

Jalapeño Valve

HEATED VACUUM VALVES FOR

- CVD Nitride, TiN LPCVD
- Other Semiconductor Processes



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Heated Vacuum Valve for Semiconductor Processes

The HPS® Jalapeño Valves are the highest temperature isolation valves offered by MKS and are designed for processes that require elevated temperatures such as nitride.

The Jalapeño Valves are specially designed to fit with the HPS® Series 46 Heater line. Each valve heater is designed for optimal temperature distribution and uniformity. The result is a fully engineered product match, which provides the highest level of performance for the silicone heater technology.

Features and Benefits

New Improved Heater Design

- Tighter temperature control enabled by microprocessor controlled thermocouple
- Improved reliability of heater control system due to no-arc relay circuit
- Improved temperature uniformity with optimized design of multiple heating zones
- Improved heater lifetimes and ease of installation with new clam-shell design of heaters
- Improved design of thermal fuse, eliminating nuisance failures caused by transient thermal spikes
- Completely compatible with Series 45 in size and connectivity
- Special temperature settings available on request

Improved Process Performance - Yield, Uptime

- Isolates pump lines and traps downstream
- Reduces particle generation with slow pump downs
- Stops unwanted sublimation of process by-products, heaters keep valve clean
- Reported increase in time between maintenance cycles from 2 weeks to 12 weeks or 20 runs to 145 runs

Enhanced Heater Safety

- Outside temperature of heater 45-65°C, safe to touch
- UL listed and CE tested and marked for both electrical and thermal safety
- Passes SEMI S9-95 strain relief test of 35 pounds

- Integral thermal fuse
- Ground Fault Equipment Leakage Circuit Interrupter power cord option eliminates shock hazard

Better Thermal Performance

- Reduced power consumption
- Improved temperature uniformity, prevents cold zones
- Patented design retains heat and improves thermal safety

Valve Features

- Formed bellows for reduced particle buildup and longer cycle life
- Heavy duty spring allows the valve to seal with contamination
- Second stage allows for soft pump down
- Adjustable orifice allows for controlled pump down
- Thumbscrew and micrometer actuators available for bypass valve
- Three stage valves available on request

Other Important Features

- May be used in vacuum forelines, or the exhaust side of the pump
- Fast delivery of standard heaters
- Controller LED confirms that the heater is operating properly and at pre-set operating temperatures
- Low temperature alert option warns when heater is cold
- Specially designed valves with heaters available

Applications

Semiconductor CVD and etch processes produce gaseous by-products that can readily be pumped out of the reaction chamber. However, they usually solidify in a vacuum pump line since the line temperature is 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, diammonium 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. It is a sublimable material that lends itself to heating and cooling strategies. Please consult MKS application engineers for further assistance.

Description

Heaters and Insulators

The Series 46 Jalapeño Valve heaters maintain a low external surface temperature while heating the standard HPS® Jalapeño Valves. They meet current strict safety standards.

The heaters can be daisy-chained with integral locking connectors. The heaters are wired in parallel. If one heater fails, the others will remain on. A power cord is required for every 12 amps drawn by a chain of heaters.

Heat is distributed with wire heating elements closely and evenly spaced. The Jalapeño Valve heater uses up to five heat control zones. Any potential for hot and cold spots is virtually eliminated because of improved, optimized heat distribution. Since each heater is designed to uniformly heat a component, there is no need for costly controllers or thermocouples with messy wires.

The heaters are made of a 1/2" or 3/4" thick silicone foam insulation bonded, using a patented technology, onto a reinforced silicone rubber mat. We have optimized the thickness of the insulation for the highest degree of temperature insulation, while still offering an easy fit into tight places. The heaters' elastic, conforming shape and new clam shell design make installation and removal fast and easy.

Flange insulators, made of the same material as the heaters; help to keep your system at a uniform inside and

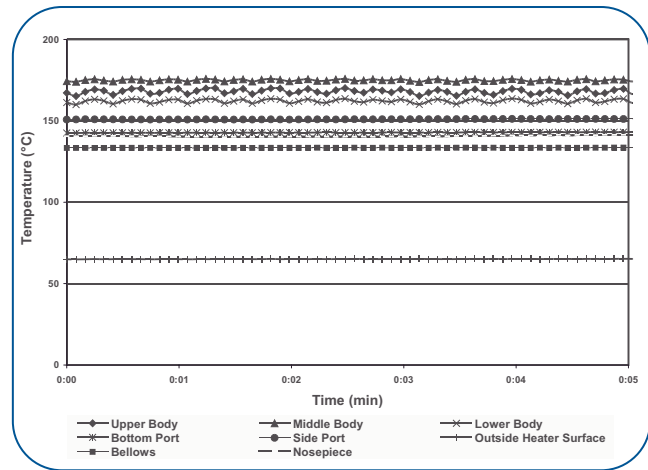
a safe outside temperature. They also restrict the rate of heat loss externally, reducing your power consumption.

All materials used in the heaters and insulators are suitable for clean room use.

Valves

The heated valves may have up to five different heat zones in the heater controlled by a microprocessor based electronic controller. This eliminates "cold zones" and maintains temperature uniformity in the valve. Minimum temperatures exceed 135°C (see Figure 1).

Figure 1



Temperature Profile of a 46 Series
NW 100 Single Stage Jalapeno Valve Heater

The valve uses a formed bellows made of 321 stainless steel. Formed bellows are easier to heat and prevent particle entrapment between the convolutions. This increases the valve cycle life.

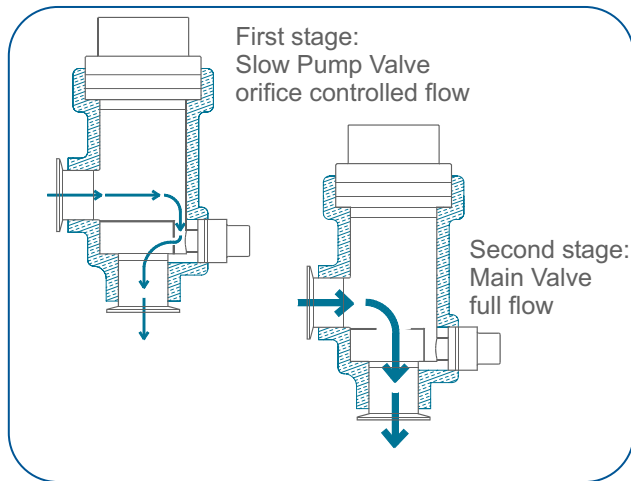
The valve is air opened and spring closed. The heavy duty spring allows the valve to seal in the presence of contamination on the seat.

Two-Stage Valves

Traditionally, the best method to soft start a vacuum system has been to run a secondary bypass line with a small orifice valve around the main vacuum isolation valve.

We have designed the Jalapeño Two-Stage Valve specifically to accommodate your space constraints and to provide a heated soft start to your system in two effortless steps (Figure 2). In the first stage, the bypass valve pumps down slowly from atmospheric pressure to a user-specified vacuum pressure. In the second stage, the main valve opens, allowing use of full pumping speed.

Figure 2



Two-Stage Valve Flow

The Jalapeño Two-Stage Valve features a removable, interchangeable small orifice within the bypass valve to vary slow pump speeds. The standard bypass orifice diameter is 0.225 inches.

A normally closed, pneumatically actuated valve at both stages, the Jalapeño Two-Stage Valve is offered with an optional thumbscrew or micrometer head for the bypass valve. This allows for additional flow adjustment by limiting the stroke.

Enhanced Safety

The Series 46 heaters engineered for the Jalapeño Valve are the result of many years of continuous improvement directed at satisfying the demands of modern semiconductor facilities. They represent the highest standard of thermal and electrical safety on the market.

Low outside temperature safe to touch

One of the primary concerns of safety engineers is exposure to hot surfaces. Pipeline heaters in particular present substantial opportunity for accidental contact because of the vast array of vacuum piping typically found in a fab. Superior thermal insulation is key to holding the heat in near the pipe where it is needed, and away from the outside surface. A heater operating at 150°C requires a 0.5 inch thick layer of silicone foam in order to meet today's safety standard limits.

UL Listed

The basic heater mat, power leads, critical temperature devices such as the thermostat and thermal fuse, and other construction materials have all been reviewed and certified by UL and given the UL listed designation. UL safety standards cover both thermal and electrical issues.

CE marked for both electrical and thermal safety

The entire heater has been tested by an independent test lab certifying compliance with the relevant European Electromagnetic Compatibility and Low Voltage directives.

Passes SEMI S9-95 strain relief test of 35 pounds

Each power lead can sustain a load in excess of 35 pounds without damage. These heaters are durable and are designed to withstand the rigors of repeated installation and removal without damage.

Integral thermal fuse

A secondary temperature limiting device is required by several safety standards organizations. Our thermal fuse is considered a critical safety component and has been certified by UL, CSA, and VDE testing agencies.

Ground Fault Equipment Leakage Circuit Interrupter (GFELCI)

Vacuum piping installations should be grounded. In the event that the ground connection is lost, the GFELCI power cord will maintain electrical safety even with a short circuit to ungrounded piping. If an operator touches the electrically "hot" piping, the GFELCI power cord will cut power off to the heaters within 25 msec upon sensing a current imbalance between power lines. The detection circuit is similar to those used in new residential construction.

Compatible with HPS® Series 45 Heaters

The Series 46 heaters are the same dimensional size as the Series 45 heaters and can be daisy-chained with Series 45 heaters.

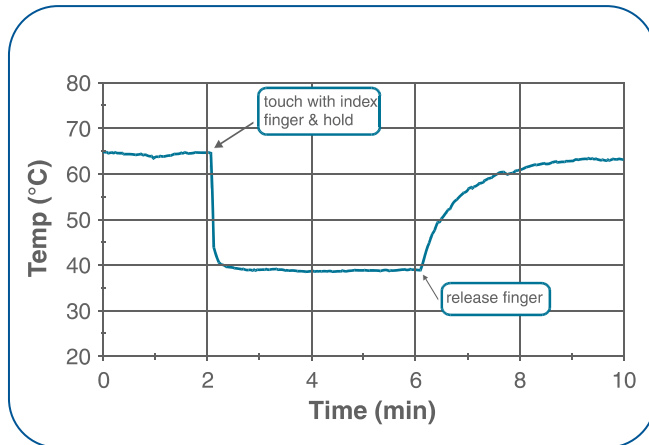
New, Improved Thermal Performance

HPS® Heaters use a patented insulation construction that is effective at maintaining heat levels required while remaining safe to touch on the outside. This allows for the following benefits:

- (1) Microprocessor-based control of thermocouple offers an extremely tight temperature control band.
- (2) No-arc relay circuit eliminates arcing of the power relays extending lifetime and improving reliability of the heater. Relay contact life exceeds 4 million cycles.
- (3) New optimized design of the heat zones within the valve heater improve temperature uniformity.
- (4) Improved design of thermal fuse configuration eliminates nuisance failures caused by transient thermal spikes.

- (5) When you touch the outside insulation, your finger acts as a heat sink. The insulation is so effective that the outside temperature of the heater where you are touching falls to 39°C. So the heaters are safe to touch. When you remove your finger, the silicone goes back to 65°C. See Figure 3.

Figure 3



HPS® Heater "Heat-Sink" Graph

- (6) The 1/2" silicone foam insulation keeps the parts heated with less power. The power consumption should be 20-30% less than conventional 1/4" silicone heaters.
- (7) All surfaces of the component are heated uniformly to the temperature range required. The HPS® heater's patented molded design completely surrounds the valve body. Total coverage improves temperature uniformity two ways: by controlling heat loss from exposed gaps, and by actively heating what used to be a dead zone. Cold zones encountered in lace-type and mat-type heaters are eliminated. There is no danger from exposure to hot metal eyelets as there is on the lace-style heaters.
- (8) Each heater is equipped with a microprocessor based electronic controller that makes each heater its own control zone. Differences in heat transfer rate, like that between vertical and horizontal piping runs, are automatically accounted for.

Low Temperature Alerts

Each heater's electronic controller is equipped with a pair of operational status LEDs, one on each side of the controller. These LEDs are visible through the controller's plastic shell when illuminated. When the LEDs are on, this indicates that the heater is operating properly and within $\pm 20^{\circ}\text{C}$ of nominal operating temperature.

Heaters equipped with the LTA option (LTA monitor required) contain a normally open switch that closes when the heater has achieved normal operating temperature. The thermal switches are designed to be daisy chained in series to permit monitoring several heaters with a single LTA monitor. If any one of the switches fails to close, then one of the heaters has gone cold and the LTA monitor will signal a fault via a flashing red LED. When all heaters are operating within their normal operating temperature range, the monitor's green LED will be on. The monitor also includes a relay with normally open and normally closed contacts. The relay can be hard wired into a user supplied computer or other instrumentation to provide remote notification of heater status. The combination of these two features provides both remote and local confirmation of heater status.

Other Important Features

These heaters are much easier to install, since they are premolded in the shape of the part. The new clam shell design for the valve body heaters improves ease of installation. The snaps will not get hot and the arduous lacing process is eliminated.

Specifications

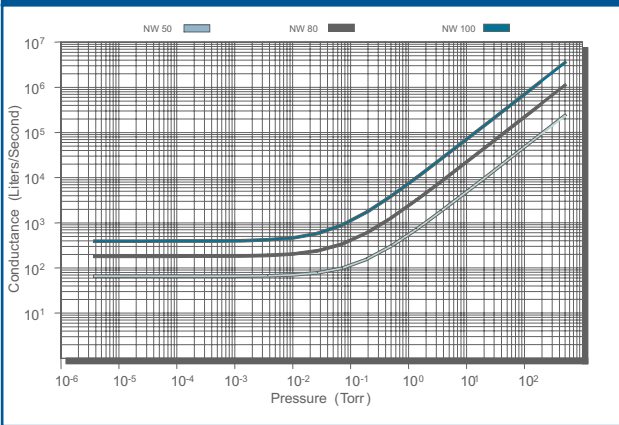
Specifications

Port Size in. (NW)	Weight lb. / (kg)				Heater Current at 120V (amps)				Actuator Cylinder Volume in. ³ (cm ³)	Actuation Time (msec) Opening (Closing)	Blow By Pressure psia	Maximum Internal Spring Closing Pressure psia
	Single Stage		Two-Stage		Angle		Inline (body and port heaters)					
	Angle	Inline	Angle	Inline	Single Stage	Two Stage	Single Stage	Two Stage				
2.0 (50)	13.0 (5.9)	16.5 (7.5)	13.8 (6.3)	17.5 (8.0)	.9	1.2	1.3	1.6	13.3 (218)	1,000 (2,000)	45	38
3.0 (80)	19.6 (8.9)	27.5 (12.5)	20.4 (9.3)	28.5 (13.0)	1.4	1.7	1.8	2.7	27.6 (453)	2,000 (2,000)	38	40
4.0 (100)	25.5 (11.6)	37.5 (17.0)	26.3 (11.9)	38.5 (17.5)	1.7	2.4	2.7	3.6	27.6 (453)	2,000 (2,000)	30	30

Specifications - Main Valve

Vacuum Range	Atmosphere to below 10 ⁻⁹ Torr
Helium Leak Rate	Less than 1.0 x 10 ⁻⁹ std cc/sec
Cylinder Air Pressure	60 to 100 psig
Limit Switch Rating Single Pole, Double Throw	5A - 250VAC 5A - 30VDC

Conductance - Main Valve



Specifications - Bypass Valve

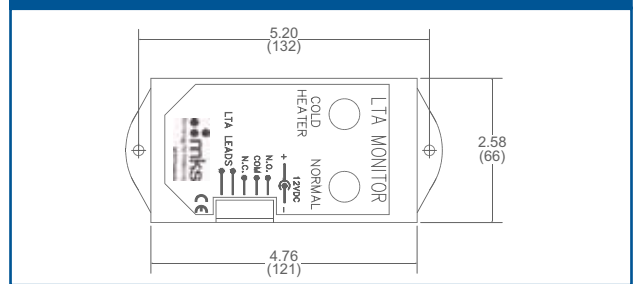
Vacuum Range	Atmosphere to below 10 ⁻⁹ Torr
Helium Leak Test	Less than 1.0 x 10 ⁻⁹ std cc/sec
Cylinder Air Pressure	60 to 120 psig
Pneumatic Cylinder Displacement Volume	0.25 in. ³ (4.1 cm ³)
Approximate Pneumatic Closing Time	100 msec
Blow-By Pressure	47 psia
Maximum Internal Spring Closing Pressure	40 psia

Heater Specifications

Temperature Nominal Set Point	150°C (302°F)
Exterior Range	60°- 70°C (140°-158°F)
Interior Range	130°-190°C (266°-374°F)
Electrical Duty Cycle	100 volts 72% 120 volts 50%
Power Cord Current	12 A maximum
Materials	Molded silicone foam, fiberglass reinforced silicone, Teflon insulated wire
Connectors	Midget Twist-Lock, nylon, NEMA ML-1
Product Safety	CE Mark: 89/336/EEC EMC Directive, 73/23/EEC LV Directive UL Listed: File E52951 2JR

LTA Monitor

in/(mm)




LTA Monitor Specifications


Enclosure	Black plastic
Power Requirements	90-130 VAC input, 12 VDC +/-3 VDC output
Power Consumption	0.3 W
Relay Contact Rating	SPDT, 2 A @ 50 VAC resistive, 1 A @ 30 VDC
Input/Output Wiring	1 Thermal switch line IN 2 Thermal switch line OUT 3 Normally closed 4 Common 5 Normally open
Dimensions (L x H x D)	2.58" x 4.76" x 1.46" (inches) 66 x 121 x 37 (mm)
CE Certification	89/336/EEC EMC Directive 92/59/EEC General Product Safety Directive

Ordering Information


Heater, Single-Stage, Angle

	Flange Size (ISO)	No LTA		With Low Temperature Alert	
		Part Number	Price	Part Number	Price
	NW 50	4620-0051		4620-1051	
	NW 80	4630-0051		4630-1051	
NW 100	4640-0051		4640-1051		


Heater, Single-Stage, Inline

	Flange Size (ISO)	For Use On	No LTA		With Low Temperature Alert	
			Part Number	Price	Part Number	Price
	NW 50	Body	4620-0071		4620-1071	
	NW 80	Body Port*	4630-0071 4630-0081		4630-1071 4630-1081	
NW 100	Body Port*	4640-0051 4640-0081		4640-1051 4640-1081		

Heater, Two-Stage, Angle

	Flange Size (ISO)	No LTA		With Low Temperature Alert	
		Part Number	Price	Part Number	Price
	NW 50	4620-0053		4620-1053	
	NW 80	4630-0053		4630-1053	
NW 100	4640-0053		4640-1053		

Heater, Two-Stage, Inline

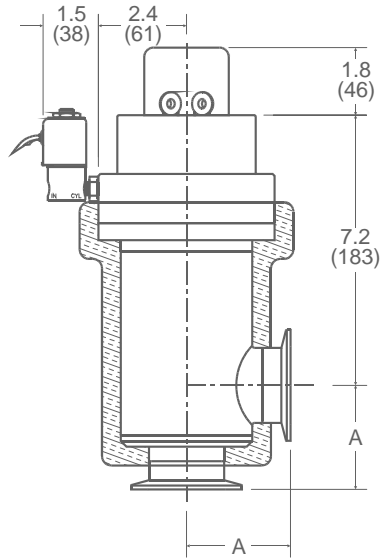
	Flange Size (ISO)	For Use On	No LTA		With Low Temperature Alert	
			Part Number	Price	Part Number	Price
	NW 50	Body Port*	4620-0073		4620-1073	
			4620-0085		4620-1085	
NW 80	Body Side Port Base Port	4630-0073		4630-1073		
		4630-0085		4630-1085		
		4630-0087		4630-1087		
NW 100	Body Side Port Base Port	4640-0073		4640-1073		
		4640-0085		4640-1085		
		4640-0087		4640-1087		

* Two required per valve. Port Heaters are not clam-shell design.



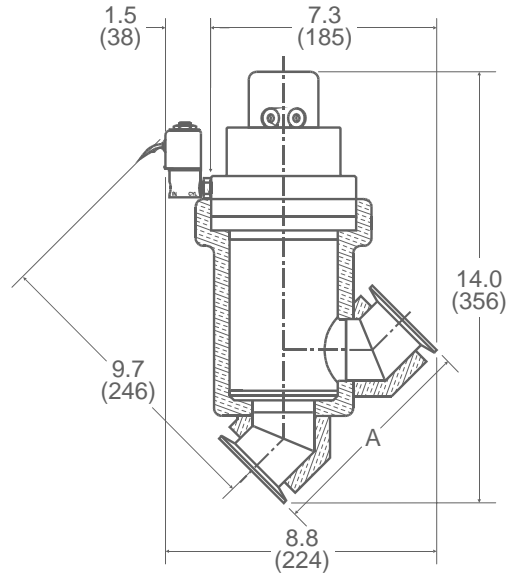
Ordering Information

NW 50 Angle Dimensions in./(mm)



A KF Tube
 2.8 (71) 3.0 (76)

NW 50 Inline Dimensions in./(mm)



A KF Tube
 7.0 (178) 7.2 (183)

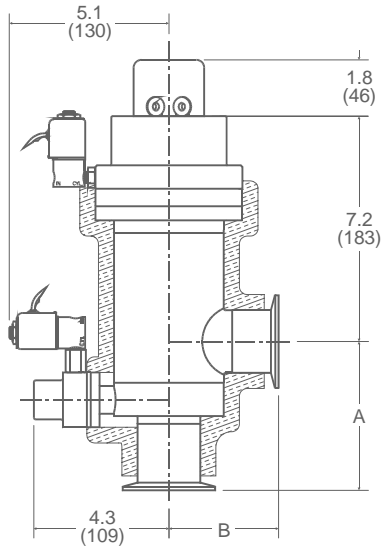
NW 50 Single-Stage Valve Ordering Information

Body Configuration		Limit Switch		Seal Type		Temperature Configuration		Pneumatic Solenoid Voltage	
J1-XXX-XX		-X		X		XXX		-XXX	
Select 1	Price	Select 1	Price	Select 1	Price	Select 1	Price	Select 1	Price
J1-050-AK KF 50 Angle		L w/ Limit Switch		H Viton Bonnet, Chemraz Nose		R6A Angle Heater		24A 24VAC 50/60 Hz	
J1-050-AT 2" Tube Angle		N w/o Limit Switch		Z Chemraz Bonnet and Nose		R6I Inline Heaters		24D 24VDC	
J1-050-IK KF 50 Inline						L6A Angle LTA Heater		120 120VAC 50/60 Hz	
J1-050-IT 2" Tube Inline						L6I Inline LTA Heaters		208 208VAC 50/60 Hz	
								240 220VAC 50/60 Hz	
								NONE 1/8" NPT-F	

Add the price of the options to the price of the body. Sample part number: J1-050-AK-LHR6A-120.

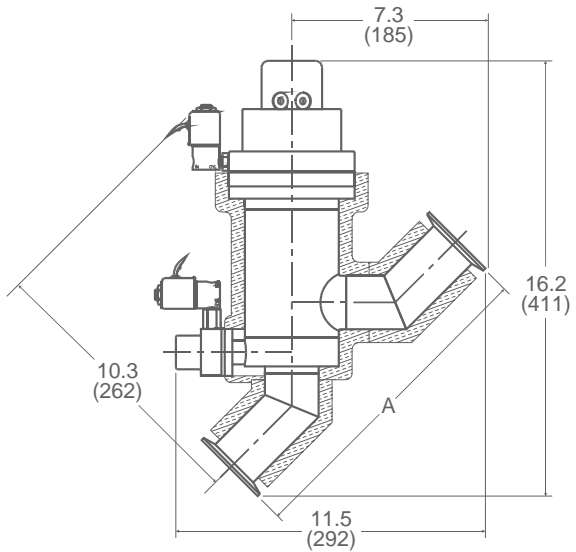
Ordering Information

NW 50 Angle Dimensions in./(mm)



	KF	Tube
A	4.8 (122)	4.6 (117)
B	3.5 (89)	3.4 (86)

NW 50 Inline Dimensions in./(mm)



	KF	Tube
A	12.0 (305)	11.7 (297)

NW 50 Two-Stage Valve Ordering Information

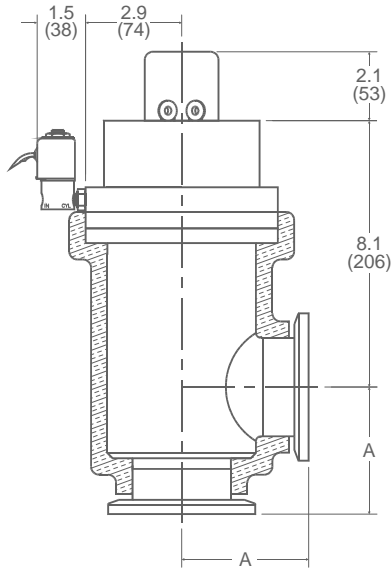
Body Configuration	Bypass Orifice Size	Bypass Actuator Type	Limit Switch	Seal Type	Temperature Configuration	Pneumatic Solenoid Voltage †	
J2-XXX-XX	-XXX	-X	X	X	XXX	-XXX	
Select 1	Price	Select 1	Price	Select 1	Price	Select 1	Price
						or leave blank	
J2-050-AK KF 50 Angle	225 0.225"	C Normally Closed	L w/ Limit Switch	H Viton Bonnet, Chemraz Nose	R6A Angle Heater	24A 24VAC 50/60 Hz	
J2-050-AT 2" Tube Angle		V Thumb Screw	N w/o Limit Switch	Z Chemraz Bonnet and Nose	R6I Inline Heaters	24D 24VDC	
J2-050-IK KF 50 Inline		M Micrometer Head			L6A Angle LTA Heater	120 120VAC 50/60 Hz	
J2-050-IT 2" Tube Inline					L6I Inline LTA Heaters	208 208VAC 50/60 Hz	
						240 220VAC 50/60 Hz	
						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: J2-050-AK-225-CLHR6A-120.

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

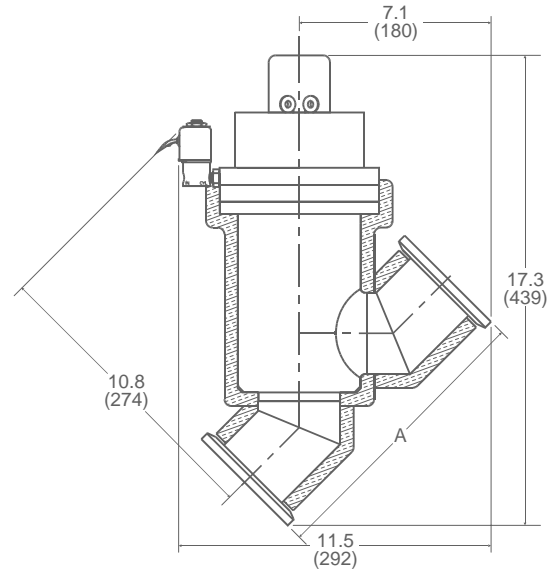
Ordering Information

NW 80 Angle Dimensions in./(mm)



A KF/MF Tube
3.9 (99) 3.3 (84)

NW 80 Inline Dimensions in./(mm)



A KF/MF Tube
10.6 (269) 10.1 (257)

NW 80 Single-Stage Valve Ordering Information

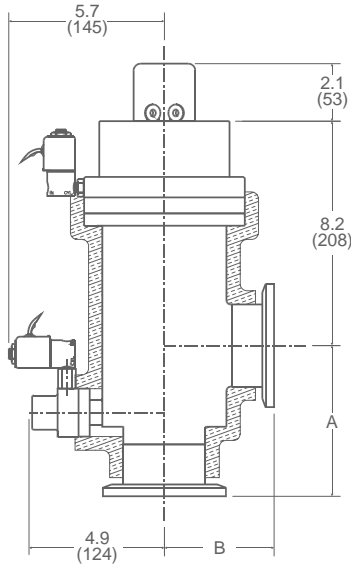
Body Configuration		Limit Switch		Seal Type		Temperature Configuration		Pneumatic Solenoid Voltage	
J1-XXX-XX		-X		X		XXX		-XXX	
Select 1	Price	Select 1	Price	Select 1	Price	Select 1	Price	Select 1	Price
								or leave blank	
J1-080-AM MF 80 Angle		L w/ Limit Switch		H Viton Bonnet, Chemraz Nose		R6A Angle Heater		24A 24VAC 50/60 Hz	
J1-080-AT 3" Tube Angle		N w/o Limit Switch		Z Chemraz Bonnet and Nose		R6I Inline Heaters		24D 24VDC	
J1-080-AK KF 80 Angle						L6A Angle LTA Heater		120 120VAC 50/60 Hz	
J1-080-IM MF 80 Inline						L6I Inline LTA Heaters		208 208VAC 50/60 Hz	
J1-080-IT 3" Tube Inline								240 220VAC 50/60 Hz	
J1-080-IK KF 80 Inline								NONE 1/8" NPT-F	

Add the price of the options to the price of the body. Sample part number: J1-080-AM-LHR6A-120.

Ordering Information

NW 80 Angle Dimensions

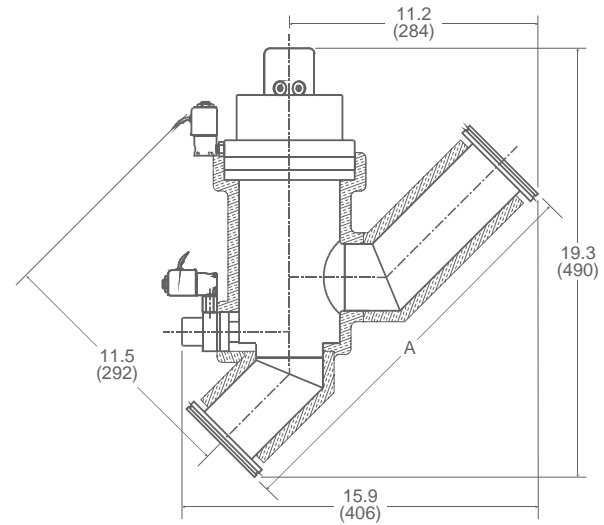
in./ (mm)



	KF/MF	Tube
A	5.5 (140)	5.3 (135)
B	4.0 (102)	3.8 (97)

NW 80 Inline Dimensions

in./ (mm)



	KF/MF	Tube
A	18.0 (457)	17.5 (445)

NW 80 Two-Stage Valve Ordering Information

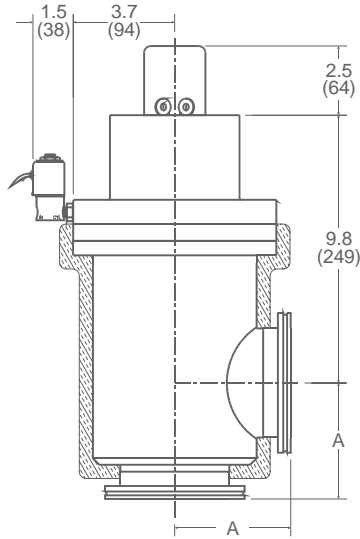
Body Configuration	Bypass Orifice Size	Bypass Actuator Type	Limit Switch	Seal Type	Temperature Configuration	Pneumatic Solenoid Voltage †
J2-XXX-XX	-XXX	-X	X	X	XXX	-XXX
Select 1 Price	Select 1 Price	Select 1 Price	Select 1 Price	Select 1 Price	Select 1 Price	Select 1 Price or leave blank
J2-080-AM MF 80 Angle	225 0.225"	C Normally Closed	L w/ Limit Switch	H Viton Bonnet, Chemraz Nose	R6A Angle Heater	24A 24VAC 50/60 Hz
J2-080-AT 3" Tube Angle		V Thumb Screw	N w/o Limit Switch	Z Chemraz Bonnet and Nose	R6I Inline Heaters	24D 24VDC
J2-080-AK KF 80 Angle		M Micrometer Head			L6A Angle LTA Heater	120 120VAC 50/60 Hz
J2-080-IM MF 80 Inline					L6I Inline LTA Heaters	208 208VAC 50/60 Hz
J2-080-IT 3" Tube Inline						240 220VAC 50/60 Hz
J2-080-IK KF 80 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: J2-080-AM-225-CLHR6A-120.

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

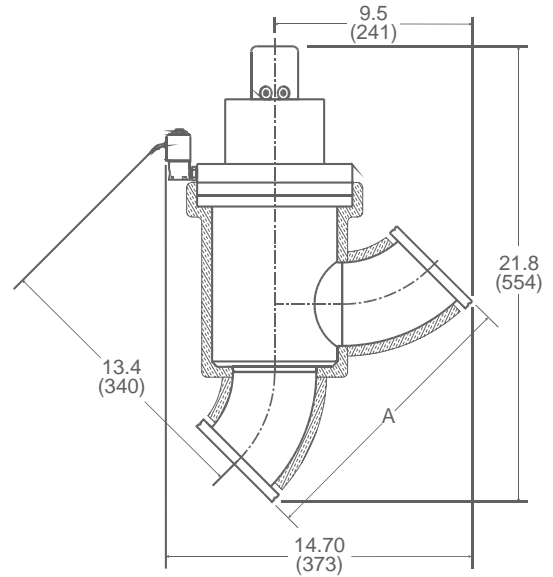
Ordering Information

NW 100 Angle Dimensions in./(mm)



A	KF/MF	Tube
	4.3 (109)	4.0 (102)

NW 100 Inline Dimensions in./(mm)



A	KF/MF	Tube
	13.6 (345)	13.1 (333)

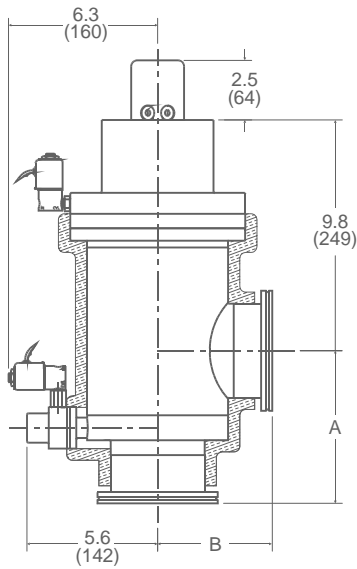
NW 100 Single-Stage Valve Ordering Information

Body Configuration		Limit Switch		Seal Type		Temperature Configuration		Pneumatic Solenoid Voltage	
J1-XXX-XX		-X		X		XXX		-XXX	
Select 1	Price	Select 1	Price	Select 1	Price	Select 1	Price	Select 1	Price
J1-100-AM MF 100 Angle		L w/ Limit Switch		H Viton Bonnet, Chemraz Nose		R6A Angle Heater		24A 24VAC 50/60 Hz	
J1-100-AT 4" Tube Angle		N w/o Limit Switch		Z Chemraz Bonnet and Nose		R6I Inline Heaters		24D 24VDC	
J1-100-AK KF 100 Angle						L6A Angle LTA Heater		120 120VAC 50/60 Hz	
J1-100-IM MF 100 Inline						L6I Inline LTA Heaters		208 208VAC 50/60 Hz	
J1-100-IT 4" Tube Inline								240 220VAC 50/60 Hz	
J1-100-IK KF 100 Inline								NONE 1/8" NPT-F	

Add the price of the options to the price of the body. Sample part number: J1-100-AM-LHR6A-120.

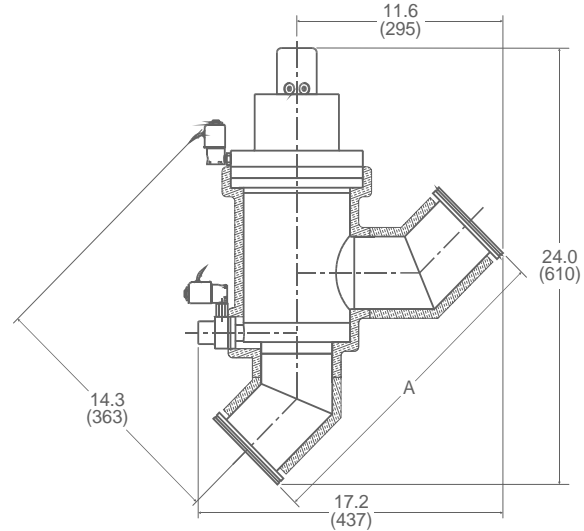
Ordering Information

NW 100 Angle Dimensions in./(mm)



	KF/MF	Tube
A	6.5 (165)	6.3 (160)
B	4.9 (124)	4.6 (117)

NW 100 Inline Dimensions in./(mm)



	KF/MF	Tube
A	18.0 (457)	17.5 (445)

NW 100 Two-Stage Valve Ordering Information

Body Configuration	Bypass Orifice Size	Bypass Actuator Type	Limit Switch	Seal Type	Temperature Configuration	Pneumatic Solenoid Voltage †	
J2-XXX-XX	-XXX	-X	X	X	XXX	-XXX	
Select 1	Price	Select 1	Price	Select 1	Price	Select 1	Price
or leave blank							
J2-100-AM MF 100 Angle	225 0.225"	C Normally Closed	L w/ Limit Switch	H Viton Bonnet, Chemraz Nose	R6A Angle Heater	24A 24VAC 50/60 Hz	
J2-100-AT 4" Tube Angle		V Thumb Screw	N w/o Limit Switch	Z Chemraz Bonnet and Nose	R6I Inline Heaters	24D 24VDC	
J2-100-AK KF 100 Angle		M Micrometer Head			L6A Angle LTA Heater	120 120VAC 50/60 Hz	
J2-100-IM MF 100 Inline					L6I Inline LTA Heaters	208 208VAC 50/60 Hz	
J2-100-IT 4" Tube Inline						240 220VAC 50/60 Hz	
J2-100-IK KF 100 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: J2-100-AM-225-CLHR6A-120.

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

Ordering Information

Main Valve Spare Parts

Port Size in (NW)	Main Valve Internals, Chemraz/Viton Seals		Main Valve Internals, Chemraz Seals		Limit Switch		Chemraz/Viton Seal Set		Chemraz Seal Set	
	Part Number	Price	Part Number	Price	Part Number	Price	Part Number	Price	Part Number	Price
2.0 (50)	100010658		100010659		100001683		100010643		100010642	
3.0 (80)	100010656		100010657		100001684		100010645		100010644	
4.0 (100)	100010654		100010655		100003663		100010647		100010646	

Bypass Valve Spare Parts

Actuator Type	Internal Rebuild Kits, Chemraz/Viton		Internal Rebuild Kits, Chemraz		Chemraz/Viton Seal Set		Chemraz Seal Set	
	Part Number	Price	Part Number	Price	Part Number	Price	Part Number	Price
Normally Closed	100010652		100010650		100010649		100010648	
Thumb Screw & Micrometer	100010653		100010651		100010649		100010648	

Replacement Solenoid Valves

Voltage and Frequency	Watts	Part Number	Price (for 1)
24VAC 50/60 Hz	6.0	100008164	
24VDC	7.0	100008163	
120VAC 50/60 Hz	7.5	100008165	
208VAC 50/60 Hz	7.5	100008166	
220VAC 50/60 Hz	7.5	100008167	

Power Cables and Accessories

Description	Specifications	Part Number	Price
Power cable	6 ft. (1.83 m), 120 VAC	43PWRCORD01	
Power cable, custom length	Max 25 ft., 120 VAC	43PWRCORD02	
GFELCI power cable with ground fault equipment leakage circuit interrupter	6 ft. (1.83 m), 120 VAC	43PWRCORD04	
Spare fuse	12 Amps	100006985	
LTA Monitor		100010832	
LTA jumper kit with male and female connector and 6 in. of wire		100008683	
LTA lead kit with male and female connector and 10 ft. of wire		100008680	
ISO-Universal grounding claw clamp	NW 80 & NW 100	100007322	

The power cables are not included with any of the jackets and must be ordered separately. Do not exceed 12 amps draw per power cord.

Bulletin 02/08 - Jalapeño Valve

Due to continuous development, specifications and prices are subject to change without notice.

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