



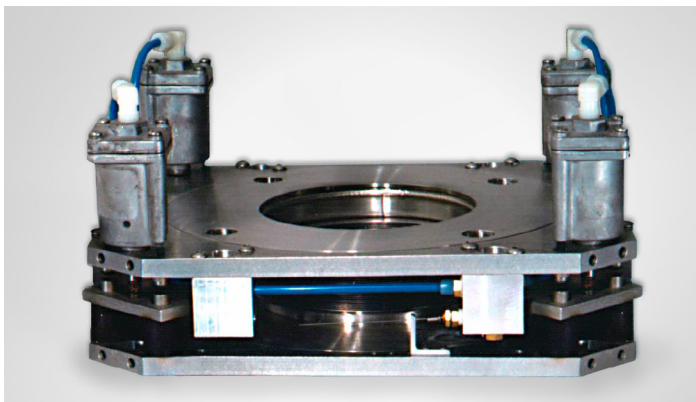
# VACUUM COMPONENTS

## National Electrostatics Corp.

### Vibration Isolator Model VI-2

#### APPLICATIONS

The NEC vibration isolator Model VI-2 mounts between a cryopump or other source of vibration and a vacuum system. Designed for the most demanding applications, it uses a pneumatic suspension system to dramatically reduce the vibrations transmitted to electron microscopes, target or wafer processing chambers, and other sensitive systems. Isolation of vibrations as low as 2Hz is possible, which essentially eliminates the effect of cryopump vibration.



- Simple installation
- Very low resonant frequency
- Very high isolation
- Large aperture; high conductance
- Self leveling
- UHV compatible materials

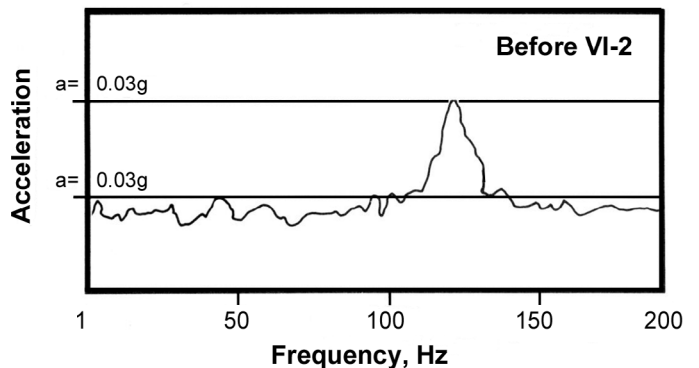
#### DESIGN

The VI-2 connects the vacuum system and the cryopump by means of a compliant welded metal bellows and a set of elastomer isolators mechanically coupled to ultra-low friction pneumatic cylinders. Automatic leveling valves control the flow of compressed air to ballast tanks, which in turn maintain air pressure in the pneumatic cylinders. Once these are pressurized, the cryopump rides on a cushion of air, having an effective spring constant in the range of 7 to 30 lbs./in., depending on flange size.

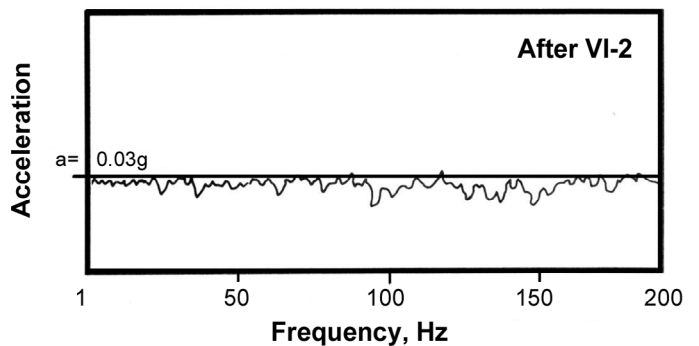
This is typically several hundred times more compliant than the equivalent VI-1 isolator, resulting in correspondingly better isolation.

#### PERFORMANCE

A typical cryopump mounted on the VI-2 has numerous vibration components in the 0.02g (0.2 m/sec<sup>2</sup>) intensity range. These can be seen in the frequency spectrum taken with the accelerometer mounted vertically on the cryopump:



*The corresponding spectrum taken with the accelerometer mounted vertically below the isolator shows the effectiveness of the VI-2.*



## CONFIGURATION

The VI-2 requires a source of reasonably clean and dry unregulated compressed air in the pressure range 75 to 90 psig (5.3 to 6.3 kg/cm<sup>2</sup> gauge) at very low flow rates, 0.05 CFM (1 l/m), during normal operation. Initial leveling requires less than 2 ft<sup>3</sup> (30 liters).

The air supply connects to the two isolator leveling systems, which in turn pressurize the active cylinders and their ballast tanks. Because they are independent, the two systems can compensate for an unbalanced load due to an overhanging cryohead motor, helium lines or a gate valve.

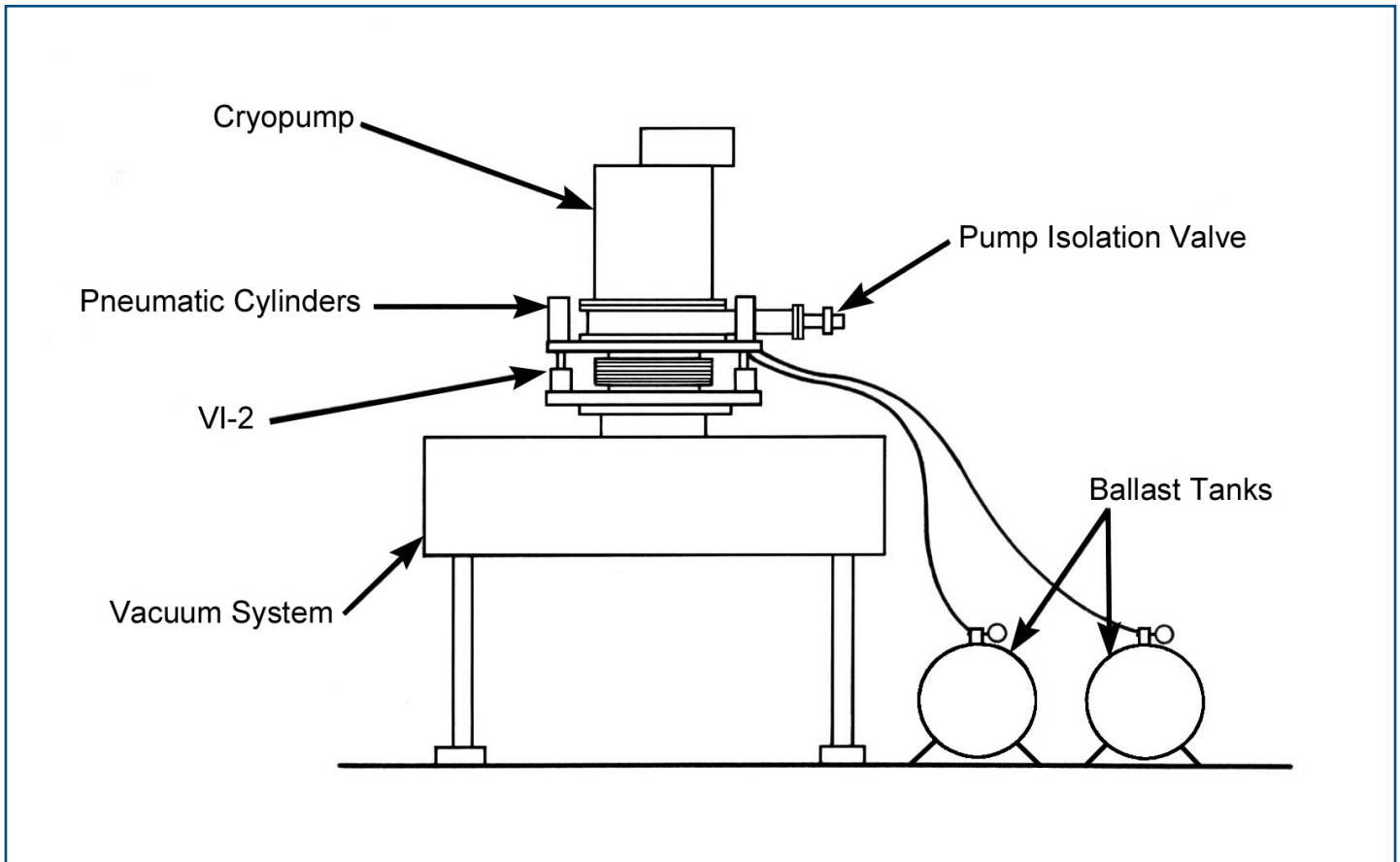
The suspension/leveling system can be rotated with respect to the vacuum flange bolt pattern. Mechanical stops prevent system motion in case of failure of the compressed air or the leveling system. In either event, if the pistons reach their limits, modest isolation will be maintained by elastomer isolators.

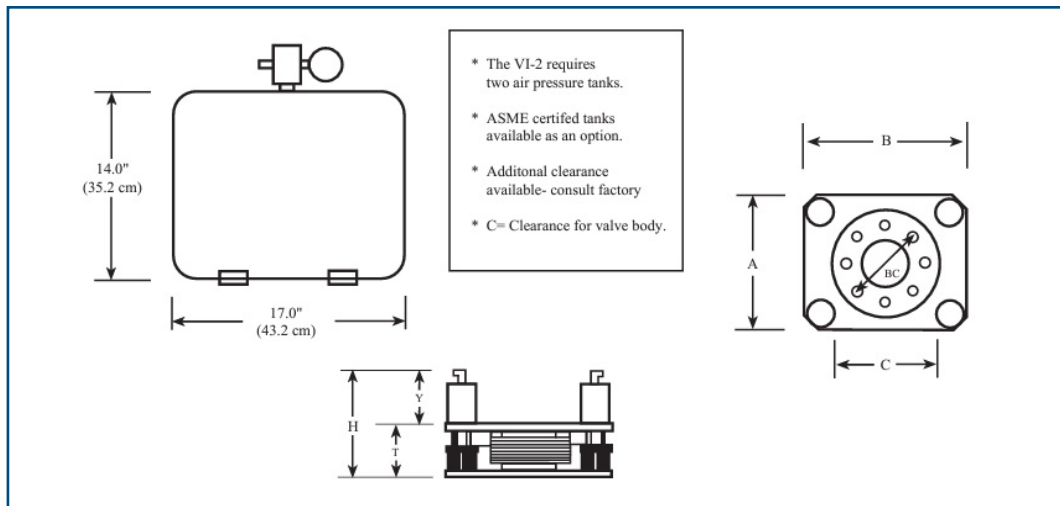
## OPTIONS

The VI-2 is available in a number of standard vacuum flange sizes, with threaded or through holes, optional rotatable flanges, and special versions on request. Generally, each VI-2 has two leveling systems allowing for unbalanced loads in one direction.

Available Flange Sizes

6" ASA-LP	6" CF	100 ISO-F
8" ASA-LP	8" CF	160 ISO-F
10" ASA-LP	10" CF	200 ISO-F
12" ASA-LP	12" CF	250 ISO-F
16" ASA-LP	16" CVC	320 ISO-F
		400 ISO-F
		500 ISO-F





Flange Type	T	H	A	B	C	B.C.	Bolts
100 ISO-F	3.00"	8.00"	9.00"	10.00"	6.00"	5.71"	8
160 ISO-F	4.00"	8.50"	11.00"	12.00"	7.50"	7.87"	8
200 ISO-F	3.00"	8.00"	12.00"	14.00"	9.50"	10.24"	12
250 ISO-F	3.50"	11.00"	16.00"	20.00"	12.00"	12.20"	12
320 ISO-F	4.00"	11.50"	19.00"	23.00"	15.00"	15.55"	12
400 ISO-F	5.50"	16.00"	21.75"	21.75"	12.50"	18.90"	16
6" O.D. CF	3.50"	8.00"	9.00"	10.00"	5.50"	5.12"	16
8" O.D. CF	4.50"	8.50"	11.00"	12.00"	7.50"	7.12"	20
10" O.D. CF	3.50"	8.50"	12.00"	15.25"	10.75"	9.12"	24
12" O.D. CF	4.00"	11.50"	16.00"	20.00"	12.00"	11.12"	32
6" ASA-LP	3.00"	8.35"	12.00"	14.00"	9.50"	9.50"	8
8" ASA-LP	3.50"	11.00"	16.00"	20.00"	12.00"	11.75"	8
10" ASA-LP	4.00"	12.62"	19.00"	24.50"	16.25"	14.25"	12
16" ASA-LP	4.00"	11.50"	26.00"	30.00"	19.00"	21.25"	16

\* Captured O-ring assemblies available for ISO and ASA flanges.

## Contact NEC

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