

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



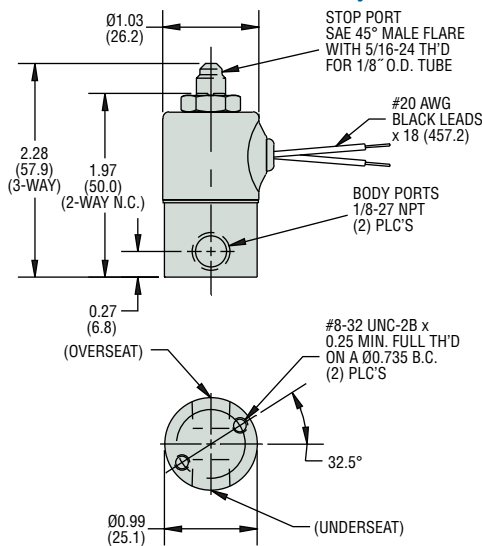
Next Day Shipping
On Many Configurations



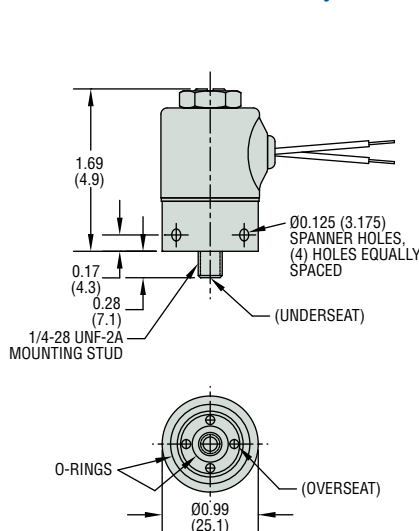
CE

Dimensions

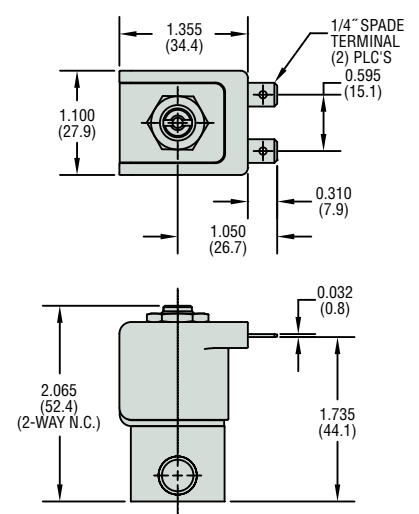
Threaded Port Body



Manifold Mount Body

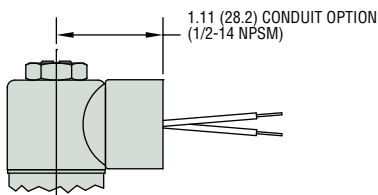


Molded Coil



Alternate 1/2" Conduit Housing

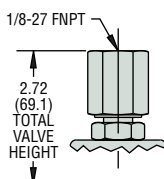
Available on all body configurations



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

Stop Port

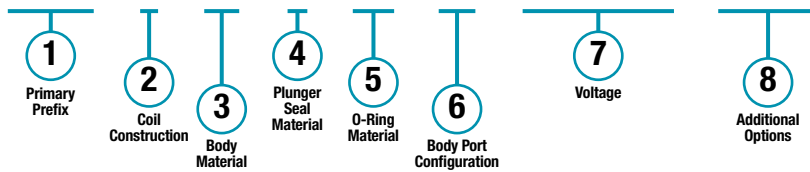
Standard on 2-way N.O.;
Option "AD" on 3-Way.



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 _v | | K _v | | 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)^{†††}
- MM3** = Manifold mount (5/16-24 UNF-2A mounting stud)^{†††}
- 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[†]

7 Voltage^{††} (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.

[†] Plastic body available, contact Gems.

^{††} Can be AC rectified without shading ring. Use coil construction Code 10.

^{†††} Teflon® o-ring not suitable for manifold mount.



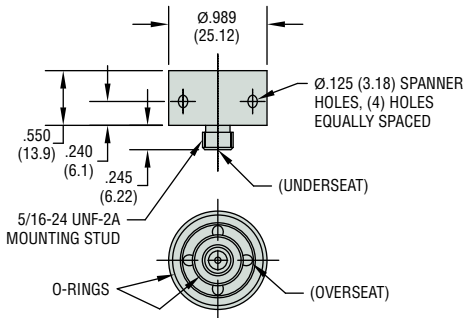
Take advantage of next day shipping by making your selections from those marked with the Lightning Bolt icon.

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.

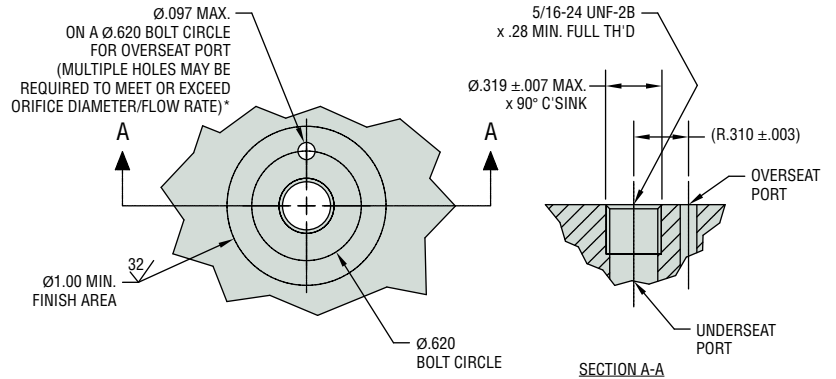
A Series – Manifold Mount Interface Details

Manifold Mounting Bodies

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



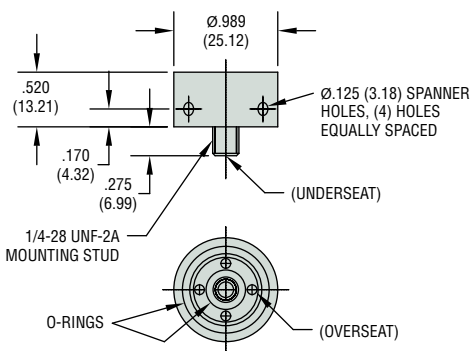
Manifold Preparation



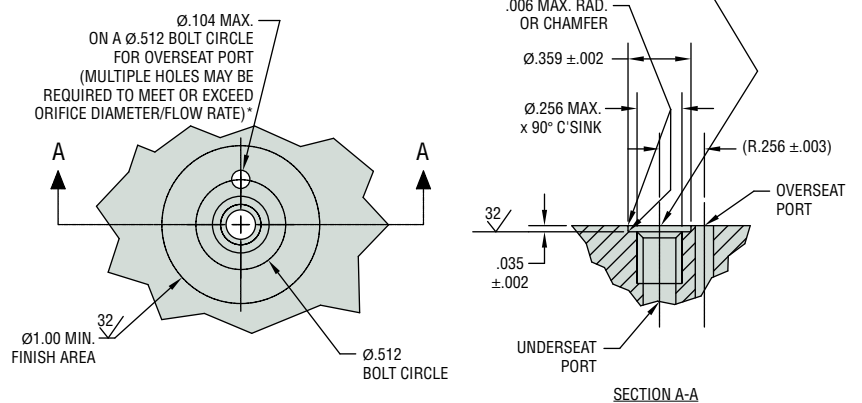
* If the total area of overseat port is less than the orifice diameter, then the overseat is the restrictor.

| 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



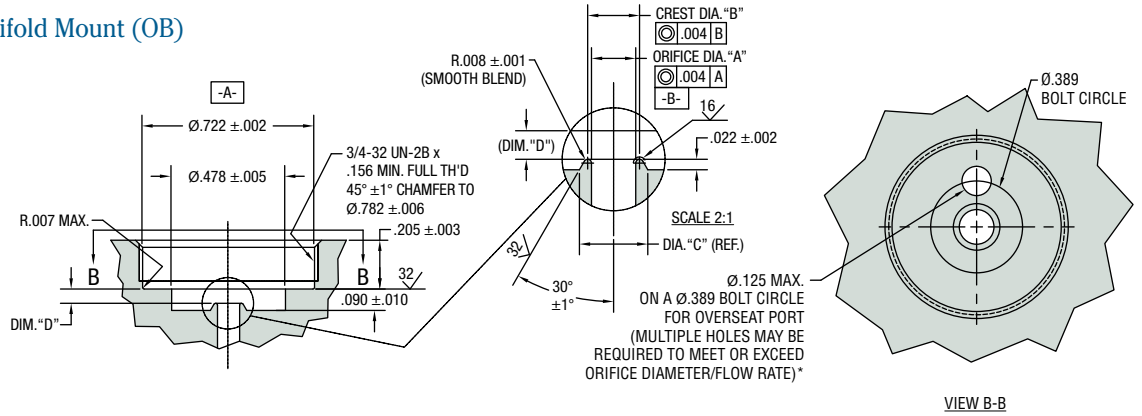
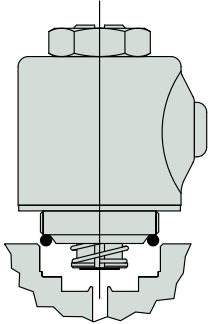
* If the total area of overseat port is less than the orifice diameter, then the overseat is the restrictor.

| 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. |

A Series – Operator (OB) Interface Details

Omit Body Manifold Mount (OB)

N.C. & 3-Way



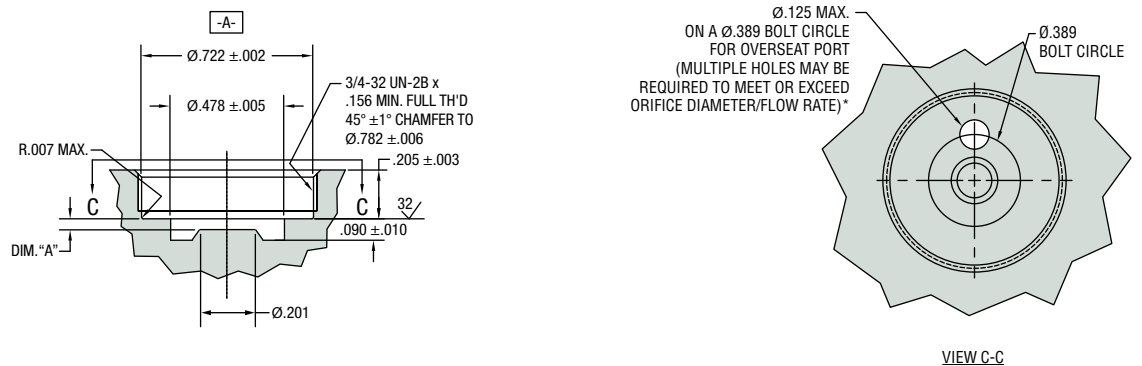
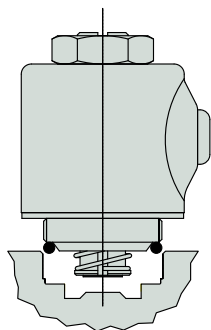
Note: All diameters to be concentric to datum -A- within .003 T.I.R.

* 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" $\pm .001$ | Crest Dia. "B" $\pm .002$ | Base Dia. "C" Ref. | Orifice Depth Dim. "D" $\pm .001$ |
|----------------|-----------------------|-----------------------------|---------------------------|--------------------|-----------------------------------|
| 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" $\pm .001$ | 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 |