

# HUMPHREY SELECTION GUIDE

Organized by Port Size

## SOLENOID

### 2-, 3-way

M3	C <sub>v</sub>	10-32	C <sub>v</sub>	1/8"	C <sub>v</sub>	1/4"	C <sub>v</sub>	3/8"	C <sub>v</sub>	1/2"	C <sub>v</sub>	3/4"	C <sub>v</sub>
H010E1	0.01	3E1	0.01	31E1	0.09	(V)062E1	0.12			(VA/VV)500(A)E1	2.16	(VA)590(A)E1	2.56
H041E1	0.08	M3E1	0.01	M31E1	0.06	T062E1	0.11			500E2	2.16	(VA)590(A)E2	2.56
H040 E1	0.08	M3E1-81-MTL	0.01	310	0.12	125E1	0.19			501E1	2.20		
		3E1-PCM	0.01	S310	0.15	T125E1	0.17			501E2	2.20		
		3E1-39-BOU	0.01	M310	0.12	(VA/VV)250(A)E	0.63						
		3E1-TSD	0.01	(VA)125(A)E1L	0.24	250E2	0.63						
		H(V)030E1	0.03	M125E1LW	0.17	320	1.00						
		H110E1	0.23	H181E1	0.57								
		H111E1	0.23										

### 4-way

M3	C <sub>v</sub>	10-32	C <sub>v</sub>	1/8"	C <sub>v</sub>	1/4"	C <sub>v</sub>	3/8"	C <sub>v</sub>	1/2"	C <sub>v</sub>	3/4"	C <sub>v</sub>
H040 4E1	0.08	401	0.05	41E1	0.03	42E1	0.43			501-4E1	1.80		
H040 4E2	0.08	M401	0.05	M41E1	0.03	M42E1	0.39			501-4E2	1.80		
		402	0.04	MC41E1	0.03	42E2	0.43						
		M402	0.04	410	0.14	062-4E1	0.07						
		H030-4E1	0.03	410-70	0.14	125-4E1	0.11						
		H110-4E1	0.23	S410	0.13	T062-4E1	0.07						
		H110-4E2	0.23	S410-70	0.13	T125-4E1	0.11						
		H113-4E2	0.21	M410	0.13	M42E2	0.39						
				M410-70	0.13	250-4E1	0.58						
				H180-4E1	0.57	250-4E2	0.88						
				H180-4E2	0.57	H240-4E1	0.88						
				H183-4E2	0.50	H243-4E2	0.83						
						S420	1.00						
						M420	1.00						

## AIR PILOTED

### 2-, 3-way

M3	C <sub>v</sub>	10-32	C <sub>v</sub>	1/8"	C <sub>v</sub>	1/4"	C <sub>v</sub>	3/8"	C <sub>v</sub>	1/2"	C <sub>v</sub>	3/4"	C <sub>v</sub>
		2P	0.09	31P	0.29	(VA/VV)250A	0.63			(VA)500A	2.20	(VA)590A	3.73
		3P	0.09	(VA)125A	0.22	250AA	0.85			500AB	2.20	590AB	3.73
				125AA	0.23	250AL	0.65			500AG	2.20	590AG	3.73
				125LA	0.15	250AH	0.50			501A	2.41		
				125AH	0.17					501AA	2.49		

### 4-way

M3	C <sub>v</sub>	10-32	C <sub>v</sub>	1/8"	C <sub>v</sub>	1/4"	C <sub>v</sub>	3/8"	C <sub>v</sub>	1/2"	C <sub>v</sub>	3/4"	C <sub>v</sub>
		4P	0.11	41P	0.29	42A	0.38			501-4A	1.89		
		4PP	0.11	41PP	0.28	42A2	0.35			501-4AA	1.89		
		110-4A	0.23	H180-4A	0.50	M42A2	0.32						
		110-4A2	0.23	H180-4A2	0.50	250-4A	0.49						
						250-4AA	0.75						

## MANUAL/MECHANICAL

### 2-, 3-way

M3	C <sub>v</sub>	10-32	C <sub>v</sub>	1/8"	C <sub>v</sub>	1/4"	C <sub>v</sub>	3/8"	C <sub>v</sub>	1/2"	C <sub>v</sub>	3/4"	C <sub>v</sub>
		2P	0.09	31P	0.29	250PL	0.83			501V	2.20	590C	3.85
		2V	0.09	31V	0.29	250P	0.84			(V)500C	2.20		
		3P	0.09	125PLG	0.22	250HO	0.83						
		3V	0.09	125P	0.22	250F	0.83						
				125HO	0.22	(V)250C	0.83						
				125B	0.23	250T	0.83						
				125MP	0.22	(V)250V	0.83						
				125MC	0.22								
				125MOC	0.22								
				125C	0.22								
				125T	0.22								
				(V)125V	0.22								

### 4-way

M3	C <sub>v</sub>	10-32	C <sub>v</sub>	1/8"	C <sub>v</sub>	1/4"	C <sub>v</sub>	3/8"	C <sub>v</sub>	1/2"	C <sub>v</sub>	3/4"	C <sub>v</sub>
		4P	0.11	41P	0.29	42P	0.39						
		4PP	0.11	41PP	0.29	42PP	0.39						
		4PPX	0.29	41PPX	0.29	M42P	0.32						
		4PP/PPX	0.29	41PP/PPX	0.29	M42PP	0.29						
		4V	0.11	41V	0.29	M42PA	0.29						
				41T	0.09	250-4F	0.75						
				41R	0.09	250-4H	0.75						

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# *Humphrey* General Guidelines

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## **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 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, 20w or 30w, 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.

## **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.

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.

The following are registered trademarks of the companies indicated: Delrin, Zytel, E.I., duPont; Rylton, Phillips Petroleum.

Specifications subject to change without notice.

All port connections are available in metric sizes. Specify metric port threads by using letter E as a model number prefix. The bottom number in all drawing dimensions is shown in millimeters.

**HUMPHREY PRODUCTS**  
**KILGORE AND SPRINKLE ROADS P O BOX 2008,**  
**KALAMAZOO MI 49003**

**MH6681 (N)**  
**CSA LR41336**

The following models are UL RECOGNIZED for component use.

Models 3E1, M3E1 valves; Models DMZ1, MZ1 manifolds.

Models 31E1, 41E1, M31E1, M41E1, MC41E1 valves; Models MM-2 through -7, MMC-2 through -7 manifolds.

Models 062-4E1, 062-4E2, 062E1, 062E2, VO62E1 valves, may be prefixed by T. Models TM-1R through -12R manifolds.

Models 125-4E1, 125E1, V125E1 valves, may be prefixed by T. Models TM-1R through -12R manifolds.

Model 310 may be prefixed by E, EM, ES, ESMP, EV, EVM, EVS, EVSMP, M, S, SMP, V, VM, VS, VSMP, may be suffixed by 2, 21, 39, 50, 81, 87, LL, MOV, RC, or SA, suffixed by UR.

Model 410 may be prefixed by E, EM, ES, ESMP, M, S, SMP, may be suffixed by 21, 39, 50, 70, 81, 87, LL, MOV, RC, or SA, suffixed by UR.

Models 250E1, 250E2.

The following models are UL LISTED for General use.

Model 062-4E1 with or without suffix 21, followed by 36, with or without suffixes 61 and/or 70.

Models 062E1, VO62E1 followed by 2 or 3, followed by 10 or 11, with or without suffix 20 or 21, followed by 36, with or without suffix 61.

Model 125-4E1 may be prefixed by T, with or without suffix 21, followed by 36, with or without suffix 60 or 70,

Model 125E1 may be prefixed by T, suffixed by 2 or 3, followed by 10 or 11, with or without suffix 20 or 21, followed by 36, may be followed by 60.

Model V125E1 followed by 2 or 3, followed by 10 or 11, with or without suffix 20 or 21, followed by 36, may be followed by 60.

Model V125E1 followed by 2 or 3, followed by 10 or 11, with or without suffix 20 or 21, followed by 36.

Models 250-4E1, 250-4E2 with or without suffix 21.

Model 250E1 followed by 2 or 3, followed by 10 or 11, followed by 20 or 21, followed by 36, with or without suffix 61.

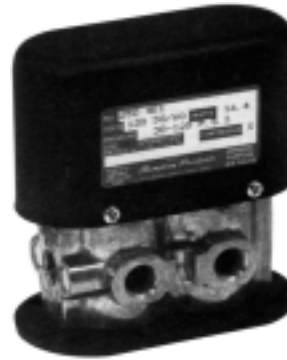
Models TM-1L thru -12L manifolds.

\* Available with U.L. Rating, consult factory

Humphrey 250 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 250 Series valve from functioning if the lubricant is varied or removed.

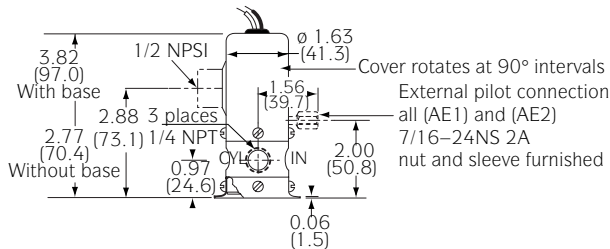
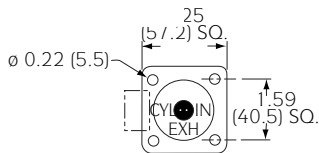
250 Series electric air valves have no sliding seals subject to cuts or metal seals subject to scratches, so they are ideal for use with contaminating media and are unaffected by compressor varnish.

250 Series air valves are 2-position, 2-way, 3-way or 4-way, single- or double-solenoid valves. They are designed for rugged duty and rapid cycling and can be mounted in any position.



**250E1** 250E1-3-10-21-36  
Model 250E1 is a single-solenoid, maintained-contact, spring return, 2-way or 3-way valve available either normally closed or normally open.

Model 250AE1 is identical to the 250E1 but has an external air pilot connection for valving media below 30 psig. Pilot air is isolated from valved media such as water, oil, instrument air, and gases.



**250E2** 250AE2-3-21  
Model 250E2 is a double-solenoid, momentary-contact, maintained-position, 2-way or 3-way valve. It holds in either the closed or open position with internal air pressure.

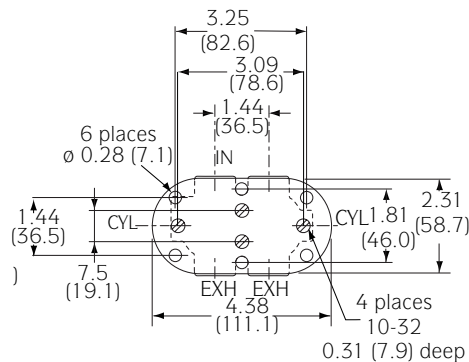
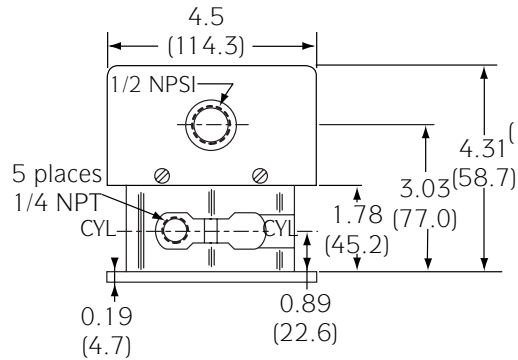
Model 250AE2 (shown) is identical to the 250E2 but has an external air pilot connection for valving media below 30 psig. Pilot air is isolated from valved media such as water, oil, instrument air, and gases.

If AC coils are to be energized longer than 30 seconds, specify Code CD (Continuous Duty). All coils for DC voltages are Code CD.



**250-4E1** 250-4E1-21  
Model 250-4E1 is a single-solenoid, maintained-contact, spring return, 4-way valve. It can be mounted with mounting base (Code 21), with four #10-32 holes

in bottom, or with the two slotted lugs on body. The 250-4E1 is also available as a 3-position, NC/NC or NO/NO valve. Furnished with conduit cover.



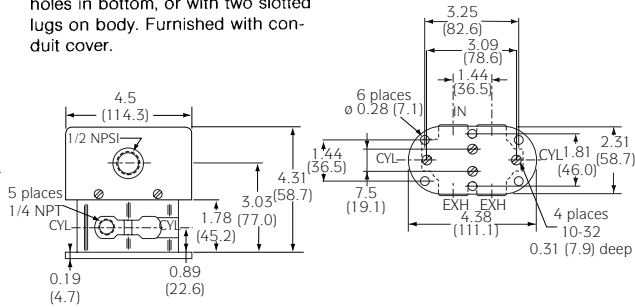


### 250-4E2

Model 250-4E2 is a double-solenoid, momentary-contact, maintained-position, 4-way valve. It can be mounted with mounting base (Code 21), with four #10-32 holes in bottom, or with two slotted lugs on body. Furnished with conduit cover.

### 250-4E2 (without cover)

All voltages Continuous Duty as standard.



#### MEDIA:

Compressed Air (Consult factory for others)

#### PRESSURE RANGE:

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 (AE1/AE2):** Equal to valve pressure, 30 psig (2.1 bars) Minimum

#### Air Flow to Atmosphere

MODEL	Weight				ACTUAL LBS	KGS
	25 PSIG CFM	(1.7 BARS) LPM	125 PSIG CFM	(8.6 BARS) LPM		
250E1/E2	25.0	707.5	75.0	2122.5	1.2	0.5
AE1/AE2					1.2	0.5
250-4E1/E2					1.4	0.6
250-4AE1	22.0	622.6	70.0	1981.0	2.8	1.3
250-4AE2					2.9	1.4

#### TEMPERATURE RANGE:

0 to 125°F (-17.8 to 51.7°C)

#### OPERATING SPEEDS:

To 600 CPM

#### MATERIALS:

Zinc Die Cast, Brass, Zinc Plated Steel, Stainless Steel, Buna N, Polyurethane

LUBRICATION ..... Not required

FILTRATION ..... Not required

### Options for 250 Series valves

When ordering, specify desired option.

#### For all 250 valves:

- Mounting Base (Code 21)
- 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:

- All voltages Continuous Duty as standard on 4-way only.

#### For 2- or 3-way models only:

- Brass body.
- Bottom inlet for normally closed models.
- Cover seal (Code 61) for dirty or wet conditions.

### Electrical Specifications

MODEL	VOLTAGE	COIL NUMBER	WATTS	AMPS	OHMS	HEAT RISE (°C)	ON TIME SECONDS	OFF TIME SECONDS
250E1	24 DC	46-8A	6.7	0.296	86	85.9	0.024	0.024
	120 AC	46-4	8.2	0.161	255	102.0	0.010	0.029
250E2	24 DC	46-8A	6.7	0.296	86	85.9	0.015	0.020
	120 AC	46-4	23.0	0.236	105	77.8	0.009	0.013
250-4E1	24 DC	46-8A	6.7	0.296	86	85.9	0.019	0.021
	120 AC	46-4	8.2	0.161	255	102.0	0.008	0.012
250-4E2	24 DC	46-10A	16.9	0.712	34	85.9	0.019	0.021
	120 AC	46-4	8.2	0.161	255	77.8	0.008	0.012

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

### 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)	
	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST	FILL	EXHAUST
250E1/E2	0.048	0.062	0.290	0.431	0.057	0.075	0.330	0.521
250-4E1/4E2	0.046	0.058	0.299	0.410	0.054	0.068	0.326	0.486

# Humphrey Electric Air Valves

## Order Information

**250/500/501/590 Series**  
**1/4-, 1/2-, and 3/4-inch ports, 2-way, 3-way, 4-way**

### VALVES

Option Code	2 Way	3 Way	Norm. Closed	Norm. Open	w/Out Mount. Base	With Mount. Base	Grommet Leads (18")	Conduit Leads (18")	DIN Connector	Grom./Conduit Leads (72")	Cover Seal	FKM* Seals	Brass Body	Bottom Inlet (NC Only)	Specify Voltage with option code				12VDC 24VDC
															120V 50/60, 240/50/60 (ID not available on E1)	24V 50/60 w/"Flywheel" Rectifiers for CD		Spec. Volt.	
Option Code	2	3	10	11	20	21	35	36	39	LL	61	w/VAI	w/BRB	w/BIN	CD	ID	CD		ID
<b>Model</b>																			
<b>250E1</b>	SP	N/C	N/C	N/C	N/C	SP	N/C	N/C	SP	SP	SP	SP	SP	SP	STD	NA	SP	NA	N/C
<b>250AE1</b>	SP	N/C	N/C	N/C	N/C	SP	NA	STD	SP	SP	NA	SP	SP	SP	STD	NA	SP	NA	N/C
<b>250E2</b>	SP	N/C	NA	NA	N/C	SP	NA	STD	SP	SP	SP	SP	SP	SP	STD	SP	SP	SP	N/C
<b>250AE2</b>	SP	N/C	NA	NA	N/C	SP	NA	STD	SP	SP	NA	SP	SP	SP	STD	SP	SP	SP	N/C
<b>250-4E1</b>	NA	NA	NA	NA	N/C	SP	NA	STD	SP	SP	NA	SP	NA	NA	STD	NA	SP	NA	N/C
<b>250-4E1 NC NC</b>	NA	NA	NA	NA	N/C	SP	NA	STD	SP	SP	NA	SP	NA	NA	STD	NA	SP	NA	N/C
<b>250-4E1 NO NO</b>	NA	NA	NA	NA	N/C	SP	NA	STD	SP	SP	NA	SP	NA	NA	STD	NA	SP	NA	N/C
<b>250-4E2</b>	NA	NA	NA	NA	N/C	SP	NA	STD	SP	SP	NA	SP	NA	NA	STD	NA	SP	NA	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
<b>HS4</b>	DIN Connector for use with Code 39 Valves.
<b>JB</b>	— 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 250E1-3-10-21-36 12VDC

3-Way Operation, Single Solenoid (250E1-3)  
 Normally Closed (250E1-3-10)  
 With Mounting Base (250E1-3-10-21)  
 Conduit Leads (18") (250E1-3-10-21-36)  
 Voltage 12VDC (250E1-3-10-21-36 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