DIRECT-ACTING SOLENOID VALVES

INTRODUCTION

Direct-Acting Solenoid Valves utilize the force generated by the magnetic field of the solenoid to operate the valve. When the electrical current is removed, a mechanical spring returns the valve to its original position. Small in size, Humphrey Direct-Acting Solenoid Valves are available in 10-32 UNF, 1/8 PIPE, 1/4 PIPE porting and 3/8 PIPE porting.

Humphrey enjoys a rich history of simple, reliable, direct-acting valve design and manufacture, with clients ranging from the critically clean and leak-free biomedical and analytical device industry, to packaging and conveying equipment, to the challenging and rugged environments of truck and bus makers. Our many sizes and designs provide us with a vast array of unique control solutions from which to choose.

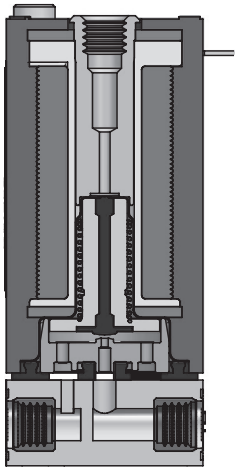
THE ADVANTAGES OF DIRECT-ACTING VALVES OVER INDIRECT-ACTING SOLENOID VALVES ARE:

- No minimum air pressure required.
- Extremely low leak rates.
- Simple construction and more robust at lower comparable costs.
- Multi-purpose. Typically, the same valve can be applied for multiple uses.
- Alternative media. Suitable for clean, dry air, other gases (bottled or other), or vacuum. Consult factory representative.
- More applicable to customization opportunities. Deviations from catalog specifications are typically welcome, such as greater flow, lower power, faster response times.

HUMPHREY OFFERS TWO DIRECT-ACTING SOLENOID VALVE DESIGN TYPES:

UNBALANCED DESIGN: In this design, the return spring is of sufficient force to seal the valve against the supplied air pressure. Characteristics of unbalanced Direct-Acting Solenoid Valves:

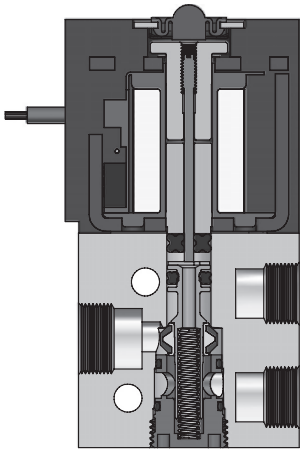
- Very simple, 2- or 3-way construction. Few parts.
- Small size.
- Resultant flow capacity determined by opposing forces of the coil versus the effective area of the air pressure. Valve orifice can be increased with greater current draw, or with reduced air pressure. Consult factory representative for details.
- Low leakage.
- Low cost.



Unbalanced Design – B3E1, Actuated

BALANCED DESIGN: In this design, forces of the supplied air pressure are neutralized in the design. As a result, coil force simply must overcome the force of the return spring and minor friction of the seals. Characteristics of balanced Direct-Acting Solenoid Valves:

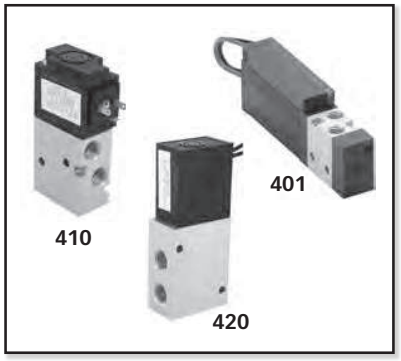
- Greater flow versus unbalanced designs.
- Simple construction; however, more parts than unbalanced design.
- Available in 2-, 3- or 4-way models.
- Porting flow paths isolated from solenoid section.



Balanced Design – 310, Unactuated

Three-Way Valves

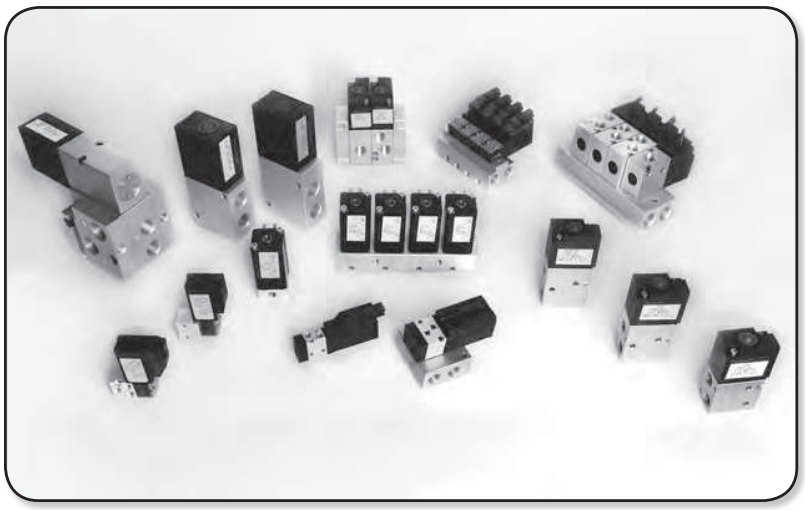
Three-Way Balanced Valves



Four-Way Valves

SECTION INDEX

**Nominal flow @100 PSI*



Pilot Valves

A1037P, A1037A

The A10 Series Pilot Valve is perfect for equipment or device makers requiring electrically controlled pneumatic signals. Available in axial or perpendicular plug-in style electrical entry in 12 or 24 volts DC, these subbase mount, direct-acting valves have a life expectancy up to 50 million cycles.

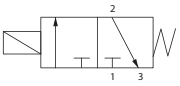
A10 Valves have excellent flow of 0.01 Cv and low 1 watt power consumption in a compact 10mm wide valve body.

Base Models

- *2- or 3-way, axial electrical entry* ***(A1037A)***
- *2- or 3-way, perpendicular electrical entry* ***(A1037P)***

Features and Benefits

- *Compact Size.*
- *Highly saturated buna nitrile seals, an encapsulated coil affixed to a molded valve body made of PBT.*
- *Subbase seal is retained within the valve body.*
- *Non-locking, recessed manual override is standard.*
- *All valves are registered CE, and are RoHS and REACH compliant.*
- *Options: Wire Connector Orientation*



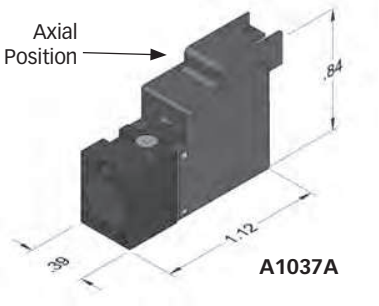
3/2 NC

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT WWW.HUMPHREY-PRODUCTS.COM TO ACCESS:

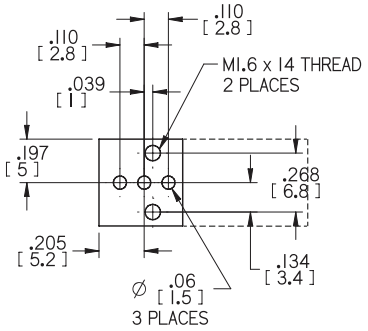
- Non-Catalog Options & Product Configuration Utility
- Additional Specifications & Data Sheets
- CAD Viewer & Model Downloads
- General Information & Handling Instructions


A1037A


A1037A

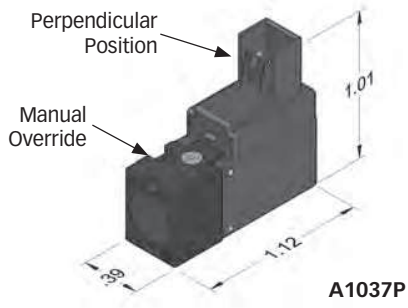


A1037A



MOUNTING FOOTPRINT REFERENCE


A1037P



A1037P

HOW TO ORDER

Base Model	Electrical Entry	Elect Entry Direction		Voltage
		Axial	Perpendicular	
A10	37	A	P	Specify

SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Spring Return	Temperature Range:	14°F to 122°F (-10° to 50°C)
Porting Type:	2- or 3-Way, NC	Flow @100 PSI:	1 SCFM
Orifice:	1.0 mm	Power:	1.0 W
Media:	Air or Inert Gas	Available Voltages:	12VDC, 24VDC
Pressure Range:	0 ~ 100 PSI	Override:	Non-Locking Type

The A15 Series Pilot Valve is perfect for equipment or device makers requiring electrically controlled pneumatic signals. Available in Normally Closed or Normally Open configurations with lead wires or Mini-DIN electrical entry in 12VDC or 24VDC. These subbase mount, direct-acting valves have a life expectancy up to 50 million cycles.

A15 Valves have excellent flow of 0.05 Cv and low 2.5 watt power consumption in a compact 15mm wide valve body. Customized flow/power consumption requirements are possible. Inquire with factory for availability.

Base Models

- *2- or 3-Way: DIN (**A151039**), Lead Wire (**A151138**)*

Features and Benefits

- *Compact Size.*
- *Fluorocarbon seals and an encapsulated coil affixed to a molded valve body made of PPS.*
- *Subbase seal is retained within the valve body.*
- *Non-locking, recessed manual override is standard.*
- *Electrical connection options include lead wires or plug-in.*
- *All valves are registered CE, and are RoHS and REACH compliant.*
- *Options: HS2 for A15__39 models*

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT WWW.HUMPHREY-PRODUCTS.COM TO ACCESS:

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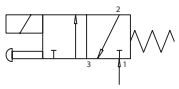
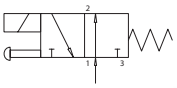
- CAD Viewer & Model Downloads
- General Information & Handling Instructions

3/2 NC



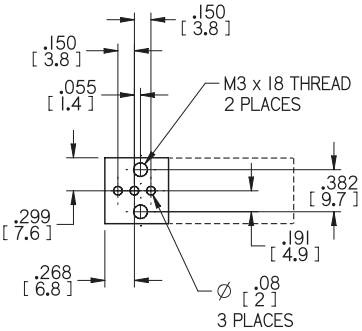
3/2 NO



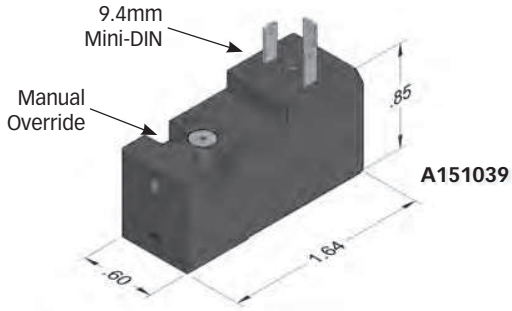
A151039 w/HS2

A151039

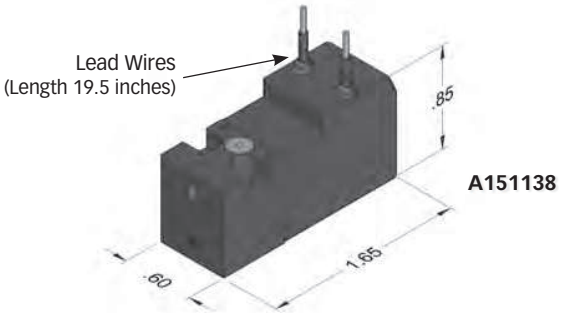
A151138



MOUNTING FOOTPRINT REFERENCE



A151039



A151138

HOW TO ORDER

Base Model	Function		Electrical Entry		
	NC	NO	Wires	DIN	Voltage
A15	-10	-11	-38	-39	Specify

SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Spring Return	Temperature Range:	14°F to 122°F
Porting Type:	2- or 3-Way, NC or NO	Flow @100 PSI:	3 SCFM
Orifice:	2.0 mm	Power:	2.5 W
Media:	Air or Inert Gas	Available Voltages:	12VDC, 24VDC
Pressure Range:	0 ~ 100 PSI	Override:	Non-Locking Type

Miniature Diaphragm Poppet Valves

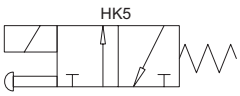
HK5, HKL5

The HK5 Series is based upon the classic Humphrey diaphragm-poppet principle, now in a sub-miniature, balanced design. This proven valve has no sliding seals while isolating coil operation from all wetted parts. The result is multi-media use, multi-purpose functionality, and plumbing conveniences in compact, more difficult valve applications. The short stroke and high flow provides fast response and rapid cycling. The innovative body design allows for versatile plumbing, electrical and mounting features unmatched in the market.

HK5 applications are highlighted by biomedical and analytical equipment, high speed sorting and cylinder cycling, and low pressure liquid and gas control.

Features

- *Inert wetted part, construction, assembled clean and dry at the factory.*
- *Versatile: Multi-purpose functionality.*
- *Long, trouble-free cycle life expected.*
- *Flexible construction simplifies plumbing and mounting objectives.*
- *Subbase or manifold mount.*
- ***HKL5**: Designed exclusively for liquid use.*



FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT WWW.HUMPHREY-PRODUCTS.COM TO ACCESS:

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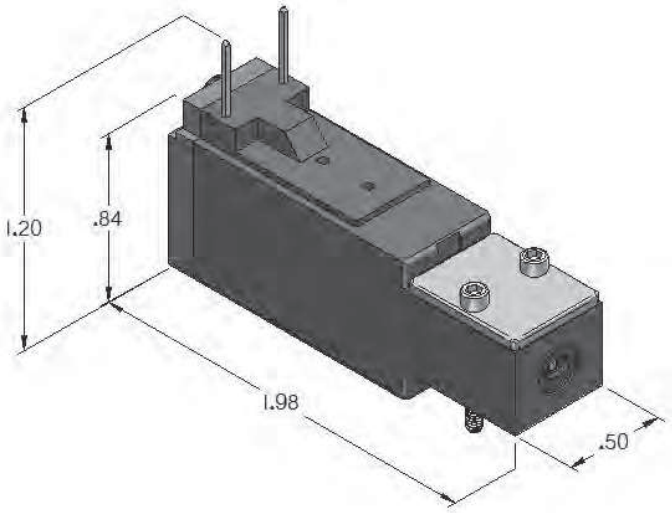
HK5

HKL5 ON SUBBASE



SPECIFICATIONS

Design Principle:	Pressure Balanced – Spring Return	Temperature Range:	32ºF to 125º
Porting Type:	2- or 3-Way	Flow @100 PSI:	3 CFM, 85 LPM (Cv=0.05)
Port Size:	10-32 UNF	Power:	1.7 W (Consult Factory for 0.9 W)
Media:	Air, Inert Gas, Liquid (HKL5)	Available Voltages:	4.5VDC, 12VDC, 24VDC
Pressure Range:	28"Hg to 100 PSI (HKL5: 0 to 35 PSI)	Override:	Non-Locking Type optional

Manifolds and Subbases

Unique configuration of the basic, multi-purpose, HK5 valve permits limitless porting and mounting variations. HK5M_ manifold accepts up to twelve HK5 valves. Rotate valve 180 degrees on manifold for normally open operation. Orient valve with electrical connections up or down. 2-way function achieved with valve to manifold gaskets.

Several single station subbases are available, including:

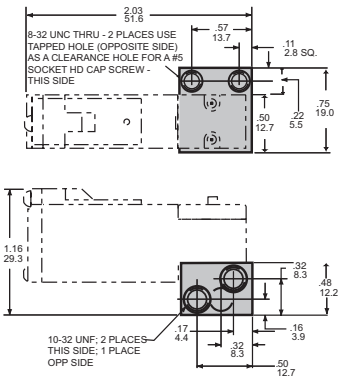
- ***S Type** (3-way, through porting)*
- ***Y Type** (3-way, single surface)*
- ***Z Type** (2-way, single surface)*

Custom subbase and porting blocks have been developed and are welcomed. Consult factory.

Click here the selection of subbases through our website's Product Configurator.

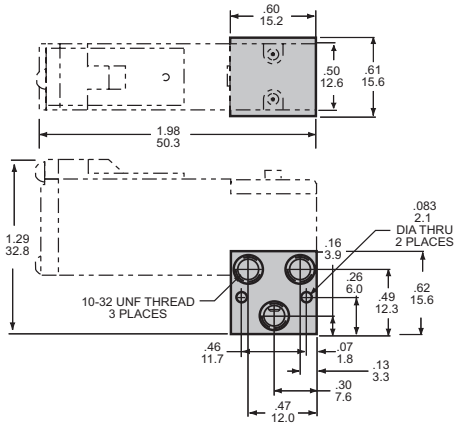
S Subbase

2- or 3-way with 10-32 UNF ports



Y Subbase

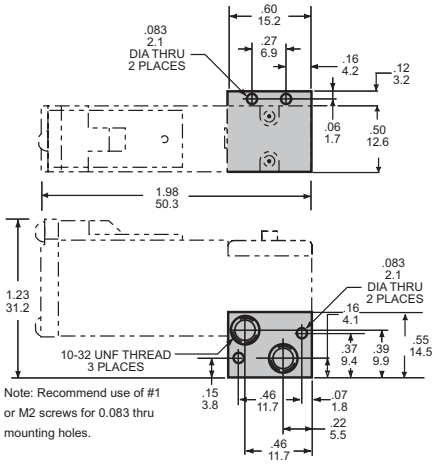
2- or 3-way with 10-32 UNF ports



Shown normally closed. Rotate valve 180 degrees on subbase for normally open operation.

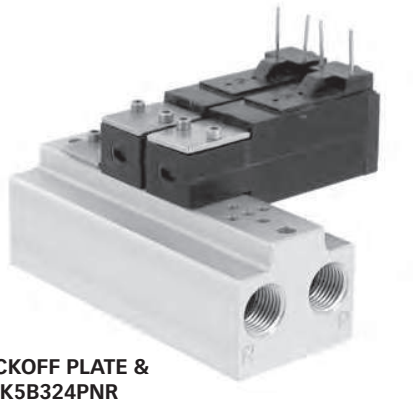
Z Subbase

2-way with 10-32 UNF ports



Shown normally closed. Rotate valve 180 degrees on subbase for normally open operation.

Manifold Types Available			
HK5 Manifold: Extruded Aluminum. Single sided. Delivery port located on manifold. Accepts HK5 valve models. Available in 4, 6, 8, 10 and 12 station lengths.			
Overall Size (valves not mounted)	**Nominal Dimensions (inch)** **L**	**H**	**D**
Four Station (HK5M04)	2.76	1.00	1.16
Each Additional 2 stations	1.10		
Max # of stations	12		
Consult website for exact dimensions.			



(1) BLOCKOFF PLATE & (2) HK5B324PNR on HK5M04

HOW TO ORDER

Base Model	Seal Material				Porting		Optional Low Power*	Voltage	Electrical Entry			Optional Long Leads*	Override		Optional Subbase*	
	NBR	EPDM	FKM	HNBR	2-way	3-way			Pins	Wires	Plug-In		None	No lock	3-port	2-port
HK5	B	E	F	H	2	3	L	Specify	P	A	C	L	NR	NL	Y	Z
HKL5																

Note *: Omit this code when not required.

Standard Manifold Model **HK5-M__** (select # of stations: 02, 04, 06, 08, 10, 12)

Small Manifold Model: **HK5-MM__** (select # of stations: 02, 03, 04) Consult factory for details (all ports: 10-32 UNF).

Latching 310 Valves

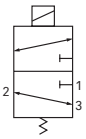
L310

L310 latching solenoid valves require just a 50 millisecond pulse of electrical current to shift and maintain shifted position. A second pulse of current in the opposite direction returns the valve to its original position. Latching valves are ideal for relatively low cycle rate applications demanding low current consumption and/or low heat generation.

The versatile direct-acting L310 is based upon our proven V310 Series balanced-poppet construction. Each valve is inline or manifold mount, multi-purpose function, from vacuum to 80 PSI.

Features

- *Low total power consumption.*
- *Low heat rise.*
- *Compact, high flow poppet construction.*
- *Multi-purpose function: 2- or 3-port detent; diverter/selector.*
- *No minimum pressure requirement. Unaffected by pressure fluctuations.*
- *Lead wire or DIN-style electrical entry.*
- *12VDC or 24VDC voltage.*
- *Mount as individual valve or on 410M Series manifold.*



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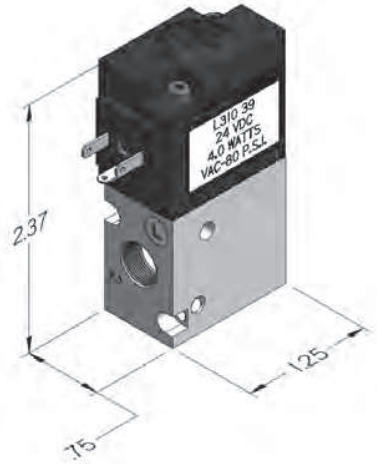
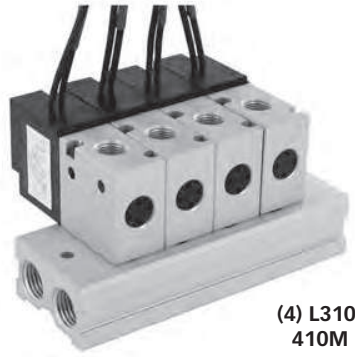
- Non-Catalog Options & Product Configuration Utility
- Additional Specifications & Data Sheets
- CAD Viewer & Model Downloads
- General Information & Handling Instructions

L310





(4) L310 Valves on 410M Manifold

MANIFOLD MOUNT

L310 valves may be mounted on 410M Series manifolds, and can be combined with standard 310, 410 and 410-70 valves (see pages 12-13).

SPECIFICATIONS

Design Principle:	Pressure Balanced – Latching
Porting Type:	2- or 3-Way, Multi-Purpose
Port Size:	1/8 PIPE
Media:	Air, Inert Gas, Vacuum
Pressure Range:	28"Hg to 80 PSI

Temperature Range:	32°F to 125°F
Flow @80 PSI:	12 CFM
Power:	4.5 W (50ms minimum pulse)
Available Voltages:	12VDC, 24VDC

ENERGY SAVINGS

Electrical current is required to shift valve only.

A 50 millisecond (minimum) pulse of electrical current shifts valve poppet from one position to the other.

Valve poppet is balanced and maintains its position until a second 50 millisecond pulse, of opposite polarity, is applied to the solenoid, returning poppet to its original position.

Result is an extremely low power, low heat rise, very efficient pneumatic control valve.

VERSATILE

Each L310 solenoid valve is multi-purpose. Functions include:

- *2-port*
- *3-port*
- *Selector (consult factory)*
- *Diverter (consult factory)*
- *Pressure to 80 PSI*
- *Vacuum to 25" Hg*

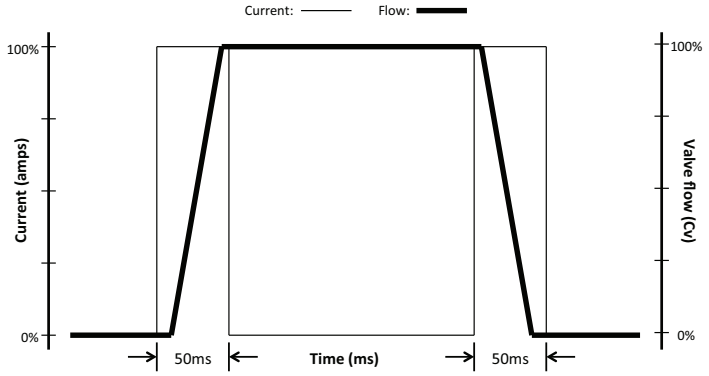
LATCHING VALVE APPLICATIONS

Limited or finite power supply applications, such as remote use or battery operation.

Low cycle rate applications where energy conservation is preferred.

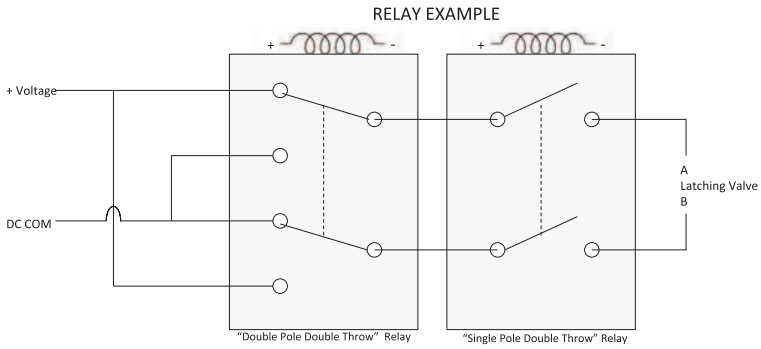
When valve position is to be maintained regardless of power supply loss.

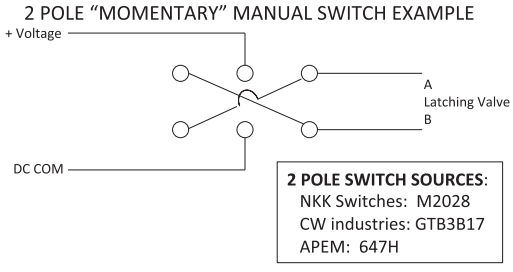
When heat rise of the solenoid can adversely affect device or system performance.



ELECTRICAL CONTROL SUGGESTIONS

The L310 is a two-wire latching valve, therefore requiring the electrical current to flow in one direction to open the flow state and another direction to close the flow state. Either of these schematics will accomplish the function.





HOW TO ORDER

- ***See Page 13 for details on ordering L310 Series Valves and Manifolds.***

310/410 Inline Valves

310, V310, 410, 410-70

Humphrey's popular 310/410 Solenoid Valve Series, provide outstanding performance and reliability in a simple, versatile design. Mounting configurations include inline, stackable and manifold mount. The pressure balanced poppet, direct-acting operating principle provides multi-purpose functionality in a compact body.

Inline models:

310: ***2- or 3-way, normally closed or open***
V310: ***2- or 3-way, multi-purpose, or vacuum***
410: ***4-way***
410-70: ***4-way with integral flow controls***

Features:

- *1/8 PIPE ports.*
- *Compact, high flow construction.*
- *Short stroke, fast response, poppet design.*
- *Low leak rate.*
- *Reliable, tolerant of difficult ambient/media conditions.*
- *Order "**V310**" for multi-purpose 3-port use, for pressure or vacuum, diverter or selector.*
- *Use **410** as universal valve, 3- or 4-way, multi-purpose.*
- *Available in common AC or DC voltages.*

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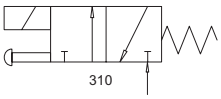
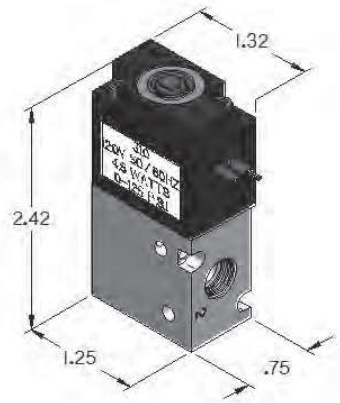
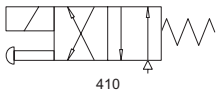
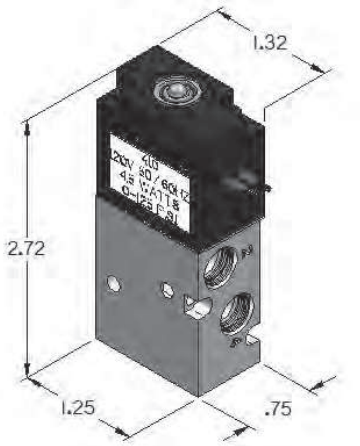


310





410



SPECIFICATIONS

Design Principle:	Pressure Balanced – Spring Return	Flow @100 PSI:	10 CFM, 283 LPM (Cv=0.15)
Porting Type:	2-, 3- or 4-Way	Power:	4.5 W
Port Size:	1/8 PIPE	Available Voltages:	12VDC, 24VDC, 24/50/60,120/50/60, 240/50/60
Media:	Air, Inert Gases		
Pressure Range:	0 to 125 PSI (V310: 28"Hg to 125 PSI)	Override:	Non-Locking Type
Temperature Range:	32°F to 125°F		

410M Manifold

310 and 410 Body Ported Inline Valves include through holes for mounting to 410M manifolds. Manifold accepts valves with lead wire or DIN type electrical entry.

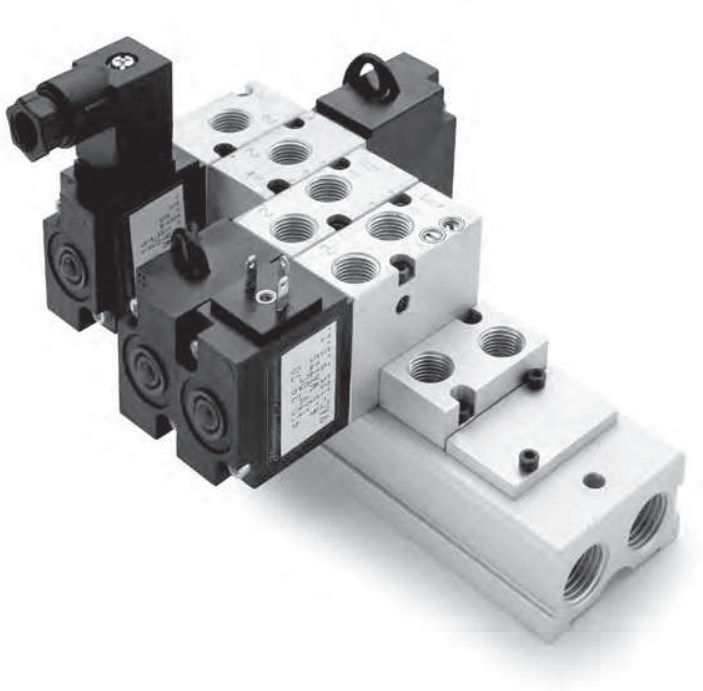
410M Manifolds are low profile, cost effective, and ideal for OEM applications. Manifolds are shipped with appropriate quantity of valve gaskets and screws.

3-port valves may be oriented on the manifold as normally closed or normally open function.

Manifold Accessories

Block Off Plate:	***410M-BOP***
DIN Rail Mount Clip:	***DRC***
1/8 PIPE Port Plug:	***130-31***
1/4 PIPE Port Plug:	***130-15***
Separate Supply Plate:	***410M-SSP***

Compact Manifold for Inline Valves	Overall Size (valves not mounted)	Nominal Dimensions (inch) L	H	D
410M Manifold: Extruded Aluminum. Delivery port 2 and 4 located on valve. Accepts 310 and 410 valve models.	Two Station (410M2)	2.69	0.89	1.57
	Each Additional station	0.76		
	Max # of stations	12		
Consult website for exact dimensions and additional manifold configurations.				



410M-6 (ASSEMBLED)

- ***stn1: 410M-BOP***
- ***stn2: 410M-SSP***
- ***stn3: 410-39-70***
- ***stn4: 410***
- ***stn5: 310 (norm open position)***
- ***stn6: 310-39***

HOW TO ORDER

Base Model	Electrical Entry: Lead Wires	Electrical Entry: Conduit	Electrical Entry: DIN	EXH Speed Control	Override: Non Locking	Override: None	Voltage
L310	-		-39		-	-87	Specify
310		-36					
V310							
410				-70			

Other Option Codes: Coil rotated: "-RC"; FKM seals: "-VAI"

Manifold: Order **410M__** (select # of stations: 2, 4, 6, 8 or 10)

310/410 Stackable Valves

S310, SV310, S410, S410-70

Humphrey's popular 310/410 Solenoid Valve Series, provide outstanding performance and reliability in a simple, versatile design. Mounting configurations include inline, stackable and manifold mount. The pressure balanced poppet, direct-acting operating principle provides multi-purpose functionality in a compact body.

Stackable models:

S310: ***2- or 3-way, normally closed or open***
SV310: ***2- or 3-way, multi-purpose or vacuum***
S410: ***4-way***
S410-70: ***4-way with integral flow controls***

Features:

- *1/8 PIPE delivery ports.*
- *Compact, high flow construction.*
- *Short stroke, fast response, poppet design.*
- *Low leak rate.*
- *Reliable, tolerant of difficult ambient/media conditions.*
- *Order "SV310" for multi-purpose 3-port use, for pressure or vacuum, diverter or selector.*
- *Available in common AC or DC voltages.*
- *Consult factory for models with separate supply and exhaust porting.*

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT WWW.HUMPHREY-PRODUCTS.COM TO ACCESS:

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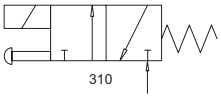
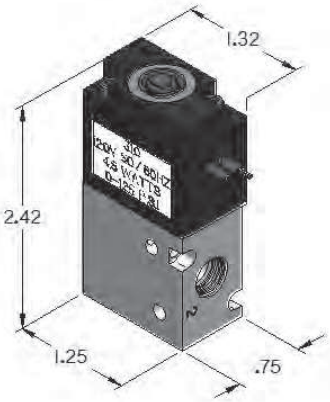
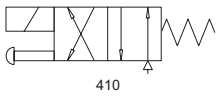
- CAD Viewer & Model Downloads
- General Information & Handling Instructions



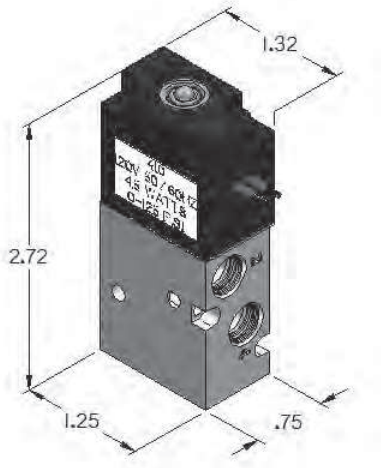
S310





S410

S410-70



SPECIFICATIONS

Design Principle:	Pressure Balanced – Spring Return	Flow @100 PSI:	10 CFM, 283 LPM (Cv=0.15)
Porting Type:	2-, 3- or 4-Way	Power:	4.5 W
Port Size:	1/8 PIPE	Available Voltages:	12VDC, 24VDC, 24/50/60,120/50/60, 240/50/60
Media:	Air, Inert Gases		
Pressure Range:	0 to 125 PSI (SV310: 28"Hg to 125 PSI)	Override:	Non-Locking Type
Temperature Range:	32°F to 125°F		

Stackable 310 410

S310, S410 and S410-70 valves "stack" together with individual spacers and gaskets to form a compact, cost effective, multiple valve solution. Any quantity and combination of valves may be configured into a single assembly.

Each Stackable 310 410 assembly is completed with End Plates. End plates include mounting features, and supply and exhaust connectivity. Station isolators and separate supply valve models are also offered (consult factory), and forming a very flexible valve system.

End Plate: 7-900A (includes 2 plates, screws and o'rings). *1/4 PIPE ports. Mount via flange or bottom method.*

Port Isolators: 40-900A (2 pcs). *Permit alternative supply or exhaust porting by isolating passageway between stations.*

Stackable Valve Manifold	Overall Size (valves not mounted)	Nominal Dimensions (inch) L	H	D
Stackable Valve Type: Extruded Aluminum End Plates for Stackable Valves. Delivery port 2 and 4 located on valve. Available in S310 and S410 valve models.	Two Valves plus End Plates	1.94	2.82	1.86
	Each Additional Valve	0.75		
	Max # of stations	12 (recommended)		
Consult website for exact dimensions and additional manifold configurations.				

STACKABLE ASSEMBLY

stn1: S410-39
stn2: S410-39-70
stn3: S310-39

End Plate Kit: 7-900A

HOW TO ORDER

Base Model	Electrical Entry: Lead Wires	Electrical Entry: DIN	EXH Speed Control	Override: Non Locking	Override: None	Voltage
S310	-	-39		-	-87	Specify
SV310						
S410			-70			

Other Option Codes: Coil rotated: "-RC"; FKM seals: "-VAI"

Stackable End Plate Kit: Order **7-900A**

310/410 Subbase, Manifold Mount Valves

M310, MV310, M410, M410-70

Humphrey's popular 310/410 Solenoid Valve Series, provide outstanding performance and reliability in a simple, versatile design. Mounting configurations include inline, stackable and manifold mount. The pressure balanced poppet, direct-acting operating principle provides multi-purpose functionality in a compact body.

Manifold Mount, Subbase Ported Models:

M310: *2- or 3-way, normally closed or open*
MV310: *2- or 3-way, multi-purpose and vacuum*
M410: *4-way*
M410-70: *4-way with integral flow controls*

Features

- *Compact, high flow construction.*
- *Short stroke, fast response, poppet design.*
- *Low leak rate.*
- *Reliable, tolerant of difficult ambient/media conditions.*
- *Order "MV310" for multi-purpose 3-port use, for pressure or vacuum, diverter or selector.*
- *Use 410 as universal valve, 3- or 4-way, multi-purpose.*
- *Available in common AC or DC voltages.*

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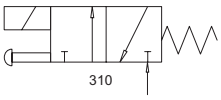
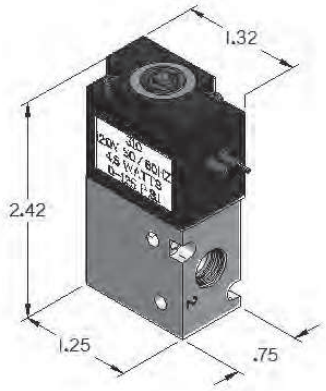
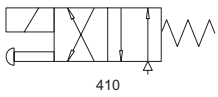


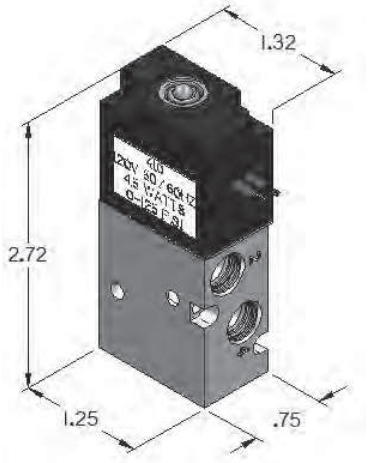
M310





M410

M410-70



SPECIFICATIONS

Design Principle:	Pressure Balanced – Spring Return	Flow @100 PSI:	10 CFM, 283 LPM (Cv=0.15)
Porting Type:	2-, 3- or 4-Way	Power:	4.5 W
Port Size:	1/8 PIPE	Available Voltages:	12VDC, 24VDC, 24/50/60,120/50/60, 240/50/60
Media:	Air, Inert Gases		
Pressure Range:	0 to 125 PSI (MV310: 28"Hg to 125 PSI)	Override:	Non-Locking Type
Temperature Range:	32°F to 125°F		

Manifold Mount, Subbase Type 310 410

M310, M410 and M410-70 subbase valves are base piping types to permit manifold mounting to SM manifolds or customer supplied manifolds. Ports 1, 2, 3 and 4 are located in manifold for convenient valve replacement without disturbing pneumatic plumbing.

Supply and Exhaust ports (each end) are 1/4 PIPE. Delivery ports are 1/8 PIPE.

Standard Manifold Models

SM-2: Two station
SM-4: Four station
SM-6: Six station
SM-8: Eight station
SM-10: Ten station
SM-12: Twelve station

Consult factory for others.

Manifold for Subbase Type Valves	Overall Size (valves not mounted)	Nominal Dimensions (inch) L	H	D
SM Manifold: Extruded Aluminum. Delivery ports 1 and 2 located on manifold. Accepts M310 and M410 valve models.	Two Station (M2)	1.94	2	1.62
	Each Additional station	0.75		
	Max # of stations	12		
Consult website for exact dimensions and additional manifold configurations.				

SM-8

stn1: M310
stn2-4: M410
stn5-8: M410-70

HOW TO ORDER

Base Model	Electrical Entry: Lead Wires	Electrical Entry: Conduit	EXH Speed Control	Override: Non Locking	Override: None	Voltage
M310	-	-36		-	-87	Specify
MV310						
M410			-70			

Other Option Codes: Coil rotated: "-RC"; FKM seals: "-VAI"

Manifold: Order **SM__** (select # of stations: 2, 4, 6, 8, 10 or 12) Consult factory for others.

320/420 Inline and Manifold Valves

320, 420, M420

The 320 and 420 Series Direct-Acting, Solenoid Valves have a maximum performance, pressure balanced poppet design, achieving very high flow rates of 1.0 Cv, in a compact design. No lubrication is required. Continuous duty molded coil and Class B insulation system provides long hours in tough working conditions.

320: Multi-purpose universal 3-way valve

420: Multi-purpose universal 4-way valve

420 Series valves are available as a manifold mount, model M420.

Features

- *Multi-purpose: Normally closed, normally open, selector or diverter, pressure or vacuum, 2-, 3- or 4-way.*
- *Quiet operation.*
- *Low leak rate.*
- *Electrical connection options include lead wires, conduit connector, or DIN connector.*
- *Available with UL rating. Consult factory.*
- *Non-locking manual override is standard. Optional no override.*
- *Mount in any position — inline, body mounting holes or mounting bracket.*

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT WWW.HUMPHREY-PRODUCTS.COM TO ACCESS:

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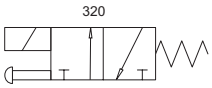

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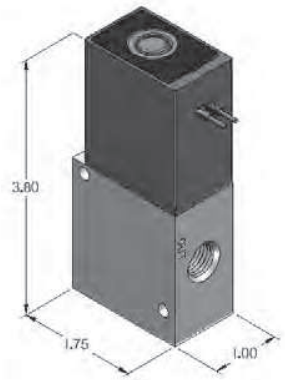

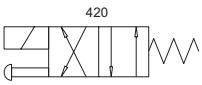

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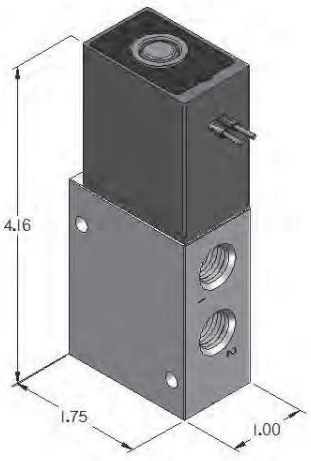


SPECIFICATIONS

Design Principle:	Pressure Balanced – Spring Return	Flow @100 PSI:	60 CFM, 1700 LPM (Cv=1.0)
Porting Type:	2-, 3- or 4-Way	Power:	8 W
Port Size:	1/4 PIPE	Available Voltages:	12VDC, 24VDC, 24/50/60, 120/50/60, 240/50/60
Media:	Air, Inert Gas, Vacuum		
Pressure Range:	28"Hg to 125 PSI	Override:	Non-Locking Type
Temperature Range:	32°F to 125°F		

M420 Series Manifold Mount

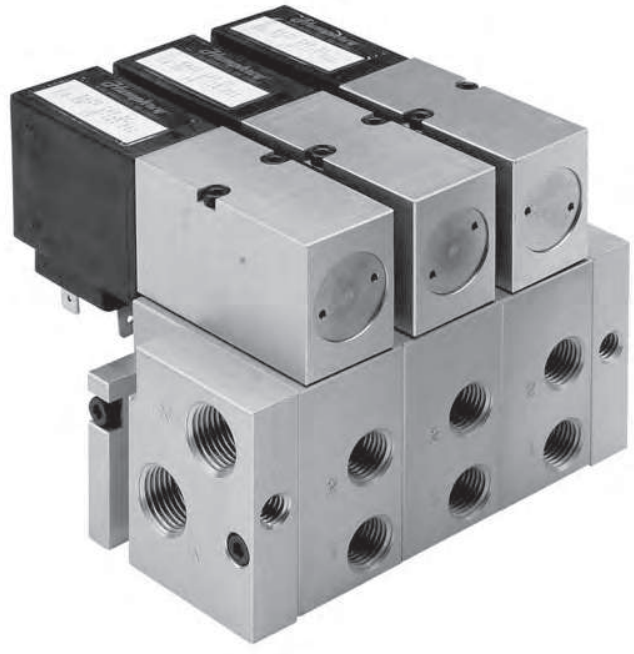
M420 series valves are multi-purpose 4-way, base piping types to permit mounting to manifolds and subbases.

The high flow (1 Cv) M420 series can be used as 2 or 3 valves, in normally closed or normally open function, as 4-way valves, or as diverter or selector function.

***Subbase**: Mount single M420 valve to an SB-2 subbase with 7-200A end plate kit. Subbase permits convenient valve replacement without disturbing pneumatic plumbing.*

***Manifold**: Stack several SB-2 subbases together and with one 7-200A end plate kit for multiple valve manifold. Mount M420 to each subbase. Ports 1, 2, 3 and 4 located in manifold for convenient valve replacement without disturbing the plumbing.*

Manifold for Subbase Type Valves	Overall Size (valves not mounted)	Nominal Dimensions (inch) L	H	D
SB2 Subbase: Extruded Aluminum subbases held together by 7-200A end plates. Delivery ports 1 and 2 located on manifold. Accepts M420 valve model.	Two Valves with End Plates	3.38	2.22	2.25
	Each Additional Valve	1.19		
	Max # of stations	12		
Consult website for exact dimensions and additional manifold configurations.				



M420 MANIFOLD ASSEMBLY

- ***Consists of 3 pcs SB-2 and 1 pc 7-200A, assembled.***
- ***Stations 1-3 assembled with M420-39.***

HOW TO ORDER

Base Model	Electrical Entry: Lead Wires	Electrical Entry: Conduit	Electrical Entry: DIN	Override: Non-Locking	Override: None	Voltage
320	-	-36	-39	-	-87	Specify
420						

Other Option Codes: Coil rotated: "-RC"; FKM seals: "-VAI"

Base Model	Electrical Entry: Lead Wires	Electrical Entry: DIN	Override: Non-Locking	Override: None	Voltage
M420	-	-39	-	-87	Specify

Buna seals std. For FKM seals, order: "-VAI"

Manifold: Stacking Subbase: Order qty of **SB-2**, with one Stacking subbase End Plate Kit: **7-200A**.

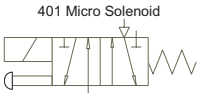
401 Series Valves

401, M401

The 401 Series, Micro-Solenoid Valves are the first 10mm direct-acting, 5-ported, 4-way valve ever produced. Based on proven balanced poppet design technology, this high flow, miniature valve features low power consumption, electrical plug-in connectors, surge suppression circuit, indicator light and manual override as standard. Mounting options include inline, subbase, or MOC Series manifolds.

Features

- *Sub-miniature, compact design*
- *Light weight*
- *Full pressure range, 0~100 PSI*
- *Use as 3- or 4-way*
- *Inline or manifold mount models*
- *MOC manifolds available with or without exhaust port flow controls*



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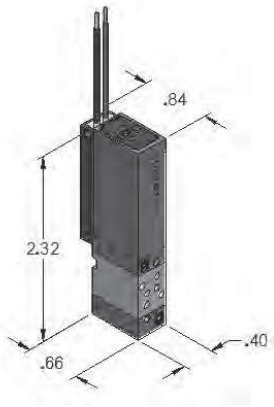
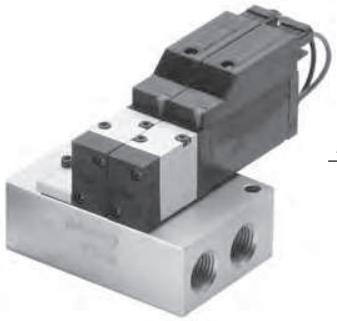
401



Manifold Types Available	Overall Size (valves not mounted)	Nominal Dimensions (inch) L	H	D
MOC Manifold: Extruded Aluminum. Delivery ports 1 and 2 located on manifold. Accepts M401 valve models.	Two Station (MOC2)	1.58	0.72	1.41
	Each Additional station	0.40		
	Max # of stations	16		
MOC-70 Manifold: Extruded Aluminum. Includes exhaust port flow controls, each station. Delivery ports 1 and 2 located on manifold. Accepts M401 valve models.	Two Station (MOC2-70)	1.58	0.72	1.41
	Each Additional station	0.40		
	Max # of stations	16		
Consult website for exact dimensions and additional manifold configurations.				



MOC-3
stn1: MOC-BP
stn2-3: M401-37

SPECIFICATIONS

Design Principle:	Pressure Balanced – Spring Return
Porting Type:	4-Way, Multi-purpose
Port Size:	10-32 UNF
Media:	Air, Inert Gas
Pressure Range:	0–125 PSI
Temperature Range:	32°F to 125°F
Flow @100 PSI:	3.5 CFM, 56 LPM (Cv=0.03)
Power:	2.0 W
Available Voltages:	5VDC, 12VDC, 24VDC, 120/50/60
Override:	Non-Locking Type

HOW TO ORDER

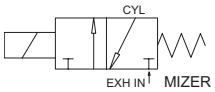
Base Model	Electrical Entry: Lead Wires	Electrical Entry: Plug-In	Voltage
401 / **M401**	-	-37	Specify

Manifold: **MO__** (specify # of stations)
Manifold with Exhaust Speed Control: **MO__-70** (specify # of stations)

The Mini Mizer Series, 3-way solenoid valve is designed to accommodate a wide range of pneumatic applications that require high cycling, small size, and low wattage. Available inline or manifold mount (2~10 stations), this valve is ideal for battery operation, micro-processor control and printed circuit board mount applications, such as piloting work valves, pressure supply and relief, and operating small actuators.

Features

- *Low Power Consumption.*
- *Quiet operation.*
- *Electrical connection options include standard spade terminals, 18" lead wires or DIN type.*
- *Several mounting options, including to MTL and DMTL Series Manifolds.*
- *Optional 1/8 male PIPE port, Bottom Outlet Subbase for plumbing convenience.*



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B3E1

Manifold Types Available	Overall Size (valves not mounted)	Nominal Dimensions (inch) L	H	D
MTL Manifold: Extruded Aluminum. Single sided. Delivery port out located on manifold. Accepts MB3E1 valve models.	Two Station (MTL2)	2.22	0.75	0.68
	Each Additional station	1.02		
	Max # of stations	16		
DMTL Manifold: Extruded Aluminum. Double sided. Delivery ports top and bottom located on manifold. Accepts MB3E1 valve models.	Two Station (DMTL2)	2.22	0.75	0.68
	Each Additional station	1.02		
	Max # of stations	16 (Accommodates 32 valves)		
Consult website for exact dimensions.				

MTL-4
stn1: MTL-BP
stn2-4: MB3E1

HOW TO ORDER

Base Model	Electrical Entry: Spade Terminals	Electrical Entry: Lead Wires	Electrical Entry: DIN	Voltage
B3E1 / **MB3E1**	-	-38	-39	Specify

Other Option Codes: Coil rotated: "-RC"; FKM seals: "-VAI"

Manifold: Order **MTL__** (select # of stations: 2, 4, 6, 8 or 10)
Order **DMTL__** (select # of stations: 2, 4, 6, 8 or 10)

SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Spring Return
Porting Type:	2- or 3-Way, NC or Multi-purpose
Port Size:	10-32 UNF
Media:	Air, Inert Gas, Vacuum
Pressure Range:	0–100 PSI (0 to 25"Hg)
Temperature Range:	0ºF to 150ºF
Flow @100 PSI:	1 CFM, 28 LPM (Cv=0.01)
Power:	0.5 W DC; 1.0 W AC
Available Voltages:	5VDC, 12VDC, 24VDC, 24/50/60, 120/50/60, 240/50/60