





### **Cv Valve (Compact Vacuum Valve)**

The Cv valve is designed for use in vacuum systems for applications such as gauge isolation, roughing, venting or bypass lines. Pneumatic and manual actuation types are available. A variety of fittings are available that include VCR, CF, tube stubs and KF flanges in angle and inline configurations. Sizes available are NW16 to NW25.



### **Lo-Pro™ Valves (Low Profile Vacuum Valve)**

The Lo-Pro valve is a small compact vacuum valve designed for high performance in gauge or system isolation. It is ideally suited for applications such as semiconductor manufacturing, process industries, high energy physics research and thin film deposition. Lo-Pro valves are rated at 1,000,000 cycles using formed bellows. Available with KF flanges, CF flanges or tube stubs in both angle and inline configurations. Sizes available are NW25 to NW100.



### **Lo-Pro™ Two-Stage Valves (Low Profile Vacuum Soft Start Valves)**

To achieve a soft pump down 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, semiconductor or optical processing, where a clean environment is needed. Turbulent flow is diminished with the integrated slow pump down feature, reducing particle contamination and damage to your product. Interchangeable orifices are available so you can create the pump down time for optimum performance of your vacuum system. Sizes available are NW25 to NW50.



### **Series 150/160 and V-100 (High Conductance Vacuum Valve)**

The Series 150/160 and V-100 valves are designed to insure product quality, reliability and value. They function reliably in applications ranging from semiconductor manufacturing to plasma physics research to nuclear accelerators. Higher conductance is achieved using larger diameter valve bodies than the Lo-Pro series. The 150/160 series valves utilize formed bellows for reliability, with angle and inline configurations. Sizes available are NW16 to NW160.



### **Two Stage Valves (High Conductance Soft Start Vacuum Valves)**

To achieve a soft pump down and isolate your vacuum system, MKS recommends its Two-Stage valve. It integrates a small bypass valve into an isolation valve, significantly simplifying system setup and reducing costs. The 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 pump down feature, turbulent flow is diminished preventing damage to your product. Interchangeable orifices are available so you can create the pump down time for optimum performance of your vacuum system. Three stage valves are available as a special product if necessary for even higher protection. Sizes available are NW25 to NW100.



### **Jalapeno Valves (Heated High Conductance Vacuum Valves)**

Semiconductor CVD, Etch and other processes produce gaseous by-products that can readily be pumped out of the reaction chamber. These gases can solidify in the pump line since the line temperature is usually lower than the reaction chamber. A clogged line means longer down time and lower product yield. A common process is LPCVD silicon nitride. Since sublimation is temperature driven, use heat to maintain the by-products in the vapor phase and use cooling to intentionally sublimate the vapors in the trap. Heaters have been used successfully in tungsten and oxide-etch systems. Heating helps in TEOS CVD systems where a very tight temperature control is required. Some processes yield unintentional by-products. For example, di-ammonium hexafluorosilicate ( $(\text{NH}_4)_2\text{SiF}_6$ ) has been observed in a silicon nitride PECVD process due to the cross chemical reaction of the products formed in the deposition and etching processes. The Jalapeno is available with Series 46 or Series 48 heaters with temperature ranges from 40°C to 185°C. Sizes available are NW50 to NW100.

# Valve Selection Guide



## Jalapeño Lo-Pro™ Valves (Heated Compact Vacuum Valves)

Semiconductor processes such as Low Pressure Chemical Vapor Deposition (LPCVD) and aluminum etch, are known for creating deposition in the pump line downstream from the process chamber. This can reduce conductance and will eventually flake off creating particles that can back stream, contaminating your chamber and product. This results in tool downtime where the system must be shut down and the contaminated vacuum components cleaned or even replaced. The Jalapeño LoPro valves reduce contamination, increase system uptime and product yield, and decrease scheduled maintenance. Available in Series 46 or Series 48 heaters with temperature ranges from 40°C to 185°C. Sizes available are NW25 to NW50.



## High Cycle Valves (Compact Load Lock Chamber Valves)

The High Cycle Valve (HCV) 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 of well over 5 years. The HCV is rated to 10,000,000 cycles keeping rebuild costs to a minimum. Sizes available are NW25 to NW50.



## Corrosion and Ozone Resistant Valves (Compact Process Valves)

The Corrosion Resistant Valve (CRV) is designed to resist process gases that can attack the internal bellows used for isolation from atmospheric air. A patented shielding system isolates the bellows when the valve is in the open position and gases are flowing through the fore line. The CRV technology can be designed in almost all valves manufactured by MKS.



## High Flow Valves (High Conductance Valves)

The High Flow Valves (HFV) are designed to be used in applications requiring high conductance and reliable isolation. Edge welded bellows are used for maximum stroke length. The advanced design of the pneumatic system allows for a smaller footprint inside the valve while maintaining high conductance. These valves can be completely disassembled for easy maintenance and low cost service. Sizes available are NW160 to NW250.



## Integrated Lo-Pro Two Stage Valves (Compact Vacuum Soft Start Valves)

Often a bypass line is used to soft start a system, which utilizes system space and can clog, requiring frequent cleaning and maintenance. The Integrated LoPro (ILP) Two Stage valve has been designed to replace the bypass line. The ILP accommodates the space constraints found on vacuum applications like load lock and transfer chambers specifically in semiconductor or optical processing for which a cleaner environment is necessary. A heater jacket is available for processes with condensable materials. The ILP employs an easily accessible adjustment screw for a wide range of conductance through the bypass valve. Sizes available are NW25 to NW50.



## IDA Valve (In-Situ Diagnostics Access Valve)

The IDA Valve is a multi-purpose, multi-port, dual valve that allows both vacuum gauge isolation and in situ diagnostics. Typically used in conjunction with a capacitance manometer the valve can be connected to a remote vacuum system allowing calibration and zero to be verified without the need to remove the transducer from the vacuum system. The IDA can come in many different configurations to fit the needs of the tool and process. Sizes available are NW16 to NW25 with many different flange configurations.

## Valve Selection Guide



### UHV Valve (High Vacuum Metal Sealed Valve)

The Ultra High Vacuum Valves (UHV) are lightweight and compact valves that use metal bonnet seals designed to limit outgassing and O-ring permeation. Available with CF flanges, this allows for lower base pressures in your chamber, while the use of welded bellows maximizes stroke length and cycle life. The UHV is generally used in applications such as high energy physics, mass spectrometry where ultra clean environments and low pressure are needed. Sizes available are NW25 to NW40.



### Electromagnetic Cv Valve (Compact Vacuum Valve)

The Electromagnetic Cv (ECv) is designed for a variety of today's high vacuum process needs. Using 12 or 24 VDC and a proven coil saver, the ECv valve provides a dampened, low vibration actuation for use on sensitive and expensive analytical instrumentation. Sizes available are NW16 to NW25.



### Series 145 Vacuum Sentry (Protect Your Vacuum System)

The Series 145 Vacuum Sentry is a safety valve that protects a vacuum system upon power failure by isolating the chamber and venting the oil sealed mechanical pump. Isolating the chamber from oil and venting the pump for quick system restarts is crucial for system uptime. This fast acting valve is easily wired into the pump. Sizes available are NW25 to NW50.



### Rapid Isolation Valves (Protect Your Vacuum System)

The Rapid Isolation Valve (RIV) takes a variety of valves and upgrades them to close quickly upon pump failure. Using quick vents and a larger orifice for pneumatics this valve can help eliminate particles and turbulence caused by back streaming gases and oils from the pump and fore line. Sizes available are NW16 to NW250.



### Ball Valves (Through Hole Valves)

MKS offers a complete line of high quality ball valves for use in aggressive processes and exhaust lines. Heated pneumatic and manual ball valves are designed with the valve body and actuator separated by an elongated actuator shaft, allowing the entire valve to be heated and insulated from heat loss. The unique ball valve heater covers the entire valve body as well as the custom stainless steel flange clamps on each end of the valve body. Temperature stability inside the valve is maximized by completely covering the valve, preventing heat loss. The valves are held to the same quality and performance standards as the rest of the MKS valve line, including lifetime and leak integrity. Sizes available are NW16 to NW100.



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