



This document is from Humphrey's Technical Library. If you need technical or sales assistance, please contact a Humphrey distributor. To locate the Humphrey distributor closest to you, please dial 1-800-477-8707.

**Title: 500A/AB/AG, 501A/AA, 501-4A/AA, 590A/AB/AG Air Piloted**

**ISO Date:** April 10, 2006

#### **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.

#### **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.

Humphrey Products Company  
1-800-477-8707  
Kalamazoo, MI 49003  
[www.humphrey-products.com](http://www.humphrey-products.com)

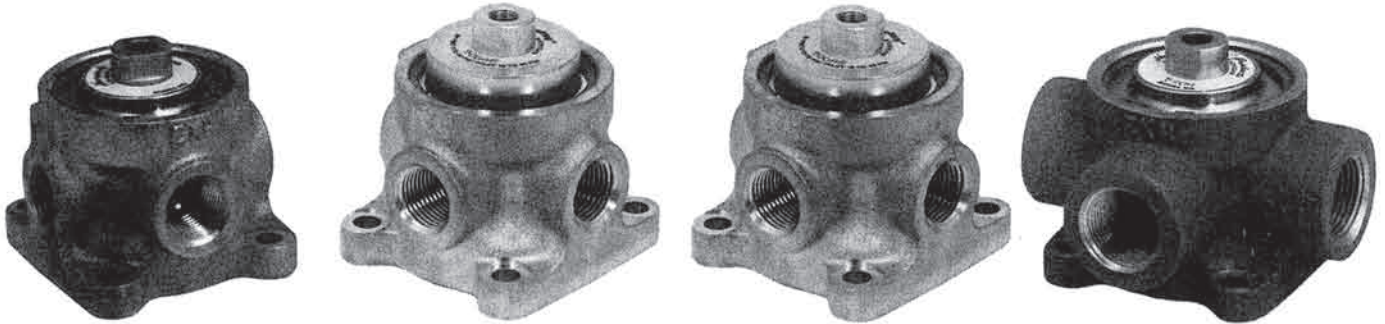
# Humphrey 500-590-501 Series Air-Piloted Valves

Air-piloted valves of this series are of either double diaphragm poppet design (500 and 590) or of piston poppet design (501). 500 and 590 Series valves require no lubrication and are ideal for use with instrument air or other media which prohibit lubrication. They have no sliding seals subject to cuts, metal seals subject to scratches, or O-rings subject to damage or replacement, so they are also ideal for use with contaminated media and are unaffected by compressor varnish.

501 Series valves require lubrication and offer the convenience of straight-line plumbing. 4-way valves are also available in the 501 Series.

500 and 501 Series valves have full 0.500-inch orifices. A 590 Series valve has a full 0.625-inch orifice.

Any 500, 501, or 590 Series valve can be mounted in any position.



**500A** 500A-3-10  
Model 500A is a 2-way or 3-way, normally closed only valve offering high flow rates (to 200 scfm at 125 psig). The 500A requires no lubrication. Pilot air is isolated from valved media for applications requiring air pilot control for air, water, oil, instrument air, and gases. The 500A may be used normally open by connecting air supply at pressures within 15-60 psig to EXH port. Valve body is brass.



**500AB** 500AB-3-10  
Model 500AB is identical to the 500A valve but has a booster piston to reduce pilot air pressure requirements. Air-operated only. Valve body is brass.



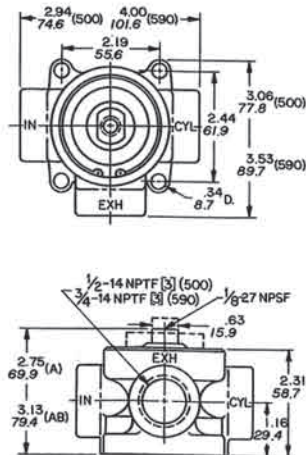
**500AG** 500AG-3-10  
Model 500AG is identical to the 500AB valve but has fluoroelastomer diaphragms to accommodate temperatures from -25°F (31.6°C) to 400°F (204.4°C). The 500AG is used extensively in the glass industry as a "blow valve." Valve body is brass.



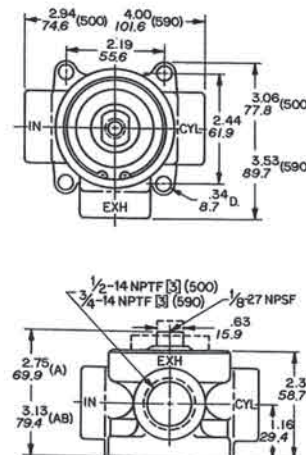
**590A** 590A-3-10  
Model 590A is a 2-way or 3-way normally closed valve offering high flow rates to (312 scfm at 125 psig). Available with lightweight aluminum body or with optional brass body. The 590A requires no lubrication.



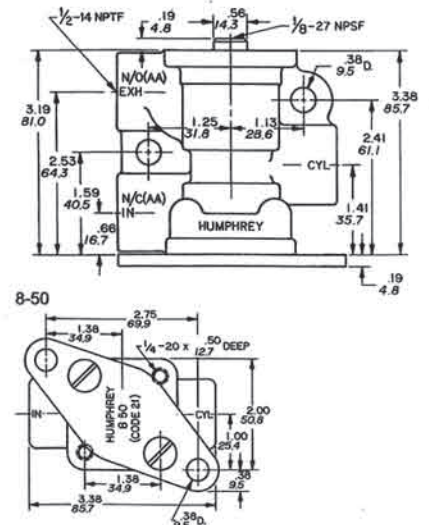
500A/AB/AG



590A/AB/AG



501A



Order Information on page 204.



**590AB** 590AB-3-10  
Model 590AB is identical to the 590A valve but has a booster piston to reduce pilot air pressure requirements and is air-operated only.



**590AG** 590AG-3-10  
Model 590AG is identical to the 590AB valve but has fluoroelastomer diaphragms to accommodate temperatures from -25°F (31.6°C) to 400°F (204.4°C). The 590AG is used extensively in the glass industry as a "blow valve."



**501A** 501A-3-12-20  
Model 501A is a multi-purpose valve offering high flow rates (to 275 scfm at 125 psig). With all ports on the same vertical plane, the 501A offers straight-line plumbing. It is constructed of lightweight aluminum which has been hardcoated for greater resistance to wear. With the pilot pressure connected to pilot port, four functions are possible:



**Normally closed:** Supply to NC port. NO port becomes exhaust port. CYL port to work.

**Normally open:** Supply to NO port. NC port becomes exhaust port. CYL to work.

**Directional:** Supply to CYL port. Pilot air shifts NC open and NO closed.

**Bi-Media:** Supply #1 to NO; Supply #2 to NC. CYL port is common.

## Specifications

**MEDIA:**  
Compressed Air (Consult factory for others)

**PRESSURE RANGE:**  
**500/590A:** 0 to 125 psig (0 to 8.6 bars)  
**500/590AB, 500/590AG:** 10 to 60 psig (.69 to 4.1 bars) inlet, 10 to 40 psig (.69 to 2.8 bars) pilot  
**501A:** 0 to 125 psig (0 to 8.6 bars)  
**501AA:** 15 to 125 psig (1.0 to 8.6 bars)

**TEMPERATURE RANGE:**  
0 to 225°F (-17.8 to 107.2°C)  
**AB:** -10 to 150°F (-23 to 65.5°C)  
**AG:** -25 to 400°F (-31.6 to 204°C)  
**501A/AA:** -30 to 225°F (-34.4 to 107.2°C)

**OPERATING SPEEDS:**  
To 600 CPM

**MATERIALS:**  
**500/590:** Cast Aluminum & Brass, Machined Brass, Stainless Steel, Machined Aluminum, Zinc Plated Steel, Buna N  
**501:** Cast Aluminum, Zinc Plated Steel, Stainless Steel, Buna N

**LUBRICATION:** .....Not required  
**FILTRATION:** .....Not required  
501 Series .....Required

## Fill/Exhaust Times (Seconds)

MODEL	SUPPLY PRESSURE							
	At 50 psig (3.5 bars)				At 100 psig (7.0 bars)			
	Chamber Fill 0-40 psig (0-2.8 bars)		Exhaust 50-10 psig (3.5-7 bars)		Chamber Fill 0-80 psig (0-5.5 bars)		Exhaust 100-20 psig (7.0-1.4 bars)	
	10 Cubic Inches (164cc)	100 Cubic Inches (1640cc)	10 Cubic Inches (164cc)	100 Cubic Inches (1640cc)		10 Cubic Inches (164cc)	100 Cubic Inches (1640cc)	
MODEL	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST
500A	0.009	0.020	0.085	0.157	0.010	0.027	0.102	0.195
500AB	0.010	0.013	0.084	0.097	0.011	0.015	0.100	0.114
590A	0.010	0.021	0.071	0.148	0.010	0.028	0.079	0.174
590AB	0.011	0.013	0.066	0.072	0.011	0.012	0.079	0.086
501A/AA	0.008	0.012	0.082	0.096	0.009	0.015	0.094	0.119

VALVED PRESSURE	25 psig	1.7 bars	75 psig	5.2 bars	125 psig	8.6 bars	
PILOT PRESSURE							
MODEL	500A	17.0	1.2	49.5	3.4	97.8	6.7
	500AB	14.5	1.0	33.3	2.3	53.2	3.7
	590A	21.8	1.5	54.0	3.7	104.0	7.2
	590AB	15.3	1.1	34.1	2.4	41.5	2.9
	501A	19.3	1.3	43.2	3.0	71.3	4.9
	501AA	17.8	1.2	42.0	2.9	69.8	4.8

## Air Flow to Atmosphere

MODEL	Weight				ACTUAL LBS	KGS
	30 PSIG CFM	(2.1 BARS) LPM	120 PSIG CFM	(8.3 BARS) LPM		
500A/AB	65.0	1839.5	214.0	6056.2	2.7	1.2
590A/AB	100.0	2831.0	289.0	8178.7	1.5	0.6
501A/AA	72.0	2037.6	267.0	7556.1	0.9	0.4

Order information on page 204.

# Humphrey 500-590-501 Series (Continued)



## 501-4A

Model 501-4A valve offers high flow rates (to 212 scfm at 125 psig). With all ports on the same horizontal plane, it provides convenient straight-line plumbing. The 501-4A can be mounted in any position: in-line or with body mounting lugs.



501AA



## 501AA

Model 501AA is a 3-way or "detented" 3-way, normally closed valve with an internal compensating orifice which maintains actuated position after momentary pilot signal, maintains "trapped" pilot pressure to compensate for minor leaks, and speeds the opening and closing response time. See further information in introductory material about piloted valves.



501AA-3-10-21

## 501-4AA

Model 501-4AA is a 4-way or "detented" 4-way valve with an internal compensating orifice which maintains actuated position after momentary pilot signal, maintains "trapped" pilot reserve to compensate for minor leaks, and speeds

both the opening and the closing response time.



## Options for 500, 590, Series Valves

- Fluoroelastomer diaphragms for resistance to mild chemicals and for sustained temperatures to 400°F (204.4°C) and intermittent temperatures to 600°F (315.5°C). Fluoroelastomer diaphragms are standard on 500AG valves. Not available for 501 valves.
- Brass Body available for 590 valves. Brass body is standard for 500 valves.

## Specifications

**MEDIA:**  
Compressed Air (Consult factory for others)

**PRESSURE RANGE:**  
501-4A: 0 to 125 psig (0 to 8.6 bars)  
501-4AA: 15 to 125 psig (1.0 to 8.6 bars)

**TEMPERATURE RANGE:**  
-30 to 225°F (-34.4 to 107.2°C)

**OPERATING SPEEDS:**  
501-4A/AA: To 360 CPM

**MATERIALS:**  
Cast Aluminum, Zinc Plated Steel, Stainless Steel, Buna N

**LUBRICATION** ..... Required

**FILTRATION** ..... Recommended

## Air Flow to Atmosphere

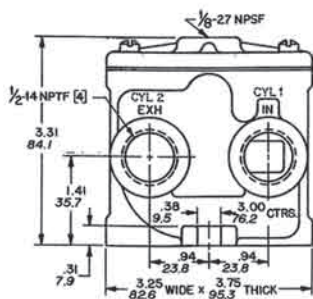
MODEL	30 PSIG CFM		(2.1 BARS) LPM		120 PSIG CFM		(8.3 BARS) LPM		ACTUAL	
									LBS	KGS
501-4A/AA	55.0		1557.0		195.0		5521.0		1.65	0.74

## Weight

## Fill/Exhaust Times (Seconds)

MODEL	SUPPLY PRESSURE								
	At 50 psig (3.5 bars)				At 100 psig (7.0 bars)				
	Chamber Fill 0-40 psig (0-2.8 bars)		Exhaust 50-10 psig (3.5-7 bars)		Chamber Fill 0-80 psig (0-5.5 bars)		Exhaust 100-20 psig (7.0-1.4 bars)		
	10 Cubic Inches (164cc)		100 Cubic Inches (1640cc)		10 Cubic Inches (164cc)		100 Cubic Inches (1640cc)		
	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST	
501-4A/AA	0.012	0.014	0.121	0.104	0.013	0.017	0.134	0.125	
VALVED PRESSURE		25 psig	1.7 bars	75 psig	5.2 bars	125 psig	8.6 bars		
PILOT PRESSURE									
MODEL	501-4A	24.3	1.7	37.6	4.0	94.2	6.5		
	501-4AA	15.5	1.1	39.0	2.7	64.2	4.4		

501-4A



Order Information on page 204.

# Humphrey Air Piloted Valves

## Order Information

### 125/250/500/501/590 Series

1/8-, 1/4-, 1/2-, and 3/4-inch ports, 2-way, 3-way, 4-way

### VALVES

	2 Way	3 Way	Norm. Closed	Norm. Open	Universal	w/Out Mounting Base	With Mounting Base	Panel Mounting Nuts	Booster (STD on NO)	FKM** Seals	Brass Body	Bottom Inlet (NC only)
Option Code	2	3	10	11	12	20	21	22	w/BOS	w/VAI	w/BRB	w/BIN
<b>MODEL</b>												
<b>125A</b>	SP	N/C	N/C	SP	NA	N/C	SP	SP	SP	SP	SP	SP
<b>125AA</b>	NA	N/C	N/C	NA	NA	N/C	SP	SP	SP	SP	SP	SP
<b>125AH</b>	SP	N/C	N/C	NA	NA	N/C	SP	SP	NA	NA	NA	SP
<b>125LA</b>	SP	N/C	N/C	NA	NA	N/C	SP	SP	NA	NA	NA	SP
<b>250A</b>	SP	N/C	N/C	SP	NA	N/C	SP	NA	SP	SP	SP	SP
<b>250AA</b>	NA	N/C	N/C	NA	NA	N/C	SP	NA	SP	SP	SP	SP
<b>250AH</b>	SP	N/C	N/C	NA	NA	N/C	SP	NA	NA	NA	NA	SP
<b>250AL</b>	SP	N/C	N/C	NA	NA	N/C	SP	NA	NA	NA	NA	SP
<b>250-4A</b>	NA	NA	NA	NA	NA	N/C	SP	NA	NA	SP	NA	NA
<b>250-4AA</b>	NA	NA	NA	NA	NA	N/C	SP	NA	NA	SP	NA	NA
<b>500A</b>	SP	N/C	N/C	*	NA	NA	STD	NA	NA	SP	STD	NA
<b>500AB</b>	SP	N/C	N/C	*	NA	NA	STD	NA	STD	SP	STD	NA
<b>590A</b>	SP	N/C	N/C	*	NA	NA	STD	NA	NA	SP	SP	NA
<b>590AB</b>	SP	N/C	N/C	*	NA	NA	STD	NA	STD	SP	SP	NA
<b>501A</b>	SP	N/C	*	*	N/C	N/C	SP	NA	NA	SP	NA	NA
<b>501AA</b>	NA	N/C	N/C	NA	NA	N/C	SP	NA	NA	SP	NA	NA
<b>501-4A</b>	NA	NA	NA	NA	NA	NA	STD	NA	NA	SP	NA	NA
<b>501-4AA</b>	NA	NA	NA	NA	NA	NA	STD	NA	NA	SP	NA	NA
<b>SS250A</b>	NA	STD	STD	NA	NA	STD	NA	NA	NA	STD	NA	NA

\*These options can be achieved by plumbing supply to the appropriate port. See specific catalog section.

\*\*Fluoroelastomer

### HOW TO ORDER

Starting with Model Number specify options in order from left to right.

Example: To Order Model 125A-3-10-22 w/BRB

3-Way Operation	(125A-3)
Normally Closed	(125A-3-10)
Panel Mounting Nuts	(125A-3-10-22)
With Brass Body	(125A-3-10-22 w/BRB)

Remember: Option Codes marked STD and NA are not used as part of the Model Number when ordering. N/C indicates no charge but Option Code must be included in the Model Number. OS indicates that Option must be ordered separately and is not used as part of the Model Number.

N/C=No charge	STD=Standard
NA =Not available	SP=Specify, additional charge for this option
OS =Order separately, additional charge for this option	