GENERANT
Valves & Bi-Lok Fittings

FORGED NEEDLE VALVE
1/8" - 3/8" NPT
1/8" and 1/4" Dual Ferrule Tube
Vacuum - 5000 Psig (345 Bar)

FNV SERIES

Description
Series FNV Needle Valves feature a forged body, integral bonnet design with PTFE and metallic wafer stem packing. This provides leak-tite service from vacuum to the maximum operating pressure. Series FNV are available in Straight and Angle configurations, with NPT and Dual Ferrule Tube connections. The industry standard panel mounting allows the FNV to be a cost effective solution to many applications. Standard metal to metal stem and optional Soft Tip stem provide accurate metering over a wide range of pressures. The Series FNV can be ordered Cleaned for Oxygen Service.

Features
- Metallic and PTFE Wafer Stem Packing provides low operating torque
- Panel Mounting Standard
- Metal to Metal Standard, Optional Soft Stem Tip (PCTFE)
- Straight or Angle Body Configurations
- Male and Female NPT or Dual Ferrule Tube Connections
- Suitable For Cryogenic Service
- 100% Factory Tested

Technical Data
Maximum Operating Pressure @ 100º F
Brass: 3000 Psig (207 Bar)
Stainless: 5000 Psig (345 Bar)

Temperature/Pressure Ratings

Temperature, °F (°C)	Max. Working Pressure, Psig (Bar)	
	Brass	316 SS
- 320 (-195) to 100 (38)	3000 (207)	5000 (345)
100 (38) to 250 (121)	2200 (151)	4085 (282)
250 (121) to 350 (177)	1470 (101)	3715 (256)
350 (177) to 450 (232)	-	3435 (237)

Temperature Range:

Metal to Metal Stem: -320° to 450° F (-195°C to 232°C)
PCTFE Soft Stem Tip: -65° to 200°F (-54° to 93°C)
NOTE: Stem Packing may begin to bind up, making valve adjustment difficult or impossible, at temperatures below -65°F.

Orifice: 0.17" (4.32 mm)

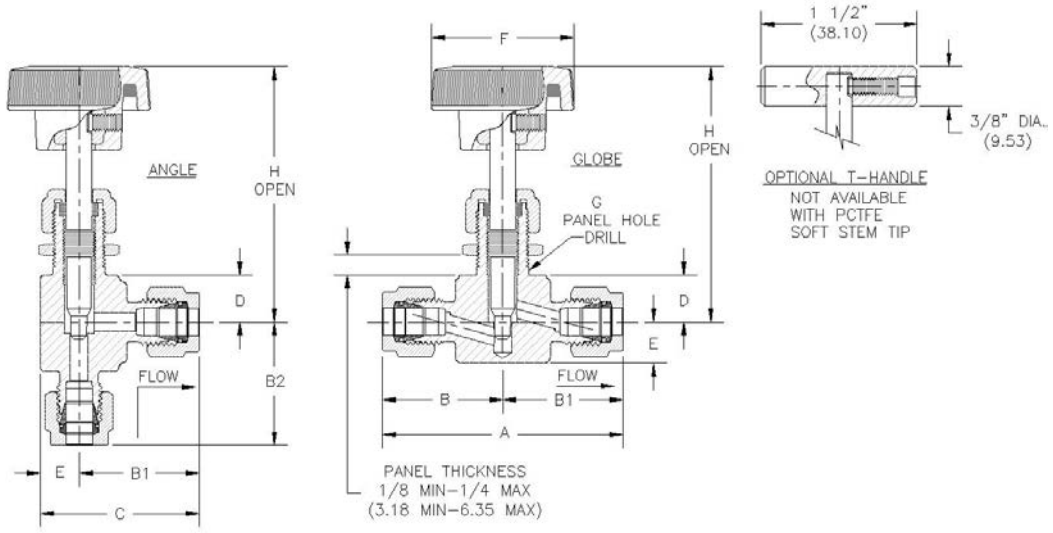
Flow Coefficient (Cv): 0.37

Internal and External Leakage:
0.1 cc/min max at 1000 PSI (69 bar).

Materials of Construction

Component	Brass	Stainless
Valve Body	Brass, ASTM 377	316 SS, ASTM A182
Packing Nut	Brass, ASTM B16	316 SS, ASTM A479
Regulating Stem	316 SS, ASTM A479	
Packing Washers	Brass, ASTM B36	316 SS, ASTM A479
Packing	PTFE, ASTM D1710	
Soft Stem Tip	PCTFE (Neoflon® M400), ASTM D1430	
Panel Nut	Brass, ASTM B16	303 SS, ASTM A582
Round Handle	Nylon 6/6 (Zytel®) with Brass Insert	
"T" Handle	303 SS, ASTM A582	
Handle Set Screw	304 SS, ASTM A182	
Lubricant	Oxygen Compatible Perfluoropolyether (PFPE) Grease	

FORGED NEEDLE VALVE

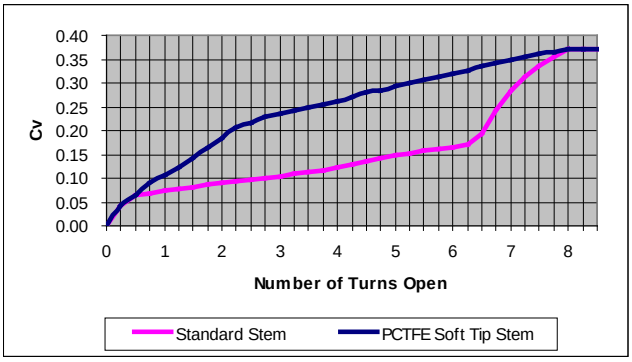


Dimensional Data

MODEL CODE	PORT CONFIGURATION		Dimension in inches (mm)										
	INLET	OULET	A	B	B1	B2	C	D	E	F	G	H (open)	Orifice
FNV-2T	1/8" Tube		2.07 (52.58)	1.04 (26.42)	1.04 (26.42)	1.04 (26.42)	1.42 (36.07)	0.44 (11.18)	0.38 (9.65)	1.34 (34.04)	0.53 (13.46)	2.34 (59.44)	.08 (2.03)
FNV-2F	1/8" Female NPT		1.62 (41.15)	.81 (20.57)	.81 (20.57)	.81 (20.57)	1.19 (30.23)						0.17 (4.32)
FNV-2M	1/8" Male NPT		1.70 (43.18)	.85 (21.59)	.85 (21.59)	.85 (21.59)	1.24 (31.50)						
FNV-2MF	1/8" Male NPT	1/8" Female NPT	1.67 (42.42)		.81 (20.57)		1.19 (30.23)						
FNV-2MT	1/8" Male NPT	1/8" Tube	1.89 (48.01)		1.02 (25.91)		1.41 (35.81)						
FNV-2M4T	1/8" Male NPT	1/4" Tube	2.01 (51.05)		1.15 (29.21)	1.15 (29.21)	1.54 (39.12)						
FNV-4T	1/4" Tube		2.31 (58.67)	1.15 (29.21)									
FNV-4F	1/4" Female NPT		2.12 (53.85)	1.06 (26.92)	1.06 (26.92)	1.11 (28.19)	1.45 (36.83)						
FNV-4M	1/4" Male NPT		2.04 (51.82)	1.02 (25.91)	1.02 (25.91)	1.02 (25.91)	1.40 (35.56)						
FNV-4MF	1/4" Male NPT	1/4" Female NPT	2.08 (52.83)		1.06 (26.92)		1.45 (36.83)						
FNV-4MT	1/4" Male NPT	1/4" Tube	2.17 (55.12)		1.15 (29.21)		1.54 (39.12)						
FNV-6M	3/8" Male NPT		2.25 (57.15)	1.12 (28.45)	1.12 (28.45)	1.12 (28.45)	1.51 (38.35)						

Note: Dimensions are shown with Bi-Lok nuts finger-tight. Dimensions are in inches (millimeters), for reference only and subject to change. All valve bodies are 3/4" (19 mm) wide. NPT Threads per ASME B1.20.1

Flow Coefficient (Cv) @ Turns Open



How To Order

F N V - 4 T A S S - K - X

- Model Code: FNV - Forged Needle Valve. See Dimensional Data Above
- Body Configuration: For Angle Configuration, Add "A" to Model Code
- Material Code: B - Brass; SS - 316 Stainless Steel
- Options: K - PCTFE Soft Tip Stem; SH - Stainless Steel Handle
- Cleaning Option: X- Cleaned and Packaged for Oxygen Service

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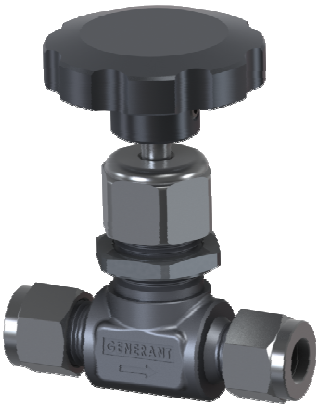
FORGED NEEDLE VALVE, ML STAINLESS
1/4” to 1/2” NPT
3/8” to 3/4" Dual Ferrule Tube Connection
Vacuum - 6000 Psig (414 Bar)

SERIES FNV ML STAINLESS

Description

Series FNV ML Stainless Forged Needle Valves feature a forged body, integral bonnet design with spring loaded PTFE and stainless steel wafer stem packing. Valves provide long life, leak-tight service from vacuum to the maximum operating pressure. Series FNV ML Stainless Forged Needle Valves are available in Straight and Angle configurations and with NPT and Dual Ferrule Tube connections. Valves come ready to panel mount and with stainless steel stem tip standard for a metal to metal internal seal but user can specify Soft Tip (PCTFE) stem. Both provide accurate metering over a wide range of pressures. All valves can be ordered Cleaned for Oxygen Service.



Features

- Spring Loaded Stainless Steel / PTFE Wafer Stem Packing provides low operating torque and long lasting stem seal.
- Panel Mounting Standard
- Metal to Metal Standard, Optional Soft Stem Tip (PCTFE)
- Straight or Angle Body Configurations
- Male NPT, Female NPT, or Dual Ferrule Tube Connections
- Suitable For Cryogenic Service
- 100% Factory Tested

Technical Data

Max Working Pressure (Temperature Dependent):

Temperature	Max. Working Pressure, Psig (Bar)
- 320°F to 300°F (-196°C to 149°C)	6000 (413.7)
300°F to 400°F (149°C to 204°C)	5640 (388.9)
400°F to 450°F (204°C to 232°C)	5480 (377.9)

Usable Temperature per Stem Type:
Metal Stem Tip: -320° to 450° F (-195°C to 232°C)
PCTFE Soft Stem Tip: -65° to 200°F (-54° to 93°C)
NOTE: Stem Packing may begin to bind up, making valve adjustment difficult or impossible, at temperatures below -65°F.

Maximum Flow Coefficient:
Dependent on Orifice Size, see Dimensional Data.

Orifice Size	Cv
0.250”	0.65
0.375”	1.60

Additional Flow Information provided in chart on next page.

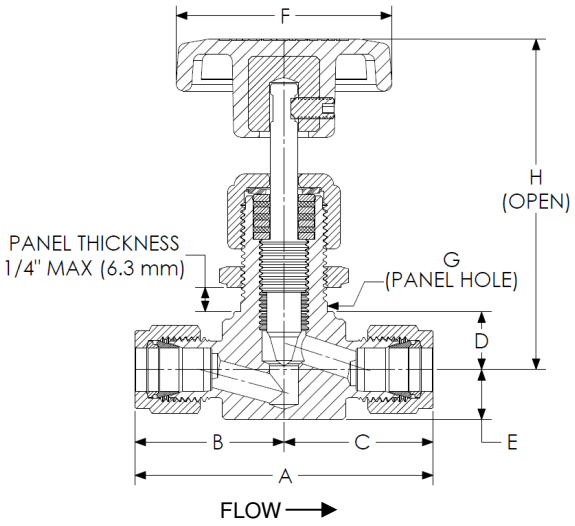
Internal and External Leakage:
0.1 cc/min max at 1000 PSI (69 Bar).

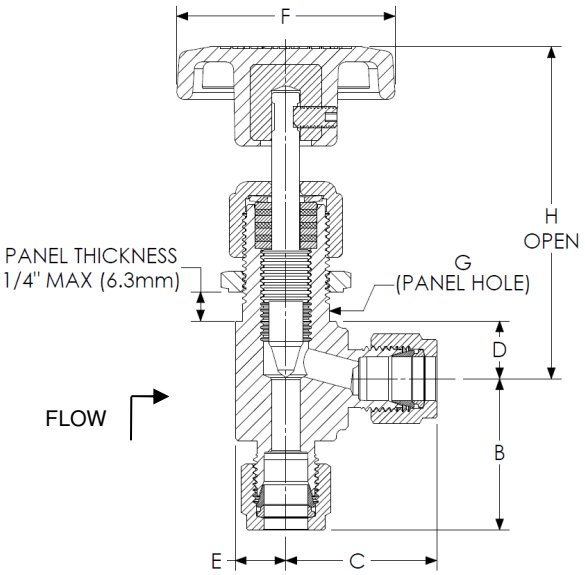
Materials of Construction

Component	Material
Valve Body	316 SS, ASTM A182
Packing Nut	316 SS, ASTM A479
Regulating Stem	
Packing Washers	
Packing	PTFE, ASTM D1710
Spring Washer	302 Stainless Steel
Soft Stem Tip	PCTFE, ASTM D1430
Panel Nut	303 SS, ASTM A582
Round Handle*	Anodized Aluminum
"T" Handle*	303 SS, ASTM A582
Handle Set Screw	304 SS, ASTM A182
Lubricant	Oxygen Compatible Perfluoropolyether (PFPE) Grease

*Round handle supplied with 0.250” orifice valves, “T” handle supplied with 0.375” orifice valves.

FORGED NEEDLE VALVE

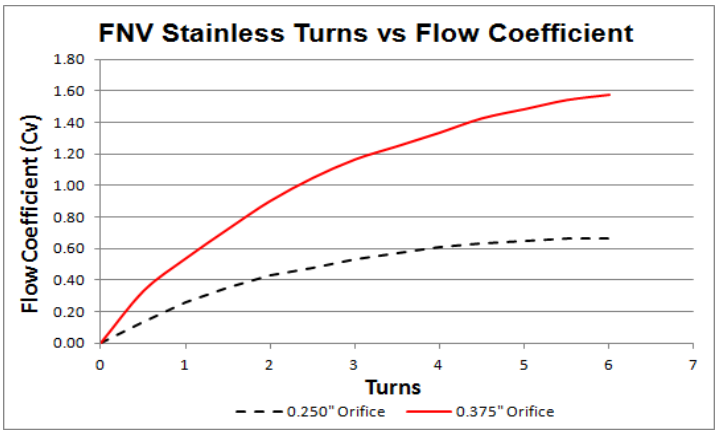




Dimensional Data

MODEL CODE	PORT CONFIGURATION		Dimension in inches (mm)									
	INLET	OULET	A	B	C	D	E	F	G	H	Orifice	Handle
FNV-6TSSM	3/8" Dual Ferrule Tube		2.58 (65.5)	1.29 (32.8)		0.50 (12.7)	0.44 (11.2)	1.87 (47.5)	0.78 (19.8)	2.86 (72.6)	0.25 (6.4)	Round
FNV-8TSSM	1/2" Dual Ferrule Tube		2.76 (70.1)	1.38 (35.1)								
FNV-4FSSM	1/4" NPT Female		2.12 (53.8)	1.06 (26.9)								
FNV-6MSSM	3/8" NPT Male		2.26 (57.4)	1.13 (28.7)								
FNV-4M6TSSM	1/4" NPT Male	3/8" Tube	2.42 (61.5)	1.13 (28.7)	1.29 (32.8)							
FNV-6MTSSM	3/8" NPT Male	3/8" Tube	2.19 (55.6)	1.13 (28.7)	1.06 (26.9)							
FNV-6M8TSSM	3/8" NPT Male	1/2" Tube	2.51 (63.8)	1.13 (28.7)	1.38 (35.1)							
FNV-4MFSSM	1/4" NPT Male	1/4" NPT Female	2.19 (55.6)	1.13 (28.7)	1.06 (26.9)							
FNV-8TSSL	1/2" Dual Ferrule Tube		3.80 (96.5)	1.90 (48.3)		0.75 (19.0)	0.60 (15.2)	3.00 (76.2)	1.03 (26.2)	3.82 (97.0)	0.38 (9.5)	T-Handle
FNV-12TSSL	3/4" Dual Ferrule Tube											
FNV-6FSSL	3/8" NPT Female		3.00 (76.2)	1.50 (38.1)								
FNV-8FSSL	1/2" NPT Female											
FNV-8MSSL	1/2" NPT Male											
FNV-8MFSSL	1/2" NPT Male	1/2" NPT Female										

Note: Dimensions are shown with Bi-Lok nuts finger-tight. Dimensions are in inches (millimeters), for reference only and subject to change. NPT Threads per ASME B1.20.1



How To Order

FNV-6TSSM - K - X

MODEL CODE

FNV-____ - Forged Needle Valve
See Dimensional Data Above.
For Angle Configuration, Insert "A" before "SS" material code.
E.G. "FNV-6TASSM"

OXYGEN CLEAN

X - Cleaned and Packaged for Oxygen Service

OPTIONS

K - PCTFE Soft Tip Stem

PROPER COMPONENT SELECTION: When specifying a component, total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

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PRECISION METERING VALVE
1/8" and 1/4" NPT
1/8" and 1/4" Dual Ferrule Tube
Vacuum - 1000 Psig (68.9 Bar)

PMV SERIES

Description

Series PMV Precision Metering Valves are designed for accurate and repeatable flow control of fluids and gases. Valves feature a one-piece forged body and a screwed bonnet design. Stainless steel 3 degree tapered stem seals bubble tight into an Acetal soft seat. With panel mounting and lockable adjustment standard, these valves offer cost effective solutions for precise metering.

Features

- Straight or Angle Flow Patterns
- Forged Body Brass or Stainless Steel Construction
- NPT or Dual Ferrule Tube Connections
- Unique Soft Seat Provides Positive Shut Off
- Wear Compensating Knob Adjustment
- Locking Screw Prevents Inadvertent Flow Changes
- Stem Threads are isolated from System Fluid
- 100% Factory Tested for Leakage

Technical Data

Maximum Operating Pressure @ 100° F
Brass and Stainless: 1000 Psig (68.9 Bar)
Stem Taper: 3 Degree (included angle)
Stem Pitch: 40 Threads per inch
Orifice: 0.055" (1.4 mm)
Flow Coefficient (Cv): 0.04
Panel Mounting
Panel Mount Hole: 9/16" (14.3 mm)
Max Panel Mount Thickness: 1/8" (3.3 mm)
Factory Preset for zero flow at positive stop with 150 Psig (10.34 Bar)

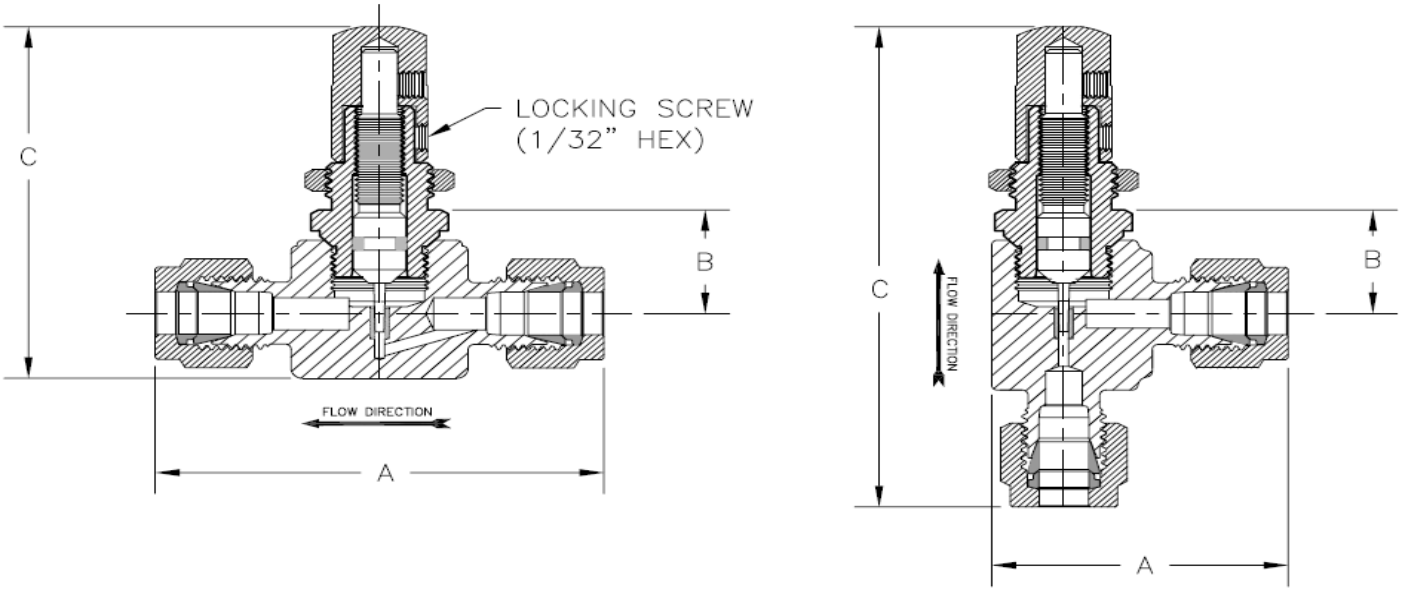
Temperature Range:
Seal Dependent (See How To Order)

Materials of Construction

Component	Valve Body Material	
	Brass	Stainless Steel
Body	Forged Brass, ASTM 377	Forged 316 SS, ASTM A182
Bonnet	Brass, ASTM B16, Nickel Plated	316 SS, ASTM A479
Stem	316 SS, ASTM A479	
Knob and Panel Nut	Brass, ASTM B16, Nickel Plated	
Seat Insert	Acetal CoPolymer, ASTM D4181	
O-Ring	Buna-N, Neoprene, Ethylene Propylene or Viton®	
Set Screw (2)	18-8 SS, ASTM A182	

Nickel Plating per ASTM B689
Stem Threads and O-Rings are lubricated with Krytox®

PRECISION METERING VALVE

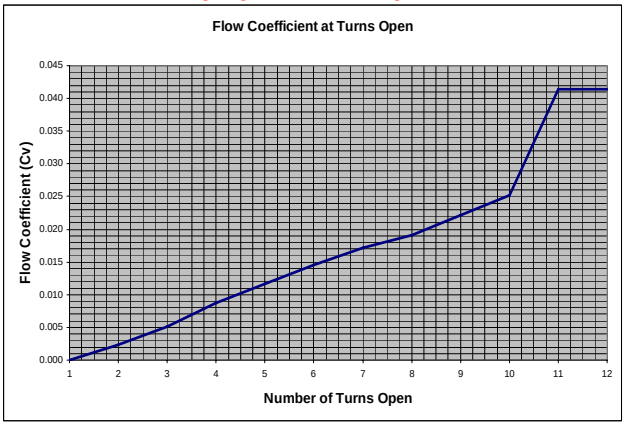


Dimensional Data

Model Code	Port Configuration			Dimensions in inches (mm)				
	Inlet	Outlet	Configuration	Orifice	OAL "A"	Panel To C/L "B"	Height "C"	Knob Diameter
PMV-2T	1/8" Tube		Straight	0.055 (1.4)	2.07 (52.58)	.62 (15.75)	2.10 (53.34)	0.50 (12.7)
PMV-4T	1/4" Tube		Straight		2.31 (58.70)		2.10 (53.34)	
PMV-2TA	1/8" Tube		Angle		1.43 (36.20)		2.75 (69.72)	
PMV-4TA	1/4" Tube		Angle		1.53 (38.74)		2.89 (73.30)	
PMV-2F	1/8" Female NPT		Straight		1.63 (41.28)		2.10 (53.34)	
PMV-2FA	1/8" Female NPT		Angle		1.19 (30.15)		2.50 (63.50)	
PMV-2PTA	1/8" Male NPT	1/8" Tube	Angle		1.43 (36.20)		2.53 (64.14)	
PMV-2P	1/8" Male NPT		Straight		1.63 (41.28)		2.10 (53.34)	
PMV-2PA	1/8" Male NPT		Angle		1.19 (30.15)		2.53 (64.14)	
PMV-4P	1/4" Male NPT		Straight		1.96 (49.78)		2.10 (53.34)	
PMV-4PA	1/4" Male NPT		Angle		1.35 (34.37)		2.71 (68.83)	

Note: Dimensions shown with Bi-Lok nuts finger-tight. Dimensions are in inches (millimeters), for reference only and subject to change. All valve bodies are 3/4" (19 mm) wide. NPT Threads per ASME B1.20.1

Flow Coefficient (Cv) @ Turns Open



Note: Valves may require up to one full turn before flow is evident.

How To Order

PMV - 4T SS - V - X

Model Code
PMV - Percision Metering Valve
See Dimensional Data Above

Material Code
B - Brass
SS - 316 Stainless Steel

Seal Material
B - Buna-N, -40° F to 180° F (-40° C to 82° C)
V - Viton, -10° F to 180° F (-23° C to 82° C)
N - Neoprene, -40° F to 180° F (-40° C to 82° C)
EP - Ethylene Propylene, -50° F to 180° F (-46° C to 82° C)

Cleaning Option
X - Cleaned and Packaged for Oxygen Service

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SCREWED BONNET NEEDLE VALVE
1/8" - 1/2" NPT
Globe and Block Configuration
Brass, 303 and 316 Stainless Steel

3000 SERIES

Description

Series 3000 bar stock, screwed bonnet type needle valves are available in brass, 303 and 316 stainless steel with working pressures to 5000 Psig in 1/8" to 1/2" sizes. The unique, externally adjustable, wear compensating, virgin PTFE stem packing offers long trouble free service life in most liquid or gas applications. A wide variety of options including panel mounting, metal to metal seat, soft stem tip and taper proof cap, the Series 3000 provides economical, quality solutions for the most demanding applications. Valves can be ordered cleaned and packaged for oxygen service.

Globe

(Panel Mount Option Shown)

Features

- Adjustable PTFE Stem Packing
- Excellent Gauge Isolation Valve
- Wide variety of options to suit many diverse applications
- Available in 303 SS as an economical alternative to 316 SS (where applicable)
- 100% factory tested

Technical Data

Maximum Operating Pressure @ 100º F (38 º C)
Brass: 3000 Psig (207 Bar)
Stainless: 5000 Psig (345 Bar)
Flow Coefficient
Globe (.187" Orifice): 0.40 Cv
Block (.312" Orifice): 0.90 Cv

Temperature Ratings

Metal to Metal Stem: -320° F to 400°F (-195° C to 204°C)
Kel-F Tip Stem: -65° F to 200°F (-54° C to 93°C)

Leakage

External leakage – zero.
Maximum allowable seat leakage – 0.1 cc/min @ 3000 psig (207 Bar) Nitrogen

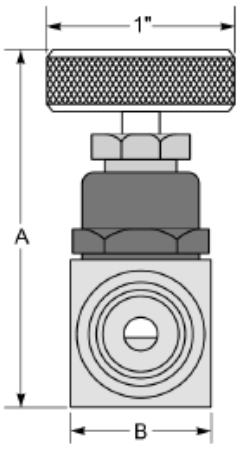
Block

Materials of Construction

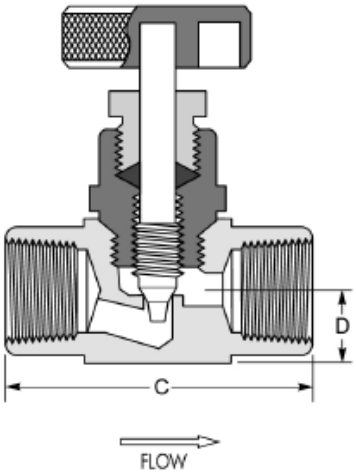
Component	Valve Body Material		
	Brass	303 Stainless	316 Stainless
Valve Body, Bonnet Packing Nut	Brass, ASTM B16	303 SS, ASTM A582	316 SS, ASTM A479
Stem[1]		303 SS, ASTM A582/Kel-F (CTFE)	316 SS, ASTM A479/Kel-F (CTFE)
Handle[2]		Brass, ASTM B16, (Nickel Plated, ASTM 689)	
Set Screw	ANSI B18.3 (Alloy Steel)		
Packing	Virgin TFE		
Panel Nut	Brass, ASTM B16	Brass, ASTM B16, (Nickel Plated, ASTM 689)	
Tamper Proof Cap		N/A	

1. Stainless valves supplied with Kel-F stem, optional metal to metal stem, option code "Q", see ordering information. Block valves not available with soft stem tip option.
2. Optional black phenolic knob, option code "M"

SCREWED BONNET NEEDLE VALVE



Square



Dimensional Data

Valve Number	Pipe Size (NPT)	PORT CONFIGURATION		Orifice	Cv	A (Open)	B (Square)	C	D
		INLET	OULET						
1	1/8"	Female		.187"	0.40	2-1/4"	3/4"	1-5/8"	3/8"
2		Male							
3		Male	Female						
4	1/4"	Female						1-13/16"	
5		Male							
6		Male	Female						
7	3/8"	Male							1/2"
8		Female		.312"	0.90	2-7/16"	1"	2-3/16"	
9		Male	Female						
10	1/2"	Female							
11		Male							
12		Male	Female						

Ordering Information

3000 - 4SS - X

Part Number

Valve Number	Port Configuration	Part Number
1	1/8" Female x 1/8" Female	3000-1
2	1/8" Male x 1/8" Male	3000-2
3	1/8" Male x 1/8" Female	3000-3
4	1/4" Female x 1/4" Female	3000-4
5	1/4" Male x 1/4" Male	3000-5
6	1/4" Male x 1/4" Female	3000-6
7	3/8" Male x 3/8" Male	3000-7
8	3/8" Female x 3/8" Female	3000-8
9	3/8" Male x 3/8" Female	3000-9
10	1/2" Female x 1/2" Female	3000-10
11	1/2" Male x 1/2" Male	3000-11
12	1/2" Male x 1/2" Female	3000-12

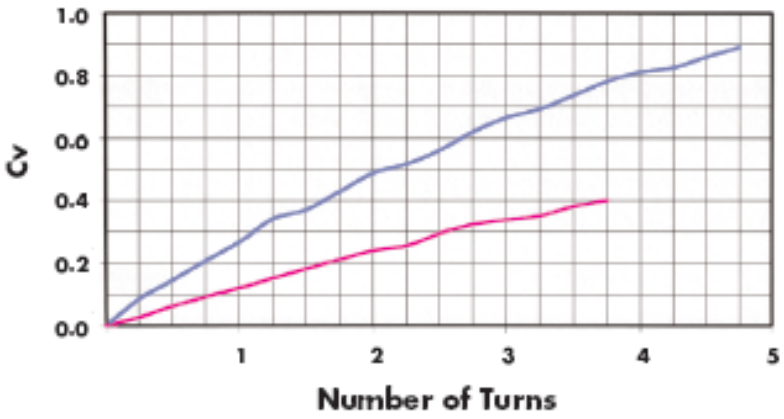
NPT threads per ANSO/ASME B1.20.1. For other thread configurations, consult factory.

Material Code
B - Brass
SS - 303 Stainless Steel
SSS - 316 Stainless Steel

Options
P - Panel Mount (9/16" Hole, 3/16" Max. Panel Thickness)
M - Plastic Knob (1-3/8" Diameter)
N - Kel-F Soft Stem Tip (Standard with SS valves)
T - PTFE Soft Stem Tip
Q - Stainless Steel Stem
QN - Stainless Steel Stem with Kel-F Soft Stem Tip
C - Screw Driver Slotted Stem
QC - Stainless Steel Screw Driver Slotted Stem
X - Cleaned and Packaged for Oxygen Service

Shaded Options are available for Globe Valves Only (1-7)

Flow Coefficient (Cv) @ Turns Open



3/16" Orifice, Valves 1-7 5/16" Orifice, Valves 8-12

PROPER COMPONENT SELECTION – When specifying a component, the total system design must be considered to ensure safe and trouble-free performance. Intended component function, materials compatibility, pressure ratings, installation, environment and maintenance are the responsibility of the system designer.

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