

# Needle Valves

Catalog 4110-NV

December 2010

aerospace  
climate control  
electromechanical  
filtration  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
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## Introduction

Parker VQ Series Toggle Valves are the right combination of performance and value for manual or pneumatic on-off control in moderate pressure and temperature applications. The manual version employs a toggle handle for quick action at pressures up to 300 psig (21 bar). Compact double acting, normally closed, and normally open pneumatically actuated versions of this valve are ideal for automatic control at pressures up to 600 psig (41 bar).

## Manual Toggle Valve Features

- ▶ Quick acting
- ▶ Inline and angle patterns
- ▶ Available with CPI™, A-LOK®, male and female NPT end connections
- ▶ Panel mountable
- ▶ Color-coded handles
- ▶ 316 stainless steel and brass body construction
- ▶ Stem seal materials –
  - Fluorocarbon Rubber
  - Nitrile Rubber
  - Ethylene Propylene Rubber
  - Highly Fluorinated Fluorocarbon Rubber
- ▶ Optional handle positioners and anti-lock handles
- ▶ 100% factory tested

## Manual Toggle Valve Specifications

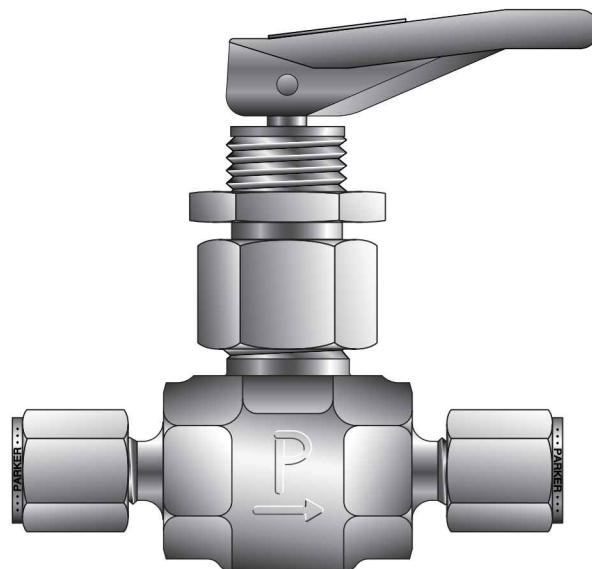
### Pressure Rating at All Temperatures:

300 psig (21 bar) CWP

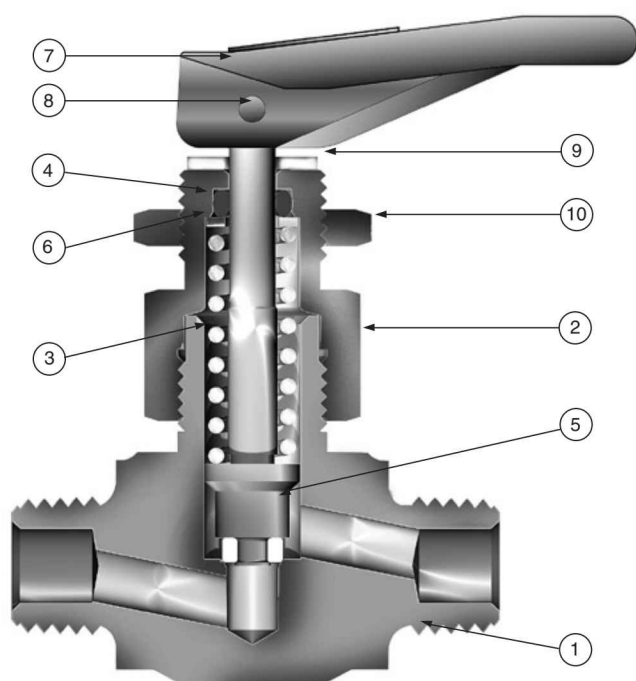
### Temperature Ratings:

PTFE Stem Tip: -20°F to 200°F (-29°C to 93°C)

PCTFE Stem Tip: -65°F to 200°F (-54°C to 93°C)



**Model Shown:**  
**4A-V4LQ-BP**



**Model Shown: 4M-V4LQ-SSP**

## Materials of Construction Manual Toggle Valve

Item #	Description	Stainless Steel	Brass
1	Body	ASTM A 182 Type F316	ASTM B 283 Alloy C37700
2	Cap	ASTM A 479 Type 316	ASTM B 453 Alloy C34000
3	Spring	Stainless Steel	Stainless Steel
4	Stem Seal*	Fluorocarbon Rubber	Fluorocarbon Rubber
5	Stem	ASTM A 276 Type 316	ASTM A 276 Type 316
6	Stem Washer	Stainless Steel	Stainless Steel
7	Handle	Nylon 6/6	Nylon 6/6
8	Handle Pin	Stainless Steel	Stainless Steel
9	Handle Washer	Acetal	Acetal
10	Panel Nut	316 Stainless Steel	316 Stainless Steel

\* Optional stem seal materials available - See How to Order  
Lubrication: Perfluorinated polyether

## Actuated Valve Features

- ▶ Available in normally open, normally closed, and double acting models
- ▶ Inline and angle patterns
- ▶ Available with CPI™, A-LOK®, male and female NPT end connections
- ▶ Mounting bracket standard
- ▶ 316 stainless steel and brass body construction
- ▶ Stem seal materials -
  - Fluorocarbon Rubber
  - Nitrile Rubber
  - Ethylene Propylene Rubber
  - Highly Fluorinated Fluorocarbon Rubber
- ▶ 100% factory tested

## Actuated Valve Specifications

### Pressure Rating at All Temperatures:

Size VQ4 Normally Closed:

600 psig (41 bar) CWP

Size VQ6 Normally Closed:

500 psig (35 bar) CWP

Normally Open:

450 psig (31 bar) CWP

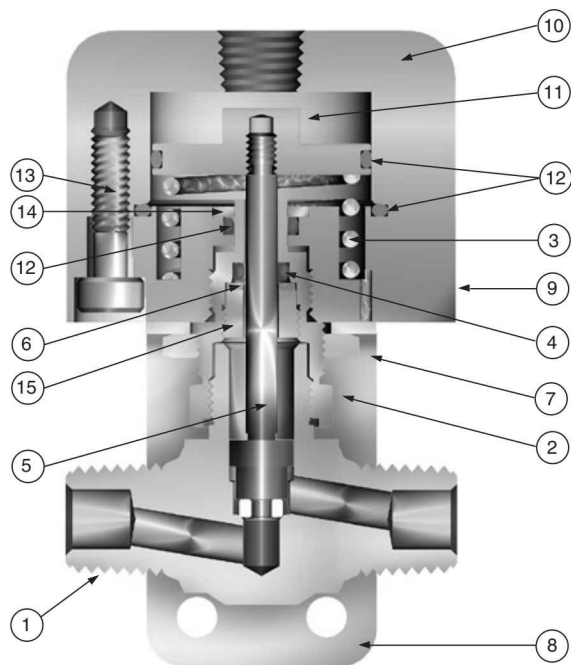
Double Acting:

450 psig (31 bar) CWP

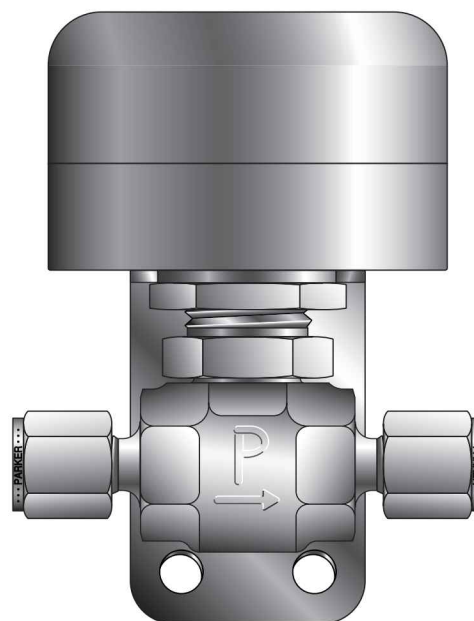
### Temperature Ratings:

PTFE Stem Tip: -20°F to 200°F (-29°C to 93°C)

PCTFE Stem Tip: -65°F to 200°F (-54°C to 93°C)



**Model Shown:**  
**4M-V4LQ-11AO-SS**



**Model Shown:**  
**M6A-V4LQ-BN-11AC-SS**

VQ

## Materials of Construction Actuated Valve

Item #	Description	Stainless Steel	Brass
1	Body	ASTM A 182 Type F316	ASTM B 283 Alloy C37700
2	Cap	ASTM A 479 Type 316	ASTM B 453 Alloy C34000
3	Spring*	Stainless Steel	Stainless Steel
4	Stem Seal**	Fluorocarbon Rubber	Fluorocarbon Rubber
5	Stem	ASTM A 276 Type 316	ASTM A 276 Type 316
6	Stem Washer	Stainless Steel	Stainless Steel
7	Lock Nut	316 Stainless Steel	316 Stainless Steel
8	Mounting Bracket	Aluminum	Aluminum
9	Actuator Base	Aluminum	Aluminum
10	Actuator Cap	Aluminum	Aluminum
11	Piston	Aluminum	Aluminum
12	Actuator Seals	Fluorocarbon Rubber	Fluorocarbon Rubber
13	Screws	Stainless Steel	Stainless Steel
14	Actuator Bushing	Aluminum	Aluminum
15	Stem Bushing***	ASTM A 479 Type 316	ASTM A 479 Type 316

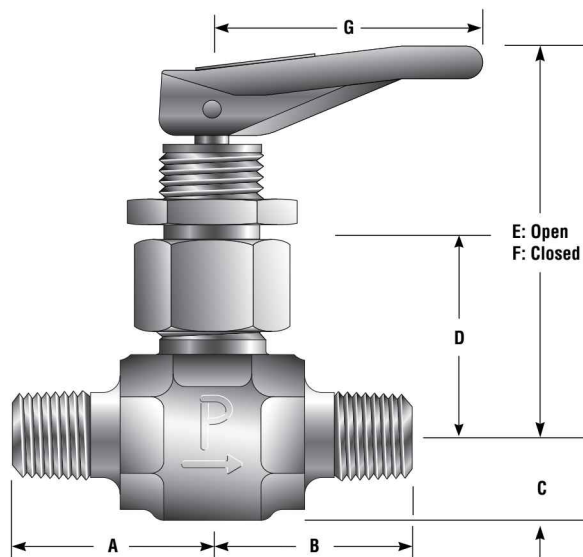
\* Spring not used on Double Acting (11AD) models

\*\* Optional stem seal materials available - See How to Order

\*\*\* Stem Bushing not used on Normally Closed (11AC) models  
Lubrication: Perfluorinated polyether



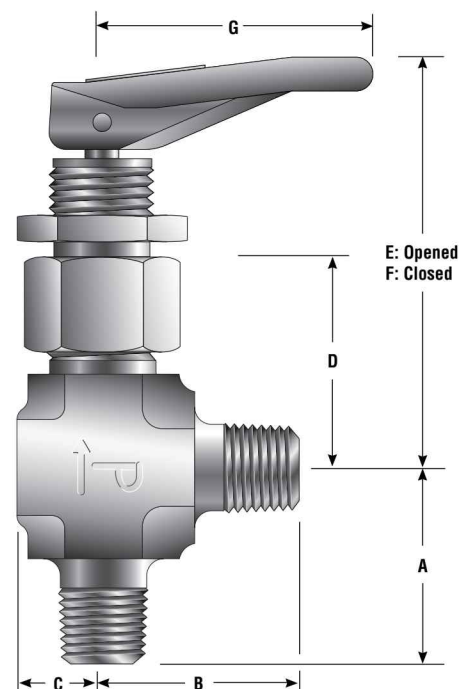
## VQ4 Dimensions / Flow Data



Model Shown: 4M-V4LQ-SSP

( ) Denotes dimensions in millimeters

Panel Hole Diameter:  
VQ4: 0.52 (13.2)  
VQ6: 0.65 (16.5)  
Max. Panel Thickness:  
VQ4: 0.25 (6.4)  
VQ6: 0.35 (8.9)



Model Shown: 4M-V4AQ-EPR-SSP

## VQ4 Dimensions / Flow Data

Basic Part Number	End Connections		Flow Data				Dimensions													
	Inlet (Port 1)	Outlet (Port 2)	Orifice		$C_v$	$X_T^*$	A†		B†		C		D		E		F		G	
			Inch	mm			Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
2A-V4LQ	1/8" Compression A-LOK®		0.078	2.0	0.14	0.52	1.10	27.9	1.10	27.9	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
2A-V4AQ					0.15	0.50														
2F-V4LQ	1/8" Female NPT		0.176	4.5	0.36	0.71	0.81	20.6	0.81	20.6	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
2F-V4AQ					0.49	0.64														
2M-V4LQ	1/8" Male NPT		0.125	3.2	0.30	0.50	0.81	20.6	0.81	20.6	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
2M-V4AQ					0.35	0.55														
2Z-V4LQ	1/8" Compression CPI™		0.078	2.0	0.14	0.52	1.10	27.9	1.10	27.9	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
2Z-V4AQ					0.15	0.50														
4A-V4LQ	1/4" Compression A-LOK®		0.176	4.5	0.36	0.71	1.15	29.2	1.15	29.2	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
4A-V4AQ					0.49	0.64														
4M-V4LQ	1/4" Male NPT		0.176	4.5	0.36	0.71	0.94	23.9	0.94	23.9	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
4M-V4AQ					0.49	0.64														
4Z-V4LQ	1/4" Compression CPI™		0.176	4.5	0.36	0.71	1.15	29.2	1.15	29.2	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
4Z-V4AQ					0.49	0.64														
6A-V4LQ	3/8" Compression A-LOK®		0.176	4.5	0.36	0.71	1.17	29.7	1.17	29.7	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
6A-V4AQ					0.49	0.64														
6Z-V4LQ	3/8" Compression CPI™		0.176	4.5	0.36	0.71	1.17	29.7	1.17	29.7	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
6Z-V4AQ					0.49	0.64														
M6A-V4LQ	6mm Compres- sion A-LOK®		0.176	4.5	0.36	0.71	1.13	28.7	1.13	28.7	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
M6A-V4AQ					0.49	0.64														
M6Z-V4LQ	6mm Compres- sion CPI™		0.176	4.5	0.36	0.71	1.13	28.7	1.13	28.7	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
M6Z-V4AQ					0.49	0.64														
M8A-V4LQ	8mm Compres- sion A-LOK®		0.176	4.5	0.36	0.71	1.13	28.7	1.13	28.7	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
M8A-V4AQ					0.49	0.64														
M8Z-V4LQ	8mm Compres- sion CPI™		0.176	4.5	0.36	0.71	1.13	28.7	1.13	28.7	0.41	10.4	0.93	23.6	2.88	73.2	1.84	46.7	1.25	31.8
M8Z-V4AQ					0.49	0.64														

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

† 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.

## VQ6 Dimensions / Flow Data

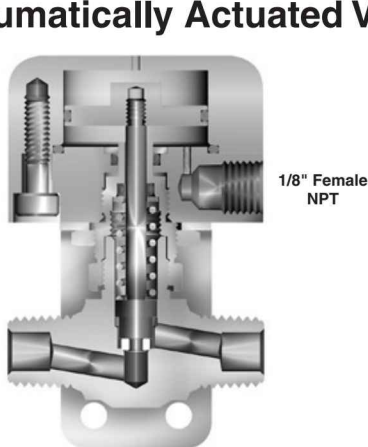
Basic Part Number	End Connections		Flow Data				Dimensions													
	Inlet (Port 1)	Outlet (Port 2)	Orifice		$C_v$	$X_{T^*}$	A†		B†		C		D		E		F		G	
			Inch	mm			Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
4F-V6LQ	1/4" Female NPT		0.250	6.4	0.83	0.70	1.00	25.4	1.00	25.4	0.53	13.5	1.07	27.2	3.45	87.6	2.13	54.1	1.60	40.6
4F-V6AQ					0.92	0.68														
6A-V6LQ	3/8" Compression A-LOK®		0.250	6.4	0.83	0.70	1.29	32.8	1.29	32.8	0.53	13.5	1.07	27.2	3.45	87.6	2.13	54.1	1.60	40.6
6A-V6AQ					0.92	0.68														
6Z-V6LQ	3/8" Compression CPI™		0.250	6.4	0.83	0.70	1.29	32.8	1.29	32.8	0.53	13.5	1.07	27.2	3.45	87.6	2.13	54.1	1.60	40.6
6Z-V6AQ					0.92	0.68														
8A-V6LQ	1/2" Compression A-LOK®		0.250	6.4	0.83	0.70	1.37	34.8	1.37	34.8	0.53	13.5	1.07	27.2	3.45	87.6	2.13	54.1	1.60	40.6
8A-V6AQ					0.92	0.68														
8Z-V6LQ	1/2" Compression CPI™		0.250	6.4	0.83	0.70	1.37	34.8	1.37	34.8	0.53	13.5	1.07	27.2	3.45	87.6	2.13	54.1	1.60	40.6
8Z-V6AQ					0.92	0.68														
M10A-V6LQ	10mm Compression A-LOK®		0.250	6.4	0.83	0.70	1.30	33.0	1.30	33.0	0.53	13.5	1.07	27.2	3.45	87.6	2.13	54.1	1.60	40.6
M10A-V6AQ					0.92	0.68														
M10Z-V6LQ	10mm Compression CPI™		0.250	6.4	0.83	0.70	1.30	33.0	1.30	33.0	0.53	13.5	1.07	27.2	3.45	87.6	2.13	54.1	1.60	40.6
M10Z-V6AQ					0.92	0.68														

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

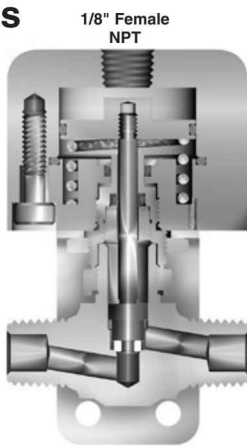
† For CPI™ and A-LOK®, dimensions are measured with nuts in the finger tight position.

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

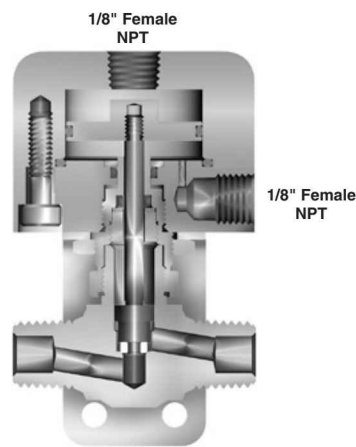
## Pneumatically Actuated Valves



Normally Closed (11AC)

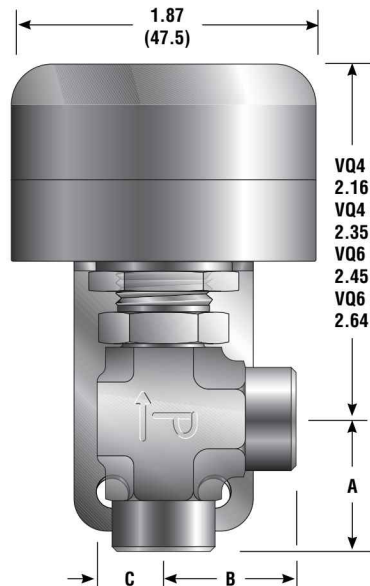
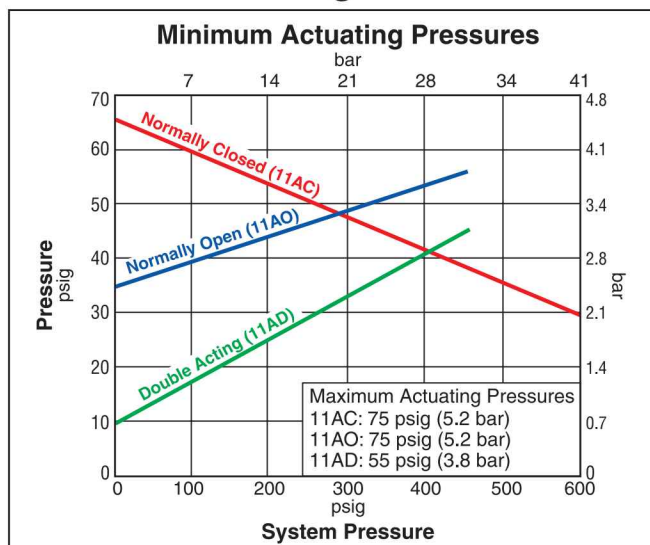


Normally Open (11AO)



Double Acting (11AD)

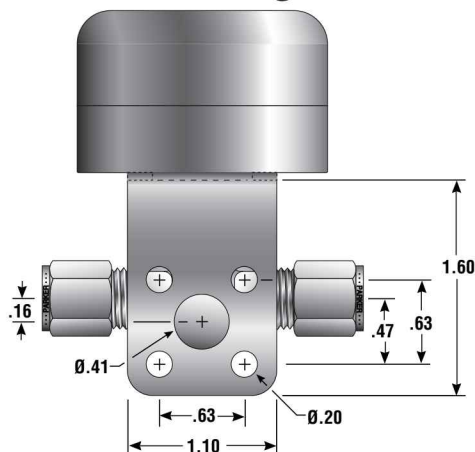
## Minimum Actuating Pressures



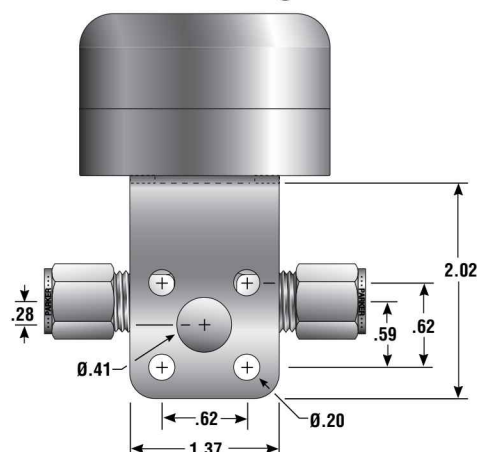
VQ4 11AC:  
2.16 (54.9)  
VQ4 11AO/AD:  
2.35 (59.7)  
VQ6 11AC:  
2.45 (62.2)  
VQ6 11AO/AD:  
2.64 (67.1)

**Model Shown:**  
4F-V6AQ-11AO-B

## VQ4 Valve Mounting Bracket



## VQ6 Valve Mounting Bracket



## How to Order Manual Toggle Valves

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 VQ4 Series inline pattern toggle valve equipped with 1/4" CPI™ compression inlet and outlet ports, PCTFE stem tip, Nitrile rubber stem seal, and stainless steel construction with panel mounting nut.

### Example 1: 4Z-V4LQK-BN-SSP

4Z				V4LQ		K		BN		SSP	
Inlet Port*		Outlet Port*		Valve Series		Stem Tip		Stem Seal		Body Material	
Inlet Port*		Outlet Port*		Valve Series		Stem Tip		Stem Seal		Body Material	
2A	4A	6A	M6A	V4LQ		Blank	PTFE	Blank	Fluorocarbon	SSP	Stainless Steel with Panel Nut
2F	4M	6Z	M6Z	V4AQ		K	PCTFE	BN	Nitrile Rubber	BP	Brass with Panel Nut
2M	4Z		M8A					EPR	Ethylene Propylene Rubber		
2Z			M8Z					KZ	Highly Fluorinated Fluorocarbon Rubber		
4F	6A	8A	M10A	V6LQ							
	6Z	8Z	M10Z	V6AQ							

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



## How to Order Actuated Valves

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 seven product characteristics required are coded as shown in the chart.

The example below describes a VQ4 Series pneumatically actuated (normally closed) angle pattern valve equipped with a 1/4" Male NPT inlet port, a 1/4" A-LOK® compression outlet port, PTFE stem tip, fluorocarbon rubber stem seal, brass construction with mounting bracket.

### Example 1: 4M4A-V4AQ-11AC-B

4M		4A		V4AQ		11AC		B	
Inlet Port*		Outlet Port*		Valve Series		Stem Seal		Body Material	
Inlet Port*		Outlet Port*		Valve Series		Stem Seal		Actuator Type	
2A	4A	6A	M6A	V4LQ	Blank	PTFE	Blank	11AC	Normally Closed
2F	4M	6Z	M6Z	V4AQ	K	PCTFE	Blank	11AO	Normally Opened
2M	4Z		M8A				BN	11AD	Double Acting
2Z			M8Z				EPR		
4F	6A	8A	M10A	V6LQ			KZ		
	6Z	8Z	M10Z	V6AQ					

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

## How to Order Options

**Colored Nylon Handles** – Add the designator corresponding to the correct handle color as a suffix to the part number. Black is standard, **W** - white, **B** - blue, **G** - green, **R** - red, **Y** - yellow. **Example:** M10A-V6LQ-SSP-**G**

**Anti-locking Handles** – Prevents the handle from locking in the open position. Add **-ALH** as a suffix to the part number. **Example:** 4M4F-V4LQ-BN-SSP-**ALH**

**Handle Positioner** – Aids in keeping the handle from rotating away from a desired position. To order, add the suffix **-Q4** or **-Q6** to the end of the part number. **Example:** 4M4F-V6LQ-EPR-SSP-**Q6**

**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-V4AQ-EPR-SSP-**C3**

## How to Order Maintenance Kits

**Colored Nylon Handles with Handle Pin** – Valve Series-Handle-Color. **Example:** V4Q-HANDLE-BLUE

**Handle Positioners** – Enables the user to position the handle in a desired location and prevents it from rotating. **Examples:** VQ4: VQ4-HANDLE-POSITIONER; VQ6: VQ6-HANDLE-POSITIONER

**Rubber Seal and Stem Kits** – Consists of one Stem, one Rubber O-ring Stem Seal; one Packing Washer, one Handle Pin, Maintenance Instructions, Kit-Valve Series and Stem Tip-Seal Material.

**Examples:** KIT-VQ4-BN; KIT-VQ6K-V