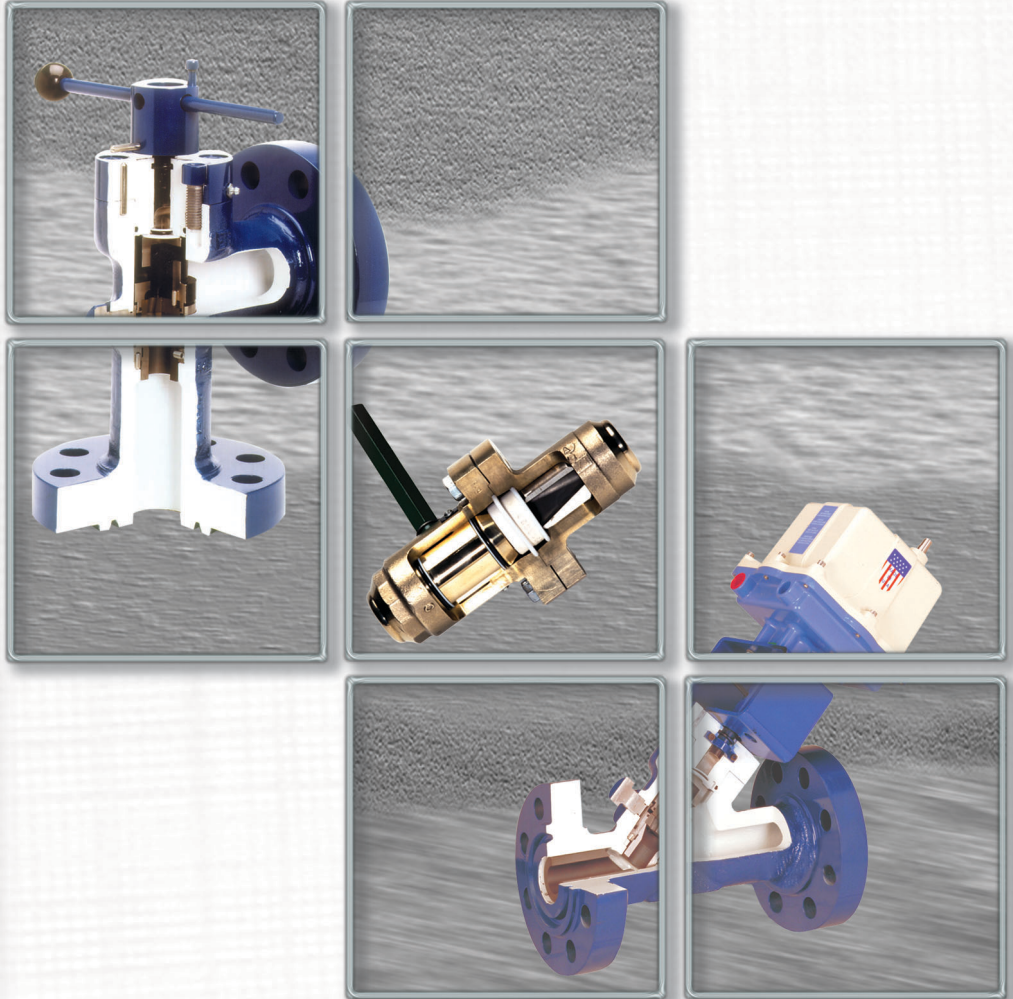


**DELIVERING
PERFORMANCE**

Choke Technical Handbook



Baker Oil Tools
BAKER SPD

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

Introduction	1
General Product List	2
Models BTE and BAP Choke/Control Valve	3
Model BDD Double Disc Inline Flow Control Choke Valve	6
Inline Choke (Delta)	7
Baker SPD Model BLF Low Flow Inline Choke	9

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% AL₂O₃
- 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 CO₂ 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

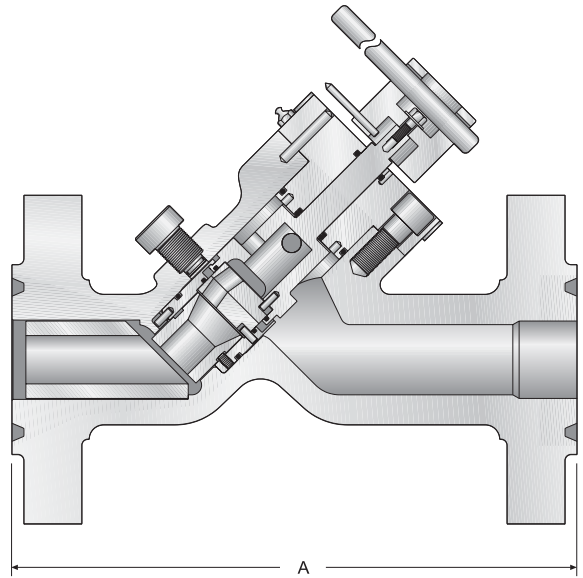
Features and Benefits of Models BTE and BAP Choke/Control Valves

- 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

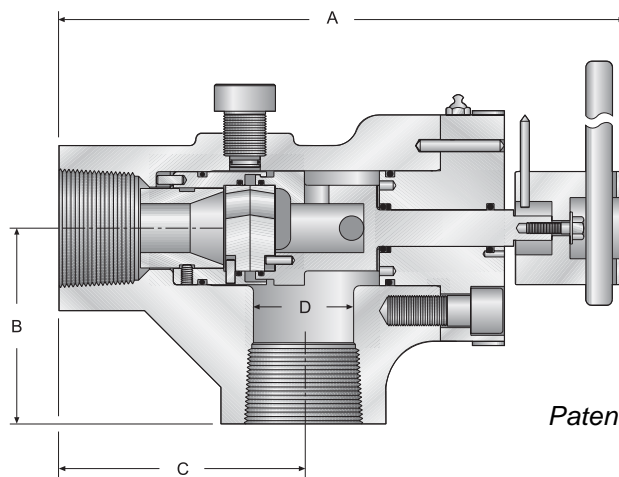
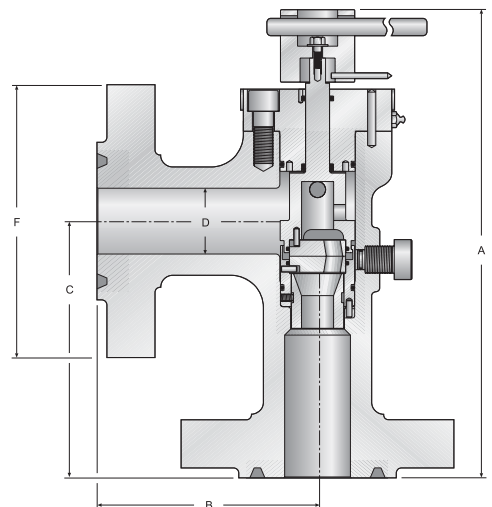
Model BTE Choke/Control Valve



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.)
		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 (3,705 psi WP and 5,575 psi Test)		FNPT 5000 WP (5,000 psi WP and 10,000 psi Test)	
	Size	2 in.	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	Size	Flanged ANSI Class 600 (1,480 psi WP and 2,225 psi Test)	Flanged ANSI Class 900 (2,220 psi WP and 3,350 psi Test)	Flanged ANSI Class 1500 (3,705 psi WP and 5,575 psi Test)	Flanged 5,000 WP (5,000 psi WP and 10,000 psi Test)	Flanged 10,000 WP (10,000 psi WP and 15,000 psi Test)
		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

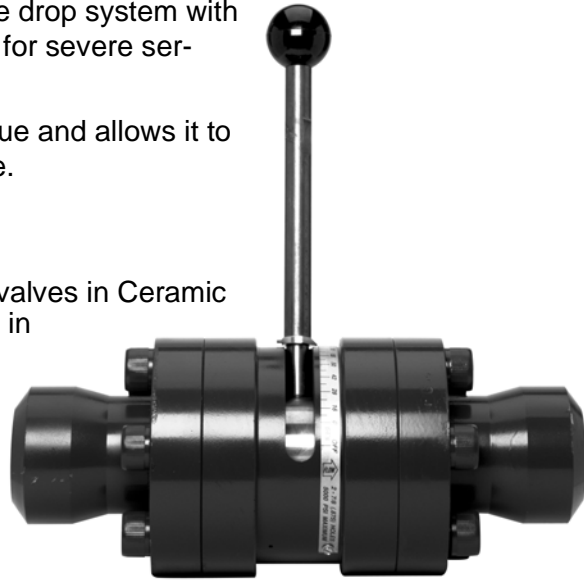
Introduction

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

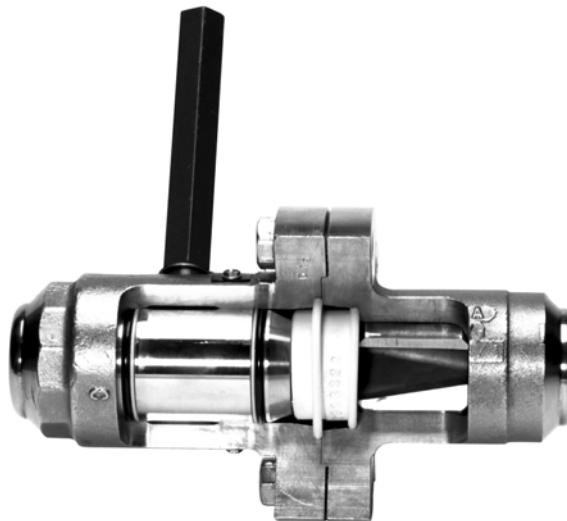
The Baker SPD Inline Choke is designed specifically for controlling gas and liquid flowline rates. Water and CO₂ systems are designed to control the rate of fluid injection. The stellite sleeve absorbs the cavitation and pitting action of the fluid as it takes the pressure drop. The sleeve design allows 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.

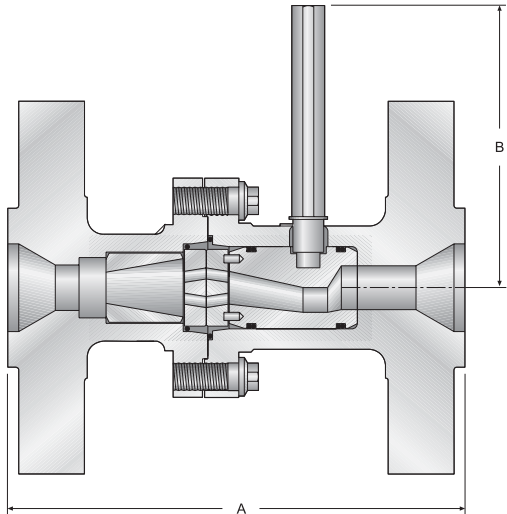
Standard Trim

Body:	ASTM A216 WCB Steel or ASTM B148 Aluminum Bronze Grade 955 D Alloy or CF8M 316 Stainless Steel or CF3M 316 L Stainless Steel	
Disc:	Ceramic Al ₂ O ₃ for applications to 400 psi Tungsten Carbide for applications above 600 psi	
Body Seals:	Type 1, Grade 1 PTFE Fluorocarbon	
Rotor Seals:	90 Durometer A Peroxide Cured Nitrile O-ring 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

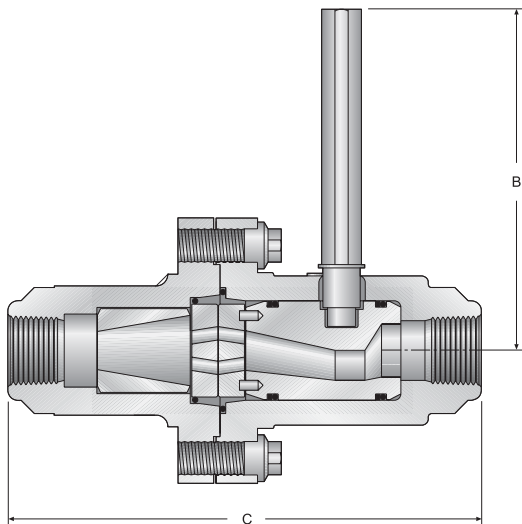
Baker SPD Choke Technical Handbook



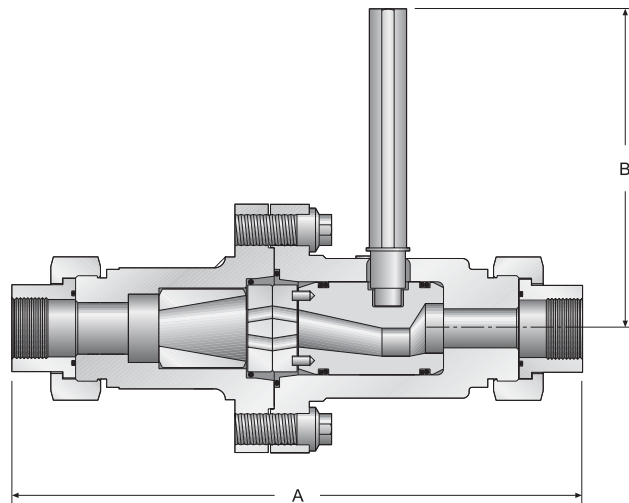
**Inline Choke Assembly
Flanged End**

Inline Choke Assembly Dimensional (Flanged End)

Description	Dim (in.)		Connections
	A	B	
2 in. Inline Choke	10-1/2 in.	6-9/16 in.	400/600 RF 900/1500 RF
2 in. Inline Choke	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
1 in. Inline Choke	11-7/16 in.	6-9/16 in.	8-7/8 in.
2 in. Inline Choke	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 CO₂ 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.

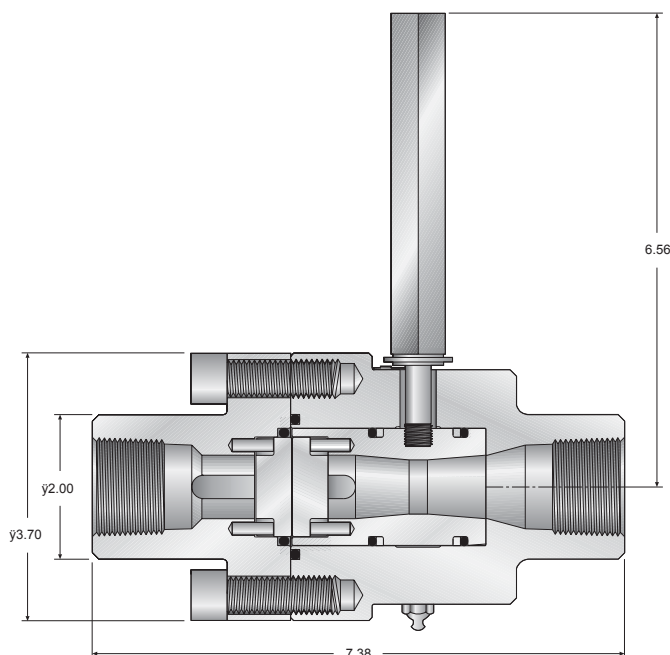


Features and Benefits

- 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. ²)	Equivalent 64 th	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.

