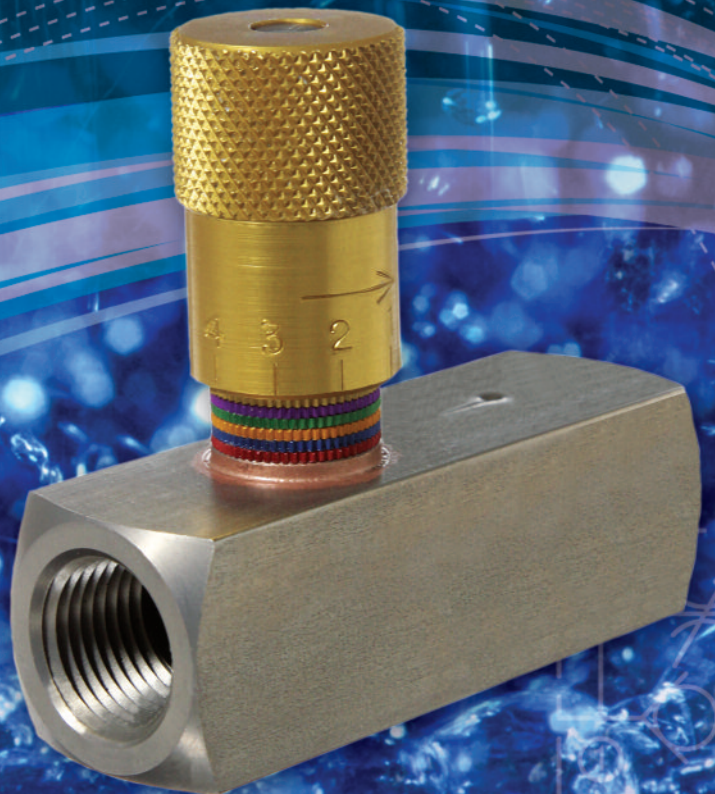
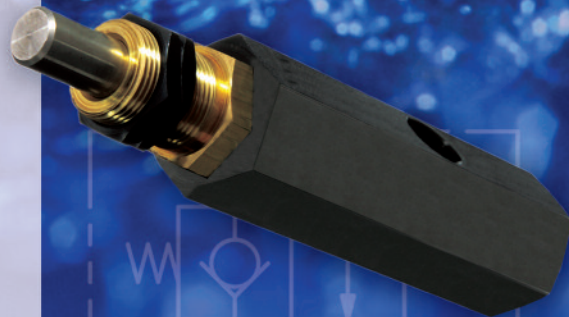


In-Line Hydraulic and Pneumatic Valves



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

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

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

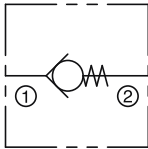
Our MRP based manufacturing system gives us the flexibility to meet our customers' delivery system requirements. We are experienced in working with various customer implementations of pull order systems. We work closely to understand our customers' ERP systems and have the flexibility to integrate our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

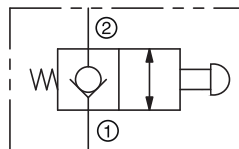
0.00.0	INTRODUCTION	
	World Class Performance	0.01.1
	Table of Contents	0.02.1

1.00.0 CHECK & SHUTTLE



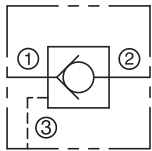
Check, Direct-Acting

Series	Threads (ports)	Flow		Pressure		Material	Model	Page
		gpm	lpm	psi	bar			
Easy Read	Female-to-Female NPTF	3.0 to 55.0	11.4 to 208.2	2000	138	Brass	EC**B EDC**B	1.01.1
		6.0 to 55.0	22.7 to 208.2	5000	345	Carbon Steel	EC**S EDC**S	
		6.0 to 20.0	22.7 to 75.7	5000	345	Stainless Steel	EC**SS EDC**SS	
	Female-to-Female BSP Taper	3.0 to 20.0	11.4 to 75.7	5000	345	Carbon Steel	ECB**S	
	Female-to-Female BSP Parallel	6.0 to 20.0	22.8 to 75.7	5000	345	Carbon Steel	ECBP**S	1.01.1
Pneu-Trol	Female-to-Female 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 NPTF 1/4"	2.5	9.5	60	4	Brass	CPMF20B	1.03.1
	Male-to-Male 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 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		



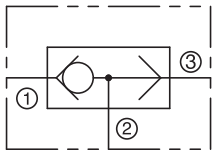
Check, Plunger-Operated

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



Check, Pilot-To-Open

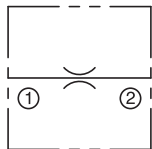
Series	Threads (ports)	Flow		Pressure		Material	Model	Page
		gpm	lpm	psi	bar			
Pneu-Trol	Female-to-Female NPTF	6.0	22.7	3000	207	Carbon Steel	PIC-20S	1.20.1
		10.0	37.9				PIDC-25S	
		12.0	45.4				PIDC-30S	
	Female-to-Female NPTF (Air Pilot)	12.0	45.4	3000	207	Carbon Steel	APIDC-30S	1.20.1
	Female-to-Female BSP Taper	6.0	22.7	3000	207	Carbon Steel	PICB-20S	1.20.1
		10.0	37.9				PICB-25S	



Shuttle, Ball-Type

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

2.00.0 FLOW CONTROL

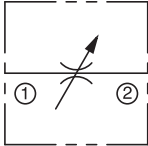


Orifice, Gauge Snubber

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

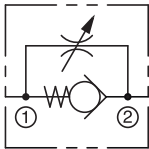
Table of Contents

(continued)



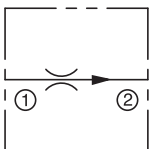
Needle Valve, Restrictive, Adjustable

Series	Threads (ports)	Flow		Pressure		Material	Model	Page
		gpm	lpm	psi	bar			
◀ Easy Read	Female-to-Female 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 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 BSP Parallel	4.5 to 40.0	17.1 to 151.4	5000	345	Carbon Steel	ENBP**S		
◀ Pneu-Trol	Female-to-Female 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 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 SAE	7.0 to 34.0	26.5 to 128.7	5000	345	Carbon Steel	NM***SK	2.11.1
	Male-to-Female NPFT Model 01	Cv = .67 to 1.89	-	10,000	690	Carbon Steel	S*01S1	2.15.1
	Female-to-Female NPTF Model 02	Cv = .85 to 3.70	-	10,000	690	Carbon Steel	S*02S1	2.15.1
		Cv = .85	-	10,000	690	Carbon Steel	SM202S1	
	Female-to-Female BSPT Model 02	Cv = .85 to 3.70	-	10,000	690	Carbon Steel	SB*02S1	2.15.1
	Female-to-Female NPTF Model 50	Cv = .37 to 4.65	-	10,000	690	Carbon Steel	S*50S1	2.15.1
		Cv = .37 to .47	-	10,000	690	Carbon Steel	SM*50S1	
	Female-to-Female BSPT Model 50	Cv = .47 to 2.65	-	10,000	690	Carbon Steel	SB*50S1	2.15.1
	Female-to-Female BSPP Model 50	Cv = .47 to 2.65	-	10,000	690	Carbon Steel	SBP*50S1	2.15.1
	Male-to-Female 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 NPTF	3.2	12.1	5000	345	Steel	NMF20-10S	2.17.1	
Female-to-Female 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			
Pneu-Trol	Female-to-Female NPTF	1.5	5.7	1000	69	Stainless Steel	SFP10SSB	2.21.1
		3.0	11.5	500	34		SFP20SSB	
	Female-to-Female 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 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 SAE	5.0	18.9	5000	345	Carbon Steel	FM620S	2.22.1
	Male-to-Female NPFT	1.5 to 8.0	5.7 to 30.3	2000	138	Brass	FMF**BK	2.23.1
Female-to-Female NPTF	3.0	11.4	5000	345	Stainless Steel	F20SS316K	2.24.1	
	8.0	30.3				F30SS316K		
Easy Read	Female-to-Female 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 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 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 SAE	6.0 to 20.0	22.7 to 75.7	5000	345	Carbon Steel	EFM****S	2.25.1

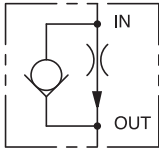


Flow Regulator, Restrictive, Pressure-Compensated, Fixed

Series	Threads (ports)	Flow		Pressure		Material	Model	Page
		gpm	lpm	psi	bar			
Pneu-Trol	Female-to-Female 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 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	

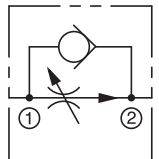
Table of Contents

(continued)



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

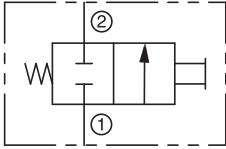
Series	Threads (ports)	Flow		Pressure		Material	Model	Page
		gpm	lpm	psi	bar			
In-line	Male-to-Female #8 SAE to #8 SAE	1.0 to 10.0	3.8 to 37.9	3000	207	Carbon Steel	PCM88	2.40.1



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

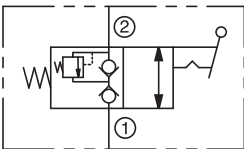
Series	Threads (ports)	Flow		Pressure		Material	Model	Page
		gpm	lpm	psi	bar			
◀ Pneu-Trol	Female-to-Female NPTF	0.75 to 15.0	2.8 to 56.8	3000	207	Carbon Steel	PC5	2.51.1
	Female-to-Female BSP Taper	0.75 to 15.0	2.8 to 56.8	3000	207	Carbon Steel	PCB5	2.51.1
	Female-to-Female #8 SAE	1.0 to 10.0	3.8 to 37.9	3000	207	Carbon Steel	PCM85-3	2.51.1
		1.5 to 15.0	5.7 to 56.8				PCM85-4	
◀ Easy Read	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

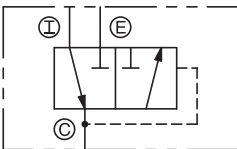
Series	Threads (ports)	Flow		Pressure		Material	Model	Page
		gpm	lpm	psi	bar			
Pneu-Trol	Female-to-Female NPTF 1/2"	Cv = 2.6	-	3000	207	Steel	POV32S	3.01.1



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

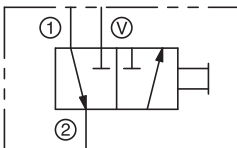
Series	Threads (ports)	Flow		Pressure		Material	Model	Page
		gpm	lpm	psi	bar			
Pneu-Trol	Female-to-Female NPTF 1/4"	5.0	18.9	2000	138	Brass	TV20B	3.02.1

4.00.0 ACCESSORIES



Quick Exhaust, 2-Position 3-Way

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

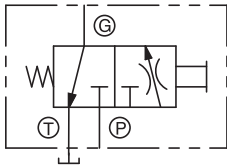


Slide Valve, 2-Position, 3-Way, Manually Operated

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

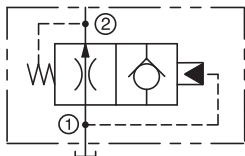
Table of Contents

(continued)



Gauge Isolator

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

5.00.0 TECHNICAL DATA

FLOW CURVES

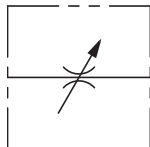
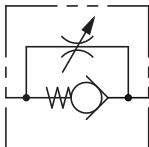
Needle Valve: EN, ENB, ENM, ENBP

Flow Control Valve : EF, EFB, EFM, EFBP5.01.1

6.00.0 MINIATURE SERIES

LFC, LFV and LNB Series Miniature Flow Control and

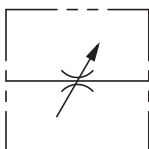
Needle Valves – MBV Series Miniature Ball Valves6.00.0



Flow Control & Needle Valve

LFC and LFV Series Miniature Flow Control6.01.1

LNB Series Miniature Needle Valve6.01.1

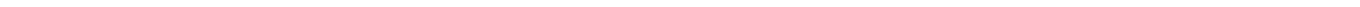


Ball Valve

MBV Series Miniature Ball Valve6.02.1

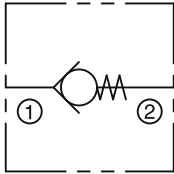
7.00.0 WARRANTY AND DISCLAIMER

.....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")

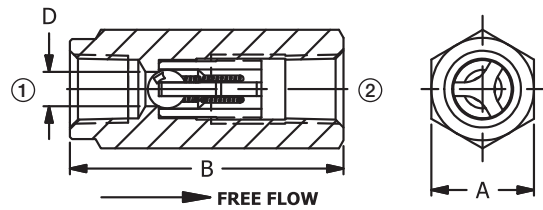
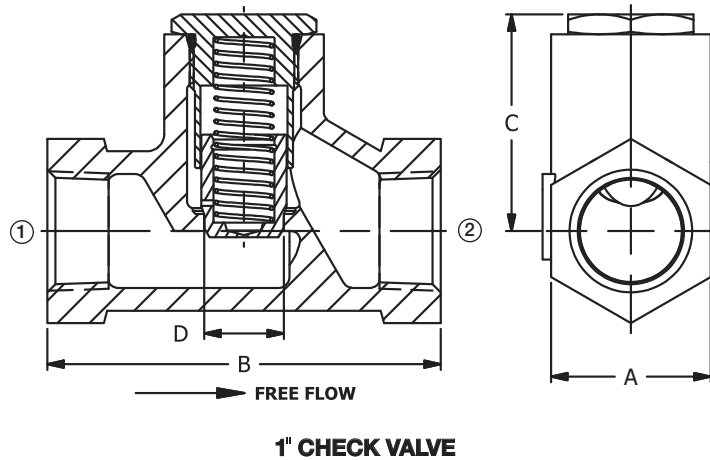
Body: Brass, Steel, Stainless Steel 303
Ball: Stainless Steel 440
Spring: Stainless Steel 302
Ball Guide: Delrin®

Materials (1")

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

IN-LINE

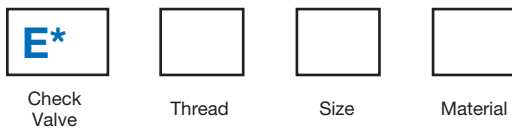
INSTALLATION DIMENSIONS



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

() Parentheses = Millimeters

HOW TO ORDER



Code	Check Valve
EC	Check Valve
EDC	

Code	Material
B	Brass (1" - Leaded Tin Bronze)
S	Carbon Steel (1" - Ductile Iron)
SS	Stainless Steel

Code	Thread
Omit	NPTF
B	BSPT
BP	BSPP

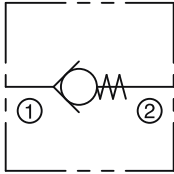
Code	Size
10	1/8"
20	1/4"
25	3/8"
30	1/2"
35	3/4"
40	1"

AVAILABLE MODEL CODES

Size	NPTF Thread			ISO 7/1 - RS BSP Taper	ISO 7/1 - RP BSP Parallel
	Brass	Steel	Stainless 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

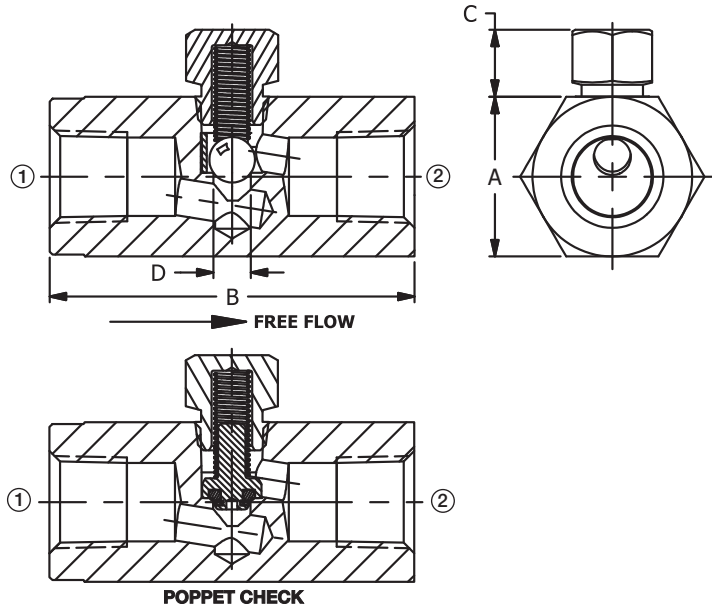
Materials

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

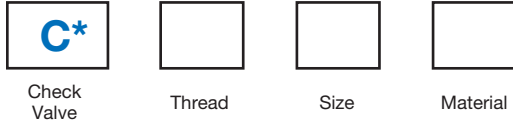
INSTALLATION DIMENSIONS



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

() Parentheses = Millimeters

HOW TO ORDER



Code	Check Valve
C	Ball Check
CP	Poppet Check

Code	Material
B	Brass
S	Carbon Steel
SS	Stainless Steel

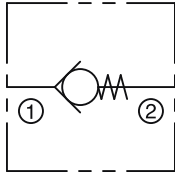
Code	Thread
Omit	NPTF

Code	Size
10	1/8"
20	1/4"
25	3/8"
30	1/2"
35	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"

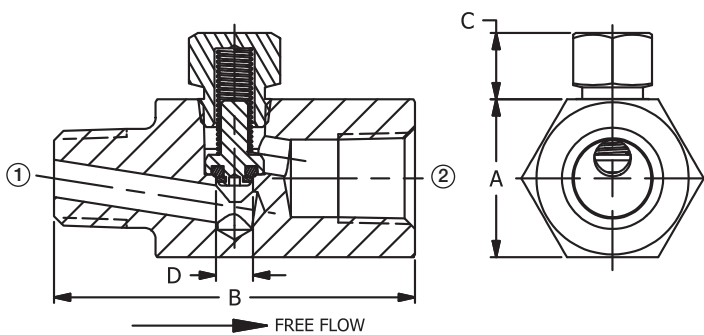
Materials

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 (22.2)	2 (50.8)	23/64 (9.1)	.203 (5.2)

() Parentheses = Millimeters

HOW TO ORDER



Code	Check Valve
CP	Poppet Check

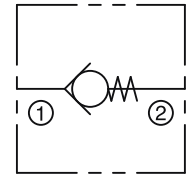
Code	Material
B	Brass

Code	Thread
MF	NPTF (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)

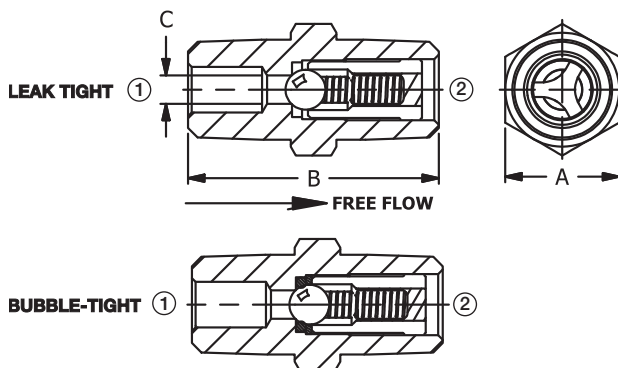
Threads

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

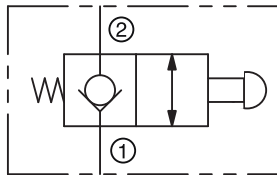
HOW TO ORDER

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 (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)

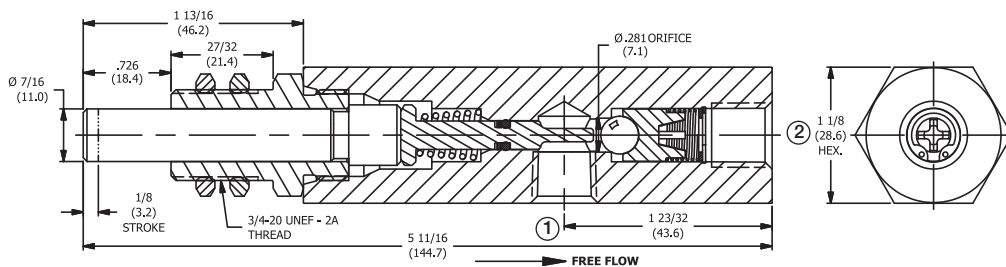
Threads

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



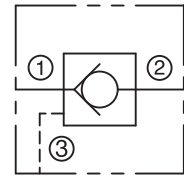
() Parentheses = Millimeters

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

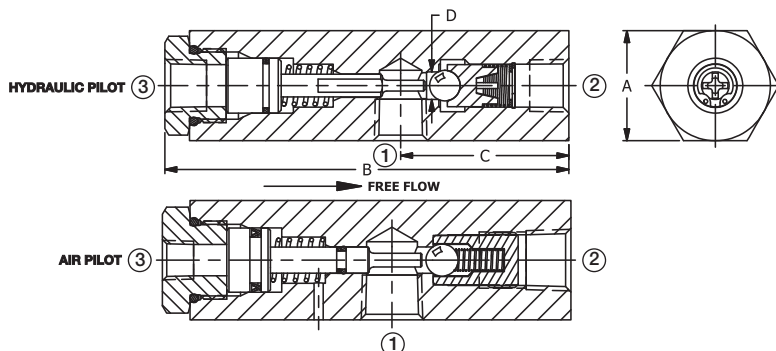
Threads

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 (28.6)	4-1/8 (104.8)	1-27/32 (43.7)	.281 (7.1)	1/4"	1/4"	1/4"
3/8"	1-3/8 (34.9)	4-7/8 (123.8)	2-1/8 (54.0)	.328 (8.3)	1/4"	3/8"	3/8"
1/2"	1-5/8 (41.3)	5-5/8 (142.9)	2-7/16 (61.9)	.359 (9.1)	1/4"	1/2"	1/2"

() Parentheses = Millimeters

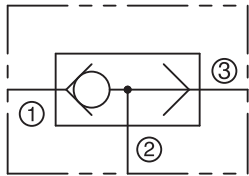
HOW TO ORDER

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

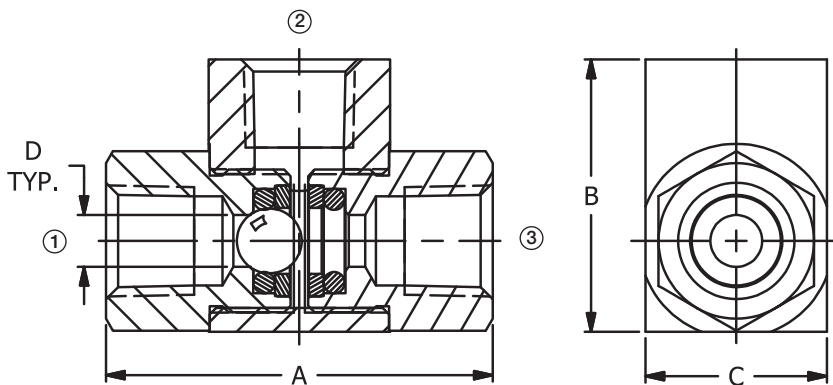
Materials

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 (31.8)	31/32 (24.6)	5/8 (15.9)	.188 (4.8)
1/4"	1-7/8 (47.6)	1-5/16 (33.4)	7/8 (22.2)	.250 (6.4)

() Parentheses = Millimeters

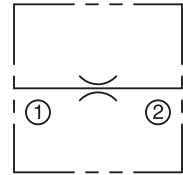
HOW TO ORDER

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

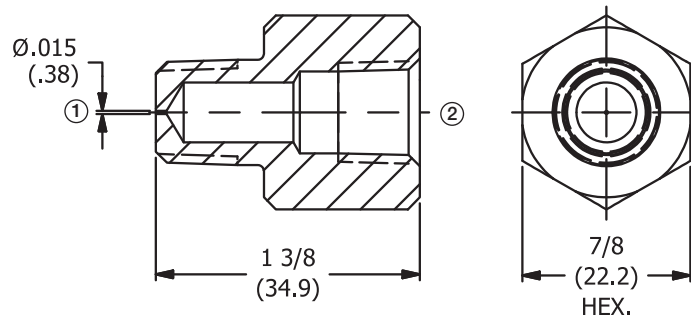
.015 (.38)

Material

Brass, Steel



INSTALLATION DIMENSIONS



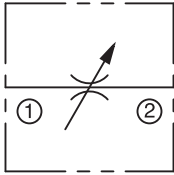
() Parentheses = Millimeters

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

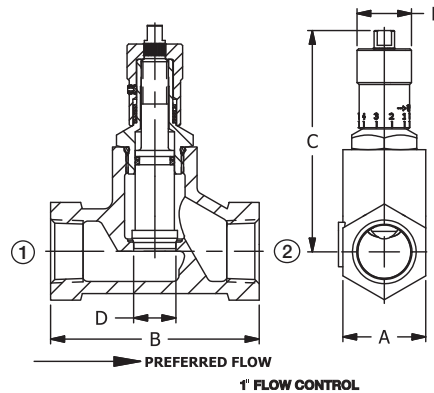
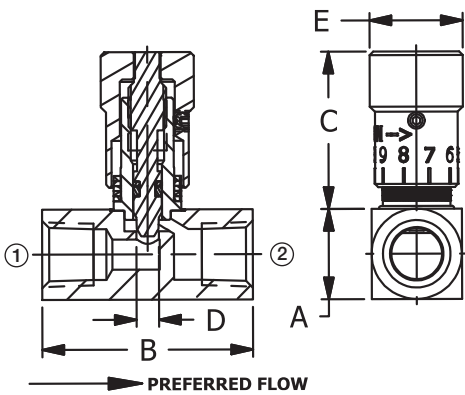
FLOW RATING

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

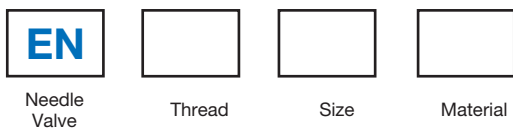
INSTALLATION DIMENSIONS



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

() Parentheses = Millimeters

HOW TO ORDER



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

Code	Size
10	1/8"
20	1/4"
25	3/8"
30	1/2"
35	3/4"
40	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.

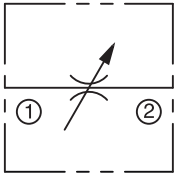
Record the information for future reference.

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

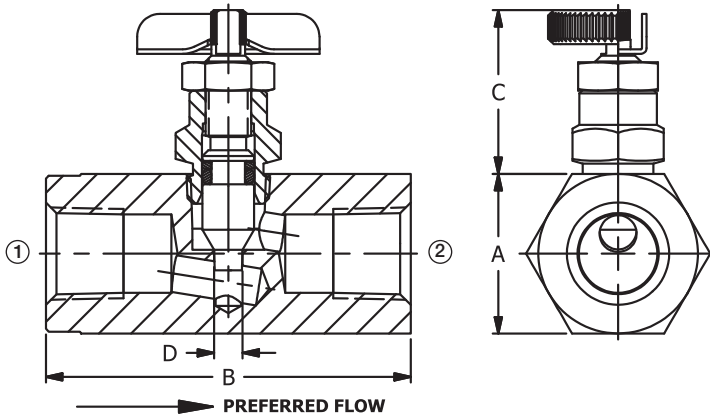
Materials

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

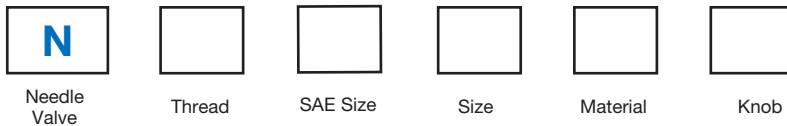
INSTALLATION DIMENSIONS



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

() Parentheses = Millimeters

HOW TO ORDER



Code	Thread
Omit	NPTF
B	BSPT
M	SAE

Code	Material
B	Brass
S	Carbon Steel
SS	Stainless Steel

Code	Knob
Omit	Tamperproof Adjustment Key
K	Knob

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

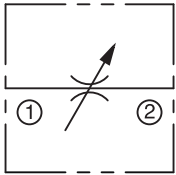
Code	Size
10	1/8"
20	1/4"
25	3/8"
30	1/2"
35	3/4"

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 N10BK	N10S N10SK	- N10SSK	NB10BK	NB10SK	-
1/4"	N20B N20BK	N20S N20SK	- N20SSK	NB20BK	NB20SK	NM620SK
3/8"	N25B N25BK	N25S N25SK	- N25SSK	NB25BK	NB25SK	-
1/2"	N30B N30BK	N30S N30SK	- N30SSK	-	NB30SK	NM830SK
3/4"	N35B N35BK	- N35SK	- -	-	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)

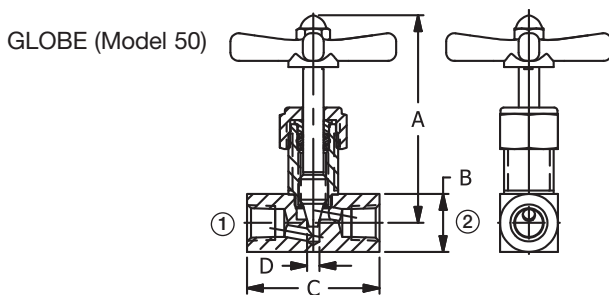
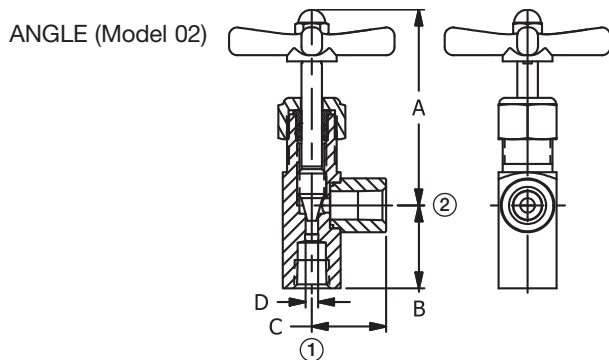
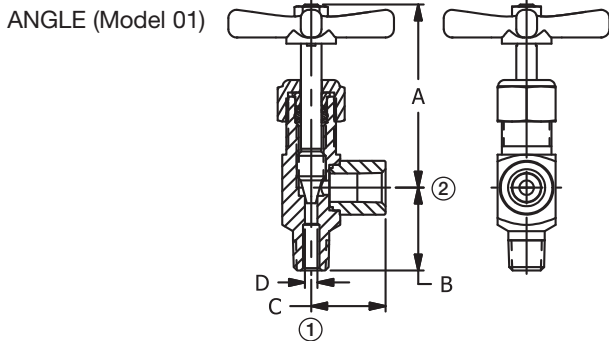
Panel Mounting Kits (Sold Separately)

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 Angle Type	Model 50 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

INSTALLATION DIMENSIONS



() Parentheses = Millimeters

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

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

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

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

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

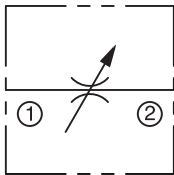
Pipe Size	A Open	B	C	D Orifice
1/8"	3-1/16 (77.8)	7/8 (22.2)	2 (50.8)	.188 (4.8)
1/4"	3-5/8 (92.1)	7/8 (22.2)	2 (50.8)	.188 (4.8)
3/8"	4-1/32 (102.4)	1 (25.4)	2-3/8 (60.3)	.281 (7.1)
1/2"	3-15/16 (100.0)	1-1/4 (31.8)	2-7/8 (75.0)	.281 (7.1)
3/4"	4-15/16 (125.5)	1-1/2 (38.1)	3-5/8 (92.1)	.438 (11.1)
1"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

HOW TO ORDER

Size	Model 01 Male-to-Female	Model 02 Female-to-Female			Model 50 Female-to-Female			
	NPTF Thread	NPTF Thread		ISO 7/1 – RS BSP Taper Thread	NPTF Thread		ISO 7/1 – RS BSP Taper Thread	ISO 7/1 – RS BSP Parallel 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

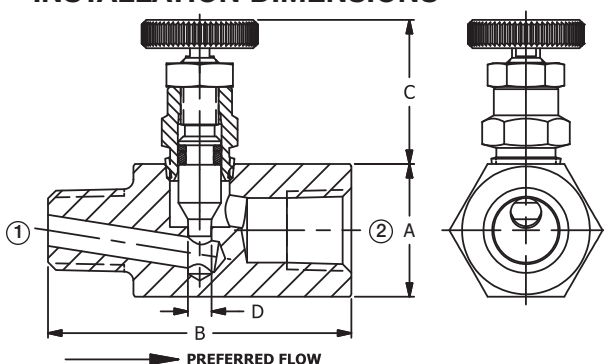
Materials

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

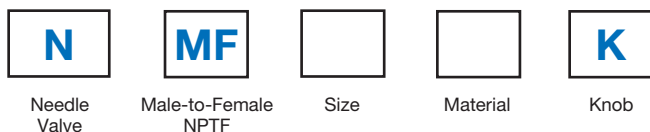
INSTALLATION DIMENSIONS



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
10	1/8"
20	1/4"
25	3/8"

Code	Material
B	Brass
S	Carbon Steel

Code	Knob
K	Knob

AVAILABLE MODEL CODES

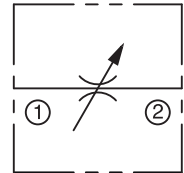
Size	NPTF Thread	
	Brass	Carbon Steel
1/8"	NMF10BK	-
1/4"	NMF20BK	NMF20SK
3/8"	-	NMF25SK

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

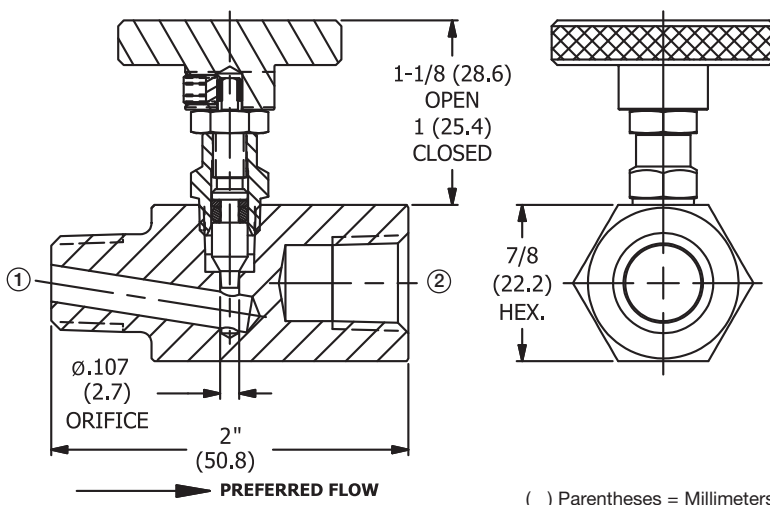
Back-Up Washer: Teflon

Lock Nut: Steel

Knob: Gold Anodized Aluminum

Set Screw: Steel

INSTALLATION DIMENSIONS



HOW TO ORDER



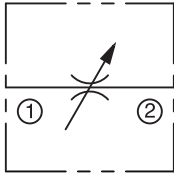
Code	Size
20	1/4"

Code	Flow
10	1/8" Needle Valve

Code	Material
S	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)

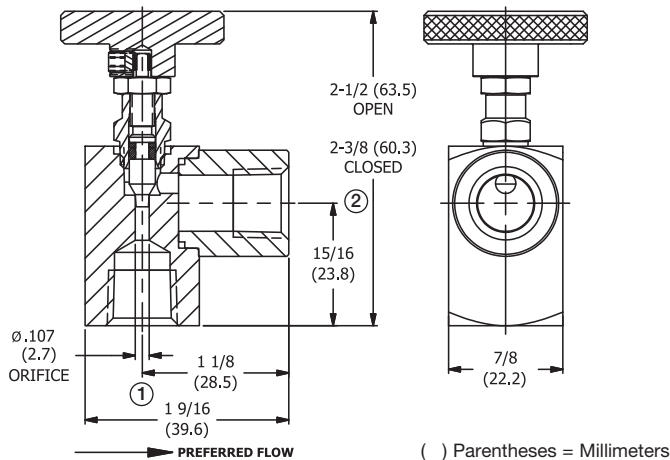
Threads

NPTF 1/4"

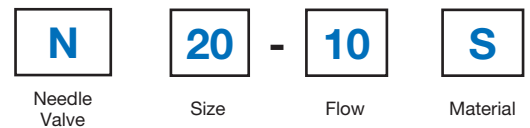
Materials

- 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



HOW TO ORDER



Code	Size
20	1/4" NPTF

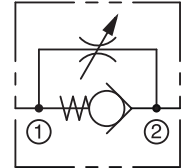
Code	Flow
10	1/8" Needle Valve

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)

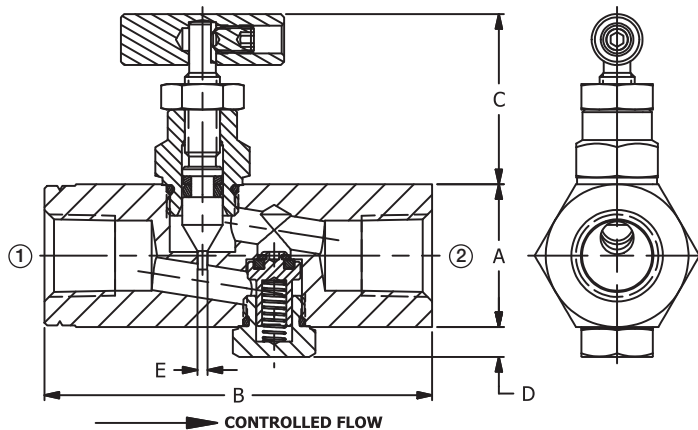
Threads

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 (17.5)	1-3/4 (44.5)	7/8 (22.3)	3/16 (4.8)	.050 (1.3)
1/4"	7/8 (22.3)	2-3/8 (60.4)	1-1/16 (27.0)	3/16 (4.8)	.062 (1.6)

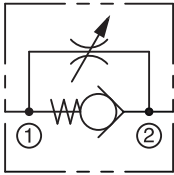
() Parentheses = Millimeters

HOW TO ORDER

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

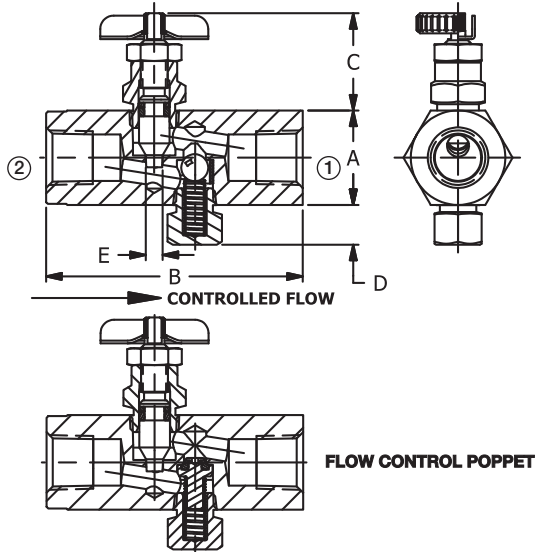
Threads

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

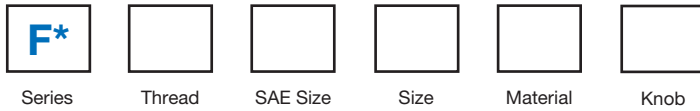
INSTALLATION DIMENSIONS



Pipe Size	A HEX	B	C Open	D	E Orifice
1/8"	11/16 (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)
3/4"	1-5/8 (41.3)	3-9/16 (90.5)	1-11/16 (42.9)	17/32 (13.5)	.344 (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"				

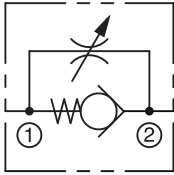
Code	Thread
Omit	NPTF
B	BSPT
M	SAE

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 F10B F10BK	F10S F10SK	- F10SSK	FB10BK	FB10SK	-
1/4"	FP20BK F20B F20BK	F20S F20SK	- F20SSK	FB20BK	FB20SK	FM620S FM620SK
3/8"	FP25BK F25B F25BK	F25S F25SK	- F25SSK	FB25BK	FB25SK	-
1/2"	F30B F30BK	F30S F30SK	- F30SSK	-	FB30SK	-
3/4"	F35B -	F35SK	- -	-	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

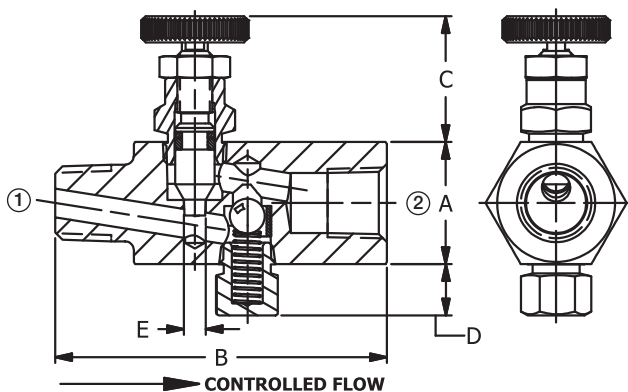
Lock Nut: Brass

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

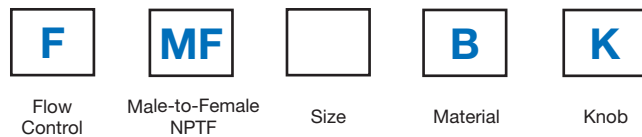
INSTALLATION DIMENSIONS



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

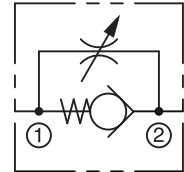
AVAILABLE MODEL CODES

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

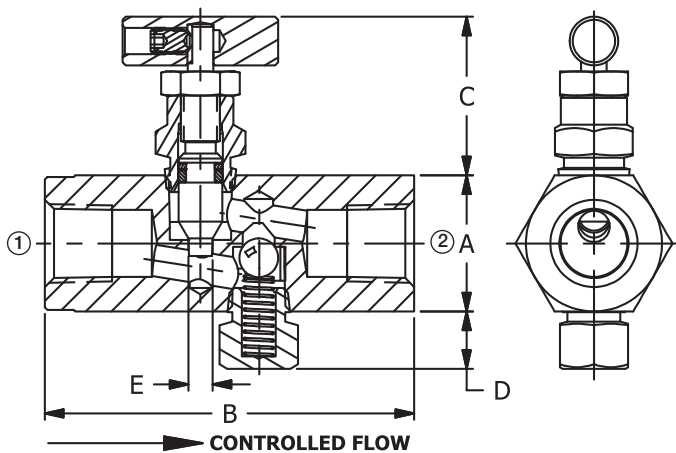
Materials

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 (22.2)	2-3/8 (60.3)	1-1/8 (28.6)	23/64 (9.1)	.156 (4.0)
1/2"	1-5/16 (33.4)	3-3/16 (81.0)	1-17/32 (38.9)	15/32 (11.9)	.281 (7.2)

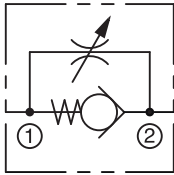
() Parentheses = Millimeters

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

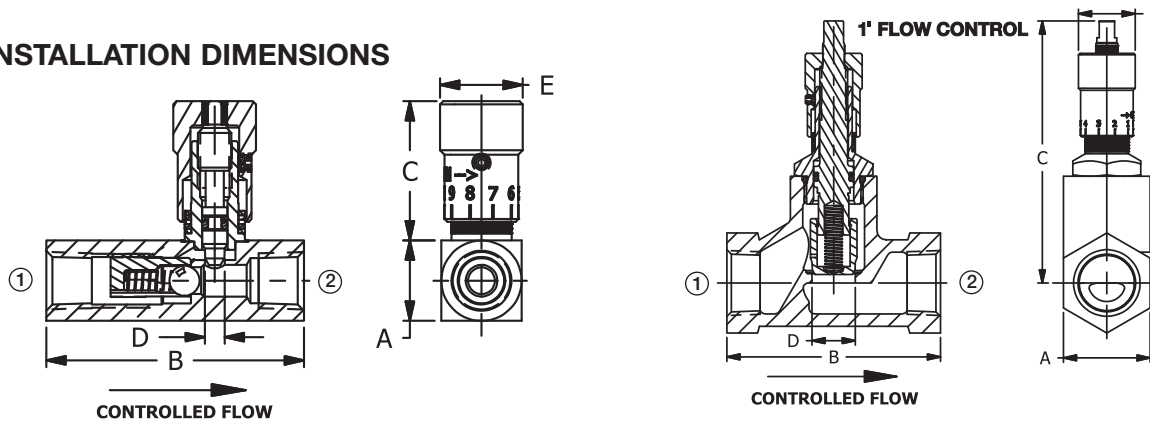
FLOW RATING

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 (15.9)	-	-	1-15/16 (49.2)	-	1-15/16 (49.2)	1-9/32 (32.5)	1-1/16 (27.0)	.125 (3.7)	23/32 (18.3)
1/4"	3/4 (19.1)	3/4 (19.1)	-	2-13/32 (61.1)	2-9/16 (65.1)	2-1/2 (63.5)	1-13/32 (35.7)	1-7/32 (31.0)	.187 (9.7)	25/32 (19.8)
3/8"	1 (25.4)	1-1/8 (28.6)	-	2-7/8 (73.1)	3-1/4 (82.6)	2-31/32 (75.4)	1-5/8 (41.3)	1-3/8 (39.9)	.250 (6.4)	57/64 (22.6)
1/2"	1-1/8 (28.6)	1-1/4 (31.8)	-	3-7/16 (87.4)	3-9/16 (90.5)	3-7/16 (87.4)	1-31/32 (50.0)	1-5/8 (41.3)	.312 (7.9)	1-1/64 (25.8)
3/4"	1-3/8 (34.9)	1-1/2 (38.1)	-	3-3/4 (95.3)	4-1/8 (104.8)	3-3/4 (95.3)	2-3/16 (55.6)	1-13/16 (46.1)	.375 (9.5)	1-5/32 (29.4)
1"	-	-	1-3/4 (44.5)	4-1/2 (114.3)	-	-	5-1/16 (128.6)	4-11/16 (119.1)	.875 (22.2)	1-5/32 (29.4)

() Parentheses = Millimeters

HOW TO ORDER



Code	Thread
Omit	NPTF
B	BSPT
BP	BSPP
M	SAE

Code	Material
B	Brass (1" - Leaded Tin Bronze)
S	Carbon Steel (1" - Ductile Iron)
SS	Stainless Steel

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

Code	Size
10	1/8"
20	1/4"
25	3/8"
30	1/2"
35	3/4"
40	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.

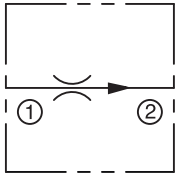
Record the information for future reference.

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 (0.4 to 7.6)	100 (6.9)
SAE 6		

SERIES 4

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

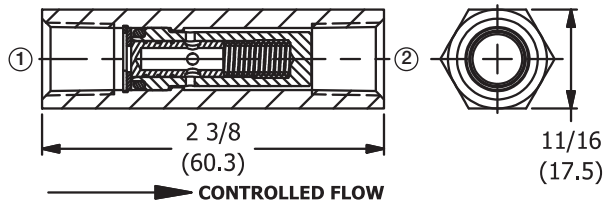
Materials (PC4)

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

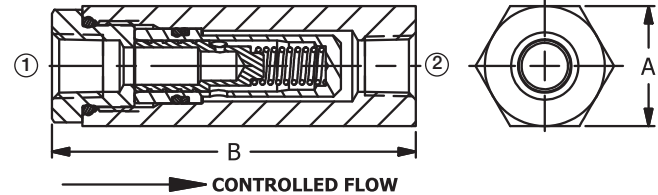
Series 3

Miniature Fixed - with Restricted Reverse Flow



Series 4

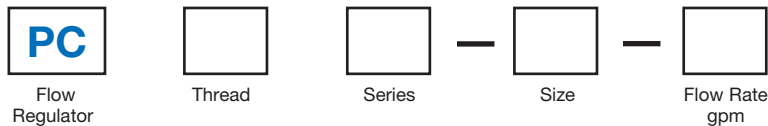
Standard Fixed - with Restricted Reverse Flow



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
M4	SAE 4
M6	SAE 6
M8	SAE 8
M12	SAE 12

Code	Series
3	Miniature
4	Standard

Code	Size		Series 3 only
	NPT	SAE	
2	1/4"	SAE 6	
21	1/4"	SAE 4	
31	3/8"	SAE 6	
41	1/2"	SAE 8	
61	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

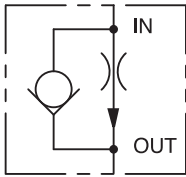
PC3 Only 1/4"		PC4 1/4"		PC4 3/8"		PC4 1/2"		PC4 3/4"	
gpm	lpm	gpm	lpm	gpm	lpm	gpm	lpm	gpm	lpm
0.10	0.38	0.50	1.90	1.00	3.79	1.50	5.68	2.00	7.57
0.15	0.57	0.75	2.84	1.20	4.55	3.00	11.36	2.50	9.47
0.20	0.76	0.90	3.41	1.50	5.68	3.50	13.25	3.00	11.36
0.30	1.14	1.00	3.79	2.00	7.57	3.75	14.20	3.50	13.25
0.40	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 Δ psi (5.2 Δ 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

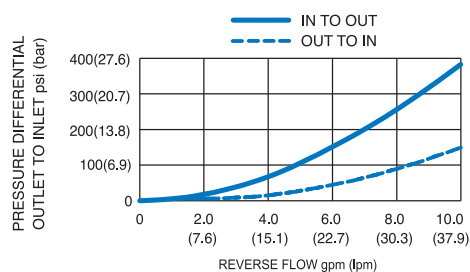
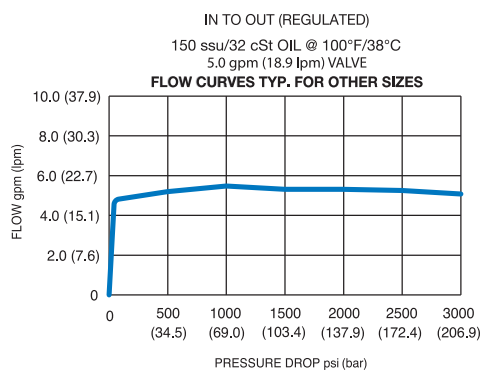
O-Ring: Buna-N

Spring: Music Wire

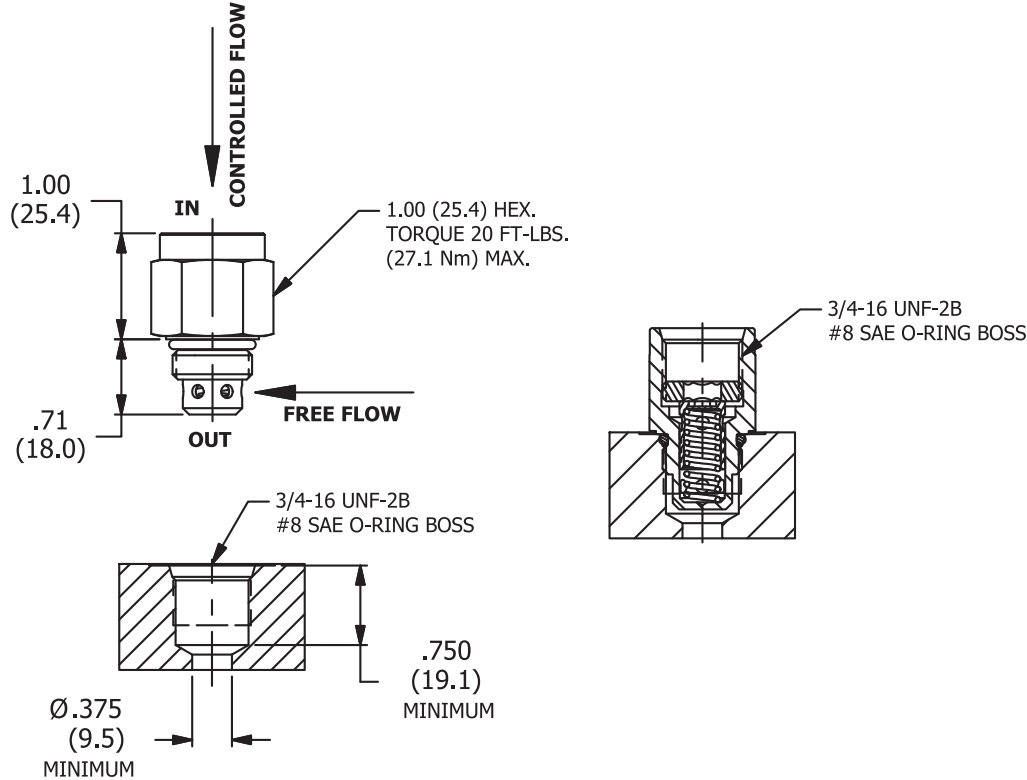
Spool: Steel

Lock Screw: Steel

PRESSURE DROP VS. FLOW

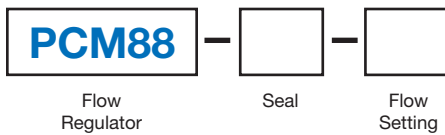


INSTALLATION DIMENSIONS



() Parentheses = Millimeters

HOW TO ORDER

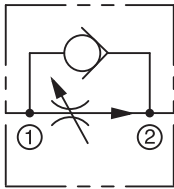


Code	Seal	Code	Flow Setting
N	Buna N	100	1.00 gpm (3.8 lpm)
		200	2.00 gpm (7.6 lpm)
		300	3.00 gpm (11.4 lpm)
		400	4.00 gpm (15.1 lpm)
		500	5.00 gpm (18.9 lpm)
		600	6.00 gpm (22.7 lpm)
		700	7.00 gpm (26.5 lpm)
		800	8.00 gpm (30.3 lpm)
		900	9.00 gpm (34.1 lpm)
		1000	10.00 gpm (37.9 lpm)

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. ΔP (Δ bar)
1/4"	0.75 to 5.0 (2.8 to 18.9)	100 - 300 (6.9 to 20.7)
3/8"	1.0 to 10.0 (3.8 to 37.9)	100 - 200 (6.9 to 13.8)
1/2"	1.5 to 15.0 (5.7 to 56.8)	200 (13.8)

ISO 7/1 - RS - BSP Taper Thread

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

SAE Thread

Size	Controlled Flow Range gpm (lpm)	Min. Oper. Press. ΔP (Δ bar)
SAE 8 (Size 3)	1.0 to 10.0 (3.8 to 37.9)	100 - 200 (6.9 to 13.8)
SAE 8 (Size 4)	1.5 to 15.0 (5.7 to 56.8)	200 (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

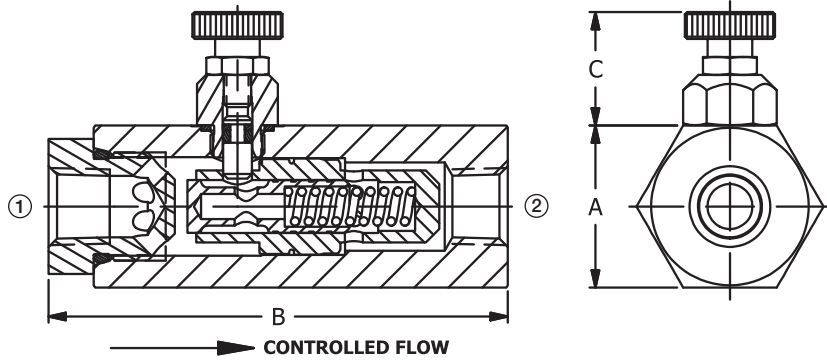
O-Rings: Viton

Back-Up Washer: Teflon

Lock Nut: Stainless Steel 303

Knob: Blue Anodized Aluminum

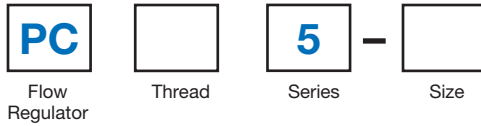
INSTALLATION DIMENSIONS



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

() Parentheses = Millimeters

HOW TO ORDER



Code	Thread
Omit	NPT
B	BSPT
M8	SAE 8

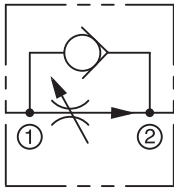
Code	Size	
	NPTF/BSPT	SAE
2	1/4"	-
3	3/8"	SAE 8
4	1/2"	SAE 8

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 (2.8 to 18.9)	100 - 300 (6.9 to 20.7)
3/8"	PC5-3	PCB5-3	-	1.0 to 10.0 (3.8 to 37.9)	100 - 200 (6.9 to 13.8)
1/2"	PC5-4	PCB5-4	-	1.5 to 15.0 (5.7 to 56.8)	200 (13.8)
SAE 8	-	-	PCM85-3	1.0 to 10.0 (3.8 to 37.9)	100 - 200 (6.9 to 13.8)
	-	-	PCM85-4	1.5 to 15.0 (5.7 to 56.8)	200 (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 ΔP (Δ bar)
1/4"	0.5 - 5.0 (1.9 - 18.9)	60 (4.1)
3/8"	1.0 - 10.0 (3.8 - 37.9)	70 (4.8)
1/2"	1.5 - 15.0 (5.7 - 56.8)	70 (4.8)
3/4"	3.0 - 30.0 (11.4 - 113.6)	70 (4.8)

SPECIFICATIONS

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

Minimum Operating Pressure
(See Flow Rating Chart)

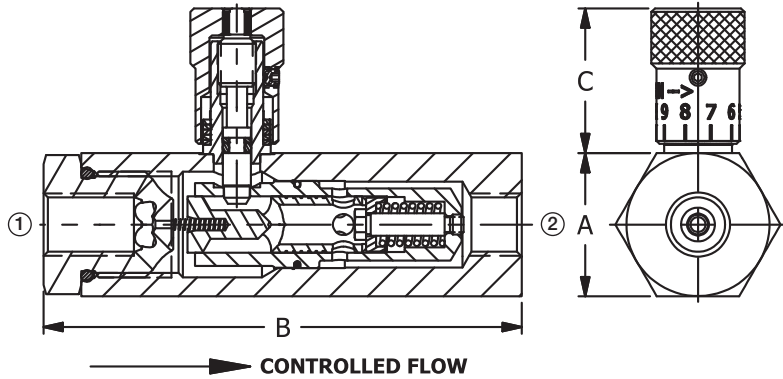
Operating Temperature Range
-15° to +400° F (-26° to +204° C)

Threads
NPTF, BSPT

Materials

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

INSTALLATION DIMENSIONS



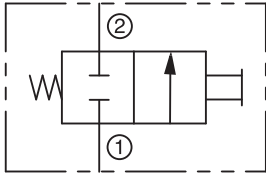
Pipe Size	A HEX	B	C Open	C Closed
1/4"	1-3/16 (30.2)	3-31/32 (100.8)	1-13/32 (35.7)	1-7/32 (31.0)
3/8"	1-1/2 (38.1)	5-27/64 (137.8)	1-31/32 (50.0)	1-5/8 (41.3)
1/2"	1-5/8 (41.3)	5-7/8 (149.3)	1-31/32 (50.0)	1-5/8 (41.3)
3/4"	1-7/8 (47.7)	6-9/16 (166.7)	2-3/16 (55.6)	1-13/16 (46.1)

() Parentheses = Millimeters

HOW TO ORDER

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

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)

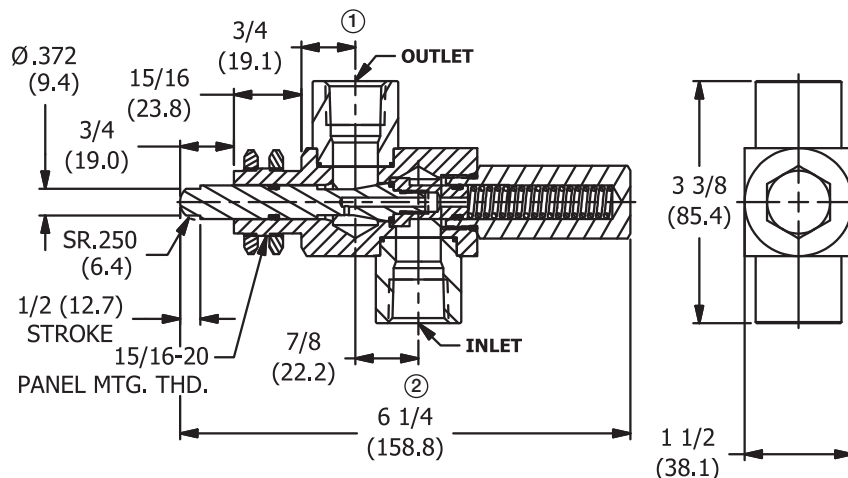
Panel Mounting Hole Size

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

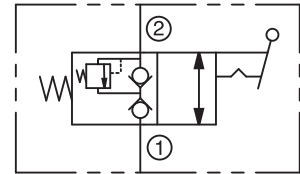
TV20B Directional Valve Female-to-Female

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"

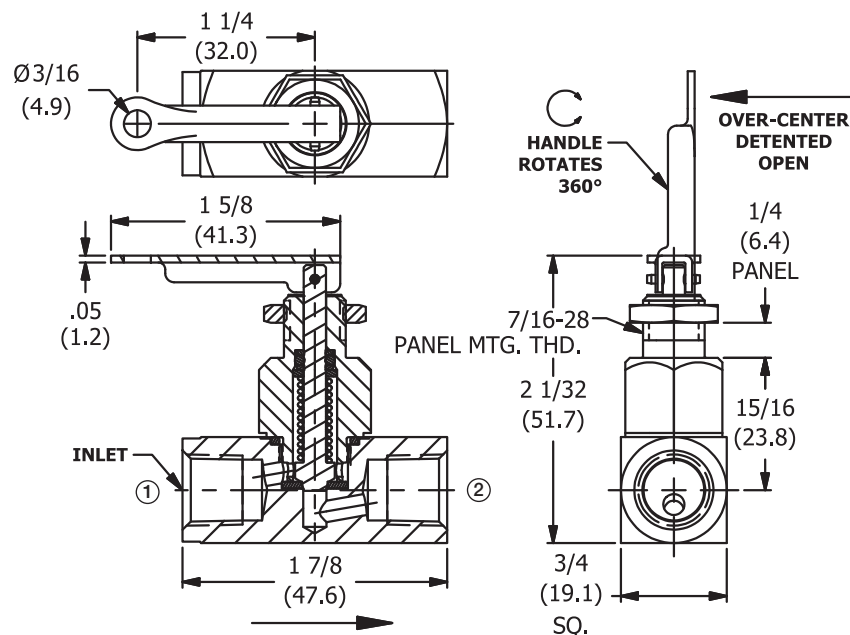
Panel Mounting Hole

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

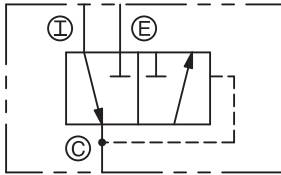


HOW TO ORDER

Size	NPTF Thread Brass	Co-Efficient (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

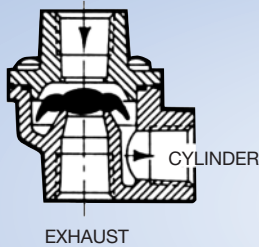


Figure A
When air is introduced into the inlet port, the diaphragm is forced into the exhaust seat. The outer lip of the diaphragm is deflected downward, away from the wall, allowing air to flow into the cylinder with a minimum of restriction. The diaphragm will remain on the exhaust seat as long as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

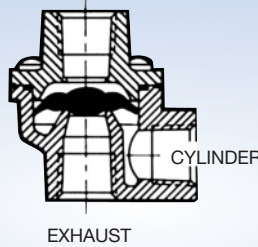


Figure B
When the cylinder is fully charged and air is no longer flowing from the inlet to cylinder port, the outer lip of the diaphragm will assume its normal shape and will contact the outer wall. The diaphragm will remain on the exhaust seat.

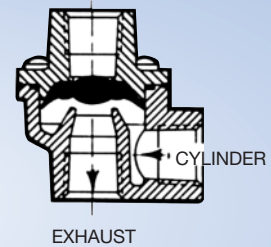
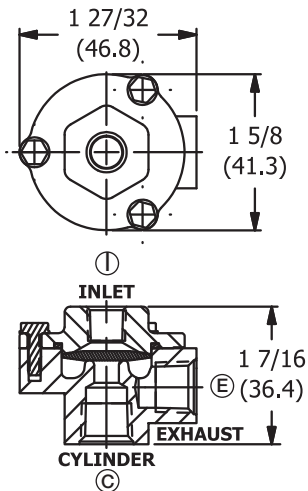


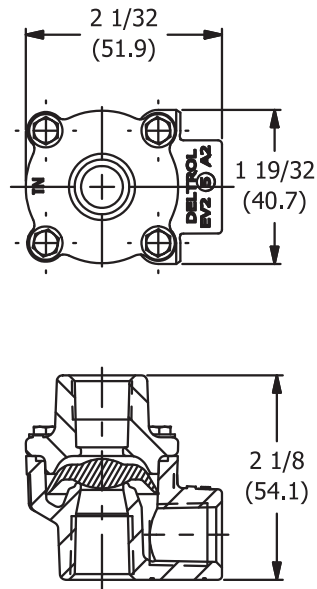
Figure C
When pressure at the inlet port is vented to atmosphere (thru the control valve) the air in the cylinder, which is at a pressure level higher than atmosphere will force the diaphragm upwards to the inlet port. This will shut off the inlet port and allow air in the cylinder to flow directly to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

INSTALLATION DIMENSIONS

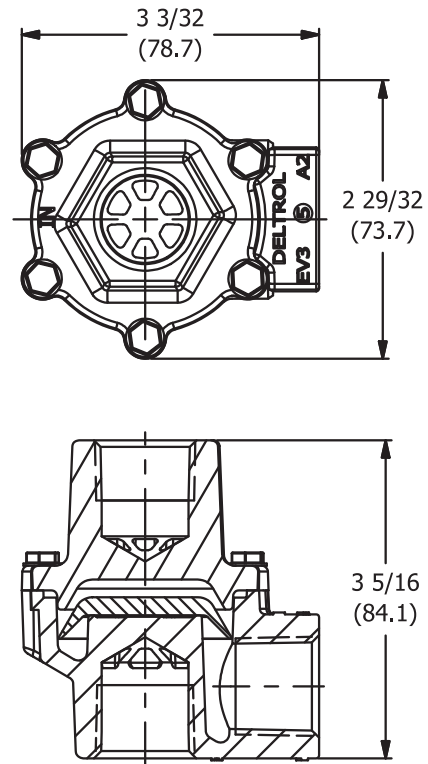
EV125-EV125-2



EV20-EV25



EV30-EV35



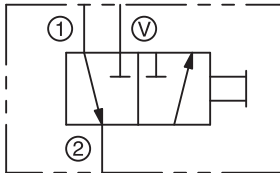
() Parentheses = Millimeters

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 ΔP (Δbar) 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

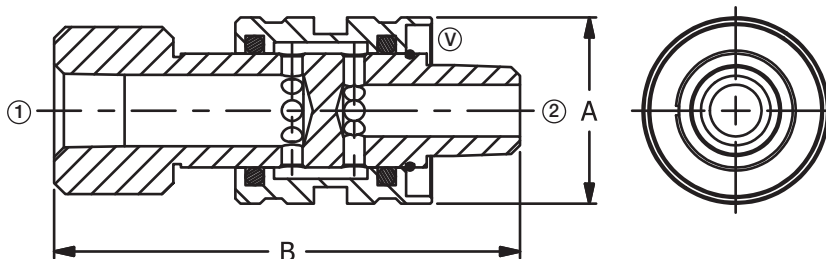
Body: Steel

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

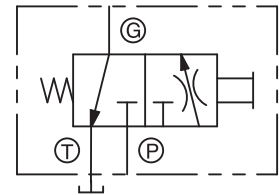
Size	NPTF Thread	Co-Efficient (Cv Factor)
1/8"	SL10	.98
1/4"	SL20	1.53
3/8"	SL25	1.78
1/2"	SL30	3.26

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

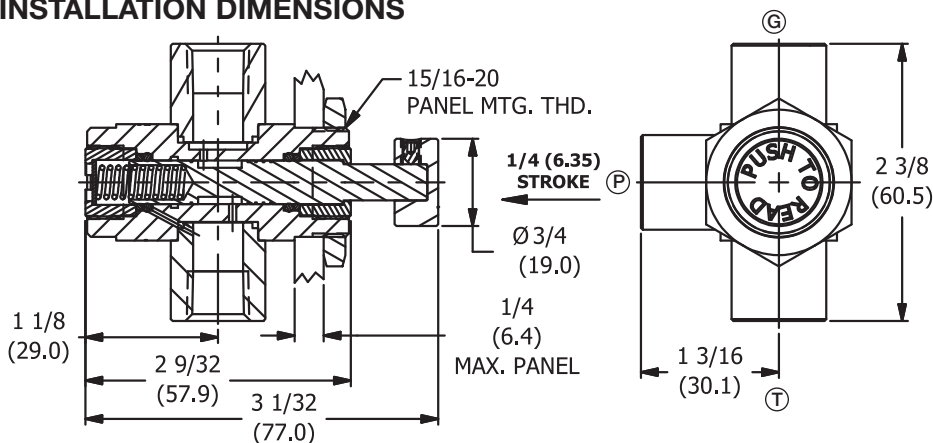
Back-Up Washers: Teflon

Set Screw: Steel

Knob: Blue Anodized Aluminum

Panel Mount Nut: Nickel Plated Brass

INSTALLATION DIMENSIONS



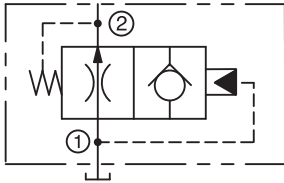
() Parentheses = Millimeters

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"

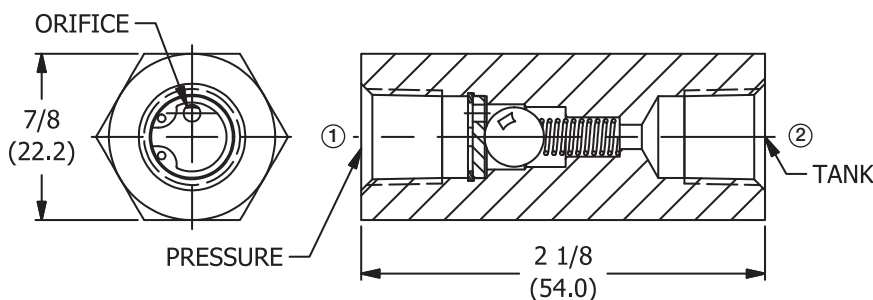
Orifice Diameter

.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.

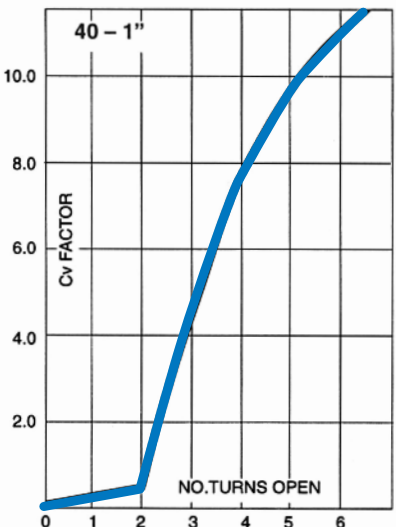
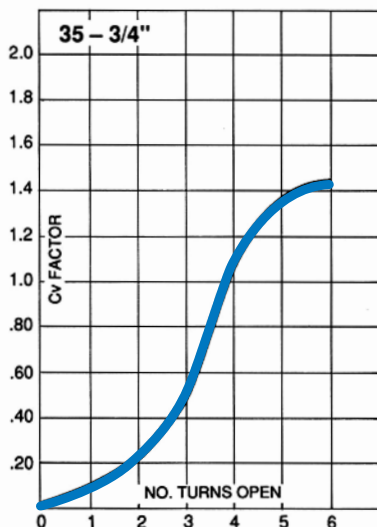
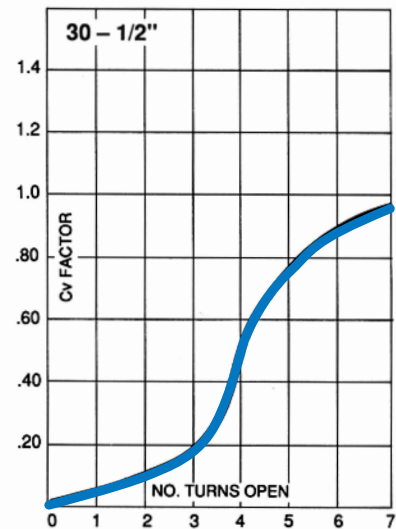
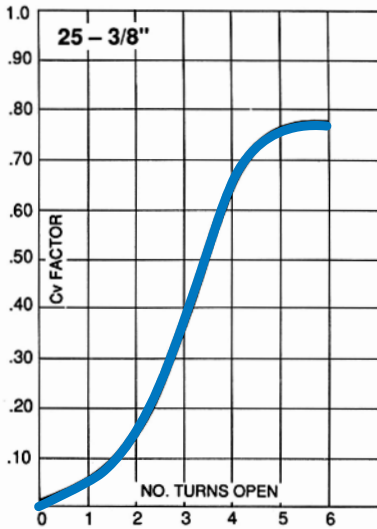
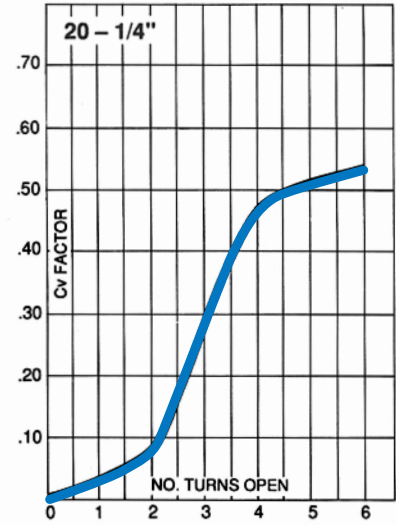
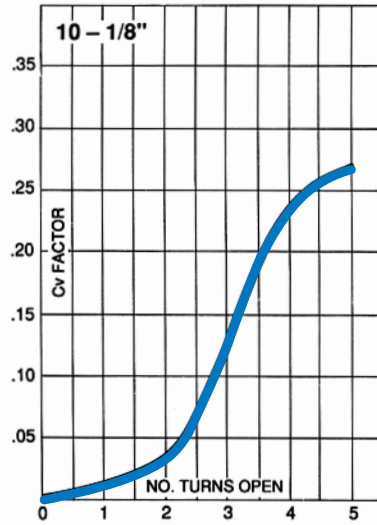
The colored band on the stem and the numerical readout indicate to what extent the valve is opened or closed. Each color on the color band represents one full turn.

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

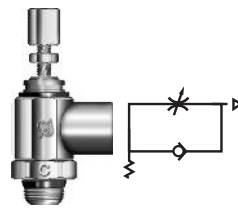
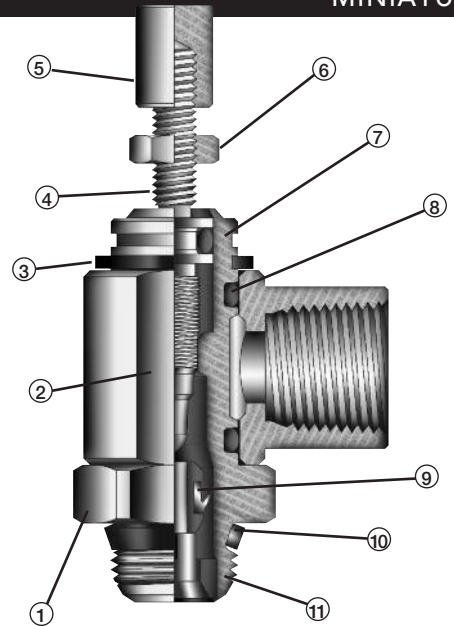
Miniature Flow Controls and Needle Valves

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

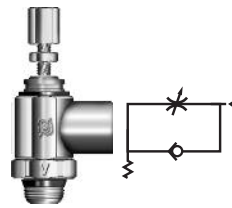
The LNB Series Needle Valve provides a wide range of adjustment in both directions.

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

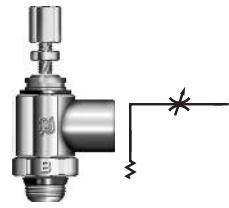
- | | | |
|----|------------------|---------------------|
| 1 | Body | Nickel Plated Brass |
| 2 | Banjo Body | Nickel Plated Brass |
| 3 | Shaft Clip | Stainless Steel |
| 4 | Adjusting Needle | Nickel Plated Brass |
| 5 | Adjusting Knob | Nickel Plated Brass |
| 6 | Locking Nut | Nickel Plated Brass |
| 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.



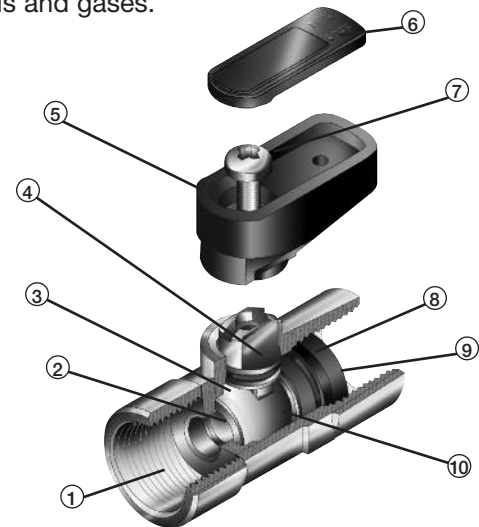
MBV SERIES

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

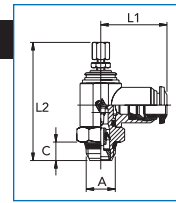
LFC, LFM, AND LNB SERIES

Tube Interface Knob Adjustment

Inch • Metric Tube Valve With Knob Adjustment



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

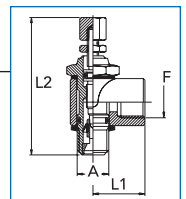


Model Code	Func	A	Tube OD	C	L1	L2 min	L2 max	Model Code	unc	A	Tube OD	C	L1	L2 min	L2 max
LFCU32TAK	C	10-32UNC	1/8"	0.22	0.75	1.30	1.47	LFVS20TKK	V	1/4" SWIFT	6mm	0.27	0.98	1.85	2.08
LFVU32TAK	V	10-32UNC	1/8"	0.22	0.75	1.30	1.47	LNBS20TKK	B	1/4" SWIFT	6mm	0.27	0.98	1.85	2.08
LNBU32TAK	B	10-32UNC	1/8"	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.

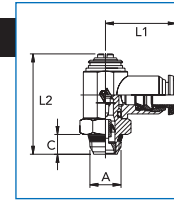
Miniature Series

LFC, LFV, AND LNB SERIES
Tube Interface Screw Adjustment

Inch • Metric Tube Valve With Knob Adjustment



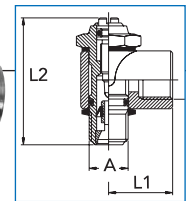
Blue Collar Identifies Inch Tube Size
Black Collar Identifies Metric Tube Size



Model Code	Func	A	Tube OD	C	L1	L2	Model Code	Func	A	Tube OD	C	L1	L2
LFUC32TAS	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
LFUC32TBS	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
LFUCM05TGS	C	M5	3mm	0.16	0.75	0.95	LFVS25TES	V	3/8" SWIFT	3/8"	0.29	1.18	1.61
LFVUM05TGS	V	M5	3mm	0.16	0.75	0.95	LNBS25TES	B	3/8" SWIFT	3/8"	0.29	1.18	1.61
LNBUM05TGS	B	M5	3mm	0.16	0.75	0.95	LFCS25TFS	C	3/8" SWIFT	1/2"	0.29	1.28	1.61
LFUCM05THS	C	M5	4mm	0.16	0.75	0.95	LFVS25TFS	V	3/8" SWIFT	1/2"	0.29	1.28	1.61
LFVUM05THS	V	M5	4mm	0.16	0.75	0.95	LNBS25TFS	B	3/8" SWIFT	1/2"	0.29	1.28	1.61
LNBUM05THS	B	M5	4mm	0.16	0.75	0.95	LFCS25TMS	C	3/8" SWIFT	10mm	0.29	1.20	1.61
LFUCM05TJS	C	M5	5mm	0.16	0.79	0.95	LFVS25TMS	V	3/8" SWIFT	10mm	0.29	1.20	1.61
LFVUM05TJS	V	M5	5mm	0.16	0.79	0.95	LNBS25TMS	B	3/8" SWIFT	10mm	0.29	1.20	1.61
LNBUM05TJS	B	M5	5mm	0.16	0.79	0.95	LFCS25TNS	C	3/8" SWIFT	12mm	0.29	1.28	1.61
LFUCM05TKS	C	M5	6mm	0.16	0.81	0.95	LFVS25TNS	V	3/8" SWIFT	12mm	0.29	1.28	1.61
LFVUM05TKS	V	M5	6mm	0.16	0.81	0.95	LNBS25TNS	B	3/8" SWIFT	12mm	0.29	1.28	1.61
LNBUM05TKS	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
LFUC32NDS	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

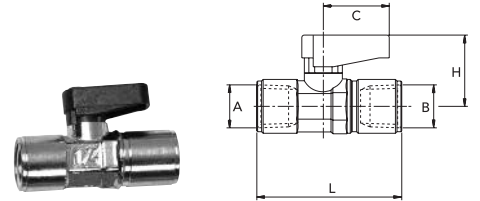
MBV Series

MINIATURE

MBV SERIES

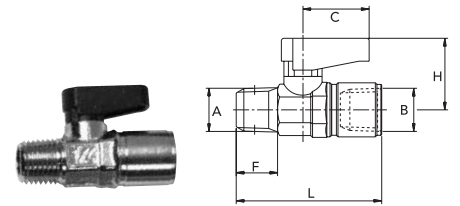
Miniature Ball Valve Female NPTF

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



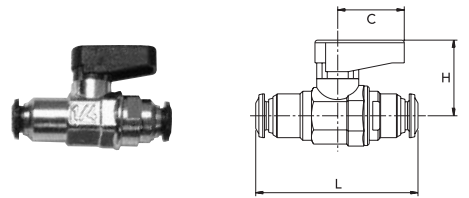
Miniature Ball Valve Male NPTF, Female NPTF

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



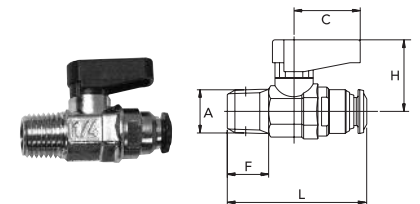
Miniature Ball Valve Tube, Tube

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



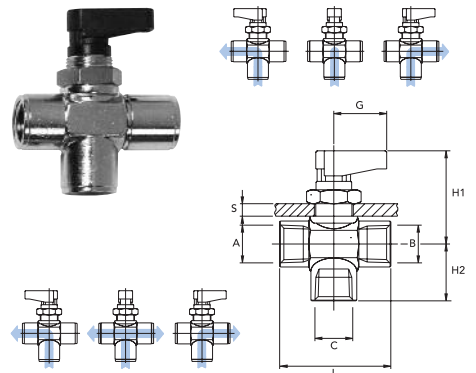
Miniature Ball Valve Tube, Male NPTF

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



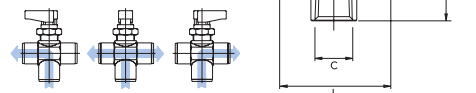
Miniature Ball Valve Female NPTF, Closed Center

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



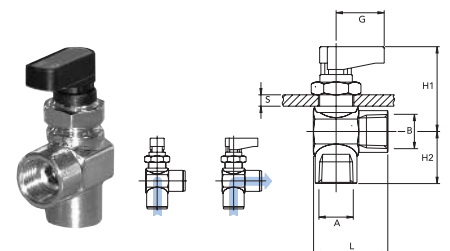
Miniature Ball Valve Female NPTF, Open Center

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



WARRANTY

Deltrol Fluid Products Division/Deltrol Corp. warrants each product manufactured by it to be free from defects in material and workmanship under normal use and service appearing within one (1) year. The obligation of Deltrol Fluid Products Division/Deltrol Corp. and the right of the purchaser under this warranty are limited to repair or replacement (at the option of Deltrol Fluid Products Division/Deltrol Corp.) at the factory. The purchaser must give notice of any defect within one (1) year from the date of purchase and must return the product intact, at its expense. Deltrol Fluid Products Division/Deltrol Corp. will have no responsibility to repair or replace product which has been repaired or altered by anyone other than Deltrol Fluid Products Division/Deltrol Corp., or which has been subject to misuse, negligence, accident, incorrect connection, or improper installation.

This warranty is in lieu of any other warranties, express or implied; and seller specifically disclaims and implied warranty or merchantability of fitness for any particular purpose.

DISCLAIMER OF OTHER LIABILITIES

The liability of Deltrol Fluid Products Division/Deltrol Corp. with respect to products that it sells is limited to performance under the warranty set forth above.

Deltrol Fluid Products Division/Deltrol Corp. shall not be subject to and disclaims: (A) Any other obligations or liabilities arising out of breach of contract or of warranty, (B) Any obligations whatsoever arising from tort claims (including negligence and strict liability claims) or arising under other theories of law with respect to goods sold or any undertakings, acts or omissions relating thereto, and (C) All consequential, incidental, special and contingent damages whatsoever.

WARNING

The products shown in this catalog were designed and developed for use in fluid power applications. Do not use the products in other applications without the express written approval of Deltrol Fluid Products Division/Deltrol Corp. Misuse of the products, including use in other applications, may cause death, serious injury or property damage.

NOTICE

Deltrol Fluid Products Division/Deltrol Corp. reserves the right to change designs and/or specifications without notice. Although it has attempted to check the data, dimensions and tables in this catalog, Deltrol Fluid Products Division/Deltrol Corp. will have no responsibility for errors or omissions that it may contain.

Please visit us at
www.deltrofluid.com
for information on these other Deltrol product lines:

- Hydraulic Integrated Circuit Manifolds
- Cartridge Valves & Integrated Circuit Manifolds
- Custom Solutions for your Fluid Power and Fluid Control demands

Or Contact Us and Request a Free Catalog



3001 Grant Avenue | Bellwood, Illinois 60104

PHONE 708. 547. 0500 | FAX 708. 547. 6881

EMAIL info@deltrofluid.com

www.deltrofluid.com

