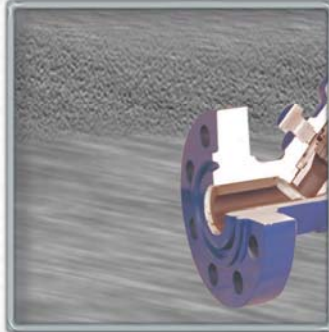
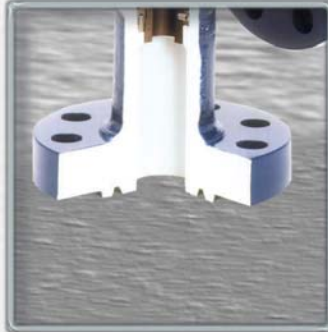
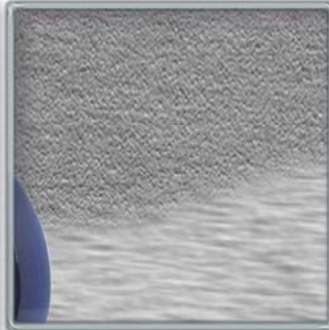


**DELIVERING  
PERFORMANCE**

# Choke Technical Handbook





**Baker SPD - San Antonio, Texas**  
Includes manufacturing, engineering, distribution center and marketing offices

## Baker SPD Choke/Control Valve

Baker SPD provides a broad range of chokes/control valves, to meet most applications from basic manual operated to fully automated systems.

As the industry continues to increase technology demands, operators select Baker SPD to obtain best-in-class service, performance and value.

We are ISO-9001 certified, thus assuring design and manufacturing of the highest quality products available in the market.

## Reference Guide

|   |   |
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## Baker SPD Choke/Control Valve General Product List



### Model BTE Inline Top Entry

- 1 in., 2 in., and 3 in. Sizes
- Carbon Steel or 316 Stainless Steel Bodies
- NPT, Butt Weld, and Flanged End Connections
- Tungsten Carbide or Ceramic Discs
- Pressure Ratings -
  - 5,000 psi API (Steel only)
  - 6,250 psi ANSI Class 2500 (Steel only)
  - 3,705 psi ANSI Class 1500 (Steel and 316 Stainless Steel)
- Maximum Differential Pressure - For Gas 4,000 psi  
For Fluid 2,000 psi
- ASME Class 5 Leakage Rate, or Better .016 SCFM @ 2,000 psi
- Maximum CV of 22



### Model BAP 90° Angle Pattern

- 2 in. and 3 in. Sizes
- Carbon Steel or 316 Stainless Steel Bodies
- NPT, Butt Weld, and Flanged End Connections
- Tungsten Carbide or Ceramic Discs
- Maximum Pressure Rating - 10,000 psi (Steel only)
- Maximum Differential Pressure - For Gas 4,000 psi  
For Fluid 2,000 psi



### Model BDD Double Disc Inline Flow Control Choke Valve

- 1 in., 2 in., and 3 in. Sizes
- Carbon Steel or 316 Stainless Steel Bodies
- NPT, Butt Weld, Grooved and Flanged Ends
- Tungsten Carbide or Ceramic Discs
- Maximum Pressure Rating - 5,000 psi (Steel only)
- Maximum Differential Pressure - 1,500 psi



### Inline Choke (Delta)

- 1 in. and 2 in. Sizes
- Carbon Steel, Aluminum Bronze or 316 Stainless Steel Bodies
- (Carbon Steel available in 1 in. only)
- NPT, Union End, and Flanged Ends
- Tungsten Carbide or Ceramic Discs
- Pressure Rating - 3,705 psi
- Maximum Differential Pressure - 1,000 psi



### Model BLF Low Flow Inline Choke

- 1 in. Size
- 316 Stainless Steel Body
- Ceramic Discs
- Maximum Pressure Rating - 3,705 psi
- Maximum Differential Pressure - 500 psi

## Models BTE and BAP Choke/Control Valve

Baker SPD introduced a new product design to upgrade old technology in angle pattern chokes. Giving you the angle pattern design, Baker has designed a new trim assembly for better versatility, with interchangeability with our Models BTE and BAP valves. With this new design you are able to convert manual operation into automation with valves in service, or at a later date.

### Connections

- Butt Weld
- FNPT Threaded
- Flanged End - Raised Face (RF) and Ring Type Joint (RTJ) ANSI Class 600, 900, 1,500, 2,500 and API 3,000 and 5,000
- 5,000 WP available in steel only

### Standard Trim

- ASTM A487 Steel Body
- AISI 4130 Steel Bonnet
- 90 Durometer Peroxide Cured Nitrile Seals
- Ceramic Disc 99.5% AL<sub>2</sub>O<sub>3</sub>
- 316 Stainless Steel Turning Fork with Xylan® Coating or 17-4 PH
- 316 Stainless Steel Wear Sleeve

### Applications

- Wellhead control valve/choke
- Wellhead choke to help reduce hydrates
- Pump bypass control
- Remote control (actuated) of wellhead flow lines
- Water and CO<sub>2</sub> injection wellhead control valve
- Gas storage wellhead
- Gas lift injection control valve
- Gas plant flow control valve
- Back pressure valve on bottom hole pump
- Remote control valve on directional drilling
- Pump start-up
- Sales gas line
- Gas blowdown line
- Automated line heater choke

### Features and Benefits of Models BTE and BAP Choke/Control Valves

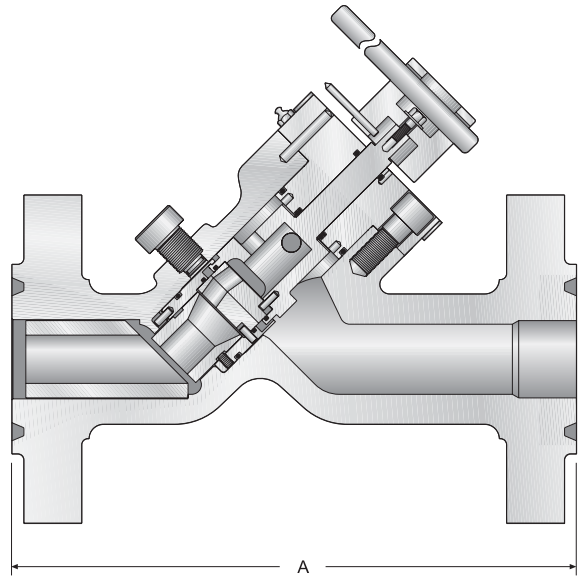
- Quarter-turn disc/turning fork valve
- Easily actuated
- Discs available in Ceramic for standard service and Tungsten Carbide for extreme erosive service
- Bodies available in corrosion-resistant, high-strength Cast Steel or 316 Stainless Steel
- Standard trim in valves is 316 Stainless Steel
- Top entry enables replacement of internal parts while in the well flow line
- Available with Tungsten Carbide wear sleeves for high-pressure drops
- Several orifice sizes available
- Manual adapter cap locking mechanism
- Unique two adjustable pressure drops
- Inhibits freeze-up for natural gas service with staged pressure drops breaking up ice crystals
- Kam-Lok wear sleeve/turning fork to install or remove complete trim in one operation
- Impinging 180 degree flow characteristics
- Low torque
- Removable handle
- Cost effective
- Lubricated and built rugged for extended service life

## Models BTE and BAP Class 600, 900, 1500, 2500, And 5000 API Torque Requirements

| 2 in. and 3 in. with Ceramic Trim                  | 2 in. and 3 in. with Tungsten Trim                |
|--|---|
| 1,000 lb diff pressure = 10 ft-lbf or 120 in.-lbf  | 1,000 lb diff pressure = 10 ft-lbf or 120 in.-lbf |
| 2,000 lb diff pressure = 22 ft-lbf or 264 in.-lbf  | 2,000 lb diff pressure = 20 ft-lbf or 240 in.-lbf |
| 3,000 lb diff pressure = 35 ft-lbf or 420 in.-lbf  | 3,000 lb diff pressure = 32 ft-lbf or 384 in.-lbf |
| 4,000 lb diff pressure = 50 ft-lbf or 600 in.-lbf  | 4,000 lb diff pressure = 40 ft-lbf or 480 in.-lbf |
| 5,000 lb diff pressure = 70 ft-lbf or 840 in.-lbf  | 5,000 lb diff pressure = 58 ft-lbf or 696 in.-lbf |
| 6,250 lb diff pressure = 85 ft-lbf or 1020 in.-lbf | 6,250 lb diff pressure = 70 ft-lbf or 840 in.-lbf |

# Baker SPD Choke Technical Handbook

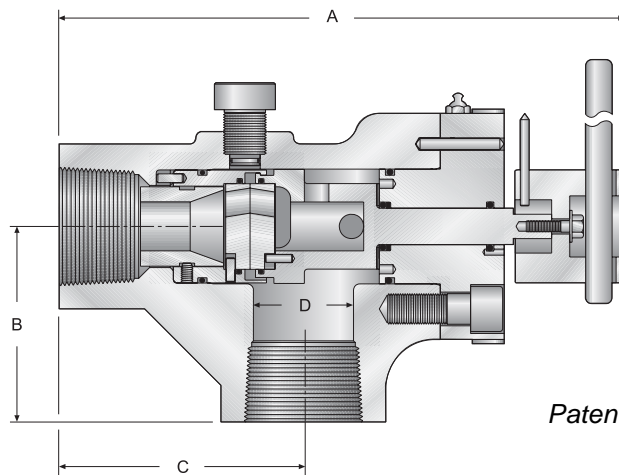
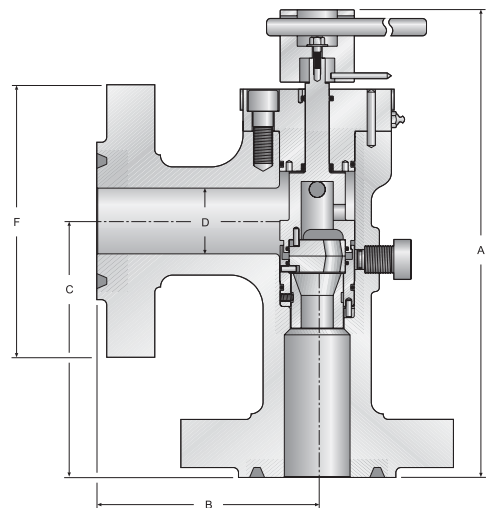
## Model BTE Choke/Control Valve



## Model BAP Choke/Control Valve



*Flanged End Connections*



*Threaded End Connections*

Patent Numbers 5217046  
and 5365978

**Baker Model BTE Top Entry Choke Dimensions**

| Size (in.) | Connection         | Dimensions (in.)<br>A |
|------------|--------------------|-----------------------|
| 1          | FNPT               | 9.50                  |
|            | Class 900/1500 RF  | 12.50                 |
|            | Class 900/1500 RTJ | 12.50                 |
| 2          | FNPT               | 9.38                  |
|            | Butt Weld End      | 7.89                  |
|            | Class 400/600 RF   | 14.50                 |
|            | Class 400/600 RTJ  | 14.50                 |
|            | Class 900/1500 RF  | 14.50                 |
|            | Class 900/1500 RTJ | 14.63                 |
|            | 5,000 API RTJ      | 14.63                 |
|            | Class 2500 RTJ     | 14.63                 |
| 3          | Weld End           | 8.75                  |
|            | Class 1500 RF      | 18.50                 |
|            | Class 1500 RTJ     | 18.63                 |
|            | 5,000 API RTJ      | 18.63                 |

**Threaded Baker Model BAP 90 Angle Pattern Choke Dimensions**

| Pressure Rating |                      | FNPT ANSI 1500<br>(3,705 psi WP and 5,575 psi Test) | FNPT 5000 WP<br>(5,000 psi WP and 10,000 psi Test) |
|-----------------|----------------------|---|--|
| Size            |                      | 2 in.   | 2 in.  |
| A               | FNPT                 | 12 in.  | 12 in.   |
|                 | Flanged RF           | N/A   | N/A  |
|                 | Flanged RTJ          | N/A   | N/A  |
| B               | Center to End Height | 4 in.   | 4 in.  |
| C               | Center to End Length | 5 in.   | 5 in.  |
| D               | ID Bore              | 2 in.   | 2 in.  |
| F               | Flanged Diameter     | N/A   | N/A  |
|                 | Flange Bolt (Qty)    | N/A   | N/A  |
|                 | Flange Bolt (Size)   | N/A   | N/A  |
|                 | Ring No. (RTJ)       | N/A   | N/A  |

**Flanged Baker Model BAP 90 Angle Pattern Choke Dimensions**

| Pressure Rating |                      | Flanged ANSI<br>Class 600<br>(1,480 psi WP<br>and<br>2,225 psi Test) | Flanged ANSI<br>Class 900<br>(2,220 psi WP<br>and<br>3,350 psi Test) | Flanged ANSI<br>Class 1500<br>(3,705 psi WP<br>and<br>5,575 psi Test) | Flanged 5,000 WP<br>(5,000 psi WP<br>and<br>10,000 psi Test) | Flanged 10,000 WP<br>(10,000 psi WP<br>and<br>15,000 psi Test) |
|-----------------|----------------------|--|--|---|--|--|
| Size            |                      | 2 in.  | 2 in.  | 2 in.   | 2 in.  | 2 in.  |
| A               | FNPT                 | N/A  | N/A  | N/A   | N/A  | N/A  |
|                 | Flanged RF           | 15 in.   | 15 in.   | 15 in.  | 15 in.   | N/A  |
|                 | Flanged RTJ          | 15 in.   | 15 in.   | 15 in.  | 15 in.   | 15-1/4 in.   |
| B               | Center to End Height | 6-7/8 in.  | 6-7/8 in.  | 6-7/8 in.   | 6-7/8 in.  | 7-1/4 in.  |
| C               | Center to End Length | 8 in.  | 8 in.  | 8 in.   | 8 in.  | 8-1/4 in.  |
| D               | ID Bore              | 2 in.  | 2 in.  | 2 in.   | 2 in.  | 2 in.  |
| F               | Flanged Diameter     | 6-1/2 in.  | 8 1/2 in.  | 8-1/2 in.   | 8-1/2 in.  | 7-7/8 in.  |
|                 | Flange Bolt (Qty)    | 8 in.  | 8 in.  | 8 in.   | 8 in.  | 8 in.  |
|                 | Flange Bolt (Size)   | 5/8 in.  | 7/8 in.  | 7/8 in.   | 7/8 in.  | 7/8 in.  |
|                 | Ring No. (RTJ)       | R23  | R24  | R24   | R24  | BX152  |

# Baker SPD Choke Technical Handbook

## Model BDD Double Disc Inline Flow Control Choke Valve

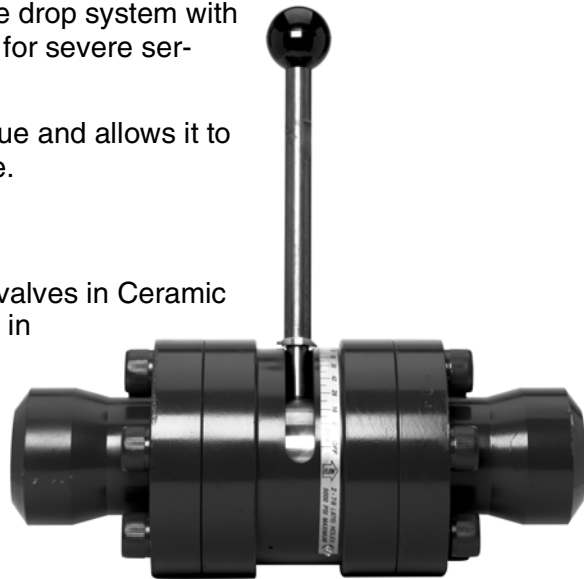
### Introduction

Baker Double Disc Inline Flow Control Choke differs from competitors' models in that it offers a double pressure drop system with two sets of double discs to step (small-large orifices) for severe services, and provides two bubble tight shutoffs.

Standard 316 Stainless Steel spool provides low torque and allows it to handle high pressure drop, cavitation, and turbulence.

### Features and Benefits

- Available in 1 in., 2 in., and 3 in. Sizes
- Slanted holes are standard on 1 in., 2 in., and 3 in. valves in Ceramic and Tungsten Carbide (promotes good laminar flow in valve, impinging on itself and inhibits cutting action on valve)
- Two sets of double discs inhibit freeze-up for gas service
- The two sets of double discs (up and down stream) offer a bubble tight seal that is excellent for gas application
- No wear sleeve or diffuser required
- Low torque (due to lubricated spool)
- Bodies and hubs are made of bar-stock for greater safety, pressure rating and appearance
- 1 in., 2 in., and 3 in. - 3,705 psi working pressure - 5,575 psi test
- 5,000 psi working pressure - 10,000 psi test (available in Steel only)
- Greasing zerk (ease of maintenance, extended service life)
- All combinations of end-connection are available
- Carbon Steel and Stainless Steel valves are standard with 316 Stainless Steel spools
- Valves are available in Carbon Steel and Stainless Steel
- 96% Alumina slanted Ceramic discs are ideal for both fluid and gas applications providing excellent abrasion resistance and chemical resistance
- All valves can be furnished with actuators



### Dimensions

Contact the Baker SPD San Antonio office for dimensional information.

## Inline Choke (Delta)

### Introduction

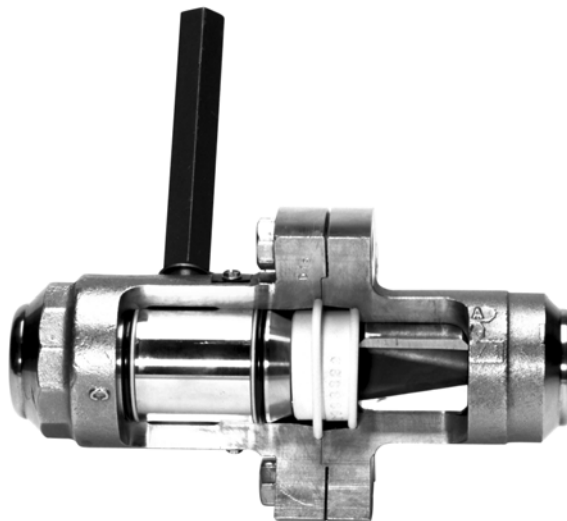
The Baker SPD Inline Choke is designed specifically for controlling gas and liquid flowline rates. Water and CO<sub>2</sub> systems are designed to control the rate of fluid injection. The stellite sleeve absorbs the cavitation and pitting action of the fluid as it takes the pressure drop. The sleeve design allows the thickest material around the disc holes and is funnel-shaped to direct the flow back into the center of the piping.

### Sizes

1 in. and 2 in.

### Connections

- Threaded
- ANSI 600 and 900/1500 Flanged
- Grooved
- Union x Socket Weld
- Union x Union
- Socket Weld x Socket Weld



### Actuation

Available upon request.

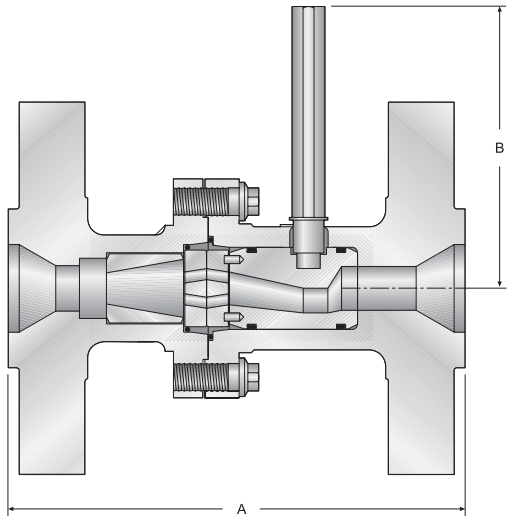
### Standard Trim

|                |   |  |
|----------------|---|--|
| Body:          | ASTM A216 WCB Steel or<br>ASTM B148 Aluminum Bronze Grade 955 D Alloy or<br>CF8M 316 Stainless Steel or<br>CF3M 316 L Stainless Steel |  |
| Disc:          | Ceramic Al <sub>2</sub> O <sub>3</sub> for applications to 400 psi<br>Tungsten Carbide for applications above 600 psi                 |  |
| Body Seals:    | Type 1, Grade 1 PTFE Fluorocarbon   |  |
| Rotator Seals: | 90 Durometer A Peroxide Cured Nitrile O-ring<br>with Type 1, Grade 1 PTFE Fluorocarbon Back-up Ring                                   |  |
| Disc Pins:     | Monel   |  |
| Wearsleeve:    | Stellite 6B   |  |

### Pressure Rating

|               |                            |                         |
|---------------|----------------------------|-------------------------|
| FNPT          | 3,705 psi Working Pressure | 5,575 psi Test Pressure |
| ANSI 600      | 1,480 psi Working Pressure | 2,225 psi Test Pressure |
| ANSI 900/1500 | 3,705 psi Working Pressure | 5,575 psi Test Pressure |

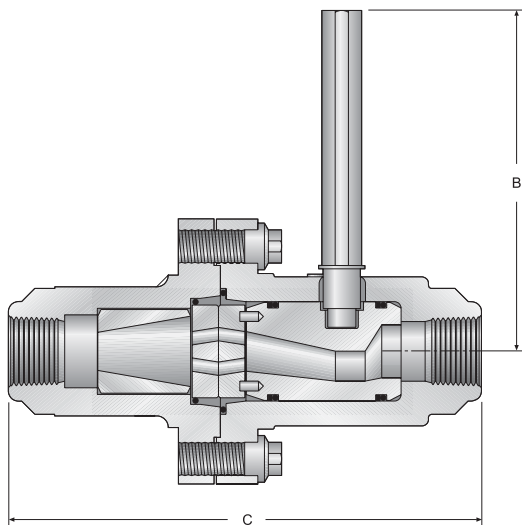
# Baker SPD Choke Technical Handbook



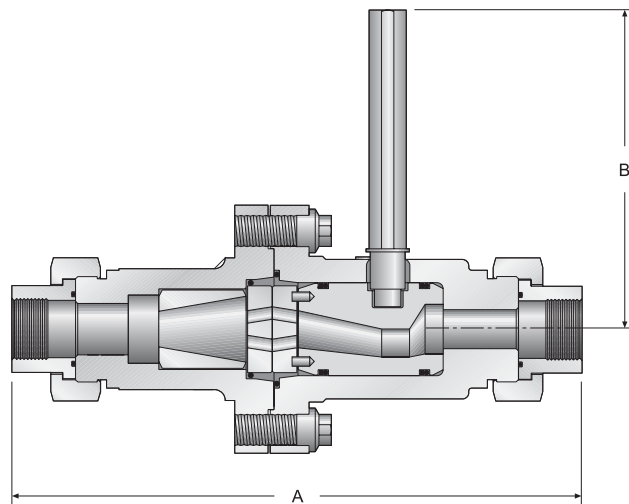
**Inline Choke Assembly  
Flanged End**

## Inline Choke Assembly Dimensional (Flanged End)

| Description               | Dim (in.)  |            | Connections  |
|---------------------------|------------|------------|--------------|
|                           | A          | B          |              |
| <b>2 in. Inline Choke</b> | 10-1/2 in. | 6-9/16 in. | 400/600 RF   |
|                           |            |            | 900/1500 RF  |
| <b>2 in. Inline Choke</b> | 10-5/8 in. | 6-9/16 in. | 400/600 RTJ  |
|                           |            |            | 900/1500 RTJ |



**Inline Choke Assembly  
Threaded End**



**Inline Choke Assembly  
Union End**

## Inline Choke Assembly Dimensions (Union End/Threaded)

| Description               | Dim (in.)   |            |           |
|---------------------------|-------------|------------|-----------|
|                           | A           | B          | C         |
| <b>1 in. Inline Choke</b> | 11-7/16 in. | 6-9/16 in. | 8-7/8 in. |
| <b>2 in. Inline Choke</b> | 12-9/16 in. | 6-9/16 in. | 10 in.    |

**Baker SPD Model BLF Low Flow Inline Choke**  
**(For Economical Control of Wellhead Injection Rates)**

With Baker SPD’s new, improved Model BLF Low Flow Inline Choke, your enhanced oil recovery project can also benefit from enhanced economy. That’s because the new BLF is designed to handle the low flow and low pressure drops that characterize CO<sub>2</sub> and water injection operations.



Simple, Inline flow characteristics make the BLF Inline Choke unsurpassed for reducing and/or controlling flow rates on gas and liquid lines near the wellhead.

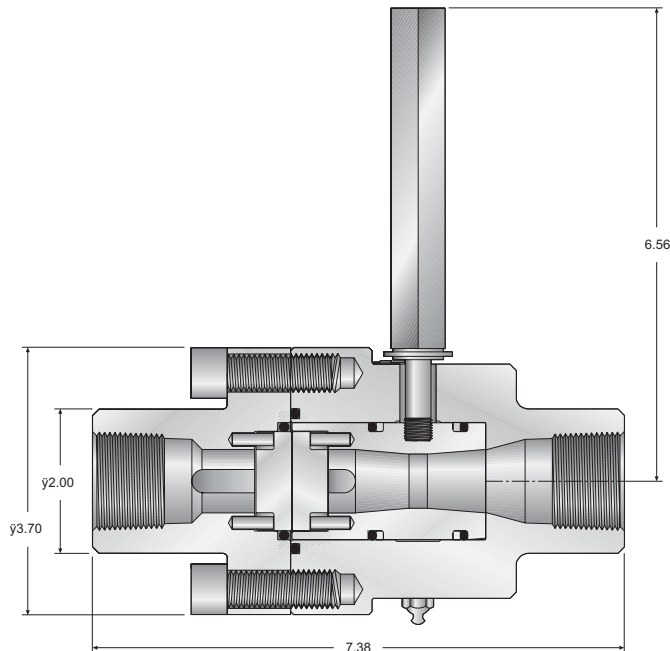
Stainless steel bar stock construction makes the BLF less susceptible to porosity leaks.

**Features and Benefits**

- Connection: 1 in. FNPT
- Maximum working pressure: 3,705 psi (ANSI Class 1500)
- Maximum recommended pressure differential: 500 psi
- Dimensional Length: 7.38 in.

Available in the following choke sizes:

| Orifice Size (Holes) | Equivalent Flow Area (in. <sup>2</sup> ) | Equivalent 64 <sup>th</sup> | Estimated Cave Factor |
|----------------------|--|-----------------------------|-----------------------|
| 1/8 in.              | .0246                                    | 11.3                        | 0.6                   |
| 1/4 in.              | .0982                                    | 22.6                        | 2.7                   |
| 3/8 in.              | .2208                                    | 33.9                        | 6.8                   |



## Notes

Xylan® is a registered trademark of Whitford Corporation.

