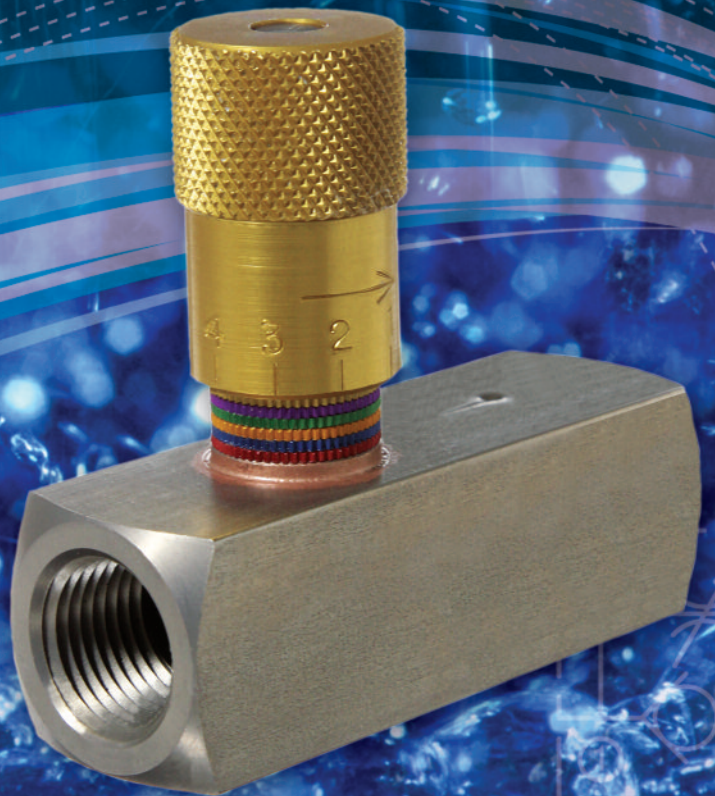
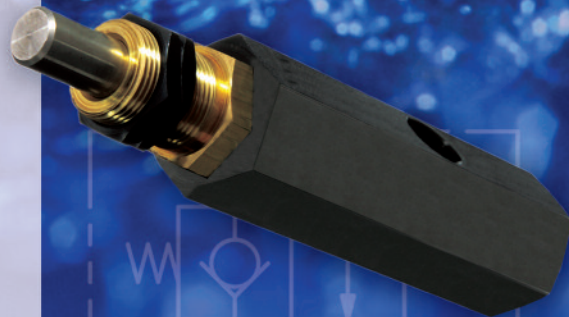


# In-Line Hydraulic and Pneumatic Valves



## FEATURING:

- **Easy Read®**  
Flow, Needle & Check Valves in  
Brass, Steel & Stainless
- **Pneu-Trol®**  
Flow, Needle & Check Valves in  
Brass, Aluminum, Steel & Stainless
- BSP and SAE port threads available  
on selected valves
- Pressure Compensated Flow  
Controls
- Quick Exhaust Valves



*Solution Specialists  
to the Fluid Power Industry*

## Committed to TOTAL Customer Satisfaction

Deltrol Fluid Products strives for **World Class Performance** standards in product design, quality, competitive prices and quick response. Whether manufacturing an extensive range of fluid power and fluid control components, or assisting in the design and building of the complete package, our goal remains...

### TOTAL Customer Satisfaction

*At Deltrol Fluid Products, our mission is to create and maintain an image of leadership, quality and integrity with our customers, employees and suppliers. We continually strive to be a world-class manufacturer of cartridge valves, custom manifold systems, and in-line valves.*

#### History

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Located in Bellwood, Illinois, just outside of Chicago, and founded in 1963, Deltrol Fluid Products designed and manufactured in-line accessory hydraulic and pneumatic flow, needle, and check valves. When screw-in style cartridge valve technology developed, our product offering expanded to include cartridge valves.

Now, fifty years since our founding, we have expanded our product line to include a full line of solenoid and manual operated, directional control, flow control, and pressure control screw-in and slip-in style cartridge valves.

We offer a comprehensive line of standard products and thrive on providing custom valves and integrated circuits that meet our customers' needs.

#### Design

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Our design group is divided into two cross-functional teams, which allows us to focus on product designs that meet our customers' requirements. The valve design group can develop valves independently or integrate with our systems design group based on customers' special applications and needs. Our three-dimensional modeling software enables us to create the most compact and efficient solutions for our customers.

#### Integrated Manufacturing

---

Our vertically integrated manufacturing facility enables us to produce high quality, cost effective parts on site. Our state-of-the-art assembly and test equipment ensure efficient through-put that meets our demanding quality standards.

#### Quality

---

Our ISO 9001-2008 certified and Six Sigma based quality system ensures that our designs are produced to our customers' expectations. Our robust design verification and vendor qualification systems ensure smooth transition from concept to production. 100% of the products we produce are functionally tested with automated computer-driven test systems.

#### Delivery

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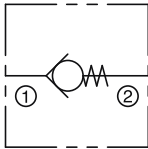
Our MRP based manufacturing system gives us the flexibility to meet our customers' delivery system requirements. We are experienced in working with various customer implementations of pull order systems. We work closely to understand our customers' ERP systems and have the flexibility to integrate our packaging and delivery with their requirements.

We take pride in our ability to provide high quality, cost effective customer solutions. We offer a wide range of standard products and excel at the opportunity to modify our current designs or develop unique products that meet our customers' special needs.

If the solution you need is not available in our catalog or you have a special application, please contact us so we can develop a component or system that meets your specific demands. Whether it's a unique environment, flow media, fit, or application, we are eager to work with you to provide products and services that make you most competitive in your marketplace.

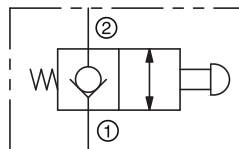
|               |                               |        |
|---------------|-------------------------------|--------|
| <b>0.00.0</b> | <b>INTRODUCTION</b>           |        |
|               | World Class Performance ..... | 0.01.1 |
|               | Table of Contents .....       | 0.02.1 |

## 1.00.0 CHECK & SHUTTLE



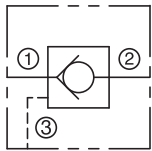
### Check, Direct-Acting

| Series           | Threads (ports)                  | Flow        |               | Pressure |                 | Material        | Model             | Page   |
|------------------|----------------------------------|-------------|---------------|----------|-----------------|-----------------|-------------------|--------|
|                  |                                  | gpm         | lpm           | psi      | bar             |                 |                   |        |
| <b>Easy Read</b> | Female-to-Female<br>NPTF         | 3.0 to 55.0 | 11.4 to 208.2 | 2000     | 138             | Brass           | EC**B<br>EDC**B   | 1.01.1 |
|                  |                                  | 6.0 to 55.0 | 22.7 to 208.2 | 5000     | 345             | Carbon Steel    | EC**S<br>EDC**S   |        |
|                  |                                  | 6.0 to 20.0 | 22.7 to 75.7  | 5000     | 345             | Stainless Steel | EC**SS<br>EDC**SS |        |
|                  | Female-to-Female<br>BSP Taper    | 3.0 to 20.0 | 11.4 to 75.7  | 5000     | 345             | Carbon Steel    | ECB**S            |        |
|                  | Female-to-Female<br>BSP Parallel | 6.0 to 20.0 | 22.8 to 75.7  | 5000     | 345             | Carbon Steel    | ECBP**S           | 1.01.1 |
| <b>Pneu-Trol</b> | Female-to-Female<br>NPTF         | 1.5 to 12.0 | 5.7 to 45.4   | 60       | 4               | Brass           | CP**B             | 1.02.1 |
|                  |                                  |             |               | 2000     | 138             | Brass           | C**B              |        |
|                  |                                  |             |               | 5000     | 345             | Carbon Steel    | C**S              |        |
|                  |                                  | 1.5 to 8.0  | 5.7 to 30.3   | 5000     | 345             | Stainless Steel | C**SS             |        |
|                  |                                  | 1.5 to 3.0  | 5.7 to 11.4   | 60       | 4               | Stainless Steel | CP**SS            |        |
|                  | Male-to-Female<br>NPTF 1/4"      | 2.5         | 9.5           | 60       | 4               | Brass           | CPMF20B           | 1.03.1 |
|                  | Male-to-Male<br>NPTF             | 1.0 to 10.0 | 3.8 to 37.9   | 2000     | 138             | Brass           | CMM**B            | 1.04.1 |
|                  |                                  | 2.5 to 10.0 | 9.5 to 37.9   | 3000     | 207             | Carbon Steel    | CMM**S            |        |
|                  |                                  | 2.5         | 9.5           |          |                 | Stainless Steel | CMM20SS2          |        |
|                  | Male-to-Male<br>NPTF (Soft Seat) | 1.0 to 15.0 | 3.8 to 56.8   | 2000     | 138             | Brass           | CMM***B           | 1.04.1 |
| 2.5 to 10.0      |                                  | 9.5 to 37.9 | 3000          | 207      | Carbon Steel    | CMM***S         |                   |        |
| 2.5 to 6.0       |                                  | 9.5 to 22.8 |               |          | Stainless Steel | CMM***SS        |                   |        |



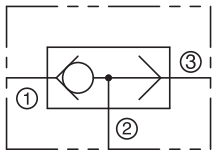
### Check, Plunger-Operated

| Series           | Threads (ports)               | Flow |      | Pressure |     | Material     | Model  | Page   |
|------------------|-------------------------------|------|------|----------|-----|--------------|--------|--------|
|                  |                               | gpm  | lpm  | psi      | bar |              |        |        |
| <b>Pneu-Trol</b> | Female-to-Female<br>NPTF 1/4" | 5.0  | 18.9 | 3000     | 207 | Carbon Steel | MOC20S | 1.10.1 |



**Check, Pilot-To-Open**

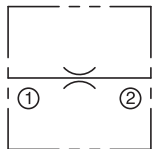
| Series           | Threads (ports)                      | Flow |      | Pressure |     | Material        | Model     | Page   |
|------------------|--------------------------------------|------|------|----------|-----|-----------------|-----------|--------|
|                  |                                      | gpm  | lpm  | psi      | bar |                 |           |        |
| <b>Pneu-Trol</b> | Female-to-Female<br>NPTF             | 6.0  | 22.7 | 3000     | 207 | Carbon<br>Steel | PIC-20S   | 1.20.1 |
|                  |                                      | 10.0 | 37.9 |          |     |                 |           |        |
|                  |                                      | 12.0 | 45.4 |          |     |                 |           |        |
|                  | Female-to-Female<br>NPTF (Air Pilot) | 12.0 | 45.4 | 3000     | 207 | Carbon<br>Steel | APIDC-30S | 1.20.1 |
|                  | Female-to-Female<br>BSP Taper        | 6.0  | 22.7 | 3000     | 207 | Carbon<br>Steel | PICB-20S  | 1.20.1 |
|                  |                                      | 10.0 | 37.9 |          |     |                 |           |        |



**Shuttle, Ball-Type**

| Series           | Threads (ports)          | Flow      |     | Pressure |     | Material | Model | Page   |
|------------------|--------------------------|-----------|-----|----------|-----|----------|-------|--------|
|                  |                          | gpm       | lpm | psi      | bar |          |       |        |
| <b>Pneu-Trol</b> | Female-to-Female<br>NPTF | Cv = .74  | -   | 200      | 14  | Brass    | SV10B | 1.30.1 |
|                  |                          | Cv = 1.35 | -   |          |     |          | SV20B |        |

**2.00.0 FLOW CONTROL**

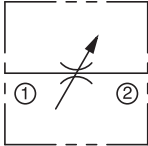


**Orifice, Gauge Snubber**

| Series           | Threads (ports)             | Flow |     | Pressure |     | Material     | Model | Page   |
|------------------|-----------------------------|------|-----|----------|-----|--------------|-------|--------|
|                  |                             | gpm  | lpm | psi      | bar |              |       |        |
| <b>Pneu-Trol</b> | Male-to-Female<br>NPTF 1/4" | -    | -   | 2000     | 138 | Brass        | GS20B | 2.01.1 |
|                  |                             | -    | -   | 5000     | 345 | Carbon Steel | GS20S |        |

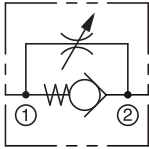
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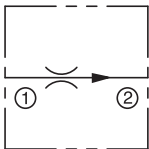
## Needle Valve, Restrictive, Adjustable

| Series                           | Threads (ports)                      | Flow                |               | Pressure |              | Material        | Model    | Page   |
|----------------------------------|--------------------------------------|---------------------|---------------|----------|--------------|-----------------|----------|--------|
|                                  |                                      | gpm                 | lpm           | psi      | bar          |                 |          |        |
| ◀ <b>Easy Read</b>               | Female-to-Female<br>NPTF             | 4.5 to 100.0        | 17.1 to 378.5 | 2000     | 138          | Brass           | EN***B   | 2.10.1 |
|                                  |                                      |                     |               | 5000     | 345          | Carbon Steel    | EN***S   |        |
|                                  |                                      | 10.0                | 37.9          | 5000     | 345          | Stainless Steel | EN20SS   |        |
|                                  | Female-to-Female<br>BSP Taper        | 4.5 to 40.0         | 17.1 to 151.4 | 2000     | 138          | Brass           | ENB**B   | 2.10.1 |
|                                  |                                      |                     |               | 5000     | 345          | Carbon Steel    | ENB**S   |        |
|                                  |                                      | 10.0 to 18.0        | 37.9 to 68.1  | 2000     | 138          | Brass           | ENBP**B  |        |
| Female-to-Female<br>BSP Parallel | 4.5 to 40.0                          | 17.1 to 151.4       | 5000          | 345      | Carbon Steel | ENBP**S         |          |        |
| ◀ <b>Pneu-Trol</b>               | Female-to-Female<br>NPTF             | 3.2 to 34.0         | 12.1 to 128.7 | 2000     | 138          | Brass           | N**B     | 2.11.1 |
|                                  |                                      | 3.2 to 34.0         | 12.1 to 128.7 | 5000     | 345          | Carbon Steel    | N**S     |        |
|                                  |                                      | 3.2 to 22.5         | 12.1 to 85.2  | 5000     | 345          | Stainless Steel | N**SSK   |        |
|                                  | Female-to-Female<br>BSP Taper        | 3.2 to 13.5         | 12.1 to 51.1  | 2000     | 138          | Brass           | NB**BK   | 2.11.1 |
|                                  |                                      | 3.2 to 34.0         | 12.1 to 128.7 | 5000     | 345          | Carbon Steel    | NB**SK   |        |
|                                  | Female-to-Female<br>SAE              | 7.0 to 34.0         | 26.5 to 128.7 | 5000     | 345          | Carbon Steel    | NM***SK  | 2.11.1 |
|                                  | Male-to-Female<br>NPFT<br>Model 01   | Cv = .67 to<br>1.89 | -             | 10,000   | 690          | Carbon Steel    | S*01S1   | 2.15.1 |
|                                  | Female-to-Female<br>NPTF<br>Model 02 | Cv = .85 to<br>3.70 | -             | 10,000   | 690          | Carbon Steel    | S*02S1   | 2.15.1 |
|                                  |                                      | Cv = .85            | -             | 10,000   | 690          | Carbon Steel    | SM202S1  |        |
|                                  | Female-to-Female<br>BSPT<br>Model 02 | Cv = .85 to<br>3.70 | -             | 10,000   | 690          | Carbon Steel    | SB*02S1  | 2.15.1 |
|                                  | Female-to-Female<br>NPTF<br>Model 50 | Cv = .37 to<br>4.65 | -             | 10,000   | 690          | Carbon Steel    | S*50S1   | 2.15.1 |
|                                  |                                      | Cv = .37 to<br>.47  | -             | 10,000   | 690          | Carbon Steel    | SM*50S1  |        |
|                                  | Female-to-Female<br>BSPT<br>Model 50 | Cv = .47 to<br>2.65 | -             | 10,000   | 690          | Carbon Steel    | SB*50S1  | 2.15.1 |
|                                  | Female-to-Female<br>BSPP<br>Model 50 | Cv = .47 to<br>2.65 | -             | 10,000   | 690          | Carbon Steel    | SBP*50S1 | 2.15.1 |
|                                  | Male-to-Female<br>NPTF               | 3.2 to 7.0          | 12.1 to 26.5  | 2000     | 138          | Brass           | NMF**BK  | 2.16.1 |
| 7.0 to 13.5                      |                                      | 26.5 to 51.1        | 5000          | 345      | Carbon Steel | NMF**SK         |          |        |
| Male-to-Female<br>NPTF           | 3.2                                  | 12.1                | 5000          | 345      | Steel        | NMF20-10S       | 2.17.1   |        |
| Female-to-Female<br>NPTF         | 3.2                                  | 12.1                | 5000          | 345      | Steel        | N20-10S         | 2.18.1   |        |



**Flow Control, Free Reverse Flow, Adjustable**

| Series                   | Threads (ports)                  | Flow        |               | Pressure |                 | Material        | Model    | Page   |
|--------------------------|----------------------------------|-------------|---------------|----------|-----------------|-----------------|----------|--------|
|                          |                                  | gpm         | lpm           | psi      | bar             |                 |          |        |
| <b>Pneu-Trol</b>         | Female-to-Female<br>NPTF         | 1.5         | 5.7           | 1000     | 69              | Stainless Steel | SFP10SSB | 2.21.1 |
|                          |                                  | 3.0         | 11.5          | 500      | 34              |                 | SFP20SSB |        |
|                          | Female-to-Female<br>NPTF         | 1.5 to 5.0  | 5.7 to 18.9   | 60       | 4               | Brass           | FP**B    | 2.22.1 |
|                          |                                  | 1.5 to 12.0 | 5.7 to 45.4   | 2000     | 138             | Brass           | F**B     |        |
|                          |                                  | 1.5 to 12.0 | 5.7 to 45.4   | 5000     | 345             | Carbon Steel    | F**S     |        |
|                          |                                  | 1.5 to 8.0  | 5.7 to 30.3   | 5000     | 345             | Stainless Steel | F**SSK   |        |
|                          | Female-to-Female<br>BSP Taper    | 1.5 to 5.0  | 5.7 to 18.9   | 2000     | 138             | Brass           | FB**BK   | 2.22.1 |
|                          |                                  | 1.5 to 12.0 | 5.7 to 45.4   | 5000     | 345             | Carbon Steel    | FB**SK   |        |
|                          | Female-to-Female<br>SAE          | 5.0         | 18.9          | 5000     | 345             | Carbon Steel    | FM620S   | 2.22.1 |
|                          | Male-to-Female<br>NPFT           | 1.5 to 8.0  | 5.7 to 30.3   | 2000     | 138             | Brass           | FMF**BK  | 2.23.1 |
| Female-to-Female<br>NPTF | 3.0                              | 11.4        | 5000          | 345      | Stainless Steel | F20SS316K       | 2.24.1   |        |
|                          | 8.0                              | 30.3        |               |          |                 | F30SS316K       |          |        |
| <b>Easy Read</b>         | Female-to-Female<br>NPTF         | 3.0 to 55.0 | 11.4 to 208.2 | 2000     | 138             | Brass           | EF**B    | 2.25.1 |
|                          |                                  |             |               | 5000     | 345             | Carbon Steel    | EF**S    |        |
|                          |                                  | 3.0 to 12.0 | 11.4 to 45.4  | 5000     | 345             | Stainless Steel | EF**SS   |        |
|                          | Female-to-Female<br>BSP Taper    | 3.0 to 20.0 | 11.4 to 75.7  | 2000     | 138             | Brass           | EFB**B   | 2.25.1 |
|                          |                                  |             |               | 5000     | 345             | Carbon Steel    | EFB**S   |        |
|                          | Female-to-Female<br>BSP Parallel | 3.0 to 12.0 | 11.4 to 45.4  | 2000     | 138             | Brass           | EFBP**B  | 2.25.1 |
|                          |                                  | 3.0 to 20.0 | 11.4 to 75.7  | 5000     | 345             | Carbon Steel    | EFBP**S  |        |
|                          | Female-to-Female<br>SAE          | 6.0 to 20.0 | 22.7 to 75.7  | 5000     | 345             | Carbon Steel    | EFM****S | 2.25.1 |

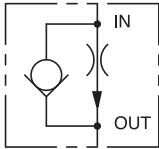


**Flow Regulator, Restrictive, Pressure-Compensated, Fixed**

| Series           | Threads (ports)          | Flow        |              | Pressure |     | Material      | Model  | Page   |
|------------------|--------------------------|-------------|--------------|----------|-----|---------------|--------|--------|
|                  |                          | gpm         | lpm          | psi      | bar |               |        |        |
| <b>Pneu-Trol</b> | Female-to-Female<br>NPTF | 0.1 to 2.0  | 0.4 to 7.6   | 3000     | 207 | Steel         | PC3    | 2.30.1 |
|                  |                          | 0.5 to 30.0 | 1.9 to 113.6 |          |     | Alum. / Steel | PC4    |        |
|                  | Female-to-Female<br>SAE  | 0.1 to 2.0  | 0.4 to 7.6   | 3000     | 207 | Steel         | PCM63  | 2.30.1 |
|                  |                          | 0.5 to 5.0  | 1.9 to 18.9  |          |     | Aluminum      | PCM44  |        |
|                  |                          | 1.0 to 10.0 | 3.8 to 37.9  |          |     | Aluminum      | PCM64  |        |
|                  |                          | 1.5 to 15.0 | 5.7 to 56.8  |          |     | Steel         | PCM84  |        |
|                  |                          | 2.0 to 30.0 | 7.6 to 113.6 |          |     | Steel         | PCM124 |        |

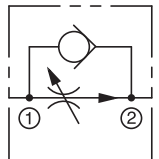
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## Flow Regulator, Free Reverse Flow, Pressure-Compensated, Fixed

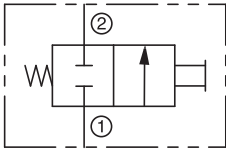
| Series  | Threads (ports)                 | Flow        |             | Pressure |     | Material     | Model | Page   |
|---------|---------------------------------|-------------|-------------|----------|-----|--------------|-------|--------|
|         |                                 | gpm         | lpm         | psi      | bar |              |       |        |
| In-line | Male-to-Female #8 SAE to #8 SAE | 1.0 to 10.0 | 3.8 to 37.9 | 3000     | 207 | Carbon Steel | PCM88 | 2.40.1 |



## Flow Regulator, Free Reverse Flow, Pressure-Compensated, Adjustable

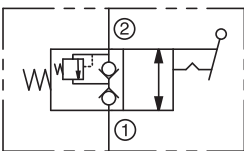
| Series           | Threads (ports)            | Flow         |              | Pressure |     | Material     | Model   | Page   |
|------------------|----------------------------|--------------|--------------|----------|-----|--------------|---------|--------|
|                  |                            | gpm          | lpm          | psi      | bar |              |         |        |
| <b>Pneu-Trol</b> | Female-to-Female NPTF      | 0.75 to 15.0 | 2.8 to 56.8  | 3000     | 207 | Carbon Steel | PC5     | 2.51.1 |
|                  | Female-to-Female BSP Taper | 0.75 to 15.0 | 2.8 to 56.8  | 3000     | 207 | Carbon Steel | PCB5    | 2.51.1 |
|                  | Female-to-Female #8 SAE    | 1.0 to 10.0  | 3.8 to 37.9  | 3000     | 207 | Carbon Steel | PCM85-3 | 2.51.1 |
|                  |                            | 1.5 to 15.0  | 5.7 to 56.8  |          |     |              | PCM85-4 |        |
| <b>Easy Read</b> | Female-to-Female NPTF      | 0.5 to 30.0  | 1.9 to 113.6 | 3000     | 207 | Carbon Steel | EPC5    | 2.51.1 |
|                  | Female-to-Female BSP Taper | 0.5 to 30.0  | 1.9 to 113.6 | 3000     | 207 | Carbon Steel | EPCB5   | 2.51.1 |

**3.00.0 DIRECTIONAL VALVES**



**Directional, Two-Way, Two-Position, Normally-Closed, Plunger-Operated**

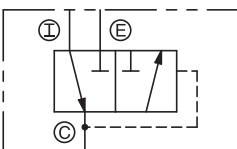
| Series           | Threads (ports)               | Flow     |     | Pressure |     | Material | Model  | Page   |
|------------------|-------------------------------|----------|-----|----------|-----|----------|--------|--------|
|                  |                               | gpm      | lpm | psi      | bar |          |        |        |
| <b>Pneu-Trol</b> | Female-to-Female<br>NPTF 1/2" | Cv = 2.6 | -   | 3000     | 207 | Steel    | POV32S | 3.01.1 |



**Directional, Two-Way, Two-Position, Normally-Closed, Toggle-Operated**

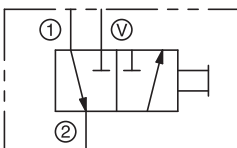
| Series           | Threads (ports)               | Flow |      | Pressure |     | Material | Model | Page   |
|------------------|-------------------------------|------|------|----------|-----|----------|-------|--------|
|                  |                               | gpm  | lpm  | psi      | bar |          |       |        |
| <b>Pneu-Trol</b> | Female-to-Female<br>NPTF 1/4" | 5.0  | 18.9 | 2000     | 138 | Brass    | TV20B | 3.02.1 |

**4.00.0 ACCESSORIES**



**Quick Exhaust, 2-Position 3-Way**

| Series           | Threads (ports)          | Flow                |     | Pressure  |            | Material | Model | Page   |
|------------------|--------------------------|---------------------|-----|-----------|------------|----------|-------|--------|
|                  |                          | gpm                 | lpm | psi       | bar        |          |       |        |
| <b>Pneu-Trol</b> | Female-to-Female<br>NPTF | Cv = .50 to<br>5.32 | -   | 20 to 125 | 1.0 to 9.0 | Aluminum | EV    | 4.10.1 |



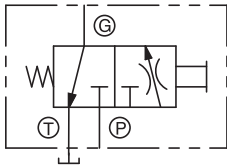
**Slide Valve, 2-Position, 3-Way, Manually Operated**

| Series           | Threads (ports)          | Flow                |     | Pressure |     | Material      | Model | Page   |
|------------------|--------------------------|---------------------|-----|----------|-----|---------------|-------|--------|
|                  |                          | gpm                 | lpm | psi      | bar |               |       |        |
| <b>Pneu-Trol</b> | Female-to-Female<br>NPTF | Cv = .98 to<br>3.26 | -   | 250      | 17  | Steel / Brass | SL    | 4.20.1 |



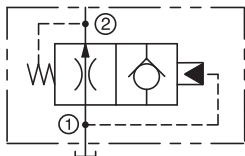
# Table of Contents

(continued)



**Gauge Isolator**

| Series           | Threads (ports)               | Flow |     | Pressure |     | Material | Model | Page   |
|------------------|-------------------------------|------|-----|----------|-----|----------|-------|--------|
|                  |                               | gpm  | lpm | psi      | bar |          |       |        |
| <b>Pneu-Trol</b> | Female-to-Female<br>NPTF 1/4" | -    | -   | 3000     | 207 | Steel    | GI21S | 4.25.1 |



**Air Bleed Valve**

| Series           | Threads (ports)               | Flow |     | Pressure |     | Material     | Model | Page   |
|------------------|-------------------------------|------|-----|----------|-----|--------------|-------|--------|
|                  |                               | gpm  | lpm | psi      | bar |              |       |        |
| <b>Pneu-Trol</b> | Female-to-Female<br>NPTF 1/4" | -    | -   | 5000     | 345 | Carbon Steel | AB20S | 4.30.1 |

## 5.00.0 TECHNICAL DATA

### FLOW CURVES

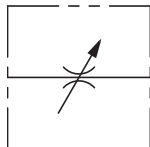
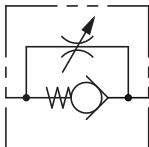
Needle Valve: EN, ENB, ENM, ENBP

Flow Control Valve : EF, EFB, EFM, EFBP .....5.01.1

## 6.00.0 MINIATURE SERIES

LFC, LFV and LNB Series Miniature Flow Control and

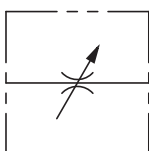
Needle Valves – MBV Series Miniature Ball Valves .....6.00.0



**Flow Control & Needle Valve**

LFC and LFV Series Miniature Flow Control .....6.01.1

LNB Series Miniature Needle Valve .....6.01.1

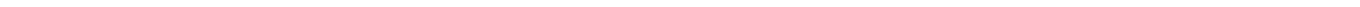


**Ball Valve**

MBV Series Miniature Ball Valve .....6.02.1

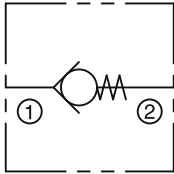
## 7.00.0 WARRANTY AND DISCLAIMER

.....7.99.1



**EC, EDC Check Valve**  
Female-to-Female

IN-LINE



**DESCRIPTION**

Check valves operate on slight differential pressure. Free flow is permitted in the direction of the arrow, positive check in the opposite direction.

These tough valves are ideal for general industrial and mobile applications including plastic injection molding machines, packaging equipment, machine tools, car washes, hospital beds, and many types of automotive equipment.

- **Elastomer-free (no O-rings)**
- **Leak-Tight Ball Check for various medias (except 1")**
- **Leak-Tight Poppet Check (1")**

**FLOW RATING**

| Size | Max Recommended Flow gpm (lpm) | Co-Efficient (Cv Factor) |
|------|--------------------------------|--------------------------|
| 1/8" | 3.0 (11.4)                     | .75                      |
| 1/4" | 6.0 ( 22.7)                    | 1.47                     |
| 3/8" | 10.0 (37.9)                    | 3.30                     |
| 1/2" | 12.0 (45.4)                    | 3.60                     |
| 3/4" | 20.0 (75.7)                    | 5.41                     |
| 1"   | 55.0 (208.2)                   | 9.60                     |

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Brass: 2,000 psi (138 bar)  
Carbon Steel: 5,000 psi (345 bar)  
Stainless Steel: 5,000 psi (345 bar)  
Ductile Iron: 5,000 psi (345 bar)

**Minimum Burst Pressure**

Brass: 8,000 psi (552 bar)  
Carbon Steel: 20,000 psi (1,379 bar)  
Stainless Steel: 20,000 psi (1,379 bar),  
Ductile Iron: 20,000 psi (1,379 bar)

**Cracking Pressure (Except 1")**

1 to 2.5 psi (.07 to .17 bar)

**Cracking Pressure (1")**

3 to 5 psi (.21 to .34 bar)

**Operating Temperature Range**

1/8" - 3/4" -30° to +200° F (-34° to +93° C)  
1" -15° to +400° F (-26° to +204° C)

**Threads**

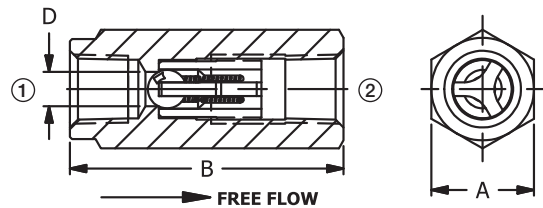
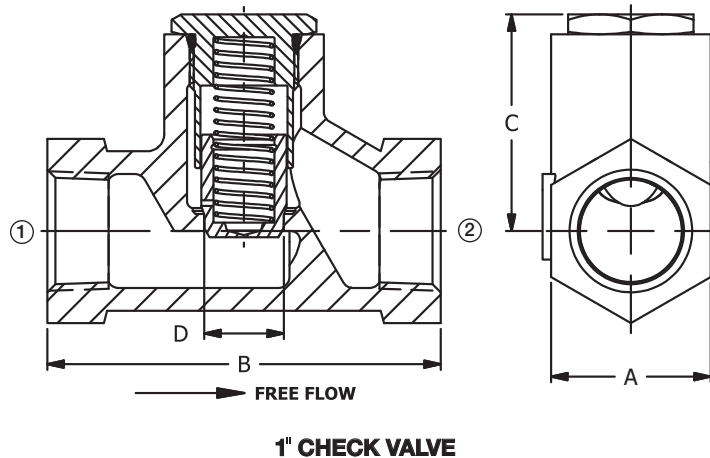
NPTF, BSPT, BSPP

**Materials (Except 1")**

Body: Brass, Steel, Stainless Steel 303  
Ball: Stainless Steel 440  
Spring: Stainless Steel 302  
Ball Guide: Delrin®

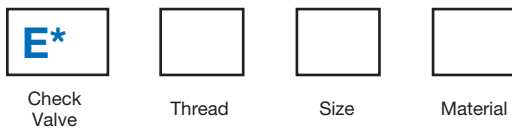
**Materials (1")**

Body: Leaded Tin Bronze, Ductile Iron  
Plug: Brass  
O-Ring: Viton  
Spring: Stainless Steel 302  
Poppet: Stainless Steel 303

**INSTALLATION DIMENSIONS**


| Pipe Size | A HEX           | B                 | C                 | D orifice      |
|-----------|-----------------|-------------------|-------------------|----------------|
| 1/8"      | 5/8<br>(15.9)   | 1-11/16<br>(42.9) | -                 | .188<br>(4.8)  |
| 1/4"      | 3/4<br>(19.1)   | 2<br>(50.8)       | -                 | .250<br>(6.4)  |
| 3/8"      | 1<br>(25.4)     | 2-1/2<br>(63.5)   | -                 | .328<br>(8.3)  |
| 1/2"      | 1-1/8<br>(28.6) | 2-7/8<br>(73.1)   | -                 | .359<br>(9.1)  |
| 3/4"      | 1-3/8<br>(35.0) | 3-1/4<br>(82.6)   | -                 | .526<br>(13.4) |
| 1"        | 1-3/4<br>(44.5) | 4-1/2<br>(114.3)  | 2-13/32<br>(61.2) | .875<br>(22.2) |

( ) Parentheses = Millimeters

**HOW TO ORDER**


| Code       | Check Valve |
|------------|-------------|
| <b>EC</b>  | Check Valve |
| <b>EDC</b> |             |

| Code      | Material                         |
|-----------|----------------------------------|
| <b>B</b>  | Brass (1" - Leaded Tin Bronze)   |
| <b>S</b>  | Carbon Steel (1" - Ductile Iron) |
| <b>SS</b> | Stainless Steel                  |

| Code      | Thread |
|-----------|--------|
| Omit      | NPTF   |
| <b>B</b>  | BSPT   |
| <b>BP</b> | BSPP   |

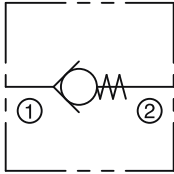
| Code      | Size |
|-----------|------|
| <b>10</b> | 1/8" |
| <b>20</b> | 1/4" |
| <b>25</b> | 3/8" |
| <b>30</b> | 1/2" |
| <b>35</b> | 3/4" |
| <b>40</b> | 1"   |

**AVAILABLE MODEL CODES**

| Size | NPTF Thread |        |                    | ISO 7/1 - RS<br>BSP Taper | ISO 7/1 - RP<br>BSP Parallel |
|------|-------------|--------|--------------------|---------------------------|------------------------------|
|      | Brass       | Steel  | Stainless<br>Steel | Steel                     | Steel                        |
| 1/8" | EC10B       | -      | -                  | ECB10S                    | -                            |
| 1/4" | EC20B       | EC20S  | EC20SS             | ECB20S                    | ECBP20S                      |
| 3/8" | EDC25B      | EDC25S | EDC25SS            | ECB25S                    | ECBP25S                      |
| 1/2" | EDC30B      | EDC30S | EDC30SS            | ECB30S                    | ECBP30S                      |
| 3/4" | EDC35B      | EDC35S | EDC35SS            | ECB35S                    | ECBP35S                      |
| 1"   | EC40B       | EC40S  | -                  | -                         | -                            |

**C, CP Check Valve**  
Female-to-Female

IN-LINE



**DESCRIPTION**

Check valves operate on slight differential pressure. Free flow is permitted in the direction of the arrow, positive check in the opposite direction.

- **Elastomer-Free (no O-rings)**
- **Leak-Tight Ball Check standard for various medias**
- **Bubble-Tight Poppet Check with O-ring optional**

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Brass: 2,000 psi (138 bar)  
Carbon Steel: 5,000 psi (345 bar)  
Stainless Steel: 5,000 psi (345 bar)

**Maximum Operating Pressure (Poppet Check)**

Brass & Stainless Steel: 60 psi (4 bar)

**Cracking Pressure**

1 to 2.5 psi (.07 to .17 bar)

Soft seat poppet check valves if left seated for a period of time, will have the rubber adhere to the metal it is in contact with. This results in an initial high crack point due to sticking. The degree depends on many things (time seated, pressure, etc.).

**Operating Temperature Range**

-30° to +400° F (-34° to +204° C)

**Operating Temperature Range (Poppet Check)**

-15° to +400° F (-26° to +204° C)

**Threads**

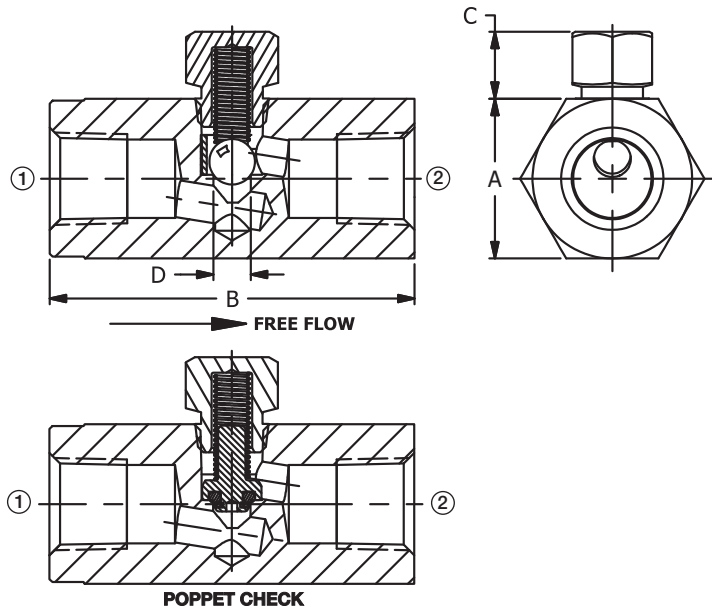
NPTF

**Materials**

Body, Plug: Brass, Steel, Stainless Steel 303  
Collar: Stainless Steel 303  
Ball: Stainless Steel 440  
Poppet: Brass or Stainless Steel 303 with Viton O-Ring  
Spring: Stainless Steel 302

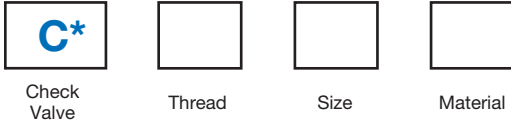
**FLOW RATING**

| Size | Max Recommended Flow gpm (lpm) | Co-Efficient (Cv Factor) |
|------|--------------------------------|--------------------------|
| 1/8" | 1.5 (5.7)                      | .23                      |
| 1/4" | 3.0 (11.4)                     | .54                      |
| 3/8" | 5.0 (18.9)                     | .83                      |
| 1/2" | 8.0 (30.3)                     | 1.47                     |
| 3/4" | 12.0 (45.4)                    | 1.90                     |

**INSTALLATION DIMENSIONS**


| Pipe Size | A HEX            | B                 | C               | D orifice      |
|-----------|------------------|-------------------|-----------------|----------------|
| 1/8"      | 11/16<br>(17.5)  | 1-15/32<br>(37.3) | 13/64<br>(5.2)  | .141<br>(3.6)  |
| 1/4"      | 7/8<br>(22.2)    | 2<br>(50.8)       | 23/64<br>(9.1)  | .203<br>(5.2)  |
| 3/8"      | 1-1/16<br>(27.0) | 2-1/4<br>(57.2)   | 11/32<br>(8.7)  | .266<br>(6.8)  |
| 1/2"      | 1-5/16<br>(33.4) | 2-21/32<br>(67.5) | 15/32<br>(11.9) | .328<br>(8.3)  |
| 3/4"      | 1-5/8<br>(41.3)  | 2-15/16<br>(74.6) | 17/32<br>(13.5) | .406<br>(10.3) |

( ) Parentheses = Millimeters

**HOW TO ORDER**


| Code      | Check Valve  |
|-----------|--------------|
| <b>C</b>  | Ball Check   |
| <b>CP</b> | Poppet Check |

| Code      | Material        |
|-----------|-----------------|
| <b>B</b>  | Brass           |
| <b>S</b>  | Carbon Steel    |
| <b>SS</b> | Stainless Steel |

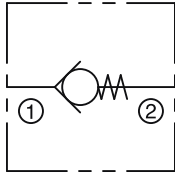
| Code | Thread |
|------|--------|
| Omit | NPTF   |

| Code      | Size |
|-----------|------|
| <b>10</b> | 1/8" |
| <b>20</b> | 1/4" |
| <b>25</b> | 3/8" |
| <b>30</b> | 1/2" |
| <b>35</b> | 3/4" |

**AVAILABLE MODEL CODES**

| Size | NPTF Thread |       |                 |
|------|-------------|-------|-----------------|
|      | Brass       | Steel | Stainless Steel |
| 1/8" | C10B        | C10S  | C10SS           |
|      | CP10B       |       | CP10SS          |
| 1/4" | C20B        | C20S  | C20SS           |
|      | CP20B       |       | CP20SS          |
| 3/8" | C25B        | C25S  | C25SS           |
|      | CP25B       |       |                 |
| 1/2" | CP30B       | C30S  | C30SS           |
| 3/4" | C35B        | C35S  | -               |

IN-LINE



**DESCRIPTION**

Check valves operate on slight differential pressure. Free flow is permitted in the direction of the arrow, positive check in the opposite direction.

- Eliminates need for extra pipe nipple
- Bubble-Tight Poppet Check with O-ring

**SPECIFICATIONS**

**Maximum Operating Pressure**

Brass: 60 psi (4 bar)

**Cracking Pressure**

1 to 2.5 psi (.07 to .17 bar)

Soft seat check valves if left seated for a period of time, will have the rubber adhere to the metal it is in contact with. This results in an initial high crack point due to sticking. The degree depends on many things (time seated, pressure, etc.).

**Flow Rating**

Maximum recommended flow 2.5 gpm (9.5 lpm)

Co-Efficient (Cv Factor) = .43

**Operating Temperature Range**

-15° to +400° F (-26° to +204° C)

**Threads**

NPTF 1/4"

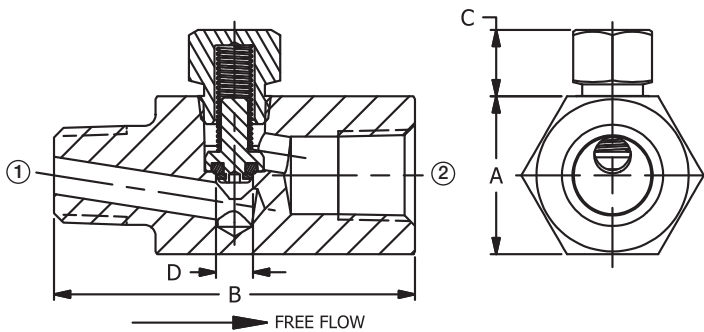
**Materials**

Body, Plug: Brass

Poppet: Brass with Viton O-ring

Spring: Stainless Steel 302

**INSTALLATION DIMENSIONS**



| Pipe Size | A HEX         | B           | C              | D orifice     |
|-----------|---------------|-------------|----------------|---------------|
| 1/4"      | 7/8<br>(22.2) | 2<br>(50.8) | 23/64<br>(9.1) | .203<br>(5.2) |

( ) Parentheses = Millimeters

**HOW TO ORDER**



| Code | Check Valve  |
|------|--------------|
| CP   | Poppet Check |

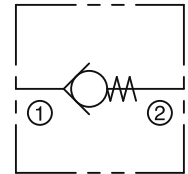
| Code | Material |
|------|----------|
| B    | Brass    |

| Code | Thread                   |
|------|--------------------------|
| MF   | NPTF<br>(Male-to-Female) |

| Code | Size |
|------|------|
| 20   | 1/4" |

## DESCRIPTION

Check valves operate on slight differential pressure. Free flow is permitted in the direction of the arrow, positive check in the opposite direction.



- **Elastomer-free (No O-ring) Leak-Tight Ball Check standard for various medias**
- **Bubble-Tight Ball Check with O-ring/Quad ring optional**
- **Compact over-all length**

## SPECIFICATIONS



### Maximum Operating Pressure

Brass: 2,000 psi (138 bar)  
Carbon Steel: 3,000 psi (207 bar)  
Stainless Steel: 3,000 psi (207 bar)

### Cracking Pressure

1 to 2.5 psi (.07 to .17 bar)  
Other cracking pressures available.  
Consult factory.  
Soft seat check valves if left seated for a period of time, will have the rubber adhere to the metal it is in contact with. This results in an initial high crack point due to sticking. The degree depends on many things (time seated, pressure, etc.).

### Operating Temperature Range

-30° to +200° F (-34° to +93° C)

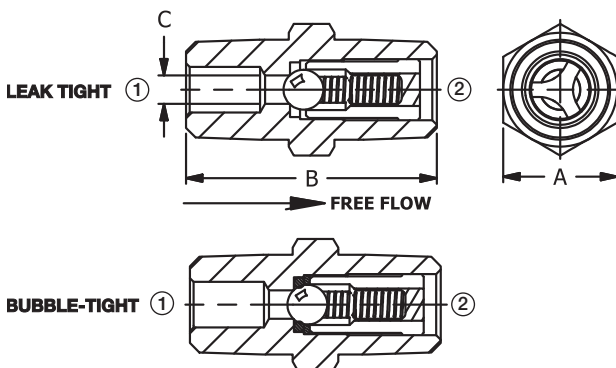
### Threads

NPTF

### Materials

Body: Brass, Steel, Stainless Steel 303  
Ball: Stainless Steel 440  
Spring: Stainless Steel 302  
Ball Guide: Delrin®  
Washer: Stainless Steel 304  
O-Ring/Quad Ring: Buna-N

## INSTALLATION DIMENSIONS



| Pipe Size | A HEX        | B             | C orifice  | gpm (lpm)   | Cv Factor |
|-----------|--------------|---------------|------------|-------------|-----------|
| 1/8"      | 7/16 (11.1)  | 31/32 (24.6)  | .125 (3.2) | 1.0 (3.8)   | .17       |
| 1/4"      | 5/8 (15.9)   | 1-3/8 (34.9)  | .188 (4.8) | 2.5 (9.5)   | .56       |
| 3/8"      | 3/4 (19.1)   | 1-5/8 (41.3)  | .250 (6.4) | 6.0 (22.7)  | 1.31      |
| 1/2"      | 7/8 (22.2)   | 2-1/16 (52.4) | .328 (8.3) | 10.0 (37.9) | 2.71      |
| 3/4"      | 1-1/8 (28.6) | 2-1/4 (57.2)  | .359 (9.1) | 15.0 (56.8) | 3.40      |

( ) Parentheses = Millimeters

## HOW TO ORDER

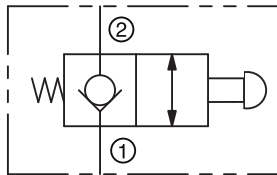
| Leak-Tight |             |        |                 |
|------------|-------------|--------|-----------------|
| Size       | NPTF Thread |        |                 |
|            | Brass       | Steel  | Stainless Steel |
| 1/8"       | CMM10B1     | —      | —               |
| 1/4"       | CMM20B      | CMM20S | CMM20SS2        |
| 3/8"       | CMM25B      | CMM25S | —               |
| 1/2"       | CMM30B      | CMM30S | —               |

| Bubble-Tight<br>(O = O-ring, Q = Quad ring) |             |         |                 |
|---|-------------|---------|-----------------|
| Size  | NPTF Thread |         |                 |
|   | Brass       | Steel   | Stainless Steel |
| 1/8"  | CMMO10B1    | —       | —               |
| 1/4"  | CMMQ20B     | CMMQ20S | CMMO20SS2       |
| 3/8"  | CMMO25B     | CMMO25S | CMMO25SS        |
| 1/2"  | CMMQ30B     | CMMQ30S | —               |
| 3/4"  | CMMQ35B     | —       | —               |



**MOC20S Check, Plunger-Operated**  
Female-to-Female

IN-LINE



**DESCRIPTION**

Plunger-Operated Check Valve. Check valves operate on slight differential pressure. Free flow is permitted in the direction of the arrow, positive check in the opposite direction. Reverse flow can be achieved by manually depressing plunger.

- **Normally-Closed, Push-to-Open**
- **For hydraulic or pneumatic applications**
- **Pneumatic applications are not Bubble-Tight**

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Carbon Steel: 3,000 psi (207 bar)

**Cracking Pressure**

1 to 2.5 psi (.07 to .17 bar)

**Maximum Recommended Flow**

5.0 gpm (18.9 lpm)

Co-Efficient (Cv Factor) = .54

**Operating Temperature Range**

-30° to +200° F (-34° to +93° C)

**Plunger Effort**

70 lbs. (311 N) per 1,000 psi (69 bar)

**Threads**

NPTF 1/4"

**Materials**

Body: Steel

Housing: Brass

Nuts: Steel

Plunger: Stainless Steel 303

Piston: Steel

Springs: Music wire

O-Ring: Buna-N

Back-Up Washer: Teflon

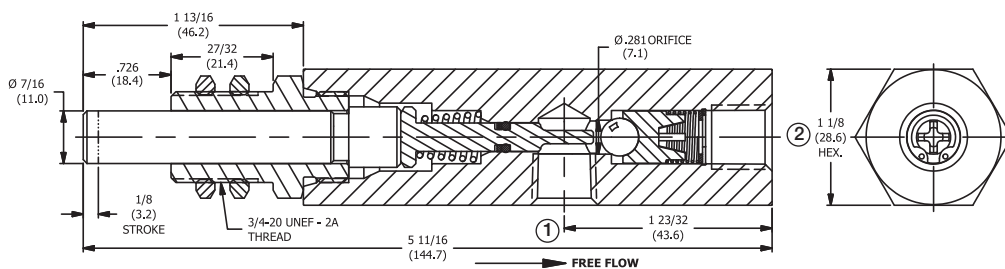
Ball: Stainless Steel 440

Ball Guide: Delrin®

Washer: Dtainless Steel 304

Retainer Ring: Steel

**INSTALLATION DIMENSIONS**



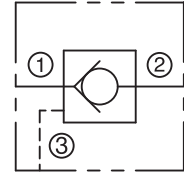
( ) Parentheses = Millimeters

**HOW TO ORDER**

| Size | NPTF Thread |
|------|-------------|
|      | Steel       |
| 1/4" | MOC20S      |

## DESCRIPTION

Pilot-Operated Check Valve. Check valves operate on slight differential pressure. Free flow is permitted in the direction of the arrow, positive check in the opposite direction. Reverse flow can be achieved by reaching the required pilot pressure at port (3).



- For hydraulic applications only
- Air pilot valves have secondary seal on pilot piston stem. A vent hole in the body between the piston seal and stem seal prevents mixing of pilot media and the system media



## SPECIFICATIONS

### Maximum Operating Pressure

Carbon Steel: 3,000 psi (207 bar)

### Operating Temperature Range

Buna-N: -30° to +200° F (-34° to +93° C)

### Maximum Recommended Flow

6.0 to 12.0 gpm (22.7 to 45.4 lpm)

### Pilot Ratio

- 4:1 Hydraulic Pilot
- 2:1 Hydraulic Pilot under 90 psi (6 bar)
- 2:1 Air Pilot

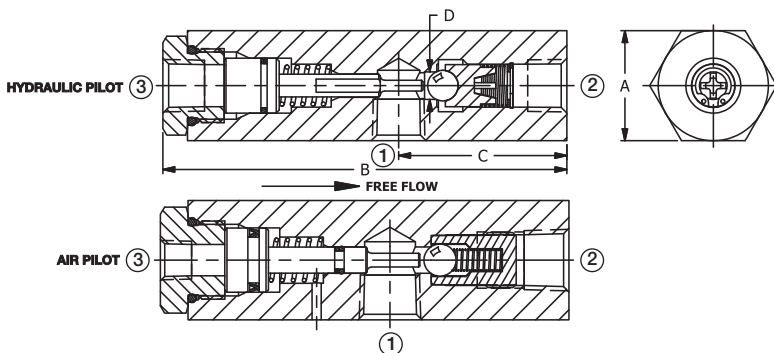
### Threads

NPTF, BSPT

### Materials

- Body: Steel
- Adapter: Steel
- O-Rings: Buna-N (PIC, PIDC)  
Viton (APIDC)
- Piston: Steel
- Piston Spring: Music wire
- Check Spring: Stainless Steel 302
- Piston Seals: Teflon (PIC, PIDC)  
Viton (APIDC)  
Teflon Back-up Washer (APIDC)
- Ball: Stainless Steel 440
- Ball Guide: Delrin®
- Washer: Stainless Steel 304
- Retainer Ring: Steel

## INSTALLATION DIMENSIONS



| Pipe Size | A HEX           | B                | C                 | D orifice     | Pilot Port | Inlet Port | Outlet Port |
|-----------|-----------------|------------------|-------------------|---------------|------------|------------|-------------|
| 1/4"      | 1-1/8<br>(28.6) | 4-1/8<br>(104.8) | 1-27/32<br>(43.7) | .281<br>(7.1) | 1/4"       | 1/4"       | 1/4"        |
| 3/8"      | 1-3/8<br>(34.9) | 4-7/8<br>(123.8) | 2-1/8<br>(54.0)   | .328<br>(8.3) | 1/4"       | 3/8"       | 3/8"        |
| 1/2"      | 1-5/8<br>(41.3) | 5-5/8<br>(142.9) | 2-7/16<br>(61.9)  | .359<br>(9.1) | 1/4"       | 1/2"       | 1/2"        |

( ) Parentheses = Millimeters

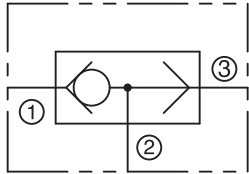
## HOW TO ORDER

| NPTF Thread |           |                 |                     |
|-------------|-----------|-----------------|---------------------|
| Size        | Air Pilot | Hydraulic Pilot | Max. Flow gpm (lpm) |
| 1/4"        | —         | PIC20S          | 6.0 (22.7)          |
| 3/8"        | —         | PIDC25S         | 10.0 (37.9)         |
| 1/2"        | APIDC30S  | PIDC30S         | 12.0 (45.4)         |

| ISO 7/1 – RS BSP Taper Thread |                 |                     |
|-------------------------------|-----------------|---------------------|
| Size                          | Hydraulic Pilot | Max. Flow gpm (lpm) |
| 1/4"                          | PICB20S         | 6.0 (22.7)          |
| 3/8"                          | PICB25S         | 10.0 (37.9)         |

**SV Shuttle, Ball-Type**  
Female-to-Female

IN-LINE



**DESCRIPTION**

Operates as a three-way valve with two inlet ports and one outlet port. The check ball moves away from the inlet port with the greatest differential pressure and against the port having the least differential pressure.

- Bubble-Tight Ball Check with O-rings

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Brass: 200 psi (14 bar)

**Flow Rating**

Co-Efficient (Cv Factor) = .74 and 1.35

**Operating Temperature Range**

-30° to +250° F (-34° to +120° C)

**Threads**

NPTF

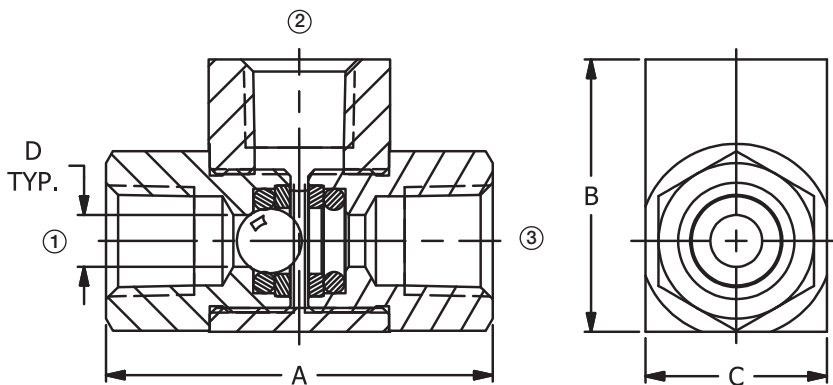
**Materials**

Body, Adapters, Retainers: Brass

Ball: Stainless Steel 440

O-Rings: Buna-N

**INSTALLATION DIMENSIONS**



| Pipe Size | A               | B                | C             | D orifice     |
|-----------|-----------------|------------------|---------------|---------------|
| 1/8"      | 1-1/4<br>(31.8) | 31/32<br>(24.6)  | 5/8<br>(15.9) | .188<br>(4.8) |
| 1/4"      | 1-7/8<br>(47.6) | 1-5/16<br>(33.4) | 7/8<br>(22.2) | .250<br>(6.4) |

( ) Parentheses = Millimeters

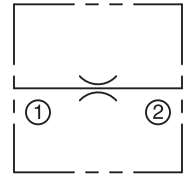
**HOW TO ORDER**

| Size | NPTF Thread | Co-Efficient (Cv Factor) |
|------|-------------|--------------------------|
|      | Brass       |                          |
| 1/8" | SV10B       | .74                      |
| 1/4" | SV20B       | 1.35                     |

### DESCRIPTION

The Gauge Snubber is a fixed pressure valve which protects your gauges and other delicate instruments from hydraulic shock, pressure surges and pulsation. Its restrictive orifice provides rapid and smooth response to pressures up to 5,000 psi (345 bar).

- Protects gauges and other delicate instruments from shock pressure surges and pulsations



### SPECIFICATIONS

#### Maximum Operating Pressure (Non-Shock Service)

Brass: 2,000 psi (138 bar)

Carbon Steel: 5,000 psi (345 bar)

#### Operating Temperature Range

-30° to +400° F (-34° to +204° C)

#### Threads

NPTF 1/4"

#### Orifice Diameter

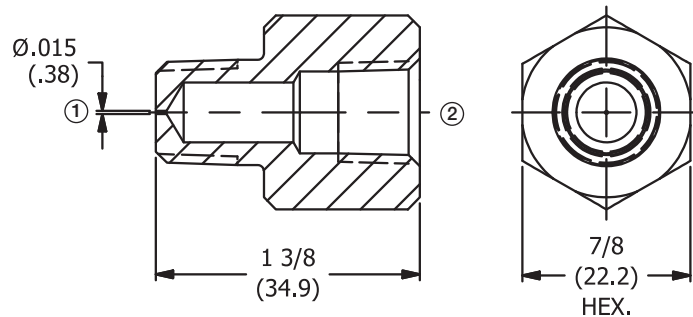
.015 (.38)

#### Material

Brass, Steel



### INSTALLATION DIMENSIONS



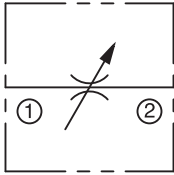
( ) Parentheses = Millimeters

### HOW TO ORDER

| Size | NPTF Thread |       |
|------|-------------|-------|
|      | Brass       | Steel |
| 1/4" | GS20B       | GS20S |

**EN Needle Valve**  
Female-to-Female

IN-LINE



**DESCRIPTION**

Deltrol's unique line of Easy Read needle valves incorporate a metal setting knob and stem for added durability and positive operation. Color coding on stem allows you to precisely set flow requirements by simply turning the knob to the appropriate marking.

Flow adjustment can be made under pressure. Setting knob can be locked in any desired position with convenient set screw.

These tough valves are ideal for general industrial and mobile applications including plastic injection molding machines, packaging equipment, machine tools, car washes, hospital beds, and many types of automotive equipment.

- **Metal setting knob and stem**
- **Color coding and numerical readout allow positive setting for precise flow control and repeatability**
- **Can be accurately adjusted within a small fraction of a turn (one full turn per color)**
- **Set Screw in knob to maintain flow setting**

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

- Brass: 2,000 psi (138 bar)
- Carbon Steel: 5,000 psi (345 bar)
- Stainless Steel: 5,000 psi (345 bar)
- Ductile Iron: 5,000 psi (345 bar)

**Minimum Burst Pressure**

- Brass: 8,000 psi (552 bar)
- Carbon Steel: 20,000 psi (1,379 bar)
- Stainless Steel: 20,000 psi (1,379 bar)
- Ductile Iron: 20,000 psi (1,379 bar)

**Operating Temperature Range**

-15° to +400° F (-26° to +204° C)

**Threads**

NPTF, BSPT, BSPP

**Materials (except 1")**

- Body: Brass, Steel, Stainless Steel 303
- Needle: Brass (Brass Valves)  
Stainless Steel 416  
(Steel and Stainless Steel Valves)
- O-Ring: Viton
- Back-Up Washer: Teflon
- Knob: Aluminum
- Set Screw: Steel
- Color Rings: Anodized Aluminum

**Materials (1")**

- Body: Leaded Tin Bronze, Ductile Iron
- Housing: Brass, Steel
- Needle: Stainless Steel 416  
(Brass and Steel Valves)
- O-Rings: Viton
- Back-Up Washer: Teflon
- Knob: Aluminum
- Set Screw: Steel
- Color Rings: Anodized Aluminum

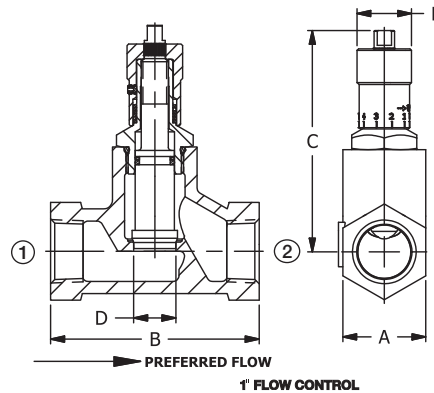
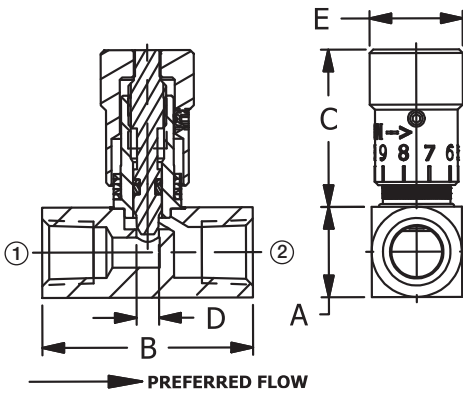
**FLOW RATING**

| Size | Max Recommended Flow gpm (L/min) | Co-Efficient (Cv Factor) Fully Open |
|------|----------------------------------|-------------------------------------|
| 1/8" | 4.5 (17.0)                       | .25                                 |
| 1/4" | 10.0 (37.9)                      | .51                                 |
| 3/8" | 18.0 (68.1)                      | .92                                 |
| 1/2" | 28.0 (106.0)                     | 1.20                                |
| 3/4" | 40.0 (151.4)                     | 1.84                                |
| 1"   | 100.0 (378.5)                    | 9.60                                |

**FLOW CURVES**

See Page 5.01.1

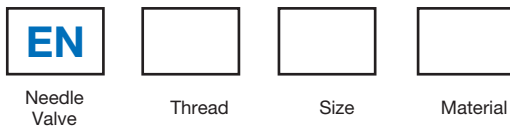
**INSTALLATION DIMENSIONS**



| Pipe Size | A HEX           | A Square        | B                | C Open            | C Closed           | D Orifice      | E Diameter       |
|-----------|-----------------|-----------------|------------------|-------------------|--------------------|----------------|------------------|
| 1/8"      | -               | 5/8<br>(15.9)   | 1-7/16<br>(36.6) | 1-9/32<br>(32.5)  | 1-1/16<br>(27.0)   | .125<br>(3.2)  | 23/32<br>(18.3)  |
| 1/4"      | -               | 3/4<br>(19.1)   | 1-3/4<br>(44.5)  | 1-13/32<br>(35.7) | 1-7/32<br>(31.0)   | .187<br>(4.7)  | 25/32<br>(19.8)  |
| 3/8"      | -               | 1<br>(25.4)     | 2-1/16<br>(52.4) | 1-5/8<br>(41.3)   | 1-3/8<br>(34.9)    | .250<br>(6.4)  | 57/64<br>(22.6)  |
| 1/2"      | -               | 1-1/8<br>(28.6) | 2-1/2<br>(63.5)  | 1-31/32<br>(50.0) | 1-5/8<br>(41.3)    | .312<br>(7.9)  | 1-1/64<br>(25.8) |
| 3/4"      | -               | 1-3/8<br>(34.9) | 2-3/4<br>(69.9)  | 2-3/16<br>(55.6)  | 1-13/16<br>(46.1)  | .375<br>(9.5)  | 1-5/32<br>(29.4) |
| 1"        | 1-3/4<br>(44.5) | -               | 4-1/2<br>(114.3) | 5-1/6<br>(128.6)  | 4-11/16<br>(119.1) | .875<br>(22.2) | 1-5/32<br>(29.4) |

( ) Parentheses = Millimeters

**HOW TO ORDER**



| Code      | Thread | Code      | Material                         |
|-----------|--------|-----------|----------------------------------|
| Omit      | NPTF   | <b>B</b>  | Brass (1" - Leaded Tin Bronze)   |
| <b>B</b>  | BSPT   | <b>S</b>  | Carbon Steel (1" - Ductile Iron) |
| <b>BP</b> | BSPP   | <b>SS</b> | Stainless Steel                  |

| Code      | Size |
|-----------|------|
| <b>10</b> | 1/8" |
| <b>20</b> | 1/4" |
| <b>25</b> | 3/8" |
| <b>30</b> | 1/2" |
| <b>35</b> | 3/4" |
| <b>40</b> | 1"   |

**HOW TO ADJUST**

From the closed position, open the valve by turning the metal knob counter-clockwise until the desired flow volume is obtained.

The colored band on the stem and the numerical readout indicate to what extent the valve is opened or closed. Each color on the color band represents one full turn.

Find the scribe mark on the upper surface of the valve body. The number on the knob in proximity to the scribe mark will indicate 10ths of a turn the valve is opened.

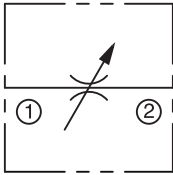
Record the information for future reference.

**AVAILABLE MODEL CODES**

| Size | NPTF Thread |       |                 | ISO 7/1 - RS - BSP Taper Thread |        | ISO 7/1 - RS - BSP Parallel Thread |         |
|------|-------------|-------|-----------------|---------------------------------|--------|------------------------------------|---------|
|      | Brass       | Steel | Stainless Steel | Brass                           | Steel  | Brass                              | Steel   |
| 1/8" | EN10B       | EN10S | -               | ENB10B                          | ENB10S | -                                  | ENBP10S |
| 1/4" | EN20B       | EN20S | EN20SS          | ENB20B                          | ENB20S | ENBP20B                            | ENBP20S |
| 3/8" | EN25B       | EN25S | -               | ENB25B                          | ENB25S | ENBP25B                            | ENBP25S |
| 1/2" | EN30B       | EN30S | -               | ENB30B                          | ENB30S | -                                  | ENBP30S |
| 3/4" | EN35B       | EN35S | -               | ENB35B                          | ENB35S | -                                  | ENBP35S |
| 1"   | EN40B       | EN40S | -               | -                               | -      | -                                  | -       |

**N Needle Valve**  
Female-to-Female

IN-LINE



**DESCRIPTION**

A variable flow restrictor with positive shut-off. A wide range of flow adjustment is possible because of the fine thread and tapered needle. Unwanted changes in adjustment are prevented by a locknut. A tamperproof adjustment key is standard; a knurled knob is available at slight extra cost.

- Wide range of flow adjustability
- Lock Nut to maintain flow setting
- Positive shut-off

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Brass: 2,000 psi (138 bar)  
Carbon Steel: 5,000 psi (345 bar)  
Stainless Steel: 5,000 psi (345 bar)

**Operating Temperature Range**

-15° to +400° F (-26° to +204° C)

**Threads**

NPTF, BSPT, SAE

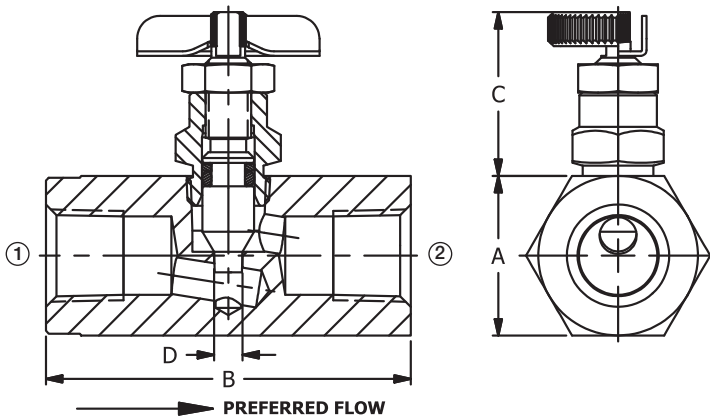
**Materials**

Body, Housing: Brass, Steel, Stainless Steel 303  
Needle: Brass (Brass Valves)  
Stainless Steel 416 (Steel and Stainless Steel Valves)  
O-Ring: Viton  
Back-Up Washer: Teflon  
Lock Nut: Brass, Steel, Stainless Steel 303  
Knob: Aluminum  
Tamperproof Key: Steel

**FLOW RATING**

| Size | Max Recommended Flow gpm (lpm) | Co-Efficient (Cv Factor) Fully Open |
|------|--------------------------------|-------------------------------------|
| 1/8" | 3.2 (12.1)                     | .20                                 |
| 1/4" | 7.0 (26.5)                     | .43                                 |
| 3/8" | 13.5 (51.1)                    | .78                                 |
| 1/2" | 22.5 (85.2)                    | 1.24                                |
| 3/4" | 34.0 (128.7)                   | 1.93                                |

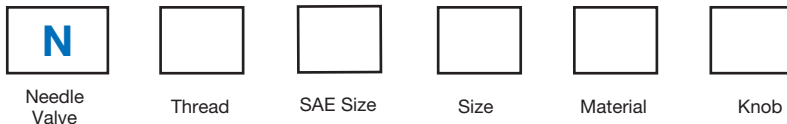
**INSTALLATION DIMENSIONS**



| Pipe Size | A HEX            | B                 | C Open            | D Orifice     |
|-----------|------------------|-------------------|-------------------|---------------|
| 1/8"      | 11/16<br>(17.5)  | 1-15/32<br>(37.3) | 7/8<br>(22.2)     | .107<br>(2.7) |
| 1/4"      | 7/8<br>(22.2)    | 2<br>(50.8)       | 1-1/16<br>(27.0)  | .156<br>(4.0) |
| 3/8"      | 1-1/16<br>(27.0) | 2-1/4<br>(57.2)   | 1-3/16<br>(30.2)  | .219<br>(5.6) |
| 1/2"      | 1-5/16<br>(33.4) | 2-21/32<br>(67.5) | 1-15/32<br>(37.3) | .281<br>(7.1) |
| 3/4"      | 1-5/8<br>(41.3)  | 2-15/16<br>(74.6) | 1-11/16<br>(42.9) | .344<br>(8.7) |

( ) Parentheses = Millimeters

**HOW TO ORDER**



| Code     | Thread |
|----------|--------|
| Omit     | NPTF   |
| <b>B</b> | BSPT   |
| <b>M</b> | SAE    |

| Code      | Material        |
|-----------|-----------------|
| <b>B</b>  | Brass           |
| <b>S</b>  | Carbon Steel    |
| <b>SS</b> | Stainless Steel |

| Code     | Knob                       |
|----------|----------------------------|
| Omit     | Tamperproof Adjustment Key |
| <b>K</b> | Knob                       |

| Code      | SAE Size     |
|-----------|--------------|
| Omit      | NPTF, BSPT   |
| <b>6</b>  | 9/16-18 UNF  |
| <b>8</b>  | 3/4-16 UNF   |
| <b>12</b> | 1-1/16-12 UN |

| Code      | Size |
|-----------|------|
| <b>10</b> | 1/8" |
| <b>20</b> | 1/4" |
| <b>25</b> | 3/8" |
| <b>30</b> | 1/2" |
| <b>35</b> | 3/4" |

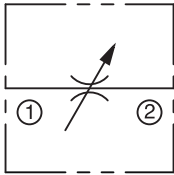
**AVAILABLE MODEL CODES**

| Size | NPTF Thread   |               |                 | ISO 7/1 - RS — BSP Taper Thread |        | SAE Thread |
|------|---------------|---------------|-----------------|---------------------------------|--------|------------|
|      | Brass         | Steel         | Stainless Steel | Brass                           | Steel  | Steel      |
| 1/8" | N10B<br>N10BK | N10S<br>N10SK | -<br>N10SSK     | NB10BK                          | NB10SK | -          |
| 1/4" | N20B<br>N20BK | N20S<br>N20SK | -<br>N20SSK     | NB20BK                          | NB20SK | NM620SK    |
| 3/8" | N25B<br>N25BK | N25S<br>N25SK | -<br>N25SSK     | NB25BK                          | NB25SK | -          |
| 1/2" | N30B<br>N30BK | N30S<br>N30SK | -<br>N30SSK     | -                               | NB30SK | NM830SK    |
| 3/4" | N35B<br>N35BK | -<br>N35SK    | -<br>-          | -                               | NB35SK | NM1235SK   |



**S, SM Needle Valve, High Pressure**  
Male-to-Female / Female-to-Female

IN-LINE



MODEL 01



MODEL 02



MODEL 50



**DESCRIPTION**

**High Pressure Angle and Globe Needle Valves**

Pneu-Trol Angle and Globe Needle Valves are ideal for use in special and general purpose applications requiring excellent flow characteristics as well as positive shut-off service, such as chemical processing and machine tool service lines.

Valves are available in globe and angle mounted types for pressures up to 10,000 psi (690 bar). The stem has 16 threads per inch for fast shut-off. Globe and angle type valves can be furnished for panel mounting by the use of a panel-mounting kit. The (SM) needle affords excellent metering characteristics for industrial applications.

- For faster, less critical needle adjustments
- Easily adjustable under pressure
- Available with Fine Metering (SM) needle

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Carbon Steel: 10,000 psi (690 bar)

**Minimum Burst Pressure:**

Carbon Steel: 20,000 psi (1,379 bar)

**Operating Temperature Range**

-30° to +250° F (-34° to +120° C)

**Threads**

NPTF, BSPT, BSPP

**Needle**

Standard 30° Included Angle  
SM – Slotted Needle

**Materials**

Body/Packing Nut: Steel (Copper Brazed Bodies)  
Stem: Stainless Steel 416  
O-Ring: Buna-N  
Back-Up Washer: Teflon  
Packing Washer/Gland: Brass  
Handle: Bright Nickel Plated Zinc Die Cast

**Panel Mounting Hole Sizes**

1/8" 25/32" (19.8)  
1/4" 25/32" (19.8)  
3/8" 31/32" (24.6)  
1/2" 31/32" (24.6)  
3/4" 1-5/32" (29.4)

**Panel Mounting Kits (Sold Separately)**

Available in Deluxe and Economy Kits in all sizes except 1" and 3/4".  
Panel Mounting Nut: Bright Nickel Plated Brass

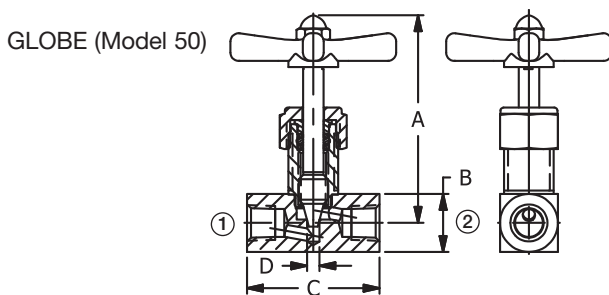
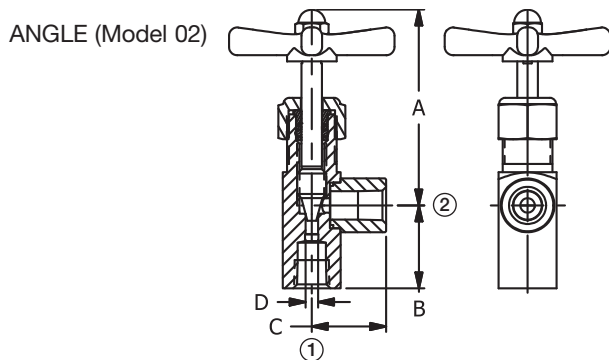
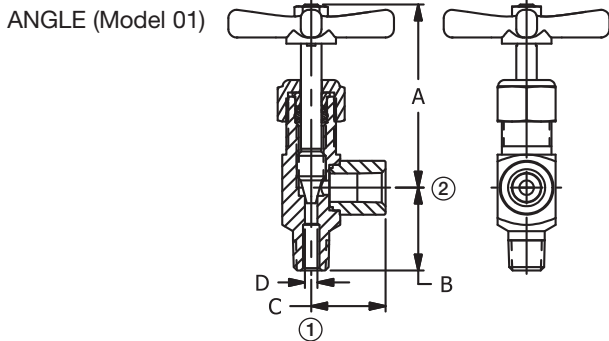
**FLOW RATING**

| Size | Co-Efficient (Cv Factor) - Fully Open |                        |
|------|---------------------------------------|------------------------|
|      | Models 01 and 02<br>Angle Type        | Model 50<br>Globe Type |
| 1/8" | .67                                   | .37                    |
| 1/4" | .85                                   | .47                    |
| 3/8" | 1.67                                  | 1.00                   |
| 1/2" | 1.89                                  | 1.10                   |
| 3/4" | 3.70                                  | 2.65                   |
| 1"   | -                                     | 4.65                   |

# S, SM Needle Valve, High Pressure Male-to-Female / Female-to-Female

IN-LINE

## INSTALLATION DIMENSIONS



( ) Parentheses = Millimeters

Angle Pattern **Model 01** Male-to-Female

| Pipe Size | A Open            | B                 | C                | D Orifice     |
|-----------|-------------------|-------------------|------------------|---------------|
| 1/8"      | 3-1/8<br>(79.4)   | 15/16<br>(23.8)   | 15/16<br>(23.8)  | .188<br>(4.8) |
| 1/4"      | 3-3/16<br>(81.0)  | 1-1/4<br>(31.8)   | 1-1/8<br>(28.6)  | .188<br>(4.8) |
| 3/8"      | 3-13/16<br>(96.9) | 1-3/8<br>(34.9)   | 1-1/4<br>(31.8)  | .281<br>(7.1) |
| 1/2"      | 3-13/16<br>(96.9) | 1-11/16<br>(42.9) | 1-9/16<br>(39.7) | .281<br>(7.1) |

Angle Pattern **Model 02** Female-to-Female

| Pipe Size | A Open            | B                 | C                | D Orifice      |
|-----------|-------------------|-------------------|------------------|----------------|
| 1/4"      | 3-23/64<br>(85.3) | 1-1/4<br>(31.8)   | 1-1/8<br>(28.6)  | .188<br>(4.8)  |
| 3/8"      | 3-13/16<br>(96.9) | 1-3/8<br>(34.9)   | 1-1/4<br>(31.8)  | .281<br>(7.1)  |
| 1/2"      | 3-13/16<br>(96.9) | 1-11/16<br>(42.9) | 1-9/16<br>(39.7) | .281<br>(7.1)  |
| 3/4"      | 5<br>(127.0)      | 1-5/8<br>(41.3)   | 1-3/4<br>(44.5)  | .438<br>(11.1) |

Angle Pattern **Model 50** Female-to-Female

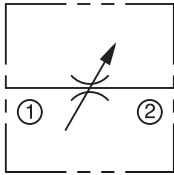
| Pipe Size | A Open             | B               | C               | D Orifice      |
|-----------|--------------------|-----------------|-----------------|----------------|
| 1/8"      | 3-1/16<br>(77.8)   | 7/8<br>(22.2)   | 2<br>(50.8)     | .188<br>(4.8)  |
| 1/4"      | 3-5/8<br>(92.1)    | 7/8<br>(22.2)   | 2<br>(50.8)     | .188<br>(4.8)  |
| 3/8"      | 4-1/32<br>(102.4)  | 1<br>(25.4)     | 2-3/8<br>(60.3) | .281<br>(7.1)  |
| 1/2"      | 3-15/16<br>(100.0) | 1-1/4<br>(31.8) | 2-7/8<br>(75.0) | .281<br>(7.1)  |
| 3/4"      | 4-15/16<br>(125.5) | 1-1/2<br>(38.1) | 3-5/8<br>(92.1) | .438<br>(11.1) |
| 1"        | 6-1/8<br>(155.6)   | 2<br>(50.8)     | 4<br>(101.6)    | .563<br>(14.3) |

## HOW TO ORDER

| Size | Model 01<br>Male-to-Female | Model 02<br>Female-to-Female |               |                                     | Model 50<br>Female-to-Female |               |                                     |  |
|------|----------------------------|------------------------------|---------------|-------------------------------------|------------------------------|---------------|-------------------------------------|--|
|      | NPTF Thread                | NPTF Thread                  |               | ISO 7/1 – RS<br>BSP Taper<br>Thread | NPTF Thread                  |               | ISO 7/1 – RS<br>BSP Taper<br>Thread | ISO 7/1 – RS<br>BSP Parallel<br>Thread |
|      |                            | Standard                     | Fine Metering |                                     | Standard                     | Fine Metering |                                     |  |
| 1/8" | S101S1                     | –                            | –             | –                                   | –                            | SM150S1       | –                                   | –                                      |
| 1/4" | S201S1                     | S202S1                       | SM202S1       | SB202S1                             | S250S1                       | SM250S1       | SB250S1                             | SBP250S1                               |
| 3/8" | S301S1                     | S302S1                       | –             | SB302S1                             | S350S1                       | –             | SB350S1                             | SBP350S1                               |
| 1/2" | S401S1                     | S402S1                       | –             | SB402S1                             | S450S1                       | –             | SB450S1                             | SBP450S1                               |
| 3/4" | –                          | S602S1                       | –             | SB602S1                             | S650S1                       | –             | SB650S1                             | SBP650S1                               |
| 1"   | –                          | –                            | –             | –                                   | S850S1                       | –             | –                                   | –                                      |

**NMF Needle Valve**  
Male-to-Female

IN-LINE



**DESCRIPTION**

A variable flow restrictor with positive shut-off. A wide range of flow adjustment is possible because of the fine thread and tapered needle. Unwanted changes in adjustment are prevented by a locknut. A knurled knob is standard.

- Eliminates need for extra pipe nipple
- Wide range of flow adjustability
- Lock Nut to maintain flow setting
- Positive shut-off

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Brass: 2,000 psi (138 bar)  
Carbon Steel: 5,000 psi (345 bar)

**Operating Temperature Range**

-15° to +400° F (-26° to +204° C)

**Threads**

NPTF

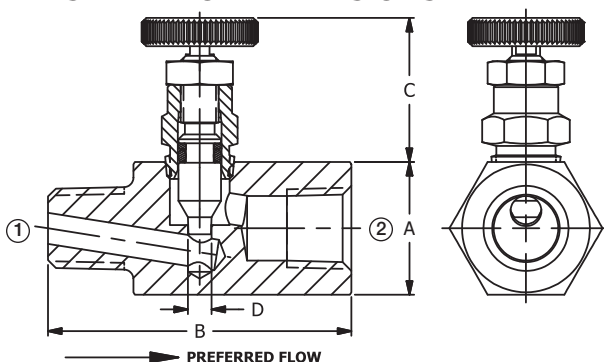
**Materials**

Body, Housing: Brass, Steel  
Needle: Brass, Stainless Steel 416  
O-Ring: Viton  
Back-Up Washer: Teflon  
Lock Nut: Brass, Steel  
Knob: Aluminum

**FLOW RATING**

| Size | Max Recommended Flow gpm (lpm) | Co-Efficient (Cv Factor) Fully Open |
|------|--------------------------------|-------------------------------------|
| 1/8" | 3.2 (12.1)                     | .20                                 |
| 1/4" | 7.0 (26.5)                     | .43                                 |
| 3/8" | 13.5 (51.1)                    | .78                                 |

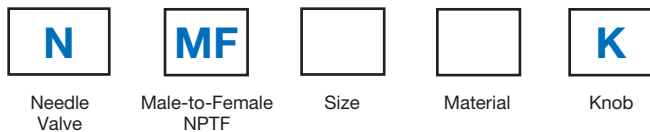
**INSTALLATION DIMENSIONS**



| Pipe Size | A HEX         | B              | C Open        | D Orifice  |
|-----------|---------------|----------------|---------------|------------|
| 1/8"      | 11/16 (17.5)  | 1-15/32 (37.3) | 7/8 (22.2)    | .107 (2.7) |
| 1/4"      | 7/8 (22.2)    | 2 (50.8)       | 1 (25.4)      | .156 (4.0) |
| 3/8"      | 1-1/16 (27.0) | 2-1/4 (57.2)   | 1-3/16 (30.2) | .219 (5.6) |

( ) Parentheses = Millimeters

**HOW TO ORDER**



| Code      | Size |
|-----------|------|
| <b>10</b> | 1/8" |
| <b>20</b> | 1/4" |
| <b>25</b> | 3/8" |

| Code     | Material     |
|----------|--------------|
| <b>B</b> | Brass        |
| <b>S</b> | Carbon Steel |

| Code     | Knob |
|----------|------|
| <b>K</b> | Knob |

**AVAILABLE MODEL CODES**

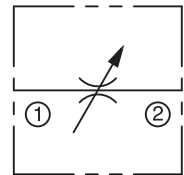
| Size | NPTF Thread |              |
|------|-------------|--------------|
|      | Brass       | Carbon Steel |
| 1/8" | NMF10BK     | —            |
| 1/4" | NMF20BK     | NMF20SK      |
| 3/8" | —           | NMF25SK      |

### DESCRIPTION

#### A Variable Flow Restrictor with Positive Shut-Off

This special purpose valve is primarily used as a gauge shut-off valve. It may also be used for any application where low flow is required.

- 1/4" NPTF threads mount directly in gauge line
- Reduced flow to that of an 1/8" Needle Valve
- Aesthetically pleasing gold knob
- Lock Nut to maintain flow setting



### SPECIFICATIONS

#### Maximum Operating Pressure (Non-Shock Service)

Carbon Steel: 5,000 psi (345 bar)

#### Flow Rating

Maximum Recommended Flow: 3.2 gpm (12.1 lpm)

#### Operating Temperature Range

-15° to +400° F (-26° to +204° C)

#### Threads

NPTF 1/4"

#### Materials

Body, Housing: Steel

Needle: Stainless Steel 416

O-Ring: Viton

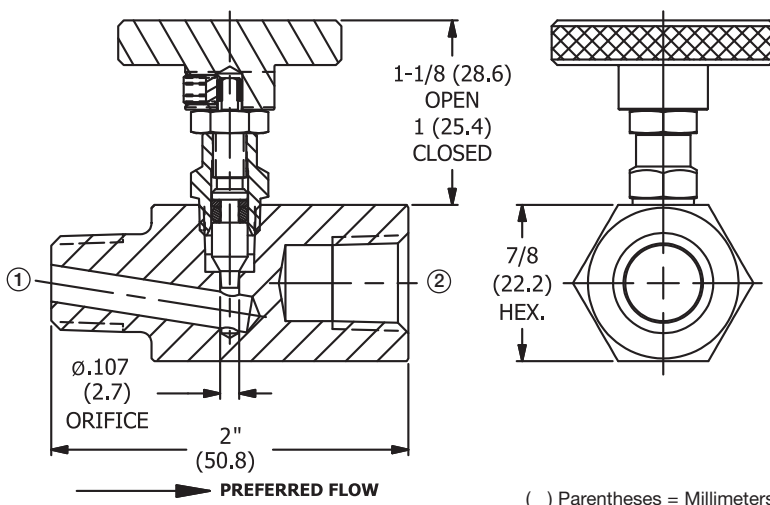
Back-Up Washer: Teflon

Lock Nut: Steel

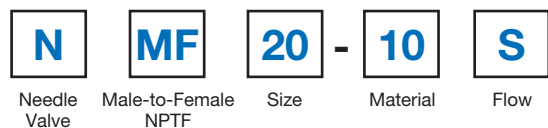
Knob: Gold Anodized Aluminum

Set Screw: Steel

### INSTALLATION DIMENSIONS



### HOW TO ORDER



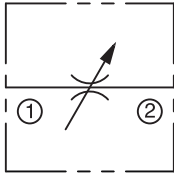
| Code      | Size |
|-----------|------|
| <b>20</b> | 1/4" |

| Code      | Flow              |
|-----------|-------------------|
| <b>10</b> | 1/8" Needle Valve |

| Code     | Material     |
|----------|--------------|
| <b>S</b> | Carbon Steel |

**N20-10S Needle Valve**  
Female-to-Female

IN-LINE



**DESCRIPTION**

**A Variable Flow Restrictor with Positive Shut-Off**

Ideally suited for use as a gauge shut-off valve, this right angle Pneu-Trol needle valve has 1/4" NPTF threads that mount directly into the gauge line. Flow is reduced to that of 1/8" needle valve for limited flow to gauge. This valve may also be used for low flow applications.

- 1/4" NPTF threads mount directly in gauge line
- Reduced flow to that of an 1/8" Needle Valve
- Aesthetically pleasing gold knob
- Lock Nut to maintain flow setting

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Carbon Steel: 5,000 psi (345 bar)

**Flow Rating**

Maximum Recommended Flow: 3.2 gpm (12.1 lpm)

**Operating Temperature Range**

-15° to +400° F (-26° to +204° C)

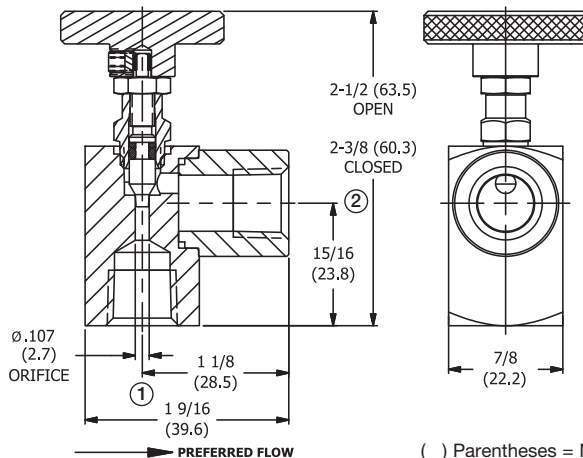
**Threads**

NPTF 1/4"

**Materials**

- Body, Housing: Steel
- Needle: Stainless Steel 416
- O-Ring: Viton
- Back-Up Washer: Teflon
- Lock Nut: Steel
- Knob: Gold Anodized Aluminum
- Set Screw: Steel

**INSTALLATION DIMENSIONS**



( ) Parentheses = Millimeters

**HOW TO ORDER**



Needle Valve      Size      Flow      Material

| Code | Size      |
|------|-----------|
| 20   | 1/4" NPTF |

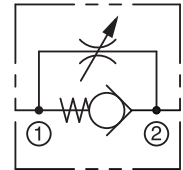
| Code | Flow              |
|------|-------------------|
| 10   | 1/8" Needle Valve |

| Code | Material     |
|------|--------------|
| S    | Carbon Steel |

**DESCRIPTION**

**A Stainless Steel Instrumentation Flow Control Valve**

A spring biased poppet check provides free flow in one direction. A fine metering tapered needle provides a range of adjustment in the controlled direction. A locknut prevents unwanted changes in adjustment.



- 316 Stainless Steel
- Fine Metering
- Bubble-Tight poppet-style check
- T-Bar handle (removable if desired)
- Lock Nut to maintain flow setting
- Ideal for food processing and petro chemical industries



**SPECIFICATIONS**

**Maximum Operating Pressure**

Stainless Steel: 1,000 psi (69 bar) and  
500 psi (34 bar)

**Flow Rating**

Maximum Recommended Flow:  
1.5 gpm (5.7 lpm) & 3.0 gpm (11.4 lpm)

**Operating Temperature Range**

-15° to +400° F (-26° to +204° C)

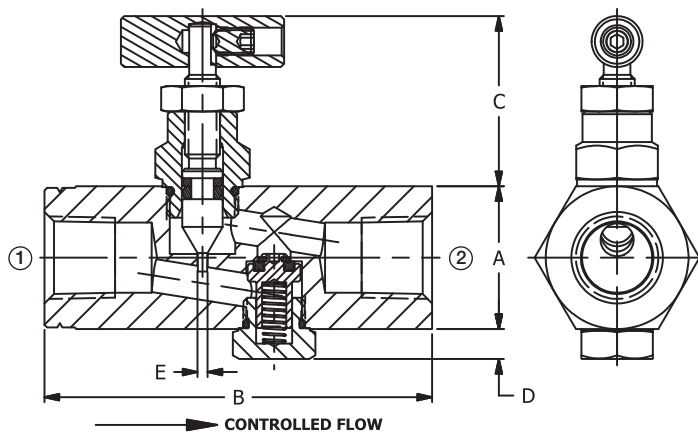
**Threads**

NPTF

**Materials**

Body, Housing: Stainless Steel 316  
Needle: Stainless Steel 316  
O-Ring: Viton  
Back-Up Washer: Teflon  
Poppet: Stainless Steel 316 with  
Viton Quad Ring  
Spring: Stainless Steel 316  
Lock Nut: Stainless Steel 316  
Handle: Stainless Steel 316  
Set Screw: Stainless Steel 303

**INSTALLATION DIMENSIONS**



| Pipe Size | A HEX           | B               | C Open           | D             | E Orifice     |
|-----------|-----------------|-----------------|------------------|---------------|---------------|
| 1/8"      | 11/16<br>(17.5) | 1-3/4<br>(44.5) | 7/8<br>(22.3)    | 3/16<br>(4.8) | .050<br>(1.3) |
| 1/4"      | 7/8<br>(22.3)   | 2-3/8<br>(60.4) | 1-1/16<br>(27.0) | 3/16<br>(4.8) | .062<br>(1.6) |

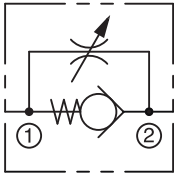
( ) Parentheses = Millimeters

**HOW TO ORDER**

| Size | NPTF Thread     | Rated Pressure<br>psi (bar) | Rated Flow<br>gpm (lpm) |
|------|-----------------|-----------------------------|-------------------------|
|      | Stainless Steel |                             |                         |
| 1/8" | SFP10SSB        | 1,000<br>(69)               | 1.5<br>(5.7)            |
| 1/4" | SFP20SSB        | 500<br>(34)                 | 3.0<br>(11.4)           |

**F, FP Flow Control**  
Female-to-Female

IN-LINE



**DESCRIPTION**

**A Variable Flow Restrictor with Positive Shut-Off and Free Reverse Flow**

A wide range of flow adjustment in the controlled flow direction is possible because of the fine thread and tapered needle. A spring biased ball check or optional poppet check allows full flow in the opposite direction. Unwanted changes in adjustment are prevented by a lock nut.

- A wide range of flow adjustability
- Lock Nut to maintain flow setting
- Positive shut-off
- Leak-Tight Ball Check standard
- Bubble-Tight Poppet with O-Ring optional

**SPECIFICATIONS**

**FLOW RATING**

| Size  | Max Recommended Flow gpm (lpm) | Co-Efficient (Cv Factor) |
|-------|--------------------------------|--------------------------|
| 1/8"  | 1.5 (5.7)                      | .23                      |
| 1/4"  | 3.0 (11.4)                     | .54                      |
| 3/8"  | 5.0 (18.9)                     | .83                      |
| SAE 6 |                                |                          |
| 1/2"  | 8.0 (30.3)                     | 1.47                     |
| 3/4"  | 12.0 (45.4)                    | 1.90                     |

**Maximum Operating Pressure (Non-Shock Service)**

Brass: 2,000 psi (138 bar)  
Carbon Steel: 5,000 psi (345 bar)  
Stainless Steel: 5,000 psi (345 bar)

**Maximum Operating Pressure (Flow Control Poppet)**

60 psi (4 bar)

**Cracking Pressure**

1 to 2.5 psi (.07 to .17 bar)  
Soft seat check valves if left seated for a period of time, will have the rubber adhere to the metal it is in contact with. This results in an initial high crack point due to sticking. The degree depends on many things (time seated, pressure, etc.).

**Operating Temperature Range**

-15° to +400° F (-26° to +204° C)

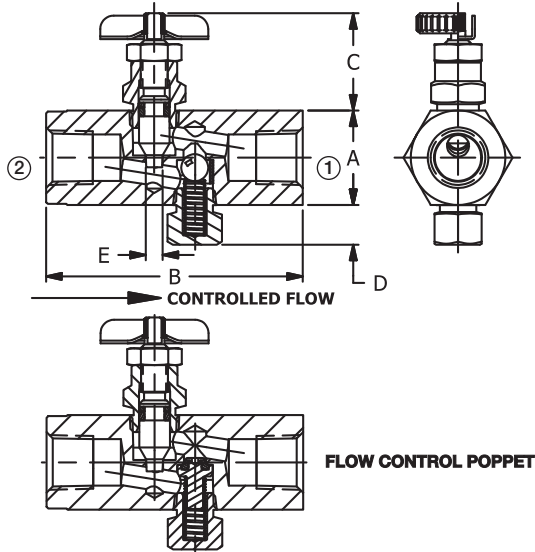
**Threads**

NPTF, BSPT, SAE

**Materials**

Body, Housing, Plug: Brass, Steel, Stainless Steel 303  
Needle: Brass (Brass Valves)  
Stainless Steel 416 (Steel and Stainless Steel Valves)  
O-Ring: Viton  
Back-Up Washer: Teflon  
Ball: Stainless Steel 440  
Spring: Stainless Steel 302  
Lock Nut: Brass, Steel, Stainless Steel 303  
Tamperproof Key: Steel  
Knob: Aluminum

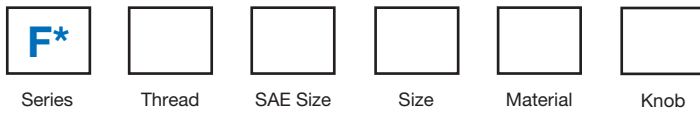
**INSTALLATION DIMENSIONS**



| Pipe Size | A HEX            | B                | C Open            | D               | E Orifice     |
|-----------|------------------|------------------|-------------------|-----------------|---------------|
| 1/8"      | 11/16<br>(17.5)  | 1-3/4<br>(44.5)  | 7/8<br>(22.2)     | 13/64<br>(5.2)  | .107<br>(2.7) |
| 1/4"      | 7/8<br>(22.2)    | 2-3/8<br>(60.3)  | 1-1/16<br>(27.0)  | 23/64<br>(9.1)  | .156<br>(4.0) |
| 3/8"      | 1-1/16<br>(27.0) | 2-3/4<br>(69.9)  | 1-3/16<br>(30.2)  | 11/32<br>(8.7)  | .219<br>(5.6) |
| 1/2"      | 1-5/16<br>(33.4) | 3-3/16<br>(81.0) | 1-15/32<br>(37.3) | 15/32<br>(11.9) | .281<br>(7.1) |
| 3/4"      | 1-5/8<br>(41.3)  | 3-9/16<br>(90.5) | 1-11/16<br>(42.9) | 17/32<br>(13.5) | .344<br>(8.7) |

( ) Parentheses = Millimeters

**HOW TO ORDER**



| Code | Series              | Code | SAE Size    | Code | Size | Code | Material        | Code | Knob                       |
|------|---------------------|------|-------------|------|------|------|-----------------|------|----------------------------|
| F    | Flow Control        | Omit | NPTF, BSPT  | 10   | 1/8" | B    | Brass           | Omit | Tamperproof Adjustment Key |
| FP   | Flow Control Poppet | 6    | 9/16-18 UNF | 20   | 1/4" | S    | Carbon Steel    | K    | Knob                       |
|      |                     |      |             | 25   | 3/8" | SS   | Stainless Steel |      |                            |
|      |                     |      |             | 30   | 1/2" |      |                 |      |                            |
|      |                     |      |             | 35   | 3/4" |      |                 |      |                            |

| Code | Thread |
|------|--------|
| Omit | NPTF   |
| B    | BSPT   |
| M    | SAE    |

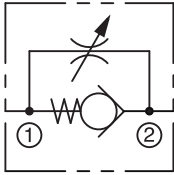
**AVAILABLE MODEL CODES**

| Size | NPTF Thread             |               |                 | ISO 7/1 - RS — BSP Taper Thread |        | SAE Thread        |
|------|-------------------------|---------------|-----------------|---------------------------------|--------|-------------------|
|      | Brass                   | Steel         | Stainless Steel | Brass                           | Steel  | Steel             |
| 1/8" | FP10BK<br>F10B<br>F10BK | F10S<br>F10SK | -<br>F10SSK     | FB10BK                          | FB10SK | -                 |
| 1/4" | FP20BK<br>F20B<br>F20BK | F20S<br>F20SK | -<br>F20SSK     | FB20BK                          | FB20SK | FM620S<br>FM620SK |
| 3/8" | FP25BK<br>F25B<br>F25BK | F25S<br>F25SK | -<br>F25SSK     | FB25BK                          | FB25SK | -                 |
| 1/2" | F30B<br>F30BK           | F30S<br>F30SK | -<br>F30SSK     | -                               | FB30SK | -                 |
| 3/4" | F35B<br>-               | F35SK         | -<br>-          | -                               | FB35SK | -                 |



**FMF Flow Control**  
Male-to-Female

IN-LINE



**DESCRIPTION**

**A Variable Flow Restrictor with Positive Shut-Off and Free Reverse Flow**

A wide range of flow adjustment in the controlled flow direction is possible because of the fine thread and tapered needle. A spring biased ball check allows full flow in the opposite direction. Unwanted changes in adjustment are prevented by a lock nut.

- A wide range of flow adjustability
- Lock Nut to maintain flow setting
- Positive shut-off
- Eliminates need for extra pipe nipple

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Brass: 2,000 psi (138 bar)

**Cracking Pressure**

1 to 2.5 psi (.07 to .17 bar)

**Operating Temperature Range**

-15° to +400° F (-26° to +204° C)

**Threads**

NPTF

**Materials**

Body, Housing, Plug: Brass

Collar: Stainless Steel 303

Needle: Brass

O-Ring: Viton

Back-Up Washer: Teflon

Ball: Stainless Steel 440

Spring: Stainless Steel 302

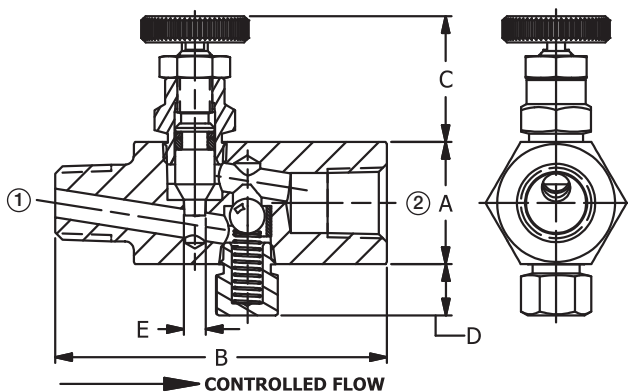
Lock Nut: Brass

Knob: Aluminum

**FLOW RATING**

| Size | Max Recommended Flow gpm (lpm) | Co-Efficient (Cv Factor) |
|------|--------------------------------|--------------------------|
| 1/8" | 1.5 (5.7)                      | .23                      |
| 1/4" | 3.0 (11.4)                     | .54                      |
| 3/8" | 5.0 (18.9)                     | .83                      |
| 1/2" | 8.0 (30.3)                     | 1.47                     |

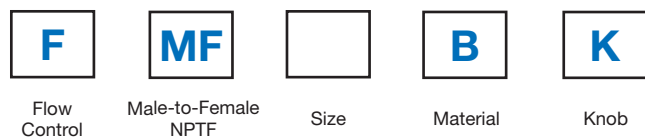
**INSTALLATION DIMENSIONS**



| Pipe Size | A HEX         | B             | C              | D            | E Orifice  |
|-----------|---------------|---------------|----------------|--------------|------------|
| 1/8"      | 11/16 (17.5)  | 1-3/4 (44.5)  | 7/8 (22.2)     | 13/64 (5.2)  | .107 (2.7) |
| 1/4"      | 7/8 (22.2)    | 2-3/8 (60.3)  | 1-1/16 (27.0)  | 23/64 (9.1)  | .156 (4.0) |
| 3/8"      | 1-1/16 (27.0) | 2-3/4 (69.9)  | 1-3/16 (30.2)  | 11/32 (8.7)  | .219 (5.6) |
| 1/2"      | 1-5/16 (33.4) | 3-3/16 (81.0) | 1-15/32 (37.3) | 15/32 (11.9) | .281 (7.1) |

( ) Parentheses = Millimeters

**HOW TO ORDER**



| Code | Size |
|------|------|
| 10   | 1/8" |
| 20   | 1/4" |
| 25   | 3/8" |
| 30   | 1/2" |

| Code | Knob |
|------|------|
| K    | Knob |

| Code | Material |
|------|----------|
| B    | Brass    |

**AVAILABLE MODEL CODES**

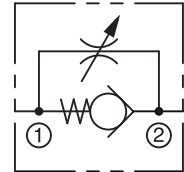
| Size | NPTF Thread |
|------|-------------|
|      | Brass       |
| 1/8" | FMF10BK     |
| 1/4" | FMF20BK     |
| 3/8" | FMF25BK     |
| 1/2" | FMF30BK     |

### A Variable Flow Restrictor with Positive Shut-Off and Free Reverse Flow

A wide range of flow adjustment in the controlled flow direction is possible because of the fine thread and tapered needle. A spring biased ball check allows full flow in the opposite direction.

Unwanted changes in adjustment are prevented by a lock nut.

- A wide range of flow adjustability
- Positive shut-off
- 316 Stainless Steel
- T-Bar handle (removable if desired)
- Lock Nut to maintain flow setting
- Ideal for food processing and petro chemical industries



### SPECIFICATIONS

#### Maximum Operating Pressure (Non-Shock Service)

Stainless Steel: 5,000 psi (345 bar)

#### Cracking Pressure

1 to 2.5 psi (.07 to .17 bar)

#### Operating Temperature Range

-15° to +400° F (-26° to +204° C)

#### Threads

NPTF

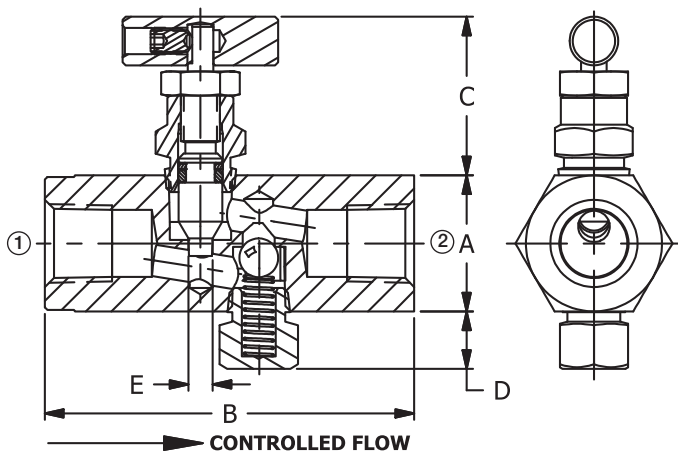
#### Materials

Body, Housing, Plug: Stainless Steel 316  
 Collar: Stainless Steel 303  
 Needle: Stainless Steel 316  
 O-Ring: Viton  
 Back-Up Washer: Teflon  
 Ball: Stainless Steel 316  
 Spring: Stainless Steel 316  
 Lock Nut: Stainless Steel 316  
 Handle: Stainless Steel 316  
 Knob: Stainless Steel 303

### FLOW RATING

| Size | Max Recommended Flow gpm (lpm) | Co-Efficient (Cv Factor) |
|------|--------------------------------|--------------------------|
| 1/4" | 3.0 (11.4)                     | .43                      |
| 1/2" | 8.0 (30.3)                     | 1.24                     |

### INSTALLATION DIMENSIONS



| Pipe Size | A HEX            | B                | C                 | D               | E Orifice     |
|-----------|------------------|------------------|-------------------|-----------------|---------------|
| 1/4"      | 7/8<br>(22.2)    | 2-3/8<br>(60.3)  | 1-1/8<br>(28.6)   | 23/64<br>(9.1)  | .156<br>(4.0) |
| 1/2"      | 1-5/16<br>(33.4) | 3-3/16<br>(81.0) | 1-17/32<br>(38.9) | 15/32<br>(11.9) | .281<br>(7.2) |

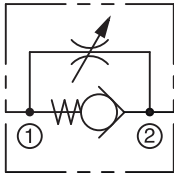
( ) Parentheses = Millimeters

### HOW TO ORDER

| Size | NPTF Thread     |
|------|-----------------|
|      | Stainless Steel |
| 1/4" | F20SS316K       |
| 1/2" | F30SS316K       |

**EF Flow Control**  
Female-to-Female

IN-LINE



**DESCRIPTION**

Deltrol's unique line of Easy Read Flow Control Valves incorporate a metal setting knob and stem for added durability and positive operation. Color coding on stem allows you to precisely set flow requirements by simply turning the knob to the appropriate marking.

Flow control valves provide flow control in one direction, free flow in opposite direction. Flow adjustment can be made under pressure. Setting knob can be locked in any desired position with convenient set screw.

These tough valves are ideal for general industrial and mobile applications including plastic injection molding machines, packaging equipment, machine tools, car washes, hospital beds, and many types of automotive equipment.

- **Metal setting knob and stem**
- **Color coding and numerical readout allow positive setting for precise flow control and repeatability**
- **Can be accurately adjusted within a small fraction of a turn (one full turn per color)**
- **Set Screw in knob to maintain flow setting**

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

- Brass: 2,000 psi (138 bar)
- Carbon Steel: 5,000 psi (345 bar)
- Stainless Steel: 5,000 psi (345 bar)
- Ductile Iron: 5,000 psi (345 bar)

**Minimum Burst Pressure**

- Brass: 8,000 psi (552 bar)
- Carbon Steel: 20,000 psi (1,379 bar)
- Stainless Steel: 20,000 psi (1,379 bar)
- Ductile Iron: 20,000 psi (1,379 bar)

**Cracking Pressure (Except 1")**

1 to 2.5 psi (.07 to .17 bar)

**Cracking Pressure (1")**

3 to 5 psi (.21 to .34 bar)

**Operating Temperature Range**

- 1/8"–3/4" -30° to +200° F (-34° to +93° C)
- 1" -15° to +400° F (-26° to +204° C)

**Threads**

NPTF, BSPT, BSPP, SAE

**Materials (except 1")**

- Body: Brass, Steel, Stainless Steel 303
- Needle: Brass (Brass Valves)  
Stainless Steel 416  
(Steel and Stainless Steel Valves)
- O-Ring: Viton
- Back-Up Washer: Teflon
- Ball: Stainless Steel 440
- Spring: Stainless Steel 302
- Ball Guide: Delrin®
- Knob: Aluminum
- Set Screw: Steel
- Color Rings: Anodized Aluminum

**Materials (1")**

- Body: Leaded Tin Bronze, Ductile Iron
- Housing: Brass, Steel
- Needle: Stainless Steel 440  
(Brass and Steel Valves)
- O-Rings: Viton
- Back-Up Washer: Teflon
- Poppet: Stainless Steel 303
- Spring: Stainless Steel 302
- Retainer Ring: Steel
- Knob: Aluminum
- Set Screw: Steel
- Color Rings: Anodized Aluminum

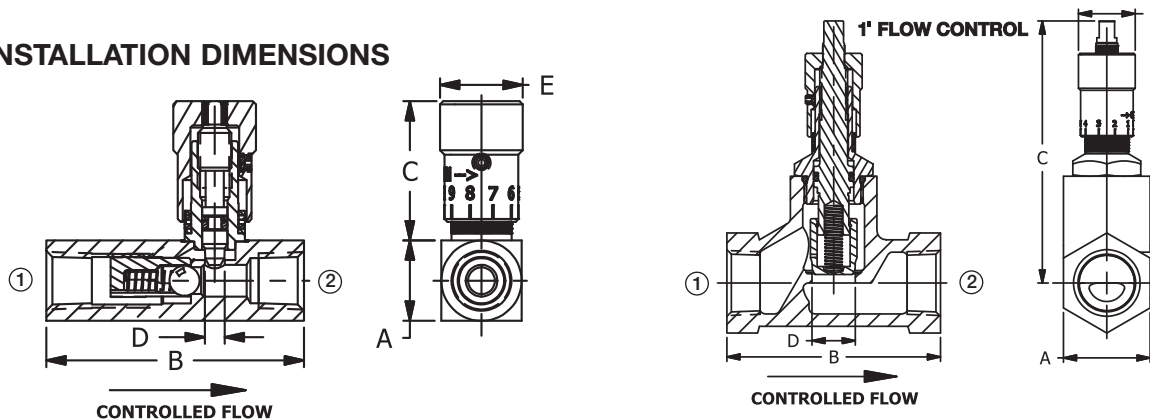
**FLOW RATING**

| Size | Max Recommended Flow gpm (lpm) | Co-Efficient (Cv Factor) Fully Open |
|------|--------------------------------|-------------------------------------|
| 1/8" | 3.0 (11.4)                     | .28                                 |
| 1/4" | 6.0 (22.7)                     | .53                                 |
| 3/8" | 10.0 (37.9)                    | .76                                 |
| 1/2" | 12.0 (45.4)                    | .93                                 |
| 3/4" | 20.0 (75.7)                    | 1.43                                |
| 1"   | 55.0 (208.2)                   | 8.00                                |

**FLOW CURVES**

See Page 5.01.1

**INSTALLATION DIMENSIONS**



| Pipe Size | A Square        | A SAE Square    | A HEX           | B                 | B SAE            | B ISO             | C Open            | C Closed           | D Orifice      | E Diameter       |
|-----------|-----------------|-----------------|-----------------|-------------------|------------------|-------------------|-------------------|--------------------|----------------|------------------|
| 1/8"      | 5/8<br>(15.9)   | -               | -               | 1-15/16<br>(49.2) | -                | 1-15/16<br>(49.2) | 1-9/32<br>(32.5)  | 1-1/16<br>(27.0)   | .125<br>(3.7)  | 23/32<br>(18.3)  |
| 1/4"      | 3/4<br>(19.1)   | 3/4<br>(19.1)   | -               | 2-13/32<br>(61.1) | 2-9/16<br>(65.1) | 2-1/2<br>(63.5)   | 1-13/32<br>(35.7) | 1-7/32<br>(31.0)   | .187<br>(9.7)  | 25/32<br>(19.8)  |
| 3/8"      | 1<br>(25.4)     | 1-1/8<br>(28.6) | -               | 2-7/8<br>(73.1)   | 3-1/4<br>(82.6)  | 2-31/32<br>(75.4) | 1-5/8<br>(41.3)   | 1-3/8<br>(39.9)    | .250<br>(6.4)  | 57/64<br>(22.6)  |
| 1/2"      | 1-1/8<br>(28.6) | 1-1/4<br>(31.8) | -               | 3-7/16<br>(87.4)  | 3-9/16<br>(90.5) | 3-7/16<br>(87.4)  | 1-31/32<br>(50.0) | 1-5/8<br>(41.3)    | .312<br>(7.9)  | 1-1/64<br>(25.8) |
| 3/4"      | 1-3/8<br>(34.9) | 1-1/2<br>(38.1) | -               | 3-3/4<br>(95.3)   | 4-1/8<br>(104.8) | 3-3/4<br>(95.3)   | 2-3/16<br>(55.6)  | 1-13/16<br>(46.1)  | .375<br>(9.5)  | 1-5/32<br>(29.4) |
| 1"        | -               | -               | 1-3/4<br>(44.5) | 4-1/2<br>(114.3)  | -                | -                 | 5-1/16<br>(128.6) | 4-11/16<br>(119.1) | .875<br>(22.2) | 1-5/32<br>(29.4) |

( ) Parentheses = Millimeters

**HOW TO ORDER**



| Code      | Thread |
|-----------|--------|
| Omit      | NPTF   |
| <b>B</b>  | BSPT   |
| <b>BP</b> | BSPP   |
| <b>M</b>  | SAE    |

| Code      | Material                         |
|-----------|----------------------------------|
| <b>B</b>  | Brass (1" - Leaded Tin Bronze)   |
| <b>S</b>  | Carbon Steel (1" - Ductile Iron) |
| <b>SS</b> | Stainless Steel                  |

| Code      | SAE Size         |
|-----------|------------------|
| Omit      | NPTF, BSPT, BSPP |
| <b>6</b>  | 9/16-18 UNF      |
| <b>8</b>  | 3/4-16 UNF       |
| <b>10</b> | 7/8-14 UNF       |
| <b>12</b> | 1-1/16-12 UN     |

| Code      | Size |
|-----------|------|
| <b>10</b> | 1/8" |
| <b>20</b> | 1/4" |
| <b>25</b> | 3/8" |
| <b>30</b> | 1/2" |
| <b>35</b> | 3/4" |
| <b>40</b> | 1"   |

**HOW TO ADJUST**

From the closed position, open the valve by turning the metal knob counter-clockwise until the desired flow volume is obtained.

The colored band on the stem and the numerical readout indicate to what extent the valve is opened or closed. Each color on the color band represents one full turn.

Find the scribe mark on the upper surface of the valve body. The number on the knob in proximity to the scribe mark will indicate 10ths of a turn the valve is opened.

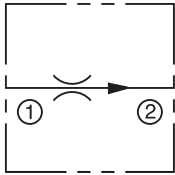
Record the information for future reference.

**AVAILABLE MODEL CODES**

| Size | NPTF Thread |       |                 | ISO 7/1 - RS - BSP Taper Thread |        | ISO 7/1 - RP - BSP Parallel Thread |         | SAE Thread   |
|------|-------------|-------|-----------------|---------------------------------|--------|------------------------------------|---------|--------------|
|      | Brass       | Steel | Stainless Steel | Brass                           | Steel  | Brass                              | Steel   | Carbon Steel |
| 1/8" | EF10B       | EF10S | EF10SS          | EFB10B                          | EFB10S | EFBP10B                            | EFBP10S | -            |
| 1/4" | EF20B       | EF20S | EF20SS          | EFB20B                          | EFB20S | EFBP20B                            | EFBP20S | EFM620S      |
| 3/8" | EF25B       | EF25S | EF25SS          | EFB25B                          | EFB25S | EFBP25B                            | EFBP25S | EFM825S      |
| 1/2" | EF30B       | EF30S | EF30SS          | EFB30B                          | EFB30S | EFBP30B                            | EFBP30S | EFM1030S     |
| 3/4" | EF35B       | EF35S | -               | EFB35B                          | EFB35S | -                                  | EFBP35S | EFM1235S     |
| 1"   | EF40B       | EF40S | -               | -                               | -      | -                                  | -       | -            |

**PC3, PC4, PCM Flow Regulator**  
Female-to-Female

IN-LINE



SERIES 3

**DESCRIPTION**

Pneu-Trol pressure compensated constant flow valves are exceptionally accurate in maintaining constant flow with pressures up to 3,000 psi (207 bar). These non-adjustable units provide exact factory-set output flow, regardless of inlet pressure, up to rated limits.

Series 3 is a miniature 1/4" valve for small flow rates. Series 4 is our standard fixed flow valve with flow capacity up to 30.0 gpm (113.6 lpm). Both Series 3 & 4 provide for "restricted" reverse flow as limited by the internal orifice.

The compensating action of these valves results from a fixed diameter orifice at the inlet end and a series of variable orifices at the outlet end. Flow through the variable orifices is controlled by a spring and piston. These elements work together to regulate hydraulic flow within the determined rates. Flows are controlled within ±15% up to 1.5 gpm (5.7 lpm) and ±10% at higher flow up to 30.0 gpm (113.6 lpm). Regulation is virtually unaffected by temperature changes from 60° F (16° C) to 180° F (82° C). At a temperature differential [ΔT] of 70° F (21° C) flow variation would be approximately ±2% max; while at temperature differential [ΔT] of 120° F (49° C) the flow variation would be approximately ±4% max.

Series 3 units are made from high-strength steel. Series 4 units are made from aluminum for the 1/4" & 3/8" sizes and high-strength steel for 1/2" & 3/4" sizes. The standard porting of these valves is NPTF with optional SAE threads available on selected models.

- For hydraulic applications only
- Maintains accurate constant flow at pressures up to 3,000 psi (207 bar)
- Fixed (Factory-Set) flow units

**FLOW RATING**

**SERIES 3**

| Size  | Controlled Flow Range gpm (lpm) | Min. Oper. Press. ΔP (Δbar) |
|-------|---------------------------------|-----------------------------|
| 1/4"  | 0.1 to 2.0<br>(0.4 to 7.6)      | 100<br>(6.9)                |
| SAE 6 |                                 |                             |

**SERIES 4**

| Size   | Controlled Flow Range gpm (lpm) | Min. Oper. Press. ΔP (Δbar) |
|--------|---------------------------------|-----------------------------|
| 1/4"   | 0.5 to 5.0<br>(1.9 to 18.9)     | 100 - 300<br>(6.9 - 20.7)   |
| SAE 4  |                                 |                             |
| 3/8"   | 1.0 to 10.0<br>(3.8 to 37.9)    | 100 - 200<br>(6.9 - 13.8)   |
| SAE 6  |                                 |                             |
| 1/2"   | 1.5 to 15.0<br>(5.7 to 56.8)    | 100<br>(6.9)                |
| SAE 8  |                                 |                             |
| 3/4"   | 2.0 to 30.0<br>(7.6 to 113.6)   | 100<br>(6.9)                |
| SAE 12 |                                 |                             |

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Carbon Steel: 3,000 psi (207 bar)  
Aluminum: 3,000 psi (207 bar)

**Minimum Operating Pressure**  
(See Flow Rating Chart)

**Operating Temperature Range**  
-15° to +400° F (-26° to +204° C)

**Threads**  
NPTF, SAE

**Materials (PC3)**

Body, Sleeve: Steel  
Spring: Music Wire  
Piston: Steel  
O-Ring: Viton  
Washer: Steel  
Retaining Ring: Steel

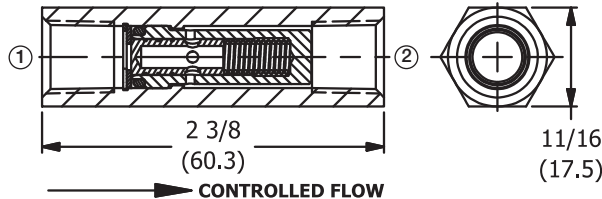
**Materials (PC4)**

Body, Adapter:  
Aluminum 2011-T3 (PC4-21, PC-4-31)  
Steel (PC4-41, PC4-61)  
Housing: Steel  
Spring: Music Wire  
Piston: Steel  
O-Rings: Viton  
Back-Up Washer: Teflon

**INSTALLATION DIMENSIONS**

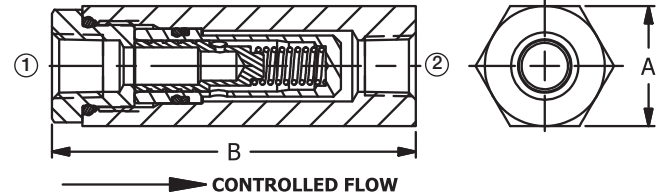
**Series 3**

Miniature Fixed - with Restricted Reverse Flow



**Series 4**

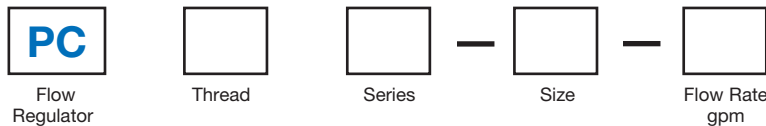
Standard Fixed - with Restricted Reverse Flow



| Size       | A HEX        | B               |
|------------|--------------|-----------------|
| 1/4"-SAE 4 | 1 (25.4)     | 3 (76.2)        |
| 3/8"-SAE 6 | 1-3/8 (34.9) | 3-7/8 (98.4)    |
| 1/2"-SAE 8 | 1-1/2 (38.1) | 4-1/4 (108.0)   |
| 3/4"       | 1-5/8 (41.3) | 4-19/32 (116.7) |
| SAE 12     | 1-5/8 (41.3) | 4-7/8 (123.8)   |

( ) Parentheses = Millimeters

**HOW TO ORDER**



| Code       | Thread |
|------------|--------|
| Omit       | NPT    |
| <b>M4</b>  | SAE 4  |
| <b>M6</b>  | SAE 6  |
| <b>M8</b>  | SAE 8  |
| <b>M12</b> | SAE 12 |

| Code     | Series    |
|----------|-----------|
| <b>3</b> | Miniature |
| <b>4</b> | Standard  |

| Code      | Size |        | Series 3 only |
|-----------|------|--------|---------------|
|           | NPT  | SAE    |               |
| <b>2</b>  | 1/4" | SAE 6  |               |
| <b>21</b> | 1/4" | SAE 4  |               |
| <b>31</b> | 3/8" | SAE 6  |               |
| <b>41</b> | 1/2" | SAE 8  |               |
| <b>61</b> | 3/4" | SAE 12 |               |

**AVAILABLE MODEL CODES**

| Size | NPT Thread | Flow Range gpm (lpm)       |
|------|------------|----------------------------|
| 1/4" | PC3-2-gpm  | 0.1 to 2.0 (0.4 to 7.6)    |
|      | PC4-21-gpm | 0.5 to 5.0 (1.9 to 18.9)   |
| 3/8" | PC4-31-gpm | 1.0 to 10.0 (3.8 to 37.9)  |
| 1/2" | PC4-41-gpm | 1.5 to 15.0 (5.7 to 56.8)  |
| 3/4" | PC4-61-gpm | 2.0 to 30.0 (7.6 to 113.6) |

| Size   | SAE Thread    | Flow Range gpm (lpm)       |
|--------|---------------|----------------------------|
| SAE 4  | PCM44-21-gpm  | 0.5 to 5.0 (1.9 to 18.9)   |
| SAE 6  | PCM63-2-gpm   | 0.1 to 2.0 (0.4 to 7.6)    |
|        | PCM64-31-gpm  | 1.0 to 10.0 (3.8 to 37.9)  |
| SAE 8  | PCM84-41-gpm  | 1.5 to 15.0 (5.7 to 56.8)  |
| SAE 12 | PCM124-61-gpm | 2.0 to 30.0 (7.6 to 113.6) |

**AVAILABLE FLOW RATES BY SIZE**

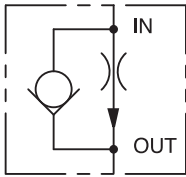
| PC3 Only<br>1/4" |      | PC4<br>1/4" |       | PC4<br>3/8" |       | PC4<br>1/2" |       | PC4<br>3/4" |        |
|------------------|------|-------------|-------|-------------|-------|-------------|-------|-------------|--------|
| gpm              | lpm  | gpm         | lpm   | gpm         | lpm   | gpm         | lpm   | gpm         | lpm    |
| 0.10             | 0.38 | 0.50        | 1.90  | 1.00        | 3.79  | 1.50        | 5.68  | 2.00        | 7.57   |
| 0.15             | 0.57 | 0.75        | 2.84  | 1.20        | 4.55  | 3.00        | 11.36 | 2.50        | 9.47   |
| 0.20             | 0.76 | 0.90        | 3.41  | 1.50        | 5.68  | 3.50        | 13.25 | 3.00        | 11.36  |
| 0.30             | 1.14 | 1.00        | 3.79  | 2.00        | 7.57  | 3.75        | 14.20 | 3.50        | 13.25  |
| 0.40             | 1.52 | 1.25        | 4.74  | 2.25        | 8.52  | 4.00        | 15.14 | 4.00        | 15.14  |
| 0.05             | 1.90 | 1.30        | 4.92  | 2.50        | 9.47  | 4.50        | 17.04 | 4.50        | 17.04  |
| 0.60             | 2.28 | 1.50        | 5.68  | 3.00        | 11.36 | 5.00        | 18.93 | 5.00        | 18.93  |
| 0.75             | 2.84 | 1.75        | 6.63  | 3.25        | 12.30 | 5.50        | 20.82 | 6.00        | 22.71  |
| 1.00             | 3.79 | 2.00        | 7.57  | 3.50        | 13.25 | 6.00        | 22.71 | 7.00        | 26.50  |
| 1.25             | 4.74 | 2.50        | 9.47  | 4.00        | 15.14 | 7.00        | 26.50 | 8.00        | 30.28  |
| 1.50             | 5.68 | 2.80        | 10.60 | 5.00        | 18.93 | 7.50        | 28.39 | 9.00        | 34.07  |
| 1.75             | 6.63 | 3.00        | 11.36 | 6.00        | 22.71 | 8.50        | 32.18 | 10.00       | 37.86  |
| 2.00             | 7.57 | 3.50        | 13.25 | 6.25        | 23.66 | 9.00        | 34.07 | 12.00       | 45.42  |
|                  |      | 4.00        | 15.14 | 7.00        | 26.50 | 10.00       | 37.86 | 14.00       | 52.99  |
|                  |      | 5.00        | 18.93 | 8.00        | 30.28 | 11.00       | 41.64 | 16.00       | 60.56  |
|                  |      |             |       | 9.00        | 34.07 | 12.00       | 45.42 | 18.00       | 68.13  |
|                  |      |             |       | 10.00       | 37.86 | 13.00       | 49.21 | 20.00       | 75.70  |
|                  |      |             |       |             |       | 14.00       | 52.99 | 22.00       | 83.27  |
|                  |      |             |       |             |       | 15.00       | 56.78 | 24.00       | 90.84  |
|                  |      |             |       |             |       |             |       | 26.00       | 98.41  |
|                  |      |             |       |             |       |             |       | 28.00       | 105.98 |
|                  |      |             |       |             |       |             |       | 30.00       | 113.55 |

**Note:** PC3s & PC4s are NOT stocked as complete or finished units.  
 All "Fixed" units are drilled to suit each customer's order "after" receipt.

# PCM88

## Fixed, Free Reverse, Externally Ported Pressure Compensated Flow Regulator Valve

### IN-LINE



### DESCRIPTION

A fixed cartridge valve designed to regulate flow regardless of load pressure. This valve is a restrictive-type flow regulator designed for a wide variety of flow applications.

The male outlet port allows for quick installation into existing manifolds for meter-in control with free flow in the opposite direction.

The PCM 88 maintains a constant flow within specified accuracies from inlet to outlet regardless of downstream load pressure. When flow produces a minimum predetermined pressure differential across the compensator spool control orifice, the spool shifts against the spring force to throttle the flow and maintain the flow setting. In the reverse direction the spool shifts to permit free flow.

- **Pressure-compensated**
- **Quiet response**
- **Free reverse flow**
- **Industry common cavity**
- **Compact size**

### SPECIFICATIONS

#### Maximum Operating Pressure (Non-Shock Service)

Carbon Steel: 3,000 psi (207 bar)

#### Minimum Operating Pressure

75  $\Delta$ psi (5.2  $\Delta$ bar)

#### Flow Range

1.0 to 10.0 gpm (3.8 to 37.9 lpm)

(See ordering table)

#### Flow Tolerances

Flows up to and including 1.5 gpm (5.7 lpm)  $\pm$ 15%

Flows over 1.5 gpm (5.7 lpm)  $\pm$ 10%

#### Operating Temperature Range

-30° to +250° F (-34° to +120° C)

#### Recommended Filtration

ISO 17/15/13

#### Fluids

Mineral-based fluids. For other fluid compatibility, consult factory.

#### Cavity

#8 SAE, see page 2.40.2

Also works in 080-2 Cartridge Valve Cavity

#### Materials

Housing: Steel

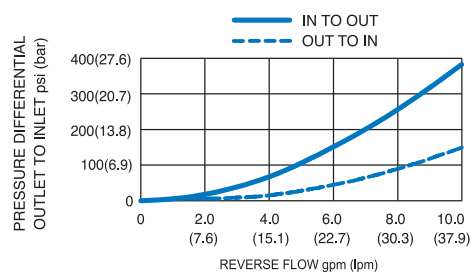
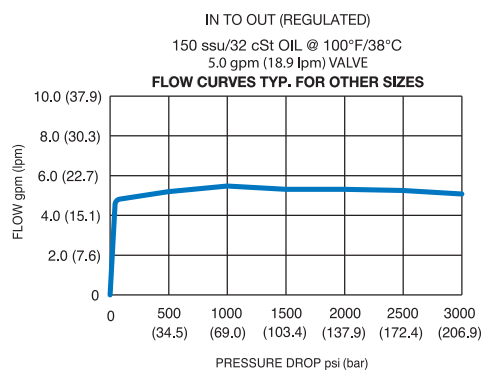
O-Ring: Buna-N

Spring: Music Wire

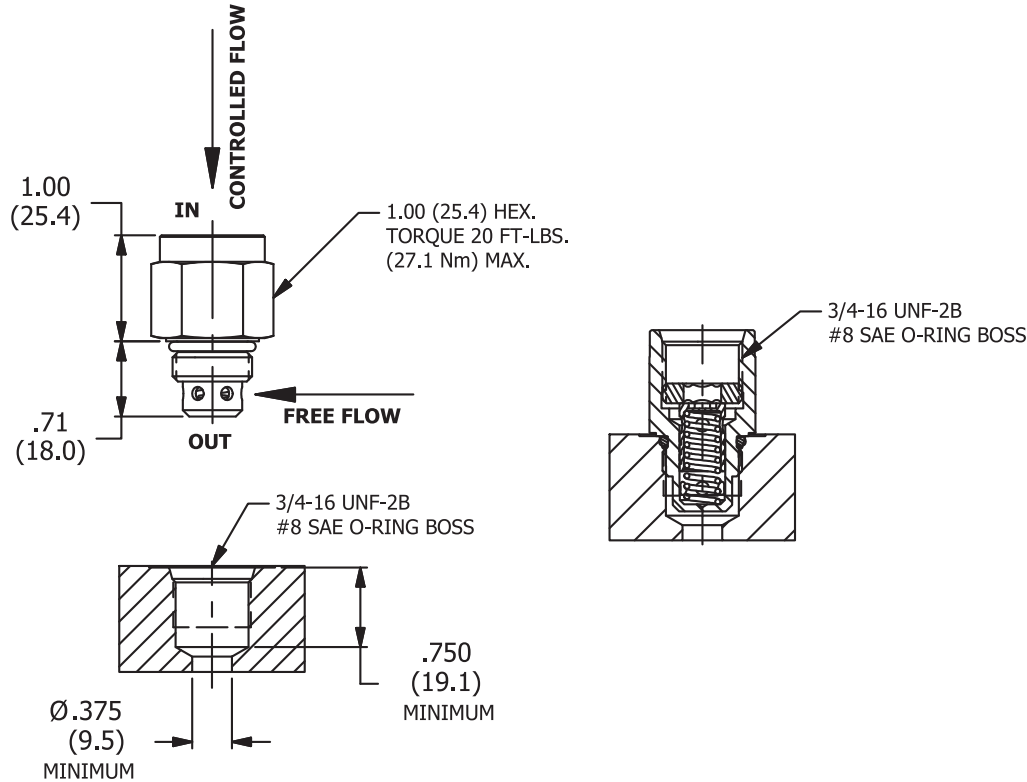
Spool: Steel

Lock Screw: Steel

### PRESSURE DROP VS. FLOW

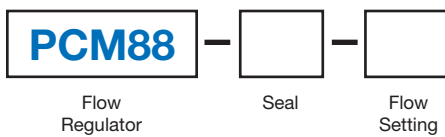


**INSTALLATION DIMENSIONS**



( ) Parentheses = Millimeters

**HOW TO ORDER**



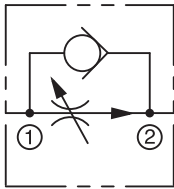
| Code     | Seal   | Code | Flow Setting         |
|----------|--------|------|----------------------|
| <b>N</b> | Buna N | 100  | 1.00 gpm (3.8 lpm)   |
|          |        | 200  | 2.00 gpm (7.6 lpm)   |
|          |        | 300  | 3.00 gpm (11.4 lpm)  |
|          |        | 400  | 4.00 gpm (15.1 lpm)  |
|          |        | 500  | 5.00 gpm (18.9 lpm)  |
|          |        | 600  | 6.00 gpm (22.7 lpm)  |
|          |        | 700  | 7.00 gpm (26.5 lpm)  |
|          |        | 800  | 8.00 gpm (30.3 lpm)  |
|          |        | 900  | 9.00 gpm (34.1 lpm)  |
|          |        | 1000 | 10.00 gpm (37.9 lpm) |

Other flow settings available. Consult factory.



**PC\*5 Flow Regulator**  
Female-to-Female

IN-LINE



**DESCRIPTION**

Pneu-Trol pressure compensated constant flow regulator valves are exceptionally accurate in maintaining constant flow with pressures up to 3,000 psi (207 bar). These adjustable valves, while under pressure, allow infinite output flow adjustment within a specified flow range independent of inlet pressure variations. An internal check valve to bypass the control orifice provides unrestricted free reverse flow.

The compensating action of these valves results from an adjustable orifice at the inlet end and a series of variable orifices at the outlet end. Flow through the variable orifices is controlled by a spring and piston. These elements work together to regulate hydraulic flow within the determined rates. Flows are controlled within  $\pm 15\%$  up to 1.5 gpm (5.7 lpm) and  $\pm 10\%$  at higher flow up to 15.0 gpm (56.8 lpm). Regulation is virtually unaffected by temperature changes from 60° F (16° C) to 180° F (82° C). At a temperature differential  $[\Delta T]$  of 70° F (21° C) flow variation would be approximately  $\pm 2\%$  max; while at temperature differential  $[\Delta T]$  of 120° F (49° C) the flow variation would be approximately  $\pm 4\%$  max.

Series 5 units are made from high-strength steel. The standard porting of these valves is NPTF with optional SAE and BSPT threads available on selected models.

- **Maintains accurate constant flow at pressures up to 3,000 PSI (207 Bar)**
- **Adjustable flow**
- **Lock Nut to maintain flow setting**
- **Free reverse flow**

**FLOW RATING**

**SERIES 5**

NPT Thread

| Size | Controlled Flow Range gpm (lpm) | Min. Oper. Press. $\Delta P$ ( $\Delta$ bar) |
|------|---------------------------------|--|
| 1/4" | 0.75 to 5.0<br>(2.8 to 18.9)    | 100 - 300<br>(6.9 to 20.7)                   |
| 3/8" | 1.0 to 10.0<br>(3.8 to 37.9)    | 100 - 200<br>(6.9 to 13.8)                   |
| 1/2" | 1.5 to 15.0<br>(5.7 to 56.8)    | 200<br>(13.8)                                |

ISO 7/1 - RS - BSP Taper Thread

| Size | Controlled Flow Range gpm (lpm) | Min. Oper. Press. $\Delta P$ ( $\Delta$ bar) |
|------|---------------------------------|--|
| 1/4" | 0.75 to 5.0<br>(2.8 to 18.9)    | 100 - 300<br>(6.9 to 20.7)                   |
| 3/8" | 1.0 to 10.0<br>(3.8 to 37.9)    | 100 - 200<br>(6.9 to 13.8)                   |
| 1/2" | 1.5 to 15.0<br>(5.7 to 56.8)    | 200<br>(13.8)                                |

SAE Thread

| Size              | Controlled Flow Range gpm (lpm) | Min. Oper. Press. $\Delta P$ ( $\Delta$ bar) |
|-------------------|---------------------------------|--|
| SAE 8<br>(Size 3) | 1.0 to 10.0<br>(3.8 to 37.9)    | 100 - 200<br>(6.9 to 13.8)                   |
| SAE 8<br>(Size 4) | 1.5 to 15.0<br>(5.7 to 56.8)    | 200<br>(13.8)                                |

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**  
Carbon Steel: 3,000 psi (207 bar)

**Minimum Operating Pressure**  
(See Flow Rating Chart)

**Operating Temperature Range**  
-15° to +400° F (-26° to +204° C)

**Threads**  
NPTF, BSPT, SAE

**Materials**

Body, Adapter: Clear, Zinc-Plated Steel

Spring: Music Wire

Piston: Steel

Housing: Brass

Needle: Stainless Steel 416

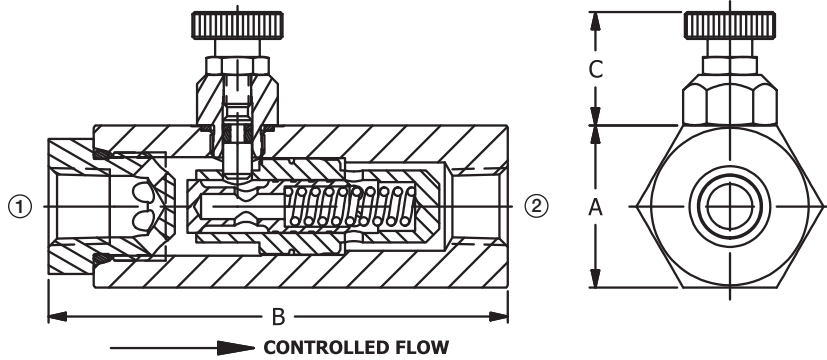
O-Rings: Viton

Back-Up Washer: Teflon

Lock Nut: Stainless Steel 303

Knob: Blue Anodized Aluminum

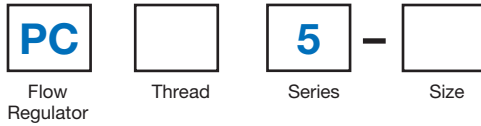
**INSTALLATION DIMENSIONS**



| Pipe Size | A HEX           | B                | C Open            | C Closed         |
|-----------|-----------------|------------------|-------------------|------------------|
| 1/4"      | 1-1/8<br>(28.6) | 3-3/16<br>(81.0) | 57/64<br>(22.6)   | 49/64<br>(19.5)  |
| 3/8"      | 1-1/2<br>(38.1) | 3-3/4<br>(95.3)  | 1-5/32<br>(29.4)  | 15/16<br>(23.8)  |
| 1/2"      | 1-5/8<br>(41.3) | 4-3/8<br>(111.1) | 1-15/32<br>(37.3) | 1-7/32<br>(31.0) |

( ) Parentheses = Millimeters

**HOW TO ORDER**



| Code      | Thread |
|-----------|--------|
| Omit      | NPT    |
| <b>B</b>  | BSPT   |
| <b>M8</b> | SAE 8  |

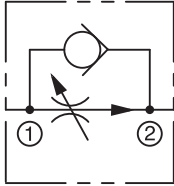
| Code     | Size      |       |
|----------|-----------|-------|
|          | NPTF/BSPT | SAE   |
| <b>2</b> | 1/4"      | -     |
| <b>3</b> | 3/8"      | SAE 8 |
| <b>4</b> | 1/2"      | SAE 8 |

**AVAILABLE MODEL CODES**

| Size  | NPTF Thread | ISO 7/1 - RS – BSP Taper Thread | SAE Thread | Flow Range gpm (lpm)         | Min. Oper. Press. ΔP (Abar) |
|-------|-------------|---------------------------------|------------|------------------------------|-----------------------------|
| 1/4"  | PC5-2       | PCB5-2                          | -          | 0.75 to 5.0<br>(2.8 to 18.9) | 100 - 300<br>(6.9 to 20.7)  |
| 3/8"  | PC5-3       | PCB5-3                          | -          | 1.0 to 10.0<br>(3.8 to 37.9) | 100 - 200<br>(6.9 to 13.8)  |
| 1/2"  | PC5-4       | PCB5-4                          | -          | 1.5 to 15.0<br>(5.7 to 56.8) | 200<br>(13.8)               |
| SAE 8 | -           | -                               | PCM85-3    | 1.0 to 10.0<br>(3.8 to 37.9) | 100 - 200<br>(6.9 to 13.8)  |
|       | -           | -                               | PCM85-4    | 1.5 to 15.0<br>(5.7 to 56.8) | 200<br>(13.8)               |

**EPC Flow Regulator**  
Female-to-Female

IN-LINE



**DESCRIPTION**

Easy Read pressure compensated constant flow regulator valves are exceptionally accurate in maintaining constant flow with pressures up to 3,000 psi (207 bar). These adjustable valves, while under pressure, allow infinite output flow adjustment within a specified flow range independent of inlet pressure variations. An internal check valve to bypass the control orifice provides unrestricted free reverse flow.

The compensating action of these valves results from an adjustable orifice at the inlet end and a series of variable orifices at the outlet end. Flow through the variable orifices is controlled by a spring and piston. These elements work together to regulate hydraulic flow within the determined rates. Flows are controlled within  $\pm 15\%$  up to 1.5 gpm (5.7 lpm) and  $\pm 10\%$  at higher flow up to 15.0 gpm (56.8 lpm). Valves will start to control flow at 60/70 psi (4.1/4.8 bar) pressure drop. Regulation is virtually unaffected by temperature changes from 60° F (16° C) to 180° F (82° C). At a temperature differential  $[\Delta T]$  of 70° F (21° C) flow variation would be approximately  $\pm 2\%$  max; while at temperature differential  $[\Delta T]$  of 120° F (49° C) the flow variation would be approximately  $\pm 4\%$  max.

Metal setting knob and stem provide added durability for positive operation of valve in harsh industrial environments. Color coded stem plus numerical read-out ensures accurate setting for precise pressure compensated flow control and repeatability.

- **Maintains accurate, constant flow at pressures up to 3,000 psi (207 bar)**
- **Metal setting knob and stem to adjust flow**
- **Positive position setting for precise flow control and easy repeatability**
- **Set Screw in knob to maintain flow setting**
- **Low pressure drop in free reverse**

**FLOW RATING**

| Size | Controlled Flow Range gpm (lpm) | Minimum Oper. Pressure $\Delta P$ ( $\Delta$ bar) |
|------|---------------------------------|---|
| 1/4" | 0.5 - 5.0<br>(1.9 - 18.9)       | 60<br>(4.1)                                       |
| 3/8" | 1.0 - 10.0<br>(3.8 - 37.9)      | 70<br>(4.8)                                       |
| 1/2" | 1.5 - 15.0<br>(5.7 - 56.8)      | 70<br>(4.8)                                       |
| 3/4" | 3.0 - 30.0<br>(11.4 - 113.6)    | 70<br>(4.8)                                       |

**SPECIFICATIONS**

**Maximum Operating Pressure**  
Carbon Steel: 3,000 psi (207 bar)

**Minimum Operating Pressure**  
(See Flow Rating Chart)

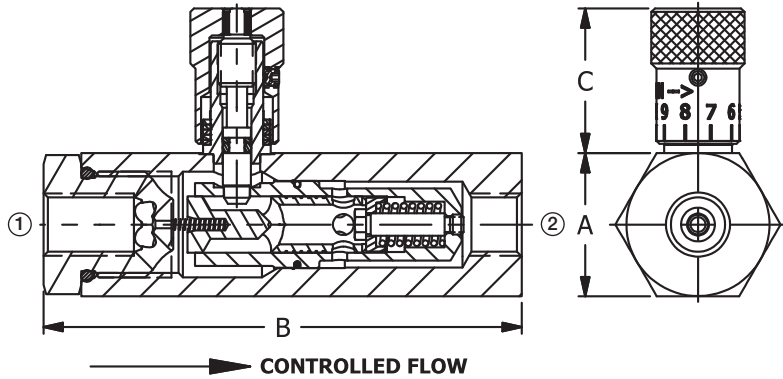
**Operating Temperature Range**  
-15° to +400° F (-26° to +204° C)

**Threads**  
NPTF, BSPT

**Materials**

Body: Steel  
Needle: Stainless Steel  
O-Ring: Vitron  
Washer: Teflon  
Knob: Aluminum  
Piston: Steel  
Spring: Music Wire

**INSTALLATION DIMENSIONS**



| Pipe Size | A HEX            | B                  | C Open            | C Closed          |
|-----------|------------------|--------------------|-------------------|-------------------|
| 1/4"      | 1-3/16<br>(30.2) | 3-31/32<br>(100.8) | 1-13/32<br>(35.7) | 1-7/32<br>(31.0)  |
| 3/8"      | 1-1/2<br>(38.1)  | 5-27/64<br>(137.8) | 1-31/32<br>(50.0) | 1-5/8<br>(41.3)   |
| 1/2"      | 1-5/8<br>(41.3)  | 5-7/8<br>(149.3)   | 1-31/32<br>(50.0) | 1-5/8<br>(41.3)   |
| 3/4"      | 1-7/8<br>(47.7)  | 6-9/16<br>(166.7)  | 2-3/16<br>(55.6)  | 1-13/16<br>(46.1) |

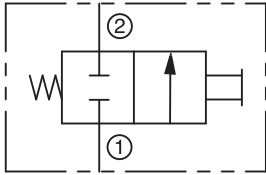
( ) Parentheses = Millimeters

**HOW TO ORDER**

| Size | NPTF Thread | ISO 7/1 - RP -<br>BSP Taper Thread |
|------|-------------|------------------------------------|
| 1/4" | EPC521      | EPCB521                            |
| 3/8" | EPC531      | EPCB531                            |
| 1/2" | EPC541      | EPCB541                            |
| 3/4" | EPC561      | EPCB561                            |

**POV32S Directional Valve**  
Female-to-Female

IN-LINE



**DESCRIPTION**

The Pneu-Trol plunger operated two-way valve controls hydraulic or pneumatic flow. This valve is normally closed and allows through flow when the plunger is manually depressed. The spring returned plunger blocks flow in the opposite direction.

- **Soft Seat for positive shut-off**
- **Panel or bracket mountable**

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Carbon Steel: 3,000 psi (207 bar)

**Operating Temperature Range**

-15° to +400° F (-26° to +204° C)

**Flow Rating**

Co-Efficient (Cv Factor) = 2.6

**Plunger Effort**

97 lbs. (431 N) per 1,000 psi (69 bar)

**Threads**

NPTF 1/2"

**Stroke**

1/2" (12.7)

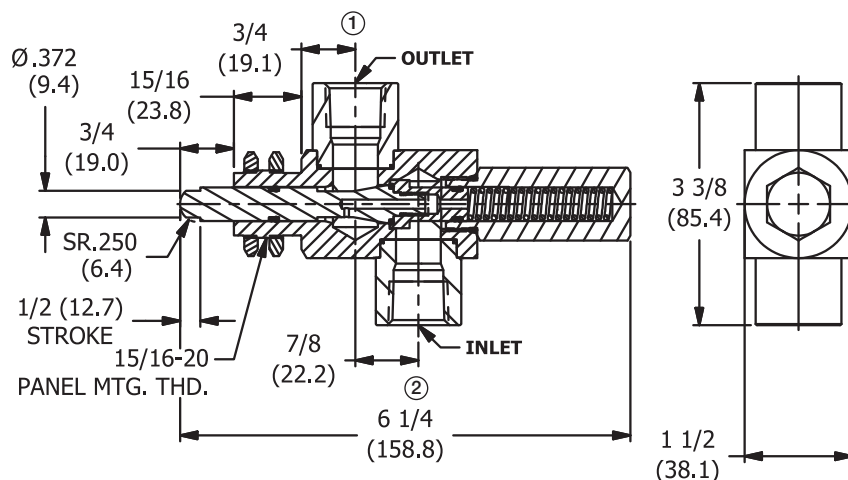
**Panel Mounting Hole Size**

31/32" (24.6)

**Materials**

- Body, Plug: Steel
- Spring: Music Wire
- Plunger: Stainless Steel 416 with Urethane O-Ring
- O-Rings: Viton
- Back-Up Washer: Teflon
- Panel Mount Nuts: Nickel Plated Brass

**INSTALLATION DIMENSIONS**



( ) Parentheses = Millimeters

**HOW TO ORDER**

| Size | NPTF Thread | Co-Efficient (Cv Factor) |
|------|-------------|--------------------------|
| 1/2" | POV32S      | 2.6                      |

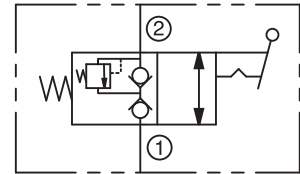
# TV20B Directional Valve Female-to-Female

IN-LINE

## DESCRIPTION

A toggle-operated two-way valve designed with positive shut off. The TV20B can be actuated by pushing or pulling the toggle and will over-center detent open.

- **Bubble-Tight operation**
- **Push or pull to operate – spring return**
- **Over-Center detent capable**
- **Panel or bracket mountable**
- **Handle hole for cable mount**



## SPECIFICATIONS

### Maximum Operating Pressure

Brass: 2,000 psi (138 bar)

### Reverse Cracking Pressure

370 psi (26 bar)

### Maximum Recommended Flow

5.0 gpm (18.9 lpm)

### Operating Temperature Range

-30° to +250° F (-34° to +120° C)

### Threads

NPTF 1/4"

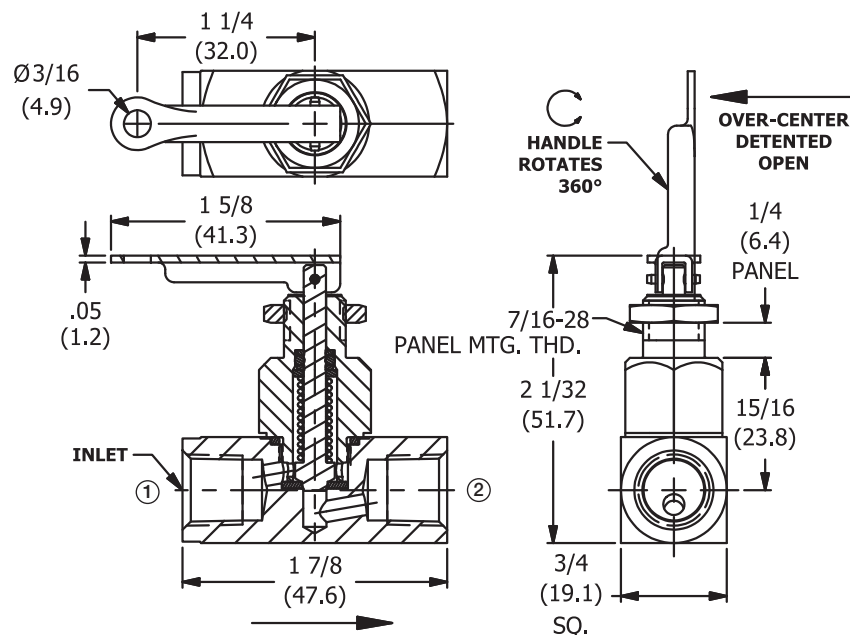
### Panel Mounting Hole

15/32" (11.9)

### Materials

Body, Housing: Brass  
 Seal Washer: Teflon  
 Seat: Teflon  
 Stem: Brass  
 Spring: Music Wire  
 Washers: Brass  
 O-Ring: Buna-N  
 Back-Up Washer: Teflon  
 Handle: Zinc Plated Steel  
 Roll Pin: Steel  
 Panel Mount Nut: Brass

## INSTALLATION DIMENSIONS

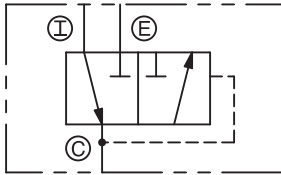


## HOW TO ORDER

| Size | NPTF Thread<br>Brass | Co-Efficient<br>(Cv Factor) |
|------|----------------------|-----------------------------|
| 1/4" | TV20B                | .20                         |

**EV Quick Exhaust**  
Female-to-Female

IN-LINE



**DESCRIPTION**

Deltrol's quick exhaust valves provide fast dumping of exhaust air at the cylinder, eliminating the need for large selector valves ordinarily required to accommodate exhaust air moving back through the pneumatic system. Substantial front end savings and better operating efficiency result from the use of smaller air system components. In addition, smoother, faster cylinder operation and wider application of air-powered motions are obtained.

The quick exhaust valve has been designed with smooth, over-size internal passages which afford unrestricted flow and prevent clogging due to contaminated air lines. The diaphragm is also an exclusive Deltrol design, assuring instantaneous and complete venting of exhaust air from cylinders, air presses and other air operated equipment.

- Instantaneous dumping of air allows use of smaller valves and piping
- Increases system efficiency and speeds
- Cost effective solution

**SPECIFICATIONS**

**Operating Pressure Range**  
20 to 125 psi (1.4 to 8.6 bar)

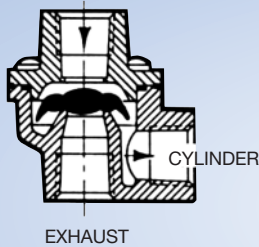
**Operating Temperature Range**  
Buna N (Standard):  
0° to +250° F (-18° to +120° C)  
Viton:  
0° to +400° F (-18° to +204° C)

**Flow Rating**  
Inlet Co-Efficient (Cv Factor) = .50 to 5.32  
Exhaust Co-Efficient (Cv Factor) = 1.0 to 7.84

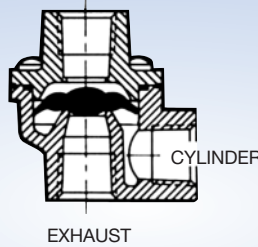
**Threads**  
NPTF

**Materials**  
Body, Bonnet:  
Die Cast Aluminum  
O-Ring: Buna-N, Viton  
Diaphragm: Buna-N, Viton  
Screws: Zinc Plated Steel

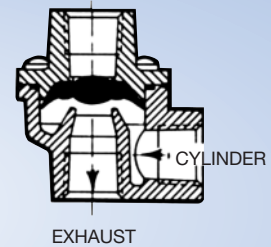
**EV20A2, EV25A2, EV30A2, EV35A2 PRINCIPLE OF OPERATION**



**Figure A**  
When air is introduced into the inlet port, the diaphragm is forced into the exhaust seat. The outer lip of the diaphragm is deflected downward, away from the wall, allowing air to flow into the cylinder with a minimum of restriction. The diaphragm will remain on the exhaust seat as long as the inlet pressure is equal to or greater than the cylinder pressure.



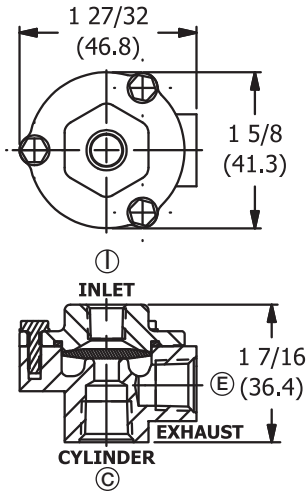
**Figure B**  
When the cylinder is fully charged and air is no longer flowing from the inlet to cylinder port, the outer lip of the diaphragm will assume its normal shape and will contact the outer wall. The diaphragm will remain on the exhaust seat.



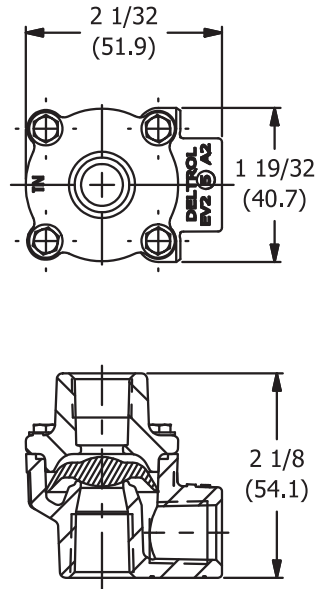
**Figure C**  
When pressure at the inlet port is vented to atmosphere (thru the control valve) the air in the cylinder, which is at a pressure level higher than atmosphere will force the diaphragm upwards to the inlet port. This will shut off the inlet port and allow air in the cylinder to flow directly to atmosphere.

**INSTALLATION DIMENSIONS**

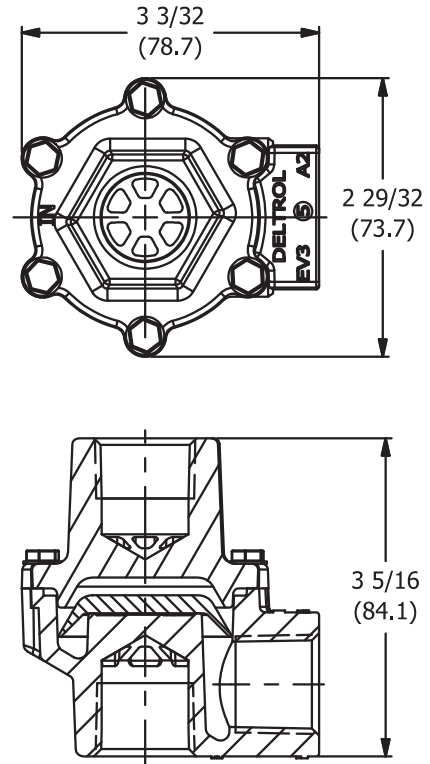
EV125-EV125-2



EV20-EV25



EV30-EV35



( ) Parentheses = Millimeters

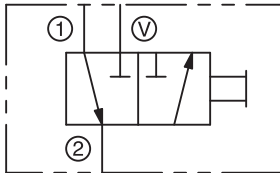
**HOW TO ORDER**

| Model Code | Seal   | Inlet Port NPTF | Inlet Co-Efficient (Cv factor) | Cylinder Port NPTF | Exhaust Port NPTF | Exhaust Co-Efficient (Cv factor) | Min $\Delta P$ ( $\Delta bar$ ) to Shift Diaphragm |
|------------|--------|-----------------|--------------------------------|--------------------|-------------------|----------------------------------|--|
| EV125A     | Buna N | 1/8"            | .50                            | 1/4"               | 1/4"              | 1.0                              | 5 (.3)   |
| EV125A2    |        | 1/4"            | .50                            | 1/4"               | 1/4"              | 1.0                              | 5 (.3)   |
| EV20A2     | Buna N | 1/4"            | 1.57                           | 1/4"               | 3/8"              | 2.33                             | 8 (.6)   |
| EV20A2V    | Viton  | 1/4"            | 1.57                           | 1/4"               | 3/8"              | 2.33                             | 8 (.6)   |
| EV25A2     | Buna N | 3/8"            | 2.50                           | 3/8"               | 3/8"              | 2.98                             | 8 (.6)   |
| EV25A2V    | Viton  | 3/8"            | 2.50                           | 3/8"               | 3/8"              | 2.98                             | 8 (.6)   |
| EV30A2     | Buna N | 1/2"            | 3.48                           | 1/2"               | 3/4"              | 5.45                             | 3 (.2)   |
| EV30A2V    | Viton  | 1/2"            | 3.48                           | 1/2"               | 3/4"              | 5.45                             | 3 (.2)   |
| EV35A2     | Buna N | 3/4"            | 5.32                           | 3/4"               | 3/4"              | 7.84                             | 3 (.2)   |
| EV35A2V    | Viton  | 3/4"            | 5.32                           | 3/4"               | 3/4"              | 7.84                             | 3 (.2)   |



**SL Slide Valve**  
Male-to-Female

IN-LINE



**DESCRIPTION**

The Pneu-Trol slide valve is a manually operated, two-position, three-way valve for pneumatic applications. Ideal for applications such as gauges, air tools, air clamps, and single acting cylinders.

- **Two-Position, Three-Way manually operated valve**
- **For pneumatic applications only up to 250 psi (17 bar)**
- **Brass Sleeves assures ease of control and positive action**

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Carbon Steel: 250 psi (17 bar)

**Operating Temperature Range (O-Ring)**

Buna N: -30° to +250° F (-34° to +120° C)

**Flow Rating**

Co-Efficient (Cv Factor) = .98 to 3.26

**Threads**

NPTF

**Materials**

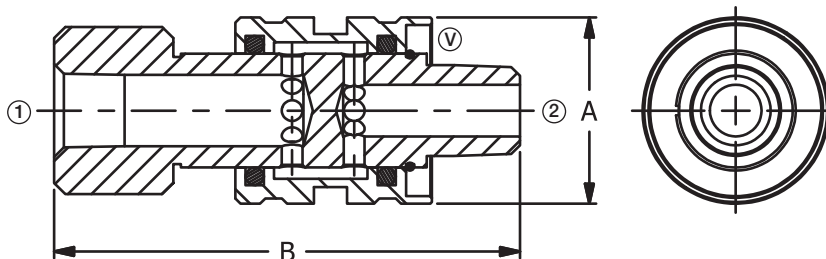
Body: Steel

Sleeve: Brass

O-Rings: Buna N

Retaining Ring: Steel

**INSTALLATION DIMENSIONS**



| Pipe Size | A Diameter   | B              |
|-----------|--------------|----------------|
| 1/8"      | 7/8 (22.2)   | 2-1/2 (63.5)   |
| 1/4"      | 1-1/8 (28.6) | 2-3/4 (69.9)   |
| 3/8"      | 1-1/8 (28.6) | 2-13/16 (71.5) |
| 1/2"      | 1-1/2 (38.1) | 3-3/4 (95.3)   |

( ) Parentheses = Millimeters

**HOW TO ORDER**

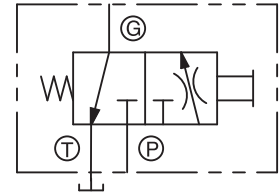
| Size | NPTF Thread | Co-Efficient (Cv Factor) |
|------|-------------|--------------------------|
| 1/8" | SL10        | .98                      |
| 1/4" | SL20        | 1.53                     |
| 3/8" | SL25        | 1.78                     |
| 1/2" | SL30        | 3.26                     |

## DESCRIPTION

The Pneu-Trol gauge isolator valve is designed to prevent surge damage to a gauge in all types of hydraulic circuits. The gauge isolator valve also acts as a snubber to prevent damage to other hydraulic components – hydraulic chatter, pulsation and fluid hammer can cause costly down time of equipment.

Simple to operate – just push to read. Depressing the knob allows fluid to flow around the spool to the gauge. When the spring-loaded knob is released the spool is automatically returned to the closed position, allowing the fluid to drain from the gauge out the tank port.

- For hydraulic applications only
- Push to operate – spring return
- Legible instructions knob – “Push To Read”
- Panel or bracket mountable



## SPECIFICATIONS

### Maximum Operating Pressure (Non-Shock Service)

Carbon Steel: 3,000 psi (207 bar)

### Operating Temperature Range

-30° to +250° F (-54° to +120° C)

### Internal Leakage Pressure Port To Tank Port

20 cc/min. max at 2,500 psi (172 bar)

### Threads

NPTF 1/4"

### Stroke

1/4" (6.4)

### Gauge Port Orifice

.020" (.51 mm) and .062" (1.57 mm)

### Panel Mounting Hole Size

31/32" (24.6)

### Materials

Body, Plugs, Retainers: Steel

Spool: Hardened Steel

Spring: Music Wire

O-Rings: Buna-N

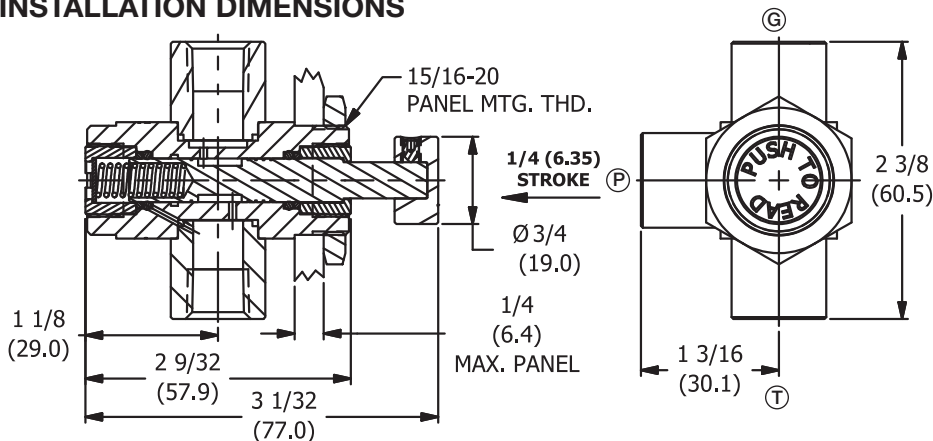
Back-Up Washers: Teflon

Set Screw: Steel

Knob: Blue Anodized Aluminum

Panel Mount Nut: Nickel Plated Brass

## INSTALLATION DIMENSIONS



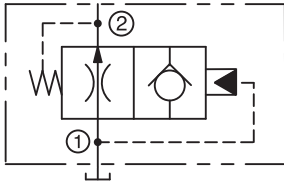
( ) Parentheses = Millimeters

## HOW TO ORDER

| Size | NPTF Thread | Orifice |
|------|-------------|---------|
|      | Steel       |         |
| 1/4" | GI21S       | .020"   |
|      | GI21S-C5    | .062"   |

**AB20S Air Bleed Valve**  
Female-to-Female

IN-LINE



**DESCRIPTION**

The Pneu-Trol air bleed valve is used to remove trapped air from a hydraulic system, allowing system pump to prime itself. The valve will pass air or a small amount of oil with pump pressure below 50 psi (3.4 bar). Trapped air in the system is bled off back to the reservoir until a solid stream of hydraulic fluid at +50 psi (3.4 bar) closes the valve. This is automatic during every system start-up. The valve should be installed at the high point of the hydraulic system using a tee connection.

- For hydraulic applications only
- Removes air trapped in hydraulic system

**SPECIFICATIONS**

**Maximum Operating Pressure (Non-Shock Service)**

Carbon Steel: 5,000 psi (345 bar)

**Minimum Seating Pressure**

50 psi (3.4 bar)

**Operating Temperature Range (O-Ring)**

Buna N: -30° to +400° F (-34° to +204° C)

**Threads**

NPTF 1/4"

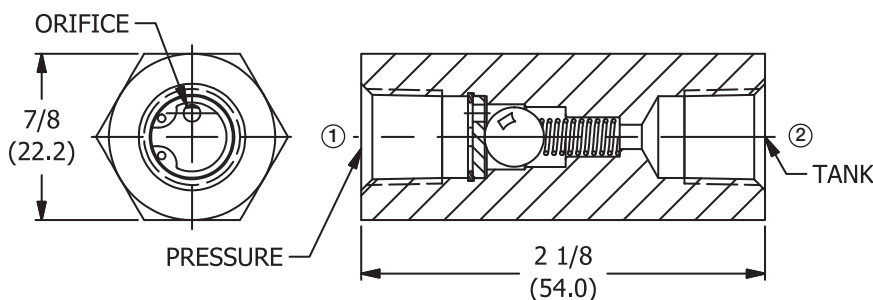
**Orifice Diameter**

.089 (2.3)

**Materials**

- Body: Steel
- Spring: Stainless Steel 302
- Ball: Stainless Steel 440
- Washer: Steel
- Retainer Ring: Steel

**INSTALLATION DIMENSIONS**



( ) Parentheses = Millimeters

**HOW TO ORDER**

| Size | NPTF Thread |
|------|-------------|
|      | Steel       |
| 1/4" | AB20S       |

**EN\*\* NEEDLE VALVE** See Page 2.10.1

**EF\*\* FLOW CONTROL** See Page 2.25.1

### FLOW RATING

#### PRESSURE DROP VS. NUMBER TURNS OPEN

(Controlled Flow)

Test Medium: 150 SSS Oil @ 140°F

#### FOR LIQUID

$$C_v \sqrt{(P_1 - P_2)}$$

Flow in GPM =

$$\sqrt{G_f}$$

#### FOR GAS

$$Q(\text{scfh}) = 42.2 C_v \sqrt{(P_1 - P_2)(P_1 + P_2)}$$

$$\sqrt{G_f}$$

When  $P_2$  is less than

$$\frac{P_1}{2}$$

the Expression

$$\sqrt{(P_1 - P_2)(P_1 + P_2)}$$

becomes  $0.87P_1$ .

$C_v$  = flow coefficient

$Q$  = std. cubic feet per hour at 14.7 PSIA and 60°F

$P_1$  = inlet pressure (PSIA)

$P_2$  = outlet pressure (PSIA)

$G_f$  = specific gravity of media at operating temperature (air = 1.0)

Pressures are absolute pressures.

**FLOW CONTROL  
CO-EFFICIENT  
( $C_v$  FACTOR)**  
(Fully Open-Controlled)

**NEEDLE  
CO-EFFICIENT  
( $C_v$  FACTOR)**  
(Fully Open-Controlled)

**CHECK FLOW  
CO-EFFICIENT  
( $C_v$  FACTOR)**  
(Return Flow)

|      |       |      |       |      |       |
|------|-------|------|-------|------|-------|
| 1/8" | .275  | 1/8" | .254  | 1/8" | .750  |
| 1/4" | .525  | 1/4" | .506  | 1/4" | 1.470 |
| 3/8" | .756  | 3/8" | .917  | 3/8" | 3.300 |
| 1/2" | .927  | 1/2" | 1.200 | 1/2" | 3.600 |
| 3/4" | 1.430 | 3/4" | 1.840 | 3/4" | 5.410 |
| 1"   | 8.000 | 1"   | 9.600 | 1"   | 9.600 |

#### How to Adjust

From the closed position, open the valve by turning metal knob counter-clockwise until the desired flow volume is obtained.

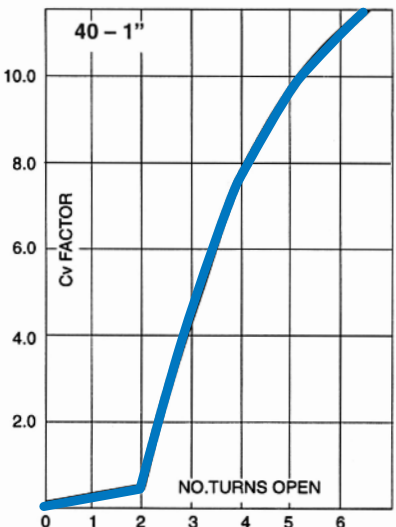
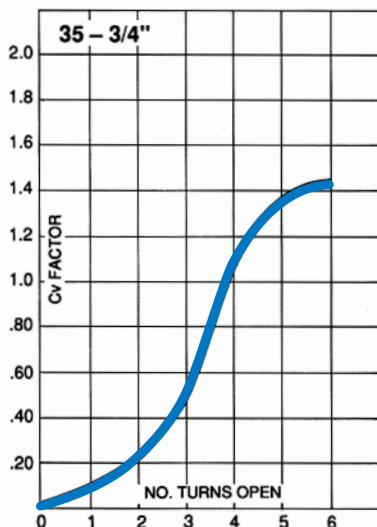
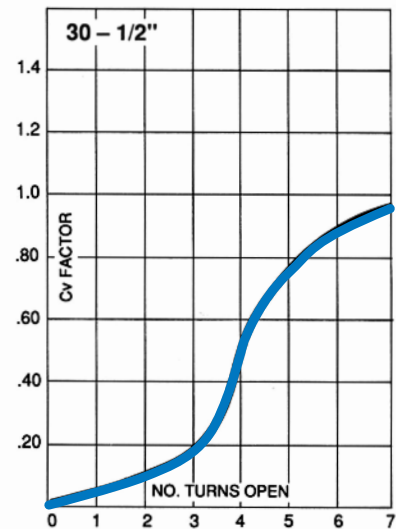
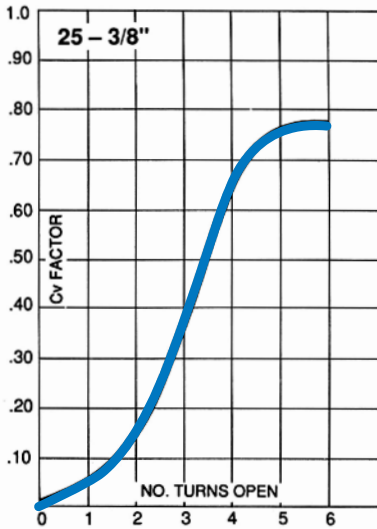
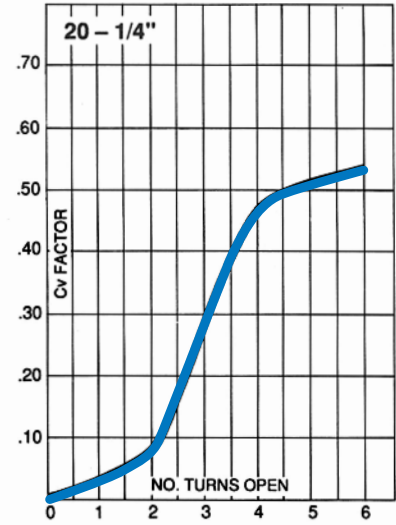
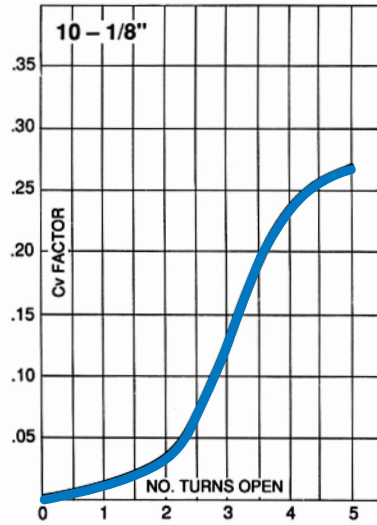
The colored band on the stem and the numerical readout indicate to what extent the valve is opened or closed. Each color on the color band represents one full turn.

Find the scribe mark on the upper surface of the valve body. The number on the knob in proximity to the scribe mark will indicate 10ths of a turn the valve is opened.

Record the information for future reference.

**Note:** Curves shown are graphical representations of Flow and Needle Valve meterability. Do not use as engineering data.

### FLOW CURVES



# Notes

MINIATURE

## LFC, LFV, AND LNB SERIES

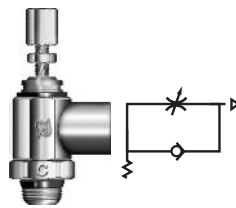
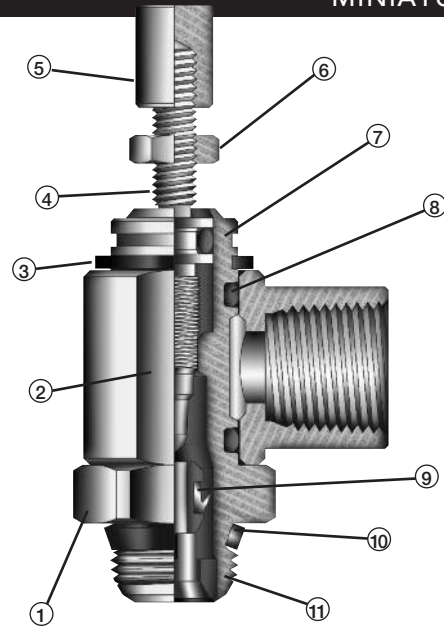
### Miniature Flow Controls and Needle Valves

The LFC and LFV Series Flow Controls are designed to allow controlled flow either into or out of the component.

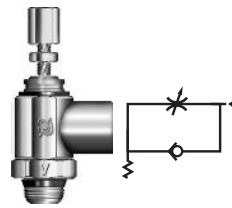
The LNB Series Needle Valve provides a wide range of adjustment in both directions.

**Pressure Range:** 15 – 145 PSI  
**Temperature Range:** 0° – 160°F  
**Media:** Air/Water  
**Sizes:** Inch and Metric

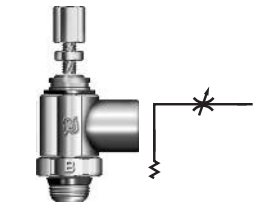
- |    |                  |                     |
|----|------------------|---------------------|
| 1  | Body             | Nickel Plated Brass |
| 2  | Banjo Body       | Nickel Plated Brass |
| 3  | Shaft Clip       | Stainless Steel     |
| 4  | Adjusting Needle | Nickel Plated Brass |
| 5  | Adjusting Knob   | Nickel Plated Brass |
| 6  | Locking Nut      | Nickel Plated Brass |
| 7  | O-Ring           | NBR-70              |
| 8  | O-Ring           | NBR-70              |
| 9  | Lip Seal         | NBR-70              |
| 10 | Thread Seal      | NBR-70              |
| 11 | Seal Support     | NBR-70              |



**Series LFC (C)**  
Controlled Flow Out



**Series LFV (V)**  
Controlled Flow In



**Series LNB (B)**  
Needle Valve-  
Bi-Directional Flow

## SWIFT-FIT

### Universal Thread System

The Swift-Fit Universal Thread System allows a wide range of application compatibility.

For example, the 1/8" Swift-Fit Thread is compatible with 1/8" NPT, 1/8" NPTF, 1/8" BSPT, 1/8" BSPP, RC 1/8", and G 1/8" Threads.

The fittings are designed with a lip type seal for exceptional sealing in both pressure and vacuum applications. The thread system will also allow sealing on inclined, concave, and convex surfaces.



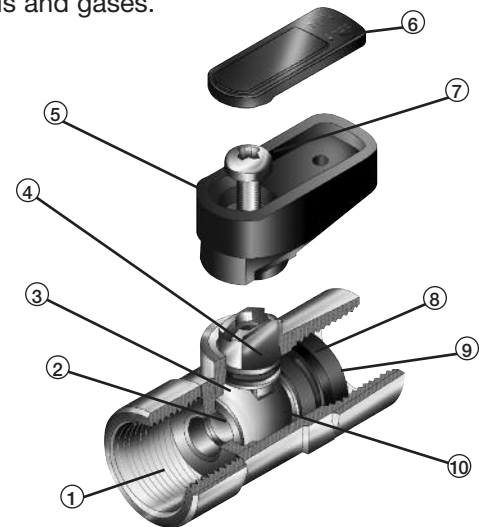
## MBV SERIES

### Miniature Ball Valves

The Mini Ball Valve body is made of chrome plated brass for corrosion resistance and long life. The valve is designed with a captured stem for blow out proof operation and a teflon seal to accommodate a variety of fluids and gases.

**Pressure Range:** 0 – 250 PSI  
**Pipe Sizes:** 1/8", 1/4", 3/8", 1/2" NPTF  
**Temperature Range:** 0° – 160°F  
**Media:** Air, Water, Gas

- |    |                    |                     |
|----|--------------------|---------------------|
| 1  | Body               | Chrome Plated Brass |
| 2  | Ball Seats         | Teflon              |
| 3  | Stem Seal          | NBR-70              |
| 4  | Stem               | Chrome Plated Brass |
| 5  | Handle             | Glass Filled Nylon  |
| 6  | Handle Plate       | Nylon               |
| 7  | Handle Screw       | Plated Steel        |
| 8  | Ball Retainer Seal | NBR-70              |
| 9  | Ball Retainer      | Chrome Plated Brass |
| 10 | Ball               | Chrome Plated Brass |



# Miniature Series

## Flow Controls & Needle Valves

### LFC, LFM & LNB Series

#### MINIATURE

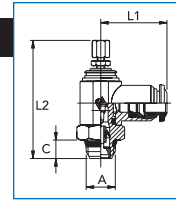
### LFC, LFM, AND LNB SERIES

#### Tube Interface Knob Adjustment

Inch • Metric Tube Valve With Knob Adjustment



Blue Collar Identifies Inch Tube Size  
Black Collar Identifies Metric Tube Size

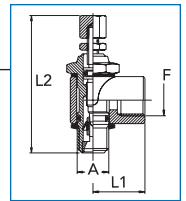


| Model Code | Func | A          | Tube OD | C    | L1   | L2 min | L2 max | Model Code | unc | A          | Tube OD | C    | L1   | L2 min | L2 max |
|------------|------|------------|---------|------|------|--------|--------|------------|-----|------------|---------|------|------|--------|--------|
| LFCU32TAK  | C    | 10-32UNC   | 1/8"    | 0.22 | 0.75 | 1.30   | 1.47   | LFVS20TKK  | V   | 1/4" SWIFT | 6mm     | 0.27 | 0.98 | 1.85   | 2.08   |
| LFVU32TAK  | V    | 10-32UNC   | 1/8"    | 0.22 | 0.75 | 1.30   | 1.47   | LNBS20TKK  | B   | 1/4" SWIFT | 6mm     | 0.27 | 0.98 | 1.85   | 2.08   |
| LNBU32TAK  | B    | 10-32UNC   | 1/8"    | 0.22 | 0.75 | 1.30   | 1.47   | LFCS20TLK  | C   | 1/4" SWIFT | 8mm     | 0.27 | 1.02 | 1.85   | 2.08   |
| LFCU32TBK  | C    | 10-32UNC   | 5/32"   | 0.22 | 0.75 | 1.30   | 1.47   | LFVS20TLK  | V   | 1/4" SWIFT | 8mm     | 0.27 | 1.02 | 1.85   | 2.08   |
| LFVU32TBK  | V    | 10-32UNC   | 5/32"   | 0.22 | 0.75 | 1.30   | 1.47   | LNBS20TLK  | B   | 1/4" SWIFT | 8mm     | 0.27 | 1.02 | 1.85   | 2.08   |
| LNBU32TBK  | B    | 10-32UNC   | 5/32"   | 0.22 | 0.75 | 1.30   | 1.47   | LFCS25TEK  | C   | 3/8" SWIFT | 3/8"    | 0.29 | 1.18 | 2.21   | 2.48   |
| LFCM05TGK  | C    | M5         | 3mm     | 0.16 | 0.75 | 1.30   | 1.47   | LFVS25TEK  | V   | 3/8" SWIFT | 3/8"    | 0.29 | 1.18 | 2.21   | 2.48   |
| LFVM05TGK  | V    | M5         | 3mm     | 0.16 | 0.75 | 1.30   | 1.47   | LNBS25TEK  | B   | 3/8" SWIFT | 3/8"    | 0.29 | 1.18 | 2.21   | 2.48   |
| LNBM05TGK  | B    | M5         | 3mm     | 0.16 | 0.75 | 1.30   | 1.47   | LFCS25TFK  | C   | 3/8" SWIFT | 1/2"    | 0.29 | 1.28 | 2.21   | 2.48   |
| LFCM05THK  | C    | M5         | 4mm     | 0.16 | 0.75 | 1.30   | 1.47   | LFVS25TFK  | V   | 3/8" SWIFT | 1/2"    | 0.29 | 1.28 | 2.21   | 2.48   |
| LFVM05THK  | V    | M5         | 4mm     | 0.16 | 0.75 | 1.30   | 1.47   | LNBS25TFK  | B   | 3/8" SWIFT | 1/2"    | 0.29 | 1.28 | 2.21   | 2.48   |
| LNBM05THK  | B    | M5         | 4mm     | 0.16 | 0.75 | 1.30   | 1.47   | LFCS25TMK  | C   | 3/8" SWIFT | 10mm    | 0.29 | 1.18 | 2.21   | 2.48   |
| LFCM05TJK  | C    | M5         | 5mm     | 0.16 | 0.79 | 1.30   | 1.47   | LFVS25TMK  | V   | 3/8" SWIFT | 10mm    | 0.29 | 1.18 | 2.21   | 2.48   |
| LFVM05TJK  | V    | M5         | 5mm     | 0.16 | 0.79 | 1.30   | 1.47   | LNBS25TMK  | B   | 3/8" SWIFT | 10mm    | 0.29 | 1.18 | 2.21   | 2.48   |
| LNBM05TJK  | B    | M5         | 5mm     | 0.16 | 0.79 | 1.30   | 1.47   | LFCS25TNK  | C   | 3/8" SWIFT | 12mm    | 0.29 | 1.28 | 2.21   | 2.48   |
| LFCM05TKK  | C    | M5         | 6mm     | 0.16 | 0.81 | 1.30   | 1.47   | LFVS25TNK  | V   | 3/8" SWIFT | 12mm    | 0.29 | 1.28 | 2.21   | 2.48   |
| LFVM05TKK  | V    | M5         | 6mm     | 0.16 | 0.81 | 1.30   | 1.47   | LNBS25TNK  | B   | 3/8" SWIFT | 12mm    | 0.29 | 1.28 | 2.21   | 2.48   |
| LNBM05TKK  | B    | M5         | 6mm     | 0.16 | 0.81 | 1.30   | 1.47   | LFCS30TFK  | C   | 1/2" SWIFT | 1/2"    | 0.35 | 1.38 | 2.40   | 2.71   |
| LFCS10TAK  | C    | 1/8" SWIFT | 1/8"    | 0.22 | 0.83 | 1.61   | 1.83   | LFVS30TFK  | V   | 1/2" SWIFT | 1/2"    | 0.35 | 1.38 | 2.40   | 2.71   |
| LFVS10TAK  | V    | 1/8" SWIFT | 1/8"    | 0.22 | 0.83 | 1.61   | 1.83   | LNBS30TFK  | B   | 1/2" SWIFT | 1/2"    | 0.35 | 1.38 | 2.40   | 2.71   |
| LNBS10TAK  | B    | 1/8" SWIFT | 1/8"    | 0.22 | 0.83 | 1.61   | 1.83   | LFCS30TNK  | C   | 1/2" SWIFT | 12mm    | 0.35 | 1.38 | 2.40   | 2.71   |
| LFCS10TBK  | C    | 1/8" SWIFT | 5/32"   | 0.22 | 0.83 | 1.61   | 1.83   | LFVS30TNK  | V   | 1/2" SWIFT | 12mm    | 0.35 | 1.38 | 2.40   | 2.71   |
| LFVS10TBK  | V    | 1/8" SWIFT | 5/32"   | 0.22 | 0.83 | 1.61   | 1.83   | LNBS30TNK  | B   | 1/2" SWIFT | 12mm    | 0.35 | 1.38 | 2.40   | 2.71   |
| LNBS10TBK  | B    | 1/8" SWIFT | 5/32"   | 0.22 | 0.83 | 1.61   | 1.83   | LFCS30TPK  | C   | 1/2" SWIFT | 14mm    | 0.35 | 1.39 | 2.40   | 2.71   |
| LFCS10TCK  | C    | 1/8" SWIFT | 1/4"    | 0.22 | 0.86 | 1.61   | 1.83   | LFVS30TPK  | V   | 1/2" SWIFT | 14mm    | 0.35 | 1.39 | 2.40   | 2.71   |
| LFVS10TCK  | V    | 1/8" SWIFT | 1/4"    | 0.22 | 0.86 | 1.61   | 1.83   | LNBS30TPK  | B   | 1/2" SWIFT | 14mm    | 0.35 | 1.39 | 2.40   | 2.71   |
| LNBS10TCK  | B    | 1/8" SWIFT | 1/4"    | 0.22 | 0.86 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LFCS10THK  | C    | 1/8" SWIFT | 4mm     | 0.22 | 0.83 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LFVS10THK  | V    | 1/8" SWIFT | 4mm     | 0.22 | 0.83 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LNBS10THK  | B    | 1/8" SWIFT | 4mm     | 0.22 | 0.83 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LFCS10TJK  | C    | 1/8" SWIFT | 5mm     | 0.22 | 0.85 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LFVS10TJK  | V    | 1/8" SWIFT | 5mm     | 0.22 | 0.85 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LNBS10TJK  | B    | 1/8" SWIFT | 5mm     | 0.22 | 0.85 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LFCS10TKK  | C    | 1/8" SWIFT | 6mm     | 0.22 | 0.89 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LFVS10TKK  | V    | 1/8" SWIFT | 6mm     | 0.22 | 0.89 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LNBS10TKK  | B    | 1/8" SWIFT | 6mm     | 0.22 | 0.89 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LFCS10TLK  | C    | 1/8" SWIFT | 8mm     | 0.22 | 0.94 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LFVS10TLK  | V    | 1/8" SWIFT | 8mm     | 0.22 | 0.94 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LNBS10TLK  | B    | 1/8" SWIFT | 8mm     | 0.22 | 0.94 | 1.61   | 1.83   |            |     |            |         |      |      |        |        |
| LFCS20TCK  | C    | 1/4" SWIFT | 1/4"    | 0.27 | 0.98 | 1.85   | 2.08   |            |     |            |         |      |      |        |        |
| LFVS20TCK  | V    | 1/4" SWIFT | 1/4"    | 0.27 | 0.98 | 1.85   | 2.08   |            |     |            |         |      |      |        |        |
| LNBS20TCK  | B    | 1/4" SWIFT | 1/4"    | 0.27 | 0.98 | 1.85   | 2.08   |            |     |            |         |      |      |        |        |
| LFCS20TEK  | C    | 1/4" SWIFT | 3/8"    | 0.29 | 1.18 | 2.21   | 2.48   |            |     |            |         |      |      |        |        |
| LFVS20TEK  | V    | 1/4" SWIFT | 3/8"    | 0.29 | 1.18 | 2.21   | 2.48   |            |     |            |         |      |      |        |        |
| LNBS20TEK  | B    | 1/4" SWIFT | 3/8"    | 0.29 | 1.18 | 2.21   | 2.48   |            |     |            |         |      |      |        |        |
| LFCS20TJK  | C    | 1/4" SWIFT | 5mm     | 0.27 | 0.98 | 1.85   | 2.08   |            |     |            |         |      |      |        |        |
| LFVS20TJK  | V    | 1/4" SWIFT | 5mm     | 0.27 | 0.98 | 1.85   | 2.08   |            |     |            |         |      |      |        |        |
| LNBS20TJK  | B    | 1/4" SWIFT | 5mm     | 0.27 | 0.98 | 1.85   | 2.08   |            |     |            |         |      |      |        |        |
| LFCS20TKK  | C    | 1/4" SWIFT | 6mm     | 0.27 | 0.98 | 1.85   | 2.08   |            |     |            |         |      |      |        |        |

Code C - Controlled Flow Out  
Code V - Controlled Flow In  
Code B - Controlled Flow Both Directions

### LFC, LFM, LNB SERIES

#### Female NPTF Interface Knob Adjustment



| Model Code | Func | A          | Rt Angle Thread F | L1   | L2 min | L2 max |
|------------|------|------------|-------------------|------|--------|--------|
| LFCU32NDK  | C    | 10-32UNC   | 10-32UNC          | 0.39 | 1.30   | 1.47   |
| LFVU32NDK  | V    | 10-32UNC   | 10-32UNC          | 0.39 | 1.30   | 1.47   |
| LNBU32NDK  | B    | 10-32UNC   | 10-32UNC          | 0.39 | 1.30   | 1.47   |
| LFCS10NAK  | C    | 1/8" SWIFT | 1/8" NPTF         | 0.65 | 1.61   | 1.83   |
| LFVS10NAK  | V    | 1/8" SWIFT | 1/8" NPTF         | 0.65 | 1.61   | 1.83   |
| LNBS10NAK  | B    | 1/8" SWIFT | 1/8" NPTF         | 0.65 | 1.61   | 1.83   |
| LFCS20NBK  | C    | 1/4" SWIFT | 1/4" NPTF         | 0.86 | 1.85   | 2.09   |
| LFVS20NBK  | V    | 1/4" SWIFT | 1/4" NPTF         | 0.86 | 1.85   | 2.09   |
| LNBS20NBK  | B    | 1/4" SWIFT | 1/4" NPTF         | 0.86 | 1.85   | 2.09   |
| LFCS25NCK  | C    | 3/8" SWIFT | 3/8" NPTF         | 1.04 | 2.21   | 2.48   |
| LFVS25NCK  | V    | 3/8" SWIFT | 3/8" NPTF         | 1.04 | 2.21   | 2.48   |
| LNBS25NCK  | B    | 3/8" SWIFT | 3/8" NPTF         | 1.04 | 2.21   | 2.48   |

Dimensions shown are in inches and are for reference only.

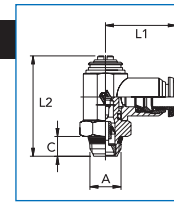
Miniature Series

**LFC, LFV, AND LNB SERIES**  
Tube Interface Screw Adjustment

Inch • Metric Tube Valve With Knob Adjustment



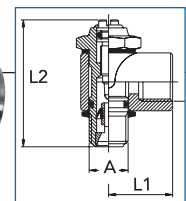
Blue Collar Identifies Inch Tube Size  
Black Collar Identifies Metric Tube Size



| Model Code | Func | A          | Tube OD | C    | L1   | L2   | Model Code | Func | A          | Tube OD | C    | L1   | L2   |
|------------|------|------------|---------|------|------|------|------------|------|------------|---------|------|------|------|
| LFCU32TAS  | C    | 10-32UNC   | 1/8"    | 0.16 | 0.75 | 0.95 | LFVS20TKS  | V    | 1/4" SWIFT | 6mm     | 0.28 | 0.98 | 1.40 |
| LFVU32TAS  | V    | 10-32UNC   | 1/8"    | 0.16 | 0.75 | 0.95 | LNBS20TKS  | B    | 1/4" SWIFT | 6mm     | 0.28 | 0.98 | 1.40 |
| LNBU32TAS  | B    | 10-32UNC   | 1/8"    | 0.16 | 0.75 | 0.95 | LFCS20TLS  | C    | 1/4" SWIFT | 8mm     | 0.28 | 1.02 | 1.40 |
| LFCU32TBS  | C    | 10-32UNC   | 5/32"   | 0.16 | 0.75 | 0.95 | LFVS20TLS  | V    | 1/4" SWIFT | 8mm     | 0.28 | 1.02 | 1.40 |
| LFVU32TBS  | V    | 10-32UNC   | 5/32"   | 0.16 | 0.75 | 0.95 | LNBS20TLS  | B    | 1/4" SWIFT | 8mm     | 0.28 | 1.02 | 1.40 |
| LNBU32TBS  | B    | 10-32UNC   | 5/32"   | 0.16 | 0.75 | 0.95 | LFCS25TES  | C    | 3/8" SWIFT | 3/8"    | 0.29 | 1.18 | 1.61 |
| LFCM05TGS  | C    | M5         | 3mm     | 0.16 | 0.75 | 0.95 | LFVS25TES  | V    | 3/8" SWIFT | 3/8"    | 0.29 | 1.18 | 1.61 |
| LFVM05TGS  | V    | M5         | 3mm     | 0.16 | 0.75 | 0.95 | LNBS25TES  | B    | 3/8" SWIFT | 3/8"    | 0.29 | 1.18 | 1.61 |
| LNBM05TGS  | B    | M5         | 3mm     | 0.16 | 0.75 | 0.95 | LFCS25TFS  | C    | 3/8" SWIFT | 1/2"    | 0.29 | 1.28 | 1.61 |
| LFCM05THS  | C    | M5         | 4mm     | 0.16 | 0.75 | 0.95 | LFVS25TFS  | V    | 3/8" SWIFT | 1/2"    | 0.29 | 1.28 | 1.61 |
| LFVM05THS  | V    | M5         | 4mm     | 0.16 | 0.75 | 0.95 | LNBS25TFS  | B    | 3/8" SWIFT | 1/2"    | 0.29 | 1.28 | 1.61 |
| LNBM05THS  | B    | M5         | 4mm     | 0.16 | 0.75 | 0.95 | LFCS25TMS  | C    | 3/8" SWIFT | 10mm    | 0.29 | 1.20 | 1.61 |
| LFCM05TJS  | C    | M5         | 5mm     | 0.16 | 0.79 | 0.95 | LFVS25TMS  | V    | 3/8" SWIFT | 10mm    | 0.29 | 1.20 | 1.61 |
| LFVM05TJS  | V    | M5         | 5mm     | 0.16 | 0.79 | 0.95 | LNBS25TMS  | B    | 3/8" SWIFT | 10mm    | 0.29 | 1.20 | 1.61 |
| LNBM05TJS  | B    | M5         | 5mm     | 0.16 | 0.79 | 0.95 | LFCS25TNS  | C    | 3/8" SWIFT | 12mm    | 0.29 | 1.28 | 1.61 |
| LFCM05TKS  | C    | M5         | 6mm     | 0.16 | 0.81 | 0.95 | LFVS25TNS  | V    | 3/8" SWIFT | 12mm    | 0.29 | 1.28 | 1.61 |
| LFVM05TKS  | V    | M5         | 6mm     | 0.16 | 0.81 | 0.95 | LNBS25TNS  | B    | 3/8" SWIFT | 12mm    | 0.29 | 1.28 | 1.61 |
| LNBM05TKS  | B    | M5         | 6mm     | 0.16 | 0.81 | 0.95 | LFCS30TFS  | C    | 1/2" SWIFT | 1/2"    | 0.35 | 1.38 | 1.85 |
| LFCS10TAS  | C    | 1/8" SWIFT | 1/8"    | 0.22 | 0.83 | 1.18 | LFVS30TFS  | V    | 1/2" SWIFT | 1/2"    | 0.35 | 1.38 | 1.85 |
| LFVS10TAS  | V    | 1/8" SWIFT | 1/8"    | 0.22 | 0.83 | 1.18 | LNBS30TFS  | B    | 1/2" SWIFT | 1/2"    | 0.35 | 1.38 | 1.85 |
| LNBS10TAS  | B    | 1/8" SWIFT | 1/8"    | 0.22 | 0.83 | 1.18 | LFCS30TNS  | C    | 1/2" SWIFT | 12mm    | 0.35 | 1.38 | 1.85 |
| LFCS10TBS  | C    | 1/8" SWIFT | 5/32"   | 0.22 | 0.83 | 1.18 | LFVS30TNS  | V    | 1/2" SWIFT | 12mm    | 0.35 | 1.38 | 1.85 |
| LFVS10TBS  | V    | 1/8" SWIFT | 5/32"   | 0.22 | 0.83 | 1.18 | LNBS30TNS  | B    | 1/2" SWIFT | 12mm    | 0.35 | 1.38 | 1.85 |
| LNBS10TBS  | B    | 1/8" SWIFT | 5/32"   | 0.22 | 0.83 | 1.18 | LFCS30TPS  | C    | 1/2" SWIFT | 14mm    | 0.35 | 1.40 | 1.85 |
| LFCS10TCS  | C    | 1/8" SWIFT | 1/4"    | 0.22 | 0.87 | 1.18 | LFVS30TPS  | V    | 1/2" SWIFT | 14mm    | 0.35 | 1.40 | 1.85 |
| LFVS10TCS  | V    | 1/8" SWIFT | 1/4"    | 0.22 | 0.87 | 1.18 | LNBS30TPS  | B    | 1/2" SWIFT | 14mm    | 0.35 | 1.40 | 1.85 |
| LNBS10TCS  | B    | 1/8" SWIFT | 1/4"    | 0.22 | 0.87 | 1.18 |            |      |            |         |      |      |      |
| LFCS10THS  | C    | 1/8" SWIFT | 4mm     | 0.22 | 0.83 | 1.18 |            |      |            |         |      |      |      |
| LFVS10THS  | V    | 1/8" SWIFT | 4mm     | 0.22 | 0.83 | 1.18 |            |      |            |         |      |      |      |
| LNBS10THS  | B    | 1/8" SWIFT | 4mm     | 0.22 | 0.83 | 1.18 |            |      |            |         |      |      |      |
| LFCS10TJS  | C    | 1/8" SWIFT | 5mm     | 0.22 | 0.85 | 1.18 |            |      |            |         |      |      |      |
| LFVS10TJS  | V    | 1/8" SWIFT | 5mm     | 0.22 | 0.85 | 1.18 |            |      |            |         |      |      |      |
| LNBS10TJS  | B    | 1/8" SWIFT | 5mm     | 0.22 | 0.85 | 1.18 |            |      |            |         |      |      |      |
| LFCS10TKS  | C    | 1/8" SWIFT | 6mm     | 0.22 | 0.89 | 1.18 |            |      |            |         |      |      |      |
| LFVS10TKS  | V    | 1/8" SWIFT | 6mm     | 0.22 | 0.89 | 1.18 |            |      |            |         |      |      |      |
| LNBS10TKS  | B    | 1/8" SWIFT | 6mm     | 0.22 | 0.89 | 1.18 |            |      |            |         |      |      |      |
| LFCS10TLS  | C    | 1/8" SWIFT | 8mm     | 0.22 | 0.94 | 1.18 |            |      |            |         |      |      |      |
| LFVS10TLS  | V    | 1/8" SWIFT | 8mm     | 0.22 | 0.94 | 1.18 |            |      |            |         |      |      |      |
| LNBS10TLS  | B    | 1/8" SWIFT | 8mm     | 0.22 | 0.94 | 1.18 |            |      |            |         |      |      |      |
| LFCS20TCS  | C    | 1/4" SWIFT | 1/4"    | 0.28 | 0.98 | 1.42 |            |      |            |         |      |      |      |
| LFVS20TCS  | V    | 1/4" SWIFT | 1/4"    | 0.28 | 0.98 | 1.42 |            |      |            |         |      |      |      |
| LNBS20TCS  | B    | 1/4" SWIFT | 1/4"    | 0.28 | 0.98 | 1.42 |            |      |            |         |      |      |      |
| LFCS20TES  | C    | 1/4" SWIFT | 3/8"    | 0.29 | 1.18 | 1.61 |            |      |            |         |      |      |      |
| LFVS20TES  | V    | 1/4" SWIFT | 3/8"    | 0.29 | 1.18 | 1.61 |            |      |            |         |      |      |      |
| LNBS20TES  | B    | 1/4" SWIFT | 3/8"    | 0.29 | 1.18 | 1.61 |            |      |            |         |      |      |      |
| LFCS20TJS  | C    | 1/4" SWIFT | 5mm     | 0.28 | 0.96 | 1.40 |            |      |            |         |      |      |      |
| LFVS20TJS  | V    | 1/4" SWIFT | 5mm     | 0.28 | 0.96 | 1.40 |            |      |            |         |      |      |      |
| LNBS20TJS  | B    | 1/4" SWIFT | 5mm     | 0.28 | 0.96 | 1.40 |            |      |            |         |      |      |      |
| LFCS20TKS  | C    | 1/4" SWIFT | 6mm     | 0.28 | 0.98 | 1.40 |            |      |            |         |      |      |      |

Code C - Controlled Flow Out  
Code V - Controlled Flow In  
Code B - Controlled Flow Both Directions

**LFC, LFV, LNB SERIES**  
Female NPTF Interface  
Screw Adjustment



| Model Code | Func | A          | Rt Angle Thread F | L1   | L2   |
|------------|------|------------|-------------------|------|------|
| LFCU32NDS  | C    | 10-32UNC   | 10-32UNC          | 0.39 | 0.95 |
| LFVU32NDS  | V    | 10-32UNC   | 10-32UNC          | 0.39 | 0.95 |
| LNBU32NDS  | B    | 10-32UNC   | 10-32UNC          | 0.39 | 0.95 |
| LFCS10NAS  | C    | 1/8" SWIFT | 1/8" NPTF         | 0.65 | 1.18 |
| LFVS10NAS  | V    | 1/8" SWIFT | 1/8" NPTF         | 0.65 | 1.18 |
| LNBS10NAS  | B    | 1/8" SWIFT | 1/8" NPTF         | 0.65 | 1.18 |
| LFCS20NBS  | C    | 1/4" SWIFT | 1/4" NPTF         | 0.86 | 1.42 |
| LFVS20NBS  | V    | 1/4" SWIFT | 1/4" NPTF         | 0.86 | 1.42 |
| LNBS20NBS  | B    | 1/4" SWIFT | 1/4" NPTF         | 0.86 | 1.42 |
| LFCS25NCS  | C    | 3/8" SWIFT | 3/8" NPTF         | 1.04 | 1.61 |
| LFVS25NCS  | V    | 3/8" SWIFT | 3/8" NPTF         | 1.04 | 1.61 |
| LNBS25NCS  | B    | 3/8" SWIFT | 3/8" NPTF         | 1.04 | 1.61 |



# Miniature Series

Ball Valves

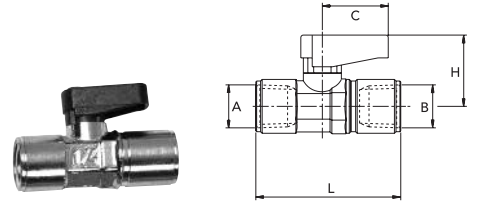
MBV Series

## MINIATURE

### MBV SERIES

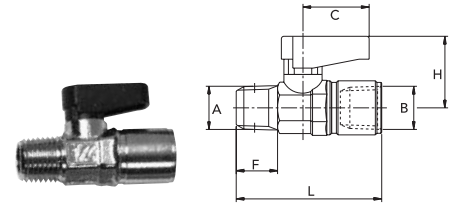
#### Miniature Ball Valve Female NPTF

| Model Code | A NPTF | B NPTF | Orifice | L    | C    | H    |
|------------|--------|--------|---------|------|------|------|
| MBVFF1010  | 1/8"   | 1/8"   | 0.22    | 1.48 | 0.75 | 0.83 |
| MBVFF2020  | 1/4"   | 1/4"   | 0.22    | 1.81 | 0.75 | 0.83 |
| MBVFF2525  | 3/8"   | 3/8"   | 0.32    | 1.91 | 0.75 | 0.87 |
| MBVFF3030  | 1/2"   | 1/2"   | 0.39    | 2.44 | 1.02 | 1.20 |



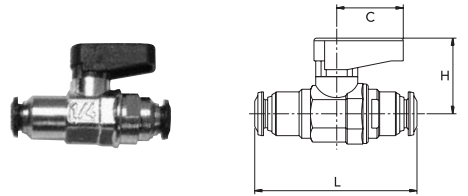
#### Miniature Ball Valve Male NPTF, Female NPTF

| Model Code | A NPTF | B NPTF | Orifice | F    | L    | C    | H    |
|------------|--------|--------|---------|------|------|------|------|
| MBVMF1010  | 1/8"   | 1/8"   | 0.22    | 0.55 | 1.45 | 0.75 | 0.83 |
| MBVMF2020  | 1/4"   | 1/4"   | 0.22    | 0.55 | 1.81 | 0.75 | 0.83 |
| MBVMF2525  | 3/8"   | 3/8"   | 0.32    | 0.71 | 1.87 | 0.75 | 0.87 |
| MBVMF3030  | 1/2"   | 1/2"   | 0.39    | 0.87 | 2.37 | 1.02 | 1.20 |



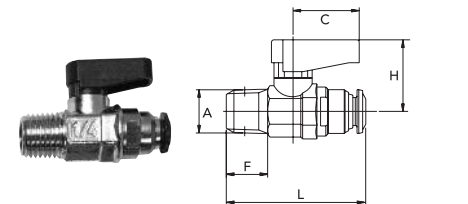
#### Miniature Ball Valve Tube, Tube

| Model Code | Tube OD | Tube OD | L    | C    | H    |
|------------|---------|---------|------|------|------|
| MBVT2TATA  | 1/8"    | 1/8"    | 1.67 | 0.75 | 0.83 |
| MBVT2TCTC  | 1/4"    | 1/4"    | 1.83 | 0.75 | 0.83 |
| MBVT2TETE  | 3/8"    | 3/8"    | 2.38 | 0.75 | 0.87 |



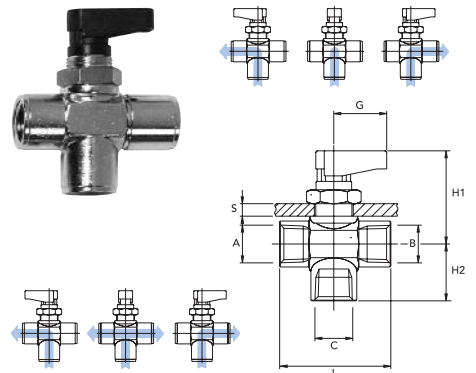
#### Miniature Ball Valve Tube, Male NPTF

| Model Code | A NPTF | Tube OD | F    | L    | C    | H    |
|------------|--------|---------|------|------|------|------|
| MBVMT10TB  | 1/8"   | 5/32"   | 0.33 | 1.37 | 0.74 | 0.82 |
| MBVMT10TC  | 1/8"   | 1/4"    | 0.33 | 1.37 | 0.74 | 0.82 |
| MBVMT20TC  | 1/4"   | 1/4"    | 0.48 | 1.50 | 0.74 | 0.82 |
| MBVMT25TE  | 3/8"   | 3/8"    | 0.51 | 1.75 | 0.74 | 0.86 |



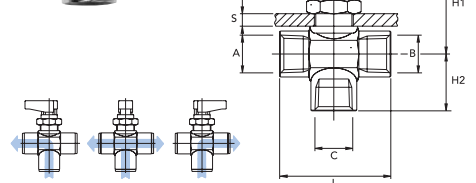
#### Miniature Ball Valve Female NPTF, Closed Center

| Model Code | A NPTF | B NPTF | C NPTF | Orifice | L    | G    | H1   | H2   | S max |
|------------|--------|--------|--------|---------|------|------|------|------|-------|
| MBVF3C10   | 1/8"   | 1/8"   | 1/8"   | 0.22    | 1.48 | 0.75 | 1.32 | 0.65 | 0.17  |
| MBVF3C20   | 1/4"   | 1/4"   | 1/4"   | 0.22    | 1.81 | 0.75 | 1.32 | 0.83 | 0.17  |
| MBVF3C25   | 3/8"   | 3/8"   | 3/8"   | 0.28    | 1.91 | 0.75 | 1.38 | 0.87 | 0.17  |



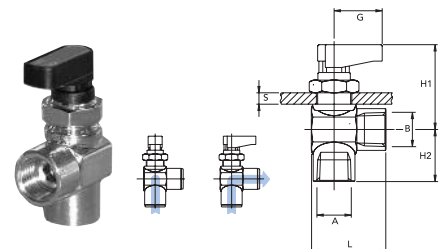
#### Miniature Ball Valve Female NPTF, Open Center

| Model Code | A NPTF | B NPTF | C NPTF | Orifice | L    | G    | H1   | H2   | S max |
|------------|--------|--------|--------|---------|------|------|------|------|-------|
| MBVF3P10   | 1/8"   | 1/8"   | 1/8"   | 0.22    | 1.48 | 0.75 | 1.32 | 0.65 | 0.17  |
| MBVF3P20   | 1/4"   | 1/4"   | 1/4"   | 0.22    | 1.81 | 0.75 | 1.32 | 0.83 | 0.17  |
| MBVF3P25   | 3/8"   | 3/8"   | 3/8"   | 0.28    | 1.91 | 0.75 | 1.38 | 0.87 | 0.17  |



#### Miniature Ball Valve Right Angle Female NPTF, Female NPTF

| Model Code | A NPTF | B NPTF | Orifice | L    | G    | H1   | H2   | S max |
|------------|--------|--------|---------|------|------|------|------|-------|
| MBVFRA10   | 1/8"   | 1/8"   | 0.22    | 1.20 | 0.75 | 1.32 | 0.65 | 0.17  |
| MBVFRA20   | 1/4"   | 1/4"   | 0.22    | 1.36 | 0.75 | 1.32 | 0.83 | 0.17  |
| MBVFRA25   | 3/8"   | 3/8"   | 0.28    | 1.54 | 0.75 | 1.38 | 0.87 | 0.17  |



Miniature Series

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