Welcome to your brand new MAC VALVES catalog.

Inside you will find more than 25 different valve series to meet the majority of industrial requirements.
They have been sorted and classified in such a way that you may easily find the required valve series.

For more than 50 years, MAC has based all new valve developments upon the specifications received from customers, both users and OEM's.
A lot of different modifications have been released for all fields of industry (automotive, aluminium, packaging, food, sorting, ...). Although they are not listed in this catalog, our technical sales staff will be pleased to provide all necessary information.

All our representatives have a "traveling lab demonstration" kit (TLD) to show you the specific design features of MAC Valves in terms of :

- speed
- reliability
- consistency
- repeatability

Feel free to ask for a personal demonstration, our team is at your disposal.

MAC Valves,
Your Partner

Introduction

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

MAC Valves warranty of 18 months

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 Garantee 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 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.

Pneumatic functions

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

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

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

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

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

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

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

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

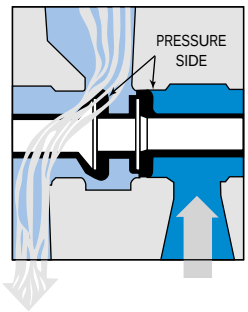
  - 4 or 5 ways
  - 3 ways NC
  - 3 ways NO
  - 2 ways NC
  - 2 ways NO
  - Selector (except 3 positions)
  - Divertor (consult factory).

EVERY VALVE FULLY TESTED PRIOR TO SHIPMENT

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.

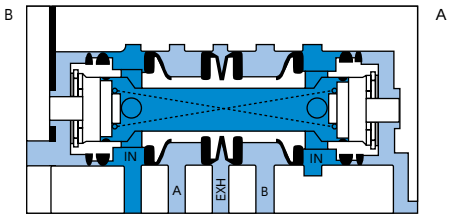


PILOT SYSTEM

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

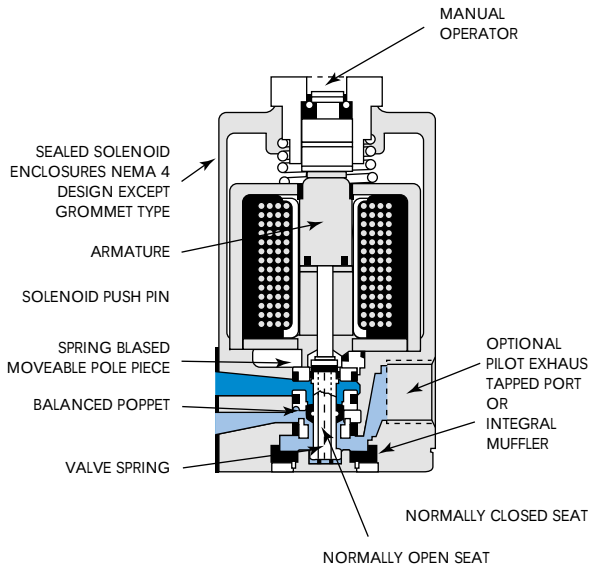
MAC 3-position solenoid and remote air pilot valves are centered by a patented spring centering device or patented combination spring and pressure assisted spool design which reduces side load potential and resultant wear, and assures fast, positive return of the main spool when the pilots are de-energized 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.). Intrinsically safe valves are available for most series listed in this catalog. This option is for DC service only at 0.6 Watts.



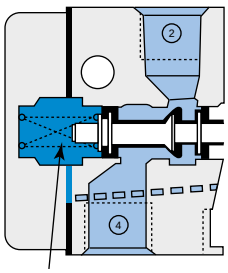
MAC DESIGN FEATURES

VIRTUALLY—BURN-OUT PROOF MACSOLENOID®

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

AIR / SPRING RETURN

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



NON-LUBE SERVICE

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

COILS

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

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

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

ADD-A-UNIT MANIFOLDS

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

MAC DESIGN FEATURES

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 elecrical wiring or air plumbing.

Let us show you via high performance demonstration kits and animated software,

HOW MAC'S PERFORMANCE ADVANTAGES HELP MAKE YOUR EQUIPMENT MORE RELIABLE - FASTER - MORE REPEATABLE.

TLD

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

PLD

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

Animation

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

Other MAC VALVE literature:

DESCRIPTION	CATALOG NUMBER
CIRCUIT BAR CATALOG	999CBCA
PROPORTIONAL VALVE CATALOG	999PPCA
CATALOG CD	999CCDA
SERIAL INTERFACE PRODUCTS	9999SI
10MM DIRECT SOLENOID AND 4-WAY PILOTED VALVES	CONSULT FACTORY
MACONNECT SYSTEM	CONSULT FACTORY

Section 1 Direct solenoid and solenoid pilot operated valves

Function	Port size	Flow (Max)	Individual mounting					Series
			inline	inline hazardous location	sub-base non "plug-in"	sub-base "plug-in"	valve only	
3/2 - 2/2	1/8"	0.17 C_v	■					35
3/2 - 2/2	# 10-32 - 1/8"	0.16 C_v						
3/2 - 2/2	# 10-32 - 1/8"	0.10 C_v						
3/2 - 2/2	1/8" - 1/4"	0.18 C_v	■					100
3/2 - 2/2	1/8"	0.14 C_v						
3/2 - 2/2	1/8" - 1/4"	0.5 C_v	■	■				200
3/2 - 2/2	1/4"	0.4 C_v						
3/2 - 2/2	1/4" - 3/8"	2.2 C_v	■					55
3/2 - 2/2	3/8" - 1/2" - 3/4"	5.7 C_v	■					56
3/2 - 2/2	1/2" - 3/4" - 1"	17.4 C_v	■					57
3/2 - 2/2	1" - 1 1/4" - 1 1/2"	26.0 C_v	■					58
3/2 - 2/2	2" - 2 1/2"	60.0 C_v	■					59
4/2	# 10-32 - 1/8"	0.15 C_v	■					45
4/2	# 10-32 - 1/8"	0.13 C_v			■			
4/2	# 10-32 - 1/8"	0.20 C_v						
4/2	# 10-32 - 1/8"	0.11 C_v						
4/2	1/8" - 1/4"	0.7 C_v	■					700
4/2	1/8" - 1/4"	0.8 C_v						
4/2	1/8" - 1/4"	1.2 C_v	■					900
4/2	1/8" - 1/4" - 3/8"	1.4 C_v						
4/2 - 4/3	1/8" - 1/4" - 3/8"	1.35 C_v			■	■		82
4/2 - 4/3	1/4" - 3/8"	1.35 C_v						
4/2 - 4/3	1/4" - 3/8" - 1/2"	3.0 C_v			■	■		6300
4/2 - 4/3	3/8" - 1/2"	3.0 C_v						
4/2 - 4/3	3/8" - 1/2" - 3/4"	5.1 C_v			■	■		6500
4/2 - 4/3	3/4" - 1"	9.6 C_v			■	■		6600
4/2 - 4/3	3/4" - 1" - 1 1/4"	9.6 C_v						
4/2 - 4/3	3/4" - 1" - 1 1/4" - 1 1/2"	15.9 C_v				■		1300
5/2 - 5/3	1/4"	1.4 C_v	■					800
5/2 - 5/3	1/4" - 3/8"	1.4 C_v						
5/2 - 5/3	1/4" - 3/8"	1.6 C_v					■	ISO 1
5/2 - 5/3	3/8" - 1/2"	3.0 C_v					■	ISO 2
5/2 - 5/3	1/2" - 3/4"	6.3 C_v					■	ISO 3
5/2 - 5/3	1/4" - 3/8"	2.5 C_v					■	MAC 125A
5/2 - 5/3	1/2" - 3/4" - 1"	7.0 C_v					■	MAC 250A
5/2 - 5/3	1" - 1 1/4"	11.2 C_v					■	MAC 500A

Function	Port size	Flow (Max)	Manifold mounting						Series
			stacking	sub-base non "plug-in"	sub-base with pressure regulators	sub-base hazardous location	sub-base with pressure regulators and flow controls	sub-base "plug-in"	
3/2 - 2/2	1/8"	0.17 C_v							35
3/2 - 2/2	# 10-32 - 1/8"	0.16 C_v	■						
3/2 - 2/2	# 10-32 - 1/8"	0.10 C_v		■	■				
3/2 - 2/2	1/8" - 1/4"	0.18 C_v	■						100
3/2 - 2/2	1/8"	0.14 C_v		■					
3/2 - 2/2	1/8" - 1/4"	0.5 C_v		■		■			200
3/2 - 2/2	1/4"	0.4 C_v			■				
3/2 - 2/2	1/4" - 3/8"	2.2 C_v							55
3/2 - 2/2	3/8" - 1/2" - 3/4"	5.7 C_v							56
3/2 - 2/2	1/2" - 3/4" - 1"	17.4 C_v							57
3/2 - 2/2	1" - 1 1/4" - 1 1/2"	26.0 C_v							58
3/2 - 2/2	2" - 2 1/2"	60.0 C_v							59
4/2	# 10-32 - 1/8"	0.15 C_v							45
4/2	# 10-32 - 1/8"	0.13 C_v							
4/2	# 10-32 - 1/8"	0.20 C_v	■						
4/2	# 10-32 - 1/8"	0.11 C_v		■	■		■		
4/2	1/8" - 1/4"	0.7 C_v							700
4/2	1/8" - 1/4"	0.8 C_v	■						
4/2	1/8" - 1/4"	1.2 C_v							900
4/2	1/8" - 1/4" - 3/8"	1.4 C_v	■						
4/2 - 4/3	1/8" - 1/4" - 3/8"	1.35 C_v							82
4/2 - 4/3	1/4" - 3/8"	1.35 C_v		■				■	
4/2 - 4/3	1/4" - 3/8" - 1/2"	3.0 C_v							6300
4/2 - 4/3	3/8" - 1/2"	3.0 C_v		■				■	
4/2 - 4/3	3/8" - 1/2" - 3/4"	5.1 C_v		■				■	6500
4/2 - 4/3	3/4" - 1"	9.6 C_v							6600
4/2 - 4/3	3/4" - 1" - 1 1/4"	9.6 C_v		■				■	
4/2 - 4/3	3/4" - 1" - 1 1/4" - 1 1/2"	15.9 C_v							1300
5/2 - 5/3	1/4"	1.4 C_v							800
5/2 - 5/3	1/4" - 3/8"	1.4 C_v							
5/2 - 5/3	1/4" - 3/8"	1.6 C_v							ISO 1
5/2 - 5/3	3/8" - 1/2"	3.0 C_v							ISO 2
5/2 - 5/3	1/2" - 3/4"	6.3 C_v							ISO 3
5/2 - 5/3	1/4" - 3/8"	2.5 C_v							MAC 125A
5/2 - 5/3	1/2" - 3/4" - 1"	7.0 C_v							MAC 250A
5/2 - 5/3	1" - 1 1/4"	11.2 C_v							MAC 500A

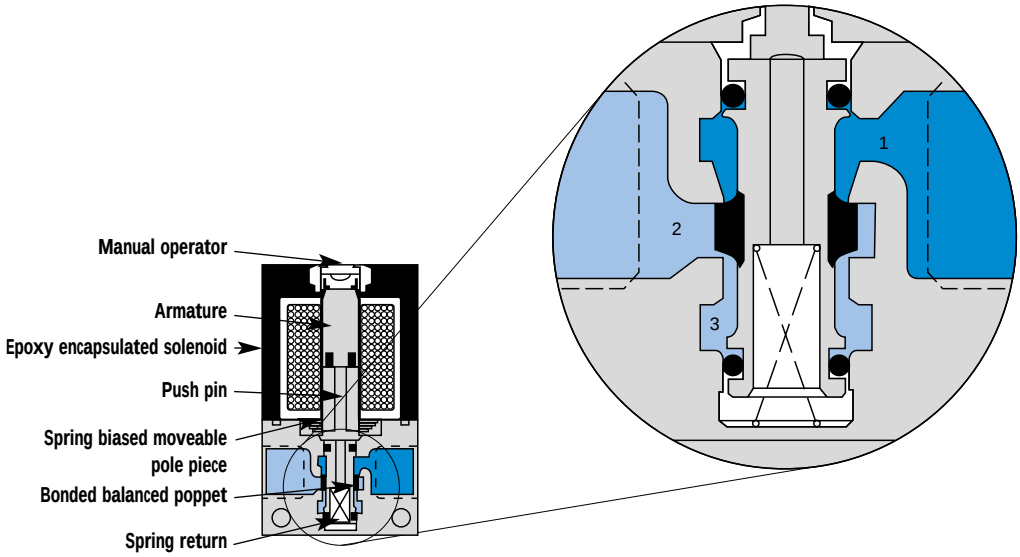
Function	Port size	Flow (Max)	Manifold mounting						Series
			stacking body with 1 common port (inlet)	stacking body with 3 common ports (inlet & exhausts)	stacking body with 3 common ports and integral F.C.	stacking body with 3 common ports with common conduit	stacking body with 3 common ports with C. C. & integral exh. F. C.	valve only	
3/2 - 2/2	1/8"	0.17 C_v							35
3/2 - 2/2	# 10-32 - 1/8"	0.16 C_v							
3/2 - 2/2	# 10-32 - 1/8"	0.10 C_v							
3/2 - 2/2	1/8" - 1/4"	0.18 C_v							100
3/2 - 2/2	1/8"	0.14 C_v							
3/2 - 2/2	1/8" - 1/4"	0.5 C_v							200
3/2 - 2/2	1/4"	0.4 C_v							
3/2 - 2/2	1/4" - 3/8"	2.2 C_v							55
3/2 - 2/2	3/8" - 1/2" - 3/4"	5.7 C_v							56
3/2 - 2/2	1/2" - 3/4" - 1"	17.4 C_v							57
3/2 - 2/2	1" - 1 1/4" - 1 1/2"	26.0 C_v							58
3/2 - 2/2	2" - 2 1/2"	60.0 C_v							59
4/2	# 10-32 - 1/8"	0.15 C_v							45
4/2	# 10-32 - 1/8"	0.13 C_v							
4/2	# 10-32 - 1/8"	0.20 C_v							
4/2	# 10-32 - 1/8"	0.11 C_v							
4/2	1/8" - 1/4"	0.7 C_v							700
4/2	1/8" - 1/4"	0.8 C_v							
4/2	1/8" - 1/4"	1.2 C_v							900
4/2	1/8" - 1/4" - 3/8"	1.4 C_v							
4/2 - 4/3	1/8" - 1/4" - 3/8"	1.35 C_v							82
4/2 - 4/3	1/4" - 3/8"	1.35 C_v							
4/2 - 4/3	1/4" - 3/8" - 1/2"	3.0 C_v							6300
4/2 - 4/3	3/8" - 1/2"	3.0 C_v							
4/2 - 4/3	3/8" - 1/2" - 3/4"	5.1 C_v							6500
4/2 - 4/3	3/4" - 1"	9.6 C_v							6600
4/2 - 4/3	3/4" - 1" - 1 1/4"	9.6 C_v							
4/2 - 4/3	3/4" - 1" - 1 1/4" - 1 1/2"	15.9 C_v							1300
5/2 - 5/3	1/4"	1.4 C_v							800
5/2 - 5/3	1/4" - 3/8"	1.4 C_v							
5/2 - 5/3	1/4" - 3/8"	1.6 C_v							ISO 1
5/2 - 5/3	3/8" - 1/2"	3.0 C_v							ISO 2
5/2 - 5/3	1/2" - 3/4"	6.3 C_v							ISO 3
5/2 - 5/3	1/4" - 3/8"	2.5 C_v							MAC 125A
5/2 - 5/3	1/2" - 3/4" - 1"	7.0 C_v							MAC 250A
5/2 - 5/3	1" - 1 1/4"	11.2 C_v							MAC 500A

Individual mounting

inline

Manifold mounting

stacking	sub-base non "plug-in"	sub-base with pressure regulators



SERIES FEATURES

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

MAC®

Series 35

100% OF PRODUCTION TESTED 100%

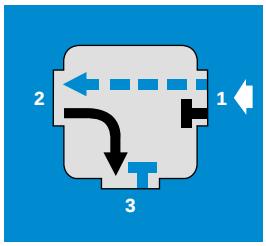
WARRANTY 18 MONTHS

VALVE CONFIGURATIONS AVAILABLE :

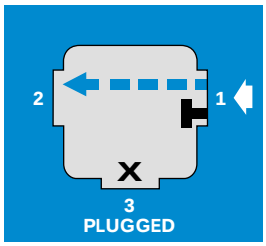
The 35 Series is a miniature 3 way or 2 way valve.
This valve provides extremely fast response, long life and high flow in a surprisingly small package.

- Individual, stacking body or manifold base.
- 3 way–Normally Open or Normally Closed.
- 2 way–Normally Open or Normally Closed.
- Optional Normally Closed Only Models.
- Selectors & Divertors.

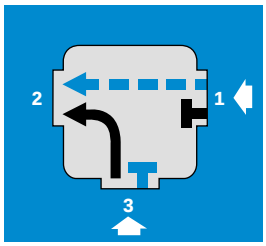
PIPING CHART FOR INDIVIDUAL MODELS



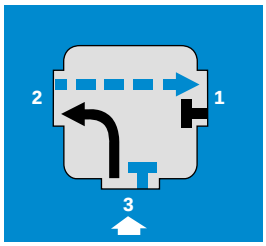
3 Way
Normally Closed



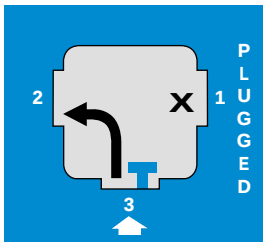
2 Way
Normally Closed



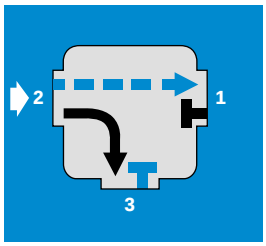
Selector



3 Way
Normally Open



2 Way
Normally Open



Divertor

Supply

Operator De-Energized

Operator Energized

Series 35

Function	Port size	Flow (Max)	Individual mounting
3/2 NO-NC, 2/2 NO-NC	1/8"	0.17 C_V	inline

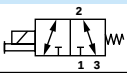
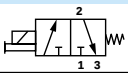
OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

Reset

HOW TO ORDER

35A-AXX-DXXX-XXX

Port size	Universal valve	NC only valve
		
1/8" NPTF	35A-AAA-D*xxx-xxx*	35A-AAB-D*xxx-xxx*

SOLENOID OPERATOR ➤ D *XX X- X XX*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)
XX	**Other options available**

X	Wire length
A	18" (Flying leads)
J	Connector
X	**Other options available**

X	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

XX	Electrical connection
KA	Square connector
KD	Square connector with light
JB	Rectangular connector
JD	Rectangular connector with light
BA	Flying leads
XX	**Other options available**

OPTIONS

35A-CAX-D*xxx-xxx*

- with (2) # 10-32 ports in backside of valve

MAC

Series 35

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

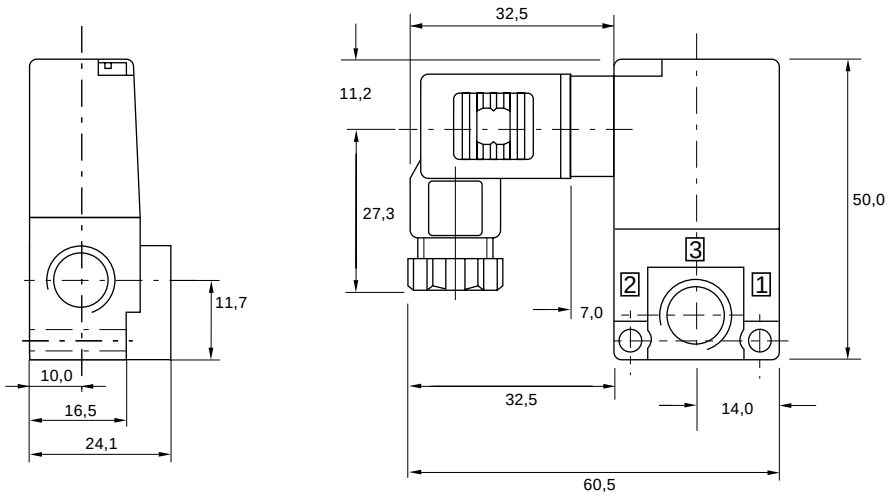
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 120 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	1.8 W : 0.08 C_V, 5.4 W : 0.15 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
Response times :	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402.

Options :
- BSPP threads. • High flow up to 0.25 C_V, according to wattage and high flow mod.

DIMENSIONS

Dimensions shown are metric (mm)

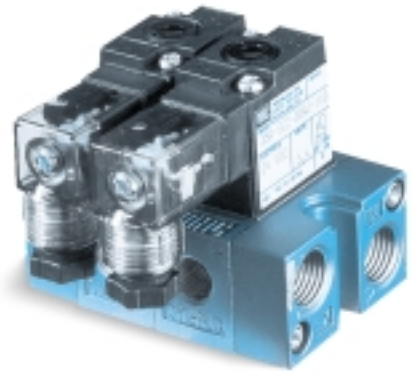


Series 35

Function	Port size	Flow (Max)	Manifold mounting
3/2 NO-NC, 2/2 NO-NC	# 10-32, 1/8"	0.16 C_V	stacking

OPERATIONAL BENEFITS

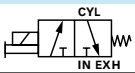
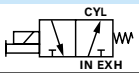
1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



Reset

HOW TO ORDER

35A-SXX-DXXX-XXX

Port size	NC only valve	NO only valve
		
1/8" NPTF	35A-SAC-D*xxx-xxx*	35A-SAD-D*xxx-xxx*
# 10-32 UNF	35A-SBC-D*xxx-xxx*	35A-SBD-D*xxx-xxx*

SOLENOID OPERATOR ➤ D *XX X- X XX*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)
XX	**Other options available**

X	Wire length
A	18" (Flying leads)
J	Connector
X	**Other options available**

X	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

XX	Electrical connection
KA	Square connector
KD	Square connector with light
BA	Flying leads
XX	**Other options available**

End plate kit required (Port size : 1/4") : M-35001-01
Note : upon request, manifolds are mounted at the factory.

OPTIONS

35A-TXX-D*xxx-xxx*
- Bottom Inlet

MAC

Series 35

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

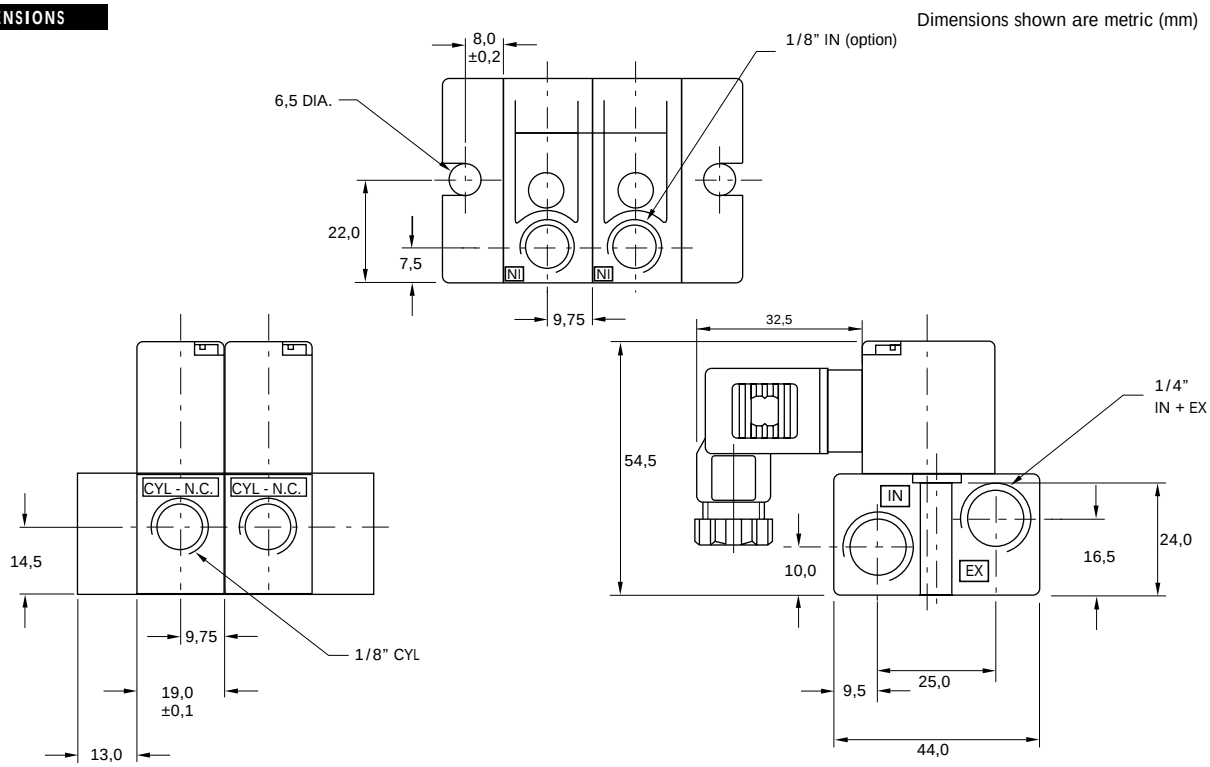
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 120 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	1.8 W : 0.12 C_V, 5.4 to12.7 W : 0.16 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
Response times :	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402. • Pressure seal (between valves) : 16433.
- Tie-rod (x2) : 19813. • Inlet isolator : N-35002. • Exhaust isolator : N-35003. • Inlet & Exhaust isolator : N-35001.

Options :
- BSPP threads. • High flow up to 0.25 C_V, according to wattage and high flow mod.

DIMENSIONS

Dimensions shown are metric (mm)



MAC®

Series 35

Function	Port size	Flow (Max)	Manifold mounting
3/2 NO-NC, 2/2 NO-NC	# 10-32, 1/8"	0.10 C_V	sub-base non "plug-in"

OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

Reset

HOW TO ORDER 35A-BXX-DXXX-XXX

SIDE CYLINDER PORTS

Port size	Norm. closed Manifold base 	Norm. open Manifold base 
Valve less base (universal)	35A-B00-D*xxx-xxx*	35A-B00-D*xxx-xxx*
# 10-32 UNF base	35A-BBE-D*xxx-xxx*	35A-BBF-D*xxx-xxx*
1/8" NPTF base	35A-BAE-D*xxx-xxx*	35A-BAF-D*xxx-xxx*

BOTTOM CYLINDER PORTS

Port size	Norm. closed Manifold base 	Norm. open Manifold base 
Valve less base (universal)	35A-B00-D*xxx-xxx*	35A-B00-D*xxx-xxx*
# 10-32 UNF base	35A-BGE-D*xxx-xxx*	35A-BGF-D*xxx-xxx*
1/8" NPTF base	35A-BFE-D*xxx-xxx*	35A-BFF-D*xxx-xxx*

SOLENOID OPERATOR ➤ D *XX X- X XX*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)
XX	Other options available

X	Wire length
A	18" (Flying leads)
J	Connector
X	Other options available

X	Manual operator
1	Non-locking
2	Locking
X	Other options available

XX	Electrical connection
KA	Square connector
KD	Square connector with light
BA	Flying leads
XX	Other options available

End plate kit required (Port size : 1/4") : M-35003-01
Note : upon request, manifolds are mounted at the factory.

OPTIONS

35A-EXX-D*xxx-xxx* — N.C. only valve

35A-FXX-D*xxx-xxx* — universal w/gage port

35A-OXX — no valve body (base only)

MAC

Series 35

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 120 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	1.8 W : 0.09 C_V, 5.4 to 12.7 W : 0.1 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
Response times :	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :

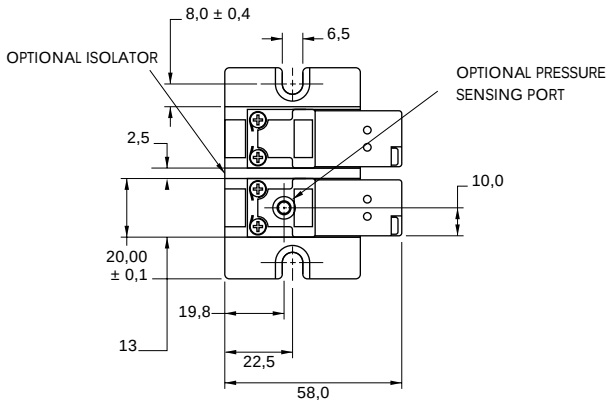
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402. • Pressure seal (between valve and base) : 16447.
- Pressure seal (between bases) : 16461. • Tie-rod (x2) : 19753. • Inlet isolator : N-35007. • Exhaust isolator : N-35008.
- Inlet & Exhaust isolator : N-35006.

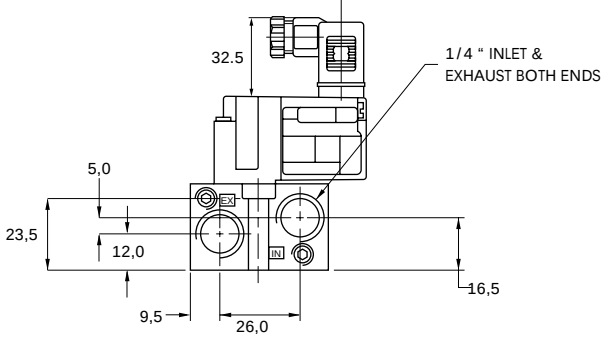
Options :

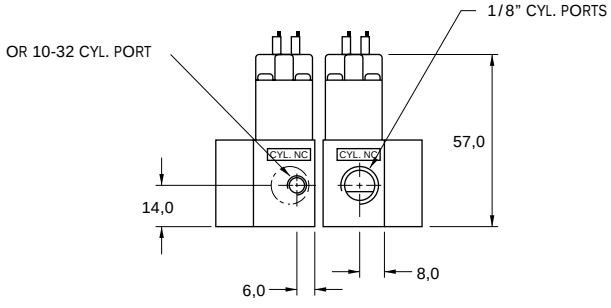
- BSPP threads. • High flow up to 0.18 Cv, according to wattage and high flow mod.

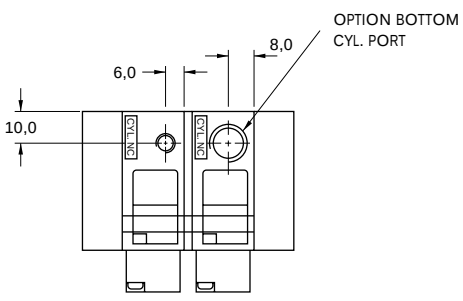
DIMENSIONS

Dimensions shown are metric (mm)









MAC®

Series 35

Function	Port size	Flow (Max)	Manifold mounting
3/2 NO-NC, 2/2 NO-NC	# 10-32, 1/8"	0.10 C_V	sub-base with pressure regulators

OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

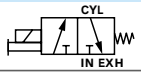
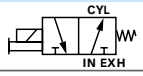
Reset

HOW TO ORDER 35A-BXX-DXXX-XXX

SIDE CYLINDER PORTS

Port size	Norm. closed Manifold base 	Norm. open Manifold base 
Valve less base (universal)	35A-B00-D*xxx-xxx*	35A-B00-D*xxx-xxx*
# 10-32 UNF base	35A-BBJ-D*xxx-xxx*	35A-BBK-D*xxx-xxx*
1/8" NPTF base	35A-BAJ-D*xxx-xxx*	35A-BAK-D*xxx-xxx*

BOTTOM CYLINDER PORTS

Port size	Norm. closed Manifold base 	Norm. open Manifold base 
Valve less base (universal)	35A-B00-D*xxx-xxx*	35A-B00-D*xxx-xxx*
# 10-32 UNF base	35A-BGJ-D*xxx-xxx*	35A-BGK-D*xxx-xxx*
1/8" NPTF base	35A-BFJ-D*xxx-xxx*	35A-BFK-D*xxx-xxx*

SOLENOID OPERATOR ➤

D *XX X- X XX*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)
XX	Other options available

X	Wire length
A	18" (Flying leads)
J	Connector
X	Other options available

X	Manual operator
1	Non-locking
2	Locking
X	Other options available

XX	Electrical connection
KA	Square connector
KD	Square connector with light
BA	Flying leads
XX	Other options available

End plate kit required (Port size : 1/4") : M-35003-01
Note : upon request, manifolds are mounted at the factory.

OPTIONS

35A-EXX-D*xxx-xxx* — N.C. only valve

35A-FXX-D*xxx-xxx* — universal w/gage port

35A-OXX — no valve body (base w/regulator)

MAC

Series 35

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 120 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	1.8 W : 0.09 C_V, 5.4 to 12.7 W : 0.1 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
Response times :	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :

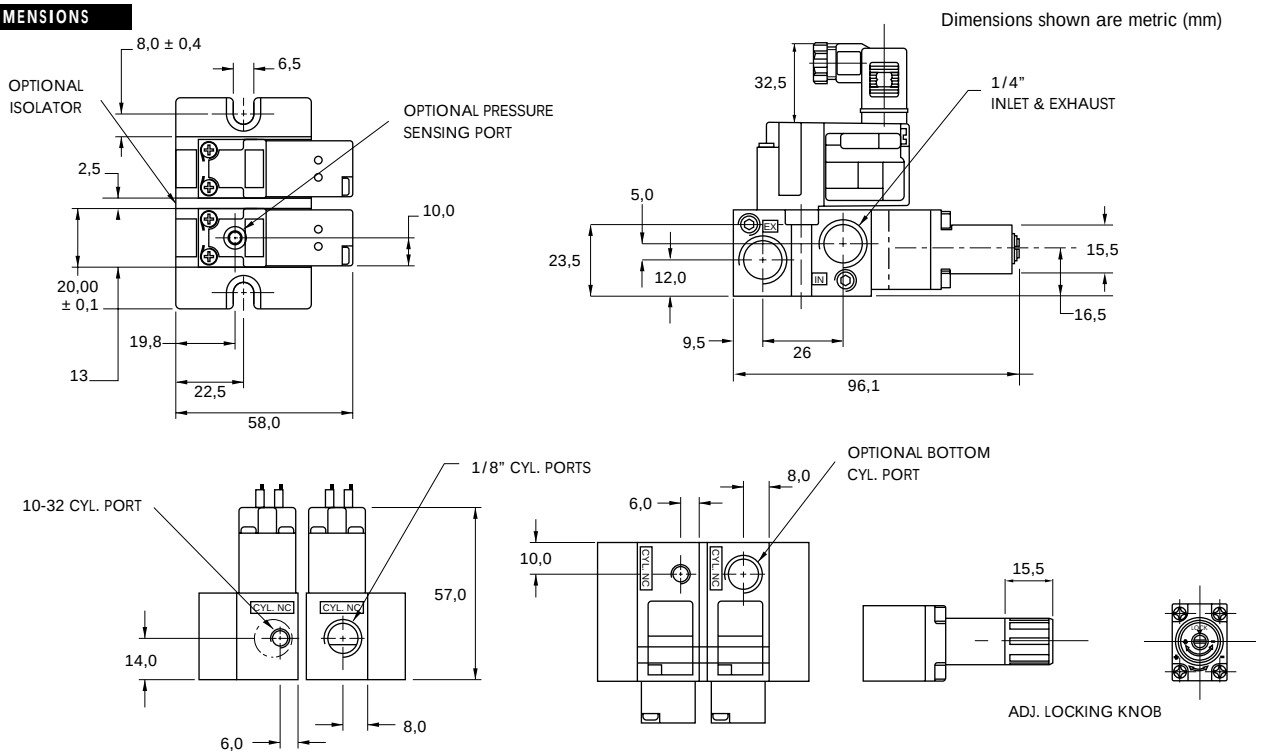
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402. • Pressure seal (between valve and base) : 16447.
- Pressure seal (between bases) : 16461. • Tie-rod (x2) : 19753. • Inlet isolator : N-35007. • Exhaust isolator : N-35008.
- Inlet & Exhaust isolator : N-35006. • Pressure regulator : 35A-00M (ADJ, KNOB) - 35A-00L (SLOTTED STEM).

Options :

- BSPP threads. • High flow up to 0.18 Cv, according to wattage and high flow mod.

DIMENSIONS

Dimensions shown are metric (mm)

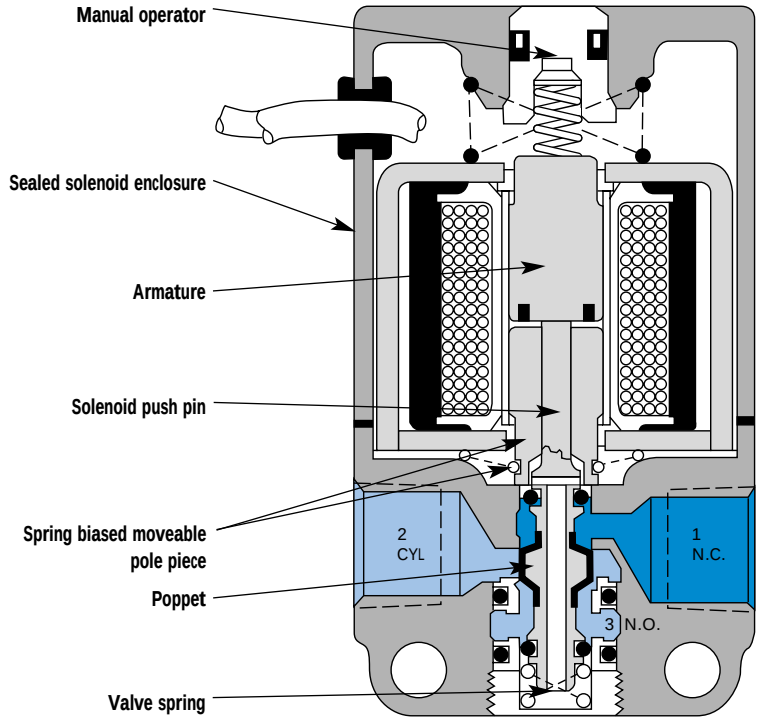


Individual mounting

inline	

Manifold mounting

stacking	sub-base non "plug-in"



SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Six valve functions with one individual valve.
- Individual, stacking body & add-a-unit manifold base capability.
- Use on lube or non-lube service.
- Extremely rapid response and cycle rate.
- Various types of manual operators and electrical enclosures.
- Extremely long service life.
- Optional low wattage DC solenoids down to 1 watt.

MAC®

Series 100

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

APPLICATION CONVERSION PROCEDURE:

INDIVIDUAL MODELS

The balanced poppet design facilitates using the same valve for 6 functions with any port being connected to vacuum, pressure or plugged. Piping is shown in the chart below.

STACKING BODY MODELS

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

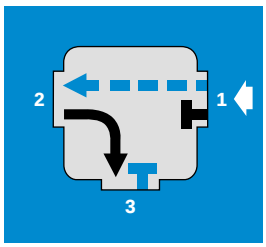
MANIFOLD BASE MODELS

The interchangeable function plate between the valve bodies and base permits selection for 2- or 3-way, Normally Closed or Normally Open operation. On 3-way applications, one function plate is used for both N.C. and N.O. When "3-NC" is visible on the plate, the function will be N.C. When "3-NO" is visible, the function is N.O. On 2-way applications, two separate plates are used-one for N.C., marked "2-NC"; the other for N.O., marked "2-NO". The 2-way plates block the exhaust at the valve, permitting the mixing in a stack of 3-ways and 2-ways. Changes within a stack from one function to another can be made without disturbing the plumbing.

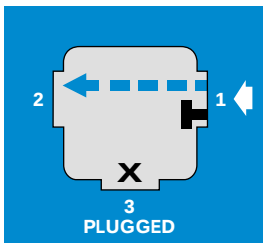
N.C. ONLY MODELS

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

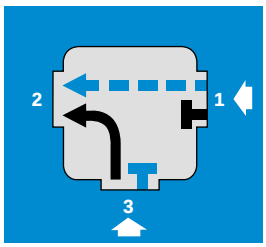
PIPING CHART FOR INDIVIDUAL MODELS



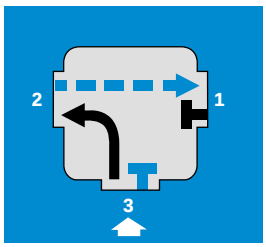
3 Way
Normally Closed



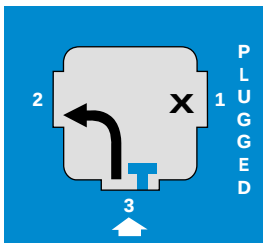
2 Way
Normally Closed



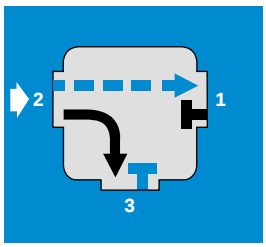
Selector



3 Way
Normally Open



2 Way
Normally Open



Divertor

Supply

Operator De-Energized

Operator Energized

Series 100

Function	Port size	Flow (Max)	Individual mounting
3/2 NO-NC, 2/2 NO-NC	1/8" - 1/4"	0.18 C_V	inline

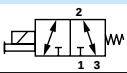
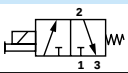
OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

Reset

HOW TO ORDER

1XXX-XXXXX

Port size	Universal valve 	NC only valve 
1/8" NPTF	111B-*XXYZZ*	161B-*XXYZZ*
1/4" NPTF	113B-*XXYZZ*	163B-*XXYZZ*

SOLENOID OPERATOR ➤ ***XX Y ZZ***

XX	Voltage
11	120/60, 110/50
12	240/60, 220/50
22	24/60, 24/50
59	24 VDC (2.5 W)
87	24 VDC (17.1 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JB	Rectangular connector
JD	Rectangular connector with light
JA	Square connector
JC	Square connector with light
BA	Flying leads (18")
CA	Conduit 1/2" NPS
XX	**Other options available**

Notes:
CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN
Individual inline valves can be changed from normally closed to normally open by connecting the inlet to port 3 instead of port 1.
NORMALLY CLOSED ONLY MODELS
A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

MAC

Series 100

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

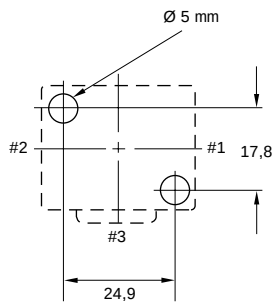
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 140°F (-18°C to 60°C)		
Flow (at 6 bar, ΔP=1bar) :	0.18 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17 W		
Response times :	24 VDC (8.5 W)	Energize : 7 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

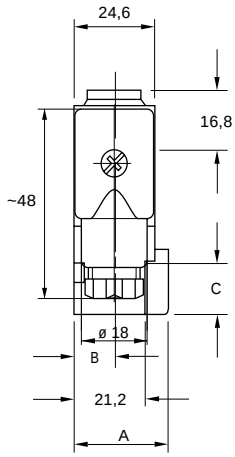
Spare parts : • Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 32184 and seal 16234.

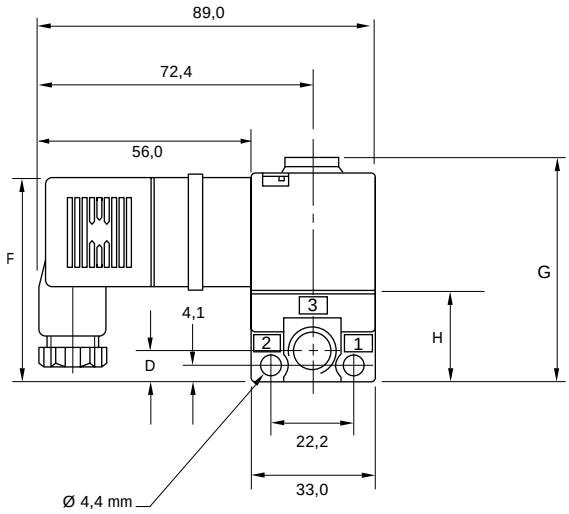
Options : • BSPP threads.

DIMENSIONS

Dimensions shown are metric (mm)







PORT SIZE	A	B	C	D	E	F	G	H
1 / 8 "	28.4	12.7	14.0	8.0	40.1	64.9	60.1	23.2
1 / 4 "	29.8	13.3	12.7	9.9	40.9	65.8	60.9	24.1

Series 100

Function	Port size	Flow (Max)	Manifold mounting
3/2 NO-NC, 2/2 NO-NC	1/8" - 1/4"	0.18 C_V	stacking

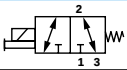
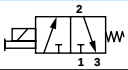
OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

Reset

HOW TO ORDER

1XXX-XXXXX

Port size	Universal valve	NC only valve
		
1/8" NPTF	181B-*XXYZZ*	184B-*XXYZZ*
1/4" NPTF	183B-*XXYZZ*	185B-*XXYZZ*

SOLENOID OPERATOR ➤ ***XX Y ZZ***

XX	Voltage
11	120/60, 110/50
12	240/60, 220/50
22	24/60, 24/50
59	24 VDC (2.5 W)
87	24 VDC (17.1 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JB	Rectangular connector
JD	Rectangular connector with light
BA	Flying leads (18")
MB	Common conduit 1" NPS
XX	**Other options available**

End plate kit required (Port size 1/4") : M-01001-01
"MB" option also requires end plate kit: M-01002-01

Notes:
CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN
In the case of stacking valves a reversible plate, complete with indicator, is placed between each valve body assembly. This determines whether the valve is N.C. or N.O.
NORMALLY CLOSED ONLY MODELS
A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

MAC

Series 100

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

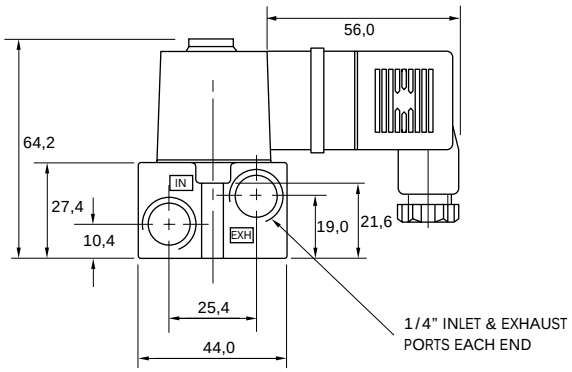
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 140°F (-18°C to 60°C)		
Flow (at 6 bar, ΔP=1bar) :	0.18 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush 14.8 VA	Holding : 10.9 VA	
	DC : 1 to 17.1 W		
Response times :	24 VDC (8.5 W)	Energize : 7 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

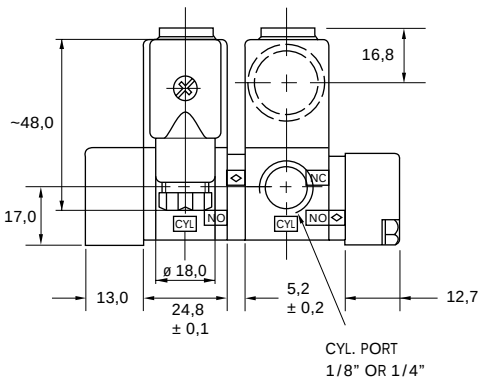
Spare parts : • Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
• Function plate : N-01002. • Tie-rod (x2) : 19674. • Inlet isolator plate : N01003. • Exhaust isolator plate : N01004.

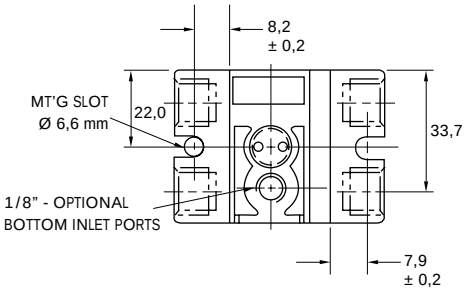
Options : • BSPP threads. • Bottom inlet (Mod. 0210).

DIMENSIONS

Dimensions shown are metric (mm)







MAC®

Series 100

Function	Port size	Flow (Max)	Manifold mounting
3/2 NO-NC, 2/2 NO-NC	1/8"	0.14 C_V	sub-base non "plug-in"

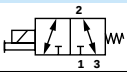
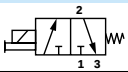
OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

Reset

HOW TO ORDER

1XXX-XXXXX

Port size	Universal valve	NC only valve
		
Valve less base	130B-*XXYZZ*	170B-*XXYZZ*
1/8" base NPTF	132B-*XXYZZ*	172B-*XXYZZ*

SOLENOID OPERATOR ➤ ***XX Y ZZ***

XX	Voltage
11	120/60, 110/50
12	240/60, 220/50
22	24/60, 24/50
59	24 VDC (2.5 W)
87	24 VDC (17.1 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JB	Rectangular connector
JD	Rectangular connector with light
BA	Flying leads (18")
MA	Common conduit 1" NPS
RA	Conduit 3/8" NPS
XX	**Other options available**

End plate kit required (Port size : 1/4") : A2-5004-01
"MA" option also requires end plate kit : M-01002-01

OPTIONS

12XB-*XXYZZ*
└ 2-way N.C.

14XB-*XXYZZ*
└ 2-way N.O.

102
(Base only)

Notes:
CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN
For manifold base mounted valves a plate is provided between the valve and the base. Three plates are available; a reversible plate for 3 Way valves (N.C. & N.O.), one plate for 2 Way N.C. and one for 2 Way N.O. Appropriate plates, determined by the valve model number, are supplied automatically with the valve.
NORMALLY CLOSED ONLY MODELS
A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

MAC

Series 100

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 140°F (-18°C to 60°C)		
Flow (at 6 bar, ΔP=1bar) :	0.14 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17 W		
Response times :	24 VDC (8.5 W)	Energize : 7 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

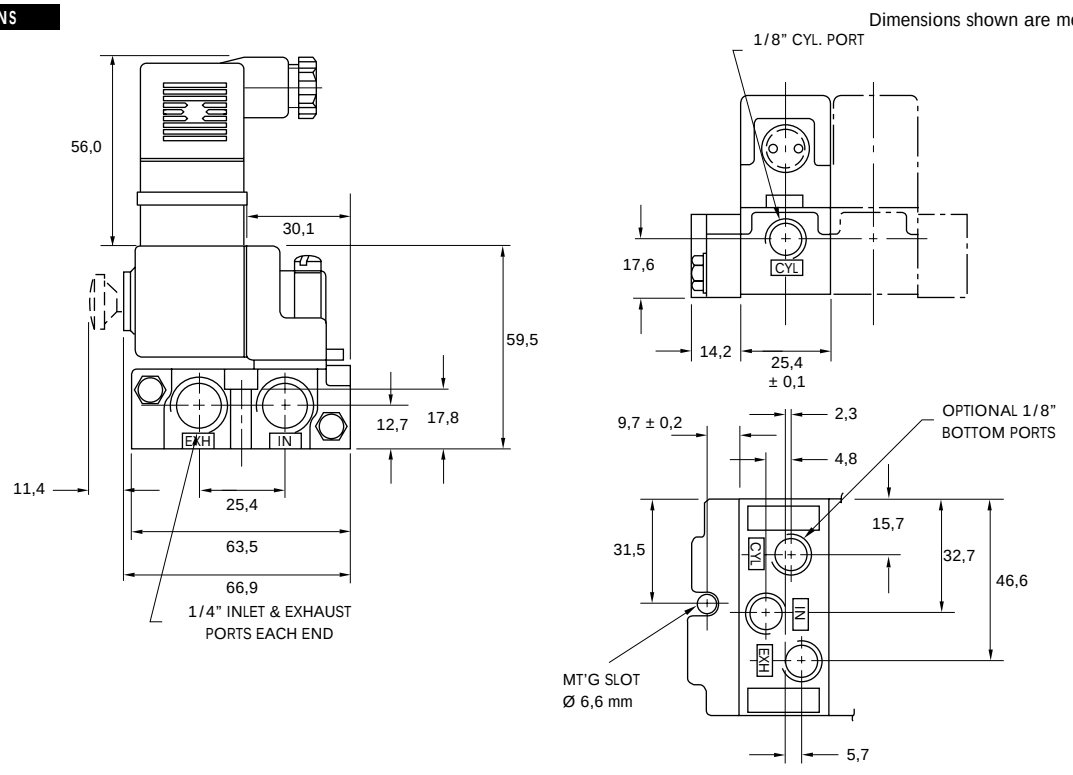
Spare parts :
• Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 32184 and seal 16234.
• Function plate : A2-7009. • Seal between manifold bases : 16226. • Tie-rod (x2) : 19546.

Options :
• BSPP threads. • Isolation of inlet : Mod. 313P. • Isolation of exhaust : Mod. 313E. • Additional bottom inlet : Mod. 0210.
• Bottom cyl. port : Mod. 0009. • All bottom & side ports : Mod. 0004.

Note :
• Specify mod. number after valve model number (i.e. 132B-111BA Mod. 0210)

DIMENSIONS

Dimensions shown are metric (mm)

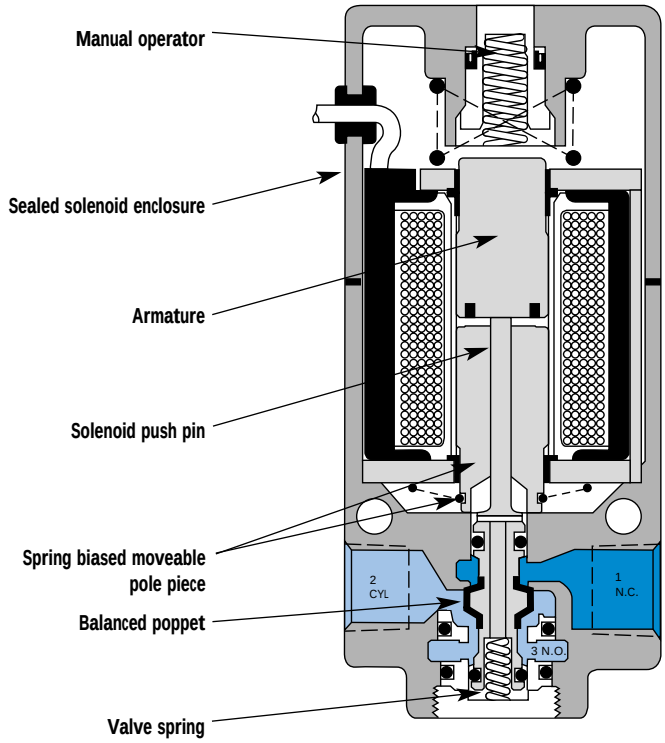


Individual mounting

inline	inline hazardous location

Manifold mounting

sub-base non "plug-in"	sub-base with pressure regulators	sub-base hazardous location



SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Six valve functions with one Inline valve and four valve functions with one Manifold valve.
- A triple rated coil for 120/60, 110/50 or 24 VDC (6 Watt).
- Inline & add-a-unit manifold capability.
- Use on lube or non-lube service.
- Extremely rapid response and cycle rate.
- Various types of manual operators and electrical enclosures.
- Extremely long service life.
- Optional low wattage DC solenoids down to 1 watt.

MAC®

Series 200

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

APPLICATION CONVERSION PROCEDURE:

INDIVIDUAL MODELS

The balanced poppet design facilitates using the same valve for 6 functions with any port being connected to vacuum, pressure or plugged. Piping is shown in the chart below.

MANIFOLD MODELS

The interchangeable function plate between the valve body and base permits selection for 2- or 3-way, Normally Closed or Normally Open operation, instead of through piping as shown below in the Inlines. On 3-way applications, one function plate is used for both N.C. and N.O. When "3-C" is visible on the plate, the function will be N.C. When "3-O" is visible, the function is N.O. On 2-way applications, a separate plate is used and like the 3-way plate is marked "2-C" for N.C. and "2-O" on the other side for N.O. The 2-way plates block the exhaust at the valve, permitting the mixing in a stack of 3-ways and 2-ways. Changes within a stack from one function to another can be made without disturbing the plumbing.

SPECIAL APPLICATIONS:

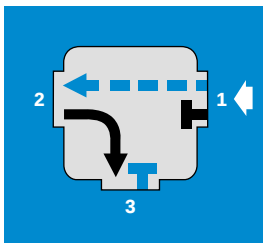
N.C. ONLY MODELS

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

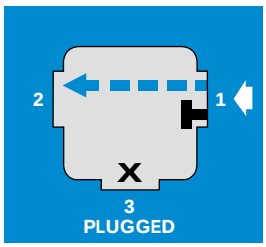
EXPLOSION PROOF MODELS

These models are designed to meet U.L. and C.S.A. standards for Division 1, Class I, Groups B, C, D and Class II, Groups E, F and G (NEMA equivalent to Class I is NEMA 7; Class II is NEMA 9). Explosion proof models are available in either inline or manifold versions but only with the no operator ("O") manual operator.

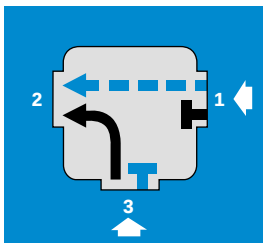
PIPING CHART FOR INDIVIDUAL MODELS



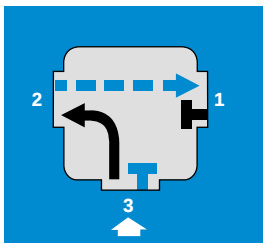
3 Way
Normally Closed



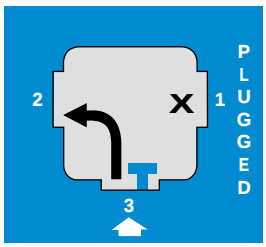
2 Way
Normally Closed



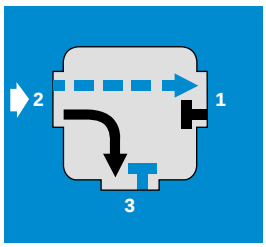
Selector



3 Way
Normally Open



2 Way
Normally Open



Divertor

Supply

Operator De-Energized

Operator Energized

MAC®

Series 200

Function	Port size	Flow (Max)	Individual mounting
3/2 NO-NC, 2/2 NO-NC	1/8" - 1/4"	0.5 C_V	inline

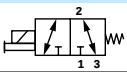
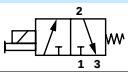
OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

Reset

HOW TO ORDER

2XXX-XXXXX

Port size	Universal valve	NC only valve
		
1/8" NPTF	224B-*XXYZZ*	274B-*XXYZZ*
1/4" NPTF	225B-*XXYZZ*	275B-*XXYZZ*

SOLENOID OPERATOR ➤ ***XX Y ZZ***

XX	Voltage
11	120/60, 110/50, 24 VDC (6.0 W)
12	240/60, 220/50
22	24/60, 24/50
52	24 VDC (2.5 W)
78	24 VDC (24.0 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JA	Square connector
JC	Square connector with light
BA	Flying leads (18")
CA	Conduit 1/2" NPS
XX	**Other options available**

Notes:

CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN

Individual inline valves can be changed from normally closed to normally open by connecting the inlet to port 3 instead of port 1.

NORMALLY CLOSED ONLY MODELS

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

MAC

Series 200

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

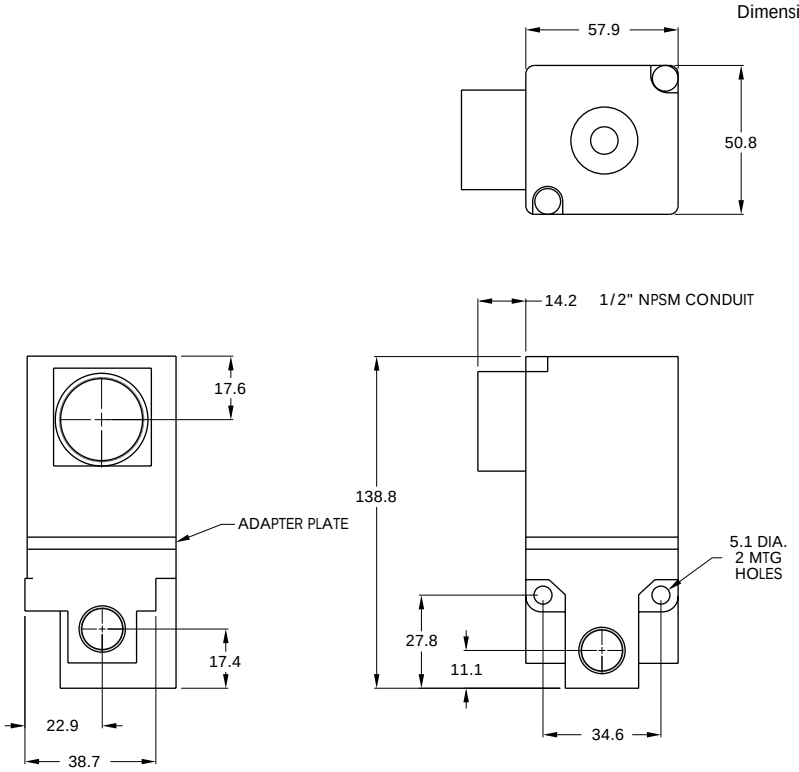
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 140°F (-18°C to 60°C)		
Flow (at 6 bar, ΔP=1bar) :	0.5 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
Response times :	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

Spare parts : • Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.

Options : • BSPP threads.

DIMENSIONS

Dimensions shown are metric (mm)



MAC®

Series 200

Function	Port size	Flow (Max)	Individual mounting
3/2 NO-NC, 2/2 NO-NC	1/8" - 1/4"	0.5 C_V	inline hazardous location

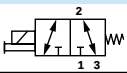
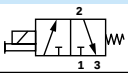
OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Burn-out proof solenoid on AC service.

Reset

HOW TO ORDER

2XXX-XXOEA

Port size	Universal valve	NC only valve
		
1/8" NPTF	224B-*XX0EA*	274B-*XX0EA*
1/4" NPTF	225B-*XX0EA*	275B-*XX0EA*

SOLENOID OPERATOR ➤ ***XX***

XX	Voltage
11	120/60, 110/50, 24 VDC (6.0 W)
12	240/60, 220/50
22	24/60, 24/50
50	24 VDC (6.0 W)
55	12 VDC (6.0 W)
60	12 VDC (9.5 W)
61	24 VDC (8.5 W)

Notes:
The special version of the 200 Series designed for hazardous locations has been approved by CSA for Class I, Groups B, C & D; Class II, Groups E, F & G. Maximum rated fluid and ambient temperature is 40°C; maximum pressure is 150 p.s.i.
Approval is limited to certain common AC & DC voltages which are those designated in the table above.

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

CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN
Individual inline valves can be changed from normally closed to normally open by connecting the inlet to port 3 instead of port 1.
NORMALLY CLOSED ONLY MODELS
A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

MAC

Series 200

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

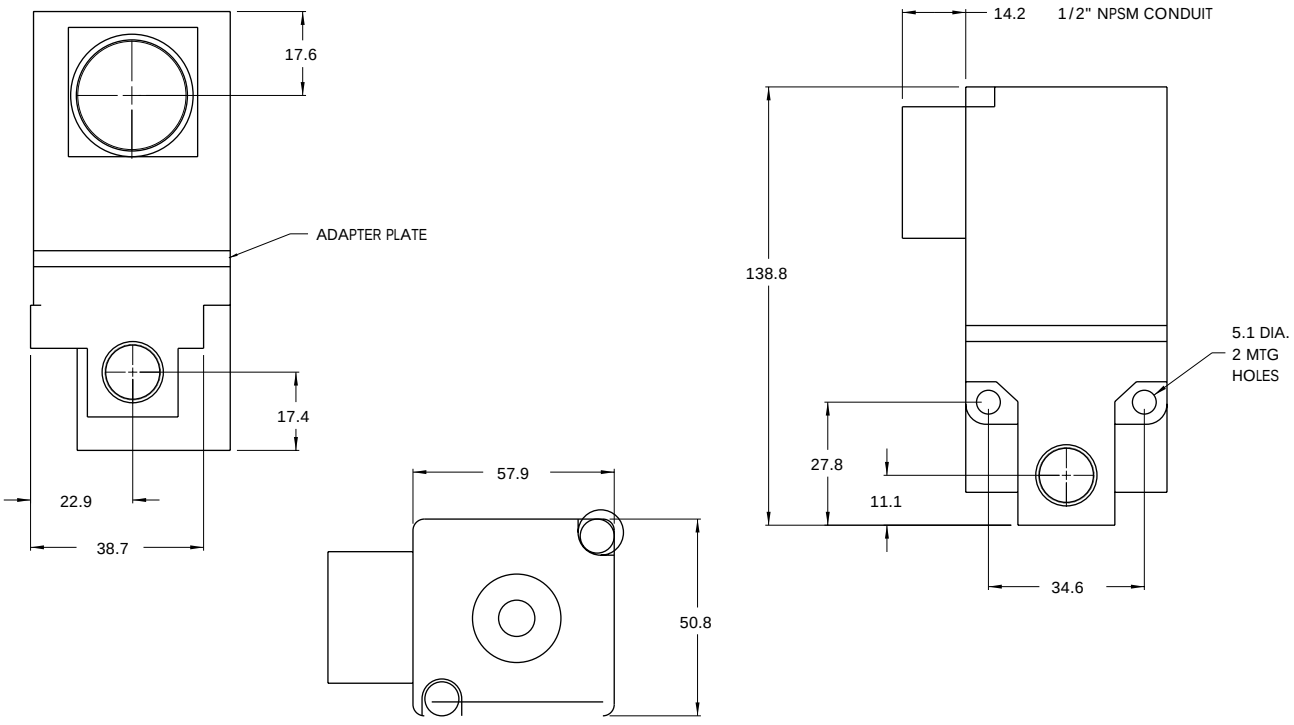
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 104°F (-18°C to 40°C)		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	NEMA 7, NEMA 9; Class I Groups B, C & D; Class II Groups E, F & G.		
Power :	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
Response times :	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

Spare parts : • Solenoid operator (power ≥ 6 W) : D4-XXAAB. • Adapter plate ass'y. : A3-0506.

Options : • BSPP threads.

DIMENSIONS

Dimensions shown are metric (mm)



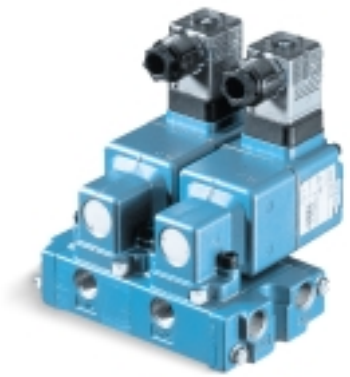
MAC®

Series 200

Function	Port size	Flow (Max)	Manifold mounting
3/2 NO-NC, 2/2 NO-NC	1/8" - 1/4"	0.5 C_V	sub-base non "plug-in"

OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



Reset

HOW TO ORDER

2XXX-XXXXX

Port size	Universal valve (CYL, T, T, IN EXH)	NC only valve (CYL, T, T, IN EXH)
Valve less base	250B-*XXYZZ*	280B-*XXYZZ*
1/8" base NPTF	256B-*XXYZZ*	286B-*XXYZZ*
1/4" base NPTF	257B-*XXYZZ*	287B-*XXYZZ*

SOLENOID OPERATOR ➤ ***XX Y ZZ***

XX	Voltage
11	120/60, 110/50, 24 VDC (6.0 W)
12	240/60, 220/50
22	24/60, 24/50
52	24 VDC (2.5 W)
78	24 VDC (24.0 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JC	Square connector with light
JA	Square connector
BA	Flying leads (18")
CA	Conduit 1/2" NPS
XX	**Other options available**

End plate kit required (Port size : 1/4") : A2-5003-01.

OPTIONS

26XB-*XXYZZ*	206	207
- universal 2-way	(Base only - 1/8")	(Base only - 1/4")

CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN

For manifold base mounted valves a plate is provided between the valve and the base. Three plates are available; a reversible plate for 3 Way valves (N.C. & N.O.), one plate for 2 Way N.C. and one for 2 Way N.O. Appropriate plates, determined by the valve model number, are supplied automatically with the valve.

NORMALLY CLOSED ONLY MODELS

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

MAC

Series 200

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 140°F (-18°C to 60°C)		
Flow (at 6 bar, ΔP=1bar) :	0.5 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
Response times :	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

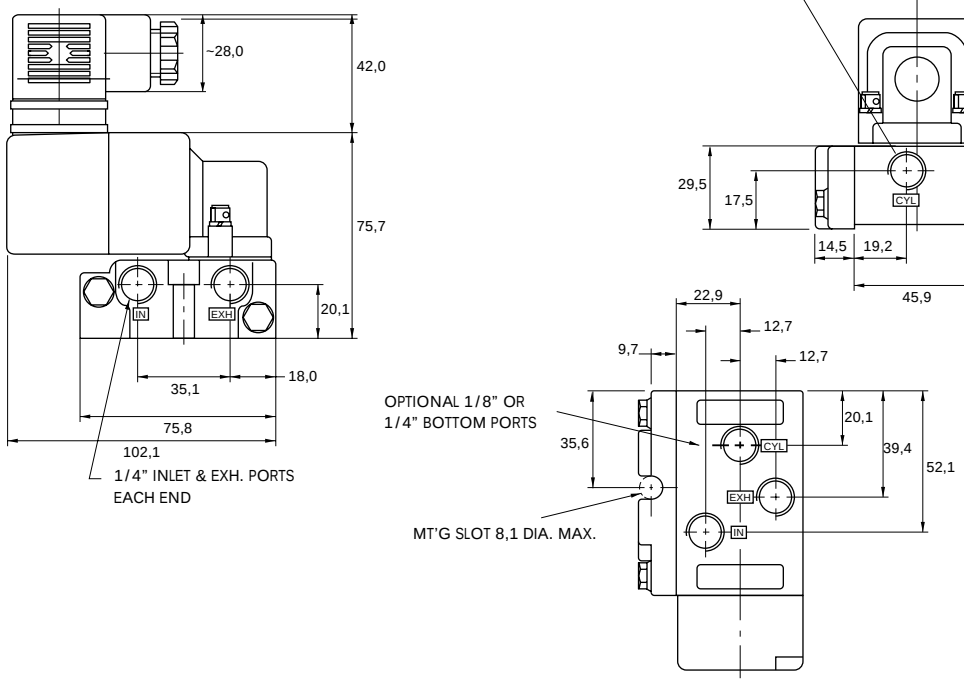
Spare parts :
• Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.
• Function plate : A2-7005. • Seal between bases : B5-5010. • Tie-rod (x2) : B4-9004.

Options :
• BSPP threads. • Explosion-proof model. • Isolation of inlet : Mod. 313P. • Isolation of exhaust : Mod. 313E.
• Additional bottom inlet : Mod. 0210. • Bottom cyl. port : Mod. 0009. • All bottom & side ports : Mod. 0004.

Note :
• Specify Mod. number after valve model number (i.e. 257B-111BA Mod. 0210)

DIMENSIONS

Dimensions shown are metric (mm)



MAC®

Series 200

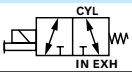
Function	Port size	Flow (Max)	Manifold mounting
3/2 NO-NC, 2/2 NO-NC	1/4"	0.4 C_V	sub-base with pressure regulators

OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.
7. Individual pressure control to each cylinder port.

Reset

HOW TO ORDER 2XXX-XXXXX

Port size	Universal valve	NC only valve
		
Valve less base	250B-*XXYZZ*	280B-*XXYZZ*
1/4" base NPTF	252B-*XXYZZ*	282B-*XXYZZ*

SOLENOID OPERATOR ➤ ***XX Y ZZ***

XX	Voltage
11	120/60, 110/50, 24 VDC (6.0 W)
12	240/60, 220/50
22	24/60, 24/50
52	24 VDC (2.5 W)
78	24 VDC (24.0 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JA	Square connector
JC	Square connector with light
BA	Flying leads (18")
CA	Conduit 1/2" NPS
XX	**Other options available**

Manifold fastening kit required : N-02003

MODEL

252B-
3-Way N.C. or N.O.

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

282B-
3-Way N.C. only

INDIVIDUAL PRESSURE CONTROL TO EACH CYLINDER PORT

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

MAC

Series 200

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 140°F (-18°C to 60°C)		
Flow (at 6 bar, ΔP=1bar) :	0.4 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
Response times :	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

Spare parts :

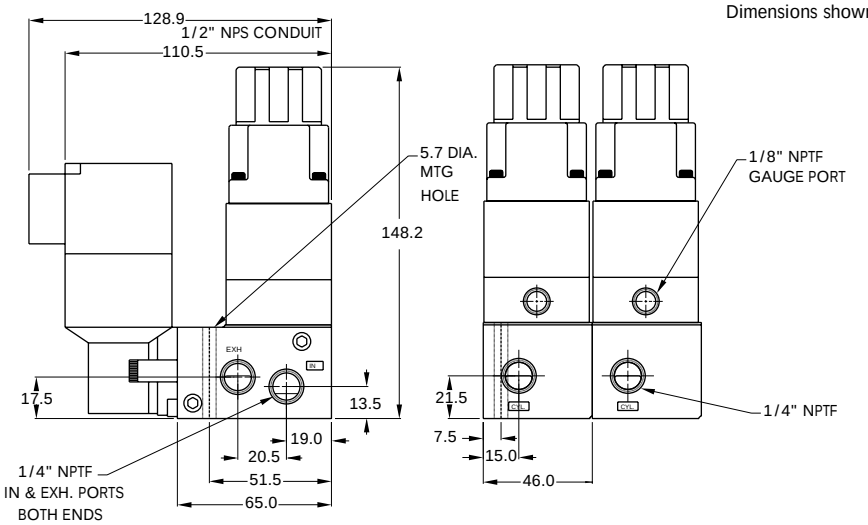
- Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.
- Function plate : A2-7005. • Seal between bases (x2) : 17016-01. • Tie-rod (x2) : B4-9004. • Pressure regulator : PR82A-J0AA.

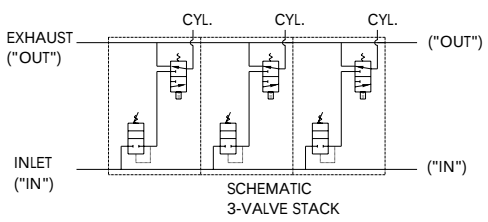
Options :

- BSPP threads. • Explosion-proof model. • Isolation of inlet and/or exhaust.
- Mod. PR80 (0-80 pressure range), Mod PR30 (0-30 pressure range)

DIMENSIONS

Dimensions shown are metric (mm)





MAC®

Series 200

Function	Inlet & outlet port size	Flow (Max)	Manifold mounting
3/2 NO-NC, 2/2 NO-NC	1/4"	0.4 C_V	sub-base with pressure regulators

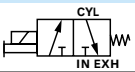
OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.
7. Selected pressure control to a single outlet.

Reset

HOW TO ORDER

251B-XXXXX

Port size	NC only valve
	
Valve	251B-XXYZZ

SOLENOID OPERATOR ➤ **XX Y ZZ**

XX	Voltage
11	120/60, 110/50, 24 VDC (6.0 W)
12	240/60, 220/50
22	24/60, 24/50
52	24 VDC (2.5 W)
78	24 VDC (24.0 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JA	Square connector
JC	Square connector with light
BA	Flying leads (18")
CA	Conduit 1/2" NPS
XX	**Other options available**

Manifold fastening kit required : N-02003

MODEL
251B-
3-Way Normally Closed

SELECTED PRESSURE CONTROL TO A SINGLE OUTLET

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

MAC

Series 200

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 140°F (-18°C to 60°C)		
Flow (at 6 bar, ΔP=1bar) :	0.4 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
Response times :	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

Spare parts :

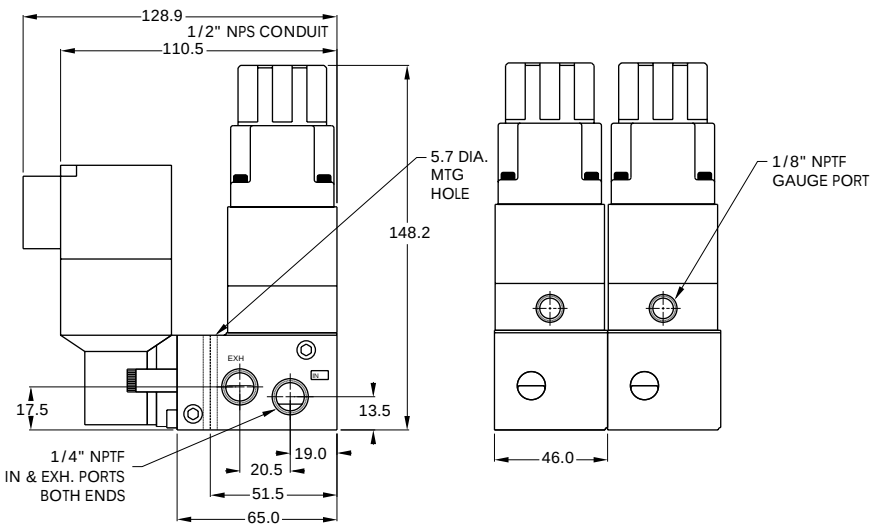
- Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.
- Function plate : A2-7005. • Seal between bases (x2) : 17016-01. • Tie-rod (x2) : B4-9004. • Pressure regulator : PR82A-J0AA.

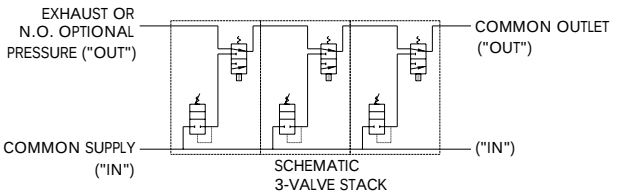
Options :

- BSPP threads. • Explosion-proof model. • Isolation of inlet and/or exhaust.
- Mod. PR80 (0-80 pressure range), Mod PR30 (0-30 pressure range)

DIMENSIONS

Dimensions shown are metric (mm)





MAC®

Series 200

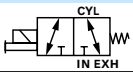
Function	Port size	Flow (Max)	Manifold mounting
3/2 NO-NC, 2/2 NO-NC	1/8" - 1/4"	0.5 C_V	sub-base hazardous location

OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Burn-out proof solenoid on AC service.

Reset

HOW TO ORDER 2XXX-XXOEA

Port size	Universal valve 	NC only valve 
Valve less base	250B-*XX0EA*	280B-*XX0EA*
1/8" base NPTF	258B-*XX0EA*	288B-*XX0EA*
1/4" base NPTF	259B-*XX0EA*	289B-*XX0EA*

SOLENOID OPERATOR ➤ *XX*

XX	Voltage
11	120/60, 110/50, 24 VDC (6.0 W)
12	240/60, 220/50
22	24/60, 24/50
50	24 VDC (6.0 W)
55	12 VDC (6.0 W)
60	12 VDC (9.5 W)
61	24 VDC (8.5 W)

End plate kit required (Port size : 1/4") : A2-5003-01.

OPTIONS

26XB-*XX0EA*	208	209
- universal 2-way	(Base only - 1/8")	(Base only - 1/4")

Notes:
The special version of the 200 Series designed for hazardous locations has been approved by CSA for Class I, Groups B, C & D; Class II, Groups E, F & G. Maximum rated fluid and ambient temperature is 40°C; maximum pressure is 150 p.s.i.
Approval is limited to certain common AC & DC voltages which are those designated in the table above.
These valves are supplied without manual operators. This version of the 200 Series can be supplied on the standard individual inline or the manifold valve body assemblies. It can also be supplied as a pilot for the 57, 58 and 59 Series (with special adapter plate # M-00012).

CHANGING FROM NORMALLY CLOSED TO NORMALLY OPEN
For manifold base mounted valves a plate is provided between the valve and the base. Three plates are available; a reversible plate for 3 Way valves (N.C. & N.O.), one plate for 2 Way N.C and one for 2 Way N.O. Appropriate plates, determined by the valve model number, are supplied automatically with the valve.
NORMALLY CLOSED ONLY MODELS
A single purpose Normally Closed only model is available for those applications where a greater tolerance for heavy concentrations of water, compressor products and other air line contaminants is desired. Model numbers are indicated above.

MAC

Series 200

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

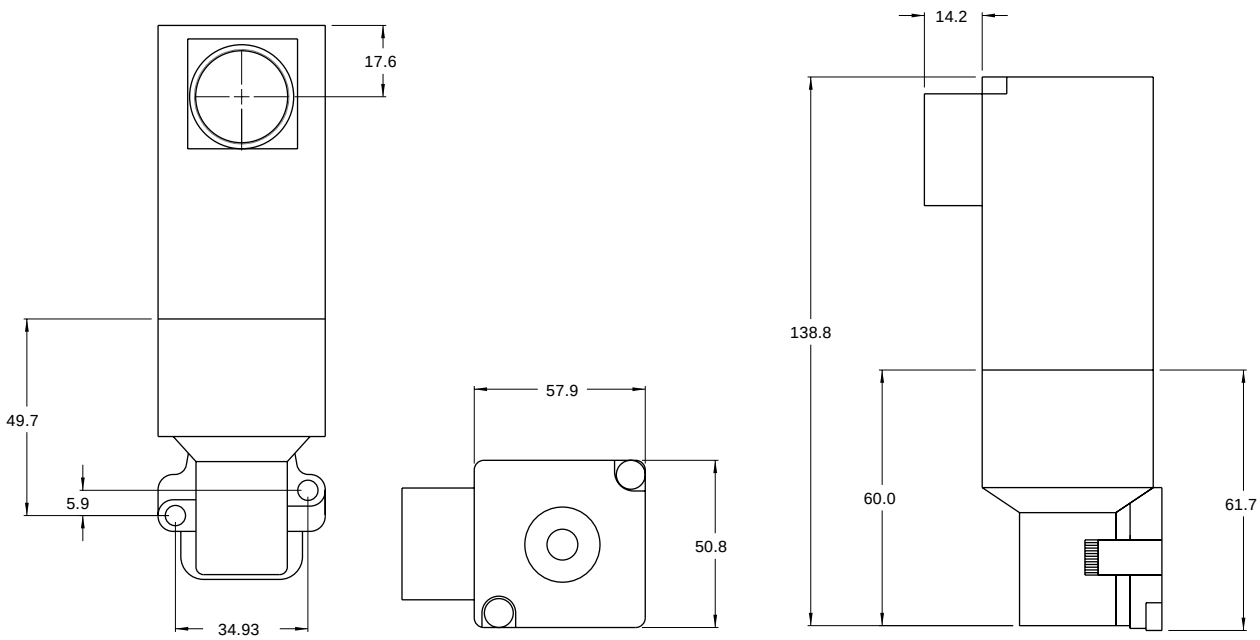
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 140°F (-18°C to 60°C)		
Flow (at 6 bar, ΔP=1bar) :	0.5 C_V		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
Response times :	24 VDC (8.5 W)	Energize : 15 ms	De-energize : 5 ms
	120/60	Energize : 3-8 ms	De-energize : 3-13 ms

Spare parts : • Solenoid operator (power ≥ 6 W) : D4-XXAAC-0EA. • Function plate : A2-7005. • Seal between bases : B5-5010.
• Tie-rod (x2) : 19598.

Options : • BSPP threads. • Isolation of inlet : Mod. 313P. • Isolation of exhaust : Mod. 313E.
• Additional bottom inlet : Mod 0210.

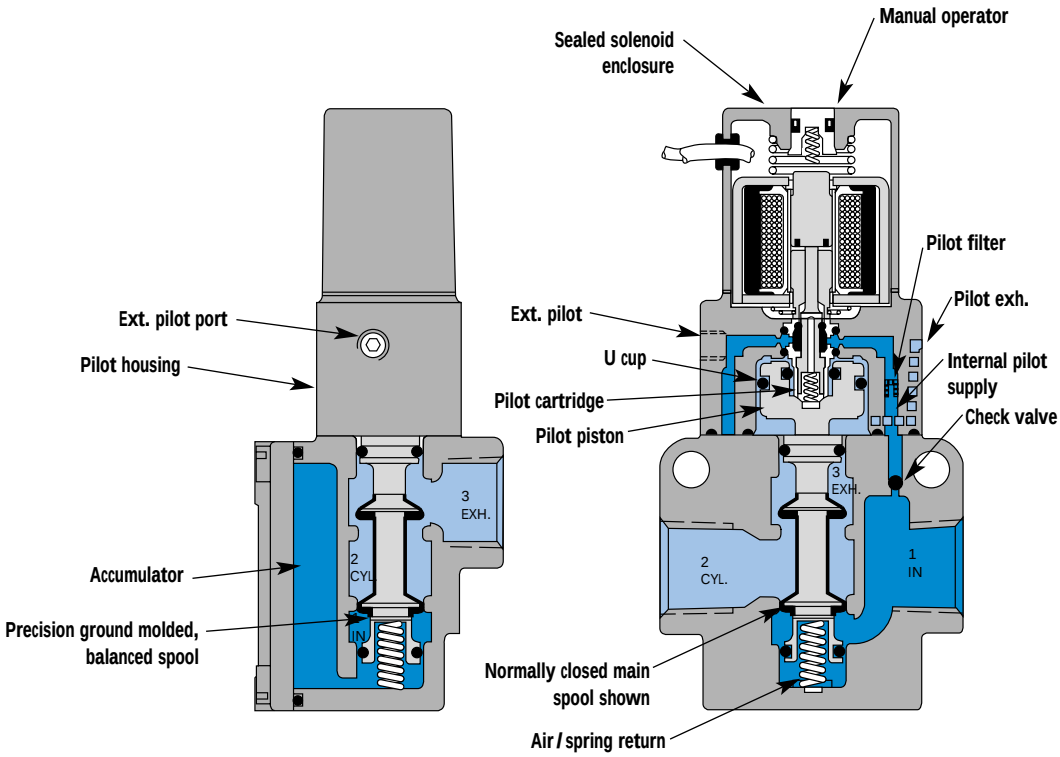
DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

inline	



SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Balanced spool unaffected by back pressure in the exhaust or by inlet restrictions. May be plugged for 2-way operation.
- A large checked accumulator which supplies the pilot and air / spring return for consistent shifting.
- Use on lube or non-lube service.
- Extremely rapid response and cycle rate.
- Various types of manual operators and solenoid enclosures.
- Optional low wattage DC solenoids down to 1 watt.

MAC®

Series 55

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

VALVE CONFIGURATIONS AVAILABLE

- 3-Way Normally Open or Normally Closed (solenoid or remote air).
- 2-Way (by plugging a port) Normally Open or Normally Closed (solenoid or remote air).
- Internal pilot or External pilot for vacuum to 30 PSI main valve pressures on solenoid or 25 on remote air operated models. Manual and mechanical operators available.

SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

These air versions feature:

- A large checked accumulator for air/spring return.
- Balanced spool unaffected by back pressure in the exhaust or by inlet restrictions. May be plugged for 2-way operation.
- Use on lube or non-lube service.

SERIES FEATURES-REMOTE AIR PILOT, PILOT OPERATED VALVES

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

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

SPECIAL APPLICATIONS:

- VACUUM APPLICATIONS: Connect the vacuum source to port #3 with port #1 open to atmosphere, and use external pilot on solenoid pilot operated models. On remote air pilot models, use -**RE**.
- SELECTOR APPLICATIONS: Pipe higher pressure to port #1 and lower pressure to port #3.
- INTERNAL PILOT: Use for main valve pressure of 30 to 150 PSI on all models. Includes ball check in the body and an M5x0.8 plug installed in the external pilot port.
- EXTERNAL PILOT: An external pilot supply is required when main valve pressures are lower than 30 psi on solenoid pilot or 25 psi on remote air pilot operated models. To convert from internal to external pilot on solenoid models simply rotate pilot housing 180 degrees and connect external pilot source. (Use either M5 or#10-32 fitting.) On remote air pilot models, specify -**RE**.

Series 55

Function	Port size	Flow (Max)	Individual mounting
3/2 NO-NC, 2/2 NO-NC	1/4" - 3/8"	2.2 C_V	inline

OPERATIONAL BENEFITS

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

Reset

HOW TO ORDER

55B-XX-XX-XXXXX

Port size	Pilot air	NC valve	NO valve
		CYL IN EXH	CYL IN EXH
1/4" NPTF	Internal	55B-11-PI-*XXYZZ*	55B-21-PI-*XXYZZ*
3/8" NPTF		55B-12-PI-*XXYZZ*	55B-22-PI-*XXYZZ*
1/4" NPTF	External	55B-11-PE-*XXYZZ*	55B-21-PE-*XXYZZ*
3/8" NPTF		55B-12-PE-*XXYZZ*	55B-22-PE-*XXYZZ*

SOLENOID OPERATOR ➤ ***XX Y ZZ***

XX	Voltage
11	120/60, 110/50
12	240/60, 220/50
22	24/60, 24/50
59	24 VDC (2.5 W)
87	24 VDC (17.1 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JB	Rectangular connector
JD	Rectangular connector with light
JA	Square connector
JC	Square connector with light
BA	Flying leads (18")
CA	Conduit 1/2" NPS
XX	**Other options available**

MAC

Series 5 5

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

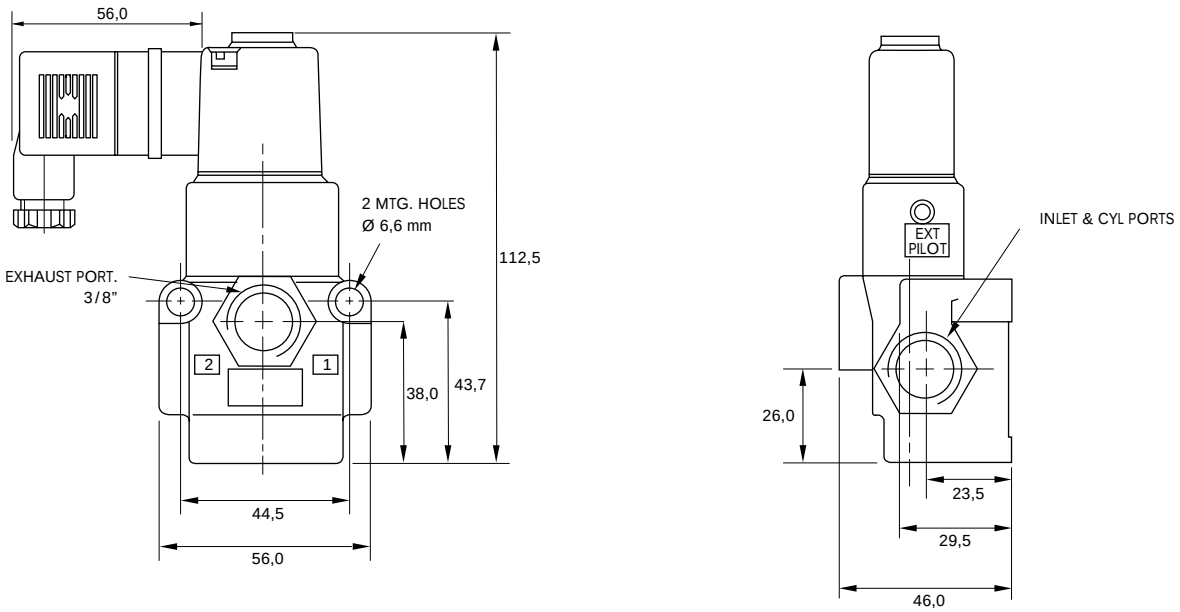
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Internal pilot : 30 to 150 PSI		
	External pilot : vacuum to 150 PSI		
Pilot pressure :	30 to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	Norm. Closed :1/4" (1.4 C_V), 3/8" (1.6 C_V), Norm. Open : 1/4" (1.8 C_V), 3/8" (2.2 C_V)		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17 W		
Response times :	24 VDC (8.5 W)	Energize : 9 ms	De-energize : 4.8 ms
	120/60	Energize : 5-11 ms	De-energize : 5-11 ms

Spare parts : • Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 35206 and seal 16234.
• Pilot valve : PID-XXYZZ, including mounting screws 35214 and seal 16363. • Check valve : 70061.

Options : • BSPP threads.

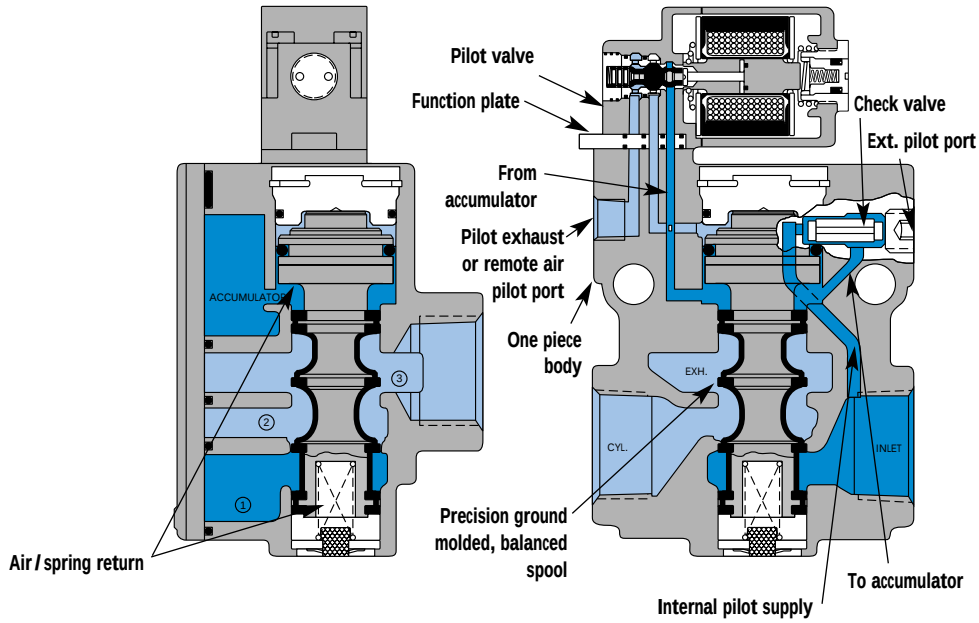
DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

inline	



SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Seven valve functions in one valve.
- Balanced spool unaffected by back pressure in the exhaust or by inlet restrictions. May be plugged for 2-way operation.
- A large checked accumulator which supplies the pilot and air / spring return for consistent shifting.
- Use on lube or non-lube service.
- Various types of manual operators and solenoid enclosures.
- Optional low wattage DC solenoids down to 1 watt.

MAC

Series 5 6

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

VALVE CONFIGURATIONS AVAILABLE

- 3-Way Normally Open or Normally Closed (solenoid or remote air).
- 2-Way (by plugging a port) Normally Open or Normally Closed (solenoid or remote air).
- Internal pilot or External pilot for vacuum to 25 PSI main valve pressures on solenoid or remote air models.
- Manual and mechanical operators available.

SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

These remote air versions feature:

- A large checked accumulator for air/spring return.
- Balanced spool unaffected by back pressure in the exhaust or by inlet restrictions. May be plugged for 2-way operation.
- Use on lube or non-lube service.
- Optional remote air pilot, pilot operated models available when application requires a pilot signal below the main valve pressure.

APPLICATION CONVERSION PROCEDURE

The balanced spool design and the unique N.C. and N.O. pilot valve function plate on solenoid models facilitate using the same valve for 7 different functions.

The 7 functions are as follows:

- 3-way Normally Closed-All 3 main valve ports utilized and function plate placed with "3N.C." (3-way N.C.) visible.
- 3-way Normally Open-All 3 main valve ports utilized and function plate placed with "3N.O." (3-way N.O.) visible.
- 2-way Normally Closed-Same as 3-way N.C. but also plug port #3.
- 2-way Normally Open-Same as 3-way N.O. but also plug port #3.
- Selector-Pipe higher pressure to port #1 and lower pressure port #3.
- Internal Pilot-Utilized for main valve pressures of 25-150 PSI. Includes a check rod in the body and a 1/8" pipe plug installed in the External Pilot port.
- External Pilot-An External Pilot supply is required when main valve pressures are lower than 25 PSI. If converting from an Internal Pilot model, remove the 1/8" pipe plug and check rod from the External Pilot port and install a 1/16" pipe plug in the check rod hole and pipe an external supply greater than 25 PSI to the External Pilot port. For vacuum service, make the vacuum connection to the port #3 and leave port #1 open to atmosphere or pressure port #1 for vacuum/pressure selector applications.

N.C.-N.O. OPERATIONS:

SOLENOID MODELS:

With the pilot valve available either N.C. or N.O., simply by inverting the function plate, maximum flexibility is available in solenoid pilot operated models by using the N.C. main spool and installing the function plate for either N.C. or N.O. operation. Where an N.C. pilot function is desired with a N.O. main valve operation, a N.O. main spool option is available.

REMOTE AIR MODELS:

On remote air pilot operated models, N.C. and N.O. main spools are both available so that a N.C. pilot signal can always be used.

MAC®

Series 5 6

Function	Port size	Flow (Max)	Individual mounting
3 / 2 NO-NC, 2 / 2 NO-NC	3 / 8 " - 1 / 2 " - 3 / 4 "	5.7 C_V	inline

OPERATIONAL BENEFITS

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

Reset

HOW TO ORDER

56C-XX-XXXXX

Port size	Pilot air	NC only valve NC pilot - NC spool	NO only valve NO pilot - NC spool	NO only valve NC pilot - NO spool
				
3 / 8 " NPTF	Internal	56C-12-*XXYZZ*	56C-22-*XXYZZ*	56C-62-*XXYZZ*
1 / 2 " NPTF		56C-13-*XXYZZ*	56C-23-*XXYZZ*	56C-63-*XXYZZ*
3 / 4 " NPTF		56C-17-*XXYZZ*	56C-27-*XXYZZ*	56C-67-*XXYZZ*
3 / 8 " NPTF	External	56C-32-*XXYZZ*	56C-42-*XXYZZ*	56C-72-*XXYZZ*
1 / 2 " NPTF		56C-33-*XXYZZ*	56C-43-*XXYZZ*	56C-73-*XXYZZ*
3 / 4 " NPTF		56C-37-*XXYZZ*	56C-47-*XXYZZ*	56C-77-*XXYZZ*

SOLENOID OPERATOR ➤ ***XX Y ZZ***

XX	Voltage
11	120/60, 110/50
12	240/60, 220/50
22	24/60, 24/50
59	24 VDC (2.5 W)
87	24 VDC (17.1 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JB	Rectangular connector
JD	Rectangular connector with light
JA	Square connector
JC	Square connector with light
BA	Flying leads (18")
CA	Conduit 1/2" NPS
XX	**Other options available**

MAC

Series 5 6

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Internal pilot : 25 to 150 PSI		
	External pilot : vacuum to 150 PSI		
Pilot pressure :	25 to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	Norm. Closed :3/8" (4.4 C_V), 1/2" (5.0 C_V), 3/4" (5.4 C_V), Norm. Open : 3/8" (4.6 C_V), 1/2" (5.1 C_V), 3/4" (5.7 C_V)		
Leak rate :	70 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 14.8 VA	Holding : 10.9 VA	
	= 1 to 17 W		
Response times :	24 VDC (8.5 W)	Energize : 11 ms	De-energize : 10,8ms
	120/60	Energize : 7-12 ms	De-energize : 9-14 ms

Spare parts :

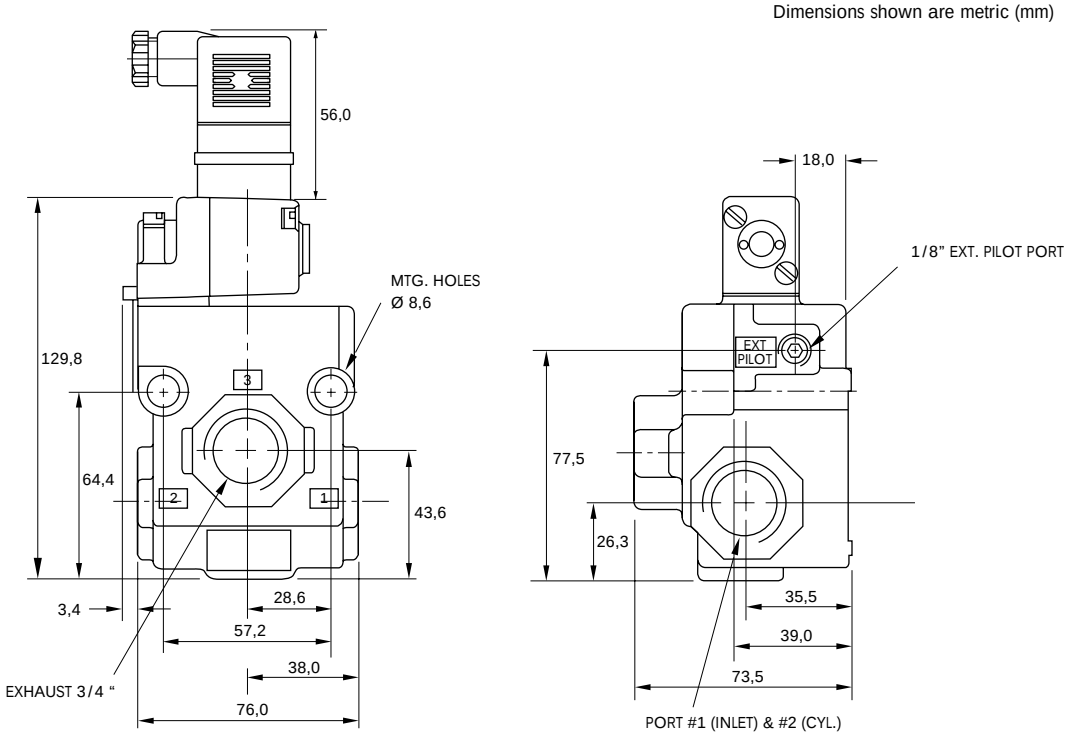
- Solenoid operator (power ≥ 4 W) : D1-XXAA, cover mounting screws 32184 and seal 16234.
- Pilot valve : 130B-XXYZZ, including function plate A2-7009. • Pilot mounting screws kit : N-56002.
- Check valve : 70063.

Options :

- BSPP threads.

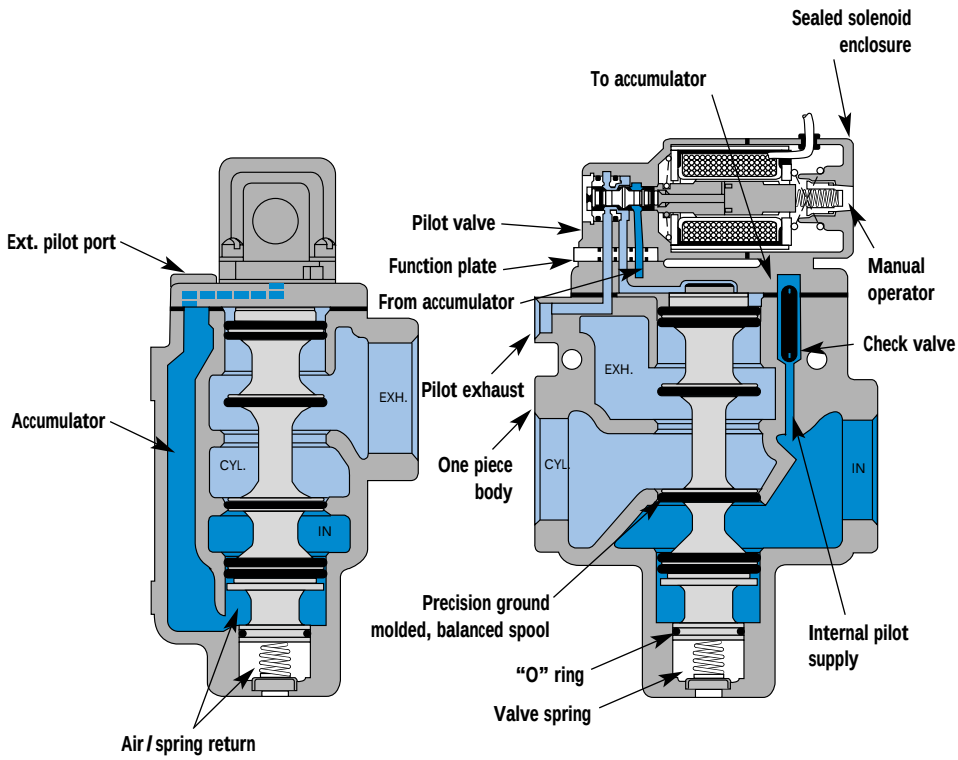
DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

inline



SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Seven valve functions in one valve.
- Balanced spool unaffected by back pressure in the exhaust.
- A large checked accumulator which supplies the pilot and air / spring return for consistent shifting.
- A triple rated coil for 120 / 60, 110 / 50 or 24 VDC (6 Watt).
- Use on lube or non-lube service.
- Various types of manual operators and solenoid enclosures.
- Optional low wattage DC coils down to 1 watt.
- Optional explosion proof models designed to meet UL & CSA standards for Class I, Groups B, C, D and Class II, Groups E, F and G. (NEMA equivalent of Class I is NEMA 7; Class II is NEMA 9).

MAC®

Series 57

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

VALVE CONFIGURATIONS AVAILABLE

- 3-Way Normally Open or Normally Closed (solenoid or remote air).
- 2-Way (by plugging Exhaust port), Normally Open or Normally Closed (solenoid or remote air).
- Internal pilot or External pilot for vacuum to 25 PSI main valve pressures on solenoid models.
- Manual and mechanical operators available.

SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

The remote air versions feature:

- A large checked accumulator for air/spring return.
- Balanced spool unaffected by back pressure in the exhaust and may be plugged for 2-way operation.
- Use on lube or non-lube service.

APPLICATION CONVERSION PROCEDURE

The balanced spool design and the unique N.C. and N.O. pilot valve function plate on solenoid models facilitate using the same valve for 7 different functions.

The 7 functions are as follows:

- 3-way Normally Closed-All 3 main valve ports utilized and function plate placed with "3-C" (3-way N.C.) visible.
- 3-way Normally Open-All 3 main valve ports utilized and function plate placed with "3-O" (3-way N.O.) visible.
- 2-way Normally Closed-Same as 3-way N.C. but also plug the Exhaust port.
- 2-way Normally Open-Same as 3-way N.O. but also plug the Exhaust port.
- Selector-Pipe higher pressure to the Inlet port and lower pressure to the Exhaust port.
- Internal Pilot-Utilized for main valve pressures of 25-150 PSI. Includes a check rod in the body and a 1/4" pipe plug installed in the External Pilot port.
- External Pilot-An External Pilot supply is required when main valve pressures are lower than 25 PSI. If converting from an Internal Pilot model, remove the 1/4" pipe plug and check rod from the External Pilot port and install a 1/8" pipe plug in the check rod hole and pipe an external supply greater than 25 PSI to the External Pilot port. For vacuum service, make the vacuum connection to the Exhaust port and leave the Inlet port open to atmosphere.

N.C.-N.O. OPERATIONS:

SOLENOID MODELS:

With the pilot valve available either N.C. or N.O., simply by inverting the function plate, maximum flexibility is available in solenoid pilot operated models by using the N.C. main spool and installing the function plate for either N.C. or N.O. operation. Where an N.C. pilot function is desired with a N.O. main valve operation, a N.O. main spool option is available.

REMOTE AIR MODELS:

On remote air pilot operated models, N.C. and N.O. main spools are both available so that a N.C. pilot signal can always be used.

Series 57

Function	Port size	Flow (Max)	Individual mounting
3/2 NO-NC, 2/2 NO-NC	1/2" - 3/4" - 1"	17.4 C_V	inline

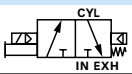
OPERATIONAL BENEFITS

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

Reset

HOW TO ORDER

57C-XX-XXXXX

Port size	Pilot air	NC only valve NC pilot - NC spool	NO only valve NO pilot - NC spool	NO only valve NC pilot - NO spool
				
1/2" NPTF	Internal	57C-11-*XXYZZ*	57C-21-*XXYZZ*	57C-61-*XXYZZ*
3/4" NPTF	Internal	57C-12-*XXYZZ*	57C-22-*XXYZZ*	57C-62-*XXYZZ*
1" NPTF	Internal	57C-13-*XXYZZ*	57C-23-*XXYZZ*	57C-63-*XXYZZ*
1/2" NPTF	External	57C-31-*XXYZZ*	57C-41-*XXYZZ*	57C-71-*XXYZZ*
3/4" NPTF	External	57C-32-*XXYZZ*	57C-42-*XXYZZ*	57C-72-*XXYZZ*
1" NPTF	External	57C-33-*XXYZZ*	57C-43-*XXYZZ*	57C-73-*XXYZZ*

SOLENOID OPERATOR ➤ ***XX Y ZZ***

XX	Voltage
11	120/60, 110/50, 24 VDC (6.0 W)
12	240/60, 220/50
22	24/60, 24/50
52	24 VDC (2.5 W)
78	24 VDC (24.0 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
0	No operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JA	Square connector
JC	Square connector with light
BA	Flying leads (18")
CA	Conduit 1/2" NPS
EA	Hazardous location
XX	**Other options available**

Note : Hazardous location option supplied with no manual operator ("0"). DC voltage not available below 6 Watts.

MAC

Series 57

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

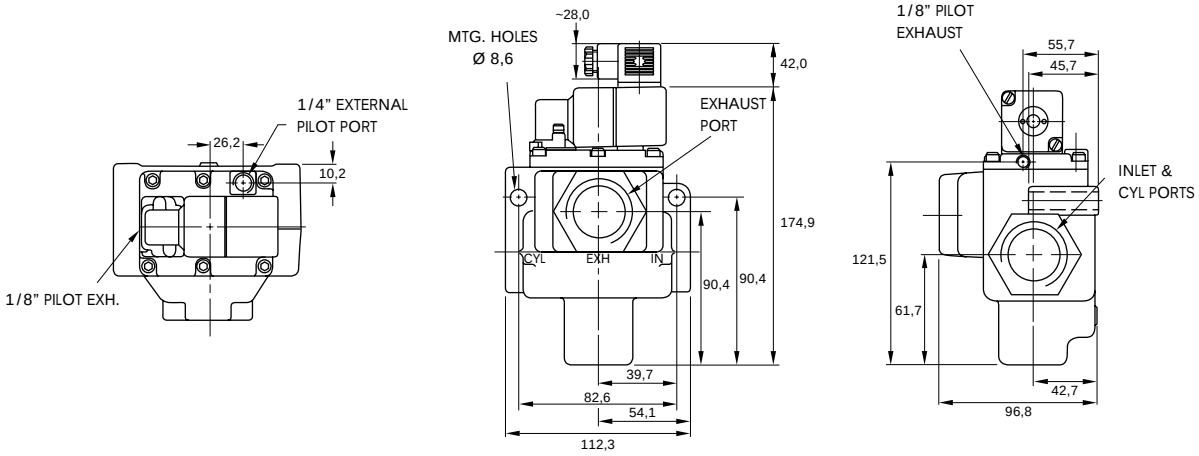
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Internal pilot : 25 to 150 PSI External pilot : vacuum to 150 PSI		
Pilot pressure :	25 to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	Norm. Closed :1/2" (9.0 C_V), 3/4" (12.7 C_V), 1" (15.9 C_V), Norm. Open : 1/2" (10.0 C_V), 3/4" (13.7 C_V), 1" (17.4 C_V)		
Leak rate :	100 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
Response times :	24 VDC (8.5 W)	Energize : 23 ms	De-energize : 13ms
	120/60	Energize : 9-16 ms	De-energize : 11-22 ms

Spare parts :
- Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.
- Pilot valve : 250B-XXYZZ, including mounting screws 32203 and function plate A2-7005. • Check valve : 70019.

Options :
- BSPP threads.

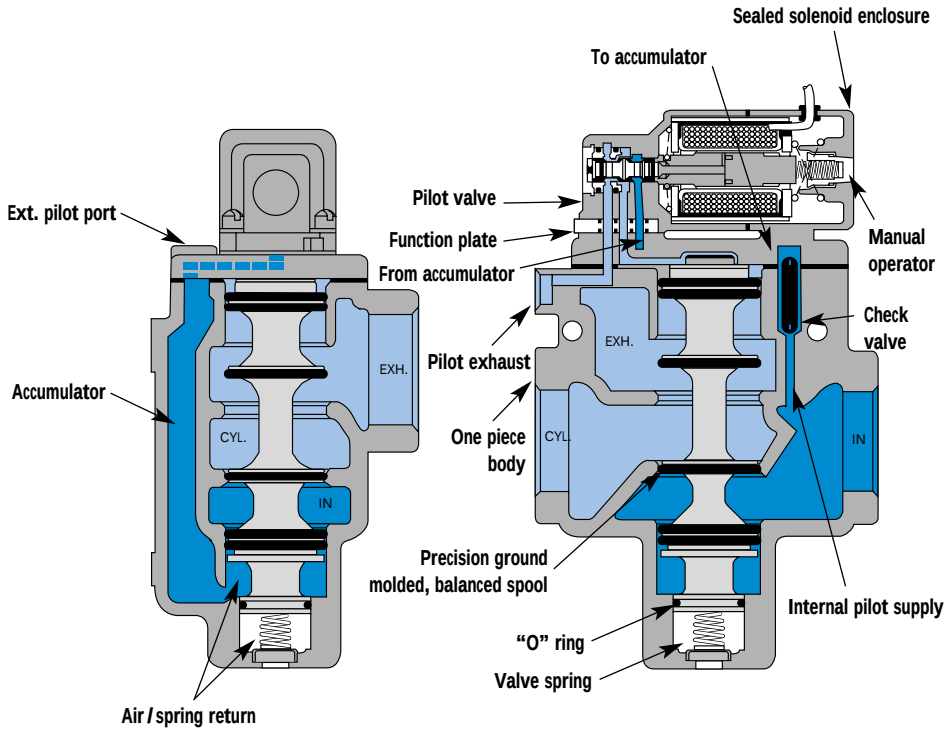
DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

inline	



SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Seven valve functions in one valve.
- Balanced spool unaffected by back pressure in the exhaust.
- A large checked accumulator which supplies the pilot and air / spring return for consistent shifting.
- A triple rated coil for 120 / 60, 110 / 50 or 24 VDC (6 Watt).
- Use on lube or non-lube service.
- Various types of manual operators and solenoid enclosures.
- Optional low wattage DC coils down to 1 watt.
- Optional explosion proof models designed to meet UL & CSA standards for Class I, Groups B, C, D and Class II, Groups E, F and G. (NEMA equivalent of Class I is NEMA 7; Class II is NEMA 9).

MAC®

Series 58

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

VALVE CONFIGURATIONS AVAILABLE

- 3-Way Normally Open or Normally Closed (solenoid or remote air).
- 2-Way (by plugging Exhaust port), Normally Open & Normally Closed (solenoid or remote air).
- Internal pilot or External pilot for vacuum to 25 PSI main valve pressures on solenoid models.

SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

The remote air versions feature:

- A large checked accumulator for air/spring return.
- Balanced spool unaffected by back pressure in the exhaust and may be plugged for 2-way operation.
- Use on lube or non-lube service.

APPLICATION CONVERSION PROCEDURE

The balanced spool design and the unique N.C. and N.O. pilot valve function plate on solenoid models facilitate using the same valve for 7 different functions.
The 7 functions are as follows:

- 3-way Normally Closed-All 3 main valve ports utilized and function plate placed with "3-C" (3-way N.C.) visible.
- 3-way Normally Open-All 3 main valve ports utilized and function plate placed with "3-O" (3-way N.O.) visible.
- 2-way Normally Closed-Same as 3-way N.C. but also plug the Exhaust port.
- 2-way Normally Open-Same as 3-way N.O. but also plug the Exhaust port.
- Selector-Pipe higher pressure to the Inlet port and lower pressure to the Exhaust port.
- Internal Pilot-Utilized for main valve pressures of 25-150 PSI. Includes a check rod in the body and a 1/4" pipe plug installed in the External Pilot port.
- External Pilot-An External Pilot supply is required when main valve pressures are lower than 25 PSI. If converting from an Internal Pilot model, remove the 1/4" pipe plug and check rod from the External Pilot port and install a 1/8" pipe plug in the check rod hole and pipe an external supply greater than 25 PSI to the External Pilot port. For vacuum service, make the vacuum connection to the Exhaust port and leave the Inlet port open to atmosphere.

N.C.-N.O. OPERATIONS:

SOLENOID MODELS:

With the pilot valve available either N.C. or N.O., simply by inverting the function plate, maximum flexibility is available in solenoid pilot operated models by using the N.C. main spool and installing the function plate for either N.C. or N.O. operation. Where an N.C. pilot function is desired with a N.O. main valve operation, a N.O. main spool option is available.

REMOTE AIR MODELS:

On remote air pilot operated models, N.C. and N.O. main spools are both available so that a N.C. pilot signal can always be used.

MAC®

Series 58

Function	Port size	Flow (Max)	Individual mounting
3/2 NO-NC, 2/2 NO-NC	1" - 1 1/4" - 1 1/2"	26.0 C_V	inline

OPERATIONAL BENEFITS

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

Reset

HOW TO ORDER

58C-XX-XXXXX

Port size	Pilot air	NC only valve NC pilot - NC spool	NO only valve NO pilot - NC spool	NO only valve NC pilot - NO spool
				
1" NPTF	Internal	58C-11-*XXYZZ*	58C-21-*XXYZZ*	58C-61-*XXYZZ*
1 1/4" NPTF		58C-12-*XXYZZ*	58C-22-*XXYZZ*	58C-62-*XXYZZ*
1 1/2" NPTF		58C-13-*XXYZZ*	58C-23-*XXYZZ*	58C-63-*XXYZZ*
1" NPTF	External	58C-31-*XXYZZ*	58C-41-*XXYZZ*	58C-71-*XXYZZ*
1 1/4" NPTF		58C-32-*XXYZZ*	58C-42-*XXYZZ*	58C-72-*XXYZZ*
1 1/2" NPTF		58C-33-*XXYZZ*	58C-43-*XXYZZ*	58C-73-*XXYZZ*

SOLENOID OPERATOR ➤ ***XX Y ZZ***

XX	Voltage
11	120/60, 110/50, 24 VDC (6.0 W)
12	240/60, 220/50
22	24/60, 24/50
52	24 VDC (2.5 W)
78	24 VDC (24.0 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
0	No operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JA	Square connector
JC	Square connector with light
BA	Flying leads (18")
CA	Conduit 1/2" NPS
EA	Hazardous location
XX	**Other options available**

Note : Hazardous location option supplied with no manual operator ("0"). DC voltage not available below 6 Watts.

MAC

Series 58

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

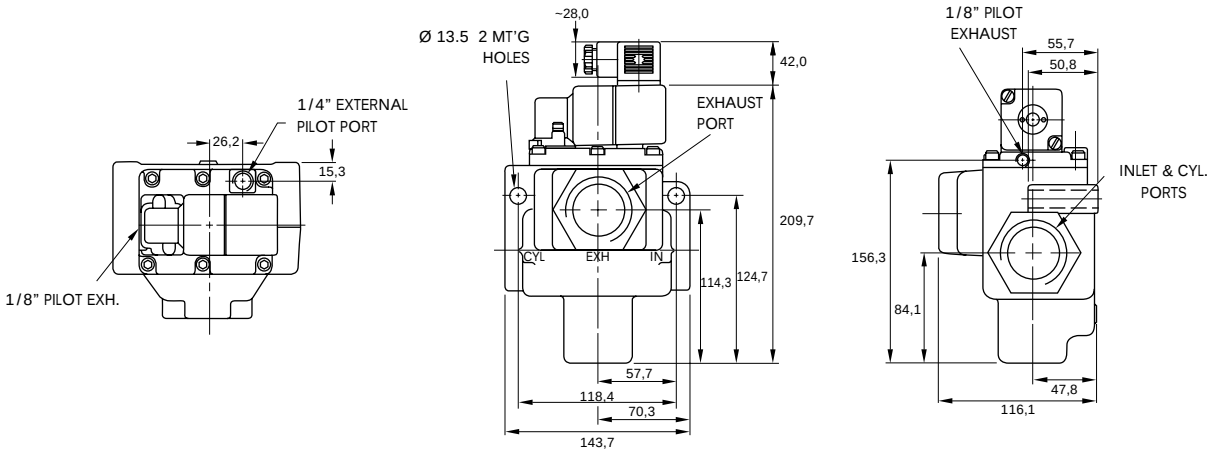
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Internal pilot : 25 to 150 PSI		
	External pilot : vacuum to 150 PSI		
Pilot pressure :	25 to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	Norm. Closed :1" (18.7 C_V), 1 1/4" (23.0 C_V), 1 1/2" (24.9 C_V), Norm. Open : 1" (20.8C_V), 1 1/4" (23.8 C_V), 1 1/2" (26.0 C_V)		
Leak rate :	125 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
Response times :	24 VDC (8.5 W)	Energize : 25 ms	De-energize : 18ms
	120/60	Energize : 10-17 ms	De-energize : 17-22 ms

Spare parts :
- Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.
- Pilot valve : 250B-XXYZZ, including mounting screws 32203 and function plate A2-7005. • Check valve : 70019.

Options :
- BSPP threads.

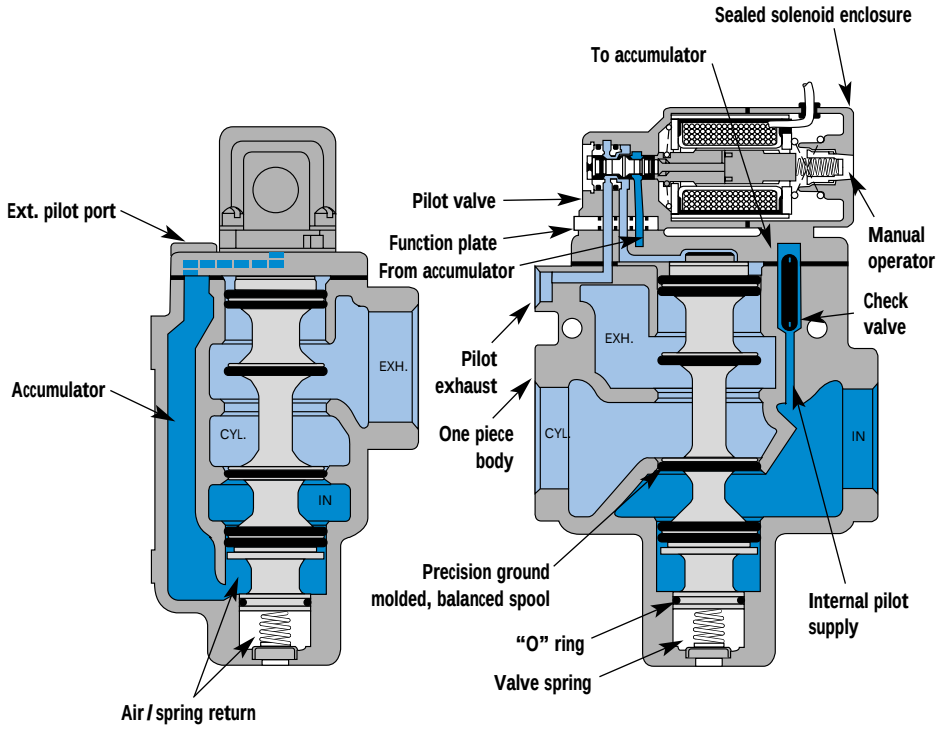
DIMENSIONS

Dimensions shown are metric (mm)



Individual mounting

inline



SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Seven valve functions in one valve.
- Balanced spool unaffected by back pressure in the exhaust.
- A large checked accumulator which supplies the pilot and air / spring return for consistent shifting.
- A triple rated coil for 120 / 60, 110 / 50 or 24 VDC (6 Watt).
- Use on lube or non-lube service.
- Various types of manual operators and solenoid enclosures.
- Optional low wattage DC coils down to 1 watt.
- Optional explosion proof models designed to meet UL & CSA standards for Class I, Groups B, C, D and Class II, Groups E, F and G. (NEMA equivalent of Class I is NEMA 7; Class II is NEMA 9).

MAC®

Series 59

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

VALVE CONFIGURATIONS AVAILABLE

- 3-Way Normally Open (solenoid) or Normally Closed (solenoid or remote air).
- 2-Way (by plugging Exhaust port), Normally Open (solenoid) & Normally Closed (solenoid or remote air).
- Internal pilot or External pilot for vacuum to 25 PSI main valve pressures on solenoid models.

SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

The remote air versions feature:

- A large checked accumulator for air/spring return.
- Balanced spool unaffected by back pressure in the exhaust and may be plugged for 2-way operation.
- Use on lube or non-lube service.

APPLICATION CONVERSION PROCEDURE

The balanced spool design and the unique N.C. and N.O. pilot valve function plate on solenoid models facilitate using the same valve for 7 different functions.

The 7 functions are as follows:

- 3-way Normally Closed-All 3 main valve ports utilized and function plate placed with "3-C" (3-way N.C.) visible.
- 3-way Normally Open-All 3 main valve ports utilized and function plate placed with "3-O" (3-way N.O.) visible.
- 2-way Normally Closed-Same as 3-way N.C. but also plug the Exhaust port.
- 2-way Normally Open-Same as 3-way N.O. but also plug the Exhaust port.
- Selector-Pipe higher pressure to the Inlet port and lower pressure to the Exhaust port.
- Internal Pilot-Utilized for main valve pressures of 25-150 PSI. Includes a check rod in the body and a 1/8" pipe plug installed in the External Pilot port.
- External Pilot-An External Pilot supply is required when main valve pressures are lower than 25 PSI. If converting from an Internal Pilot model, remove the 1/8" pipe plug from the External Pilot and remove adapter plate. Remove check rod from the body and install an 1/8" pipe plug in the check rod hole and pipe an external supply greater than 25 PSI to the External Pilot port. For vacuum service, make the vacuum connection to the Exhaust port and leave the Inlet port open to atmosphere.

N.C.-N.O. OPERATIONS:

SOLENOID MODELS:

With the pilot valve available either N.C. or N.O., simply by inverting the function plate, and using the N.C. main spool, N.C or NO main valve functions are achieved.

REMOTE AIR MODELS:

On remote air pilot operated models, N.O. pilot signal must be used for a N.C. main valve function.

Series 59

Function	Port size	Flow (Max)	Individual mounting
3/2 NO-NC, 2/2 NO-NC	2" - 2 1/2"	60.0 C_V	inline

OPERATIONAL BENEFITS

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

Reset

HOW TO ORDER

59B-XX-XXXXX

Port size	Pilot air	NC only valve NC pilot - NC spool	NO only valve NO pilot - NC spool
			
2" NPTF	Internal	59B-12-*XXYZZ*	59B-22-*XXYZZ*
2 1/2" NPTF		59B-13-*XXYZZ*	59B-23-*XXYZZ*
2" NPTF	External	59B-32-*XXYZZ*	59B-42-*XXYZZ*
2 1/2" NPTF		59B-33-*XXYZZ*	59B-43-*XXYZZ*

SOLENOID OPERATOR ➤ ***XX Y ZZ***

XX	Voltage
11	120/60, 110/50, 24 VDC (6.0 W)
12	240/60, 220/50
22	24/60, 24/50
52	24 VDC (2.5 W)
78	24 VDC (24.0 W)
61	24 VDC (8.5 W)
XX	**Other options available**

Y	Manual operator
0	No operator
1	Non-locking
2	Locking
X	**Other options available**

ZZ	Electrical connection
JA	Square connector
JC	Square connector with light
BA	Flying leads (18")
CA	Conduit 1/2" NPS
EA	Hazardous location
XX	**Other options available**

Note : Hazardous location option supplied with no manual operator ("0"). DC voltage not available below 6 Watts.

MAC

Series 5 9

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

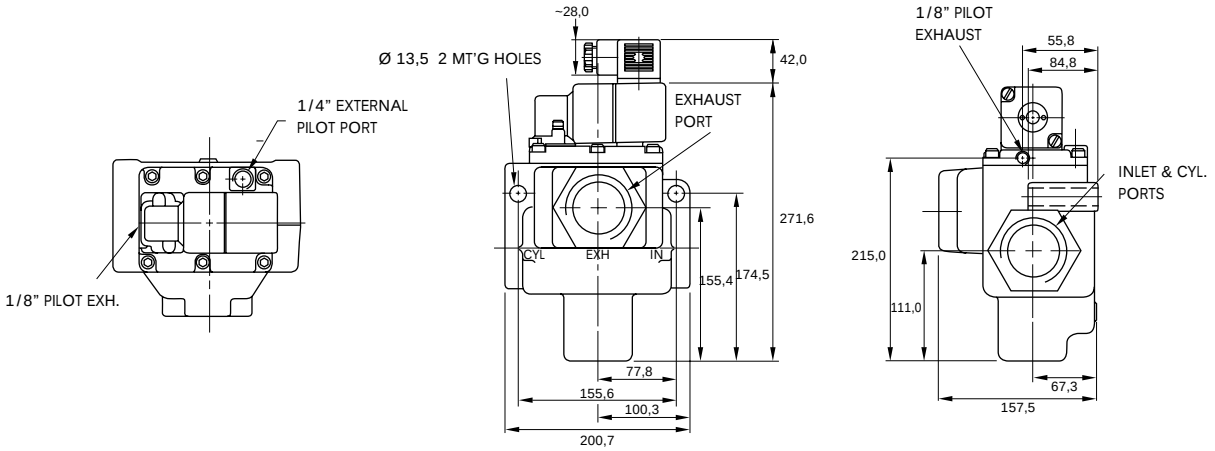
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Internal pilot : 25 to 150 PSI External pilot : vacuum to 150 PSI		
Pilot pressure :	25 to 150 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	2" (55.0 C_V), 2 1/2" C_V (60.0 C_V)		
Leak rate :	150 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 33 VA	Holding : 19.7 VA	
	= 1 to 24 W		
Response times :	24 VDC (8.5 W)	Energize : 38 ms	De-energize : 25ms
	120/60	Energize : 35-45 ms	De-energize : 25-34 ms

Spare parts : • Solenoid operator (power ≥ 6 W) : D4-XXAAB, cover mounting screws 32222 and seal B5-6001.
• Pilot valve : 250B-XXYZZ, including mounting screws 32203 and function plate A2-7005. • Check valve : 70019.

Options : • BSPP threads.

DIMENSIONS

Dimensions shown are metric (mm)

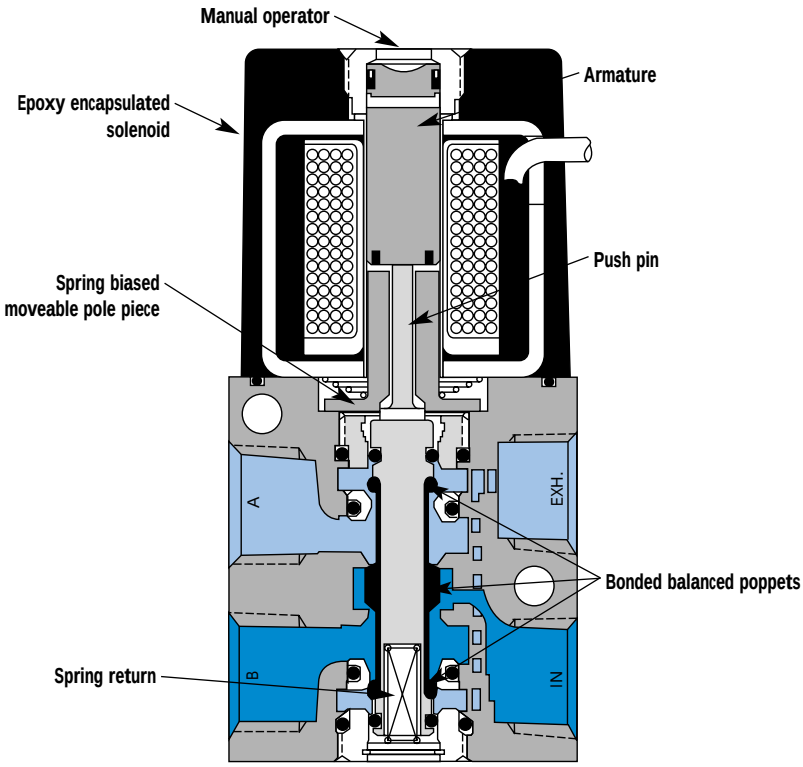


Individual mounting

inline	sub-base non"plug-in"

Manifold mounting

stacking	sub-base non"plug-in"	sub-base with pressure regulators	sub-base with pressure regulators and flow controls



SERIES FEATURES

- Single and double solenoid or remote air.
- The patented MACSOLENOID® for fastest possible response times.
- Bonded balanced poppets for high flow, precise repeatability, and consistent operation.
- Balanced poppet design permits versatility in pipping. Valves can be piped as 4-way, 3-way or 2-way, normally closed or normally open or can be used for vacuum, diverter or selector applications.
- Use on lube or non-lube service.
- Extremely high cycle rates.
- Extremely long service life due to unique poppet cushions.
- Manual overrides as standard.
- Various solenoid enclosures and plug-in connectors
- Optional surge suppression available.
- Low wattage DC solenoids — down to 1.8 watts.
- Patented MACSOLENOID® — virtually burn-out proof on AC service.

MAC®

Series 45

100% OF PRODUCTION TESTED 100%

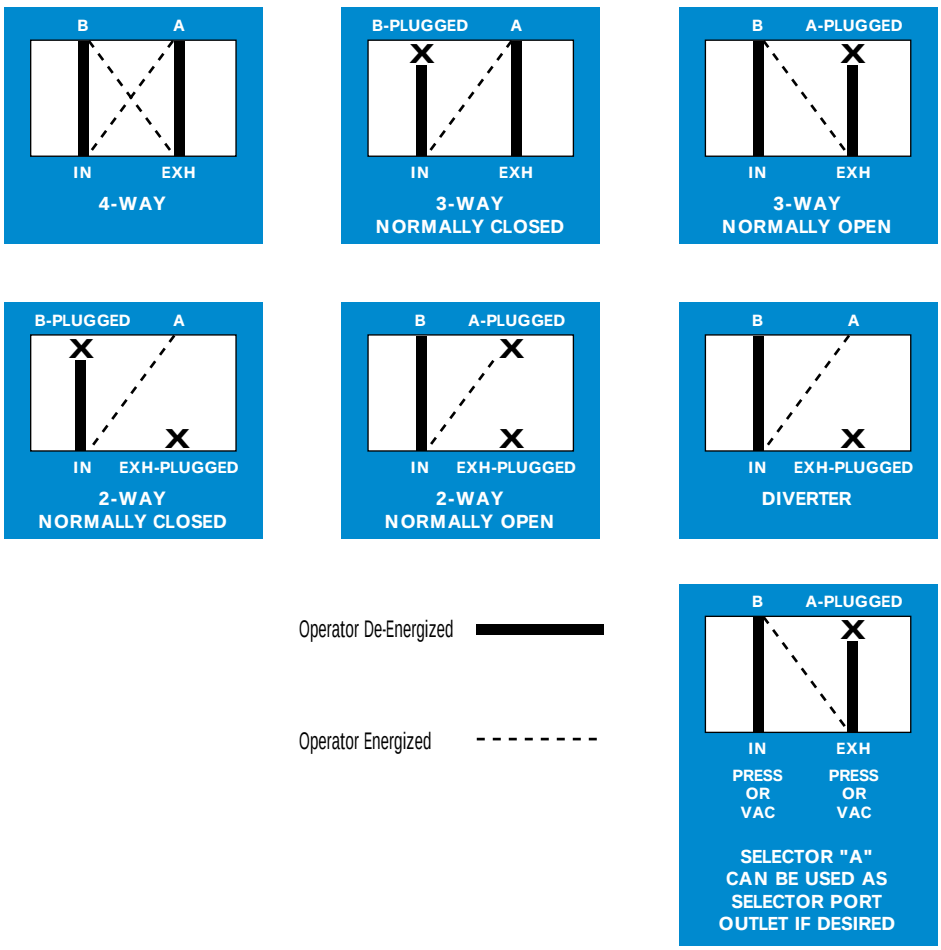
WARRANTY 18 MONTHS

VALVE CONFIGURATIONS AVAILABLE

- 2-position single and double solenoid or remote air.
- Single pressure (4 or 5 ports)
- Individual, stacking and manifold base mounted models.
- Integral individual exhaust flow controls with common exhaust port.
- Integral regulators and flow controls on manifolds.

SPECIAL APPLICATIONS :

The balanced poppet design facilities using the same valve for many functions and can be used for pressure, vacuum or plugged without the necessity of changing any parts. Pipping suggestions are shown in the chart below.



MAC®

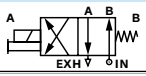
Series 45

Function	Port size	Flow (Max)	Individual mounting
4 / 2	#10-32 - 1/8"	0.15 C_V	inline

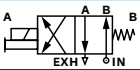
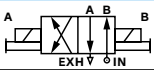
OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

HOW TO ORDER 45A-XXX-DXXX-XXX

Port size	Single operator	Double operator (Minimum DC wattage 5.4W)
		
1/8" NPTF	45A-AA1-D*xxx-xxx*	45A-GA1-D*xxx-xxx*
# 10-32 UNF	45A-AB1-D*xxx-xxx*	45A-GB1-D*xxx-xxx*

WITH INTEGRATED FLOW CONTROLS

Port size	Single operator	Double operator (Minimum DC wattage 5.4W)
		
1/8" NPTF	45A-AA2-D*xxx-xxx*	45A-GA2-D*xxx-xxx*
# 10-32 UNF	45A-AB2-D*xxx-xxx*	45A-GB2-D*xxx-xxx*

SOLENOID OPERATOR ➤ D *XX X- X XX*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)
XX	Other options available

X	Wire length
A	18" (Flying leads)
J	Connector
X	Other options available

X	Manual operator
1	Non-locking
2	Locking
X	Other options available

XX	Electrical connection
KA	Square connector
KD	Square connector with light
JB	Rectangular connector
JD	Rectangular connector with light
BA	Flying leads
XX	Other options available

BOTTOM PORT OPTIONS (O'RING MOUNT)

45A-XXX-D *xxx-xxx*

- D-Sgl. oper. - All ports
- F-Sgl. oper. - "A" & "B" ports
- H-Dbl. oper. - All ports
- J-Dbl. oper. - "A" & "B" ports

MAC

Series 45

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 120 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	1.8 W : (0.1 C_V), 5.4 W : (0.15 C_V)		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
Response times :	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :

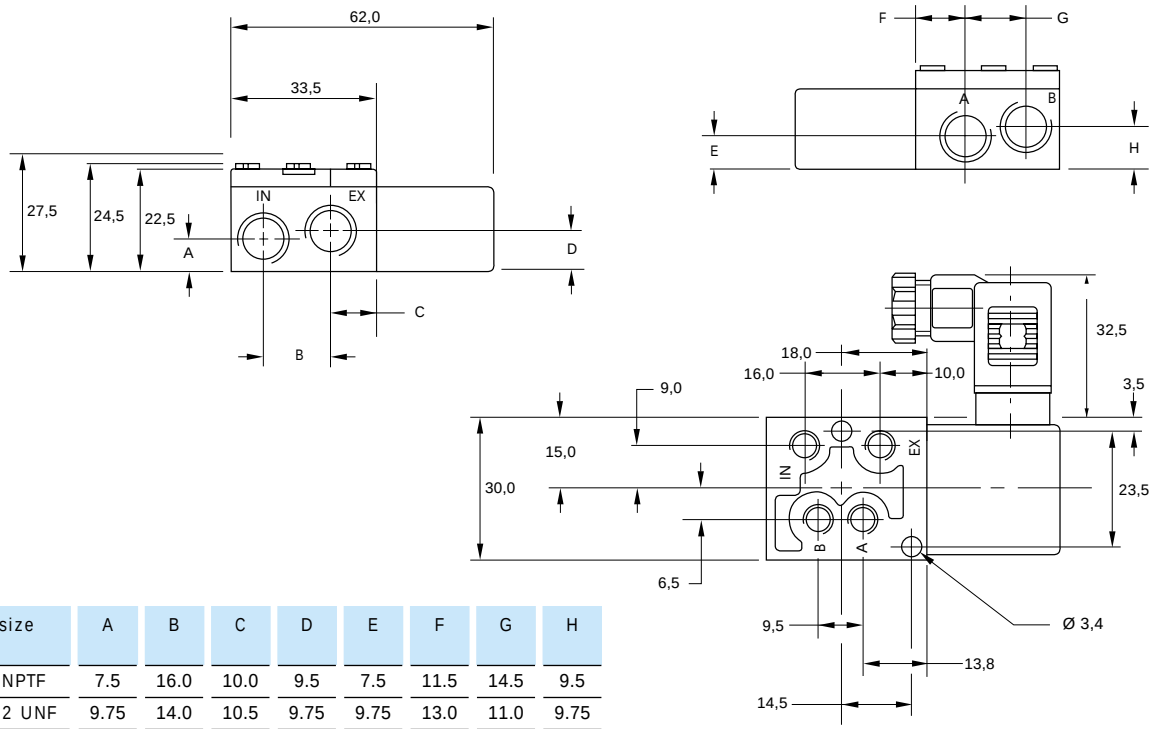
• Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
• Seal (between solenoid and valve body) : 16402. • Valve cover plate with flow controls : N-45002.

Options :

• BSPP threads. • High flow up to 0.23 C_V, according to wattage and high flow Mod. • NAMUR interface - 45A-FA1DXXX-XXX and required NAMUR adapter kit: N-45028-03 (for 3-way operation) - N-45028-04 (for 4-way operation).

DIMENSIONS

Dimensions shown are metric (mm)



Port size	A	B	C	D	E	F	G	H
1/8" NPTF	7.5	16.0	10.0	9.5	7.5	11.5	14.5	9.5
# 10-32 UNF	9.75	14.0	10.5	9.75	9.75	13.0	11.0	9.75

MAC®

Series 45

Function	Port size	Flow (Max)	Individual mounting
4/2	#10-32 - 1/8"	0.13 C_V	sub-base non"plug-in"

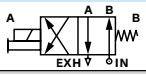
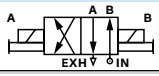
OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

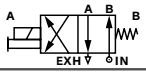
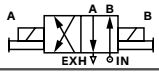
Reset

HOW TO ORDER

45A-XXX-DXXX-XXX

Port size	Single operator	Double operator (Minimum DC wattage 5,4W)
		
Valve less base	45A-L00-D*xxx-xxx*	45A-N00-D*xxx-xxx*
1/8" NPTF base	45A-LAA-D*xxx-xxx*	45A-NAA-D*xxx-xxx*
#10-32 UNF base	45A-LBA-D*xxx-xxx*	45A-NBA-D*xxx-xxx*

WITH INTEGRATED FLOW CONTROLS

Port size	Single operator	Double operator (Minimum DC wattage 5,4W)
		
Valve less base	45A-L00-D*xxx-xxx*	45A-N00-D*xxx-xxx*
1/8" NPTF base	45A-LAB-D*xxx-xxx*	45A-NAB-D*xxx-xxx*
#10-32 UNF base	45A-LBB-D*xxx-xxx*	45A-NBB-D*xxx-xxx*

SOLENOID OPERATOR ➤ D *XX X- X XX*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)
XX	Other options available

X	Wire length
A	18" (Flying leads)
J	Connector
X	Other options available

X	Manual operator
1	Non-locking
2	Locking
X	Other options available

XX	Electrical connection
KA	Square connector
KD	Square connector with light
BA	Flying leads
XX	Other options available

OPTIONS

45A-LAA-D *xxx-xxx*

└ Substitute "J" for 1/8" bottom cylinder ports

MAC

Series 45

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

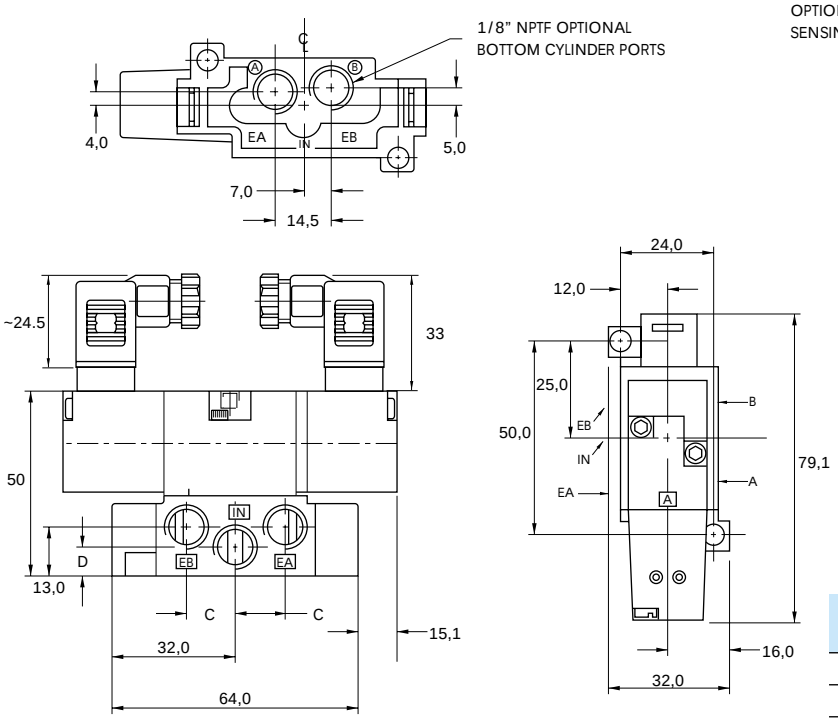
Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 120 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	1.8 W : (0.11 C_V), 5.4 W : (0.13 C_V)		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
Response times :	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts : • Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
• Seal (between solenoid and valve body) : 16402. • Seal between base and valve : 16453. • Flow control : N-45018.

Options : • BSPP threads. • High flow up to 0.20 C_V, according to wattage and high flow mod.

DIMENSIONS

Dimensions shown are metric (mm)



Port size	A	B	C	D
1/8" NPTF	16.0	8.0	13.0	8.0
# 10-32 UNF	12.0	6.0	15.0	10.0

MAC®

Series 45

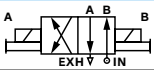
Function	Port size	Flow (Max)	Manifold mounting
4/2	# 10-32 - 1/8"	0.20 C_V	stacking

OPERATIONAL BENEFITS

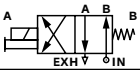
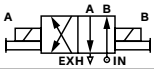
1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

Reset

HOW TO ORDER 45A-XXX-DXXX-XXX

Port size	Single operator	Double operator (Minimum DC wattage 5,4W)
		
1/8" NPTF	45A-SA1-D*xxx-xxx*	45A-TA1-D*xxx-xxx*
# 10-32 UNF	45A-SB1-D*xxx-xxx*	45A-TB1-D*xxx-xxx*

WITH INTEGRATED FLOW CONTROLS

Port size	Single operator	Double operator
		
1/8" NPTF	45A-SA2-D*xxx-xxx*	45A-TA2-D*xxx-xxx*
# 10-32 UNF	45A-SB2-D*xxx-xxx*	45A-TB2-D*xxx-xxx*

SOLENOID OPERATOR ➤ D *XX X- X XX*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)
XX	Other options available

X	Wire length
A	18" (Flying leads)
J	Connector
X	Other options available

X	Manual operator
1	Non-locking
2	Locking
X	Other options available

XX	Electrical connection
KA	Square connector
KD	Square connector with light
BA	Flying leads
XX	Other options available

End plate kit required (Port size 1/4" NPTF) : M-45001-01.

MAC

Series 45

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 120 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	1.8 W : (0.14 C_V), 5.4 W : (0.2 C_V)		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
Response times :	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :

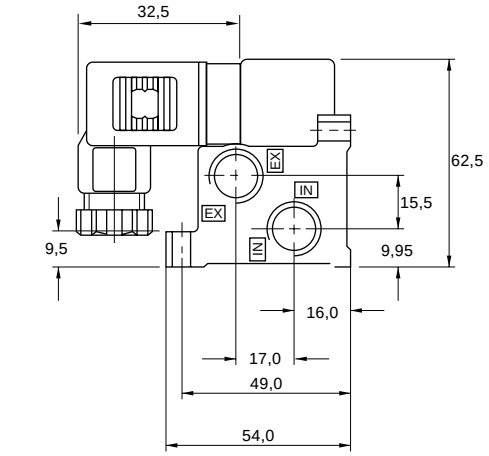
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402. • Seal between valves : 16422. • Tie-rod (x2) : 19813.
- Valve cover plate with flow controls : N-45004.
- Inlet & exhaust isolator : N-45005. Inlet isolator : N-45006. Exhaust isolator : N-45007

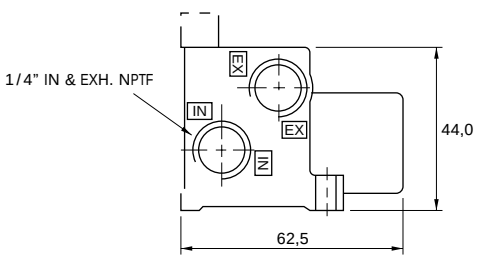
Options :

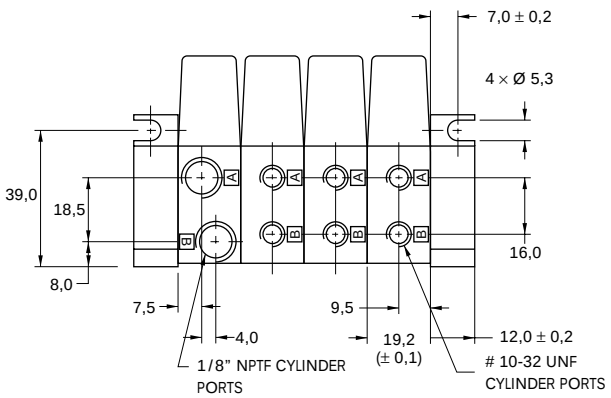
- BSPP threads. • High flow up to 0.3 C_V, according to wattage and high flow mod.

DIMENSIONS

Dimensions shown are metric (mm)







MAC®

Series 45

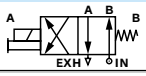
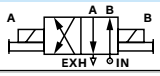
Function	Port size	Flow (Max)	Manifold mounting
4/2	# 10-32 - 1/8"	0.11 C_V	sub-base non"plug-in"

OPERATIONAL BENEFITS

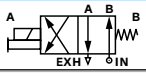
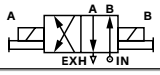
1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

Reset

HOW TO ORDER 45A-XXX-DXXX-XXX

Port size	Single operator	Double operator (Minimum DC wattage 5.4W)
		
Valve less base	45A-L00-D*xxx-xxx*	45A-N00-D*xxx-xxx*
1/8" NPTF base	45A-LAC-D*xxx-xxx*	45A-NAC-D*xxx-xxx*
# 10-32 UNF base	45A-LBC-D*xxx-xxx*	45A-NBC-D*xxx-xxx*

WITH INTEGRATED FLOW REGULATORS

Port size	Single operator	Double operator (Minimum DC wattage 5.4W)
		
Valve less base	45A-L00-D*xxx-xxx*	45A-N00-D*xxx-xxx*
1/8" NPTF base	45A-LAD-D*xxx-xxx*	45A-NAD-D*xxx-xxx*
# 10-32 UNF base	45A-LBD-D*xxx-xxx*	45A-NBD-D*xxx-xxx*

SOLENOID OPERATOR ➤ D *XX X- X XX*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)
XX	Other options available

X	Wire length
A	18" (Flying leads)
J	Connector
X	Other options available

X	Manual operator
1	Non-locking
2	Locking
X	Other options available

XX	Electrical connection
KA	Square connector
KD	Square connector with light
BA	Flying leads
XX	Other options available

End plate kit required (Port size 1/4" NPTF) : M-45008-01

MAC

Series 45

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 120 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	1.8 W : (0.09 C_V), 5.4 W : (0.11 C_V)		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
Response times :	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :

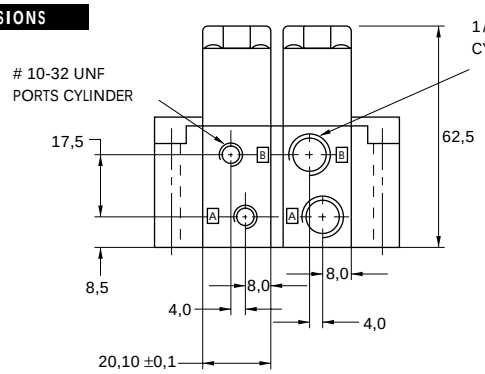
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402. • Seal between base and valve : 16453. • Seal between bases : 16455.
- Tie-rod (x2) : 19753. • Side cover plate with flow controls : N-45016.
- Inlet & exhaust isolator : N-45008. • Inlet isolator : N-45009. • Exhaust isolator : N-45010.

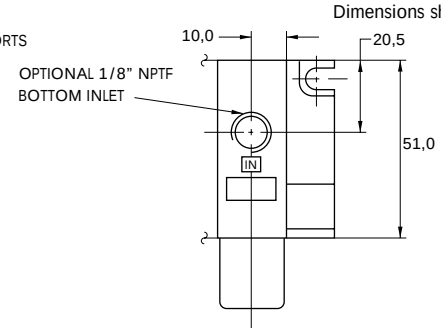
Options :

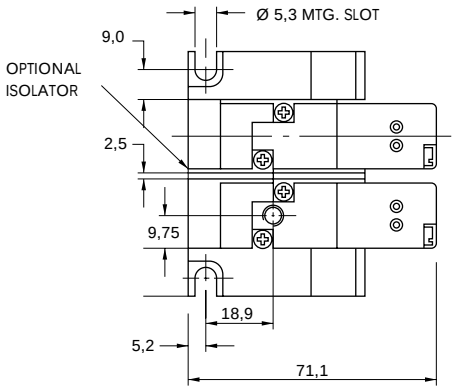
- BSPP threads. • High flow up to 0.18 C_V, according to wattage and high flow Mod. • Bottom inlet : specify Mod. 0210.

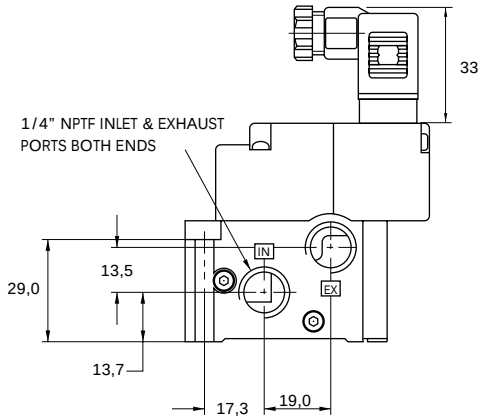
DIMENSIONS

Dimensions shown are metric (mm)









MAC®

Series 45

Function	Port size	Flow (Max)	Manifold mounting
4/2	# 10-32 - 1/8"	0.11 C_V	sub-base with pressure regulators

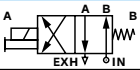
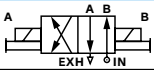
OPERATIONAL BENEFITS

1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.

Reset

HOW TO ORDER

45A-XXX-DXXX-XXX

Port size	Single operator	Double operator (Minimum DC wattage 5,4W)
		
Valve less base	45A-L00-D*xxx-xxx*	45A-N00-D*xxx-xxx*
1/8" NPTF base	45A-LAJ-D*xxx-xxx*	45A-NAJ-D*xxx-xxx*
# 10-32 UNF base	45A-LBJ-D*xxx-xxx*	45A-NBJ-D*xxx-xxx*

SOLENOID OPERATOR ➤ D *XX X- X XX*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)
XX	Other options available

X	Wire length
A	18" (Flying leads)
J	Connector
X	Other options available

X	Manual operator
1	Non-locking
2	Locking
X	Other options available

XX	Electrical connection
KA	Square connector
KD	Square connector with light
BA	Flying leads
XX	Other options available

End plate kit required (Port size 1/4" NPTF) : M-45008-01.
Options (with gauge port) : Single operator : replace L by M.
Double operator : replace N by P.

REGULATOR OPTIONS

45A-XXJ-D *xxx-xxx* ("J" is for Adj. knob)

- Replace with "E" for slotted stem
- Replace with "G" for locking slotted stem

MAC

Series 45

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 120 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	1.8 W : (0.09 C_V), 5.4 W : (0.11 C_V)		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
Response times :	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :

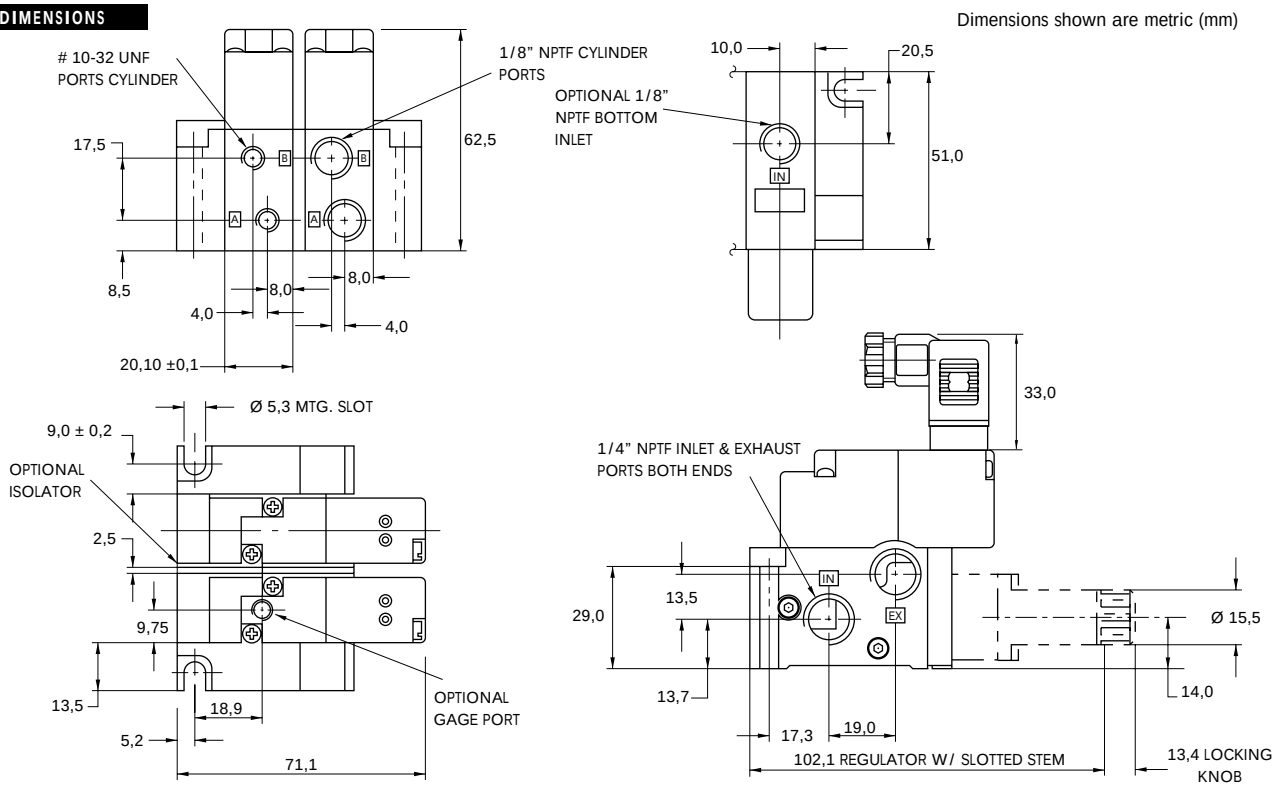
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402. • Seal between base and valve : 16453. • Seal between bases : 16455.
- Tie-rod (x2) : 19753. • Pressure regulator : 45A-00R (Adj. Knob), 45A-00L (Slotted Stem), 45A-00M (Locking Slotted Stem).
- Inlet & exhaust isolator : N-45008. • Inlet isolator : N-45009. • Exhaust isolator : N-45010.

Options :

- BSPP threads. • High flow up to 0.18 C_V, according to wattage and high flow mod. • Bottom inlet : specify Mod. 0210.

DIMENSIONS

Dimensions shown are metric (mm)



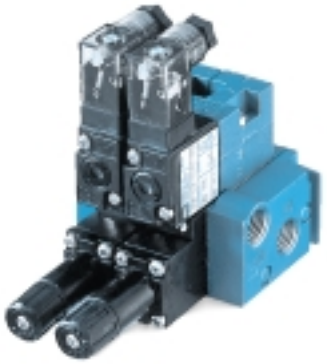
MAC®

Series 45

Function	Port size	Flow (Max)	Manifold mounting
4/2	# 10-32 - 1/8"	0.11 C_V	sub-base with pressure regulators and flow controls

OPERATIONAL BENEFITS

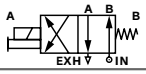
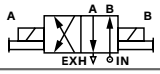
1. Balanced poppet, immune to variations of pressure.
2. Short stroke with high flow.
3. The patented solenoid develops high shifting forces.
4. Powerful return spring.
5. Manual operator standard on all valves.
6. Burn-out proof solenoid on AC service.



Reset

HOW TO ORDER

45A-XXX-DXXX-XXX

Port size	Single operator	Double operator (Minimum DC wattage 5,4W)
		
Valve less base	45A-L00-D*xxx-xxx*	45A-N00-D*xxx-xxx*
1/8" NPTF base	45A-LAK-D*xxx-xxx*	45A-NAK-D*xxx-xxx*
# 10-32 UNF base	45A-LBK-D*xxx-xxx*	45A-NBK-D*xxx-xxx*

SOLENOID OPERATOR ➤ D *XX X- X XX*

XX	Voltage
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
FB	24 VDC (1.8 W)
DA	24 VDC (5.4 W)
DF	24 VDC (12.7 W)
XX	**Other options available**

X	Wire length
A	18" (Flying leads)
J	Connector
X	**Other options available**

X	Manual operator
1	Non-locking
2	Locking
X	**Other options available**

XX	Electrical connection
KA	Square connector
KD	Square connectorwith light
BA	Flying leads
XX	**Other options available**

End plate kit required (Port size 1/4" NPTF) : M-45008-01.
Options (with gauge port) : Single operator : replace L by M
Double operator : replace N by P.

REGULATOR AND F.C. OPTIONS

45A-XXK-D *xxx-xxx* ("K" option is for Adj. knob and F.C.)

- Replace with "F" for slotted stem and F.C.
- Replace with "H" for locking slotted stem and F.C.

MAC

Series 45

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

TECHNICAL DATA

Fluid :	Compressed air, vacuum, inert gases		
Pressure range :	Vacuum to 120 PSI		
Lubrication :	Not required, if used select a medium aniline point lubricant (between 180°F and 210°F)		
Filtration :	40 µ		
Temperature range :	0°F to 120°F (-18°C to 50°C)		
Flow (at 6 bar, ΔP=1bar) :	1.8 W : (0.09 C_V), 5.4 W : (0.11 C_V)		
Leak rate :	50 cm^3/min		
Coil :	General purpose class A, continuous duty, encapsulated		
Voltage range :	-15% to +10% of nominal voltage		
Protection :	Consult factory		
Power :	~ Inrush : 10.9 VA	Holding : 7.7 VA	
	= 1.8 to 12.7 W		
Response times :	24 VDC (5.4 W)	Energize : 6 ms	De-energize : 2 ms
	120/60	Energize : 3-8 ms	De-energize : 2-7 ms

Spare parts :

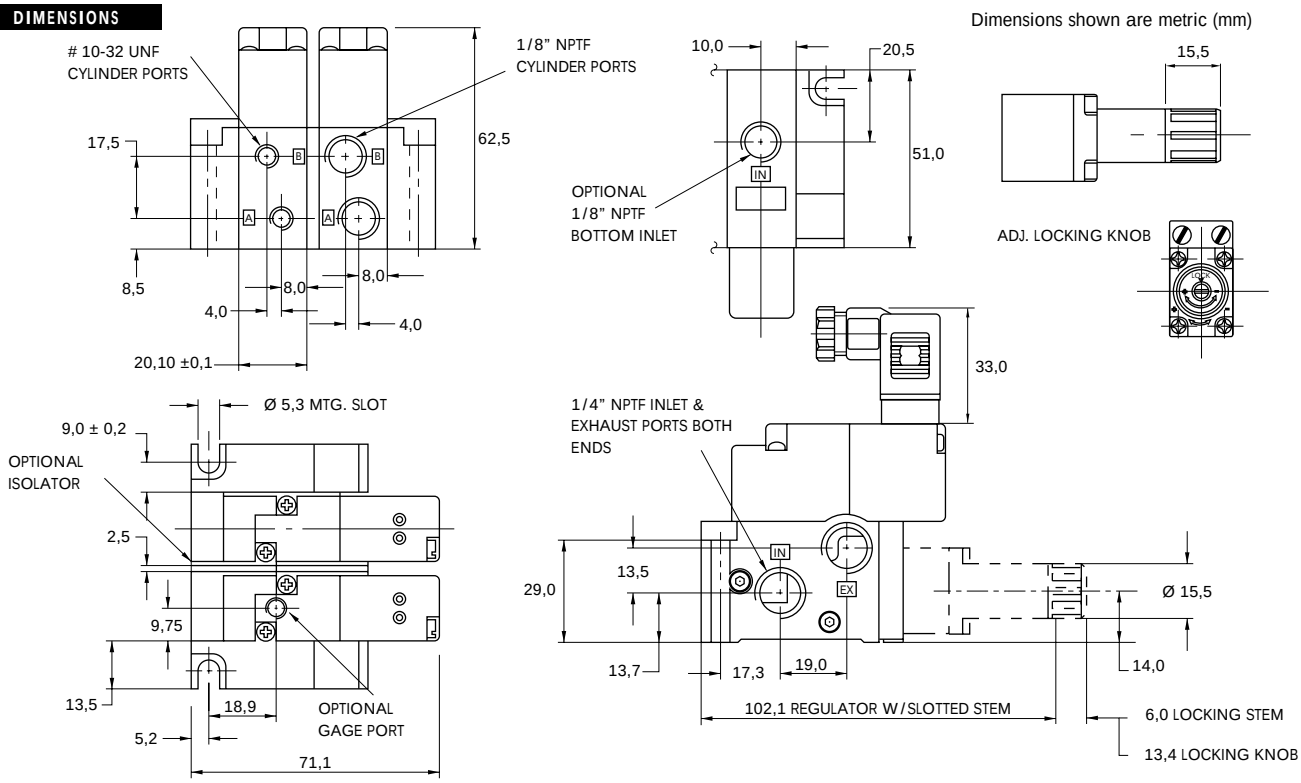
- Solenoid operator (power ≥ 5.4 W) : DXXX-XXX, including mounting screws 35013.
- Seal (between solenoid and valve body) : 16402. • Seal between base and valve : 16453. • Seal between bases : 16455.
- Tie-rod (x2) : 19753. • Pressure regulator with flow controls : 45A-00N (Slotted Stem), 45A-00P (Locking Slotted Stem), 45A-00S(Adj. Knob). • Inlet & exhaust isolator : N-45008. • Inlet isolator : N-45009. • Exhaust isolator : N-45010.

Options :

- BSPP threads. • High flow up to 0.18 C_V, according to wattage and high flow Mod. • Bottom inlet : specify Mod. 0210.

DIMENSIONS

Dimensions shown are metric (mm)

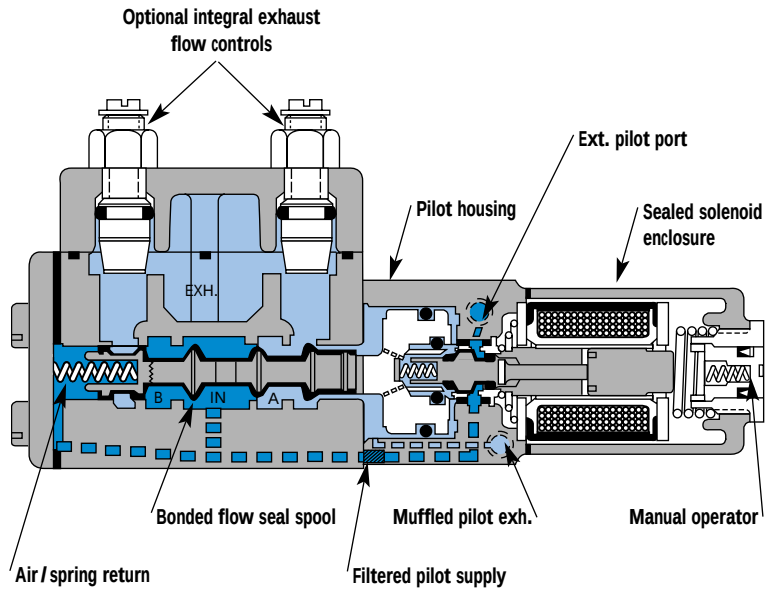


Individual mounting

inline	

Manifold mounting

stacking	



SERIES FEATURES

- The patented MACSOLENOID® with its non-burn out feature on AC service.
- Air / spring return for consistent shifting on single solenoid internal pilot valves.
- Use on lube or non-lube service.
- Optional integral adjustable exhaust flow controls with a single common exhaust port.
- Optional low wattage DC solenoids down to 1 watt.
- Various types of manual operators and solenoid enclosures.

MAC®

Series 700

100% OF PRODUCTION TESTED 100%

WARRANTY 18 MONTHS

VALVE CONFIGURATIONS AVAILABLE

The 700Series is a compact 4-way valve with a Cv of up to .8. This series provides fast response, long life and high flow not commonly found in this size valve.

- 2-Pos., single or double operator (solenoid or remote air).
- Individual body or stacking body (2 common ports).
- Integral adjustable exhaust flow control models.
- Internal pilot or external pilot for vacuum to 20 psi main valve pressures.
- Manual and mechanical operators available.

SERIES FEATURES-REMOTE AIR PILOT OPERATED VALVES

The remote air versions feature:

- Air/spring return for consistent shifting on single remote air valves for main valve pressures of 20 psi or more.
- Optional integral adjustable exhaust flow controls.

SERIES FEATURES-REMOTE AIR PILOT, PILOT OPERATED VALVES

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

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

SPECIAL APPLICATIONS:

On all models, energizing the operator nearest the "A" port supplies pressure to cylinder port "A" and energizing the operator nearest the "B" port supplies pressure to cylinder port "B". For the following special applications additional considerations are required.

- INTERNAL PILOT-Utilized for main valve pressures equal to or greater than minimum pilot pressures. Pilot supply is fed to both the pilot valves and the air/spring return from the inlet.
- EXTERNAL PILOT-Required for all solenoid pilot operated models when main valve pressures are below 20 PSI on single operator or 10 PSI on double operator models. Single operators require MOD 158-heavy duty spring. Pipe using either an M5x0.8 or a #10-32 UNF fitting to the external pilot port. To convert from internal to external pilot, simply rotate pilot housing 180° and install heavy duty spring.
- VACUUM APPLICATIONS-Use external pilot models only, without flow controls and connect vacuum source to the exhaust port and leave the inlet open to atmosphere.
- SELECTOR APPLICATIONS-Use models without flow controls, connect the higher pressure to the inlet port and lower pressure to the exhaust port.

Section 8 Options

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

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

OPTIONS AVAILABLE FOR	OPTIONS AVAILABLE FOR
- valves type 100 Series - pilot valves "CNOMO"	- valves type 200 Series
- Pilot operated valves with pilots type 100 Series Series : 55 - 56 - 700 - 800 - 900 - 6300 - 6500 - 6600 - 1300 - ISO 1 - ISO 2 - ISO 3. - MAC 125 - MAC 250 - MAC 500	- pilot operated valves with pilots type 200 Series Series : 200 - 57 - 58 - 59.
- Pilot operated valves with pilots "CNOMO" Series : ISO1 - ISO2 - ISO3	

MAC

OPTIONS

Back

Used on valve series: 100, 55, 56, 700, 800, 900, 6300, 6500, 6600, 1300, MVA1C, MVA2B, MVA3B, MAC125, MAC250, MAC500.

1. VOLTAGE (100 Serie type coil)

- XX Y ZZ	VOLTAGE
11	120/60, 110/50
12	240/60, 220/50
13	100/60, 100/50
15	200/60, 200 /50
16	10/60
20	6/60
21	12/50, 12/60
22	24/60, 24/50
23	32/60, 32/50
24	48/60, 42/50
26*	380/50, 440/50, 440/60, 480/60
29	220/60
34	127/50, 120/50
35	48/50
36	16/60
B1	24/50
50	24 VDC (6 W)
51	24 VDC (4 W)
54	12 VDC (4 W)
55	12 VDC (6 W)
57	12 VDC (2.5 W)
59	24 VDC (2.5 W)
60	12 VDC (8.5 W)
61	24 VDC (8.5 W)
64	6 VDC (6 W)
65	32 VDC (7 W)
66	48 VDC (5.8 W)
67	64 VDC (7.5 W)
68	120 VDC (6.4 W)
69*	220 VDC (8.7 W), 250 VDC (11.2 W)
75	90 VDC (8.8 W)
76*	100 VDC (6.9 W)
84*	125 VDC (10.9 W)
87*	24 VDC (17.1 W)
88*	12 VDC (17.4 W)
89*	36 VDC (18.8 W)
90	28 VDC (8.2 W)
91*	6 VDC (10.6 W)
92	190 VDC (6.5 W)
94	3 VDC (7 W)
95	38 VDC (6.4 W)
A1	24 VDC (1 W)
A2	12 VDC (1 W)
A3	9 VDC (1 W)

MOD. DD01 : Protection diode (DC) - MAX. 8.5W

MOD. MOV1 : Protection varistor (AC) - MAX. 8.5W

* Voltages are CLSF only

Used on valve series: 200, 57, 58, 59.

1. VOLTAGE (200 Serie type coil)

- XX Y ZZ	VOLTAGE
11	120/60, 110/50, 24 VDC (6 W)
12	240/60, 220/50
13	100/60, 100/50
14	200/60, 200/50
20	6/60
21	12/60
22	24/60, 24/50
23	32/60, 32/50
24	48/60, 42/50
25	240/50
26	480/60, 440/50
27	127/60
28	415/50
29	220/60
30	380/50
31	550/60, 550/50
32	120/60, 110/50
33	600/60
34	127/50
35	48/50
50	24 VDC (6 W)
51	24 VDC (4.5 W)
52	24 VDC (2.5 W)
53	24 VDC (1.0 W)
55	12 VDC (6 W)
57	12 VDC (2.5 W)
58	48 VDC (2.5 W)
60	12 VDC (9.5 W)
61	24 VDC (8.5 W)
64	6 VDC (8.5 W)
65	32 VDC (10 W)
66	48 VDC (11.5 W)
67	64 VDC (10.5 W)
68	120 VDC (12.3 W)
69	250 VDC (9.2 W)
71	8 VDC (8.2 W)
72	24 VDC (12 W)
73	198 VDC (10 W)
74	72 VDC (11.3 W)
75	90 VDC (11.3 W)
76	100 VDC (9 W)
77	220 VDC (10 W), 230 VDC (11.6 W)
78*	24 VDC (24 W)
80	55 VDC (10.6 W)
82	170 VDC (11.1 W)
83	15 VDC (8.1 W)
84	125 VDC (10 W)
86	36 VDC (11 W)
93*	12 VDC (24 W)

Back

Back

2. MANUAL OPERATOR (Common options for 100 & 200 Series type coils)

- XX Y ZZ	MANUAL OPERATOR		
0	No operator	5*	No Operator with Light
1	Non-locking recessed	6*	Non-Locking Recessed with Light
2	Locking recessed	7*	Locking Recessed with Light
3	Non-locking extended	8*	Non-Locking Extended with Light
4	Locking extended	9*	Locking Extended with Light

* Lights used with "AA" electrical connection

3. ELECTRICAL CONNECTION (100 Serie type coil)

- XX Y ZZ	ELECTRICAL CONNECTION
AA	Wiring box with 1/2" NPS conduit
BA	Flying leads
CA	1/2" NPS conduit
CC	1/2" NPT conduit
FA	Military type 2 PIN
GA	Military type 3 PIN
HA	AA with ground wire
JA*	Square connector
JB	Rectangular connector
JC*	Square connector with light
JD	Rectangular connector with light
JE	Square connector on top (ISO2, ISO3)
JF	Rectangular connector on top (ISO1, ISO2, ISO3)
JG	JE with light
JH	JF with light
JJ	Square connector, male only
JM	Rectangular connector, male only
MA	Electrical common conduit (100 Series-Manifold/900 Series)
MB	Electrical common conduit (100 Series-Stacking/700 Series)
NA	CA with ground wire
NC	CC with ground wire
RA	3/8" NPS conduit

* Not to be used with 100, 800 and 900 Series manifold mounting

3. ELECTRICAL CONNECTION (200 Serie type coil)

- XX Y ZZ	ELECTRICAL CONNECTION
AA	Wiring box with 1/2" NPS conduit
BA	Flying leads
CA	1/2" NPS conduit
CC	1/2" NPT conduit
EA	Explosion proof (200 Series)
EA	Explosion proof (57, 58 & 59 Series)
FA	Military type 2 PIN
GA	Military type 3 PIN
HA	AA with ground wire
JA*	Square connector
JC	Square connector with light
JJ	Square connector, male only
NA	CA with ground wire
NC	CC with ground wire

Back

OPTIONS

Back

4. COIL WIRE LENGTH (Common options for 100 & 200 Serie type coils)

- XX Y ZZ (-VV)	WIRE LENGTH
AA	18”
AB	24”
AD	36”
AE	48”
AF	72”
AG	6”
AR	12”
AU	120”
BA	60”
BB	144”
Series 6000 : wire length, from the base	
MOD L024	24”
MOD L036	36”
MOD L048	48”
MOD L060	60”
MOD L072	72”
MOD L120	120”

Back

Codification table for voltages / Wire length / Manual operators / Electrical connections

VALVE CODE ➤ $-D\underset{1}{XX}\,\underset{2}{X}\,-\,\underset{3}{X}\,\underset{4}{XX}$

OPTIONS AVAILABLE FOR

- Solenoid valves 35, 45 and 82 Series

MAC

OPTIONS

Back

1. VOLTAGE

-D XX X - X XX	VOLTAGE
AA	120/60, 110/50
AB	240/60, 220/50
AC	24/60, 24/50
AD	24/60
AE	200/60
AF	240/50
AG	100/50, 100/60, 110/60
DA	24 VDC (5.4 W)
DB	12 VDC (5.4 W)
DC	12 VDC (7.5 W)
DD	24 VDC (7.3 W)
DE	12 VDC (12.7 W) - CLSFonly
DF	24 VDC (12.7 W) - CLSF only
DK	110 VDC (4.7 W)
DL	64 VDC (6 W)
DM	36 VDC (5.3 W)
DN	6 VDC (6 W)
DP	48 VDC (5.8 W)
DU	24 VDC (6 W)
EA	12 VDC (6 W)
FA	12 VDC (1.8 W)
FB	24 VDC (1.8 W)
FE	12 VDC (2.4 W)
FF	24 VDC (2.4 W)

2. WIRE LENGTH

-D XX X - X XX	WIRE LENGTH
A	18”
B	24”
C	36”
D	48”
E	72”
F	96”
J	For external plug-in connector (“J”, “K” & “T” type electrical connection)
P	For plug-in valves (82 Series only)

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3. MANUAL OPERATOR

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

4. ELECTRICAL CONNECTION

-D XX X - X XX	ELECTRICAL CONNECTION
BA	Flying leads
BK	BA with protection diode
BL	BA with protection varistor (M.O.V.)
** CA	1/2" NPS conduit
** CM	1/2" NPS metal conduit
** CN	1/2" NPS metal conduit w/ground
JB	Rectangular connector
JD	Rectangular connector with light
JM	Rectangular connector, male only
KA	Square connector
KB	Square connector with protection diode
KC	Square connector with protection varistor (M.O.V.)
KD	Square connector with light
KE	Square connector with light and protection diode
KF	Square connector with light and protection varistor (M.O.V.)
KJ	Square connector (male only)
KK	Square connector with protection diode (male only)
KL	Square connector with protection varistor (male only) (M.O.V.)
*** MA	Electrical common conduit
TA	Dual tabs
TB	TA with protection diode
TD	TA with light
TE	TA with light and protection diode
TJ	Dual tabs (male only)
TK	TJ with protection diode
TM	TJ with light
TN	TJ with light and protection diode
DA*	Plug-in connector
DK*	DA with protection diode
DL*	DA with protection varistor (M.O.V.)

* To be used with 82 Series only

** Inline valves only for 35 & 45 series. No restrictions for 82 series.

*** Stacking valves only for 35 & 45 series. Conduit end plate kit required, one per stack.

35 series : M-35002-01

45 series : M-45005-01

PRECAUTIONS
CONCERNING THE APPLICATION, INSTALLATION AND SERVICE OF MAC VALVES

The precautions below are important to be read and understood before 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 to remove the trapped air.

3- POSITION VALVES-

Some MAC valves are 3-position, 4-way valves. These valves are either double solenoid or double remote air operated.
If either of the two operators is in control, air supplied to the inlet port(s) will pass through the valve to one of the outlets as on 2-position, 4-way valves. However, if neither operator is in control, the valve moves to a center position. Listed below are the various center position functions :

A. CLOSED CENTER-

With this type valve, when in the center position all ports are blocked (inlets and exhausts) meaning the air at both outlet ports is trapped. If trapping the air in both outlet ports would present a hazard in the application or servicing, a separate method in the system must be provided to remove the trapped air or this type valve should not be used.

B. OPEN CENTER-

With this type valve, when in the center position, the inlet port(s) is blocked and the two outlet ports are open to the exhaust port(s) of the valve. If having no air in either outlet port would present a hazard in the application or servicing, this type valve should not be used.

C. PRESSURE CENTER-

With this type valve, when in the center position, the inlet port(s) is connected to both outlet ports of the valve. If having pressurized air to either or both outlet ports would present a hazard in the application or servicing of the valve or system, a separate method in the system must be
provided to remove the retained air.

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 then the "no operator" option should be used.

REMOTE AIR OPERATED VALVES

Pilot valves supplying signal pressure to remote air operated valves should be 3-way valves with adequate supply and exhaust capacity to provide positive pressurizing and exhausting of the pilot supply line. Pilot lines should be open to exhaust when valves are deenergized.

INSTALLATION PRECAUTIONS :

A. Do not install 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, knowledgeable personnel who understand how the specific valve is to be pneumatically piped and electrically connected (where applicable). Flow paths through the valve are shown in the catalog and on the valve by use of ANSI or ISO type standard graphic symbols. Do not install unless these symbols and the valve functions and operations are thoroughly understood.

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. 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 on power presses for air clutch and/or brake operations where failure of the valve to operate as intended could in any way jeopardize the safety of the operator or any other person. Under no circumstances are Mac valves to be used in any circuit or in any manner intended to prevent unintended operation of any machinery or other equipment where failure of the valve to operate as intended could jeopardize the safety of the operator or any other person. Air valves are not safety devices nor should they be used in safety systems of any type.

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.

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Realisation by : strategie