60		7	, m	
	-37	-77	-61		8		
Options:	BSPP Ports – Last dig	it of body t	ype is '5', '6' or	181	9		

*MOD C004 required † MOD C007 required

57 & 58 SERIES

Basic Model Number	and the second second second	ody pe	Solenoid Voltage	Manual Operators	Enclosures	MOD
57C	-11	-41	-11	0	* AA	C004
58C	-12	-42	-12	1	BA	C007
	-13	-43	-22	2	CC	1076
	-21	-61	-50	3	NC	390R
	-22	-62	-55	4	*HA	390L
	-23	-63	-60	5	† JA	
	-31	-71	-61	6	· JJ	
	-32	-72		7		
	-33	-73		8		
				^		

Options: BSPP Ports - Last digit of body type is '4', '5' or '6'

*MOD C004 required † MOD C007 required

800 SERIES

Basic Model No.	Pilot Type	Solenoid Voltage	Manual Operators	Enclosures	- [Body Type	•	MOD
811C	-PM	-11	0	*AA	-112	-542	-663	C004
812C	-PP	-12	i i	BA	-122	-543	-692	C007
821C	-, 1	-22	2	CC	-123	-552	-693	C009
822C		-50	3	DA	-132	-562	-812	0358
825C		-55	4	NC	-142	-563	-822	1076
826C		-57	5	*HA	-143	-592	-823	2711
0200		-59	6	† JA	-152	-593	-832	2910
		-60	7	† JB	-162	-612	-842	2911
		-61	8	JJ	-163	-622	-843	1080
		-A1	9	••	-192	-623	-852	
		-A2	,		-193	-632	-862	
.		/ _			-512	-642	-863	
Options:					-522	-643	-892	
	First digit of body t				-523	-652	-893	
- BSPP Ports: Las	st digit of body type	is '5' or '6'.			-532	-662	0,0	

- MOD 0358

MOD 1076 MOD 2711

- MOD C009 *MOD C004 required

† MOD C007 required

The appropriate end plates are included with stacking valves when odered.

900 SERIES

Basic Model No.	Number of Pilots	Port Size Body Size	Pilot Type	Solenoid Voltages	Manual Operators	Enclosures
9	1	1	PM	11	0	*AA
	2	2	PP	12	1	∗ HA
		3		22	2	BA
Modifications:		4		50	3	CC
*C004 required		5		55	4	NC
0476		6		60	5	† JA
		7		. 61	6	† JB
† C007 required		8			7	JJ
C008		9			8	
1076					9	

The appropriate end plates are included with stacking valves when ordered.

600 SERIES

Model Number	Solenoid Voltages	Manual Operators	Enclosures	MO No.
Individual Body	11	0	* AA	C004
611B-11-	12	i	BA CC	C007
611B-14-	22	2	CC NC	C010
612B-11-	50	3	* HA	
612B-14-	55	4		
621B-11-	60	5	† JA † JA	
621B-14-	61	6	33	
622B-11-		/ 8		
622B-14-		9		
Stacking Body 613B-11-		Options:		
613B-14-		- 1/8" BSPP Thread:	The last digit is '2' i	nstead of '1'.
614B-11- 614B-14-			Example: 6XXB-X2	
623B-11-		— M5 x 0.8 Thread:	The last digit is '5' i	
623B-14-		Mox 0.0 micad.	•	nsiedd o'i 4.
624B-11-			Example: 6XXB-X5	
624B-14-		 Bottom Ports (#10-32 or I 	M5 only): The first digit is '2' i	nstead of '1'.
			Example: 6XXB-2X	

*MOD C004 required †MOD C007 required The appropriate end plates are included with stacking valves when ordered.

T 1 1

45 SERIES

Model No.	Body Style	Port Size	Base Type	Voltage	Lead Length	Manual Operator	Electrical Conn.
45A—	Α	0	0	AA	Α	0	BA
	В	Α	1	AB	В	1	JM
	L	В	2	AD	С	2	ĸ
	M	C		DA	D	3	IJ †JB
	S	D		DB	E	4	TA
		F		FA	J		
				FB			
				FE			
MOD C007 re	equired			FF			

†MOD C007 required MOD 0449

55 SERIES

Model Number	Body Type	Pilot Type	Solenoid Voltages	Manual Operators	Enclosures
55B	-11	PI	-11	0	* AA
	-12	PE	-12	1	BA
	-13		-22	2	CC
	-14		-50	3	NC
	-21		-55	4	* HA
	-22		-57	5	†JA
	-23		-59	6	†JB
	-24		-60	7	JJ
			-61	8	
			-A1	9	
			-A2		

MOD-1076 *MOD C004 required †MOD C007 required

ISO 1, 2, 3

						Angree State of the
Model Number	Body Type	Pilot Type	Voltage	Manual Operator	Enclosures	Lead Length
MVA1CA MVA2BA MVA3BA	-111 -112 -114 -121 -122 -124 -131 -132 -134 -135 -136 -138 -141 -142 -144 -151 -152 -154	PM PP CM CP	-11 -12 -22 -39 -50 -55 -57 -59 -60 -61 -A1 -A2	0 1 2 3 4	BA CC †JA †JB †JE †JF	AA AB AD AE AF AU BA AG
	-231 -241 -251					T12
	-312 -321 -322 -331 -332					
	-341 -351 -352					

Individual Base & Manifold Options

†MOD-C007 required

Base Type	Series Type	Port Size	Port Location	Modifications
MB MM	A1B A2B A3B A1C	-11 -12 -13 -14 -15 -16 -21 -22 -23	1 2 3 4 5 6 7 8	C011 300H 300J 300M 300N 300P 300R 300S 300V C014

ISO 1, 2, 3 (continued)

Pressure Regulator Options

	ĸ			
e	rı	е	S	

PRA1A

Type Adjust

A B C D E G H K L

Regulator Configuration

OABCDE

Gage

A B C F G K

Pressure

ACDEFGHJ

Assy.

9

Series

PRA2B PRA3C

Type Adjust

Regulator Configuration

OABCDEFGH.

Gage

A B C D E

Pressure

Α

Assy.

9

T13

700 Series

Model

7

Operator

1

Body Type

1 2 4

Rev. Level

С

Porting

1 2

Port Size

Pilot Type

PE Pl

Voltage

Manual Operators

Enclosures

Modifications

*MOD C004 required †MOD C007 required MOD 2208

MAC 125, 250, 500

Series	Body Type	Conn.	Pilot Type	Pilot Exh.	Voltage	Oper.	Lead Length
125	1	Α	1	PM	11 12	0	DA
250	2	В	2	PP	22 39	1	
500	3 4	C D	3 4		50 55	2 3	
	5	E			57 59	4	
	6	F			60 61		
	/				A1 A2		
					RA		

Individual Base & Manifold Options

Туре	Port Size	Individual Base	Side	Btm.	Side & Btm.	
125	1/4"	-B21A	-M21A	-M21B	-M21C T 4	Л
125	3/8"	-B31A	-M31A	-M31B	-M21C -M31C	4
250	1/2″	-B21A	-M21A	-M21B	-M21·C	
250	3/4"	-B31A	-M31A	-M31B	-M31C	
250	1″	-B41A	N/A	N/A	N/A	
500	1″	-B21A	N/A	N/A	N/A	
500	1-1/4"	-B31A	N/A	N/A	N/A	

Pressure Regulator Options

Ser	ies	Type Adjust.	Config.	Gages	Pressure Range	Assy.
PR1	25A	1	0	Α	Α	9
		2	Α	В		
		4	В	C		
		5	С	D		
			D	Е		
			Е			
Modifications :	0353	3, 1180	F			
	1103	3, 2248	G			
			Н			
			j			

Model #	Body Type	Port Size	Valve Type	Voltage
35A-	Α	0	0 K	AA .
	В	Α	A L	AB
	С	В		AD
	D	С	B M	DA
	E	D	C N	DB
	F	E	D P	FA
	G S	F G	E R	FB FE
	T	Н	F S	FF
		J	G T	
		K	H U	
			J	

T15

Lead Wire Length	Manual Operator	Electrical Connection
A	0	BA
В	1	BK
С	2	BL
D	3	FM
E	4	FN
J		FP
		JB
		JW .
		KA
		KJ
		KK
		KL
		TA
		ТВ
		TD

Modifications: MOD 0389, 416G, 416K, 416Y, 0446, 0449, 0532, 532A, 532B, 532F, 0547, 0624, 1048, 1125, 1142, 1172, 1260, 2211, 2431, 2470, DD01, MOV1, RPTE, M923, 2509, 3038, C013

Model	Spool Type	Body Options	Port Size/ Thread Type	Base Configuration	Int/Ext Pilot
52A	1	1	0	0	Α
	2	3	Α		В
	3	4	В		C
	4	6	С		
			D		
			Е		
			F		

Pilot Style	Volt	age	Lead Wire Length	Manual Operator		trical ections
DM	JA	DL	Α	0	ВА	JD
	JB	DM	В	1	BG	JM
	JC	DN	С	2	вн	KA
	JD	DP	D	3	BJ	KJ
	DA	DR	Е	4	BK	KK
	DB	DS	F		BL	KL
	DC	DT	J		BM	TA
	DD	FA			BN	TB
	DJ	FB			BP	TD
	DK	FE			JB	TJ
		EE				

T16

Modifications:	MOD	0389	532A
		416G	532F
		416K	M955
		416L	1290
		416P	2545
		0446	2833
		0449	DD01
		0532	RPTE

Model	Spool Type	Body Options	Revision Level	Port Size/ Thread Type	Base Configuration	Int/Ext Pilot
4	0	0	Α	0	0	Α
	1	1		Α	Α	В
	2	3		В	В	С
	3	4		С		D
	4	6		D		
	5			E		
	6			F		
	7					

Pilot Style	Volt	age	Lead Wire Length	Manual Operator	Elect Conne	rical ctions
DM	JA	DL	A	0	ВА	JD
	JB	DM	В	1	ВG	JM
	JC	DN	С	2	вн	KA
	JD	DP	D	3	BJ	KJ
	DA	DR	E	4	BK	KK
	DB	DS	F		BL	KL
	DC	DT	J		BM	TA
	DD	FA			BN	TB
	DJ	FB			BP	TD
	DK	FE			JB	TJ
		FF				

T17

Modifications:	MOD	0389	0446	2470
		416K	0449	2749
		416L	0547	2808
		416P	M955	2833
		0532	1142	2859
		532A	1333	2984
		532B	1416	2993
		532F	2192	RPTE

Model	Valve Function	Body Type Exhaust Opt.	Body Elect. Options	Port Size	Ind. Base Manifold Config.
92B	0	0	0	0	0
	Α	Α	Α	Α	Α
	В	В	В	В	В
	С		F	С	С
	D		Н	D	D
	Е		K	Е	J
	F			F	K
	G			G	
				Н	
				1	

Int./ Ext. Pilot	Pilot Style	Vol	Voltage		ad .ength	Manual Operator	Electrical Connections	
0	DM	JA	DB	Р	0	0	BA	DP
Α		JB	DC	1	Α	1	BK	JB
В		JC	DD	2	В	2	BL	JD
С		JD	FA	3	С	3	BM	JM
D		JE	FB	4	D	4	BN	KA
E		JF	FE	5	E		BP	KJ
F		JG	FF	6	F		BG	KK
G		DA			J		BH	KL
Н							BJ	TA
							DG	TB
							DM	TD
							DN	TJ

T18

Modifications:	MOD	416G
		416L
		416K
		0446
		0449
		0476
		0532
		532A
		RPTE

EUROPEAN UNION DIRECTIVES (CE MARK) RELATING TO MAC® PRODUCTS

MOST COMMONLY ASKED QUESTIONS:

- 1. What does CE mean?
 - European Community, i.e. "Communauté Europeénne".
- 2. Why is it necessary to comply with CE directives?
 - To export products to the European community.
- 3. Which CE directive guidelines do MAC® products (excluding the PPC and Serial Interface) need to comply with?
 - Low Voltage Directive (73/23/CEE).
- 4. Which CE directive guidelines do MAC® PPC and Serial Interface need to comply with?
 - EMC Directive (89/336/EEC) Electromagnetic Compatibility
- 5. Is it necessary for the CE label to appear on all MAC® products?
 - No, only the products that apply to a CE directive.

LOW VOLTAGE GUIDELINES: CE MARK

All electrical materials destined to be used at nominal voltage and are within the following guidelines:

D.C. Voltage (direct current) 75 Volts to 1500 Volts.

A.C. Voltage (alternating current) 50 Volts to 1000 Volts.

All MAC® Valves' coils within these two ranges have been approved to be CE marked. We <u>may not</u> CE mark those valves with coils that do not fall within these guidelines.

EMC DIRECTIVE:

The EMC (Electromagnetic compatibility) directive applies only to MAC® PPC and Serial Interface. It does not apply to any of our other products. Our customers may require data about the emissions of electromagnetic energy and the susceptibility of the components in order for their equipment to comply with the EMC directive. Please consult factory.

EMC DIRECTIVE: PPC AND SERIAL INTERFACE

Testing for the PPC and Serial Interface are in process in order to comply with the EMC directive. Please consult factory.

MACHINE DIRECTIVE (89/392/CEE)

Pneumatic and electro-pneumatic components do not need to be individually CE marked for the machine directive. The basic product and operating data given in the catalog is sufficient for the selection of components in order for the machine to comply with this directive.

CSA CONDUIT LINERS

INSTALLATION & DIMENSIONS

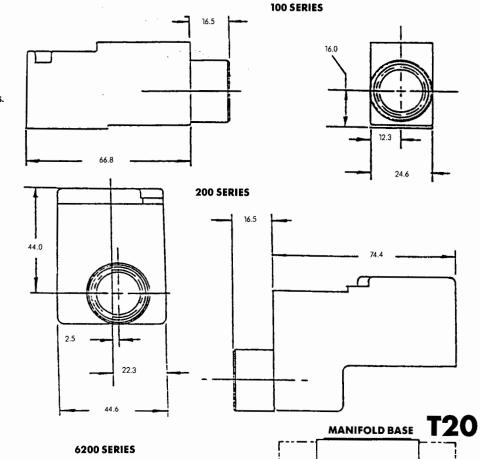
CSA APPROVED

The Mac 100 and 200 Series AA & HA cover options are now approved for the following valve series 56, 57, 58, 600, 800, 900 Series.

The CSA version of these Valve Series are designated by the use a MOD No.

55, 56, 57, 58, 600, 800, 900 Series

MOD C004



CSA APPROVED

The Mac 6000 (6200, 6300, 6500) and 82 Series are certified by CSA.

- <u>Individual Base</u> -

- <u>MOD. #</u> -C001

6200-6300-6500-82

CO

- Manifold Base -

All Series w/o conduit liner

C001 C002

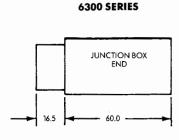
All Series w/conduit liner – left All Series w/conduit liner – right

C002

Ordering example:

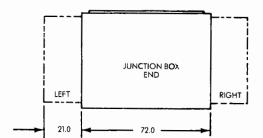
- (1) 5-valve assembly consisting of:
 - 1) 6511B-611-PM-111DA Mod. C002
 - 4) 6511B-611-PM-111DA Mod. C001
 - 1) N-65002

The above assembly would require the customer's electrical connection to be made to the LEFT hand side of the manifold.



JUNCTION BOX

54.0



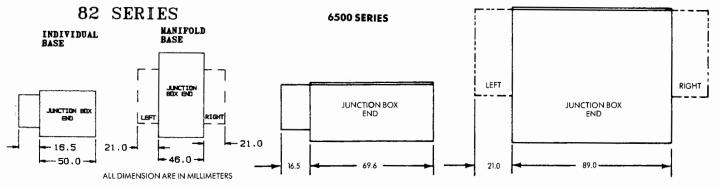
LEFT

21.0

JUNCTION BOX

57.0

RIGHT



MANUAL AND MECHANICAL OPERATOR OPTIONS

55, 56, 700, 800, 900, 6200, 6300, 6500 OR 6600 SERIES

In addition to the manual and mechanical operated valves covered in the catalog (1100 and 1800 Series), the operators shown for the 1100A Series (catalog page A13) can be used on the above series. These operators replace the solenoid and cover assembly, converting the valve to a pilot operated, manual or mechanical, operated valve.

Select the desired models from the solenoid pilot operated tables for the desired series

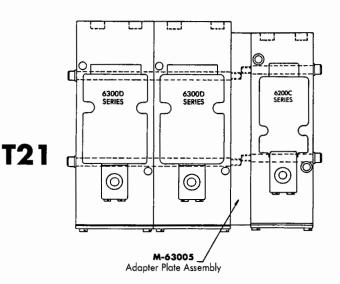
in the catalog. Substitute the voltage, manual operator and enclosure codes with MXXXX where XXXX equals the selected operator from page A13.

EXAMPLES: 55B-12-PI-M0027

56C-12-M0027 711C-12-PI-M0027 911B-PM-M0027 6212C-131-PM-M0027 6312D-131-PM-M0027 6512B-131-PM-M0027 811C-PM-M0027-152 All of the examples have the 1100A Series manual operator (027) installed in place of the solenoid & cover assembly. 027 being a LEVER LOCKING PULL HANDLE.

NOTE: Certain operators, because of space limitations or pilot valve mounting cannot be adapted. Check both valve and operator orientation for compatibility.

MANIFOLD ADAPTER PLATE ASSEMBLIES



6300D Series manifold valves can be ganged together with 6200C Series manifold valves by use of an M-63005 adapter plate assembly. (For reverse series, use M-63007 adapter.)

The above is an example of one of many various adapter plates that are available. Select the desired adapter plate assembly from the list below.

NOTE: The valve series mentioned first under "Description" is located to the left of the adapter plate.

ADAPTER PLATE ASSEMBLY

DESCRIPTION

^^^^^^^^	A-62007— A-62008— A-63005— A-63012— A-63013— A-65004— A-65005— A-65007— A-65008— A-65010— A-65011— A-66001-01 A-68005— A-82005—	- 45A Series Stacking Valves to 35A Series Stacking Valves - 6200C Series to the 82A Series - 82A Series to the 6200C Series - 6300D Series to the 6300D Series - 6200C Series to the 6300D Series - 6300D Series to the 82A Series - 82A Series to the 6300D Series - 6200C Series to the 6500B Series - 6500B Series to the 6300D Series - 6500B Series to the 6200C Series - 6300D Series to the 6500B Series - 6300D Series to the 82A Series - 6500B Series to the 6500B Series - 82A Series to the 6500B Series - 6500B Series to the 6500B Series - 82A Series to the 6500B Series - 82A Series to the 45 Series Circuit Bar® Common Conduit with plug-in - 45 Series Circuit Bar® Common Conduit with plug-in to the 82A Series
1	M-82006———————————————————————————————————	
,	11 /12002	100 2 b oction to the 100 T C octies

Modified 45 Series Circuit Bar® must be used to mount Adapter Plate.

PRECAUTIONS CONCERNING THE APPLICATION, INSTALLATION AND SERVICE OF MAC® VALVES

precautions below are important to be read and understood core designing into a system any MAC valve, and before installing or servicing any MAC valve. Improper use, installation or servicing of any MAC valve in some systems could create a hazard to personnel or equipment.

APPLICATION PRECAUTIONS:

INDUSTRIAL USE—

MAC valves are intended for use in industrial pneumatic and/or vacuum systems. They are not intended for consumer use or service. They are general purpose industrial valves 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 valves 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 remove the trapped air.

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 prevent 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.

CAUTION:

- DO NOT OPERATE OUTSIDE OF PRESSURE RANGE LISTED ON VALVE LABEL OR OUTSIDE OF DESIGNATED TEMPERATURE RANGE.
- AIR SUPPLY MUST BE CLEAN. CONTAMINATION OF VALVE CAN AFFECT PROPER OPERATION.
- BEFORE ATTEMPTING TO REPAIR, ADJUST OR CLEAN VALVE, CONSULT CATALOG, PARTS & OPERATION
 SHEET, OR FACTORY FOR PROPER MAINTENANCE PROCEDURES, LUBRICATION, AND CLEANING AGENTS.
 ATTEMPT TO REPAIR OR PERFORM OTHER MAINTENANCE WITH AIR PRESSURE TO VALVE.
- IRLINE LUBRICATION IS USED, CONSULT CATALOG, PARTS & OPERATION SHEET, OR FACTORY FOR RECOMMENDED LUBRICANTS.

OPERATING SPECIFICATIONS—

MAC valves are to be installed only on applications that meet all operating specifications described in the MAC catalog for the valve.

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. Accidental activation of a manual operator could create a dangerous situation. If intentional or accidental operation of a valve by a manual operator could create a dangerous situation, the "no operator" option should be used.

REMOTE AIR OPERATED VALVES—

Pilot valves supplying the 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 de-energized.

INSTALLATION PRECAUTIONS:

- A. Do not install MAC valves on a machine without first turning off air (bleed system completely) and electricity to the machine.
- B. MAC valves should only be installed by qualified, know-ledgeable 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.

SERVICE PRECAUTIONS:

- A. Do not service or remove from service any MAC valve 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 should only be serviced or removed from service by qualified, knowledgeable personnel who understand 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 service, maintenance, repair or cleaning, consult local distributor or factory for Parts & Operation Sheet and information on proper cleaning and lubrication agents. Do not subject MAC Valves' parts to any foreign substance including lubricants and cleaning agents not specifically recommended by MAC Valves, Inc.
- D. MAC valves are never to be stepped on while working on a machine. Damage to the valve, or lines to the valve (either air or electrical lines) or accidental activating of a manual operator on the valve could result in a dangerous situation.

WARNING: Under no circumstances are MAC valves to be used in power press operation or circuits where the failure of the valve to operate as intended could jeopardize the safety of the operator or any other person.

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