



# High Cycle Valves

## COMPACT VACUUM VALVES

### Description

The High Cycle Valve is a small vacuum valve expressly designed for long life in demanding applications. It has a small profile, is light, low in cost and is easy to maintain. The High Cycle Valve can be purchased with a high conductance stainless body or without (internal configuration) if being designed to fit directly into the product, for example, a load lock chamber.

Manufactured using superior techniques and high quality materials, the High Cycle Valve is extremely durable and dependable. Lifetime can be extended to 10,000,000 cycles, greatly increasing system uptime and lowering maintenance cost. A new formed stainless steel bellows prevents outgassing, virtual leaks and particle entrapment, extending the cycle life of the valve. The bellows stroke length is optimized to ensure a longer cycle life while maintaining a high conductance. Another standard feature, a TIG fusion welded vacuum grade body made of high-grade, corrosion resistant, 304 stainless steel, creates fewer entrapment areas, resulting in less contamination buildup. In the event of power loss, a high-grade reliable heavy-duty spring will automatically close the valve.

The High Cycle Valve is available in angle, inline and internal only configurations. Port sizes include NW 25, NW 40 and NW 50 using maximum internal diameters for greater conductance. Internal configuration can be used to integrate directly into the chamber reducing the footprint of new tools. For leak-tight operation, elastomer seals are available in Viton® for typical vacuum operating conditions, or in Kalrez® or Chemraz® for higher temperature conditions and increased chemical resistance.

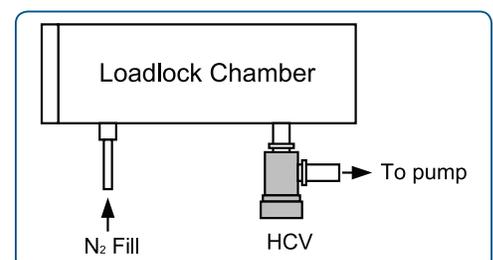
Options for the High Cycle Valve include an air solenoid for electro-pneumatic control of the valve and a limit switch assembly for remote "open or closed" position indication. MKS offers the largest line of bellows-sealed poppet valves for vacuum systems. For more information, please contact MKS at 1-800-227-8766 or visit our website at [www.mksinst.com](http://www.mksinst.com).

### Features & Benefits

- Rated for 10,000,000 cycles, minimizing maintenance cost and tool down time
- Bellows sealed poppet valve, ensures high cycle life and easy maintenance
- High flow inlet and outlet ports, designed for maximum conductance
- Compact low profile, compatible with small footprint designs
- Internal configuration reduces size and can be integrated into load lock chambers
- Spring to close, air to open pneumatic valve, for safety
- Greater sealing force, provides better leak integrity
- High purity, 304 and 316 stainless steel materials, to minimize corrosion
- Industry standard dimensions support easy system integration
- Angle or inline option, for ease of integration in new tool designs
- Available in port diameters of NW 25, NW 40 and NW 50
- Multiple seal options to meet process needs

### Applications

The MKS High Cycle Valve is designed to be used in applications where the cycle life of the valve is critical. It is ideally suited for Load Lock chambers where over 1,000,000 cycles can be achieved yearly giving it a life span greater than 5 years.

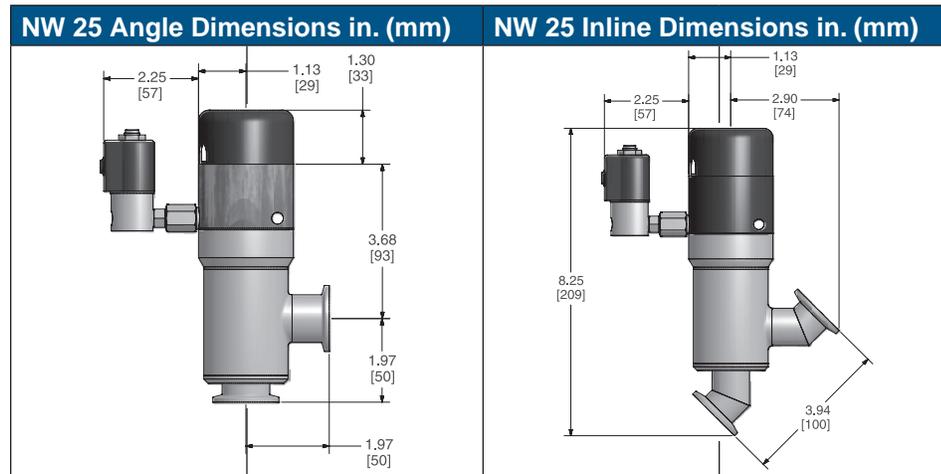


Application Schematic

# Specifications

<b>Vacuum Range</b>	Atmosphere to $1.0 \times 10^{-9}$ Torr		
<b>Cylinder Air Pressure</b>	90 psig $\pm$ 30 psig		
<b>Helium Leak Rate</b>	$1.0 \times 10^{-9}$ std cc/sec		
<b>Maximum Service Temperature</b>	80°C		
<b>Limit Switch Rating</b>	5A - 250 VAC		
<b>Single Pole, Single Throw</b>	5A - 30 VDC		
<b>Typical Life</b>	10,000,000 cycles in clean non-corrosive environments		
	<b>NW 25</b>	<b>NW 40</b>	<b>NW 50</b>
<b>Port Size in. (mm)</b>	1.0 (25.4)	1.5 (38.1)	2.0 (50.8)
<b>Weight ISO-KF, Pneumatic lb. (kg)</b>			
Angle	1.6 (0.7)	3.0 (1.4)	5.4 (2.5)
Inline	1.9 (0.9)	3.1 (1.4)	6.4 (2.9)
<b>Cylinder Volume in<sup>3</sup> (cm<sup>3</sup>)</b>	1.2 (20)	2.2 (36)	6.4 (105)
<b>Actuation Time</b>	40 (90)	60 (90)	160 (220)
at 100 psi msec opening (closing)			
<b>Blow-By Pressure (psia)</b>	80	50	45

# Dimensional Drawing & Ordering Information

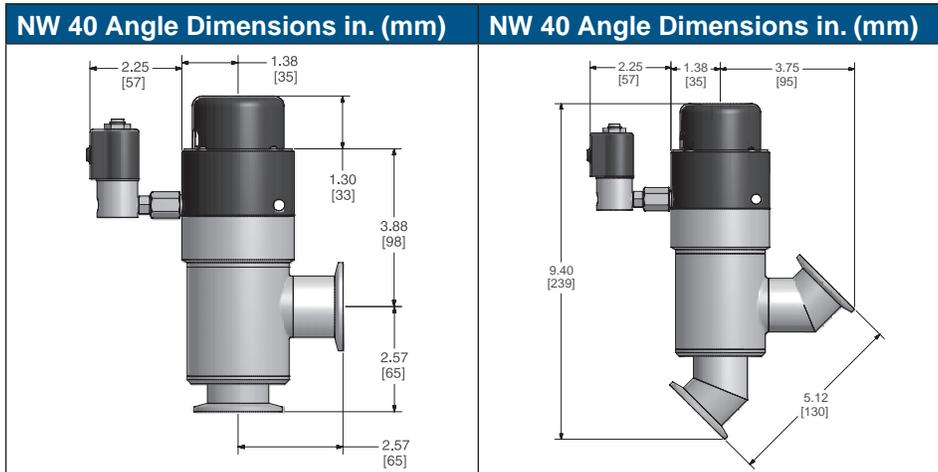


NW 25 High Cycle Valve Ordering Information			
Body Configuration HCV25-XX	Actuator Type -XX	Seal Type X	Pneumatic Solenoid Voltage -XXX
Select 1	Select 1	Select 1	Select 1
<b>HCV25-AK</b> KF 25, Angle <b>HCV25-IK</b> KF 25, Inline	<b>CN</b> Normally Closed Pneumatic (No Limit Switch) <b>CL</b> Normally Closed Pneumatic (Limit Switch)	<b>V</b> Viton® <b>K</b> Kalrez® <b>Z</b> Chemraz®	<b>12D</b> 12 VDC <b>24D</b> 24 VDC <b>24A</b> 24 VAC 50/60 Hz <b>120</b> 120 VAC 50/60 Hz <b>240</b> 240 VAC 50/60 Hz <b>NONE</b> 1/8" NPT

Add the price of the options to the price of the body. Sample part number: HCV25-AK-CLV-120.



# Dimensional Drawing & Ordering Information



NW 40 High Cycle Valve Ordering Information			
Body Configuration HCV40-XX	Actuator Type -XX	Seal Type X	Pneumatic Solenoid Voltage -XXX
Select 1	Select 1	Select 1	Select 1
<b>HCV40-AK</b> KF 40, Angle <b>HCV40-IK</b> KF 40, Inline	<b>CN</b> Normally Closed Pneumatic (No Limit Switch) <b>CL</b> Normally Closed Pneumatic (Limit Switch)	<b>V</b> Viton® <b>K</b> Kalrez® <b>Z</b> Chemraz®	<b>12D</b> 12 VDC <b>24D</b> 24 VDC <b>24A</b> 24 VAC 50/60 Hz <b>120</b> 120 VAC 50/60 Hz <b>240</b> 240 VAC 50/60 Hz <b>NONE</b> 1/8" NPT
Add the price of the options to the price of the body. Sample part number: HCV40-AK-CLV-120.			

## Spare & Replacement Parts

### Spare Kits

Valve Size	Internal Rebuild Kit (includes Viton Seal)	Limit Switch Retrofit Kit
	Part Number	Part Number
NW 25	100016407	100002227
NW 40	100016408	100002228
NW 50	100016409	100002229

### Replacement Solenoids

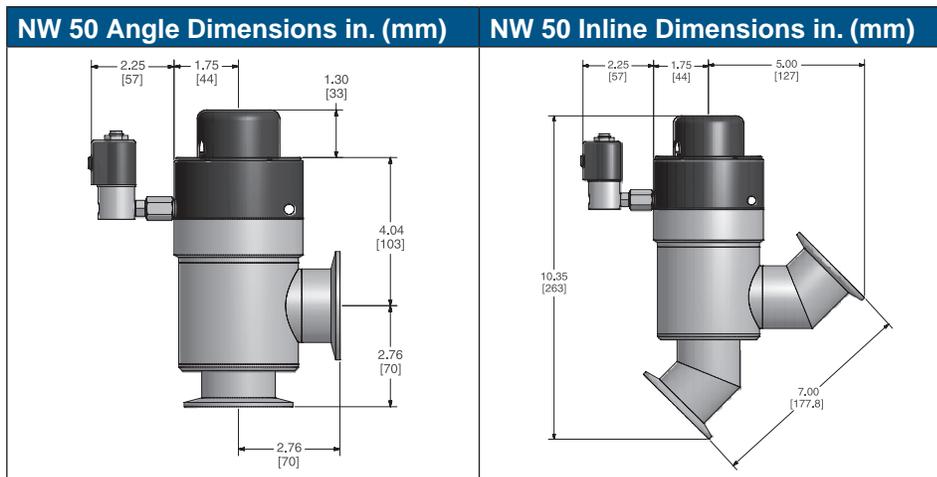
Voltage	Watts	Part Number
12 VDC	7.0	100008539
24 VDC	7.0	100008163
24 VAC	6.0	100008164
120 VAC	7.5	100008165
240 VAC	7.5	100008167

### Replacement Seal Kits

Valve Size	Viton Seal Set	Kalrez Seal Set	Chemraz Seal Set
	Part Number	Part Number	Part Number
NW 25	100002224	100002218	100009145
NW 40	100002225	100002219	100009146
NW 50	100002226	100002220	100009147



# Dimensional Drawing & Ordering Information



## NW 50 High Cycle Valve Ordering Information

Body Configuration HCV50-XX	Actuator Type -XX	Seal Type X	Pneumatic Solenoid Voltage -XXX
Select 1	Select 1	Select 1	Select 1
<b>HCV50-AK</b> KF 50, Angle <b>HCV50-IK</b> KF 50, Inline	<b>CN</b> Normally Closed Pneumatic (No Limit Switch) <b>CL</b> Normally Closed Pneumatic (Limit Switch)	<b>V</b> Viton® <b>K</b> Kalrez® <b>Z</b> Chemraz®	<b>12D</b> 12 VDC <b>24D</b> 24 VDC <b>24A</b> 24 VAC 50/60 Hz <b>120</b> 120 VAC 50/60 Hz <b>240</b> 240 VAC 50/60 Hz <b>NONE</b> 1/8" NPT

Add the price of the options to the price of the body. Sample part number: HCV50-AK-CLV-120.



### MKS Instruments, Inc. Global Headquarters

2 Tech Drive, Suite 201  
Andover, MA 01810  
Tel: 978.645.5500  
Tel: 800.227.8766 (in U.S.A.)  
Web: www.mksinst.com

### MKS Instruments, Inc. Valve Solutions

Six Shattuck Road  
Andover, MA 01810  
Tel: 978.975.2350