

## A Series

- ▶ MOPD: 1000 PSI (69 Bar)
- ▶  $C_v$  Range: 0.019 to 0.3 ( $K_v$  Range: 0.016 to 0.256)
- ▶ 6 Watts

The A Series gives you a highly adaptable design for practically all applications requiring flow between  $C_v$  0.019 and 0.300 ( $K_v$  0.016 to 0.259). This robust 2- or 3-way miniature solenoid utilizes a stainless steel body to resist corrosion for most acids, alkaline solutions, and harsh environments. Also available in plastic—from polypropylene to Delrin®—when specific inert or demanding requirements are needed. Available in numerous port configurations, orifice sizes, and material combinations, the A Series is a highly flexible valve that fulfills the requirements for most applications.

### Typical Applications

#### Stainless Steel Bodies:

- Medical Equipment
- Laboratory Equipment
- Food Processing Equipment

#### Brass Bodies:

- Industrial Applications
- Automotive
- Water Transfer Systems

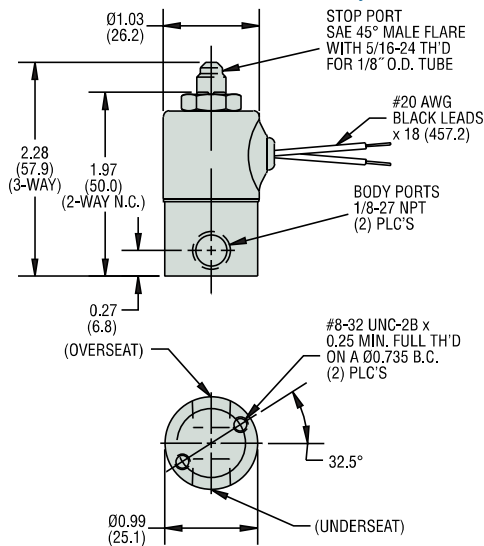


**Next Day Shipping**  
On Many Configurations

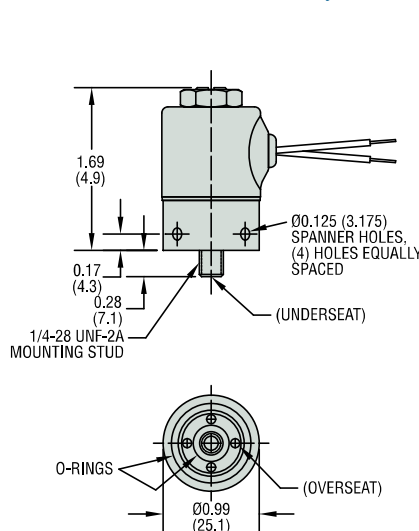


### Dimensions

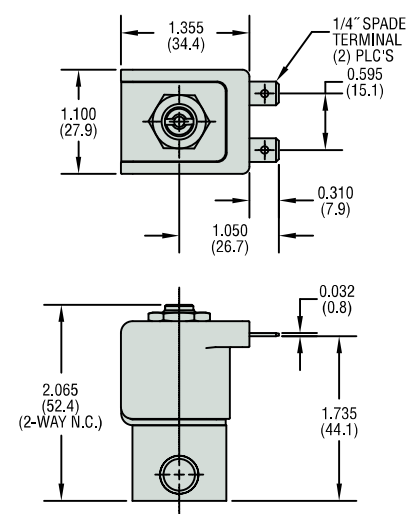
#### Threaded Port Body



#### Manifold Mount Body

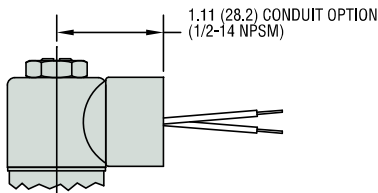


#### Molded Coil



#### Alternate 1/2" Conduit Housing

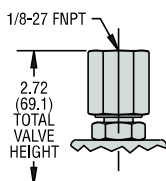
Available on all body configurations



See Manifold Mount Interface Details on pages J-17–J-18.

#### Stop Port

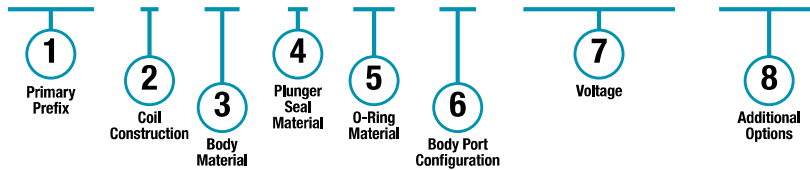
Standard on 2-way N.O.;  
Option "AD" on 3-Way.



How To Order

Use the **Bold** characters from the choices listed on the following page to construct a product code.

**A2213 - 3 - BB - N - NO - LB - 110/60VAC - WM-TP**



Note: After the Primary Prefix, any "-Code" may be blank when standard (blank) selections are specified.

Example:

A2213-3-BB-N-NO-LB-110/60VAC-WM-TP

2-Way N.O. (with 1/8"-27 NPT stop port adaptor) solenoid valve, with brass body, neoprene plunger seal, neoprene O-ring, 1/4"-18 FNPT body ports, operating at 110/60 VAC/Hz, and includes the mounting bracket and PTFE coated plunger options.





Take advantage of next day shipping by making your selections from those marked with the Lightning Bolt icon.

Part Prefix Table ①


	Orifice				MOPD		C <sub>v</sub>		K <sub>v</sub>		① Primary Prefix	
	Body		Stop		psig	bar	Body	Stop	Body	Stop	Grommet Housing	Conduit Housing
	inches	mm	inches	mm								
2-WAY N.C.	1/32	0.79	—	—	1000	69	0.020	—	0.017	—	A2011	A2021
	3/64	1.19	—	—	500	34	0.035	—	0.030	—	A2012	A2022
	1/16	1.59	—	—	300	21	0.065	—	0.055	—	A2013	A2023
	5/64	1.98	—	—	200	14	0.090	—	0.077	—	A2014	A2024
	3/32	2.38	—	—	175	12	0.155	—	0.132	—	A2015	A2025
	1/8	3.18	—	—	100	6.9	0.240	—	0.205	—	A2016	A2026
	5/32	3.97	—	—	50	3.4	0.300	—	0.256	—	A2017	A2027
2-WAY N.O. (option AD standard)	—	—	1/32	0.79	200	14	—	0.019	—	0.016	A2211	A2221
	—	—	3/64	1.19	150	10	—	0.040	—	0.034	A2212	A2222
	—	—	1/16	1.59	100	6.9	—	0.075	—	0.064	A2213	A2223
3-WAY N.C. Free Vent	1/32	0.79	1/32	0.79	200	14	0.019	0.019	0.016	0.016	A3011	A3021
	3/64	1.19	3/64	1.19	150	10	0.040	0.040	0.034	0.034	A3012	A3022
	1/16	1.59	3/64	1.19	100	6.9	0.070	0.040	0.060	0.034	A3013	A3023
	1/16	1.59	1/16	1.59	75	5.2	0.070	0.070	0.060	0.060	A3014	A3024
	3/32	2.38	3/64	1.19	50	3.4	0.170	0.040	0.145	0.034	A3015	A3025
3-WAY N.C. Line Connection	1/32	0.79	1/32	0.79	200	14	0.019	0.019	0.016	0.016	A3111	A3121
	3/64	1.19	3/64	1.19	150	10	0.040	0.040	0.034	0.034	A3112	A3122
	1/16	1.59	3/64	1.19	100	6.9	0.070	0.040	0.060	0.034	A3113	A3123
	1/16	1.59	1/16	1.59	75	5.2	0.070	0.070	0.060	0.060	A3114	A3124
	3/32	2.38	3/64	1.19	50	3.4	0.170	0.040	0.145	0.034	A3115	A3125
3-WAY N.O.	1/32	0.79	1/32	0.79	150	10	0.019	0.019	0.016	0.016	A3211	A3221
	3/64	1.19	3/64	1.19	100	6.9	0.040	0.040	0.034	0.034	A3212	A3222
	1/16	1.59	3/64	1.19	90	6.2	0.070	0.040	0.060	0.034	A3213	A3223
	1/16	1.59	1/16	1.59	75	5.2	0.070	0.070	0.060	0.060	A3214	A3224
	3/32	2.38	3/64	1.19	50	3.4	0.170	0.040	0.145	0.034	A3215	A3225
3-WAY Multi Purpose	1/32	0.79	1/32	0.79	125	8.6	0.019	0.019	0.016	0.016	A3311	A3321
	3/64	1.19	3/64	1.19	100	6.9	0.040	0.040	0.034	0.034	A3312	A3322
	1/16	1.59	3/64	1.19	90	6.2	0.070	0.040	0.060	0.034	A3313	A3323
	1/16	1.59	1/16	1.59	75	5.2	0.070	0.070	0.060	0.060	A3314	A3324
	3/32	2.38	3/64	1.19	25	1.7	0.170	0.040	0.145	0.034	A3315	A3325
3-WAY Directional Control	1/32	0.79	1/32	0.79	225	16	0.019	0.019	0.016	0.016	A3411	A3421
	3/64	1.19	3/64	1.19	150	10	0.040	0.040	0.034	0.034	A3412	A3422
	1/16	1.59	3/64	1.19	100	6.9	0.070	0.040	0.060	0.034	A3413	A3423
	1/16	1.59	1/16	1.59	75	5.2	0.070	0.070	0.060	0.060	A3414	A3424
	3/32	2.38	3/64	1.19	50	3.4	0.155	0.040	0.132	0.034	A3415	A3425

SOLENOID VALVES







## 2 Coil Construction

- (blank)** = Tape-wrapped, Class B (130°C), with 18" (45.7cm) lead wires\* 
- W**\_\_\_ = Tape-wrapped coil, lead wires, non-standard length (specify length in inches)
- 10** = Externally rectified coil (AC voltages lead wires only) 
- 1** = Encapsulated coil, Class B (130°C), lead wires
- 3** = Encapsulated coil, Class H (180°C), lead wires
- 4** = Encapsulated coil, Class B (130°C), 3/16" (4.76mm) spade terminals (1/4" (6.35mm) spade terminal optional)
- 11** = Tape-wrapped coil, Class H (180°C), lead wires
- 2M** = Over molded coil, Class F (155°C), lead wires
- 3M** = Over molded coil, Class H (180°C), lead wires
- 5M** = Over molded coil, Class F (155°C), 1/4" (6.35mm) spade terminals
- 6M** = Over molded coil, Class H (180°C), 1/4" (6.35mm) spade terminals
- HC2** = Encapsulated coil, Class B (130°C), 9.4mm DIN (EN175301-803 Style C Industrial 2+1 poles)







## 3 Body Material

- (blank)** = 303 Stainless Steel\* 
- BB** = Brass
- SB** = 304 Stainless Steel
- SB5** = 316 Stainless Steel
- SBF** = 430F Stainless Steel


## 4 Plunger Seal Material

- (blank)** = Nitrile\* 
- E** = EPR 
- GV** = Gasoline Viton® (2-way N.C. valves only)
- N** = Neoprene 
- NS** = Nitrile (NSF/FDA, 2-way N.C. valves only) 
- PF** = Perfluoroelastomer 
- R** = Rulon® (2-way N.C. valves only)
- T** = PTFE
- V** = Viton® 





## 5 O-Ring Material

- (blank)** = Nitrile\* 
- EO** = EPR 
- NO** = Neoprene 
- NSO** = Nitrile (NSF/FDA, 2-way N.C. valves only) 
- PFO** = Perfluoroelastomer 
- TO** = PTFE
- VO** = Viton® 


## 6 Body Port Configuration

- (blank)** = 1/8-27 NPT female thread\* 
- LB** = 1/4-18 NPT female thread
- BD** = #10-32 female straight thread  
– max. orifice = 1/8" (3.18mm)
- LT** = 1/8-28 BSPT female thread (2-way N.C. valves only)
- LU** = 1/4-19 BSPT female thread (2-way N.C. valves only)
- MM** = Manifold mount (1/4-28 UNF-2A mounting stud)<sup>†††</sup>
- MM3** = Manifold mount (5/16-24 UNF-2A mounting stud)<sup>†††</sup>
- OB** = Omit body (operator style)
- MB** = Bottom metering – max. orifice = 3/32" (2.38mm)
- BI** = Bottom over-seat port, female thread  
– max. orifice = 1/8" (3.18mm)
- BIM** = Bottom over-seat port, 1/8-27 NPT male thread  
– max orifice = 5/64" (1.98mm) brass body only
- BO** = Bottom under-seat port, female thread
- BOM** = Bottom under-seat port, 1/8-27 NPT male thread  
– max orifice = 1/8" (3.18mm) brass body only
- RL** = 90° porting - left hand
- RR** = 90° porting - right hand
- BS** = Stop port, #10-32 female straight thread<sup>†</sup>

## 7 Voltage<sup>††</sup> (see note below)

- C203** = 12 VDC 
- C204** = 24 VDC 
- C301** = 120/50/60R (add Coil Option -10) 
- C303** = 240/50/60R (add Coil Option -10) 
- \_\_\_ **VDC** = DC (specify DC voltage)
- \_\_\_ **VAC** = AC (specify AC voltage; includes copper shading ring)

## 8 Additional Options

- Y** = Yoke
- WM** = Mounting bracket
- TP** = PTFE coated plunger
- AD** = 1/8 - 27 NPT stop port adapter (3-way valves only) 
- QO** = Quiet operation (2-way valves only)
- S** = Silver shading ring
- OC** = Cleaned for oxygen use
- VAC** = Vacuum application – 0 to 29.5" Hg (0 to 1000mBar)
- G1** = One-piece 303 Stainless Steel guide assembly
- G5** = One piece 316 Stainless Steel guide assembly

\* Standard selection; will be used unless otherwise specified. Standard selections are not referenced in final part number.

<sup>†</sup> Plastic body available, contact Gems.

<sup>††</sup> Can be AC rectified without shading ring. Use coil construction Code 10.

<sup>†††</sup> Teflon® o-ring not suitable for manifold mount.



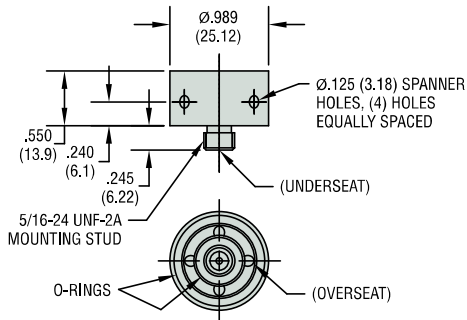
Take advantage of next day shipping by making your selections from those marked with the Lightning Bolt icon.

Gems specializes in the design and manufacturing of custom solenoid valves and fluidic systems. If you don't see what you're looking for, or have a question, contact us at 800-378-1600 or info@gemssensors.com.

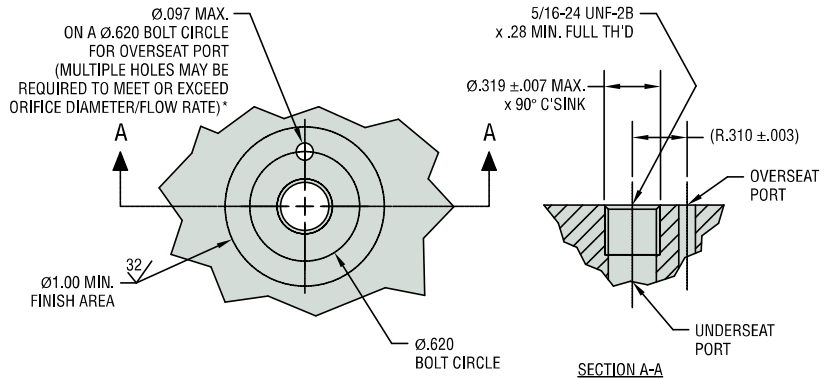
# A Series – Manifold Mount Interface Details

## Manifold Mounting Bodies

### Manifold Mount 5/16"-24 Stud Body (MM3)



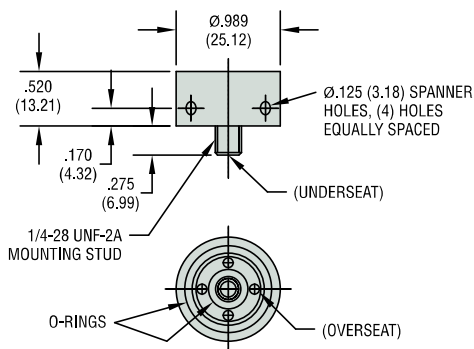
#### Manifold Preparation



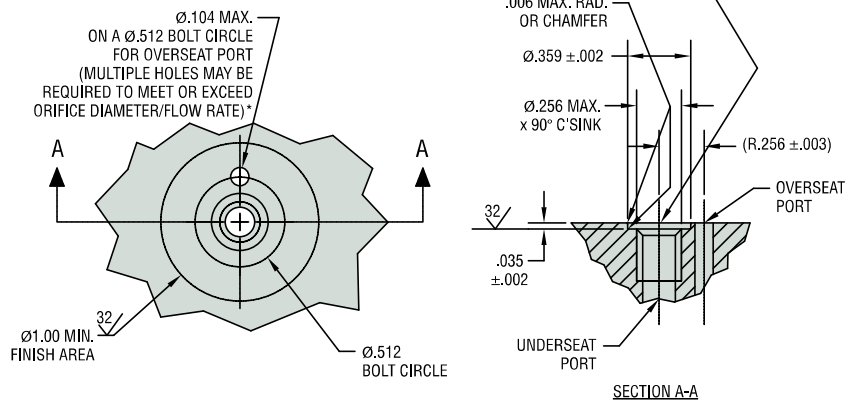
\* If the total area of overseat port is less than the orifice diameter, then the overseat is the restrictor.

Valve Type	Standard		Vacuum	
	Overseat Port	Underseat Port	Overseat Port	Underseat Port
2-Way N.C.	IN	OUT	VAC	IN
2-Way N.O.	IN	—	IN	—
3-Way N.C.	CYL	IN	IN	VAC
3-Way N.O.	CYL	EXH	CYL	EXH
3-Way M.P.	COM	N.C.	COM	N.C.
3-Way D.C.	IN	N.C.	VAC	N.C.

### Manifold Mount 1/4"-28 Stud Body (MM)



#### Manifold Preparation



\* If the total area of overseat port is less than the orifice diameter, then the overseat is the restrictor.

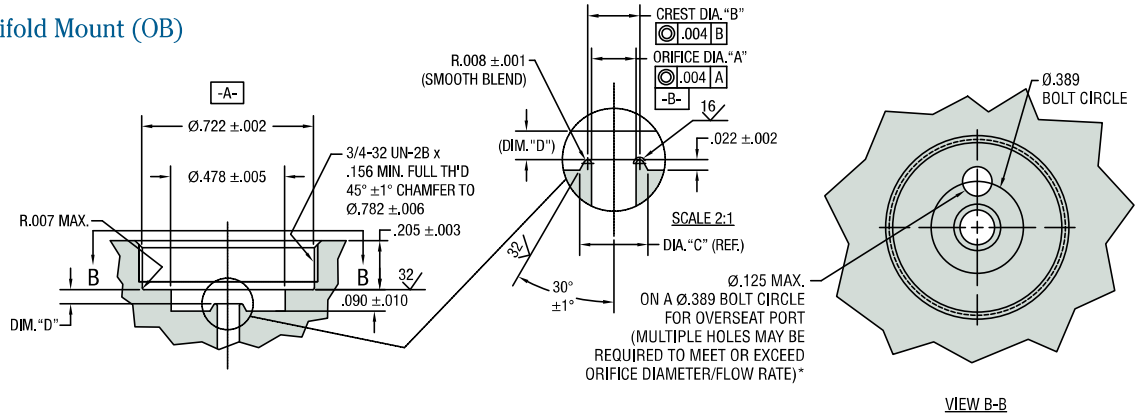
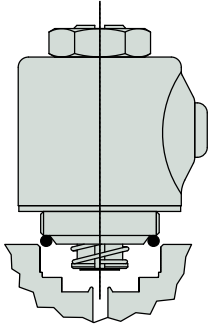
Valve Type	Standard		Vacuum	
	Overseat Port	Underseat Port	Overseat Port	Underseat Port
2-Way N.C.	IN	OUT	VAC	IN
2-Way N.O.	IN	—	IN	—
3-Way N.C.	CYL	IN	IN	VAC
3-Way N.O.	CYL	EXH	CYL	EXH
3-Way M.P.	COM	N.C.	COM	N.C.
3-Way D.C.	IN	N.C.	VAC	N.C.

SOLENOID VALVES

# A Series – Operator (OB) Interface Details

## Omit Body Manifold Mount (OB)

N.C. & 3-Way



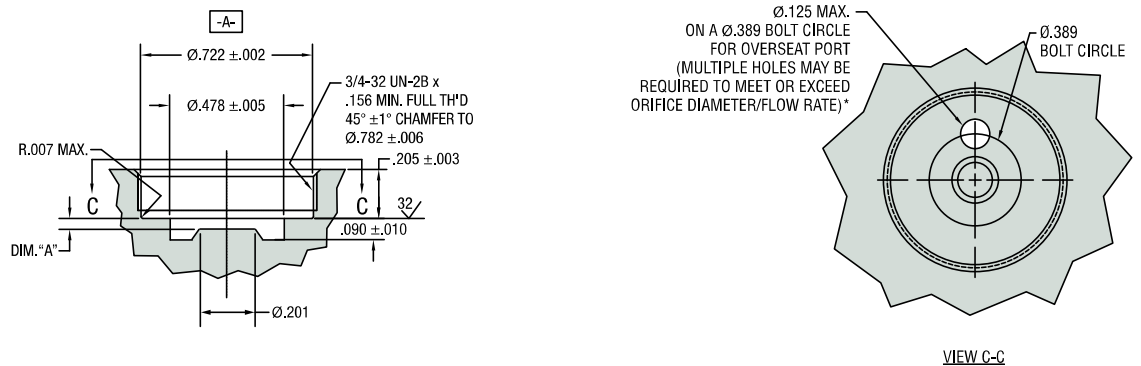
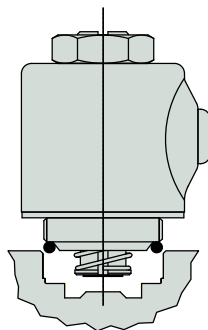
Note: All diameters to be concentric to datum -A- within .003 T.I.R.

\* If the total area of overseat port is less than the orifice diameter, then the overseat is the restrictor.

### Dimensions

Valve Function	Valve Prefix (Code 1)	Orifice Dia. "A" ±.001	Crest Dia. "B" ±.002	Base Dia. "C" Ref.	Orifice Depth Dim. "D" ±.001
2-Way N.C.	2011	.040 (1.02)	.052 (1.32)	.0843 (2.141)	.047 (1.19)
	2012	.046 (1.19)	.062 (1.57)	.0966 (2.454)	.048 (1.22)
	2013	.062 (1.57)	.078 (1.98)	.1126 (2.860)	.052 (1.32)
	2014	.078 (1.98)	.094 (2.38)	.1286 (3.266)	.056 (1.42)
	2015	.093 (2.36)	.109 (2.77)	.1436 (3.647)	.060 (1.52)
	2016	.120 (3.05)	.136 (3.45)	.1706 (4.333)	.067 (1.70)
	2017	.148 (3.76)	.164 (4.17)	.1986 (5.044)	.074 (1.88)
3-Way (All)	3X11	.040 (1.02)	.052 (1.32)	.0843 (2.141)	.047 (1.19)
	3X12	.046 (1.19)	.062 (1.57)	.0966 (2.454)	.048 (1.22)
	3X13	.062 (1.57)	.078 (1.98)	.1126 (2.860)	.052 (1.32)
	3X14	.062 (1.57)	.078 (1.98)	.1126 (2.860)	.052 (1.32)
	3X15	.093 (2.36)	.109 (2.77)	.1436 (3.647)	.060 (1.52)

N.O.



Note: All diameters to be concentric to datum -A- within .003 T.I.R.

\* If the total area of overseat port is less than the orifice diameter, then the overseat is the restrictor.

### Dimensions

Valve Function	Valve Prefix (Code 1)	Orifice Depth Dia. "A" ±.001	Stop Orifice Ref.
2-Way N.O.	2211	.047 (1.19)	1/32
	2212	.048 (1.22)	3/64
	2213	.052 (1.32)	1/16