

*Humphrey*<sup>®</sup>

# VALVE CATALOG



[www.humphrey-products.com](http://www.humphrey-products.com)



## HUMPHREY PRODUCTS

Founded more than 100 years ago, the long history of Humphrey designed and produced innovations date back to the commercialization of gaslight products in 1901. Today, Humphrey is recognized as a leading producer of fluid control products, serving organizations worldwide. Our expertise in a wide range of markets and industries is based on technologies time-tested and proven in our standard products, enabling us to create truly customized solutions for those customers having unique commercial and industrial applications.

Headquartered in Kalamazoo, Michigan, we have an experienced staff at multiple locations of not more than 200 associates at each one in order to serve you with the very best personal service at locations throughout the United States and Canada. We also have a long-standing alliance with the Japan-based Koganei Corporation, one of the largest and highest quality fluid control companies in the world.

*More than 50 years ago, Humphrey and Koganei become the first independent North American and Japanese manufacturers of pneumatics to join forces.*



Koganei is a top supplier of pneumatic components in Asia, and among the top five in the world. Over the years, we've worked with Koganei to develop products, exchange the latest design and manufacturing technology, and manufacture some of the finest pneumatic actuators and valves in the world. This relationship continues today. With Koganei, we can call on a breadth and depth of experience which crosses continents and industries, helping us create more innovative, inventive solutions which will help you succeed. For more information, go to [www.koganei.co.jp](http://www.koganei.co.jp).

*Humphrey*

We work to solve not only your fluid control challenges, but to also improve the ease and efficiency of your manufacturing processes. This comprehensive approach offers you tremendous outsourcing advantages, significantly reducing your product development cycle and creating vital cost efficiencies. You gain access to our advanced manufacturing technologies, reduced time-to-market, and the ability to reassign critical internal resources to focus on your core competencies. Our purpose is to serve and solve whatever the problem is you face in automating your controls and processes.



General Gas Light Co, circa 1906

*Humphrey has a rich history dating back to 1901, when it was General Gas Light Company.*

*For details and photos reflecting on our history, go to [www.humphrey-products.com](http://www.humphrey-products.com), select "Our Company" and then click on the photo you see on this page.*



ISO 9001:2008 Registered  
ISO 13485:2003 Registered

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The information in this publication and other information from Humphrey Products and its authorized distributors is intended for use by persons having technical expertise in selecting and using these products. Refer to our website ([www.humphrey-products.com](http://www.humphrey-products.com)) for more information.

All technical and safety requirements of your specific application, including the consequences of any possible failure, should be analyzed prior to selecting and applying the products.

These products are not suitable for all applications, such as applications related to or connected with aviation, aircraft or aerospace.

### THIS CATALOG

The Humphrey Valve Catalog provides basic decision-making information about our broad range of valve products. View valve fundamentals, principles and background information on the first page of each valve section, then use the index to navigate to the best solution.

Further information, such as detailed specifications, CAD viewers and CAD downloads, are readily available at [www.humphrey-products.com](http://www.humphrey-products.com). Specifications listed in this catalog and on the website are based on testing data and may vary by environment and application. Dimensions are in nominal inches to depict the overall size of the product.

### GET MORE INFORMATION



VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM)

- FIND A DISTRIBUTOR**

Humphrey markets its products globally through factory trained, authorized stocking distributors. Click FIND A DISTRIBUTOR to locate one in your local area.

- ENGINEERED SOLUTIONS**

Humphrey produces custom valve solutions and systems through its ENGINEERED SOLUTIONS GROUP. Click ENGINEERED SOLUTIONS to view Case History examples of this service.

- ONLINE PRODUCT GUIDE**

The ONLINE PRODUCT GUIDE is a comprehensive real time catalog of products – both valves and cylinders.

- Search by spec or model number.
- List prices shown for all products.
- Specification sheets are in PDF format for easy viewing and download.
- Product drawings in several formats for downloading and using in 3D CAD software.
- Configure your product and email the distributor to Request a Quote.



### CONTACT HUMPHREY PRODUCTS

#### FACTORY CUSTOMER SERVICE PHONE

1-800-477-8707 or 269-381-5500

#### FACTORY CUSTOMER SERVICE FAX

269-381-4113

#### FACTORY CUSTOMER SERVICE EMAIL

[webcust@humphrey-products.com](mailto:webcust@humphrey-products.com)

#### WEBSITE

[www.humphrey-products.com](http://www.humphrey-products.com)

#### TECHNICAL SUPPORT

[webtech@humphrey-products.com](mailto:webtech@humphrey-products.com)

#### LITERATURE AND MARKETING REQUESTS

[websales@humphrey-products.com](mailto:websales@humphrey-products.com)

**COMMITMENT TO INNOVATION AND PERFORMANCE**

Humphrey product development is founded on the premise of resolving customer problems with innovative, affordable solutions.

In production, Humphrey is committed to process control and continuous improvement throughout the organization.

The Humphrey product offering is fully supported via a network of factory trained authorized stocking distributors and outstanding factory customer service.

**STANDARD PRODUCTS**

Wide variety of valve designs and configurations to choose from, addressing most any application.

Commitment to produce valves that perform, first time, every time.

Product Offering includes:

- Solenoid Valves
- Proportional Control Valves
- Air-Pilot Valves
- Manual and Mechanical Valves
- Vacuum Control Products
- Quick Exhausts
- Cylinders



**HK5**



**310**



**TAC series**

**MODIFICATIONS**

Humphrey has 50 years of valve customizing experience. Common modifications include:

- Enhanced performance (environment, media, flow, etc).
- Connectivity (pneumatic, electrical, etc).
- Mounting and packaging (physical changes)

Contact your Humphrey authorized representative for details.



**Stainless Steel Cylinders**

For more information on our cylinders, visit our website: [www.humphrey-products.com](http://www.humphrey-products.com)

**ENGINEERED SOLUTIONS**

Humphrey offers complete pneumatic or fluid handling system design, development and production, through the **Engineered Solutions Group**.

- A variety of proven and unique Humphrey valve designs and proprietary sealing technology to select from;
- 25 years experience collaborating with client engineers, as their fluid system control partner;
- Regulatory experience and process control systems in place, including ISO13485 registration for medical device.

Additional information on Engineered Solutions, and references to case history examples, can be found on pages 82 and 83.

Contact your Humphrey authorized representative for more information.



**CH-VI1**

# 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.

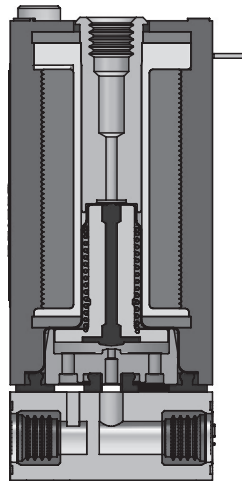
## THE ADVANTAGES OF DIRECT-ACTING VALVES OVER INDIRECT-ACTING SOLENOID VALVES ARE:

- 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:

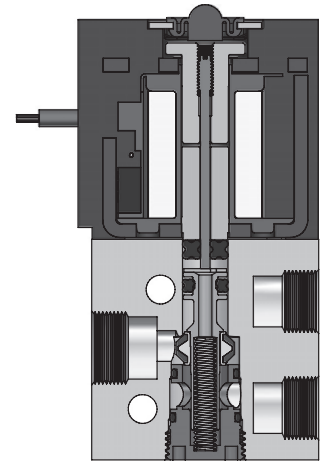
- Very simple, 2- or 3-way construction. Few parts.
- Small size.
- Resultant flow capacity determined by opposing forces of the coil versus the effective area of the air pressure. Valve orifice can be increased with greater current draw, or with reduced air pressure. Consult factory representative for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



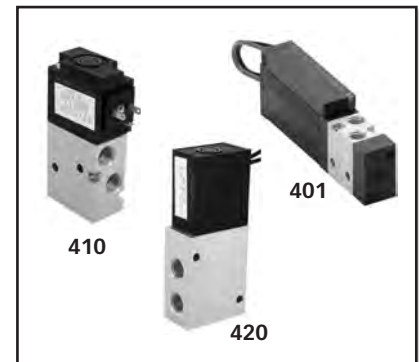
Balanced Design – 310, Unactuated



Three-Way Valves



Three-Way Balanced Valves



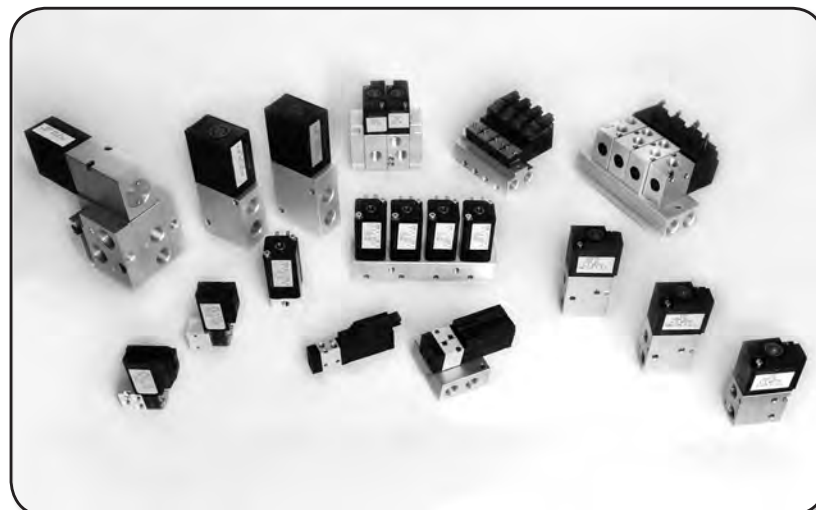
Four-Way Valves

<b>2-, 3-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Valves</b>	<b>Page</b>
<b>SMALL</b>	A10	Subbase	1	A1037P, A1037A	6
	A15	Subbase	2	A151039, A151138	7
	Mini Mizer Series	10-32	1	B3E1, MB3E1	21
	HK5 Series	10-32	3	HK5, HKL5	8-9
	L310 Series	1/8	12	L310	10-11
	310 Series	1/8	10	310, V310	12-13
	S310 Series	1/8	10	S310, SV310	14-15
	M310 Series	1/8	10	M310, MV310	16-17
<b>LARGE</b>	320 Series	1/4	60	320	18-19

<b>4-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Valves</b>	<b>Page</b>
<b>SMALL</b>	401 Series	10-32	2	401, M401	20
	410 Series	1/8	10	410, 410-70	12-13
	S410 Series	1/8	10	S410, S410-70	14-15
	M410 Series	1/8	10	M410, M410-70	16-17
<b>LARGE</b>	420 Series	1/4	60	420, M420	18-19

\*Nominal flow @100 PSI



DIRECT-ACTING SOLENOID VALVES

# 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

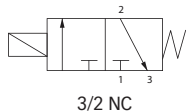
- 2- or 3-way, axial electrical entry (A1037A)
- 2- or 3-way, perpendicular electrical entry (A1037P)

## 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

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

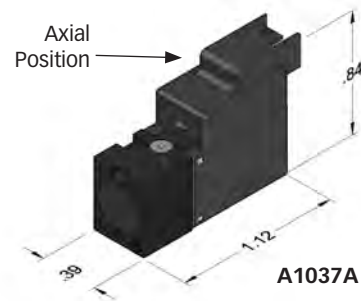
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



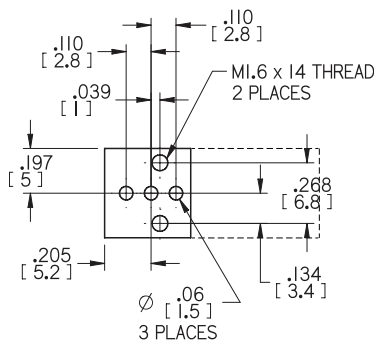
A1037A



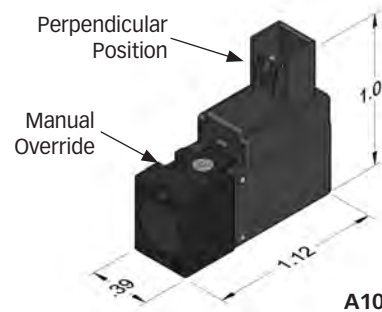
A1037A



A1037A



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**

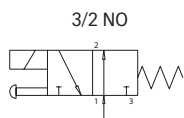
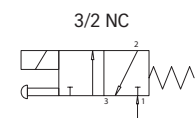
- 2- or 3-Way: DIN (A151039), Lead Wire (A151138)

**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](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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



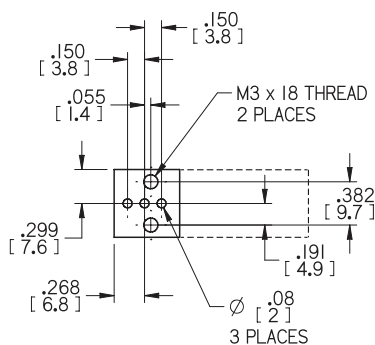
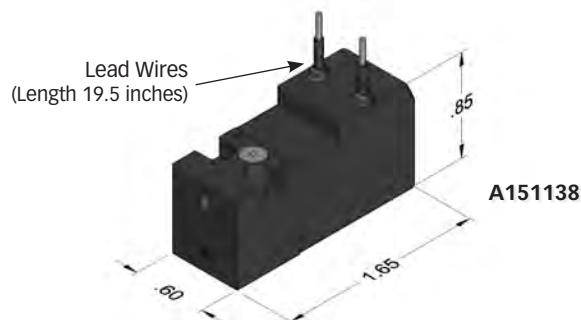
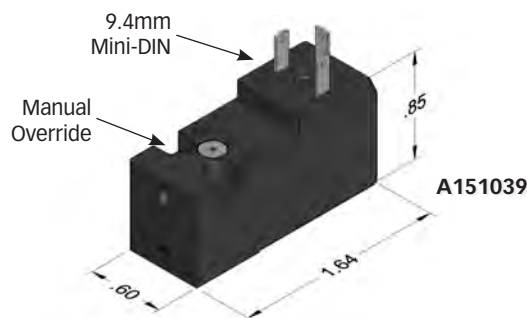
A151039 w/HS2



A151039



A151138



MOUNTING FOOTPRINT REFERENCE

**HOW TO ORDER**

Base Model	Function		Electrical Entry		Voltage
	NC	NO	Wires	DIN	
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

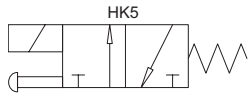
HK5, HKL5

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](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

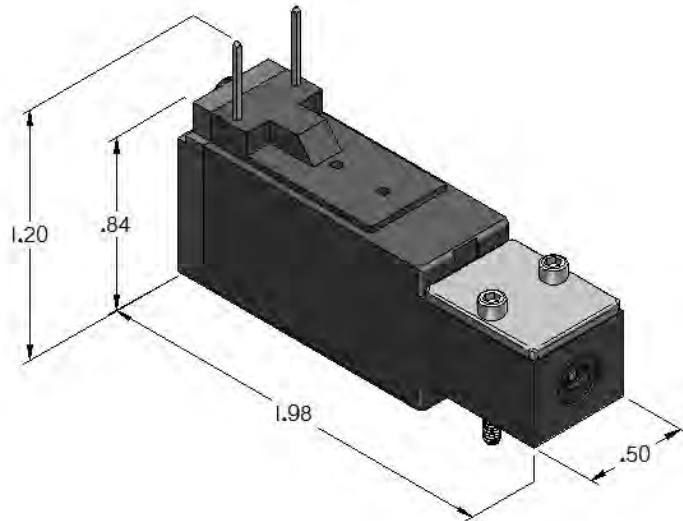
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



HK5



HKL5 ON SUBBASE



### SPECIFICATIONS

Design Principle:	Pressure Balanced – Spring Return
Porting Type:	2- or 3-Way
Port Size:	10-32 UNF
Media:	Air, Inert Gas, Liquid (HKL5)
Pressure Range:	28"Hg to 100 PSI (HKL5: 0 to 35 PSI)

Temperature Range:	32°F to 125°
Flow @100 PSI:	3 CFM, 85 LPM (Cv=0.05)
Power:	1.7 W (Consult Factory for 0.9 W)
Available Voltages:	4.5VDC, 12VDC, 24VDC
Override:	Non-Locking Type optional

DIRECT-ACTING SOLENOID VALVES

## 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)

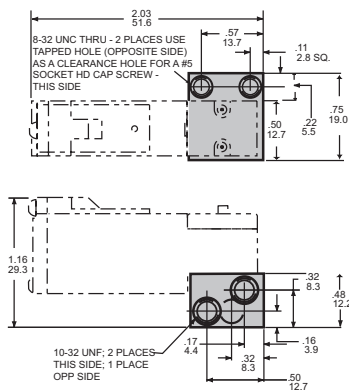
**Y Type** (3-way, single surface)

**Z Type** (2-way, single surface)

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

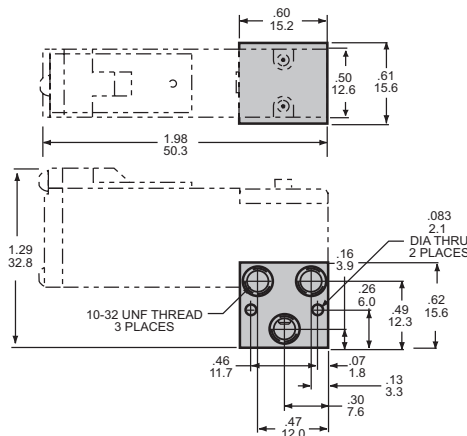
### S Subbase

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



### Y Subbase

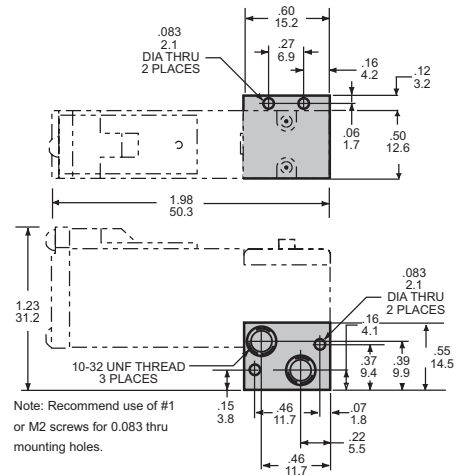
2- or 3-way with 10-32 UNF ports



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

### Z Subbase

2-way with 10-32 UNF ports



Note: Recommend use of #1 or M2 screws for 0.083 thru mounting holes.

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

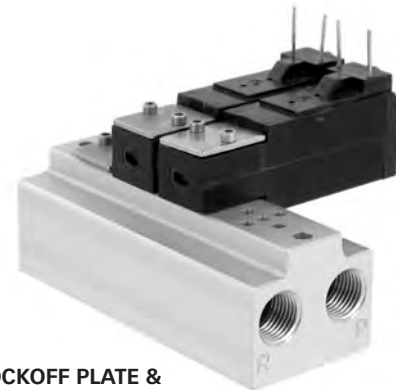
DIRECT-ACTING SOLENOID VALVES

### 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.**

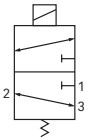
**The versatile direct-acting L310 is based upon our proven V310 Series balanced-poppet construction. Each valve is inline or manifold mount, multi-purpose function, from vacuum to 80 PSI.**

### Features

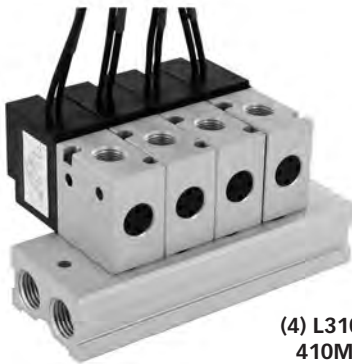
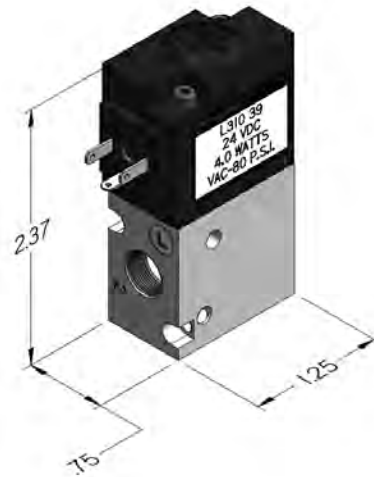
- Low total power consumption.
- Low heat rise.
- Compact, high flow poppet construction.
- Multi-purpose function: 2- or 3-port detent; diverter/selector.
- No minimum pressure requirement. Unaffected by pressure fluctuations.
- Lead wire or DIN-style electrical entry.
- 12VDC or 24VDC voltage.
- Mount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

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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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	Temperature Range:	32°F to 125°F
Porting Type:	2- or 3-Way, Multi-Purpose	Flow @80 PSI:	12 CFM
Port Size:	1/8 PIPE	Power:	4.5 W (50ms minimum pulse)
Media:	Air, Inert Gas, Vacuum	Available Voltages:	12VDC, 24VDC
Pressure Range:	28"Hg to 80 PSI		

**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

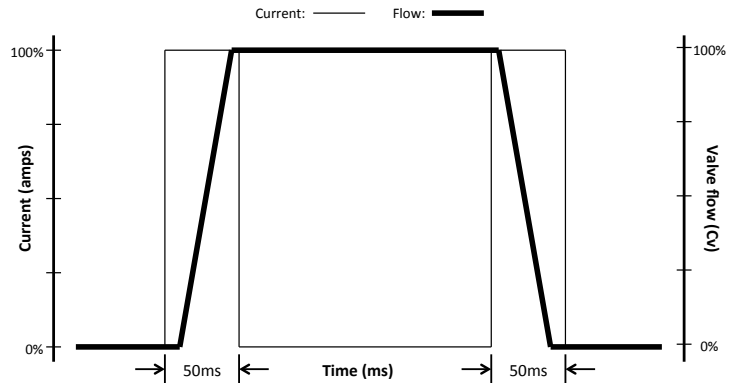
**LATCHING VALVE APPLICATIONS**

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

Low cycle rate applications where energy conservation is preferred.

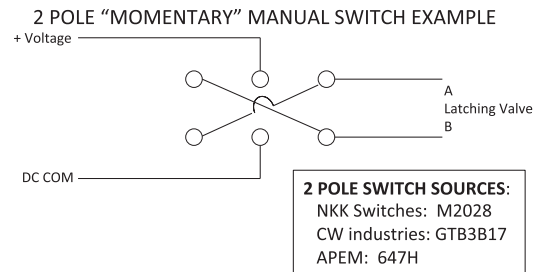
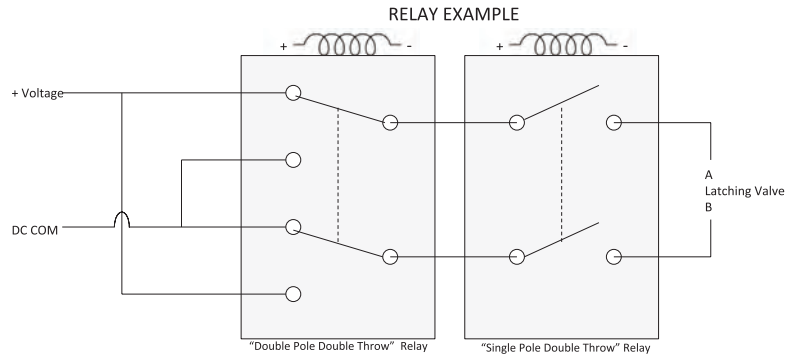
When valve position is to be maintained regardless of power supply loss.

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.



**2 POLE SWITCH SOURCES:**  
 NKK Switches: M2028  
 CW industries: GTB3B17  
 APEM: 647H



**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

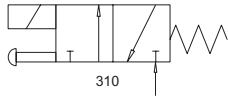
**410-70:** 4-way with integral flow controls

### Features:

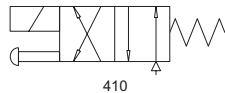
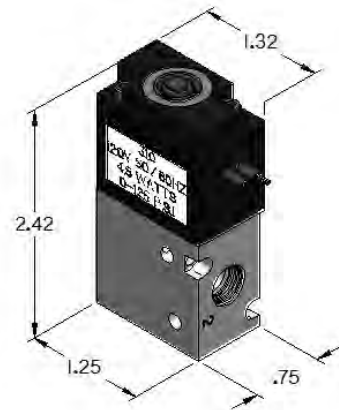
- 1/8 PIPE ports.
- Compact, high flow construction.
- Short stroke, fast response, poppet design.
- Low leak rate.
- Reliable, tolerant of difficult ambient/media conditions.
- Order "V310" for multi-purpose 3-port use, for pressure or vacuum, diverter or selector.
- Use 410 as universal valve, 3- or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

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

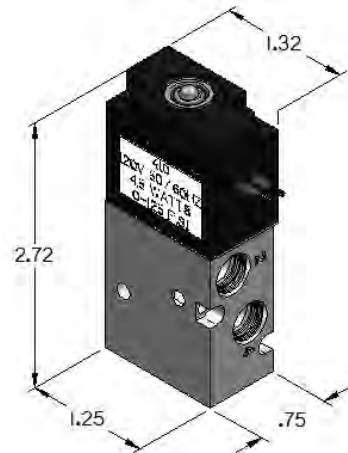
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



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	Override:	Non-Locking Type
Pressure Range:	0 to 125 PSI (V310: 28"Hg to 125 PSI)		
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

DIRECT-ACTING SOLENOID VALVES

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		
<i>Consult website for exact dimensions and additional manifold configurations.</i>				



**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			EXH Speed Control	Override		Voltage
	Lead Wires	Conduit	DIN		Non Locking	None	
<b>L310</b>							
<b>310</b>	-	-36	-39		-	-87	Specify
<b>V310</b>							
<b>410</b>				-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

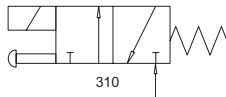
**S410-70:** 4-way with integral flow controls

### 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](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

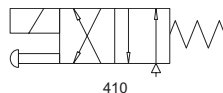
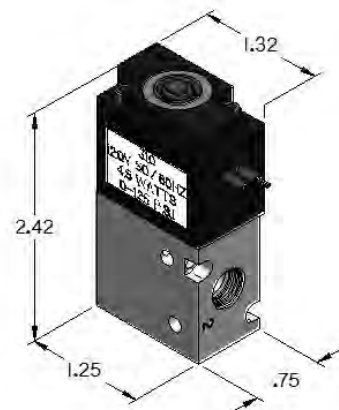
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



310



S310



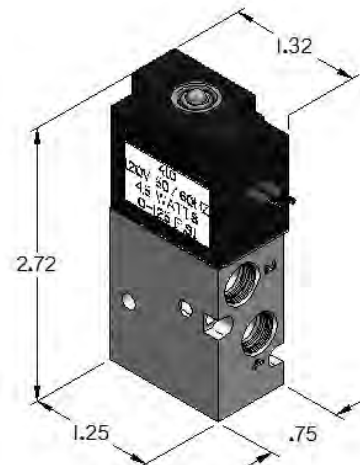
410



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	Override:	Non-Locking Type
Pressure Range:	0 to 125 PSI (SV310: 28" Hg to 125 PSI)		
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.

DIRECT-ACTING SOLENOID VALVES

Stackable Valve Manifold	Overall Size (valves not mounted)	Nominal Dimensions (inch)		
		L	H	D
<b>Stackable Valve Type:</b> 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		EXH Speed Control	Override		Voltage
	Lead Wires	DIN		Non Locking	None	
<b>S310</b>	-	-39	-70	-	-87	Specify
<b>SV310</b>						
<b>S410</b>						

**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**

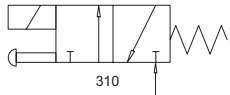
**M410-70: 4-way with integral flow controls**

### Features

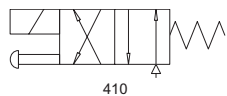
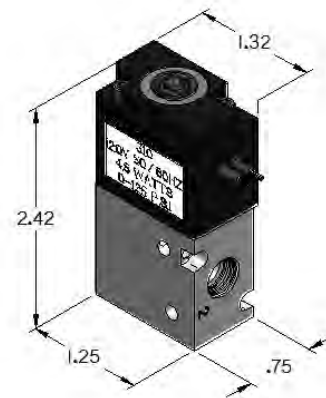
- Compact, high flow construction.
- Short stroke, fast response, poppet design.
- Low leak rate.
- Reliable, tolerant of difficult ambient/media conditions.
- Order "MV310" for multi-purpose 3-port use, for pressure or vacuum, diverter or selector.
- Use 410 as universal valve, 3- or 4-way, multi-purpose.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

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



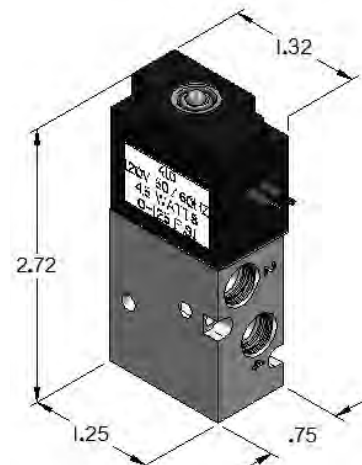
M310



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	Override:	Non-Locking Type
Pressure Range:	0 to 125 PSI (MV310: 28"Hg to 125 PSI)		
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.**

DIRECT-ACTING SOLENOID VALVES

Manifold for Subbase Type Valves	Overall Size (valves not mounted)	Nominal Dimensions (inch)		
		L	H	D
<b>SM Manifold:</b> 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		
<i>Consult website for exact dimensions and additional manifold configurations.</i>				



**SM-8**

**stn1: M310**

**stn2-4: M410**

**stn5-8: M410-70**

**HOW TO ORDER**

Base Model	Electrical Entry		EXH Speed Control	Override		Voltage
	Lead Wires	Conduit		Non Locking	None	
<b>M310</b>						Specify
<b>MV310</b>	-	-36		-	-87	
<b>M410</b>			-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**

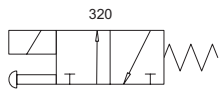
**420 Series valves are available as a manifold mount, model M420.**

### Features

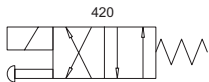
- *Multi-purpose: Normally closed, normally open, selector or diverter, pressure or vacuum, 2-, 3- or 4-way.*
- *Quiet operation.*
- *Low leak rate.*
- *Electrical connection options include lead wires, conduit connector, or DIN connector.*
- *Available with UL rating. Consult factory.*
- *Non-locking 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](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

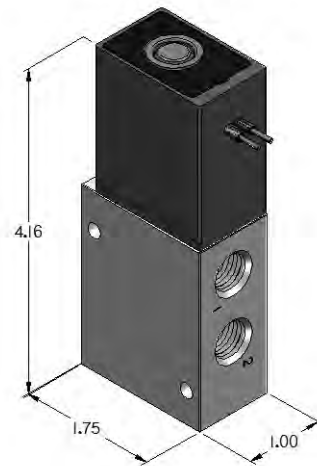
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



320



420



### 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	Override:	Non-Locking Type
Pressure Range:	28"Hg to 125 PSI		
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.

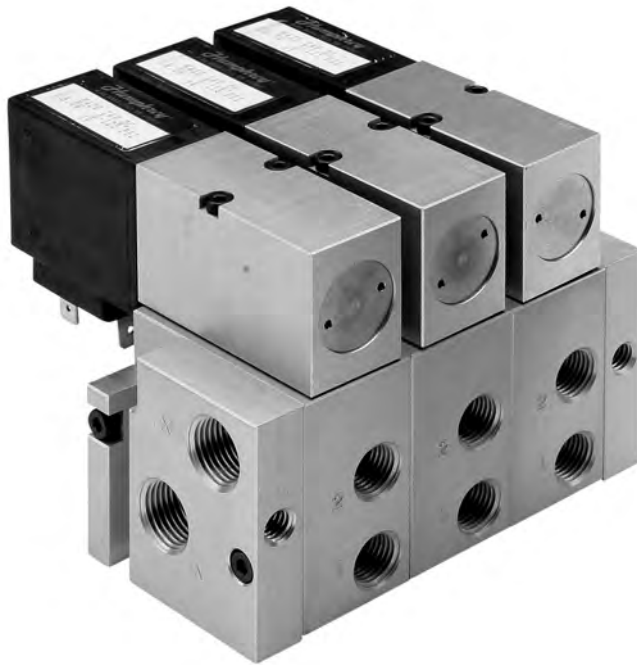
**Subbase:** Mount single M420 valve to an SB-2 subbase with 7-200A end plate kit. Subbase permits convenient valve replacement without disturbing pneumatic plumbing.

**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.

DIRECT-ACTING SOLENOID VALVES

Manifold for Subbase Type Valves	Overall Size (valves not mounted)	Nominal Dimensions (inch)		
		L	H	D
<b>SB2 Subbase:</b> 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			Override		Voltage
	Lead Wires	Conduit	DIN	Non-Locking	None	
320	-	-36	-39	-	-87	Specify
420	-	-36	-39	-	-87	

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

Base Model	Electrical Entry		Override		Voltage
	Lead Wires	DIN	Non-Locking	None	
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

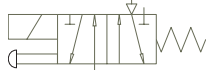
401, M401

**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

401 Micro Solenoid

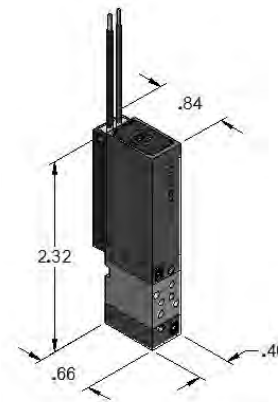


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401



Manifold Types Available	Overall Size (valves not mounted)	Nominal Dimensions (inch)		
		L	H	D
<b>MOC Manifold:</b> 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		
<b>MOC-70 Manifold:</b> 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		Voltage
	Lead Wires	Plug-In	
401			Specify
M401	-	-37	

Manifold: **MO\_\_** (specify # of stations)

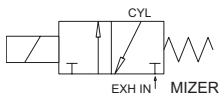
Manifold with Exhaust Speed Control: **MO\_\_-70** (specify # of stations)

DIRECT-ACTING SOLENOID VALVES

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.



FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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B3E1



Manifold Types Available	Overall Size (valves not mounted)	Nominal Dimensions (inch)		
		L	H	D
<b>MTL Manifold:</b> 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		
<b>DMTL Manifold:</b> 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			Voltage
	Spade Terminals	Lead Wires	DIN	
B3E1	-	-38	-39	Specify
MB3E1				

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)

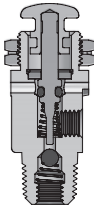
**SPECIFICATIONS**

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:	0°F to 150°F
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

# TAC VALVES

## INTRODUCTION

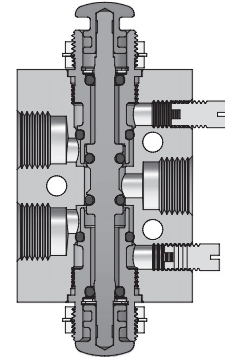
Based on their long life, small size, rugged construction and attractive appearance, the Humphrey TAC, TAC2 and TAC3 family of manual/mechanical air valves are popular choices by design automation engineers. The small stainless steel push button or plated-steel toggle are popular for panel mounting solutions to start, sequence or control equipment with the same outward appearance as traditional electric-style machine controls. The wide variety of valves is available as 2-, 3- and 4-way, in three sizes, and either spring return or detent function. Unique and miniature, three-position, 4-way, exhaust-center valves, in toggle or rocker operator, are also available.



3P

### TAC VALVE FEATURES:

- Work-hardened, SST button attached, as standard.
- Button bottoms out, limits overstroke/internal damage.
- TAC bodies include hex for wrench engagement.
- Electric style, 15/32-32 threaded collar for panel mount.
- "Building block" approach to pneumatic automation.
- Unique "Air Operators" simplify pneumatic circuitry.



41PP

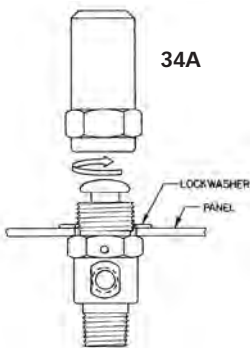
## HUMPHREY TAC "TOTAL AIR CONTROL" SYSTEM

Humphrey asserts pneumatic logic and sequencing provides a simple, reliable, cost effective alternative to PC or PLC control. Many of today's simpler machine control, secondary operations, and assembly fixtures do not require, or sometimes even permit expensive PC or PLC control, particularly in hazardous environments.

The heart of Humphrey TAC "Total Air Control" system is the push button valve. All TAC/TAC2 push button valves are produced with a single-button operator design, such that a variety of manual, mechanical, or air-pilot operators

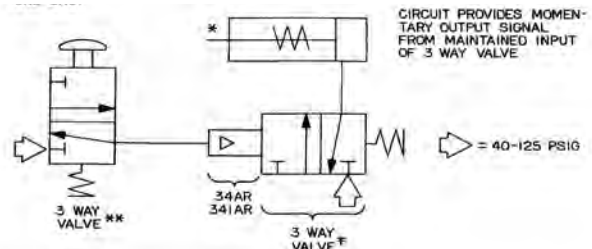
can be added with ease (i.e., thread-on air operator, 34A, to 3P valve, and 3P push button valve becomes air-pilot valve). Consult factory representative for TAC3 push button valves.

Complementing the TAC and TAC2 valve line-up, Humphrey offers a variety of valve operators, auxiliary items, and miniature fittings, effectively "arming" the engineer technician with a complete toolbox of logic items to resolve factory automation problems pneumatically.



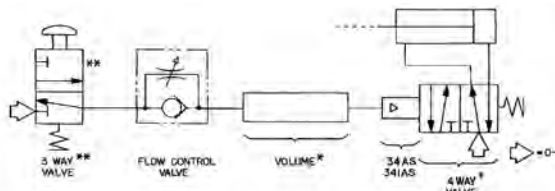
34A

3P Push Button



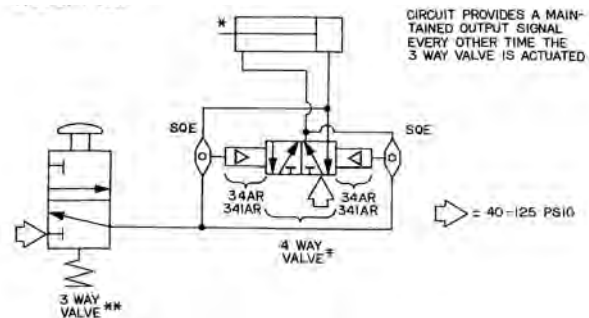
- \* Single acting cylinder shown.
- \*\* Valve used can be any 3-way or from one side of any 4-way.
- † Valve used with 34AR or 341AR operator must be TAC Series, but can be 2-, 3-, or 4-way depending on work function.

One Shot



- \* One cubic inch of volume equals approximately two seconds delay.
- † Valve used with 34AS or 341AS actuator must be TAC Series but can be either 2-, 3- or 4-way depending on work function (Double Acting Cylinder shown).
- \*\* Valve used can be any 3-way or from one side of any 4-way.

Time Delay Circuit



- \* Double acting cylinder shown. Single acting cylinder can be used.
- † Valve used with 34AR or 341AR operator must be TAC Series 4-way model: 4PP, 41PP, or 42PP.
- \*\* Valve used can be any 3-way or from one side of any 4-way.

Ball Point Pen Circuit



<b>2-, 3-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Valves</b>	<b>Page</b>
TAC		10-32	6	2P, 3P, 2V, 3V, 2VR, 3VR	24
TAC2		1/8	18	31P, 31PPX, 31V, 31VR	26
<b>4-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Valves</b>	<b>Page</b>
TAC		10-32	9	4P, 4PP, 4PPX, 4V, 4VR	25
TAC2		1/8	18	41P, 41PP, 41PPX, 41V, 41VR	27
TAC3		1/4	31	42P, 42PP, 42PA, 42A, 42A2	28
TAC three-position		1/8	6	41R-D(S)3, 41T-D(S)3	29

\*Nominal flow @100 PSI

<b>Air Operators</b>		<b>Part No.</b>	<b>Page</b>
A	Air-Pilot	34A, 341A	30
AR	Air-Pilot with Reset	34AR, 341AR	30
AS	Air-Pilot with Time Delay	34AS, 341AS	30
ASR	Air-Pilot with Reset and Snap	34ASR, 341ASR	30

<b>Operators</b>		<b>Part No.</b>	<b>Page</b>
Ball Mechanical		34B	31
Cam Mechanical		34C	31
Heavy Duty Cam Mechanical		34CH	31
One Way Trip Cam Mechanical		34CW	31
Foot (Knee) Manual		34F	31
Finger Tip Manual		34T	31

<b>Auxiliary Equipment</b>		<b>Page</b>
C1	10-32 UNF Check Valve	33
C125	1/8 PIPE Check Valve	33
RSR	Air Pressure Regulator	33
S125	1/8 PIPE Shuttle Valve	33
SC1	10-32 UNF Speed Control	33
SQE	10-32 UNF Shuttle/Quick Exhaust Valve	33

<b>Fittings</b>	<b>Description</b>	<b>Page</b>
150-30A	Exhaust Muffler	32
150-31A	Exhaust Muffler	32
BF	Straight Fitting	32
BF1	Straight Fitting	32
PBF1	Straight Fitting	32
SF	Swivel Fitting	32
UEF	Elbow Fitting	32
URTF	Running Tee Fitting	32
UTF	Tee Fitting	32

**HUMPHREY "TOTAL AIR CONTROL" LINE UP:**

- **Air Valves:** Manual/Mechanical 2-, 3- or 4-way, spring return or detent. 3 sizes.
- **Air Operators:** Standard, Air Reset, Air Snap, Air Reset/Snap.
- **Manual Operators:** Finger Tip, Foot/ Knee/Hand.
- **Mechanical Operators:** Ball, Cam, Cam-One Way Trip, Cam-Heavy Duty.
- **Auxiliary Items:** Air Regulator; Flow Control, Check, Shuttle and Quick Exhaust Valves.
- **Barbed Fittings:** Straight, Elbow, Tee, Reducer, Bulkhead, Plug, Extension, Swivel.



TAC VALVES

## TAC Series 2- and 3-Way Valves

2P, 3P, 2V, 3V, 2VR, 3VR

The Humphrey TAC Series, miniature 10-32 ported, 2- and 3-way, manual or mechanical air valves are attractive, compact and rugged. Available as spring return or detent functionality, TAC valves provide excellent flow relative to their size, and are ideal for pneumatic sequencing circuits, panel mount pilot signaling, or control of small cylinders.

### Models/Descriptions:

**2P:** 2-way, Pushbutton, Spring Return

**3P:** 3-way, Pushbutton, Spring Return

**2V:** 2-way, Toggle, Detented

**3V:** 3-way, Toggle, Detented

**2VR:** 2-way, Toggle, Spring Return

**3VR:** 3-way, Toggle, Spring Return

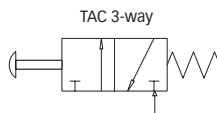
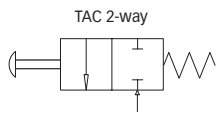
Pushbutton valves feature a hardened, SST button that bottoms out on valve collar, preventing over stroke and internal valve damage. Button design permits addition of various manual, mechanical or air operators (see pages 30, 31).

### All Valves Feature:

- Emulates similar styled electric buttons and toggles, the operators and 15/32-32 threaded collar, to enhance machine appearance.
- Hex feature on valve body assists with mounting.
- Panel mounting nuts and lockwasher standard with each valve.

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

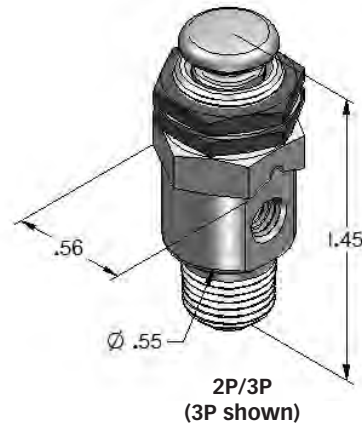
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



2P/3P



2V/3V  
2VR/3VR



2P/3P  
(3P shown)

### HOW TO ORDER

To order TAC Series 2 & 3-way valves, specify: **2P**  
**3P**  
**2V**  
**3V**  
**2VR**  
**3VR**

### SPECIFICATIONS

Design Principle:	Pressure Unbalanced, Air Return, Spring Assist	Pressure Range:	0-125 PSI
Porting Type:	2- or 3-Way	Temperature Range:	-20°F to 180°F
Port Size:	10-32 UNF	Flow @100 PSI:	6 CFM, 169 LPM (Cv=0.1)
Media:	Air, Inert Gases		

The Humphrey TAC Series, miniature 10-32 ported, 4-way, manual or mechanical air valves are attractive, compact and rugged. Available as spring return or detent functionality, TAC 4-way valves provide excellent flow relative to their size, and are ideal for pneumatic sequencing circuits, panel mount pilot signaling, or control of small cylinders.

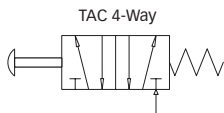
**Models/Descriptions:**

- 4P:** 4-way, Pushbutton, Spring Return
- 4PP:** 4-way, Dual Pushbutton, Detented
- 4V:** 4-way, Toggle, Detented
- 4VR:** 4-way, Toggle, Spring Return
- 4PPX:** 4-way, Push/Pull Button, Detented

Pushbutton valves feature a hardened, SST button that bottoms out on valve collar, preventing over stroke and internal valve damage. Button design permits addition of various manual, mechanical or air operators (see pages 30, 31).

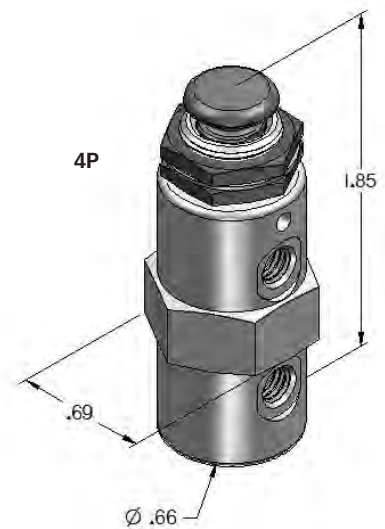
**All Valves Feature:**

- Emulating similar styled electric buttons and toggles, the operators and 15/32-32 threaded collar enhance appearance.
- Plug normally closed delivery port for 3-port normally open function.
- Panel mounting nuts and lockwasher standard with each valve.



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**HOW TO ORDER**

To order TAC Series 4-way valves, specify: **4P**  
**4PPX**  
**4PP**  
**4V**  
**4VR**

**SPECIFICATIONS**

Design Principle:	Pressure Balanced, Spring Return	Pressure Range:	0–125 PSI
Porting Type:	4-Way	Temperature Range:	-20°F to 180°F
Port Size:	10-32 UNF	Flow @100 PSI:	9 CFM, 254 LPM (Cv=0.2)
Media:	Air, Inert Gases		

TAC VALVES

## TAC2 Series 2- and 3-Way Valves

31P, 31PPX, 31V, 31VR

Humphrey TAC2, 1/8 PIPE port, 3-way, manual or mechanical air valves are attractive, compact and rugged. Available as spring return or detent functionality, TAC2 3-way valves provide excellent flow, and are ideal for pneumatic sequencing circuits, panel mount pilot signaling, or control of small cylinders. 31P is multi-purpose. Use as 2- or 3-way, normally closed or open, diverter, selector.

### Models/Descriptions:

**31P: Spring Return, Pushbutton**

**31PPX: Detent, Push/Pull**

**31V: Detent, Toggle**

**31VR: Spring Return, Toggle**

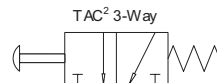
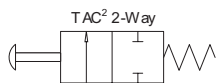
Pushbutton valves feature a hardened, SST button that bottoms out on valve collar, preventing over stroke and internal valve damage. Button design permits addition of various manual, mechanical or air operators (see pages 30, 31).

### All Valves Feature:

- Emulating similar styled electric buttons and toggles, the operators and 15/32-32 threaded collar, enhances machine appearance.
- Panel mounting nuts and lockwasher standard with each valve.

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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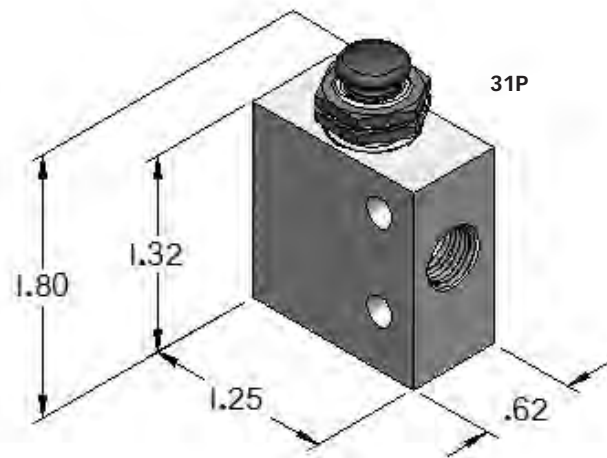
31P



31PPX



31V  
31VR



### HOW TO ORDER

To order TAC2 Series 2 & 3-way valves, specify: **31P**

**31PPX**

**31V**

**31VR**

### SPECIFICATIONS

Design Principle: Pressure Balanced, Air Return, Spring Assist

Porting Type: 2- or 3-Way

Port Size: 1/8 PIPE

Media: Air, Inert Gases

Pressure Range: 0-125 PSI

Temperature Range: -20°F to 180°F

Flow @100 PSI: 18 CFM, 509 LPM (Cv=0.3)

Humphrey TAC2, 1/8 PIPE port, 4-way, manual or mechanical air valves are attractive, compact and rugged. Available as spring return or detent functionality, TAC2 4-way valves provide excellent flow, and are ideal for pneumatic sequencing circuits, panel mount pilot signaling, or control of small cylinders. Two, exhaust port metering screws are standard on all models.

**Models/Descriptions:**

**41P: Spring Return, Pushbutton**

**41PPX: Detent, Push/Pull**

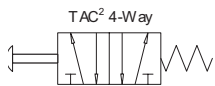
**41V: Detent, Toggle**

**41VR: Spring Return, Toggle**

Pushbutton valves feature a hardened, SST button that bottoms out on valve collar, preventing over stroke and internal valve damage. Button design permits addition of various manual, mechanical or air operators (see pages 30, 31).

**All Valves Feature:**

- Emulating similar styled electric buttons and toggles, the operators and 15/32-32 threaded collar, enhances machine appearance.
- Standard panel mount button design permits addition of various manual.
- Panel mounting nuts and lockwasher standard with each valve.



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41P



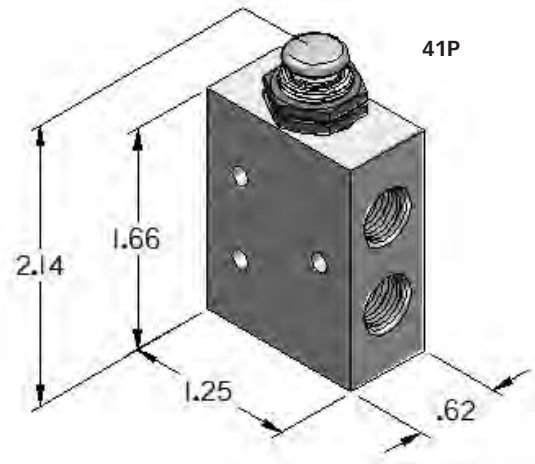
41PPX



41PP



41V  
41VR



**HOW TO ORDER**

To order TAC2 Series 4-way valves, specify: **41P**  
**41PPX**  
**41PPX**  
**41V**  
**41VR**

**SPECIFICATIONS**

Design Principle:	Pressure Balanced, Air Return, Spring Assist	Pressure Range:	0-125 PSI
Porting Type:	4-Way	Temperature Range:	-20°F to 180°F
Port Size:	1/8 PIPE	Flow @100 PSI:	18 CFM, 509 LPM (Cv=0.3)
Media:	Air, Inert Gases		

# TAC3 Series 4-Way Valves

42A, 42A2, 42P, 42PP, 42PA

**Humphrey TAC3, 1/4 PIPE port, 4-way, manual (or mechanical) and air operated valves are attractive, compact and rugged. Available as air spring return or detent functionality, TAC3 valves provide excellent flow, and are ideal for cylinder control.**

**Order Codes/Available Types:**

**42P: Spring Return, Pushbutton**

**42A: Spring Return, Air-Pilot**

**42PP: Detent, Push/Push**

**42A2: Detent, Double Air-Pilot**

**42PA: Detent, Push/Air-Pilot**

**Features**

- Hardened, stainless steel button bottoms out on valve collar, preventing overstroke and internal valve damage.
- Emulating similar styled electric buttons and toggles, the operators and 15/32-32 threaded collar, enhances machine appearance.
- Standard panel mount button design (P models) permits addition of various manual, mechanical or air operators. Consult factory.
- Panel mounting nuts and lockwasher standard with pushbutton valves.



**FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:**

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TAC VALVES



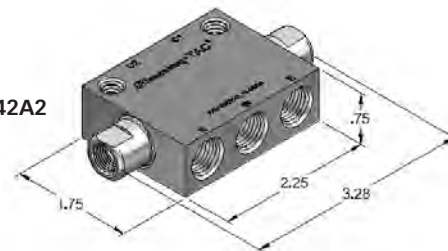
42A

42A



42A2

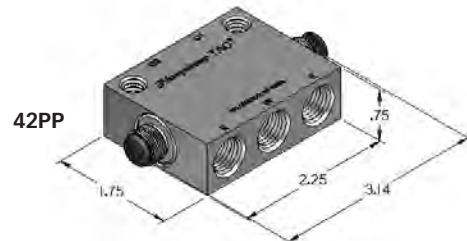
42A2



42P



42PP



42PP



42PA

**HOW TO ORDER**

To order TAC3 Series 4-way valves, specify: **42A**  
**42A2**  
**42P**  
**42PP**  
**42PA**

**SPECIFICATIONS**

Design Principle:	Pressure Balanced, Air Return, Spring Assist	Pressure Range:	0-125 PSI
Porting Type:	4-Way	Temperature Range:	-20°F to 180°F
Port Size:	1/4 PIPE	Flow @100 PSI:	31 CFM, 877 LPM (Cv=0.5)
Media:	Air, Inert Gases		

**TAC2 Series, three position, 4-way, valves are space saving in industrial or instrumentation applications. Available as detented, spring return or a combination function, these toggle or rocker actuated valves can pilot larger pneumatic or hydraulic valves, or directly operate small bore cylinders and actuators.**

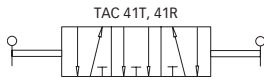
**Order Codes/Available Types:**

- 41R-D3: Rocker, Detented**
- 41R-S3: Rocker, Spring Centered**
- 41R-DS3: Rocker, Detent/Spring combo**
- 41T-D3: Toggle, Detented**
- 41T-S3: Toggle, Spring Center**
- 41T-DS3: Toggle, Detent/Spring combo**

**Open (Exhaust) Center position only. Ideal for control panel or dashboard mount applications.**

**Features**

- Two TAC 3-way valves in common body.
- Extremely small size, light weight.
- Variety of six models to choose from.
- Use single valve as two "dependent" 3-way functions.
- Independent exhaust ports (not threaded).
- Panel mounting nuts and lockwasher standard with each toggle valve.



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**41T**



**41R**

Model	Description	Dimensions (inch)			Action at Position		
		H	W	D	Left	Center	Right
<b>41T-D3, 41R-D3</b>	3-position, exhaust center, 4-way, manual valve	2.38 (T) 1.91 (R)	0.88	0.63	Detent	Detent	Detent
<b>41T-S3, 41R-S3</b>					Spring Return		Spring Return
<b>41T-DS3, 41R-DS3</b>					Detent		Spring Return

**HOW TO ORDER**

To order TAC Series 3 position, 4-way valves, specify: **41R-S3**  
**41R-D3**  
**41R-DS3**  
**41T-S3**  
**41T-D3**  
**41T-DS3**

**SPECIFICATIONS**

Design Principle:	Pressure Balanced, Air Return, Spring Assist	Pressure Range:	0-125 PSI
Porting Type:	4-Way	Temperature Range:	-20°F to 180°F
Port Size:	1/8 PIPE	Flow @100 PSI:	6 CFM, 169 LPM (Cv=0.1)
Media:	Air, Inert Gases		

**TAC VALVES**

# Air Operators

34A, 341A, 34AS, 341AS, 34AR, 341AR, 34ASR, 341ASR

A variety of TAC Operators compliment TAC, TAC2 and TAC3 pushbutton air valves, easily mounting and thereby converting them to manual, cam, air-pilot and specialty air-pilot valves.

TAC Air Operator order code and function:

- 34A: 10-32 Air Operator
- 341A: 1/8 PIPE Air Operator
- 34AR: 10-32 Air Reset
- 341AR: 1/8 PIPE Air Reset
- 34AS: 10-32 Air Snap
- 341AS: 1/8 PIPE Air Snap
- 34ASR: 10-32 Air Snap & Reset
- 341ASR: 1/8 PIPE Air Snap & Reset

TAC Air Operators convert pushbutton valves to air-pilot and specialty air-pilot valves. They easily mate to the pushbutton valve collar in a "building block" approach to miniature pneumatic logic automation.

Line up is highlighted by unique, specialty air operators:

- **AR: Air Reset.** Operator resets against pilot signal automatically within 1 sec, whether signal is left "on" or not.
- **AS: Air Snap.** Operator shifts only when pilot signal's minimum pressure is achieved. Permits "time delay" with slow build of pressure.
- **ASR: Combines AR and AS functions.**

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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- Additional Specifications & Data Sheets
- General Information & Handling Instructions

34AR  
34AS  
34ASR



34A  
341A



341AR  
341AS  
341ASR



## HOW TO ORDER

To order TAC Series air pilot operators, specify:

- 34A
- 34AR
- 34AS
- 34ASR
- 341A
- 341AR
- 341AS
- 341ASR

Operator Type	Model	Pilot Port	Hex	H	Dia	Function
Air-Pilot	34A	10-32 UNF	9/16"	1.25"	0.56"	Thread onto any push button valve and convert manual valve to air-pilot valve.
	341A	1/8 PIPE		1.38"	0.63"	
Air-Pilot with Snap Action	34AS	10-32 UNF	13/16"	2.34"	0.86"	Actuation of valve is delayed until pilot pressure reaches 35 +/-5 PSI, then snaps forward to activate valve.
	341AS	1/8 PIPE		2.44"		
Air-Pilot with Reset	34AR	10-32 UNF		2.34"		Combines the functions of the "Air-Pilot with Snap Action" and the "Air-Pilot with Reset" in one operator.
	341AR	1/8 PIPE		2.44"		
Air-Pilot with Snap Action and Reset	34ASR	10-32 UNF		2.34"		
	341ASR	1/8 PIPE		2.44"		

TAC VALVES



A variety of TAC Operators compliment TAC, TAC2 and TAC3 pushbutton air valves, easily mounting and thereby converting them to manual, cam, air-pilot and specialty air-pilot valves.

**Order Code and Manual/Mechanical Function:**

**34B: Roller Ball Operator**

**34C: Cam Operator**

**34CW: One-Way Trip Cam Operator**

**34CH: Heavy Duty Cam Operator**

**34F: Foot or Knee Operator**

**34T: Finger Tip Operator**

TAC Operators convert pushbutton valves to other manual or mechanical valves. They easily mate to the pushbutton valve collar in a "building block" approach to miniature pneumatic logic automation. Valve locknuts and lockwashers secure operators to valve body.

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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- General Information & Handling Instructions



**34C**  
Cam  
Operator



**34B**  
Ball  
Operator



**34T**  
Finger Tip  
Operator



**34F**  
Foot, Knee or  
Hand Operator



**34CW**  
Cam Operator with  
One-Way Actuation



**34CH**  
Heavy Duty  
Cam Operator

#### HOW TO ORDER

To order TAC Series manual/mechanical operators, specify:

**34B**  
**34C**  
**34CR**  
**34CH**  
**34F**  
**34T**

## TAC Fittings

BF, BF1, PBF1, SF, UEF, UTF, URTF, 150-30A, 150-31A

TAC Fittings compliment Valves and TAC Operators in pneumatic logic design and assembly. Miniature and rugged, the line up has excellent variety and used commonly by instrument and device makers.

Available in 10-32 or 1/8 NPT sizes.

Humphrey TAC fittings are sold in bags of 10 pieces only.

Breather mufflers are sintered bronze type.

**Breather Mufflers:**

150-30A: 10-32 UNF

150-31A: 1/8 NPT

**Fitting Codes (Bag of 10) and Descriptions:**

**BF:** Barb fitting. 10-32 - 1/8" ID tubing

**BF1:** Barb fitting. 10-32 - 1/4" ID tubing

**PBF1:** Barb fitting. 1/8 PIPE - 1/4" ID tubing

**SF:** Swivel fitting. 10-32

**UEF:** Universal elbow fitting. 10-32

**UTF:** Universal tee fitting. 10-32

**URTF:** Universal running tee fitting. 10-32

**ORDER EXAMPLE: BF - Bag of 10**

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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

TAC VALVES

TAC Miniature Fittings



### BARBED FITTING CHART

Model	Description
BF	10-32 UNF by 1/8 OD tube, straight fitting.
BF1	10-32 UNF by 1/4 OD tube, straight fitting.
PBF1	1/8 PIPE by 1/4 OD tube, straight fitting.
SF	10-32 UNF male to 10-32 UNF female, swivel fitting.
UEF	10-32 UNF male to 10-32 UNF female, universal elbow fitting.
UTF	10-32 UNF male to 10-32 UNF female, universal tee fitting.
URTF	10-32 UNF male to 10-32 UNF female, universal running tee fitting.
150-30A	10-32 UNF sintered bronze muffler.
150-31A	1/8 PIPE sintered bronze muffler.

### HOW TO ORDER

To order TAC Series fittings, specify: **BF-Bag of 10**  
**BF1-Bag of 10**  
**PBF1-Bag of 10**  
**SF-Bag of 10**  
**UEF-Bag of 10**  
**UTF-Bag of 10**  
**URTF-Bag of 10**  
**150-30A-Bag of 10**  
**150-31A-Bag of 10**

**TAC auxiliary components compliment TAC Valves and Operators in pneumatic logic design and solutions. Miniature and rugged, the line up is also used commonly by instrument and device makers as stand alone items. Available in 10-32 ported or 1/8 PIPE port sizes.**

**Order Codes and Descriptions:**

**C1: Check valve. 10-32 port**

**SQE: Shuttle or quick exhaust. 10-32 port**

**C125: Check valve. 1/8 PIPE**

**S125: Shuttle valve. 1/8 PIPE**

**RSR: Pressure regulator. 10-32 port**

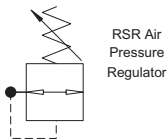
**SC1: Flow controller. 10-32 port**

**Features**

- Miniaturization. Small and compact.
- RSR self relieving regulator is designed for panel mounting, and achieves 22 CFM at 100 PSI output pressure.
- SC1 flow control allows full flow on one direction and controlled return flow. Is unaffected by vibration, maintaining an accurate setting.
- Two sizes of check and shuttle valves.
- Model SQE can be used as shuttle or quick exhaust.

**FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:**

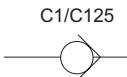
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
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RSR Air Pressure Regulator



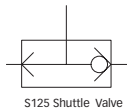
**RSR Air Pressure Regulator**



**C125 Check Valve**



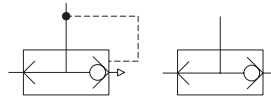
**C1 Check Valve**



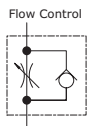
S125 Shuttle Valve



**S125 Shuttle Valve**



**SQE Shuttle and Quick Exhaust Valve**



Flow Control



**SC1 Speed Control**

**HOW TO ORDER**

To order TAC Series auxiliary components, specify:

<b>C1</b>
<b>C125</b>
<b>SQE</b>
<b>S125</b>
<b>SC1</b>
<b>RSR</b>

# AIR-PILOT VALVES

## INTRODUCTION

*Air-Pilot Valves operate via a remote air signal to shift the valve and internal air pressure to return to its original position when the air signal is removed. Often, they contribute to the most economical, lowest total cost solutions, due to their simple construction and trouble free service in difficult environments.*

Air-Pilot Valves use air piping only, and therefore, are inherently explosion-proof. They can be mounted close to work, isolating machine operators or electrical signals away from hazardous or difficult environments. Use of small electrical or manual valves becomes possible as piloting valves, for one or more Air-Pilot Valves in a system. More often than not, this reduces overall cost, total air consumption, and troubleshooting downtime.

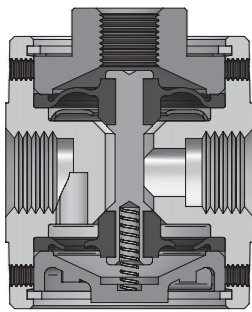
Other common Air-Pilot Valve applications:

- Slave function.
- Interlock function.
- Tight leak requirements.
- Alternate media (use our brass or SST body material).

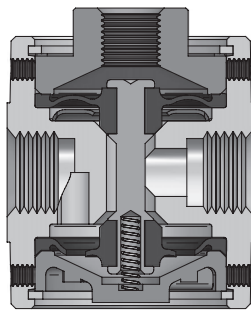
### AIR-PILOT VALVE FEATURES:

- Simple construction. Trouble free. Reliable.
- Works equally well with or without air line lubrication, with clean or dirty air.
- Compact and light weight.
- Mount in any direction.
- Cost effective.

### "A" TYPE AIR-PILOT VALVES

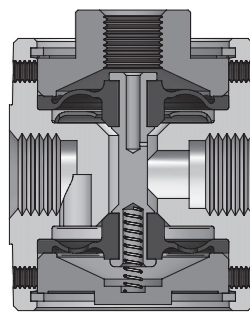


250A  
Normal Position

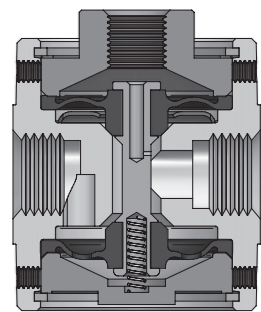


250A  
Operating Position

### "AA" TYPE AIR-PILOT VALVES



250AA  
Normal Position



250AA  
Operating Position

Round "A" type valves require continuous pilot pressure to maintain the operating condition. Round "AA" type valves incorporate a bypass hole on the main stem and are for compressed air only. The bypass hole speeds up the valve and also helps the piloting valve maintain its operating condition during a momentary operation, even if there are small air leaks within the pilot line.

### EXAMPLES OF AIR-PILOT VALVES



Round Type Valve Offering



Specialty Round Type

<b>2-, 3-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Valves</b>	<b>Page</b>
<b>SMALL</b>	125A Series	1/8	18	125A	36
	125AA Series	1/8	18	125AA	37
	125 Interface Series	1/8	14	125LA, 125AH	42
	Glue Valve Series	1/8	–	R322C, R561	41
<b>LARGE</b>	250A Series	1/4	50	250A	36
	250AA Series	1/4	50	250AA	37
	250 Interface Series	1/4	40	250AL, 250AH	43
	500 Series	1/2	160	500A, 500AB	38
	501 Series	1/2	220	501A, 501AA	44
	590 Series	3/4	260	590A, 590AB	39
	Glue Valve Series	1/4	–	R332	41
<b>4-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Valves</b>	<b>Page</b>
<b>LARGE</b>	250-4A Series	1/4	50	250-4A	40
	250-4AA Series	1/4	50	250-4AA	40
	501-4 Series	1/2	170	501-4A, 501-4AA	45

*\*Nominal flow @100 PSI*



# Diaphragm-Poppet Air-Pilot Valves

125A, 250A

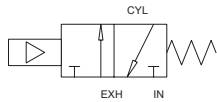
*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air, and inert media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

## 125A and 250A (SS250A) Air-Pilot Valves

*Valves are available as a 2- or 3-way, normally closed or open, single or double piloted. Optional brass body material available.*

## Features

- Full ported 1/8" orifice, 1/8 PIPE ports, and 1/4" orifice, 1/4 PIPE ports.
- Fast cycling, high flow, quick dump.
- Reliable operation in lubricated or not lubricated systems. No sliding seals.
- Hard plumb mount, base mount, or panel mount (use panel mount nuts for 125 series or inverted mounting base for 250 series).
- Buna N seals standard. Fluorocarbon seals optional.
- **SS250A:** All Stainless Steel, normally closed, 3-way valve. Includes FKM seals.

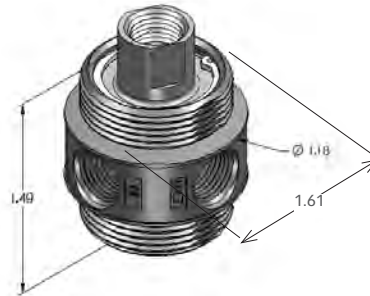


FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

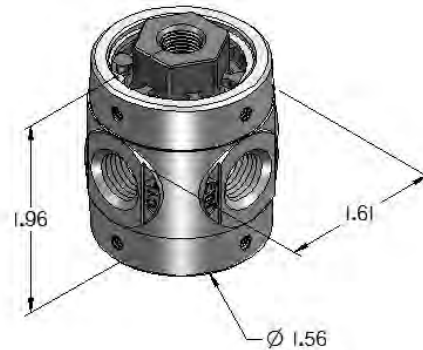
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



125A-NC



250A-NC



## HOW TO ORDER

Base Model	Ports		Function		Mounting	
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base
125A	-2	-3	-10	-11	-20	-21
250A						
SS250A						

Other Option Codes: FKM Seals: "-VAI"; Brass Body: "-BRB"

## SPECIFICATIONS

Design Principle: Pressure Unbalanced – Air Return, Spring Assist  
 Porting Type: 2- or 3-Way  
 Port Size: 125: 1/8 PIPE; 250: 1/4 PIPE  
 Media: Air, Inert Gas, Liquid (brass body)

Pressure Range: 0–125 PSI  
 Temperature Range: -20°F to 225°F  
 Flow @100 PSI: 125: 18 CFM, 509 LPM (Cv=0.3)  
 250: 50 CFM, 1415 LPM (Cv=0.8)

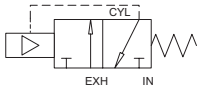
The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air, and inert media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.

### 125AA and 250AA Air-Pilot, Internal Air Assist Valves

Unique Humphrey "AA" principle. See introduction section. Incorporates an internal compensating orifice to achieve faster response or momentary pilot signal. Available as 2- or 3-way, normally closed, single pilot. Optional brass body material available.

### Features

- Full ported 1/8" orifice, 1/8 PIPE ports, and 1/4" orifice, 1/4 PIPE ports.
- Fast cycling, high flow, quick dump.
- Reliable operation in lubricated or not lubricated air systems. No sliding seals.
- Hard plumb mount, base mount, or panel mount (use panel mount nuts for 125 series or inverted mounting base for 250 series).
- Excellent for interlocking or sequencing applications.
- Buna N seals standard. Fluorocarbon seals optional.

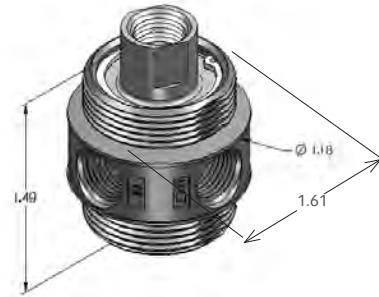


FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

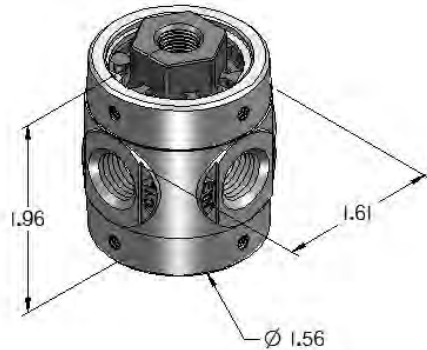
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



125AA



250AA



### HOW TO ORDER

Base Model	Ports		Function		Mounting	
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base
125AA	-2	-3	-10		-20	-21
250AA						

Other Option Codes: FKM Seals: "-VAI"; Brass Body: "-BRB"

### SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Pressure Range:	125AA: 10–125 PSI; 250AA: 15–125 PSI
Porting Type:	2- or 3-Way	Temperature Range:	-20°F to 225°F
Port Size:	125: 1/8 PIPE; 250: 1/4 PIPE	Flow @100 PSI:	125AA: 18 CFM, 509 LPM (Cv=0.3) 250AA: 50 CFM, 1415 LPM (Cv=0.8)
Media:	Air		

# Diaphragm-Poppet Air-Pilot Valves

500A, 500AB

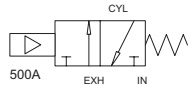
*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air, and inert media. Millions of trouble-free cycles are expected, regardless of media or ambient conditions.*

## 500A and 500AB Air-Pilot Valves

*Valves are available as a 2- or 3-way, normally closed, single air-pilot. Optional aluminum body material available.*

## Features

- Full ported 1/2" orifice, 1/2 PIPE ports.
- Fast cycling, high flow.
- Reliable operation in lubricated or not lubricated systems. No sliding seals.
- Hard plumb mount, or use body mounting holes.
- Buna N seals standard. Fluorocarbon seals optional.
- Booster type (500AB) available for reduced pilot pressure.

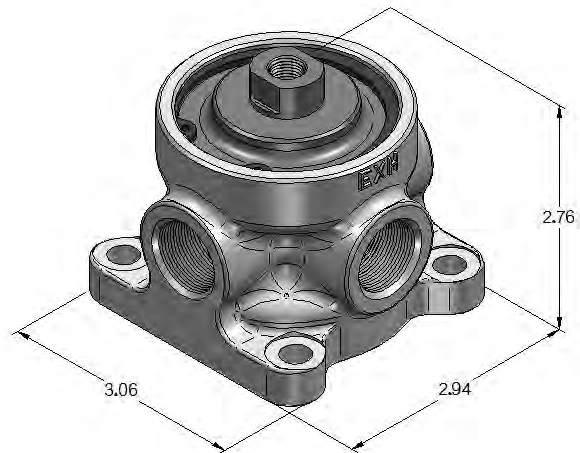


FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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- General Information & Handling Instructions



500A



AIR-PILOT VALVES

## HOW TO ORDER

Base Model	Ports		Function	
	2-way	3-way	Norm Closed	Norm Open
500A	-2	-3	-10	
500AB				

Other Option Codes: FKM Seals: "-VAI"; Aluminum Body: "-ALU"

## SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Pressure Range:	0–125 PSI
Porting Type:	2- or 3-Way	Temperature Range:	0°F to 225°F
Port Size:	1/2 PIPE	Flow @100 PSI:	160 CFM, 4530 LPM (Cv=2.7)
Media:	Air, Inert Gas (Liquid with brass body)		



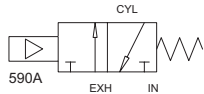
*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air, and inert media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

**590A and 590AB Air-Pilot Valves**

*Valves are available as a 2- or 3-way, normally closed, single air-pilot. Optional brass body material available.*

**Features**

- Valve has 0.59" orifice, 3/4 PIPE ports.
- Fast cycling, high flow.
- Reliable operation in lubricated or not lubricated systems. No sliding seals.
- Hard plumb mount, or use body mounting holes.
- Buna N seals standard. Fluorocarbon seals optional.
- Booster type (590AB) available for reduced pilot pressure.

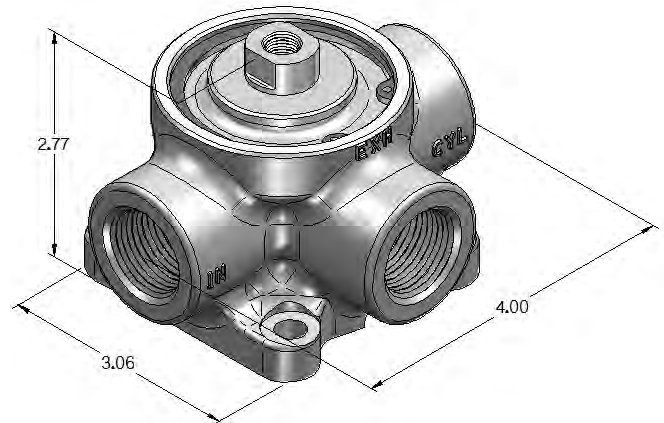


**FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:**

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590A



**HOW TO ORDER**

Base Model	Ports		Function	
	2-way	3-way	Norm Closed	Norm Open
590A	-2	-3	-10	
590AB				

Other Option Codes: FKM Seals: "-VAI"; Brass Body: "-BRB"

**SPECIFICATIONS**

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Pressure Range:	0–125 PSI
Porting Type:	2- or 3-Way	Temperature Range:	0°F to 225°F
Port Size:	3/4 PIPE	Flow @100 PSI:	260 CFM, 7362 LPM (Cv=3.7)
Media:	Air, Inert Gas (Liquid with brass body)		

**AIR-PILOT VALVES**

# Diaphragm-Poppet, 4-Way Valves

250-4A, 250-4AA

*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air, and inert media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

### 250-4A and 250-4AA Air-Pilot Type

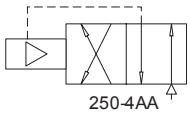
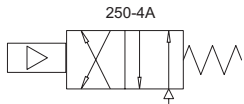
**Valves are available as 4-way air operated. Consider unique Humphrey "AA" type. Consult factory for 3-position models.**

### Features

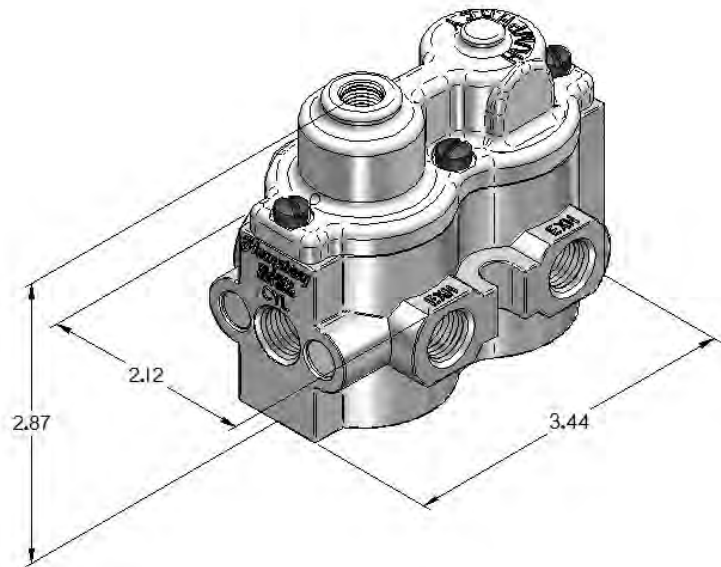
- Full ported 1/4" orifice, 1/4 PIPE ports.
- Fast cycling, high flow, quick dump.
- Reliable operation in lubricated or not lubricated systems. No sliding seals.
- Hard plumb mount, use body threads or mounting base.
- Buna N seals standard. Fluorocarbon seals optional.
- "AA" type is excellent for interlocking or sequencing applications.

**FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:**

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250-4A, 250-4AA



AIR-PILOT VALVES

### HOW TO ORDER:

Base Model	Mounting	
	No Base	With Base
250-4A	-	-21
250-4AA	-	-21

Other Code: FKM Seals: "-VAI"

### SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Media:	Air
Porting Type:	4-Way	Pressure Range:	15–125 PSI
Port Size:	1/4 PIPE	Temperature Range:	-20°F to 225°F
		Flow @100 PSI:	50 CFM, 1415 LPM (Cv=0.8)

125 and 250 Series Air-Pilot "Glue" valves feature the classic Humphrey diaphragm-poppet in a double air-pilot, 2-way configuration. The design assures a tight seal actuated, or unactuated. Compact design permits close proximity mounting to the work and fast cycling, clean performance. "Suck back" characteristic achieved when valve closes.

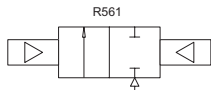
**R322C:** 1/8 PIPE with fluorocarbon diaphragms.

**R561A:** 1/8 PIPE with teflon profile diaphragms.

**R332:** 1/4 PIPE with fluorocarbon diaphragms.

## Features

- Full ported 1/8" orifice, 1/8 PIPE ports, and 1/4" orifice, 1/4 PIPE ports.
- Fast cycling, high flow.
- Hard plumb mount, or panel mount using nuts or mounting base, via the 1"-20 UNEF body mounting threads (125 series) or mounting base (250 series).
- Fluorocarbon seals standard. Teflon coated diaphragms are optional.



FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

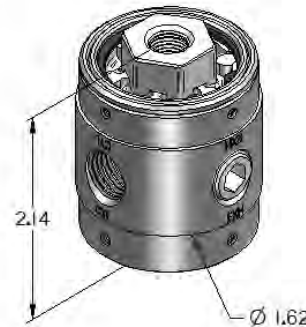
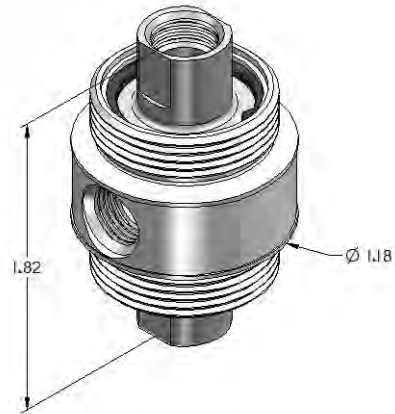
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



R561, R322C



R332



## HOW TO ORDER

To order Glue Valves, specify: **R322C**  
**R561A**  
**R332**

## SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Double Air Maintained Pilot	Pressure Range:	0–35 PSI (pilot => body pressure, 30 PSI)
Porting Type:	2-Way	Temperature Range:	-20°F to 225°F
Port Size:	1/8 PIPE, 1/4 PIPE	Flow @100 PSI:	R322C, R561: LPM=7.5 (Cv=0.3) R332: LPM=22.5 (Cv=0.8)
Media:	Glue; Consult factory for others		

# Diaphragm-Poppet Air-Pilot Interface Valves

125LA, 125AH

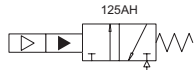
*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air, and inert media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

**125LA and 125AH Air-Pilot, "Interface" Type**

*"Interface" valves are ultra low pilot pressure bleed valves. Pilot pressure as low as 0.1 PSI effectively blocks bleed orifice and internal, full pressure completes shift to actuated position.*

## Features

- Ideal for fluidics, proximity switching, air jet sensing or back pressure sensing.
- Very fast cycling speeds.
- Super sensitive **125LA** responds to 0.10 ~ 10 PSI pilot pressure.
- Sensitive **125AH** respond to 0.33 ~ 30 PSI pilot pressure.
- Primary valve is 1/8" orifice, 1/8 PIPE ports.



FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



125LA



125AH



## HOW TO ORDER

Base Model	Ports		Function		Mounting	
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base
125LA	-2	-3	-10		-20	-21
125AH						

Other Option Codes: FKM Seals: "-VAI"; Brass Body: "-BRB"

## SPECIFICATIONS

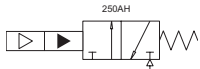
Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Pilot Pressure:	125LA: 0.07; 125AH: 0.33
Porting Type:	2- or 3-Way	Pressure Range:	30–100 PSI
Port Size:	1/8 PIPE	Temperature Range:	40°F to 225°F
Media:	Air	Flow @100 PSI:	14 CFM, 400 LPM (Cv=0.2)

*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air, and inert media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

**250AL and 250AH Air-Pilot, "Interface" Type**  
**"Interface" valves are ultra low pilot pressure bleed valves. Pilot pressure as low as 0.1 PSI effectively blocks bleed orifice and internal, full pressure completes shift to actuated position.**

### Features

- Ideal for fluidics, proximity switching, air jet sensing or back pressure sensing.
- Very fast cycling speeds.
- Super sensitive **250AL** responds to 0.10 ~ 10 PSI pilot pressure.
- Sensitive **250AH** respond to 0.33 ~ 30 PSI pilot pressure.
- Primary valve is 1/4" orifice, 1/4 PIPE ports.



FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

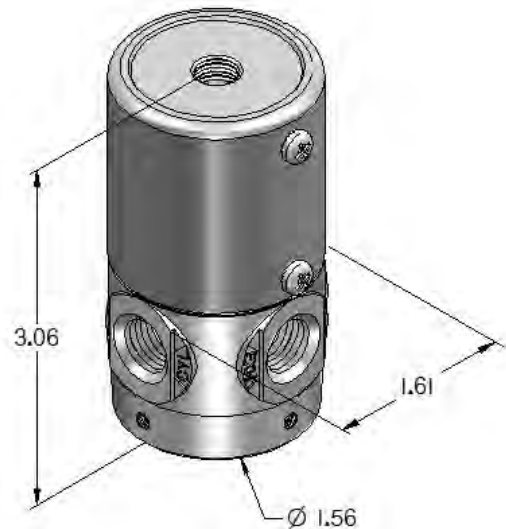
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



250AH



250AL



### HOW TO ORDER

Base Model	Ports		Function		Mounting	
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base
250AL	-2	-3	-10		-20	-21
250AH						

Other Option Codes: FKM Seals: "-VAI"; Brass Body: "-BRB"

### SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Pilot Pressure:	250AH: 0.08; 250AL: 0.33
Porting Type:	2- or 3-Way	Pressure Range:	30–125 PSI
Port Size:	1/4 PIPE	Temperature Range:	40°F to 225°F
Media:	Air	Flow @100 PSI:	40 CFM, 1130 LPM (Cv=0.7)

# Piston-Poppet Air-Pilot Valves

501A, 501AA

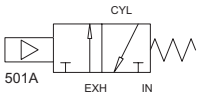
**Humphrey piston-poppet, 1/2 PIPE port Air-Pilot valves achieve fully ported, high flow performance relative to overall size. Hard coated, cast aluminum body permits resistance to wear and easy mounting/plumbing. The pressure unbalanced piston poppet design achieves greater flow than comparable 1/2" valves and millions of trouble free cycles.**

### 501A and 501AA Air-Pilot Type

**Available as 2- or 3-way, multi-purpose, single air-pilot. Consider unique Humphrey "AA" type (see introduction page).**

### Features

- Full ported 1/2" orifice, 1/2 PIPE ports.
- "Flow through" construction achieves greater flow than competition.
- Short stroke and "quick dump" permits fast cycling.
- Mount in any position via body mounting holes or threads, or optional base (-21).
- Plug for 2-way service.
- "AA" type is excellent for interlocking or sequencing applications.

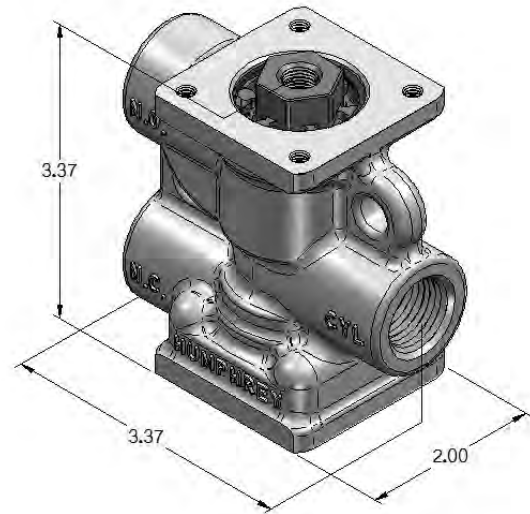


FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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- General Information & Handling Instructions



501A



AIR-PILOT VALVES

### HOW TO ORDER

Base Model	Ports		Function		Mounting	
	2-way	3-way	Norm Closed	Multi-Purpose	No Base	With Base
501A	-2	-3		-12	-20	-21
501AA			-10			

Other Option Code: FKM Seals: "-VAI"

### SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Media:	Air, Inert Gas
Porting Type:	2- or 3-Way	Pressure Range:	0–125 PSI (501AA=15–125 PSI)
Port Size:	1/2 PIPE	Temperature Range:	-30°F to 225°F
		Flow @100 PSI:	220 CFM, 6229 LPM (Cv=3.5)

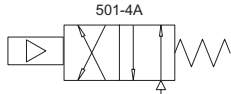
**Humphrey piston-poppet, 1/2 PIPE port Air-Pilot valves achieve fully ported, high flow performance relative to overall size. Hard coated, cast aluminum body permits resistance to wear and easy mounting/plumbing. The pressure unbalanced piston poppet design achieves greater flow than comparable 1/2" valves and millions of trouble free cycles.**

**501-4A and 501-4AA Air-Pilot Type**

**Available as 4-way, single air-pilot. Consider unique Humphrey "AA" type (see introduction page).**

**Features**

- Full ported 1/2" orifice, 1/2 PIPE ports.
- "Flow through" construction achieves greater flow than competition.
- Short stroke and "quick dump" permits fast cycling.
- Mount in any position via body mounting lugs.
- "AA" type is excellent for interlocking or sequencing applications.

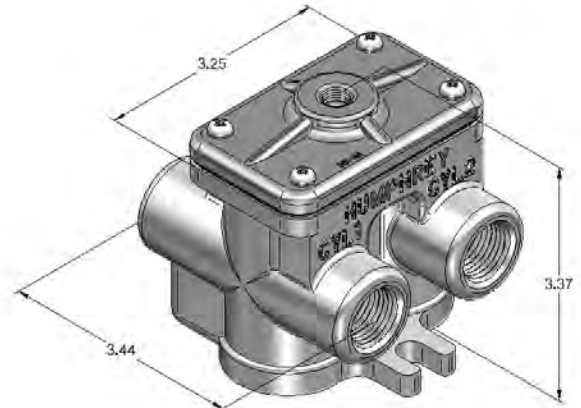


**FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:**

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501-4AA



501-4A

**HOW TO ORDER**

Base Model	Seals	
	Buna (std)	FKM
501-4A	-	-VAI
501-4AA	-	-VAI

**SPECIFICATIONS**

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Media:	Air, Inert Gas
Porting Type:	4-Way	Pressure Range:	0–125 PSI (501-4AA=15–125 PSI)
Port Size:	1/2 PIPE	Temperature Range:	-30°F to 225°F
		Flow @100 PSI:	170 CFM, 4810 LPM (Cv=2.5)

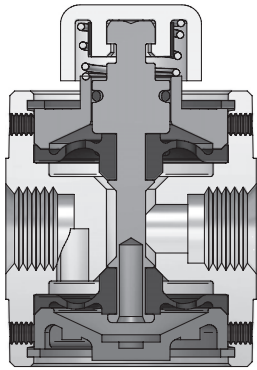
# MANUAL AND MECHANICAL VALVES

## INTRODUCTION

*Humphrey Manual and Mechanical Air Valves feature the exclusive diaphragm-poppet design originated by Humphrey. The design consists of two specially contoured diaphragms mounted to an axial stem within a full orifice valve body. This classic design is simple, versatile, and highly reliable. Valves of this design perform equally well with or without air supply lubrication, and better than competitive products when under poor air conditions.*

Humphrey Manual and Mechanical valves are available in 2-, 3- and 4-way porting types, and in a variety of rugged actuator styles.

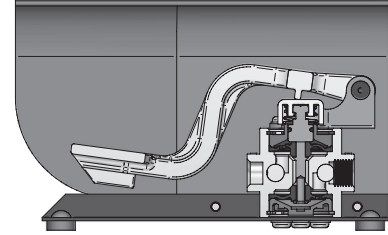
- Manual actuator styles: Push Button, Palm Button, Low-Force Palm, Detented Palm, Foot, Finger Tip, Toggle and Hand.
- Mechanical actuator styles: Ball, Plunger, Cam and Overstroke-Compensated Cam.



250P-3-10-20  
Push Button, Unactuated

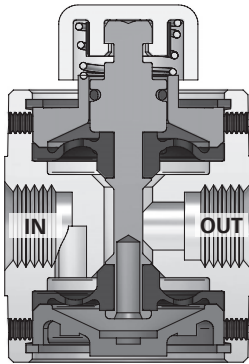
### MANUAL/MECHANICAL VALVE FEATURES:

- Simple construction
- No lubrication
- Reliable Operation
- Compact and Lightweight
- Rugged
- Cost effective



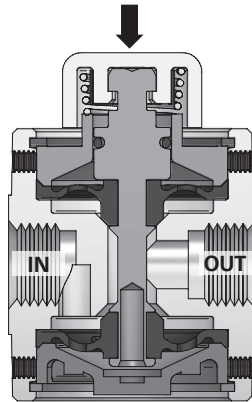
250-4F  
Four-Way Foot, Unactuated

### FLOW PATH, BASIC NORMALLY CLOSED (NC) AND NORMALLY OPEN (NO) VALVES



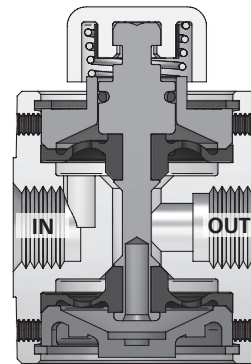
250 NC, Unactuated

Media applied to IN routes down, passing through perforations in bottom diaphragm-poppet and becomes primary force holding valve closed. Top diaphragm-poppet is not seated, so OUT port is open to EXHAUST port (backside, not shown).



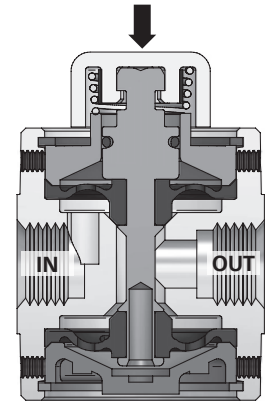
250 NC, Actuated

When the button is depressed, the top diaphragm-poppet seats, while bottom diaphragm-poppet opens, allowing media to pass through to OUT port, while EXHAUST port (backside, not shown), becomes blocked.



250 NO, Unactuated

Media applied to IN routes up, passing by unseated diaphragm-poppet to OUT port, and becomes primary force holding valve open. Bottom diaphragm-poppet is seated and OUT port is blocked from the EXHAUST port (backside, not shown).



250 NO, Actuated

When the button is depressed, the top diaphragm-poppet seats, while bottom diaphragm-poppet opens, allowing media to become blocked from OUT port, while EXHAUST port (backside, not shown), becomes open to OUT port.



TAC Valves



Three-Way Valves



Four-Way Valves

MANUAL AND MECHANICAL VALVES



<b>2-, 3-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Valves</b>	<b>Page</b>
<b>SMALL</b>	TAC	10-32	6	2P, 3P, 2V, 3V, 2VR, 3VR	24
	TAC2	1/8	18	31P, 31PPX, 31V, 31VR	26
	125 Series Manual	1/8	18	125PLG, 125P, 125HO, 125T, 125V	48-49
	125 Series Mechanical	1/8	18	125B, 125MP, 125MC	54
<b>LARGE</b>	250 Series Manual	1/4	50	250P, 250PL, 250F, 250V, 250HO, 250T	50-51
	250 Series Mechanical	1/4	50	250C	55
	501 Series Manual	1/2	220	501V	53
	500 Series Mechanical	1/2	160	500C	55

<b>4-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Valves</b>	<b>Page</b>
<b>SMALL</b>	TAC	10-32	9	4P, 4PP, 4PPX, 4V, 4VR	25
	TAC2	1/8	18	41P, 41PP, 41PPX, 41V, 41VR	27
	TAC three-position	1/8	6	41R-D(S)3, 41T-D(S)3	29
<b>LARGE</b>	TAC3	1/4	31	42P, 42PP, 42PA, 42A, 42A2	28
	250-4 Series	1/4	50	250-4F, 250-4H	52

\*Nominal flow @100 PSI



<b>Force to Actuate @100 PSI (lbs.) Manual or Mechanical Actuator Code</b>	<b>B</b>	<b>C</b>	<b>F</b>	<b>H</b>	<b>HO</b>	<b>MC</b>	<b>MP</b>	<b>P</b>	<b>PL</b>	<b>PLG</b>	<b>T</b>	<b>V</b>
125	8				7	5	8	8		3	4	2
250		11	5		14			23	21		5	3
250-4			13	4								
501												4

# Diaphragm-Poppet Manual Valves

125PLG, 125P, 125HO, 125T, 125V

*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

**Models/Descriptions:**

**125PLG: Easy Actuation Palm Button**

**125P: Pushbutton Operated**

**125HO: Push and Turn, Detented**

**125T: Fingertip Operated**

**125V: Toggle, Detented**

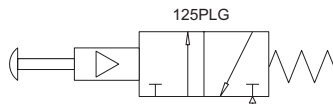
*These rugged 2- or 3-way valves are available in normally closed or normally open, or optional brass body construction (for alternate media).*

**Features**

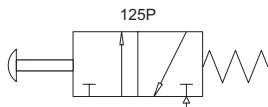
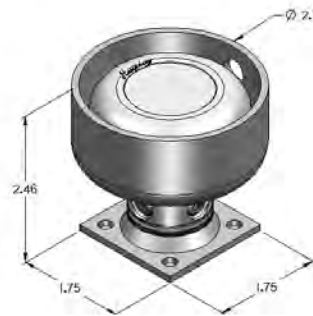
- Full ported 1/8" orifice, 1/8 PIPE ports.
- Fast cycling, high flow, quick dump.
- Reliable operation in lubricated or not lubricated systems. No sliding seals.
- Hard plumb mount, base mount, or panel mount using nuts or mounting base, via the 1"-20 UNEF body mounting threads.
- Buna N seals standard. Fluorocarbon seals optional.

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

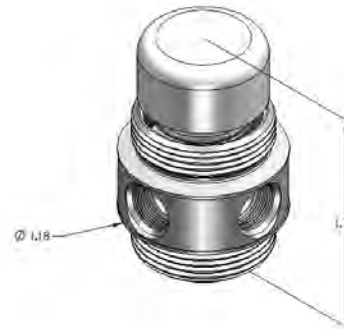
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



**125PLG – Large, Easy Actuation, Push Button**



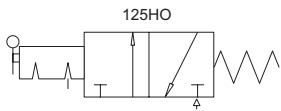
**125P – Push Button**



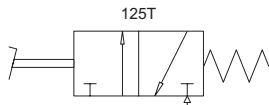
**SPECIFICATIONS**

Design Principle:	Pressure Unbalanced, Air Return, Spring Assist	Media:	Air, Inert Gas
Porting Type:	2- or 3-Way	Pressure Range:	0–125 PSI; PLG: 30–125 PSI
Port Size:	1/8 PIPE	Temperature Range:	-20°F to 225°F
		Flow @100 PSI:	18 CFM, 509 LPM (Cv=0.3)

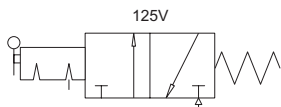
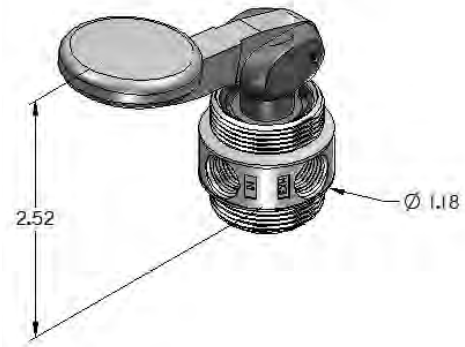
MANUAL AND MECHANICAL VALVES



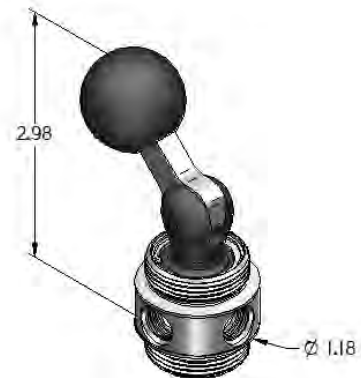
125HO - Hold On



125T - Finger Tip



125V - Toggle



## HOW TO ORDER

Base Model	Ports		Function		Mounting		Nylon Button
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base	
125P							-40
125HO							
125T	-2	-3	-10	-11	-20	-21	
125V							
125PLG							

Other Option Codes: FKM Seals: "-VAI"; Brass Body: "-BRB"

# Diaphragm-Poppet Manual Valves

250P, 250PL, 250F, 250V, 250HO, 250T

*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

**Models/Descriptions:**

- 250P: Pushbutton Operated**
- 250PL: Palm Operated**
- 250HO: Hold-On, Detented**
- 250T: Fingertip Operated**
- 250V: Toggle, Detented**
- 250F: Foot Operated**

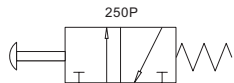
*These rugged 2- or 3-way valves are available in normally closed or normally open, or optional brass body construction (for alternate media).*

**Features**

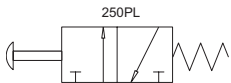
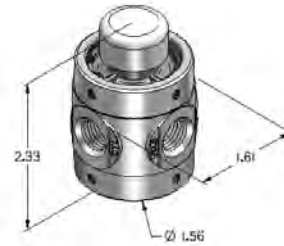
- Full ported 1/4" orifice, 1/4 PIPE ports.
- Fast cycling, high flow, quick dump.
- Hard plumb mount, or base mount.
- Buna N seals standard. Fluorocarbon seals optional.
- 250F includes foot guard.

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

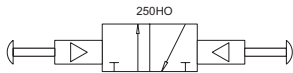
- Non-Catalog Options & Product Configuration Utility
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- General Information & Handling Instructions



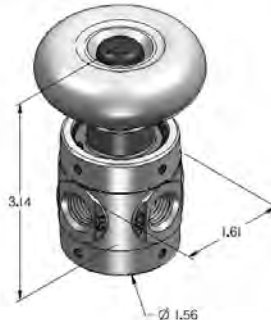
250P – Push Button



250PL – Large Push Button



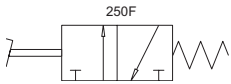
250HO – Hold On



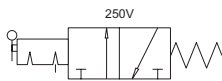
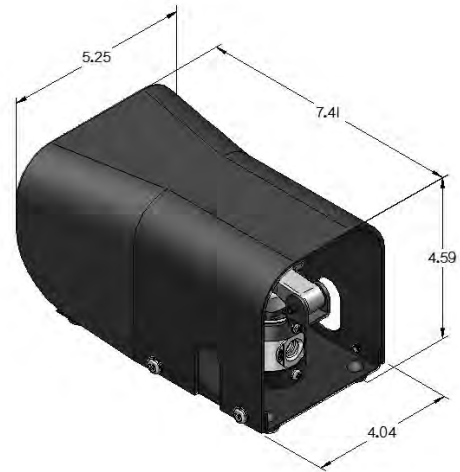
**SPECIFICATIONS**

Design Principle:	Pressure Unbalanced, Air Return, Spring Assist	Media:	Air, Inert Gas
Porting Type:	2- or 3-Way	Pressure Range:	0–125 PSI; HO: 25–125 PSI
Port Size:	1/4 PIPE	Temperature Range:	-20° to 225°F
		Flow @100 PSI:	50 CFM, 1415 LPM (Cv=0.8)

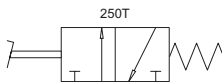
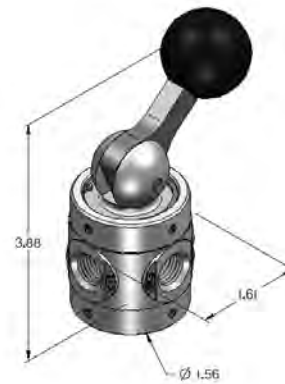
MANUAL AND MECHANICAL VALVES



250F – Foot Valve



250V – Toggle



250T – Finger Tip



## HOW TO ORDER

Base Model	Ports		Function		Mounting	
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base
250F						
250PL						
250P	-2	-3	-10	-11	-20	-21
250T						
250HO						
250V						

Other Option Codes: FKM Seals: "-VAI"; Brass Body: "-BRB"

# Diaphragm-Poppet 4-Way Manual Valves

250-4F, 250-4H

*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

**Models/Descriptions:**

- 250-4F: Foot Operated (2-position)**
- 250-4H: Lever Operated (3-position)**

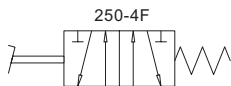
*These rugged 4-way valves are available in 2-position (250-4F) and 3-position (250-4H).*

**Features**

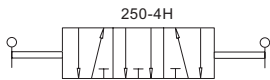
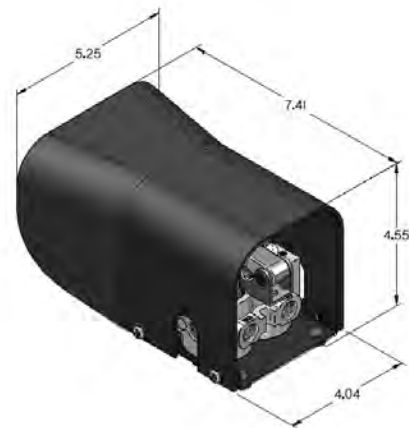
- Full ported 1/4" orifice, 1/4 PIPE ports.
- Fast cycling, high flow, quick dump.
- Hard plumb mount, or base mount.
- Buna N seals standard. Fluorocarbon seals optional.
- 250-4F includes foot guard.

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

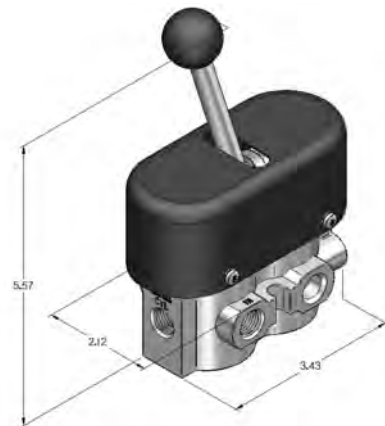
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250-4F – Foot Valve



250-4H – Hand Valve



MANUAL AND MECHANICAL VALVES

**SPECIFICATIONS**

Design Principle:	Pressure Unbalanced, Air Return, Spring Assist
Porting Type:	250-4F: 2-pos, 4-way; 250-4H: 3-pos, 4-way
Port Size:	1/4 PIPE
Media:	Air, Inert Gas
Pressure Range:	0–125 PSI
Temperature Range:	-20°F to 225°F
Flow @100 PSI:	50 CFM, 1415 LPM (Cv=0.8)

**HOW TO ORDER**

Base Model	Seals	
	Buna (std)	FKM
<b>250-4F</b>	-	-VAI
<b>250-4H</b>	-	-VAI

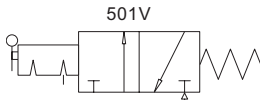
**Humphrey piston-poppet, 1/2 PIPE port Toggle valves achieve fully ported, high flow performance relative to overall size. Hard coated, cast aluminum body permits resistance to wear and easy mounting/plumbing. The pressure unbalanced piston poppet design achieves greater flow than comparable 1/2" valves and millions of trouble free cycles.**

**501V Toggle Valve, Detented**

**Available as 2- or 3-way, multi-purpose.**

**Features**

- Full ported 1/2" orifice, 1/2 PIPE ports.
- "Flow through" construction achieves greater flow than competition.
- Heavy duty lever.
- "Quick dump" permits fast cycling.
- Mount in any position via body mounting holes or threads, or optional base (-21).
- Plug for 2-way service.

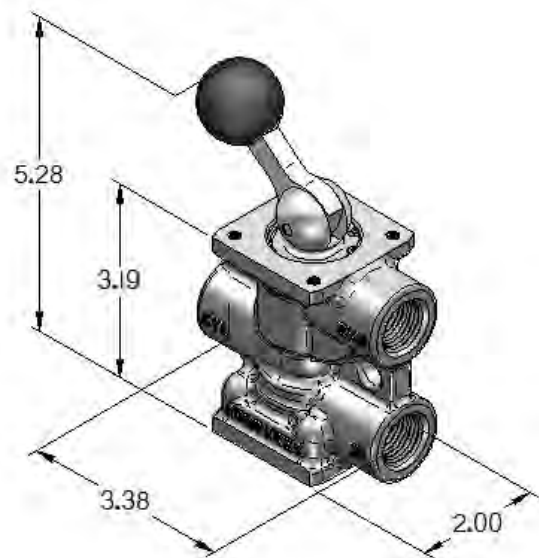


**FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:**

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



501V



**HOW TO ORDER**

Base Model	Ports		Multi-Purpose	Mounting	
	2-way	3-way		No Base	With Base
<b>501V</b>	-2	-3	-12	-	-21

Other Option Code: FKM Seals: "-VAI"

**SPECIFICATIONS**

Design Principle:	Pressure Unbalanced, Air Return, Spring Assist	Media:	Air, Inert Gas
Porting Type:	2- or 3-Way	Pressure Range:	0–125 PSI
Port Size:	1/2 PIPE	Temperature Range:	-20°F to 225°F
		Flow @100 PSI:	220 CFM, 6229 LPM (Cv=3.5)

# Diaphragm-Poppet Mechanical Valves

125B, 125MP, 125MC

*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

### Models/Descriptions:

- 125B:** Roller Ball Operated
- 125MP:** Plunger Operated
- 125MC:** Cam Operated

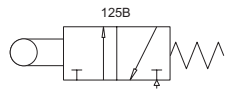
*These rugged 2- or 3-way valves are available in normally closed or normally open configurations, in standard or optional brass body construction (for alternate media).*

### Features

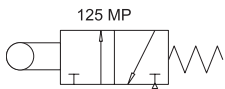
- Full ported 1/8" orifice, 1/8 PIPE ports.
- Fast cycling, high flow, quick dump.
- Reliable operation in lubricated or not lubricated systems. No sliding seals.
- Hard plumb mount, or panel mount using nuts or mounting base, via the 1"-20 UNEF body mounting threads (125 series) or mounting base (250 series).
- Buna N seals standard. Fluorocarbon seals optional.

**FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:**

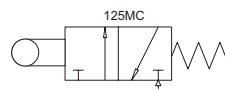
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



125B – Ball Cam



125MP – Plunger



125MC – Roller Cam



### SPECIFICATIONS

Design Principle:	Pressure Unbalanced, Air Return, Spring Assist
Porting Type:	2- or 3-Way
Port Size:	1/8 PIPE
Media:	Air, Inert Gas (Liquid with brass body)
Pressure Range:	0–125 PSI
Temperature Range:	-20°F to 225°F
Flow @100 PSI:	18 CFM, 510 LPM (Cv=0.3)

### HOW TO ORDER

Base Model	Ports		Function		Mounting	
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base
<b>125B</b>						
<b>125MP</b>	-2	-3	-10	-11	-20	-21
<b>125MC</b>						

Other Option Codes: FKM Seals: "-VAI"; Brass Bodv: "-BRB"

MANUAL AND MECHANICAL VALVES



The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air. Millions of trouble free cycles are expected, regardless of media or ambient conditions.

**250 Series Mechanical Valve:**

**250C: Cam Operated**

**500 Series Mechanical Valve:**

**500C: Cam Operated**

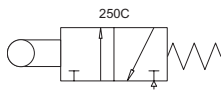
The rugged 250C is available 2- or 3-way, normally closed or open, and in optional brass body (for alternate media). High flow 500C is normally closed brass body only.

**Features**

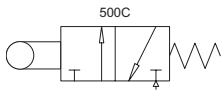
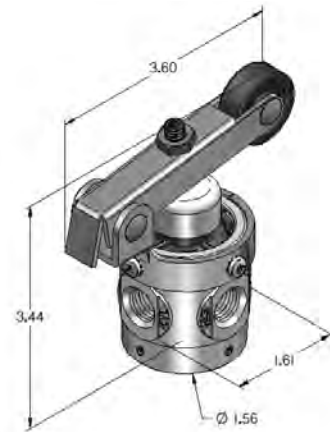
- 250C is full ported 1/4" orifice, 1/4 PIPE ports.
- 500C is full ported 1/2" orifice, 1/2 PIPE ports.
- Fast cycling, high flow, quick dump.
- Reliable operation in lubricated or not lubricated systems. No sliding seals.
- Hard plumb mount base mount.
- Buna N seals standard. Fluorocarbon seals optional.

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

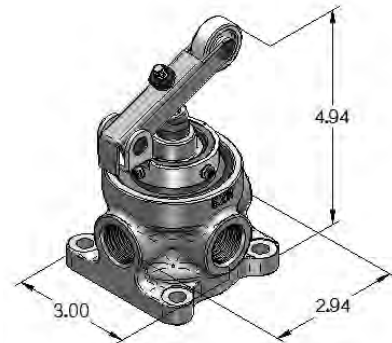
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



250C – Roller Cam



500C



**HOW TO ORDER**

Base Model	Ports		Function		Mounting	
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base
<b>250C</b>	-2	-3	-10	-11	-20	-21

Other Option Codes: FKM Seals: "-VAI"; Brass Body: "-BRB"

Base Model	Ports		NC Function
	2-way	3-way	
<b>500C</b>	-2	-3	-10

Other Option Codes: FKM Seals: "-VAI"; Aluminum Body: "-ALU"

**SPECIFICATIONS**

Design Principle:	Pressure Unbalanced, Air Return, Spring Assist	Pressure Range:	0–125 PSI
Porting Type:	2- or 3-Way	Temperature Range:	-20°F to 225°F
Port Size:	250C: 1/4 PIPE; 500C: 1/2 PIPE	Flow @100 PSI:	250: 50 CFM, 1415 LPM (Cv=0.8) 500: 160 CFM, 4530 LPM (Cv=2.7)
Media:	Air, Inert Gas		

## INDIRECT-ACTING SOLENOID VALVES

### INTRODUCTION

*Indirect-Acting Solenoid Valves utilize a small Humphrey Direct-Acting Solenoid Valve to pneumatically operate a larger Air-Pilot Valve, thus achieving high-flow capacity in smaller overall sizes and low power consumption. Indirect-Acting Solenoid Valves are the popular choice for operating pneumatic cylinders and actuators where the pneumatic pressures are typically set to 30-125 PSI. High internal shifting forces can be achieved resulting in reliable operation and long, trouble-free service.*

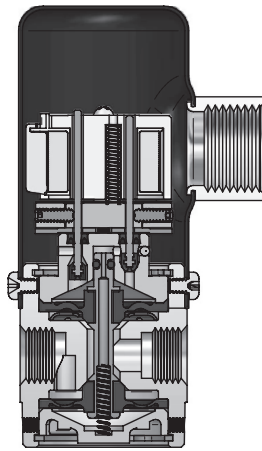
**INDIRECT-ACTING SOLENOID VALVES** are essentially two pneumatic valves in one package. Their advantages over Direct-Acting Valves are:

- Greater shifting forces.
- Smaller overall size, relative to flow.
- Lower power consumption, relative to flow and size.
- Greater variety. 2-, 3- or 4-way.

Available in porting through large 3/4 PIPE in 2-, 3- and 4-way models, they are the ideal choice for factory automation applications.

**DIAPHRAGM-POPPET TYPE:** Features its classic unique, simple and trouble free construction. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air. Millions of trouble free cycles are expected, regardless of media or ambient conditions.

**PISTON-POPPET TYPE:** Features a fully ported, high flow performance relative to overall size. The pressure unbalanced design achieves greater flow than comparable 1/2" valves, and millions of trouble free cycles.



250E1 Series  
Round Type, Unactuated

### INDIRECT-ACTING SOLENOID VALVE FEATURES:

- Compact Size.
- Low power consumption.
- High flow.
- No lubrication required.
- Types: Single Solenoid - Spring Return, or Double Solenoid - Detented.
- Brass body option available.
- External Air-Pilot models available for alternate media, including vacuum (see vacuum section, p. 64-71).



Round Type Valve Offering

<b>2-, 3-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Valves</b>	<b>Page</b>
<b>LARGE</b>	250 Series	1/4	50	250(A)E1, 250(A)E2	58
	500 Series	1/2	160	500(A)E1, 500(A)E2	60
	501 Series	1/2	220	501E1, 501E2	62
	590 Series	3/4	260	590(A)E1, 590(A)E2	61
<b>4-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Valves</b>	<b>Page</b>
<b>LARGE</b>	250-4 Series	1/4	50	250-4E1, 250-4E2	59
	501-4 Series	1/2	170	501-4E1, 501-4E2	63

*\*Nominal flow @100 PSI*



# Diaphragm-Poppet Solenoid Valves

250E1, 250AE1, 250E2, 250AE2

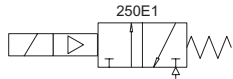
*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air, and inert media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

**250E1/250AE1: Single Solenoid – Spring Return Type**  
**250E2/250AE2: Double Solenoid – Detented Type**

**Valve is available as a 2- or 3-way, normally closed or open, single or double solenoid, and either internally or externally piloted (AE).**

## Features

- Full ported 1/4" orifice, 1/4 PIPE ports.
- Impervious to air quality, or whether lubricated or not lubricated.
- Short stroke and "quick dump" permits fast cycling.
- Class B rated, continuous duty coils.
- For low pressure or alternate media, select external piloted "AE" type.
- Optional brass body available.
- Design characteristics translate to an excellent vacuum valve. See vacuum valve section.



**FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:**

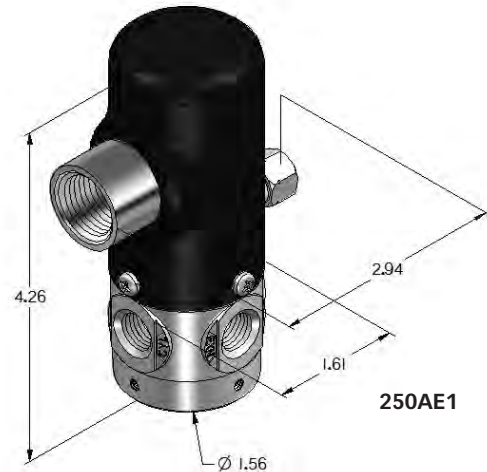
- Non-Catalog Options & Product Configuration Utility
- Additional Specifications & Data Sheets
- CAD Viewer & Model Downloads
- General Information & Handling Instructions



250E1



250AE1



250AE1

INDIRECT-ACTING SOLENOID VALVES

## HOW TO ORDER

Base Model	Ports		Function		Mounting		Electrical Entry		Voltage
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base	Lead Wires	Conduit	
<b>250E1</b>			-10	-11			-35		Specify
<b>250AE1</b>									
<b>250E2</b>	-2	-3			-20	-21		-36	
<b>250AE2</b>			-						

## SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Pressure Range:	30–100 PSI; AE 0–125 PSI
Porting Type:	2- or 3-Way	Temperature Range:	0°F to 125°F
Port Size:	1/4 PIPE	Flow @100 PSI:	50 CFM, 1415 LPM (Cv=0.8)
Media:	Air, Inert Gas (Liquid: AE-Type with brass body)	Power:	6.7 W/8.2 W
		Available Voltages:	12VDC, 24VDC, 24/50/60, 120/50/60, 240/50/60

*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air, and inert media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

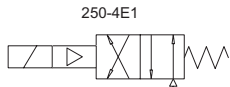
**250-4E1: Single Solenoid – Spring Return Type**

**250-4E2: Double Solenoid – Detented Type**

**Valve is available as a 4-way, single or double solenoid, internally piloted. Consult factory for 3-position models.**

### Features

- Full ported 1/4" orifice, 1/4 PIPE ports.
- Impervious to air quality, or whether lubricated or not lubricated.
- Short stroke and "quick dump" permits fast cycling.
- Class B rated, continuous duty coils.

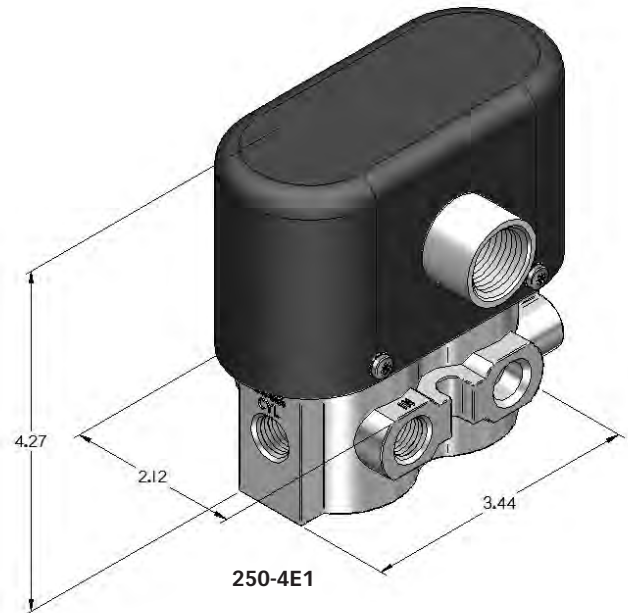


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- General Information & Handling Instructions



250-4E2



250-4E1

### HOW TO ORDER

Base Model	Mounting		Electrical Entry		Voltage
	No Base	With Base	Lead Wires	Conduit	
<b>250-4E1</b>	-	-21		-36	Specify
<b>250-4E2</b>					

Other Option Code: FKM Seals: "-VAI"

### SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Temperature Range:	0°F to 125°F
Porting Type:	4-Way	Flow @100 PSI:	50 CFM, 1415 LPM (Cv=0.8)
Port Size:	1/4 PIPE	Power:	6.7 W/8.2 W
Media:	Air, Inert Gas	Available Voltages:	12VDC, 24VDC, 24/50/60, 120/50/60, 240/50/60
Pressure Range:	30–100 PSI		

# Diaphragm-Poppet Solenoid Valves

500E1, 500AE1, 500E2, 500AE2

*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air, and inert media. Millions of trouble-free cycles are expected, regardless of media or ambient conditions.*

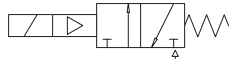
**500E1/500AE1: Single Solenoid – Spring Return Type**

**500E2/500AE2: Double Solenoid – Detented Type**

**Valve has brass body and available as a 2- or 3-way, normally closed or open, single or double solenoid, and either internally or externally piloted (AE).**

## Features

- Full ported 1/2" orifice, 1/2 PIPE ports.
- Impervious to air quality, or whether lubricated or not lubricated.
- Short stroke and "quick dump" permits fast cycling.
- Class B rated, continuous duty coils.
- For low pressure or alternate media, select external piloted "AE" type.
- Optional aluminum body available.
- Design characteristics translate to an excellent vacuum valve. See vacuum valve section.

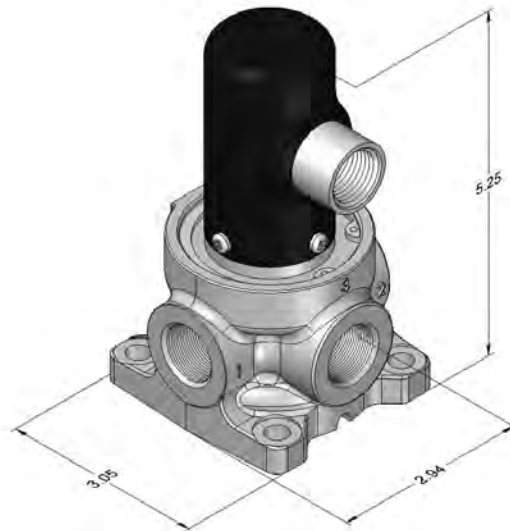


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500E1



INDIRECT-ACTING SOLENOID VALVES

## HOW TO ORDER

Base Model	Ports		Function		Electrical Entry		Voltage
	2-way	3-way	Norm Closed	Norm Open	Lead Wires	Conduit	
500E1	-2	-3	-10	-11	-35	-36	Specify
500AE1							
500E2							
500AE2							

Other Option Codes: Cover seal: "-61"; FKM Seals: "-VAI"; Aluminum Body: "-ALU"

## SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Temperature Range:	0°F to 125°F
Porting Type:	2- or 3-Way	Flow @100 PSI:	5160 CFM, 4530 LPM (Cv=2.7)
Port Size:	1/2 PIPE	Power:	6.7 W/8.2 W
Media:	Air, Inert Gas (Liquid: AE Type)	Available Voltages:	12 VDC, 24VDC, 24/50/60, 120/50/60, 240/50/60
Pressure Range:	30–105 PSI (AE-Type: 0–125 PSI)		

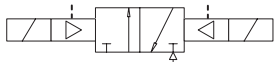
**The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air, and inert media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.**

**590E1/590AE1: Single Solenoid – Spring Return Type**  
**590E2/590AE2: Double Solenoid – Detented Type**

**Valve is available as a 2- or 3-way, normally closed or open, single or double solenoid, and either internally or externally piloted (AE).**

### Features

- Valve has 0.59" orifice, 3/4 PIPE ports.
- Impervious to air quality, or whether lubricated or not lubricated.
- Short stroke and "quick dump" permits fast cycling.
- Class B rated, continuous duty coils.
- For low pressure or alternate media, select external piloted "AE" type.
- Optional brass body available.
- Design characteristics translate to an excellent vacuum valve. See vacuum valve section.

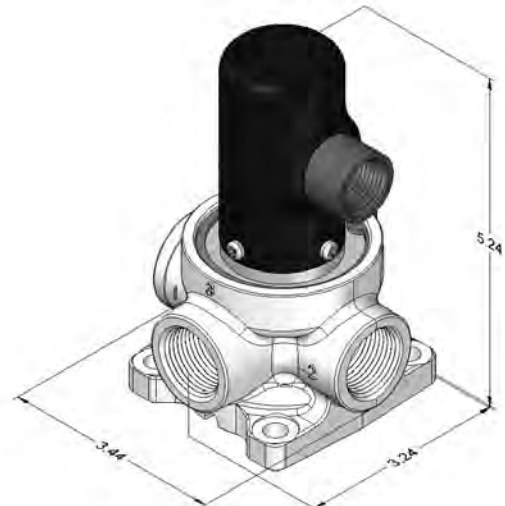


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590E1



### HOW TO ORDER

Base Model	Ports		Function		Electrical Entry		Voltage
	2-way	3-way	Norm Closed	Norm Open	Lead Wires	Conduit	
590E1	-2	-3	-10	-11	-35	-36	Specify
590AE1							
590E2			-				
590AE2							

Other Option Codes: Cover seal: "-61"; FKM Seals: "-VA1"; Brass Body: "-BRB"

### SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Pressure Range:	30–100 PSI (AE-Type: 0–125 PSI)
Porting Type:	2- or 3-Way	Temperature Range:	0°F to 125°F
Port Size:	3/4 PIPE	Flow @100 PSI:	260 CFM, 7362 LPM (Cv=3.7)
Media:	Air, Inert Gas (Liquid: AE Type with brass body)	Power:	6.7 W/8.2 W
		Available Voltages:	12 VDC, 24VDC, 24/50/60, 120/50/60, 240/50/60

# Piston-Poppet Solenoid Valves

501E1, 501E2

**Humphrey piston-poppet, 1/2 PIPE port solenoid valves achieve fully ported, high flow performance relative to overall size. Hard coated, cast aluminum body permits resistance to wear and easy mounting/plumbing. The pressure unbalanced piston poppet design achieves greater flow than comparable 1/2" valves and millions of trouble free cycles.**

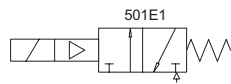
**501E1: Single Solenoid – Spring Return Type**

**501E2: Double Solenoid – Detented Type**

**Available as 2- or 3-way, normally open or normally closed, and single or double solenoid.**

## Features

- Full ported 1/2" orifice, 1/2 PIPE ports.
- "Flow through" construction achieves greater flow than competition.
- Short stroke and "quick dump" permits fast cycling.
- Class B rated, continuous duty coils.
- Mount in any position via body mounting holes or threads, or optional base (-21).
- Plug for 2-way service.

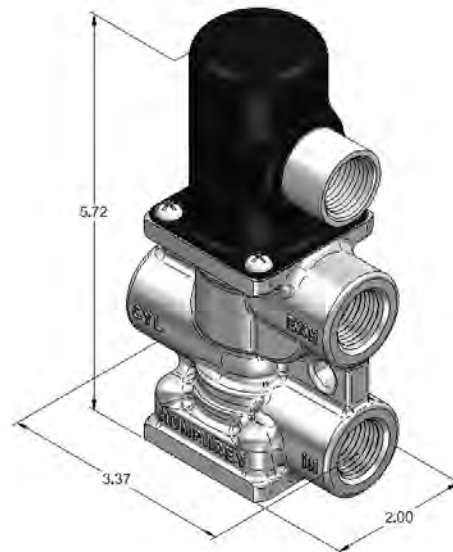


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501E1



## HOW TO ORDER

Base Model	Ports		Function		Mounting		Electrical Entry		Voltage
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base	Lead Wires	Conduit	
501E1	-2	-3	-10	-11	-	-21	-35	-36	Specify
501E2									

Other Option Code: Cover seal: "-61"; FKM Seals: "-VAI"

## SPECIFICATIONS

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Temperature Range:	0°F to 150°F
Porting Type:	2- or 3-Way	Flow @100 PSI:	220 CFM, 6230 LPM (Cv=3.5)
Port Size:	1/2 PIPE	Power:	6.7 W/8.2 W
Media:	Air, Inert Gas	Available Voltages:	12 VDC, 24VDC, 24/50/60, 120/50/60, 240/50/60
Pressure Range:	30–100 PSI		

INDIRECT-ACTING SOLENOID VALVES



*Humphrey piston-poppet, 1/2 PIPE port solenoid valves achieve fully ported, high flow performance relative to overall size. Hard coated, cast aluminum body permits resistance to wear and easy mounting/plumbing. The pressure unbalanced piston poppet design achieves greater flow than comparable 1/2" valves and millions of trouble free cycles.*

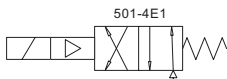
**501-4E1: Single Solenoid – Spring Return Type**

**501-4E2: Double Solenoid – Detented Type**

**Available as 4-way, single or double solenoid.**

**Features**

- Full ported 1/2" orifice, 1/2 PIPE ports.
- "Flow through" construction achieves greater flow than competition.
- Short stroke and "quick dump" permits fast cycling.
- Class B rated, continuous duty coils.
- Mount in any position via body mounting lugs.

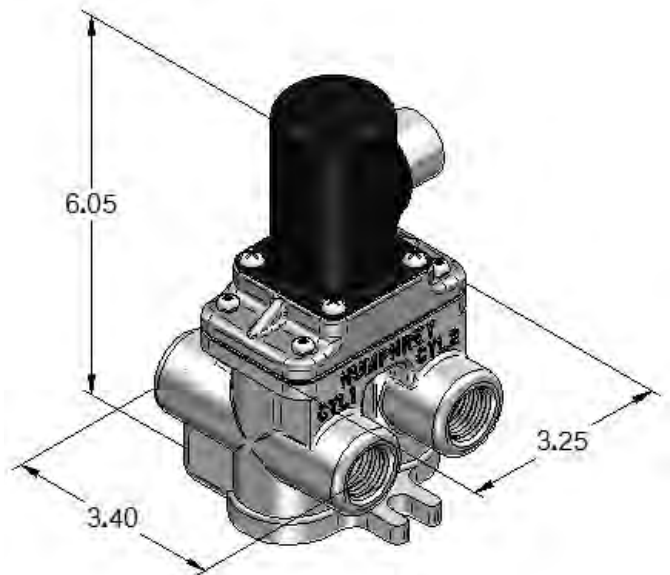


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501-4E1



**HOW TO ORDER**

Base Model	Electrical Entry		Voltage
	Lead Wires	Conduit	
501-4E1		-36	Specify
501-4E2			

Other Option Code: FKM Seals: "-VAI"

**SPECIFICATIONS**

Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Temperature Range:	0°F to 150°F
Porting Type:	4-Way	Flow @100 PSI:	170 CFM, 4810 LPM (Cv=2.5)
Port Size:	1/2 PIPE	Power:	6.7 W/8.2 W
Media:	Air, Inert Gas	Available Voltages:	12 VDC, 24VDC, 24/50/60, 120/50/60, 240/50/60
Pressure Range:	30–100 PSI		

# VACUUM VALVES

## INTRODUCTION

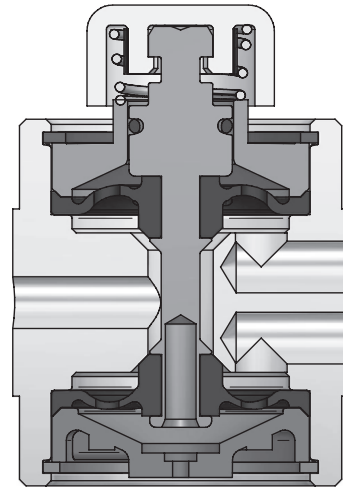
**Vacuum Valves control the flow of vacuum for material handling or process control where other mechanical methods may not be suitable. Various Humphrey valves may be used for vacuum but the poppet and diaphragm poppet designs shown below offer unique advantages versus competitive models that are not specifically modified for vacuum use.**

The advantages of vacuum valves are the following:

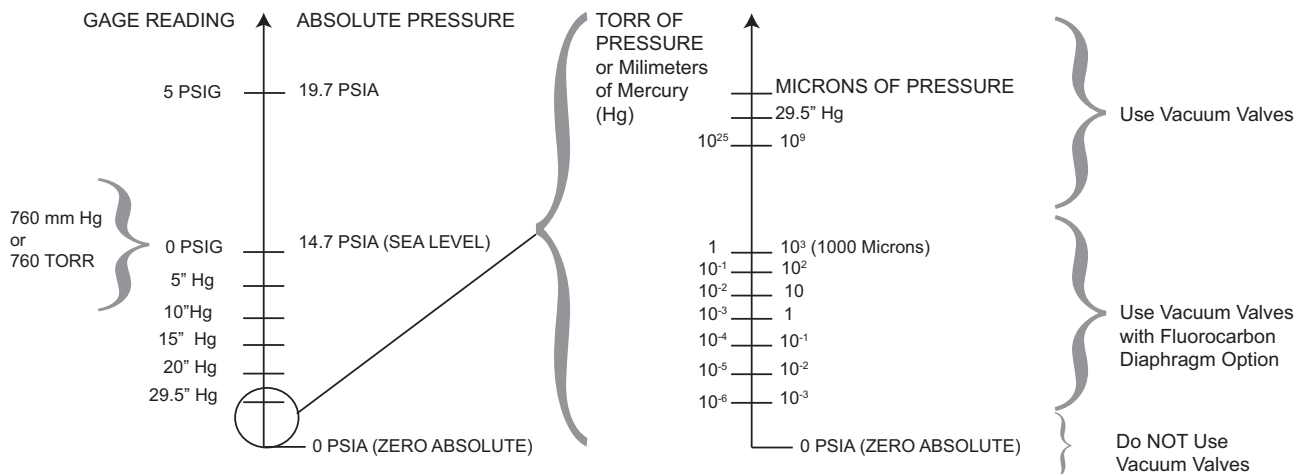
- Poppet design offers small Direct-Operating Solenoid Valves requiring no air or vacuum pilot. Many models are available, with a full pressure range of 28"Hg ~ 125 PSI. See Humphrey Direct-Acting Solenoid Valve section, pages 10-19 in this catalog.
- Diaphragm poppet design, featured in this section, offers unique construction that uses the vacuum to assist sealing resulting in a condition where the higher the vacuum the tighter the valve's seal. A wide variety of actuation types are available including Solenoid, Air-Pilot, Manual and Mechanical.

### VACUUM VALVE FEATURES:

- Small Size – mount close to work.
- No Lubrication.
- Contamination tolerant.
- No sliding seals.
- No sticking.
- Full orifice.
- Multi media/vacuum and air/gas.
- Various types of actuation.



**V250P - Diaphragm Poppet Valve**



### GENERAL VACUUM INFORMATION

<b>SOLENOID 2-, 3-WAY VALVES</b>		<b>Ports</b>	<b>Valves</b>	<b>Page</b>
<b>LARGE</b>	250 Series	1/4	VA250AE1(2), VV250AE1	66
	500 Series	1/2	VA500AE1(2), VV500AE1	67
	590 Series	3/4	VA590AE1(2), VV590AE1	67
<b>AIR-PILOT 2-, 3-WAY VALVES</b>		<b>Ports</b>	<b>Valves</b>	<b>Page</b>
<b>SMALL</b>	125 Series	1/8	VA125A, VV125A	68
	250 Series	1/4	VA250A, VV250A	68
<b>LARGE</b>	500 Series	1/2	VA500A, VV500A	69
	590 Series	3/4	VA590A, VV590A	69
<b>MANUAL/MECHANICAL 2-, 3-WAY VALVES</b>		<b>Ports</b>	<b>Valves</b>	<b>Page</b>
<b>SMALL</b>	125 Series	1/8	V125B, V125HO, V125P, V125V	70
	250 Series	1/4	V250C, V250F, V250P, V250V	71

*See Direct-Acting Solenoid Valves (pages 4-21) for additional models suitable for vacuum service.*



# Diaphragm-Poppet Vacuum Valves

VA250AE1(2), VV250AE1

*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works well with clean or dirty vacuum service. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

**VA250AE1/VV250AE1:**

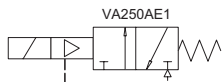
**Single Solenoid – Spring Return Type**

**VA250AE2: Double Solenoid – Detented Type**

*Valve is available as a 2- or 3-way, normally closed or open, single or double solenoid, and either externally air or vacuum piloted (VV).*

## Features

- Full ported 1/4" orifice, 1/4 PIPE ports.
- Impervious to media quality, particularly as atmospheric air enters exhaust.
- Short stroke and high flow permits fast cycling.
- Class B rated, continuous duty coils.
- Optional brass body available.

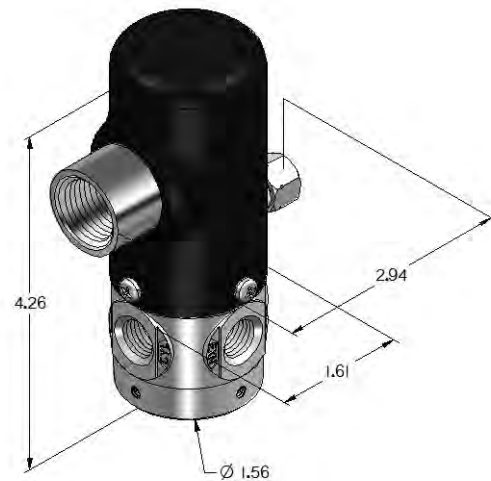


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- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



VA250AE1



VACUUM VALVES

## HOW TO ORDER

Base Model	Ports		Function		Mounting		Electrical Entry		Voltage
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base	Lead Wires	Conduit	
<b>VA250AE1</b>	-2	-3	-10	-11	-20	-21		-36	Specify
<b>VV250AE1</b>									
<b>VV250AE2</b>			-						

Other Option Codes: FKM Seals: "-VAI"; Brass Body: "-BRB"

## SPECIFICATIONS

Design Principle:	Pressure Unbalanced - Spring Return	Temperature Range:	0° to 125°F
Porting Type:	2- or 3-Way	Flow @100 PSI:	Cv=0.8
Port Size:	1/4 PIPE	Power:	6.7 W/8.2 W
Media:	Vacuum	Available Voltages:	12VDC, 24VDC, 24/50/60, 120/50/60, 240/50/60
Pressure Range:	VA type: 0-29.5" Hg. (VV type: 20-29.5" Hg)		

# Diaphragm-Poppet Vacuum Valves

VA500AE1(2), VV500AE1, VA590AE1(2), VV590AE1

The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works well with clean or dirty vacuum service. Millions of trouble free cycles are expected, regardless of media or ambient conditions.

- VA500AE1/VV500AE1:**  
Single Solenoid – Spring Return Type
- VA590AE1/VV590AE1:**  
Single Solenoid – Spring Return Type
- VA500AE2/VA590AE2:**  
Double Solenoid – Detented Type

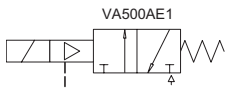
Valve is available as a 2- or 3-way, normally closed or open, single or double solenoid, and either externally air or vacuum piloted (VV).

### Features

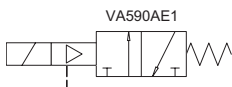
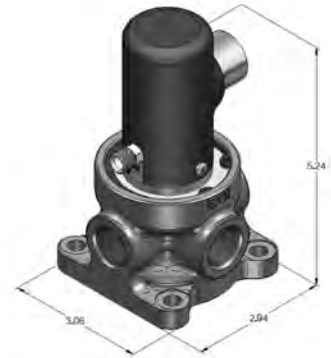
- Full ported 1/2" orifice, 1/2 PIPE ports, and 0.59" orifice, 3/4 PIPE ports.
- Impervious to media quality, particularly as atmospheric air enters exhaust.
- Short stroke and high flow permits fast cycling.
- Class B rated, continuous duty coils.
- Optional aluminum body available.
- Valve body includes mounting through holes.

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

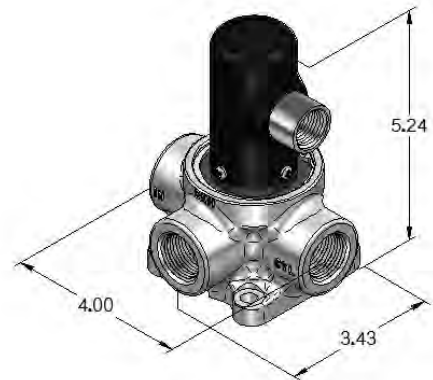
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



VA500AE1



VA590AE1



### HOW TO ORDER

Base Model	Ports		Function		Electrical Entry		Voltage
	2-way	3-way	Norm Closed	Norm Open	Lead Wires	Conduit	
VA500AE1	-2	-3	-10	-11		-36	Specify
VV500AE1							
VA590AE1							
VV590AE1							
VA500AE2							
VA590AE2							

Other Option Codes: FKM Seals: "-VA1"

### SPECIFICATIONS

Design Principle:	Pressure Unbalanced - Spring Return
Porting Type:	2- or 3-Way
Port Size:	1/2 PIPE, 3/4 PIPE
Media:	Vacuum
Pressure Range:	VA type: 0-29.5" Hg. (VV type: 20-29.5" Hg)
Temperature Range:	0° to 125°F
Flow @100 PSI:	500: Cv=2.7; 590: Cv=3.7
Power:	6.7W/8.2W
Available Voltages:	12VDC, 24VDC, 24/50/60, 120/50/60, 240/50/60

VACUUM VALVES

# Diaphragm-Poppet Piloted Vacuum Valves

VA125A, VA250A, VV250A

The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or dirty vacuum media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.

**VA125A/VA250A: Air-Pilot – Spring Return Type**

**VV250A: Vacuum-Pilot – Spring Return Type**

Valves are available as a 2- or 3-way, normally closed, single air or vacuum piloted (VV250A).

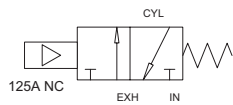
**Optional brass body material available.**

## Features

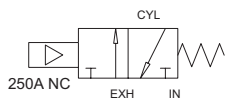
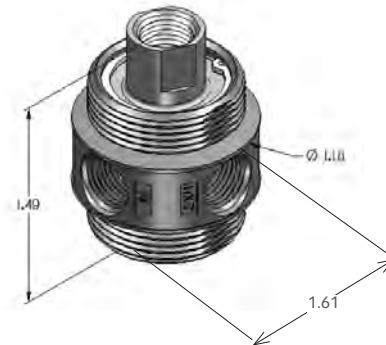
- Full ported 1/8" orifice, 1/8 PIPE ports, and 1/4" orifice, 1/4 PIPE ports.
- Fast cycling, high flow, quick dump.
- Impervious to media quality, particularly as atmospheric air enters exhaust.
- Hard plumb mount, base mount, or panel mount (use panel mount nuts for 125 series or inverted mounting base for 250 series).
- Buna N seals standard. Fluorocarbon seals optional.

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

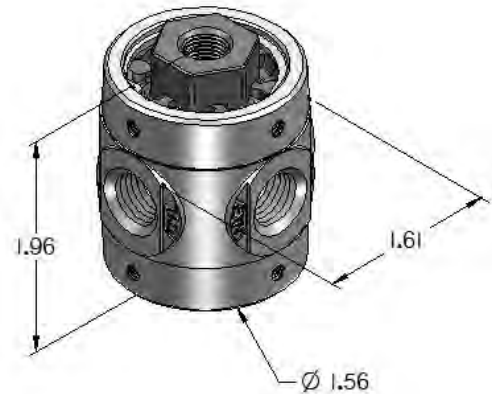
- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



VA125A



VA/VV250A



## HOW TO ORDER

Base Model	Ports		Function		Mounting	
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base
<b>VA125A</b>						
<b>VA250A</b>	-2	-3	-10		-20	-21
<b>VV250A</b>						

Other Option Codes: FKM Seals: "-VAI"; Brass Body: "-BRB"

## SPECIFICATIONS

Design Principle:	Pressure Unbalanced - Spring Return	Pressure Range:	VA type: 0-29.5" Hg. (VV type: 20-29.5" Hg)
Porting Type:	2- or 3-Way, NC	Temperature Range:	-20° to 225°F
Port Size:	125: 1/8 PIPE; 250: 1/4 PIPE	Flow @100 PSI:	125: Cv=0.3; 250: Cv=0.8
Media:	Vacuum		

The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or dirty vacuum media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.

**VA500A/VA590A: Air-Pilot – Spring Return Type**

**VV500A/VV590A: Vacuum-Pilot – Spring Return Type**

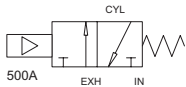
Valves are available as a 2- or 3-way, normally closed, single air or vacuum piloted (VV).

## Features

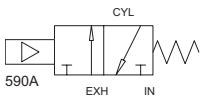
- Full ported 1/2" orifice, 1/2 PIPE ports, and 0.59" orifice, 3/4 PIPE ports.
- Fast cycling, high flow, quick dump.
- Impervious to media quality, particularly as atmospheric air enters exhaust.
- Hard plumb mount or base mount via body mounting through holes.
- Buna N seals standard. Fluorocarbon seals optional.
- **500 Series:** Brass body standard, optional aluminum body available.
- **590 Series:** Aluminum body standard, optional brass body available.

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VA/VV500A



VA/VV590A



## HOW TO ORDER

Base Model	Ports		Function	
	2-way	3-way	Norm Closed	Norm Open
VA500A	-2	-3	-10	
VV500A				
VA590A				
VV590A				

Other Option Codes: FKM Seals: "-VAI"  
 Aluminum Body: "-ALU" (500 Series)  
 Brass Body: "-BRB" (590 Series)

## SPECIFICATIONS

Design Principle:	Pressure Unbalanced, Spring Return	Pressure Range:	VA type: 0-29.5" Hg. (VV type: 20-29.5" Hg)
Porting Type:	2- or 3-Way, NC	Temperature Range:	0° to 225°F
Port Size:	500: 1/2 PIPE; 590: 3/4 PIPE	Flow @100 PSI:	500: Cv=2.7; 590: Cv=3.7
Media:	Vacuum		

# Diaphragm-Poppet Manual/Mechanical Vacuum Valves

V125B, V125HO, V125P, V125V, V250P, V250V, V250C, V250F

The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or dirty vacuum media. Millions of trouble free cycles are expected, regardless of media or ambient conditions.

**Valves include:**

- V125B:** 1/8 Roller Ball Operated
- V125HO:** 1/8 Push and Turn Detented
- V125P:** 1/8 Pushbutton
- V125V:** 1/8 Toggle
- V250P:** 1/4 Pushbutton
- V250V:** 1/4 Toggle
- V250C:** 1/4 Cam Operated
- V250F:** 1/4 Foot Operated

Valves are available as a 2- or 3-way, normally closed. Optional brass body material available.

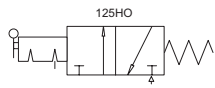
**Features**

- Full ported 1/8" orifice, 1/8 PIPE ports, and 1/4" orifice, 1/4 PIPE ports.
- Impervious to media quality, particularly as atmospheric air enters exhaust.
- Hard plumb mount, base mount, or panel mount (use panel mount nuts for 125 series or inverted mounting base for 250 series).
- Buna N seals standard. Fluorocarbon seals optional.

FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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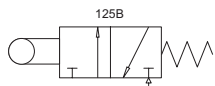
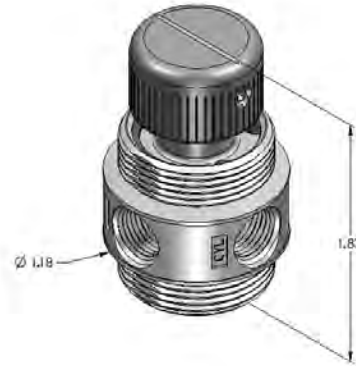
VACUUM VALVES



125 Manual Series



V125HO - Hold On



125 Mechanical Series



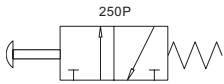
V125B - Ball Cam



**SPECIFICATIONS**

Design Principle:	Pressure Unbalanced - Spring Return	Pressure Range:	0-29.5" Hg.
Porting Type:	2- or 3-Way, NC	Temperature Range:	-20° to 225°F
Port Size:	125: 1/8 PIPE; 250: 1/4 PIPE	Flow @100 PSI:	125: Cv=0.3; 250: Cv=0.8
Media:	Vacuum		

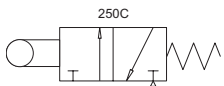
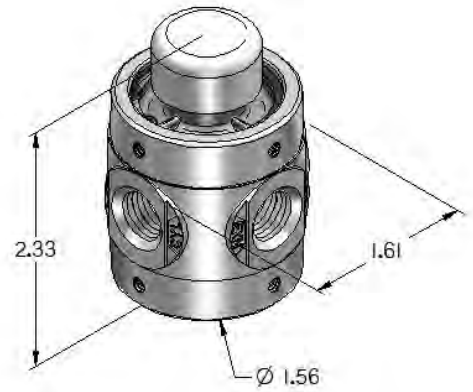




250 Manual Series



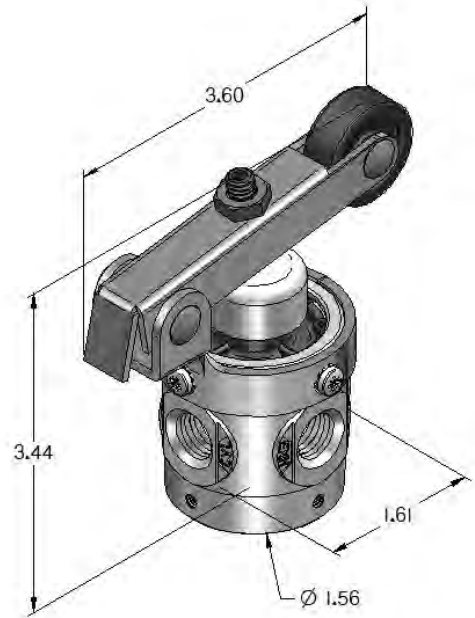
V250P – Push Button



250 Mechanical Series



V250C – Cam Roller



## HOW TO ORDER

Base Model	Ports		Function		Mounting	
	2-way	3-way	Norm Closed	Norm Open	No Base	With Base
V125B						
V125HO						
V125P						
V125V						
V250P	-2	-3	-10		-20	-21
V250V						
V250C						
V250F						

Other Option Codes: FKM Seals: "-VAI"; Brass Body: "-BRB"

VACUUM VALVES

# CARTRIDGE INSERT VALVES

## INTRODUCTION

Cartridge Insert Valves use the proven designs and principles of Humphrey inline and manifold valves, but with valve bodies that permit insertion into a custom manifold. These manifolds can be designed by the customer or by Humphrey Engineered Solutions to satisfy the function and shape of each design requirement.

The advantages of Cartridge Insert Valves are the following:

- Incorporation into customer's own product vs. "hanging on" as an external component.
- Insert valve becomes unrecognizable element of customer's own product.
- Insert valve become a proprietary element for service control by customer.
- Combinations of insert valves permit various and multiple valve configurations.



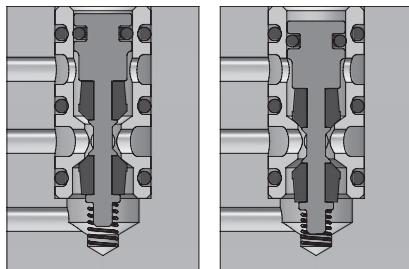
Two-Way Valves



Three-Way Valves

## INSERT VALVE FEATURES:

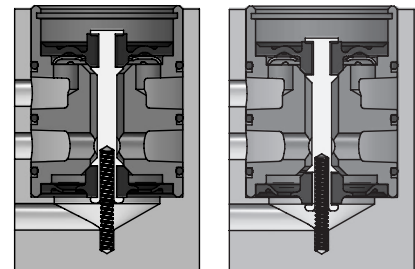
- Various orifices (1/8" thru 1/2").
- Various functions (2-, 3- and 4-way).
- Small size.
- Short stroke.
- Fast response.
- Simple construction.
- Reliability.
- Multi media.
- Various types of actuation (See below).



Y125IN Closed

Y125IN Open

Piston Poppet Type  
(J, W and Y Series)

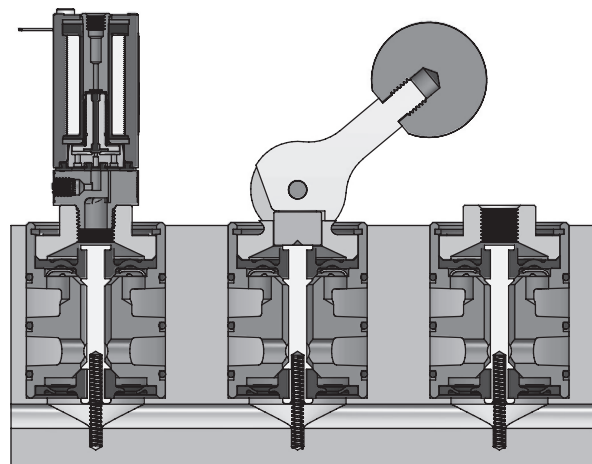


250IN Closed

250IN Open

Diaphragm Poppet Type  
(125INS, 125INL and 250IN Series)

## VARIOUS TYPES OF ACTUATION



Solenoid

Lever

Air-Pilot

CARTRIDGE INSERT VALVES

<b>2-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Page</b>
<b>AIR, MANUAL, OR MECHANICAL</b>	125INS Diaphragm Poppet Series	1/8"	22	74-75
	J125IN Poppet Series	1/8"	15	76-77
<b>3-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Page</b>
<b>AIR, MANUAL, OR MECHANICAL</b>	125INL Diaphragm Poppet Series	1/8"	22	74-75
	Y125IN Poppet Series	1/8"	15	76-77
	250IN Diaphragm Poppet Series	1/4"	60	74-75
	Y250IN Poppet Series	1/4"	50	76-77
	Y500IN Poppet Series	1/2"	190	76-77
<b>3-WAY VALVES</b>		<b>Ports</b>	<b>CFM*</b>	<b>Page</b>
<b>MANUAL OR MECHANICAL</b>	W125IN Poppet Series	1/8"	15	76-77
	W250IN Poppet Series	1/4"	50	76-77

\*Nominal flow @100 PSI



# Diaphragm-Poppet Cartridge Valves

125INS, 125INL, 250IN

*The classic Humphrey diaphragm-poppet design is unique, simple and trouble free. Valve does not leak. Seals tight and cannot stick. Works with clean or poor air. Millions of trouble free cycles are expected, regardless of media or ambient conditions.*

### 125INS, 125INL and 250IN Cartridge Valves

*The compact design permits limited space occupied by the valve within your product.*

*Multiple manual, mechanical or air-pilot operators available, or simply apply direct force to the valve stem.*

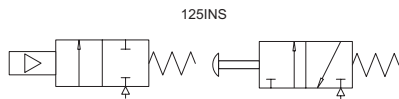
### Features

- Full ported 1/8" orifice, and 1/4" orifice.
- Fast cycling, high flow, quick dump.
- Reliable operation in lubricated or not lubricated systems whether media is clean or dirty. No sliding seals.
- Buna N seals standard. Fluorocarbon seals optional.
- Solenoid pilot operators available. Consult factory.
- Standard Optional Operators:
  - A: Air-Pilot
  - AA: Air-Pilot, "AA" type
  - P: Manual Pushbutton
  - HO: Manual Push and Hold
  - V: Manual Detented Lever
  - B: Mechanical Roller Ball

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CARTRIDGE INSERT VALVES



125INS



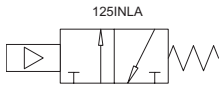
### HOW TO ORDER 125INS

Base Model	Ports		Function	
	2-way	3-way	Norm Closed	Norm Open
125INS-A	-2		-10	
125INS-B				
125INS-HO		-3		
125INS-P				
125INS-V				
125INS				

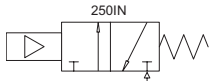
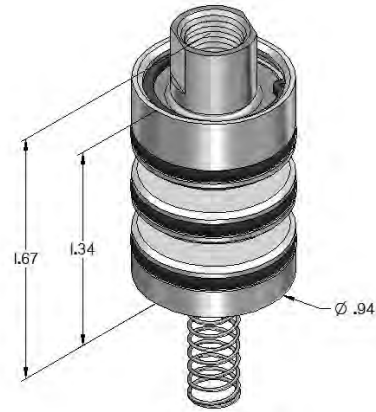
Buna seals std. FKM Seals: "-VAI"

### SPECIFICATIONS (Please consult factory representative prior to use with oxygen.)

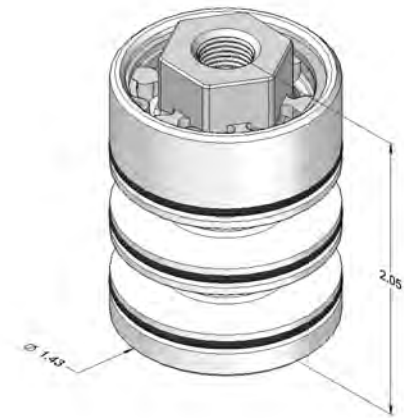
Design Principle:	Pressure Unbalanced – Spring Return	Pressure Range:	0–125 PSI
Porting Type:	2- or 3-Way	Temperature Range:	-10°F to 125°F
Orifice Size (inch):	1/8, 1/4	Flow @100 PSI:	125: 18 CFM, 510 LPM (Cv=0.3)
Media:	Air, Inert Gas		250: 50 CFM, 1415 LPM (Cv=0.8)



125INLA-3-10



250INA-3-10



CARTRIDGE INSERT VALVES

## HOW TO ORDER 125INL

Base Model	Ports		Function	
	2-way	3-way	Norm Closed	Norm Open
125INL		-3	-10	
125INL-P				
125INL-B				
125INL-AA				
125INL-A				

Buna seals std. FKM Seals: "-VAI"

## HOW TO ORDER 250INL

Base Model	Ports		Function	
	2-way	3-way	Norm Closed	Norm Open
250INL-BASIC		-3	-10	
250INL-P				
250INL-A				

Buna seals std. FKM Seals: "-VAI"

# Piston-Poppet Cartridge Valves

J125IN, Y125IN, Y250IN, Y500IN, W125IN, W250IN

The Humphrey J, and W Series, piston-poppet valves are the smallest of the Humphrey cartridge valve family. The pressure unbalanced, high flow, 2- and 3-way design uses the air supply to seal the valve closed in the normal, unactuated position. The two sizes are operated via manual or mechanical means.

Y Series piston-poppet, cartridge valves have a captured exhaust, and can be plumbed normally closed or open. Large flow capacity, Y500IN, 3-way cartridge valve with captured exhaust also available. Actuate via manual, mechanical or air-pilot means.

### Order Codes and descriptions:

J125IN: 2-way, 1/8 orifice

J250IN: 2-way, 1/4 orifice

W125IN: 3-way, 1/8 orifice

W250IN: 3-way, 1/4 orifice

### Order Codes and descriptions:

Y125IN: 3-port, 1/8 orifice

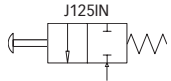
Y250IN: 3-port, 1/4 orifice

Y500IN: 3-port, 1/2 orifice

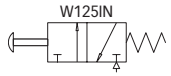
FOR ADDITIONAL INFORMATION AND SPECIFICATIONS, VISIT [WWW.HUMPHREY-PRODUCTS.COM](http://WWW.HUMPHREY-PRODUCTS.COM) TO ACCESS:

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

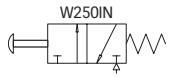
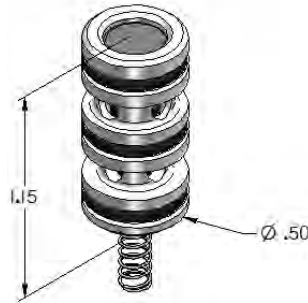
CARTRIDGE INSERT VALVES



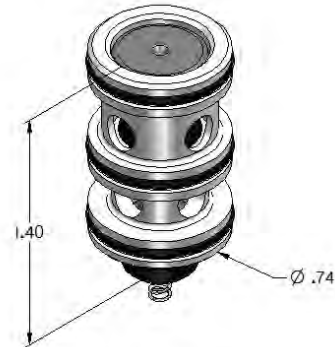
J125IN



W125IN



W250IN

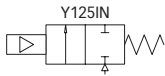


### SPECIFICATIONS

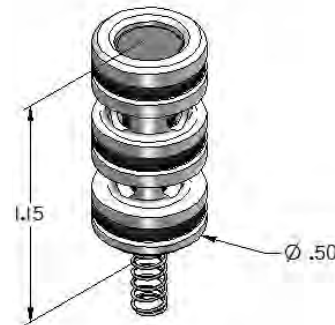
Design Principle:	Pressure Unbalanced – Air Return, Spring Assist	Pressure Range:	0–125 PSI
Porting Type:	J Series: 2-Way, NC W Series: 3-Way, NC Y Series: 3-Way, Multi-purpose	Temperature Range:	-10°F to 225°F
Orifice Size (inch):	1/8, 1/4, 1/2	Flow @100 PSI:	125: 15 CFM, 425 LPM (Cv=0.3) 250: 50 CFM, 1415 LPM (Cv=0.8) 500: 190 CFM, 5380 LPM (Cv=3.2)
Media:	Air, Inert Gas		

# Piston-Poppet Cartridge Valves

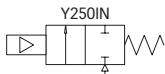
J125IN, Y125IN, Y250IN, Y500IN, W125IN, W250IN



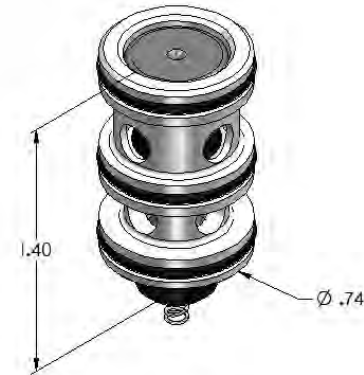
Y125IN



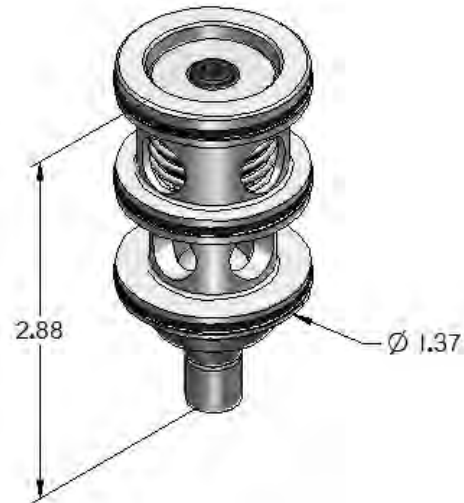
Y125



Y250IN



Y500IN



## HOW TO ORDER

Base Model	Ports		Function	
	2-way	3-way	Norm Closed	Norm Open
J125IN	-		-	
J250IN				
W125IN			-	
W250IN				
Y125IN		-	-	
Y250IN				
Y500IN				

Buna seals std. FKM Seals: "-VAI"

CARTRIDGE INSERT VALVES

# QUICK EXHAUST VALVES

## INTRODUCTION

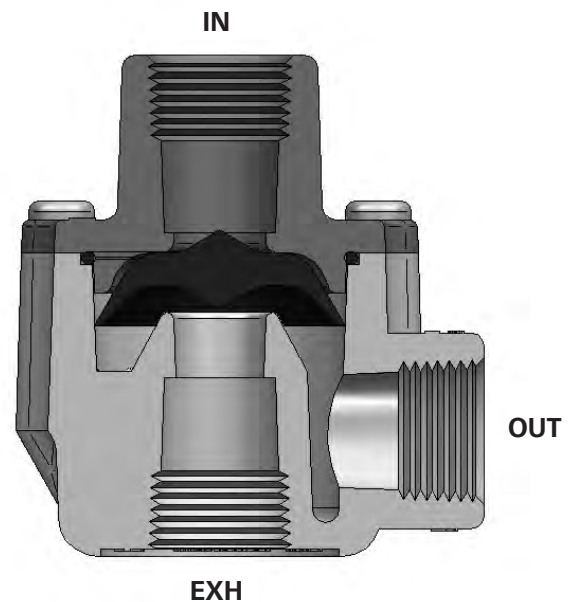
*Quick Exhaust Valves accelerate the speed of pneumatic functions. The valves release pneumatic pressure to atmosphere at a point close to the functioning device (such as linear cylinders, rotary actuators, and volume chambers) versus at the remotely placed control valve.*

## THE ADVANTAGES OF HUMPHREY'S SUPER QUICK EXHAUSTS ARE THE FOLLOWING:

- Special molded shuttle designed especially for quick exhaust valve service.
- Shuttle's full-formed seating surface provides:
  - Long cycle life.
  - Outperforms flat-disk (sheet stock) diaphragms found in competitive designs.
- Shuttle's reinforced center section eliminates flow restricting metal body webbing of flat-disk designs.

## QUICK EXHAUST VALVES CAN ALSO BE USED AS:

- Shuttle valves.
- Check valves.
- Flow/speed control valves.



## How Super Quick Exhaust Valves are used to enhance the performance of air cylinders

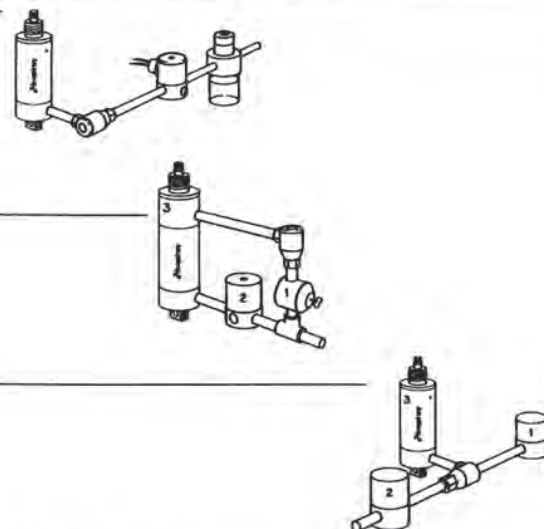
**Lubrication Problem.** Small bore cylinders are often poorly lubricated due to the small displacement of air per cycle. Lubricant back-flows through control valve on the exhaust cycle without reaching cylinder. Oil traces at the valve exhaust port does not prove proper cylinder lubrication.

**Solution:** Close nipple Super Quick Exhaust to cylinder. This stops back-flow and allows progressive oil flow to cylinder. Oil traces at the Super QE exhaust port prove cylinder lubrication.

**"Air Spring" Return.** Provides controlled "air spring" return, a potential advantage over standard spring return cylinders in that the "air spring" return force can be adjusted by a regulator. Also provides a method of controlling double acting cylinders with a 3-way valve. Return-regulator (1) set at selected pressure. (2) Normally closed 3-way valve. (3) Double acting cylinder. Example of use: Cylinder rod extends with high pressure for impact. Rod retracts under low pressure.

**Super Quick Exhaust used as a shuttle valve.** Air from 3-way valves (1 or 2) always directed to cylinder (3).

**High-Low Pressure.** Reduce noise, shock, and stress on cylinder. Extend rod with low pressure (2) to position, hold, etc. Switch to high pressure (1) to lock, bend, reposition, etc. Return to low pressure by closing (1), or retract rod by closing (1) and (2).





	<b>QUICK EXHAUST VALVES</b>	<b>Ports</b>	<b>CFM*</b>	<b>Page</b>
<b>SMALL</b>	SQE	10-32	7	80-81
	SQE1	1/8	63	80-81
	SQE2	1/4	85	80-81
<b>LARGE</b>	QE2	1/4	120	80-81
	QE3	3/8	155	80-81
	QE4	1/2	373	80-81
	QE5	3/4	395	80-81

*\*Nominal flow @100 PSI*



# Super Quick Exhaust Valves

SQE, SQE1, SQE2, QE2, QE3, QE4, QE5

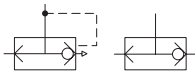
The Humphrey family of Super Quick Exhaust valves are world renowned for service life and high flow. Available in seven sizes from 10-32 porting to 3/4 PIPE port, Humphrey Quick Exhaust valves have a bat wing, molded shuttle that totally outperforms competitive flat-disc, sheet stock diaphragm types.

## Features

- Mount close cylinder port. Quick dumps exhausting air for high speed cycling.
- Compact size, very high flow.
- Outperforms all others.
- Outlasts all others.
- Use as shuttle valve. Plug exhaust port for check valve function.

## Order Codes and Descriptions:

- SQE:** 10-32 UNF Miniature Quick Exhaust
- SQE1:** 1/8 PIPE Small Quick Exhaust
- SQE2:** 1/4 PIPE Small quick exhaust
- QE2:** 1/4 PIPE Quick Exhaust
- QE3:** 3/8 PIPE Quick Exhaust
- QE4:** 1/2 PIPE Large Quick Exhaust
- QE5:** 3/4 PIPE Large Quick Exhaust

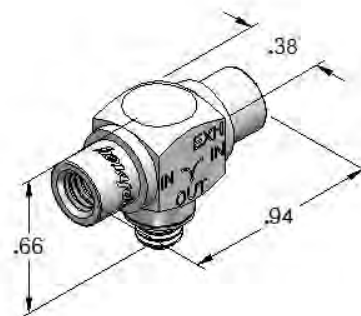


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- Non-Catalog Options & Product Configuration Utility
- CAD Viewer & Model Downloads
- Additional Specifications & Data Sheets
- General Information & Handling Instructions



SQE



QUICK EXHAUST VALVES

## HOW TO ORDER

To order Super Quick Exhaust Valves, specify: **SQE**

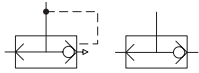
- SQE1**
- SQE2**
- QE2**
- QE3**
- QE4**
- QE5**

## SPECIFICATIONS

Design Principle:	Quick Exhaust	Flow @100 PSI:	SQE: 7 CFM (Cv=0.1)
Port Size:	10-32 UNF, 1/8, 1/4, 3/8, 1/2, 3/4 PIPE		SQE1: 63 CFM (Cv=1.1)
Media:	Air, Inert Gases		SQE2: 85 CFM (Cv=1.4)
Pressure Range:	0-150 PSI		QE2: 120 CFM (Cv=2.0)
Temperature Range:	-25° to 180°F		QE3: 155 CFM (Cv=2.6)
			QE4: 373 CFM (Cv=6.2)
			QE5: 395 CFM (Cv=6.6)

# Super Quick Exhaust Valves

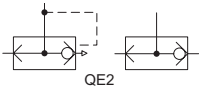
SQE, SQE1, SQE2, QE2, QE3, QE4, QE5



SQE1, SQE2



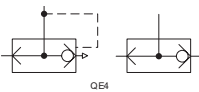
SQE1, SQE2



QE2, QE3



QE2, QE3



QE4, QE5



QE4, QE5

QUICK EXHAUST VALVES

## BUILD ON OUR EXPERIENCE

Humphrey brings over 50 years of valve design and fluid control experience to our valued customers, and over 20 years of custom tailored products through our Engineered Solutions team. With Engineered Solutions, our clients effectively outsource the design and manufacture of the fluid control, or fluid power element, of their product to Humphrey. In turn, they are able to focus a greater amount of their time and resources on what they do best — what actually differentiates them from their competitors. Our engineers carefully select from a variety of proven Humphrey valve designs and years of application experience to tailor the best component or system for our clients. That combination results in a better, often simpler, product and faster time to market, at a lower total cost.

## THE ENGINEERED SOLUTIONS PROCESS

### Challenge

We begin working closely on a peer-to-peer basis with your engineers early in the design process to understand your needs.

### Concept

Often we present multiple concepts and will recommend a design that provides maximum benefits to you.

### Solution

We finalize the design using proven reliable Humphrey valve technology and assist you in moving quickly from prototype, through pilot production, to production.

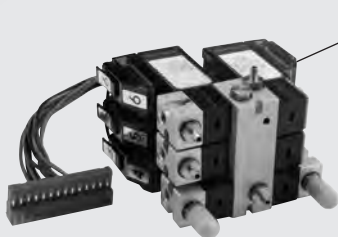
### Results

We implement your solution, measuring results against your original request, and continue to explore ways to help you further reduce your costs.



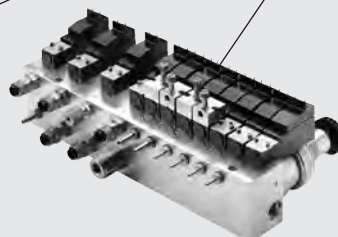
### Example:

Humphrey HK5 Solenoid Valve was the key to numerous Engineered Solutions successes.



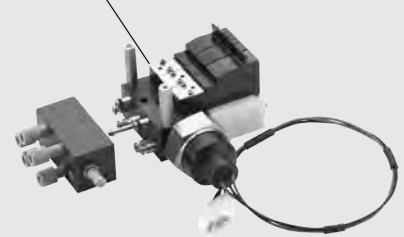
### CASE HISTORY CH-BK1 Ultra-Low Leakage Custom Manifold Assembly

Humphrey engineers utilized the proven HK5 valve to achieve virtually zero leakage to meet the customer's critical specifications. Then they designed a custom valve assembly to fit inside an extremely small envelope. The special manifold design interconnects certain valves.



### CASE HISTORY CH-LE1 Custom Manifold Assembly Improves Performance

To improve performance and reduce costs in a portable test unit, Humphrey engineers integrated separate components into a single package. Incorporating the proven HK5 valve that functions with a wide range of gases enabled Humphrey to reduce the size and complexity of the pneumatic control valve manifold.



### CASE HISTORY CH-LE2 Unique Miniature Dockable Valve Module

Utilizing the proven HK5 valve, to achieve ultra-low leak rates, Humphrey engineers developed the unique docking station design that provides a positive seal and fast, easy separation. This turned a four-hour service call into a 10-minute replacement process. Humphrey reduced the overall size by 75%, enabling the customer to shrink the product from a desktop unit down to the size of briefcase.



## HUMPHREY ENGINEERED SOLUTIONS — CASE HISTORIES



### Case History CH-SP1: Air Bed Mattress

A manufacturer of special mattress systems for pressure management and patient repositioning to help prevent the formation of pressure ulcers had a concern about leak rates. Humphrey designed a custom valve assembly utilizing its proven 310 valves to create a unit that not only reduced the leak rates, but made installation easier thus reducing assembly costs.



### Case History CH-TH1: Heart Assist Device

A manufacturer of a range of Ventricular Assist Devices need a valve manifold system that was reliable. Humphrey designed a complete assembly that greatly improved reliability by utilizing the proven 320 valve. Humphrey also accelerated the development process, delivering functioning products in an exceptionally short period of time.

### Case History CH-CH1: Oxygen Concentrator

A manufacturer of O<sub>2</sub> concentrators for in-home oxygen therapy wanted a design that would increase flow rate. Starting with Humphrey's proven 320 and Mizer valves, Humphrey engineers designed a low pressure pilot valve that increased the flow rate by 20%.

### Case History CH-VI1: Respiratory Care

A manufacturer of respiratory care and critical care products wanted to introduce a portable rebreather for emergency medical treatment of victims of toxic gas or smoke inhalation. Humphrey designed a valve/manifold assembly using pilot-operated 310 valves that met the critical response time and desired size requirements for portability.

### Case History CH-AB1: Heart Assist Valve/Pump

Humphrey developed a custom valve manifold assembly to power and control the operation of a critical medical device. Humphrey engineers also developed a special hand pump with a unique tube-inside-a-tube design. The hand pump can be used when the patient needs to be untethered from the powered unit.



### Case History CH-AMT-01: Bus Door Operator

A school bus manufacturer needed a compact manifold assembly for the door operator on a new vehicle design. Humphrey utilized their proven 310 and 410 valves and created a special manifold that was simple and easy to install in the restricted space.

### Case History CH-WB1: Truck Trailer Control

A manufacturer of trailers that can operate on the highway or be coupled together on wheelsets to make up a train wanted to reduce the time and cost of the process. Humphrey redesigned their valve module using the proven Cartridge Insert valves to lower the unit cost, increase air flow to speed up the process, and make the module far more robust.



### Case History: Conveyor System

A major manufacturer of accumulation conveyor systems wanted to replace its existing mechanically actuated pneumatic valve controls system with a photoelectric sensor-actuated valve control. Humphrey designed a valve assembly that incorporated DIP switches to enable a user to also manually change the conveyor logic mode.

### Case History CH-PE1: Pendant Control

A manufacturer of air balancing equipment wanted to enhance its existing control handle. Using Humphrey's proven pendant control valve, Humphrey engineers designed a modular system that could scale to virtually any control requirement.



### Case History CH-SM1: Paintball Marker

A major manufacturer of pneumatically-powered paintball markers wanted to introduce a new product having faster firing rate. Working in conjunction with Japanese partner, Koganei, Humphrey was able to offer a new valve with fewer parts, less weight, lower manufacturing costs, more reliable operation and a standard operation pressure at 225 PSI.



### Case History CH-FA1: Firearm Simulator

A manufacturer of simulated firearms training systems wanted to provide the same recoil ("kick") that the trainee would experience firing a real weapon. Humphrey designed a custom valve manifold/cylinder assembly that fits in the stock of laser-emitting firearms. Humphrey engineers utilized a proven 310 valve on a custom manifold and modified a Humphrey air cylinder to reduce friction.



### Case History CH-BRA-01: Ultrasonic Welder

A manufacturer of ultrasonic welding equipment needed a custom flow control to improve product performance. Humphrey developed a compact custom valve assembly to meet the exacting design and performance specifications.



### Case History CH-SAF-01: Air Motor Control

A manufacturer of automotive parts cleaning systems wanted a rugged, dual-function control valve. Humphrey engineers designed a valve assembly with a single shaft for both on/off control and pressure regulation.

### HOW TO OBTAIN THE COMPLETE CASE HISTORIES OF THESE AND OUR OTHER ENGINEERED SOLUTIONS

- Go directly to [www.humphrey-products.com](http://www.humphrey-products.com)
- Select "Engineered Solutions" from the top menu bar.
- On the left side of the screen under "Proven Custom Applications in These Fields," select from the following categories: Medical, Dental, Materials Handling, Analytical Instrumentation, Transportation, Food Automation, Process Control, Manufacturing Equipment, Small Arms, Firearms Simulator, Railroad Equipment, or Environmental.
- Each category contains a list of related case histories, which are available for you to download in a PDF format at your convenience.

**DON'T TAKE CHANCES**

Compressed air is an extremely powerful medium. Always take maximum precautions when handling any component of a compressed air system.

Never attempt to construct, replace, operate or service any component of a compressed air system unless you have been specifically and properly trained to do so. Always disconnect the supply air and exhaust the air system before attempting to remove or service a component of that system.

Failure to heed these warnings could result in **SERIOUS, EVEN FATAL, PERSONAL INJURY.**

**USE THE RIGHT VALVE**

Humphrey valves are general purpose air valves designed for use in general industrial applications in accordance with the limitations described in this catalog for each valve. The specifications of individual products are subject to change without notice. Consult factory representative for specific information concerning valve/application compatibility. Each Humphrey valve is tested before it leaves our factory to assure the valve's conformance to catalog specifications. Any use or application which deviates from the valve's specifications will void the warranty unless Humphrey has provided specific and written authorization beforehand.

**USE THE RIGHT LUBRICATION**

Except where model specifications state "No lubrication required," all Humphrey valves require appropriate lubrication. Humphrey recommends a non-detergent, 20 W or 30 W, mineral-based petroleum oil for most of its valves. Some lubricants may cause swelling or deterioration of the valve's seals, therefore lubricant/seal compatibility must be confirmed. Read specifications carefully. If there is any doubt, Consult factory representative.

**USE THE RIGHT AIR SUPPLY**

The valved medium, including the lubricants and other substances it may contain, must be compatible with the materials of which the valve is constructed. Read the specifications carefully; if there is any doubt, consult factory representative. Some valve models are vulnerable to contaminated or moisture-laden compressed air. To promote proper functioning and long life in such instances, appropriate air treatment equipment should be installed. Consult your supplier of air filters, regulators, and lubricators.

**USE PROPER SERVICE PROCEDURES**

Never attempt to service a Humphrey valve or any system component unless you have been properly trained to do so. A properly trained person will never attempt to remove or service a component of a compressed air system unless the compressed air has been disconnected and the system thoroughly exhausted.

Some Humphrey valves can be repaired in the field. Humphrey makes available factory seal repair kits (SRKs) and individual valve components for this purpose. All repaired valves should be tested for conformance to specifications before they are returned to service. Field repairing of Humphrey valves voids their warranty.

**DESIGN A PROPER SYSTEM**

Always strive to design systems which are safe as well as efficient. Either eliminate potential hazards completely or install safety features which neutralize them.

Give special consideration to any potential for accidental actuation of a valve. Either select a model that resists accidental actuation or mount the valve to prevent unintended actuation.

Consider the adverse consequences of individual component failure and design to prevent or minimize these consequences. Design a system that will fail safe under conditions of pressure variation, pressure loss, or other system failures.

Read the component literature carefully. If a model is not completely understood, do not apply it without first consulting the factory.

Size valves properly. A model having a capacity insufficient to the system may cause the entire system to be inefficient. Always note the size of the valve orifice – this is often more important than the PIPE connection.

The circuit drawings in this catalog are intended only as examples of circuits in which certain components might typically be used. They are not to be considered recommendations of specific applications. The proper, safe functioning of any system must be insured by the system's designer or user.

Specifications subject to change without notice.

**ORDERS:** All orders are subject to final approval by the Manufacturer.

**QUOTATIONS:** Special pricing on standard or custom products is available and subject to situational-based terms and conditions.

**CREDIT:** Written consent from Manufacturer must be obtained on all credits. Include purchase order number used when goods were ordered. A handling fee will be charged. Additional fees may be charged dependent on age and resalability of returned merchandise, etc.

**CANCELLATIONS:** Written consent from the Manufacturer must be obtained on all cancellations, and a cancellation fee may be charged at time cancellation is authorized.

**SHIPMENTS:** The Manufacturer will ship all goods via the most economical carrier unless otherwise instructed.

**DELAYED DELIVERY:** The Manufacturer shall not be liable for delays, damage, loss of goods in transit, or inability to supply goods for any reason at any time.

**BONDS, INSURANCE, OR SPECIAL WARRANTIES, ETC.:** The Buyer agrees to pay all costs in obtaining same.

**CHANGES:** The Manufacturer reserves the right to make changes in specifications and design, etc., and is not liable for any inconvenience or damage whatsoever caused by such design or specification changes.

**DIES AND FIXTURES, ETC.:** All dies, jigs and fixtures etc. shall be the property of the Manufacturer.

**PRICES:** The Manufacturer reserves the right to change prices without notice.

**INSPECTION:** Buyer waives any claims for shipping errors, shortages, non conformance of goods to order, and defective goods, unless Manufacturer receives written notice of same within ten (10) days after delivery of goods.

**DESIGN AND SPECIFICATIONS:** The design and specifications and other product information contained in this catalog is for general reference purposes based upon customary and usual manufacturing standards and product applications. However, it is difficult to predict or to anticipate the functioning or suitability of the product for any particular application or use. Therefore, nothing herein shall be deemed a representation or warranty of the product design or specifications and Buyer shall have the responsibility for investigating and testing the product in any particular application or use and all risks attendant in such use.

**PRODUCT LIMITED WARRANTY:** Manufacturer Humphrey Products Company warranties its product to be free from defects in workmanship and/or material for one (1) year from date of shipment from factory. Manufacturer shall have no liability under the warranty or otherwise if:

1. The product is not inspected by Buyer within ten (10) days after delivery;
2. The product is used other than in accordance with current operating instructions;
3. The product is subjected to any abuse or abnormal or unintended use;
4. A claim in writing under this warranty is not presented to manufacturer at Kalamazoo, Michigan address on or before ninety (90) days after the date of any alleged defect was first known or could reasonably have been known, whichever is sooner, or;
5. The product is not returned unaltered to Manufacturer within such ninety (90) day period for inspection. Any warranty extends only to the first user of the product.

**DISCLAIMER:** The above Limited Warranty is EXCLUSIVE of any and all other warranties, liabilities or obligations of Manufacturer. MANUFACTURER DISCLAIMS ANY OTHER WARRANTY AND MAKES NO REPRESENTATIONS OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHER MATTER.

Manufacturer neither authorizes nor assumes responsibility for any other affirmation of fact, description or other representation with respect to its product.

**LIMITATIONS OF LIABILITY:** Manufacturer's liability shall be limited to: 1. product replacement, 2. product repair, or 3. a refund of the product purchase price F.O.B. point of manufacture, and as Manufacturer, at its option may elect. The above remedies shall be Buyer's exclusive remedies for any and all loss or damage claimed by or through Buyer from any cause whatsoever including, without limitation, inability to supply product, errors or delays in shipment, Manufacturer's negligence, or any other matter. Manufacturer shall not be liable for any incidental, special, or consequential damages.







*Humphrey has a rich history of valve design for industry, including but not limited to, the products shown here. Our design variety allows us to apply the best solution to each application, based on your specific requirements, such as flow, pressure, media, porting, ambient/temperature environment, etc. Many designs are flexible, and can be customized for exact or difficult requirements. Please contact a factory representative for more details.*

*Please refer to the facing page for the corresponding illustrations.*

**Diaphragm-Poppet**

Two, molded diaphragm-poppet elastomers pressed on to the common stem. In operation, poppets shuttle between mating seats within the valve body. Simple design has short stroke, high flow and tight sealing characteristics. No sliding seals, or metal to metal contact, results in excellent performance whether media is gas or liquid, instrument clean and dry, or dirty and contaminated. Rugged, reliable. A classic Humphrey original.



250A

**Quick Exhaust**

World’s best. Beefed up “umbrella” shaped shuttle allows supply air to pass easily from IN to OUT port. When upstream supplied pressure drops, shuttle shifts, sealing off IN port, via lip seals, and media quick exhausts to piped exhaust port. Shuttle is the only moving part and lasts longer than competitive sheet stock designs.



QE3

**Mini-Mizer: Solenoid Operated Plunger**

Simple, unbalanced solenoid plunger design was the first solenoid valve to offer low 0.5 Watt power consumption. Plunger shifts from sealing at bottom seat to sealing at top seat when coil is energized. Spring returns plunger to bottom seat when coil is de-energized. Design is flexible, and can be tailored to exact requirements.



B3E1

**HK5: Balanced Diaphragm-Poppet**

Design is based on our heritage, the diaphragm-poppet principle, but in a miniature, balanced design. Result is a multi-purpose, multi-media valve unmatched in the market. Solenoid directly operates main stem and the opposing diaphragm-poppets as they shuttle between valve seats. The injection molded body is designed for maximum mounting and porting flexibility.



HK5

**310/320: Balanced Poppet, 3-port**

Internal forces from the supplied media are neutralized, based on the principle of opposing forces. Thus, force from the solenoid’s magnetic field must overcome only the force of the return spring. Result is a fast response, full pressure range valve with high flow and low current consumption. Humphrey’s most popular seller.



310

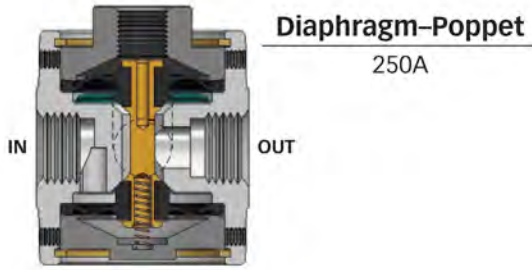
**410/420: Balanced Double Poppet, 4-port**

Internal forces from the supplied media are neutralized based on the principle of opposing forces in a 4-port, multi-purpose design. Force from the solenoid’s magnetic field must overcome only the force of the return spring. Result is a fast response, full pressure range valve with high flow and relatively low current consumption. Each valve can be used as 2-, 3- or 4-way, diverter or selector function.

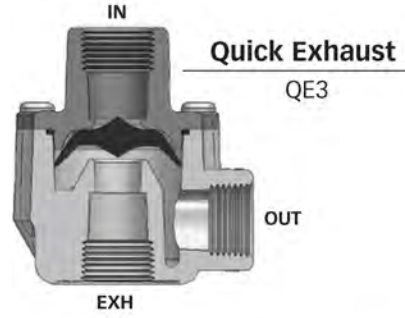


420

# HUMPHREY VALVES – DESIGN PRINCIPLES

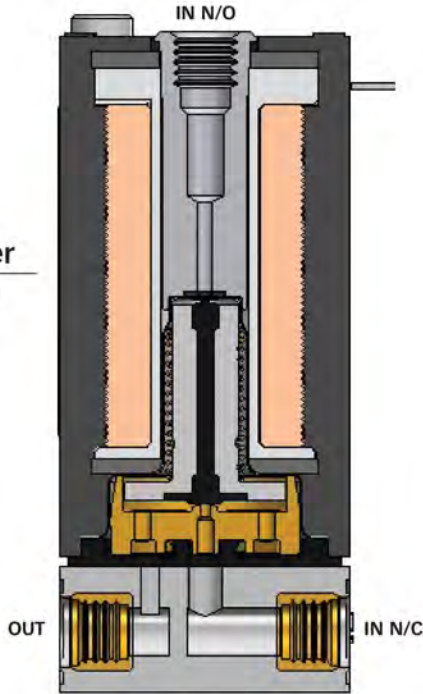


**Diaphragm-Poppet**  
250A

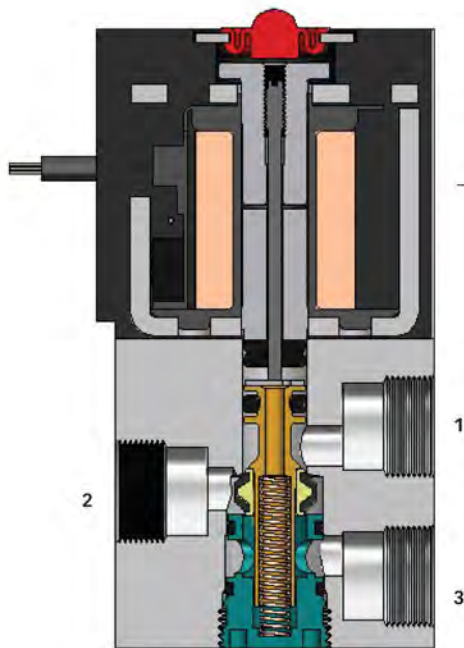
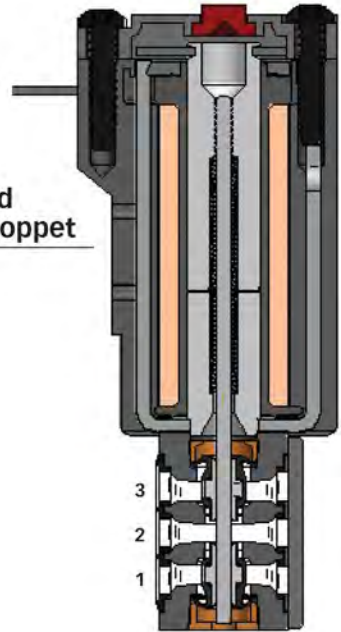


**Quick Exhaust**  
QE3

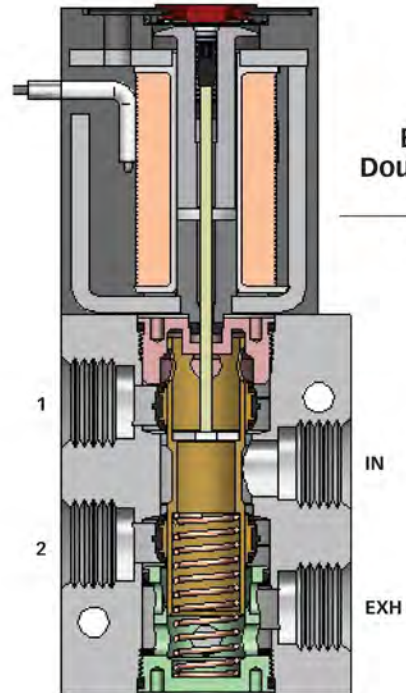
**Solenoid Operated Plunger**  
Mini Mizer, B3E1



**Balanced Diaphragm-Poppet**  
HK5



**Balanced Poppet, 3-port**  
310/320



**Balanced Double Poppet, 4-port**  
410/420

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