



# LoPro™ Two Stage

## COMPACT VACUUM SOFT-START VALVES

### Features & Benefits

- Compact design
- Provides soft pumpdown and isolation of your vacuum system
- Reduces particulate contamination during early turbulent pumpdown
- Adjustable conductance for variable pumpdown speed
- Eliminates the need for small bypass lines that clog easily
- Bellows-sealed poppet valves
- Bellows are formed for less particle trapping and a longer cycle life
- Angle or inline option
- Available in port diameters of 1, 1½, and 2 inches
- Choice of KF flanges, CF flanges, or weld stubs
- May easily be accommodated into existing systems

### Applications

To achieve a soft pumpdown of your vacuum system with limited space conditions, MKS recommends the LoPro™ Two-Stage Valve. A low-profile isolation valve with an integrated small bypass valve, the LoPro Two-Stage Valve significantly simplifies system setup and reduces costs.

The LoPro Two-Stage Valve is best suited for high vacuum applications, specifically semiconductor or optical processing for which a cleaner environment is necessary. With the integrated slow pumpdown feature, turbulent flow is diminished, reducing particle contamination and damage to the product.

### Description

The LoPro Two-Stage Valve soft starts the system in two easy steps without the use of secondary bypass lines, which clog easily and are expensive to maintain. In the first stage, the bypass valve pumps down slowly from atmospheric pressure to a vacuum pressure specified by the end-user. In the second stage, the main valve opens, allowing use of full pumping speed. The main valve is smaller, lighter, and lower in cost than similar competitive valves while offering improved reliability and increased uptime. The square cap design is easy to assemble and maintain.

The LoPro Two-Stage Valve is a normally closed, pneumatically actuated valve at both stages. Within the bypass valve, a removable, interchangeable small orifice is provided to allow for variable slow pump-down times. The standard bypass orifice diameter is 0.225". An optional thumbscrew or micrometer head is available for the bypass valve for flow adjustment by stroke limitation. The formed 321 stainless steel bellows prevents outgassing, virtual leaks, and particle entrapment between bellows convolutions and extends the valve's cycle life. The optimized bellows' stroke length assures a longer cycle life while maintaining a high conductance.

The valve body is comprised of a high grade, corrosion resistant, 304 stainless steel using clean, tungsten inert gas (TIG) welding to ensure significantly fewer entrapment areas, resulting in less contaminant build-up. Select the LoPro Two-Stage Valve in a right angle or inline version and a port diameter of either 1, 1½, or 2 inches. Standard port interfaces include ISO-KF and CF flanges and weld stubs. Elastomer seal choices, for both stages of the valve, include Viton® or Chemraz®, which have a higher chemical resistance. Vacuum exposed parts are clean and free of lubricants. Options include an air solenoid for electropneumatic control and a limit switch for remote indication of the main valve's position.

MKS offers the largest selection 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).



# Specifications

<b>Vacuum Range</b>	Atmosphere to 1.0 x 10 <sup>-9</sup> Torr		
<b>Cylinder Air Pressure</b>	90 psig ±30 psig		
<b>Helium Leak Rate</b>	1.0 x 10 <sup>-9</sup> std cc/sec		
<b>Maximum Bakeout Temperature</b>	150°C		
<b>Limit Switch Rating</b>	5A - 250 VAC		
<b>Single Pole, Single Throw</b>	5A - 30 VDC		
<b>Typical Life</b>	1,000,000 cycles		
<b>Bypass Blow-By</b>	45 psia		
	<b>NW 25</b>	<b>NW 40</b>	<b>NW 50</b>
<b>Port Size</b>	1.0 (25)	1.5 (40)	2.0 (50)
<b>Cylinder Volume in<sup>3</sup> (cm<sup>3</sup>)</b>			
Main	1.2 (20)	2.2 (36)	6.4 (105)
Bypass	<0.25 (<4.1)	<0.25 (<4.1)	<0.25 (<4.1)
<b>Actuation Time msec opening (closing)</b>			
Main	40 (90)	60 (90)	160 (220)
Bypass	100	100	100
<b>Blow-By Pressure Main Valve psia</b>	80	50	45
<b>Maximum Internal Spring Closing Pressure Main Valve psia</b>	43	60	38

# Ordering Information

NW 25 LoPro Two-Stage Valve Ordering Information						
Body Configuration LPV2-XX-XX	Bypass Orifice Size -XXX	Bypass Actuator Type -X	Limit Switch X	Seal Type X	Temperature Configuration X	Pneumatic Solenoid Voltage* -XXX
Select 1	Select 1	Select 1	Select 1	Select 1	Select 1	Select 1
LPV2-25-AK KF 25 Angle	225 0.225"	C Normally Closed	L With Limit Switch	V Viton®	NH Regular	24A 24VAC 50/60 Hz
LPV2-25-IK KF 25 Inline		V Thumb Screw	N No Limit Switch	Z Chemraz®		24D 24VDC
LPV2-25-AC CF 2 1/8 Angle		M Micrometer Head				120 120VAC 50/60 Hz
LPV2-25-IC CF 2 1/8 Inline						208 208VAC 50/60 Hz
LPV2-25-AT 1" Tube Angle						240 220VAC 50/60 Hz
LPV2-25-IT 1" Tube Inline						None Main: 1/8" NPT-F Bypass: 10-32 UNF-F

Add the price of the options to the price of the body. Sample part number: LPV1-25-AK-CLVS-120.

\* Price includes one solenoid each for the bypass and main valve.

NW 25 Angle Dimensions in. (mm)				NW 25 Inline Dimensions in. (mm)			
<b>A</b>	<b>KF</b>	<b>CF</b>	<b>Tube</b>	<b>A</b>	<b>KF</b>	<b>CF</b>	<b>Tube</b>
<b>B</b>	2.8 (71)	3.6 (91)	3.4 (86)	<b>B</b>	3.94 (100)	4.62 (117)	4.35 (110)
	2.0 (51)	2.0 (51)	1.9 (48)	<b>C</b>	1.3 (33)	1.2 (30)	1.3 (33)
					1.5 (38)	1.4 (36)	1.5 (38)



# Ordering Information

NW 40 LoPro Two-Stage Valve Ordering Information						Pneumatic Solenoid Voltage -XXX
Body Configuration LPV2-XX-XX	Bypass Orifice Size -XXX	Bypass Actuator Type -X	Limit Switch X	Seal Type X	Temperature Configuration X	
Select 1	Select 1	Select 1	Select 1	Select 1	Select 1	Select 1
<b>LPV2-40-AK</b> KF 40 Angle  <b>LPV2-40-IK</b> KF 40 Inline  <b>LPV2-40-AC</b> CF 2¼ Angle  <b>LPV2-40-IC</b> CF 2¼ Inline  <b>LPV2-40-AT</b> 1½" Tube Angle  <b>LPV2-40-IT</b> 1½" Tube Inline	<b>225</b> 0.225"	<b>C</b> Normally Closed  <b>V</b> Thumb Screw  <b>M</b> Micrometer Head	<b>L</b> With Limit Switch  <b>N</b> No Limit Switch	<b>V</b> Viton®  <b>Z</b> Chemraz®	<b>NH</b> Regular	<b>24A</b> 24VAC 50/60 Hz  <b>24D</b> 24VDC  <b>120</b> 120VAC 50/60 Hz  <b>208</b> 208VAC 50/60 Hz  <b>240</b> 220VAC 50/60 Hz  <b>None</b> Main: 1/8" NPT-F Bypass: 10-32 UNF-F

Add the options to the body. Sample part number: LPV2-40-AK-225-CLVNH-120.  
\* Price includes one solenoid each for the bypass and main valve.

NW 40 Angle Dimensions in. (mm)				NW 40 Inline Dimensions in. (mm)			
<b>A</b>	<b>KF</b> 2.6 (66)	<b>CF</b> 3.5 (89)	<b>Tube</b> 3.3 (84)	<b>A</b>	<b>KF</b> 6.0 (152)	<b>CF</b> 6.0 (152)	<b>Tube</b> 5.7 (145)
<b>B</b>	2.6 (66)	2.4 (61)	2.3 (58)	<b>B</b>	1.2 (30)	1.2 (30)	1.4 (36)
				<b>C</b>	1.6 (41)	1.6 (41)	1.7 (43)

Spare Parts				
Port Size in. (NW)	Manual Valve Internals Viton Seals	Limit Switch	Viton Seal Set	Chemraz Seal Set
	Part Number	Part Number	Part Number	Part Number
1.0 (25)	100010104	100002227	100008619	100008623
1.5 (40)	100010103	100002228	100008624	100008628
2.0 (50)	100010102	100002229	100008629	100008633

Bypass Valve Spare Parts, Viton® Seals		
Actuator Type	Internal Rebuild Kits	Conversion Kits
	Part Number	Part Number
Normally Closed	100004937	100004919
Thumb Screw	100004938	100004920
Micrometer	100004939	100004921



# Ordering Information

NW 50 LoPro Two-Stage Valve Ordering Information						
Body Configuration LPV2-XX-XX	Bypass Orifice Size -XXX	Bypass Actuator Type -X	Limit Switch X	Seal Type X	Temperature Configuration X	Pneumatic Solenoid Voltage -XXX
Select 1	Select 1	Select 1	Select 1	Select 1	Select 1	Select 1
<b>LPV2-50-AK</b> KF 50 Angle	<b>225</b> 0.225"	<b>C</b> Normally Closed	<b>L</b> With Limit Switch	<b>V</b> Viton®	<b>NH</b> Regular	<b>24A</b> 24VAC 50/60 Hz
<b>LPV2-50-IK</b> KF 50 Inline		<b>V</b> Thumb Screw	<b>N</b> No Limit Switch	<b>Z</b> Chemraz®		<b>24D</b> 24VDC
<b>LPV2-50-AC</b> CF 3 3/8 Angle		<b>M</b> Micrometer Head				<b>120</b> 120VAC 50/60 Hz
<b>LPV2-50-IC</b> CF 3 3/8 Inline						<b>208</b> 208VAC 50/60 Hz
<b>LPV2-50-AT</b> 2" Tube Angle						<b>240</b> 220VAC 50/60 Hz
<b>LPV2-50-IT</b> 2" Tube Inline						<b>None</b> Main: 1/8" NPT-F Bypass: 10-32 UNF-F

Add the options to the body. Sample part number: LPV2-50-AK-225-CLVNH-120.  
\* Price includes one solenoid each for the bypass and main valve.

NW 50 Angle Dimensions in. (mm)				NW 50 Inline Dimensions in. (mm)			
<b>A</b>	<b>KF</b> 2.8 (71)	<b>CF</b> 4.1 (104)	<b>Tube</b> 3.9 (99)	<b>A</b>	<b>KF</b> 7.8 (198)	<b>CF</b> 8.4 (213)	<b>Tube</b> 8.0 (203)
<b>B</b>	2.8 (71)	3.2 (81)	3.0 (76)	<b>B</b>	0.7 (18)	0.4 (10)	0.6 (15)
				<b>C</b>	1.8 (46)	1.5 (38)	1.7 (43)

Replacement Solenoid Valves		
Voltage and Frequency	Watts	Part Number
24VAC 50/60 Hz	6.0	100008164
24VDC	7.0	100008163
12 VDC	7.0	100008539
120VAC 50/60 Hz	7.5	100008165
208VAC 50/60 Hz	7.5	100008166
220VAC 50/60 Hz	7.5	100008167



## 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