



# Metering Valves

Catalog 4170-MV

June 2011

aerospace  
climate control  
electromechanical  
filtration  
**fluid & gas handling**  
hydraulics  
pneumatics  
**process control**  
sealing & shielding



ENGINEERING YOUR SUCCESS.

## NS Series Introduction

N

The Parker NS Series of metering valves are designed to provide accurate and stable control of flow rates in analytical, instrumentation, and research applications. A variety of connection sizes, body patterns and materials of construction provide considerable application versatility. For higher flow rates, refer to the NM and NL Series of metering valves.

## Features

- ▶ Precision tapered valve stem accurately controls flow
- ▶ Brass or 316 SS forged body construction
- ▶ Panel or in-line mounting
- ▶ Positive handle stop prevents overtightening
- ▶ Angle or in-line patterns
- ▶ Valve stem threads not in contact with process fluid
- ▶ 100% function tested
- ▶ Optional stem seals and handles

## Specifications

### Pressure Rating at all temperatures:

.....2000 psig (138 bar) CWP

### Flow Data:

Orifice: .....0.03" (0.76mm)

In-line pattern: .....  $C_v = 0.039$ ;  $X_T = 0.64$

Angle pattern: .....  $C_v = 0.042$ ;  $X_T = 0.53$

Stem Taper: ..... 1°

Turns to open: ..... 13 +/- 1

## Valve / Seal Temperature Ratings

### Nitrile Rubber:

..... -10°F to 250°F (-23°C to 121°C)

### Ethylene Propylene Rubber:

..... -40°F to 250°F (-40°C to 121°C)

### Neoprene Rubber:

..... -40°F to 250°F (-40°C to 121°C)

### Fluorocarbon Rubber:

..... -10°F to 400°F (-23°C to 204°C)

### Highly Fluorinated Fluorocarbon Rubber:

..... -25°F to 200°F (-32°C to 93°C)

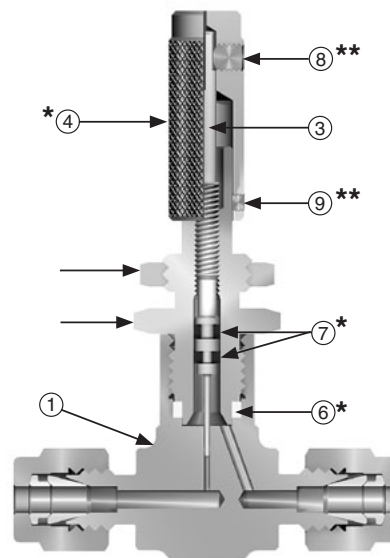
**Note:** These products are not intended for use as shut-off valves. For metering valves with shut-off capabilities, please refer to page 8 of this catalog.

Item #	Description	Stainless Steel	Brass
1	Body	ASTM A 182 Type F316	ASTM B 283 Alloy C37700 (Nickel Plated)
2	Bonnet	ASTM A 479 Type 316	ASTM B 16 Alloy C36000 (Nickel Plated)
3	Stem	ASTM A 276 Type 316	ASTM A 276 Type 316
4	Handle*	ASTM A 582 Type 303	ASTM A 582 Type 303
5	Panel Nut	ASTM B 16 (Nickel Plated)	ASTM B 16 (Nickel Plated)
6	Sealing Ring*	Fluorocarbon Rubber	Fluorocarbon Rubber
7	Stem Seals*	Fluorocarbon Rubber	Fluorocarbon Rubber
8	Handle Set Screw**	Stainless Steel	Stainless Steel
9	Handle Lock Screw**	Stainless Steel	Stainless Steel

\* Optional Handles, Sealing Ring and Stem Seal materials are available. See How to Order.

\*\* K, KS, and F Handles use 18-8 stainless steel screws. V Handles use alloy steel screws. Lock Screws are not used on F and V Handles.

Lubrication: Perfluorinated polyether.



**Model Shown: 2A-NSL-NE-SS-K**

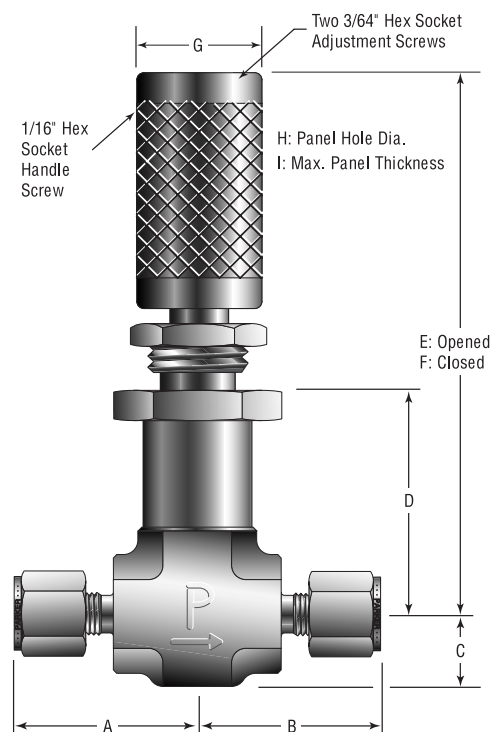
Flow tested in accordance with ISA S75.02. Gas flow will be choked when  $P_1 - P_2 / P_1 = X_T$ .

## NS Series Dimensions

Basic Part Number	End Connections		Dimensions							
	(Inlet) Port 1	(Outlet) Port 2	A*		B*		C		D	
			inch	mm	inch	mm	inch	mm	inch	mm
1A-NSL	1/16" Compression A-LOK®		0.78	19.8	0.78	19.8	0.31	7.9	0.94	23.9
1A-NSA			0.82	20.8	0.82	20.8	0.31	7.9	0.94	23.9
1Z-NSL	1/16" Compression CPI™		0.78	19.8	0.78	19.8	0.31	7.9	0.94	23.9
1Z-NSA			0.82	20.8	0.82	20.8	0.31	7.9	0.94	23.9
2A-NSL	1/8" Compression A-LOK®		0.95	24.1	0.95	24.1	0.31	7.9	0.94	23.9
2A-NSA			1.01	25.7	1.01	25.7	0.31	7.9	0.94	23.9
2M-NSL	1/8" Male NPT		0.88	22.4	0.88	22.4	0.31	7.9	0.94	23.9
2M-NSA			0.88	22.4	0.88	22.4	0.31	7.9	0.94	23.9
2Z-NSL	1/8" Compression CPI™		0.95	24.1	0.95	24.1	0.31	7.9	0.94	23.9
2Z-NSA			1.01	25.7	1.01	25.7	0.31	7.9	0.94	23.9
4A-NSL	1/4" Compression A-LOK®		1.02	25.9	1.02	25.9	0.31	7.9	0.94	23.9
4A-NSA			1.02	25.9	1.02	25.9	0.31	7.9	0.94	23.9
4V-NSL	1/4" VacuSeal		1.03	26.2	1.03	26.2	0.53	13.5	0.94	23.9
4Z-NSL	1/4" Compression CPI™		1.02	25.9	1.02	25.9	0.31	7.9	0.94	23.9
4Z-NSA			1.02	25.9	1.02	25.9	0.31	7.9	0.94	23.9
M3A-NSL	3mm Compression A-LOK®		0.94	23.9	0.94	23.9	0.31	7.9	0.94	23.9
M3A-NSA			1.00	25.4	1.00	25.4	0.31	7.9	0.94	23.9
M3Z-NSL	3mm Compression CPI™		0.94	23.9	0.94	23.9	0.31	7.9	0.94	23.9
M3Z-NSA			1.00	25.4	1.00	25.4	0.31	7.9	0.94	23.9
M6A-NSL	6mm Compression A-LOK®		1.02	25.9	1.02	25.9	0.31	7.9	0.94	23.9
M6A-NSA			1.02	25.9	1.02	25.9	0.31	7.9	0.94	23.9
M6Z-NSL	6mm Compression CPI™		1.02	25.9	1.02	25.9	0.31	7.9	0.94	23.9
M6Z-NSA			1.02	25.9	1.02	25.9	0.31	7.9	0.94	23.9

\* For CPI™ and A-LOK®, dimensions are measured with nuts in the finger tight position.

Dimensions in inches/millimeters are for reference only, subject to change.

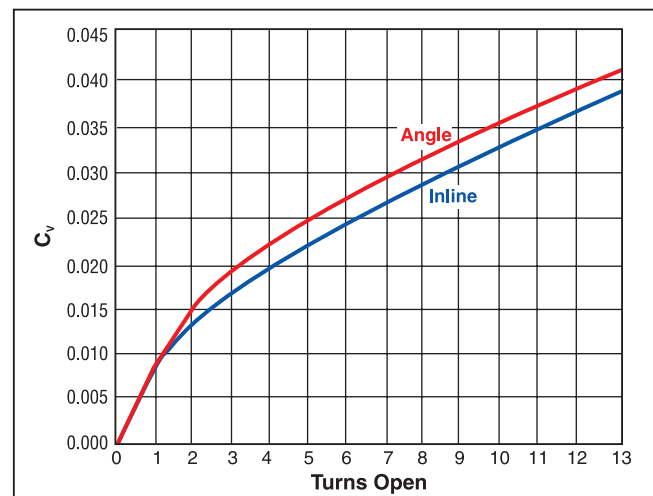


Model Shown: 2A-NSL-BN-SS-F

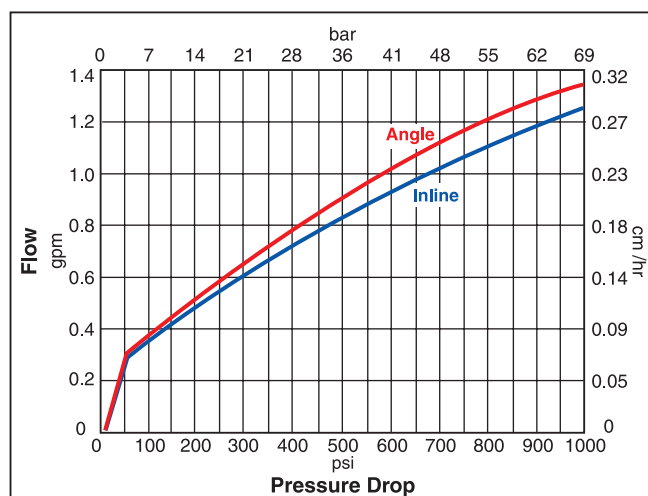
## Handle Dimensions

	K & KS		V		F	
	inch	mm	inch	mm	inch	mm
E	2.50	63.5	2.97	75.4	2.97	75.4
F	2.27	57.7	2.74	69.6	2.74	69.6
G	0.37	9.4	0.84	21.3	0.37	9.4
H	0.46	11.7	0.46	11.7	0.46	11.7
I	0.16	4.1	0.16	4.1	0.16	4.1

Dimensions in inches/millimeters are for reference only, subject to change.

NS Series –  $C_v$  vs. Turns Open

## NS Series – Water Flow Data



## Introduction

N

The Parker NM and NL Series of metering valves provide higher flow rates than the NS Series of metering valves and retain most of the features found in the NS Series.

## Features

- ▶ Precisely tapered valve stem accurately controls flow
- ▶ Brass or 316 SS forged body construction
- ▶ Panel or in-line mounting
- ▶ Angle or in-line patterns
- ▶ Valve stem threads not in contact with process fluid
- ▶ 100% function tested
- ▶ Optional stem seals and handles

## Specifications

### Pressure Rating at all temperatures:

.....1000 psig (69 bar) CWP

## NM Specifications

### Flow Data:

Orifice: .....0.06" (1.5mm)

In-line pattern: .....  $C_v = 0.055$ ;  $X_T = 0.41$

Angle pattern: .....  $C_v = 0.057$ ;  $X_T = 0.38$

Stem Taper: ..... 3°

Turns to open: ..... 9 +/- 1

## NL Specifications

### Flow Data:

Orifice: .....0.13" (3.3mm)

In-line pattern: .....  $C_v = 0.207$ ;  $X_T = 0.71$

Angle pattern: .....  $C_v = 0.299$ ;  $X_T = 0.60$

Stem Taper: ..... 5°

Turns to open: ..... 10 +/- 1

## Valve / Seal Temperature Ratings

Nitrile Rubber: ..... -10°F to 250°F (-23°C to 121°C)

### Ethylene Propylene Rubber:

..... -40°F to 250°F (-40°C to 121°C)

Neoprene Rubber: ..... -40°F to 250°F (-40°C to 121°C)

### Fluorocarbon Rubber:

..... -10°F to 400°F (-23°C to 204°C)

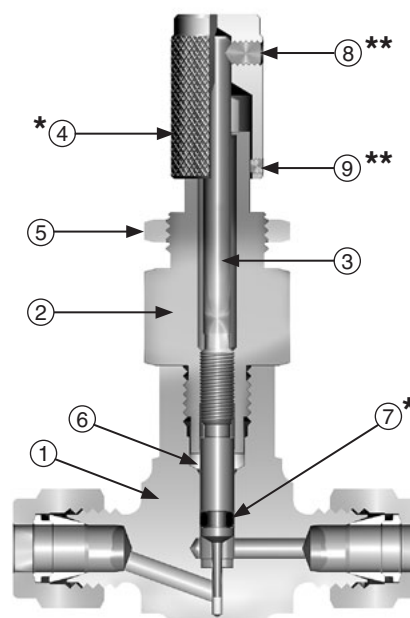
### Highly Fluorinated Fluorocarbon Rubber:

..... -25°F to 200°F (-32°C to 93°C)

Item #	Description	Stainless Steel	Brass
1	Body	ASTM A 182 Type F316	ASTM B 283 Alloy C37700 (Nickel Plated)
2	Bonnet	ASTM A 479 Type 316	ASTM B 16 Alloy C36000 (Nickel Plated)
3	Stem	ASTM A 276 Type 316	ASTM A 276 Type 316
4	Handle*	Stainless Steel	Stainless Steel
5	Panel Nut	ASTM B 16 (Nickel Plated)	ASTM B 16 (Nickel Plated)
6	Sealing Ring*	PTFE	PTFE
7	Stem Seals*	Fluorocarbon Rubber	Fluorocarbon Rubber
8	Handle Set Screw**	Stainless Steel	Stainless Steel
9	Handle Lock Screw**	Stainless Steel	Stainless Steel

\* Optional Handles, Sealing Ring and Stem Seal materials are available. See How to Order.

\*\* K and KS Handles use 18-8 stainless steel screws. V Handles use alloy steel screws. Lock Screws are not used on F and V Handles. Lubrication: Perfluorinated polyether.



Model Shown: 4A-NML-KZ-SS-K

**Note:** These products are not intended for use as shut-off valves. For metering valves with shut-off capabilities, please refer to page 8 of this catalog.

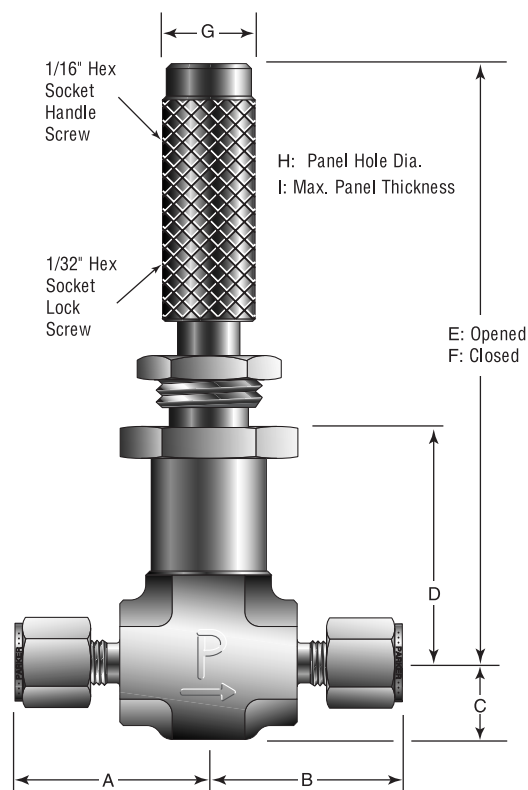
Flow tested in accordance with ISA S75.02. Gas flow will be choked when  $P_1 - P_2 / P_1 = X_T$ .

## NM Dimensions

Basic Part Number	End Connections		Dimensions							
	(Inlet) Port 1	(Outlet) Port 2	A*		B*		C		D	
			inch	mm	inch	mm	inch	mm	inch	mm
2A-NML	1/8" Compression A-LOK®		1.03	26.2	1.03	26.2	0.41	10.4	1.56	39.6
2A-NMA			1.03	26.2	1.03	26.2	0.41	10.4	1.07	27.2
2F-NML	1/8" Female NPT		0.93	23.6	0.93	23.6	0.41	10.4	1.56	39.6
2F-NMA			0.93	23.6	0.93	23.6	0.41	10.4	1.07	27.2
2Z-NML	1/8" Compression CPI™		1.03	26.2	1.03	26.2	0.41	10.4	1.56	39.6
2Z-NMA			1.03	26.2	1.03	26.2	0.41	10.4	1.07	27.2
4A-NML	1/4" Compression A-LOK®		1.11	28.2	1.11	28.2	0.41	10.4	1.56	39.6
4A-NMA			1.11	28.2	1.11	28.2	0.41	10.4	1.07	27.2
4M-NML	1/4" Male NPT		0.93	23.6	0.93	23.6	0.41	10.4	1.56	39.6
4M-NMA			0.93	23.6	0.93	23.6	0.41	10.4	1.07	37.2
4V-NML	1/4" VacuSeal		1.03	26.2	1.03	26.2	0.53	13.5	1.56	39.6
4Z-NML	1/4" Compression CPI™		1.11	28.2	1.11	28.2	0.41	10.4	1.56	39.6
4Z-NMA			1.11	28.2	1.11	28.2	0.41	10.4	1.07	27.2
M3A-NML	3mm Compression A-LOK®		1.00	25.4	1.00	25.4	0.41	10.4	1.56	39.6
M3A-NMA			1.00	25.4	1.00	25.4	0.41	10.4	1.07	27.2
M3Z-NML	3mm Compression CPI™		1.00	25.4	1.00	25.4	0.41	10.4	1.56	39.6
M3Z-NMA			1.00	25.4	1.00	25.4	0.41	10.4	1.07	27.2
M6A-NML	6mm Compression A-LOK®		1.09	27.7	1.09	27.7	0.41	10.4	1.56	39.6
M6A-NMA			1.09	27.7	1.09	27.7	0.41	10.4	1.07	27.2
M6Z-NML	6mm Compression CPI™		1.09	27.7	1.09	27.7	0.41	10.4	1.56	39.6
M6Z-NMA			1.09	27.7	1.09	27.7	0.41	10.4	1.07	27.2

\* For CPI™ and A-LOK®, dimensions are measured with nuts in the finger tight position.

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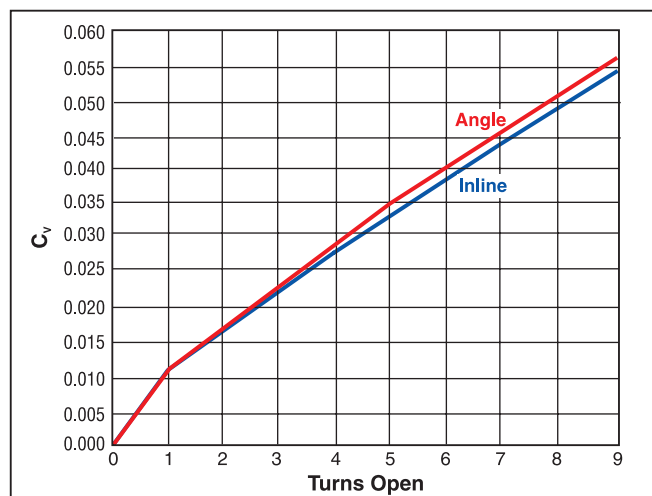
Model Shown: 2A-NML-V-SS-K

## Handle Dimensions

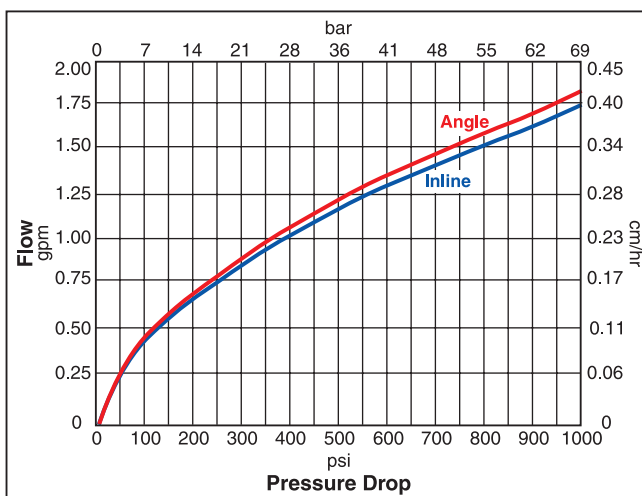
	On In-Line Pattern Valves				On Angle Pattern Valves			
	K & KS		V		K & KS		V	
	inch	mm	inch	mm	inch	mm	inch	mm
E	3.22	81.8	3.63	92.2	2.82	71.6	3.23	82.0
F	2.99	75.9	3.40	86.4	2.59	65.8	3.00	76.2
G	0.50	12.7	0.84	21.3	0.50	12.7	0.84	21.3
H	0.58	14.7	0.58	14.7	0.58	14.7	0.58	14.7
I	0.19	4.8	0.19	4.8	0.27	6.9	0.27	6.9

Dimensions in inches/millimeters are for reference only, subject to change.

## NM Series – $C_v$ vs. Turns Open



## NM Series – Water Flow Data



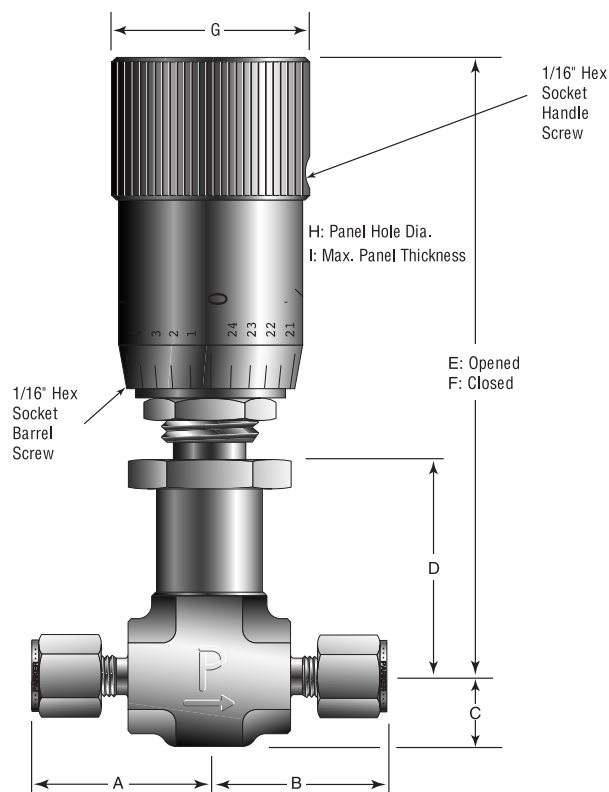


## NL Dimensions

Dimensions in inches/millimeters are for reference only, subject to change.

Basic Part Number	End Connections		Dimensions							
	(Inlet) Port 1	(Outlet) Port 2	A*		B*		C		D	
			inch	mm	inch	mm	inch	mm	inch	mm
2F-NLL	1/8" Female NPT		0.93	23.6	0.93	23.6	0.41	10.4	1.56	39.6
2F-NLA			0.93	23.6	0.93	23.6	0.41	10.4	1.07	27.2
4A-NLL	1/4" Compression A-LOK®		1.16	29.5	1.16	29.5	0.41	10.4	1.56	39.6
4A-NLA			1.16	29.5	1.16	29.5	0.41	10.4	1.07	27.2
4M-NLL	1/4" Male NPT		0.93	23.6	0.93	23.6	0.41	10.4	1.56	39.6
4M-NLA			0.93	23.6	0.93	23.6	0.41	10.4	1.07	37.2
4V-NLL	1/4" VacuSeal		1.03	26.2	1.03	26.2	0.53	13.5	1.56	39.6
4Z-NLL			1.16	29.5	1.16	29.5	0.41	10.4	1.56	39.6
4Z-NLA	1/4" Compression CPI™		1.16	29.5	1.16	29.5	0.41	10.4	1.07	27.2
6A-NLL	3/8" Compression A-LOK®		1.24	31.5	1.24	31.5	0.41	10.4	1.56	39.6
6Z-NLL			1.24	31.5	1.24	31.5	0.41	10.4	1.07	27.2
M6A-NLL	6mm Compression A-LOK®		1.12	28.4	1.12	28.4	0.41	10.4	1.56	39.6
M6A-NLA			1.15	29.2	1.15	29.2	0.41	10.4	1.07	27.2
M6Z-NLL	6mm Compression CPI™		1.12	28.4	1.12	28.4	0.41	10.4	1.56	39.6
M6Z-NLA			1.15	29.2	1.15	29.2	0.41	10.4	1.07	27.2

\* For CPI™ and A-LOK®, dimensions are measured with nuts in the finger tight position.



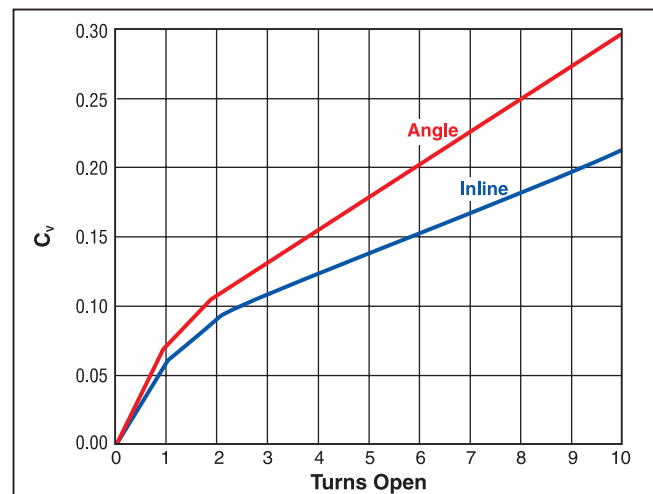
Model Shown: 4A-NLL-V-SS-V

## Handle Dimensions

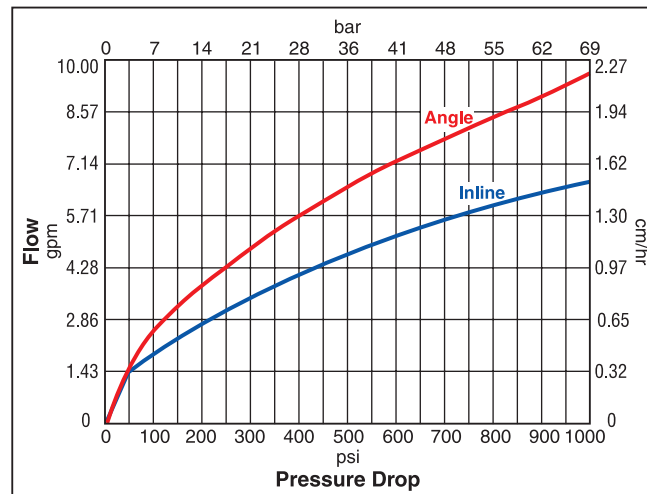
	On In-Line Pattern Valves				On Angle Pattern Valves			
	K & KS		V		K & KS		V	
	inch	mm	inch	mm	inch	mm	inch	mm
E	2.92	74.2	3.33	84.6	2.83	71.9	3.24	82.3
F	2.67	67.8	3.08	78.2	2.58	65.8	2.99	75.9
G	0.50	12.7	0.84	21.3	0.50	12.7	0.84	21.3
H	0.58	14.7	0.58	14.7	0.58	14.7	0.58	14.7
I	0.19	4.8	0.19	4.8	0.27	6.9	0.27	6.9

Dimensions in inches/millimeters are for reference only, subject to change.

## NL Series – $C_v$ vs. Turns Open



## NL Series – Water Flow Data



## How to Order

Dimensions in inches/millimeters are for reference only, subject to change.

The correct part number is easily derived from the following example and ordering chart. The six product characteristics required are coded as shown in the chart.

The example below describes a stainless steel in-line NLL series valve with 1/4" CPI compression ends, fluorocarbon seals and vernier handles.

**Example: 4Z-NLL-V-SS-V**

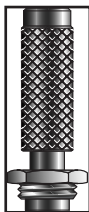
4Z		NLL		V		SS		V
Inlet Port*	Outlet Port*	Valve Series	Seal Material	Body Material	Handle Type			
Inlet Port	Outlet Port	Valve Series	Seal Material	Body Material	Handle Type			
1A, 1Z, 2A, 2M, 2Z, 4A, 4V, 4Z, M3A, M3Z, M6A, M6Z		NSA NSL	BN Nitrile EPR Ethylene Propylene Rubber	B Brass SS Stainless Steel	K Knurled KS Knurled with Slot			
2A, 2F, 2Z, 4A, 4M, 4V, 4Z, M3A, M3Z, M6A, M6Z		NMA NML	NE Neoprene Rubber V Fluorocarbon Rubber		V Vernier F** Precision Adjustment			
2F, 4A, 4M, 4V, 4Z, 6A, 6Z, M6A, M6Z		NLA NLL	KZ Highly Fluorinated Fluorocarbon Rubber					

\* If the inlet and outlet ports are the same, eliminate the outlet port designator.

\*\* F handle available only on NS Series.

## Optional Handles

### Knurled (K) and Knurled with Slot (KS)



- Knurled K handle for ease of actuation
- Knurled with Slot (KS) adds a screw-driver slot across the top for locations where handle access is difficult

### Vernier (V)



- Precision graduated aluminum alloy permits repeatable flow settings
- Resolution to 1/25th turn

### Precision Adjustment (F)



- Adjustable torque handle for precise positioning
- Knurled metal with two top mounted adjustment screws
- NS Series only

## How to Order Options

**Oxygen Cleaning** — Add the suffix **-C3** to the end of the part number to receive valves cleaned and assembled for oxygen service in accordance with Parker Specification ES8003. Example: 4A-NMA-EPR-SS-V-**C3**.