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Title: 500/501/590 Electric Solenoid Valves

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

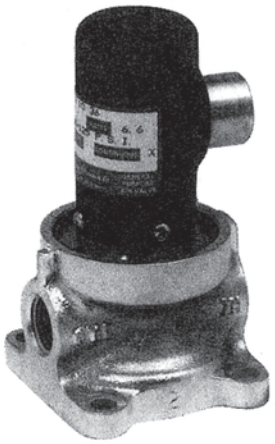
Humphrey 500 Series Electric Air Valves

Humphrey 500 Series electric air valves are of double diaphragm poppet design. Because these "no-stick" valves require no lubrication, they are ideal for use with instrument air and other media which prohibit lubrication. The use of lubrication, however, will not prevent a 500 Series valve from functioning if the lubricant is varied or removed.

500 Series electric valves have no sliding seals subject to cuts or metal seals subject to scratches, so they are ideal for use with contaminated media and are unaffected by compressor varnish.

With full 0.500-inch orifices, 500 Series valves have high flow (200 scfm at 125 psig).

500 Series valves are 2-position, 2-way or 3-way, single- or double-solenoid valves. They are designed for rugged duty and rapid cycling, and can be mounted in any position with body mounting holes. All 500 Series electric valves are furnished with brass bodies.

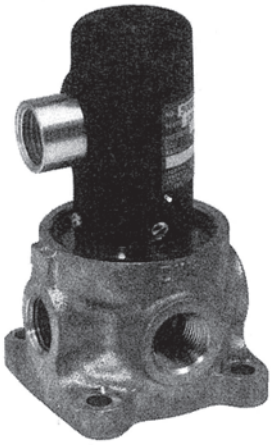


500E1

500E1-3-10-36

Model 500E1 is a single-solenoid, maintained contact, spring return, 2-way or 3-way valve available either normally closed or normally open. It can be mounted in any position with body mounting holes.

Model 500AE1 is identical to the 500E1 but has an external air pilot connection for the valving of media below 30 psig. Pilot air is isolated from valved media such as water, oil, instrument air, and gases.



500E2

500E2-3

Model 500E2 is a double-solenoid, momentary-contact, maintained-position, 2-way or 3-way valve. If AC coils are to be energized longer than 30 seconds, specify Code CD (Continuous Duty) Coils. All coils for DC voltages are Code CD.

Model 500AE2 is identical to the 500E2 but has an external air-pilot connection for the valving of media below 30 psig. Pilot air is isolated from valved media such as water, oil, instrument air, and gases.

Options for 500 Series valves

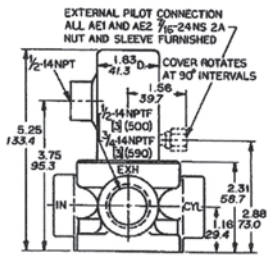
When ordering, specify desired option.

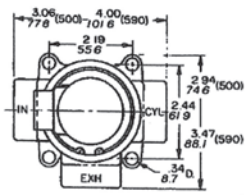
For all 500 valves:

- Cover seal (Code 61).
- 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).

For E2 models only:

- Code CD (Continuous Duty) coils for AC voltage valves to be energized longer than 30 seconds.





Specifications

MEDIA:
Compressed Air (Consult factory for others)

PRESSURE RANGE:
E1/E2: 30 to 125 psig (2.1 to 8.6 bars)
AE1/AE2: 0 to 125 psig (0 to 8.6 bars) (body), 30 to 125 psig (2.1 to 8.6 bars) (pilot)
External Pilot Pressure (500AE1/AE2 only): Equal to valved pressure 30 psig (2.1 bars) Minimum

TEMPERATURE RANGE:
0 to 125°F (–17.8 to 51.7°C)

OPERATING SPEEDS:
To 600 CPM

MATERIALS:
Cast Brass, Machined Aluminum & Brass, Stainless Steel, Zinc Plated Steel, Buna N

LUBRICATION ..... Not required
FILTRATION ..... Not required

Air Flow to Atmosphere

MODEL	30 PSIG CFM	(2.1 BARS) LPM	120 PSIG CFM	(8.3 BARS) LPM
500E1/E2 500AE1/AE2	68.6	1941.4	206.0	5829.8

Weight

ACTUAL LBS	KGS
3.6	1.6

Electrical Specifications

MODEL	VOLTAGE	COIL NUMBER	WATTS	AMPS	OHMS	HEAT RISE (°C)	ON TIME SECONDS	OFF TIME SECONDS
500E1	24 DC 120 AC	46-8A 46-4	6.7 8.2	0.296 0.161	86 255	85.9 102.0	0.039 0.028	0.042 0.050
500E2	24 DC 120 AC	46-8A 46-4	6.7 23.0	0.296 0.236	86 105	85.9 77.8	0.035 0.031	0.043 0.037

Lead Wire: # 18 AWG, 16-30 TC, 1/32, 105°C, PVC, UL & CSA.

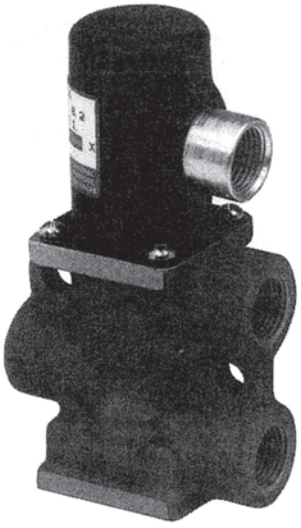
Fill/Exhaust Times (Seconds)

	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)	
MODEL	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST
500E1/E2	0.055	0.064	0.122	0.205	0.061	0.064	0.135	0.239

Humphrey 501 Series Electric Air Valves

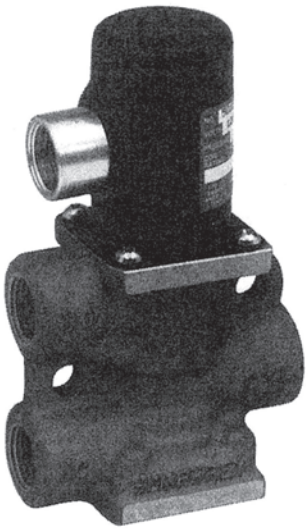
Humphrey 501 Series electric air valves feature 0.500-inch orifices for high flow (275 scfm at 125 psig) and the convenience of straight-line plumbing. They are constructed of lightweight aluminum which has been hard-coated for resistance to harsh ambient conditions.

501 Series electric air valves are 2-position, 2-way, 3-way or 4-way, single- or double-solenoid valves. They offer rapid cycling, to 600 cpm. Lubrication is recommended for optimum performance. They can be mounted in any position: in-line, with mounting base (Code 21; 3-way models only), with mounting holes, or with lugs.



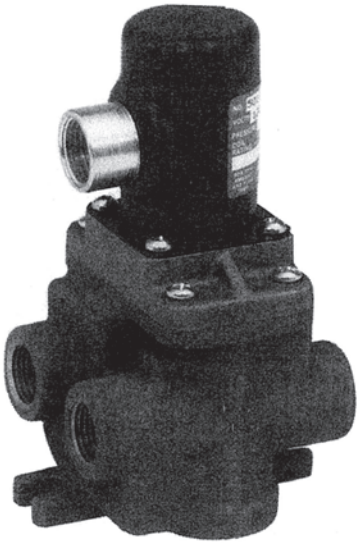
501E1 501E1-3-10-20-36

Model 501E1 is a single-solenoid, maintained-contact, spring-return, 2-way or 3-way valve available either normally closed or normally open.



501E2 501E2-3-20

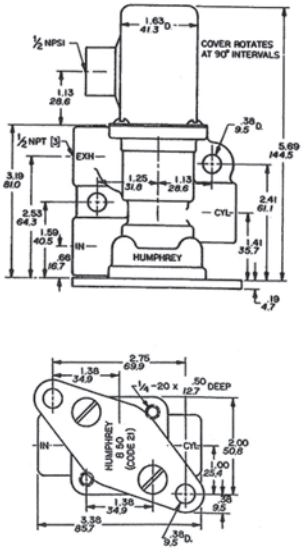
Model 501E2 is a double-solenoid, momentary-contact, maintained-position, 2-way or 3-way valve. If AC coils are to be energized longer than 30 seconds, specify Code CD (Continuous Duty) coils. All coils for DC voltages are Code CD.

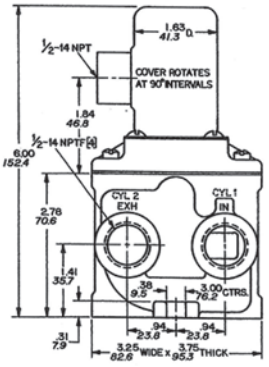


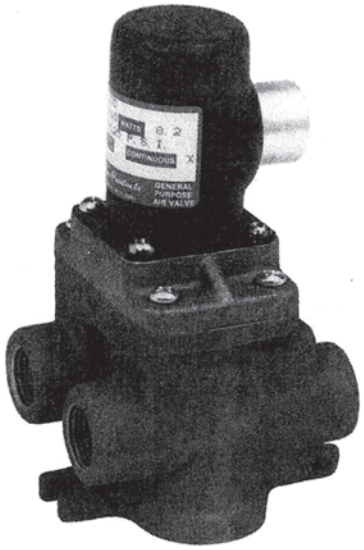
501-4E1 501-4E1

Model 501-4E1 is a single-solenoid, maintained-contact, spring-return, 4-way, 4-port valve with common inlet and common exhaust. Cylinder port #1 is normally open; cylinder port #2 is normally closed.

Consult factory for air piloted vacuum options.







501-4E2

501-4E2

Model 501-4E2 is a double- solenoid, momentary-contact, maintained-position, 4-way, 4-port valve. If AC coils are to be energized longer than 30 seconds, specify Code CD (Continuous Duty) coils. All coils for DC voltages are Code CD.

Options for 501 Series Electric Valves

When ordering specify desired option.

- Mounting Base (Code 21; 3-way models only)
- Cover Seal (Code 61) for dirty or wet conditions.

Specifications

MEDIA:
Compressed Air (Consult factory for others)

PRESSURE RANGE:
30 to 125 psig (2.1 to 8.6 bars)

TEMPERATURE RANGE:
–30 to 125°F (–34.4 to 51.7°C)

OPERATING SPEEDS:
3 Ways: To 600 CPM, 4 Ways: To 360 CPM

MATERIALS:
Cast Aluminum, Zinc Die Cast, 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
501E1/E2	71.0	2009.3	242.0	6848.6
501-4E1/E2	55.0	1556.5	174.0	4924.2

Weight

ACTUAL LBS	KGS
1.5	.7
2.7	1.2

Electrical Specifications

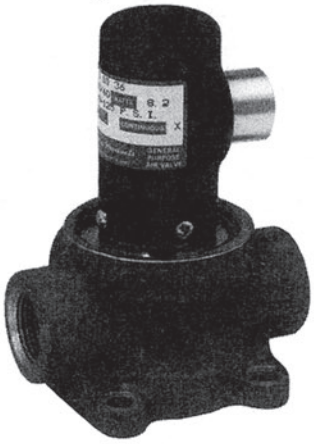
MODEL	VOLTAGE	COIL NUMBER	WATTS	AMPS	OHMS	HEAT RISE (°C)	ON TIME SECONDS	OFF TIME SECONDS
501E1	24 DC	46-8A	6.7	0.296	86	85.9	0.034	0.033
	120 AC	46-4	8.2	0.161	255	74.5	0.021	0.038
501E2	24 DC	46-8A	6.7	0.296	86	85.9	0.051	0.069
	120 AC	46-3	23.0	0.236	105	77.8	0.020	0.024
501-4E1	24 DC	46-8A	6.7	0.296	86	85.9	0.027	0.036
	120 AC	46-4	8.2	0.161	255	102.0	0.014	0.044
501-4E2	24 DC	46-8A	6.7	0.296	86	85.9	0.022	0.024
	120 AC	46-4	8.2	0.161	255	102.0	0.009	0.010

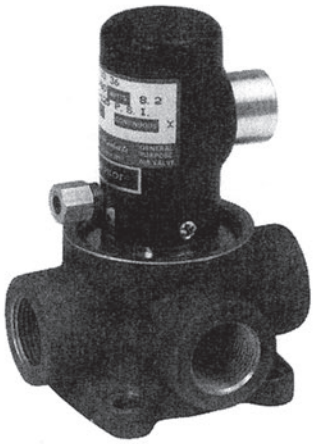
Fill/Exhaust Times (Seconds)

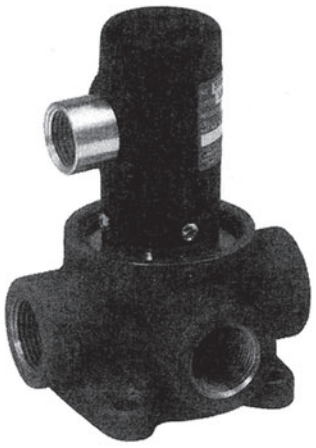
	SUPPLY PRESSURE							
	At 50 psig (3.5 bars)				At 100 psig (7.0 bars)			
	Chamber Fill 0-40 psig (0-2.8 bars)		Exhaust 50-10 psig (3.5-.7 bars)		Chamber Fill 0-80 psig (0-5.5 bars)		Exhaust 100-20 psig (7.0-1.4 bars)	
	10 Cubic Inches (164cc)		100 Cubic Inches (1640cc)		10 Cubic Inches (164cc)		100 Cubic Inches (1640cc)	
MODEL	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST
501E1/E2	0.041	0.040	0.106	0.123	0.046	0.047	0.119	0.146
501-4E1/E2 NC	0.069	0.075	0.158	0.171	0.068	0.058	0.169	0.201
501-4E1/E2 NO	0.059	0.104	0.147	0.205	0.069	0.110	0.169	0.231

Humphrey 590 Series electric air valves are of double diaphragm poppet design. Because these "no-stick" valves require no lubrication, they are ideal for use with instrument air and other media which prohibit lubrication. The use of lubrication, however, will not prevent a 590 Series valve from functioning if the lubricant is varied or removed.

590 Series electric valves have no sliding seals subject to cuts or metal seals subject to scratches, so they are also ideal for use with contaminated media and are unaffected by compressor varnish. Constructed of lightweight anodized aluminum, these valves offer 0.625 inch orifices for high flow (312 scfm at 125 psig). 590 Series electric valves are two-position, 2-way or 3-way, single- or double-solenoid valves. They are designed for rugged duty and rapid cycling and can be mounted in any position with body mounting holes.

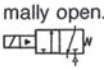






590E1 590E1-3-10-36

Model 590E1 is a single-solenoid, maintained-contact, spring-return, 2-way or 3-way valve available either normally closed or normally open.



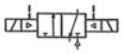
590AE1 590AE1-3-10-36

Model 590AE1 is identical to the 590E1 but has an external air pilot connection for the valving of media below 30 psig. The valve isolates pilot air from valved media such as water, oil, instrument air, or gases.

590E2 590E2-3

Model 590E2 is a double-solenoid, momentary-contact, maintained-position, 2-way or 3-way valve. If AC coils are to be energized longer than 30 seconds, specify Code CD (Continuous Duty) Coils. All coils for DC voltages are Code CD.

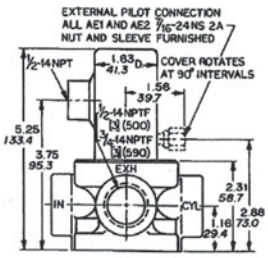
Model 590AE2 is identical to the 590E2 but has an external air pilot connection for the valving of media below 30 psig.

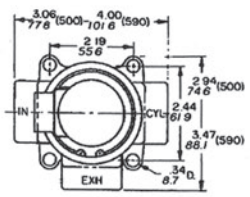


Options for 590 Series Electric Valves

When ordering specify desired option.

- Cover Seal (Code 61) for dirty or wet conditions.
- Continuous Duty Coils (Code CD) for double-solenoid 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).
- Brass Body.





Specifications

MEDIA:
Compressed Air (Consult factory for others)

PRESSURE RANGE:
E1/E2: 30 to 125 psig (2.1 to 8.6 bars)
AE1/AE2: 0 to 125 psig (0 to 8.6 bars)
External pilot pressure (AE1/AE2): Equal to valved pressure 30 psig (2.1 bars) Minimum.

TEMPERATURE RANGE:
0 to 125°F (–17.8 to 51.7°C)
OPERATING SPEEDS:
To 600 CPM
MATERIALS:
Cast Aluminum & Brass, Machined Aluminum & Brass, Stainless Steel, Zinc Plated Steel, Buna N
LUBRICATION ..... Not required
FILTRATION ..... Not required

Air Flow to Atmosphere

MODEL	30 PSIG CFM	(2.1 BARS) LPM	120 PSIG CFM	(8.3 BARS) LPM
590E1/E2	95.0	2688.5	283.0	8008.9

Weight

ACTUAL LBS	KGS
2.1	0.9

Electrical Specifications

MODEL	VOLTAGE	COIL NUMBER	WATTS	AMPS	OHMS	HEAT RISE (°C)	ON TIME SECONDS	OFF TIME SECONDS
590E1	24 DC 120 AC	46-8A 46-4	6.7 8.2	0.296 0.161	86 255	85.9 102.0	0.046 0.034	0.050 0.042
590E2	24 DC 120 AC	46-8A 46-4	6.7 8.2	0.296 0.161	86 255	85.9 102.0	0.039 0.009	0.042 0.041

Lead Wire: # 18 AWG, 16-30 TC, 1/32, 105°C, PVC, UL & CSA.

Fill/Exhaust Times (Seconds)

	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)	
MODEL	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST
590E1/E2	0.063	0.069	0.100	0.185	0.063	0.070	0.118	0.225

500/501/590 Series
1/4-, 1/2-, and 3/4-inch ports, 2-way, 3-way, 4-way

VALVES

	2 Way	3 Way	Norm. Closed	Norm. Open	w/Out Mount. Base	With Mount. Base	Grom-met Leads (18")	Conduit Leads (18")	DIN Con-nector	Grom./ Conduit Leads (72")	Cover Seal	FKM* Seals	Brass Body	Bottom Inlet (NC Only)	Specify Voltage with option code: 120V 50/60, 240/50/60 (ID not avail-able on E1)		Specify Voltage with option code: 24V 50/60 w/"Flywheel" Rectifiers for CD		12VDC 24VDC
Option Code	2	3	10	11	20	21	35	36	39	LL	61	w/VAI	w/BRB	w/BIN	CD	ID	CD	ID	Spec. Volt.
500AE1	SP	N/C	N/C	N/C	NA	STD	NA	STD	SP	SP	NA	SP	STD	NA	STD	NA	SP	NA	N/C
500E2	SP	N/C	NA	NA	NA	STD	NA	STD	SP	SP	SP	SP	STD	NA	SP	STD	SP	SP	N/C
500AE2	SP	N/C	NA	NA	NA	STD	NA	STD	SP	SP	NA	SP	STD	NA	SP	STD	SP	SP	N/C
590E1	SP	N/C	N/C	N/C	NA	STD	N/C	N/C	SP	SP	SP	SP	SP	NA	STD	NA	SP	NA	N/C
590AE1	SP	N/C	N/C	N/C	NA	STD	NA	STD	SP	SP	NA	SP	SP	NA	STD	NA	SP	NA	N/C
590E2	SP	N/C	NA	NA	NA	STD	NA	STD	SP	SP	SP	SP	SP	NA	SP	STD	SP	SP	N/C
590AE2	SP	N/C	NA	NA	NA	STD	NA	STD	SP	SP	NA	SP	SP	NA	SP	STD	SP	SP	N/C
501E1	SP	N/C	N/C	N/C	N/C	SP	N/C	N/C	SP	SP	SP	SP	NA	NA	STD	NA	SP	NA	N/C
501E2	SP	N/C	NA	NA	N/C	SP	NA	STD	SP	SP	SP	SP	NA	NA	SP	STD	SP	SP	N/C
501-4E1	NA	NA	NA	NA	NA	STD	N/C	N/C	SP	SP	SP	SP	NA	NA	STD	NA	SP	NA	N/C
501-4E2	NA	NA	NA	NA	NA	STD	NA	STD	SP	SP	SP	SP	NA	NA	SP	STD	SP	SP	N/C

CD=Continuous Duty; ID=Intermittent Duty.
Note: Code 39 not available on E2 models with continuous duty coils (Code CD).
*Fluoroelastomer

ACCESSORIES

Model	Description
HS4	DIN Connector for use with Code 39 Valves.
JB	— Add "JB" to model number of any solenoid valve with conduit Connection (Code 36).

HOW TO ORDER

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

Example: To Order Model 500E1-3-10-36 12VDC

3-Way Operation, Single Solenoid	(500E1-3)
Normally Closed	(500E1-3-10)
Conduit Leads (18")	(500E1-3-10-36)
Voltage 12VDC	(500E1-3-10-36) 12VDC

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
NA =Not available
OS =Order separately, additional charge for this option
STD=Standard
SP=Specify, additional charge for this option