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Acoustic, Vibration, and EMI Isolation Specialists

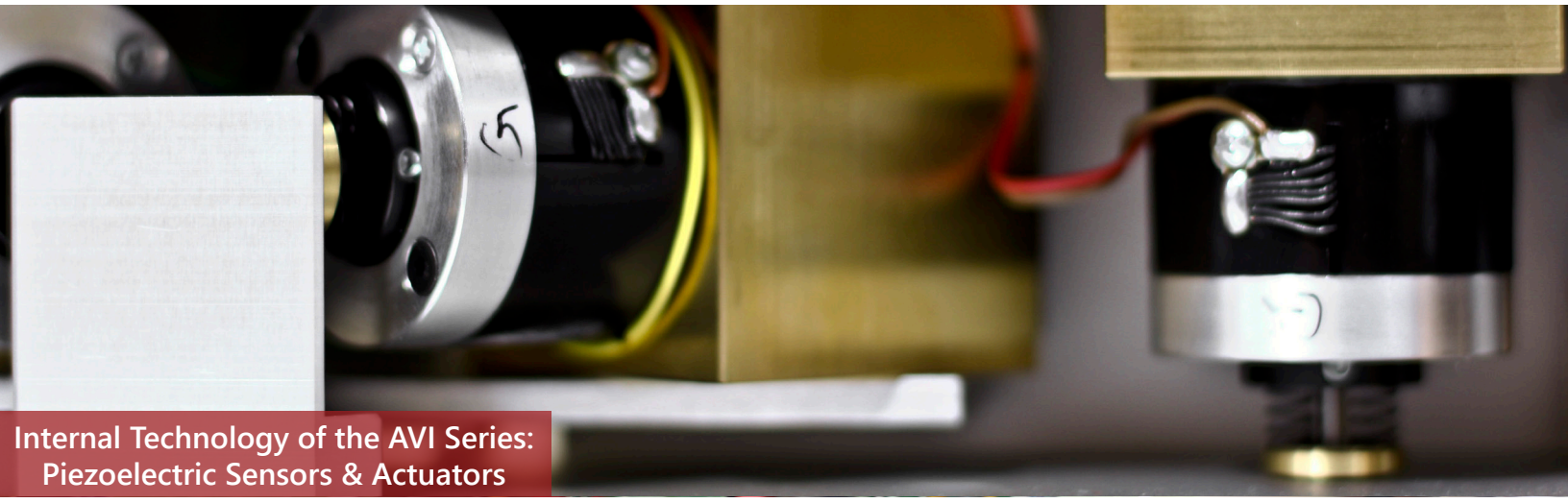
AVI-200 Series

Overview

The AVI-200 platforms provide industry-leading active vibration isolation performance (starting at 0.5 Hz) for compact microscopes performing nanoscale research. The AVI-200 platforms help users achieve more from their research by removing disruptive low-frequency vibration noise from affecting their measurements. The AVI-200 platforms include a low-profile and modular design, becoming the perfect solution for users wanting an effective and easy-to-install platform to protect their high-load instruments from low-frequency vibrations.

AVI-200S Isolators and AVI-200 Controller

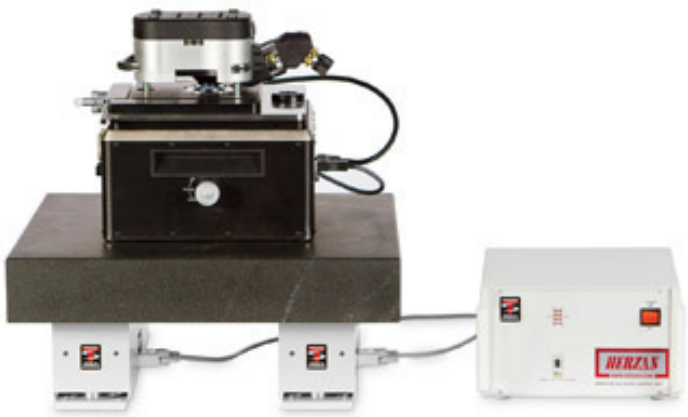
The AVI-200 is available in three standard sizes: **AVI-200S**, **AVI-200M**, and **AVI-200XL**.



Internal Technology of the AVI Series: Piezoelectric Sensors & Actuators

Product Highlights

- Active Isolation from 1 to 200 Hz *(0.5 Hz with the LFS System)*
- Passive Isolation Beyond 200 Hz
- Isolates vibrations in all six degrees of freedom
- No low-frequency resonance
- Advanced piezoelectric sensors & actuators
- Internal feedback loop damps resonances
- Compact, modular form factor
- Easy to install, no persistent maintenance
- Minimal impact on the overall profile of the supported microscope
- Easy to customize for unique requirements
- And More!



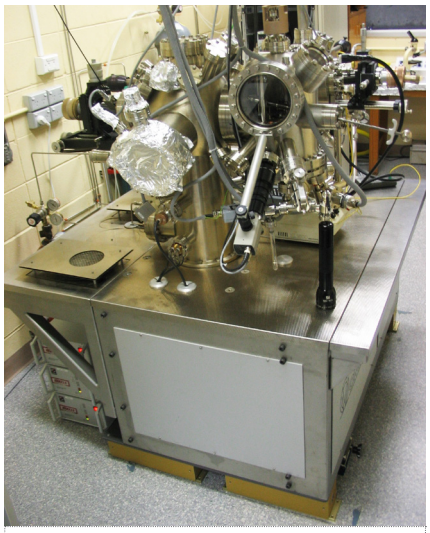
AVI-200S Platform Supporting an Asylum Research MFP-3D AFM

Popular Applications

The AVI-200 platforms support a wide range of high-precision microscopes sensitive to low-frequency vibration noise. The most common application for the AVI-200 platforms is atomic force microscopy, supporting both end users and OEMs around the world by removing low-frequency vibration noise from important measurements.

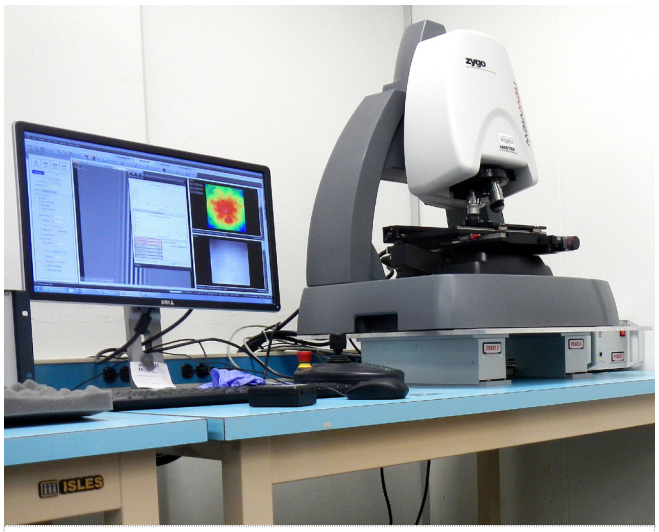
In addition to AFMs, the AVI-200 platforms often support:

- Interferometry
- Profilometry
- Tribology
- High Precision Metrology
- And More!



AVI-200S-8 Supporting An Omicron UHV-STM

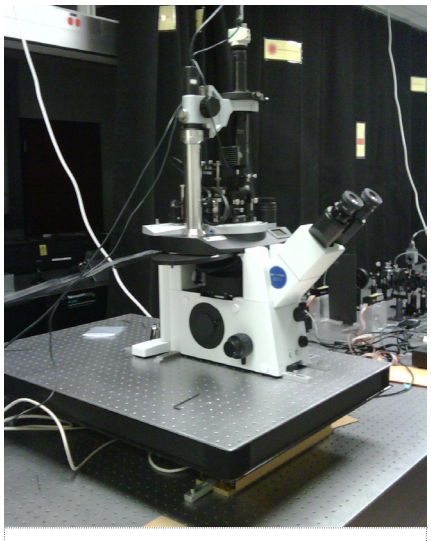
Due to the modular design of the AVI-200 platform, a UHV-STM weighing over 1,000 Kg can be supported by an eight isolator configuration. This image depicts an Omicron UHV-STM supported by the AVI-200S-8 platform, which was previously limited by low-frequency vibration noise, but now is thriving when performing high magnification measurements.



AVI-200S Supporting A ZYGO NewView 8000 3D Optical Profilometer

3D optical profilometers are often utilized in environments where low-frequency vibration noise is prevalent, limiting their effectiveness as well as the quality of data collected.

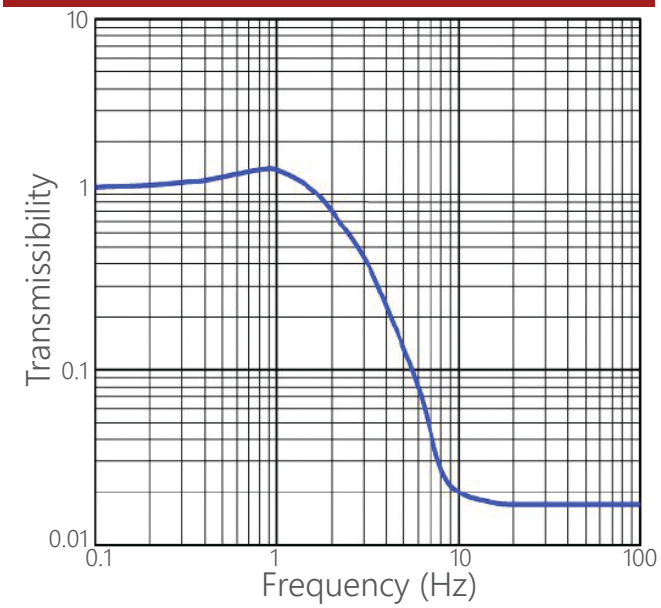
In this image, a ZYGO NewView 8000 3D optical profilometer is supported by an AVI-200S platform and aluminum top plate. This platform enabled the profilometer to drastically improve the quality of measurement data collected by reducing the local vibration noise by greater than 99%.



AVI-200S Supporting A NT-MDT AFM

Atomic force microscopes from a wide range of manufacturers have improved their measurement data by utilizing the AVI-200 platform. This image depicts a NT-MDT AFM integrated with an inverted optical microscope, supported by an AVI-200S platform and optical breadboard. The modular design of the AVI-200 platform also allows for any top plate to be used as well.

TRANSMISSIBILITY

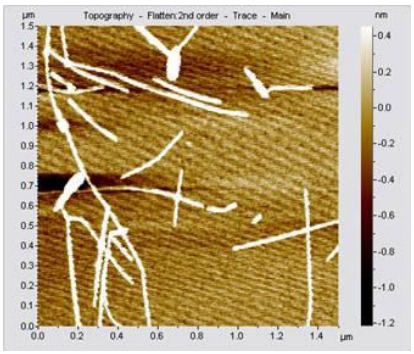


Performance

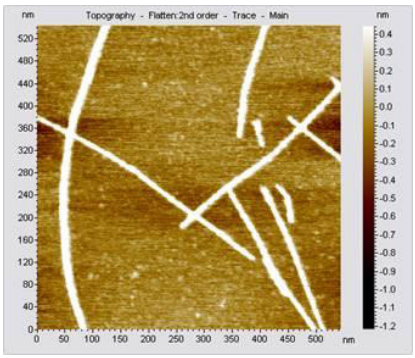
The transmissibility graph represents the vibration isolation performance of the AVI-200 Series over a frequency domain. The performance data is representative of all rotational modes of vibration (all six degrees of freedom) and should serve as a conservative estimate of performance customers can receive when pairing their instrument with an AVI-200 platform.

Performance Upgrade - LFS System

The AVI-200 Series can improve its low-frequency vibration isolation performance by pairing it with the LFS System (Low Frequency Sensor). This upgrade enables the platform to isolate vibrations starting at 0.5 Hz and can be easily retrofitted for existing systems in the field. More details on the upgraded performance can be found below.



Without Vibration Isolation



With Active Vibration Isolation

Performance Comparison Images

A researcher operating an AFM imaged a sample under two unique conditions: **without a vibration isolation system** and **with an AVI-200S platform**. The resulting images demonstrate a significant improvement in image quality and overall measurement clarity when an AVI platform is used to support an AFM.

PERFORMANCE HIGHLIGHTS

Product Series	Resonant Frequency	Isolation Starting At	Isolation % at 2.5 Hz	Isolation % at 5 Hz	Isolation % at 10 Hz	Max. Isolation %	Isolation Performance	Active Vibration Isolation Bandwidth
AVI-200 Series	None	1 Hz	90%	97%	99%	99.8% at 70 Hz	Greater than 40 dB	Up to 200 Hz
AVI-200 Series with LFS System	None	0.5 Hz	95%	99%	99.5%	99.8% at 20 Hz	Greater than 55 dB	Up to 200 Hz

Note On the LFS System

The LFS System is an external feedforward sensor engineered to target low-frequency vibrations (0 - 50 Hz). The LFS System complements the AVI-200 Series by interfacing with the isolators directly, enabling the platform to delivery industry-leading low-frequency vibration isolation in all six degrees of freedom.

LFS-3 Sensor

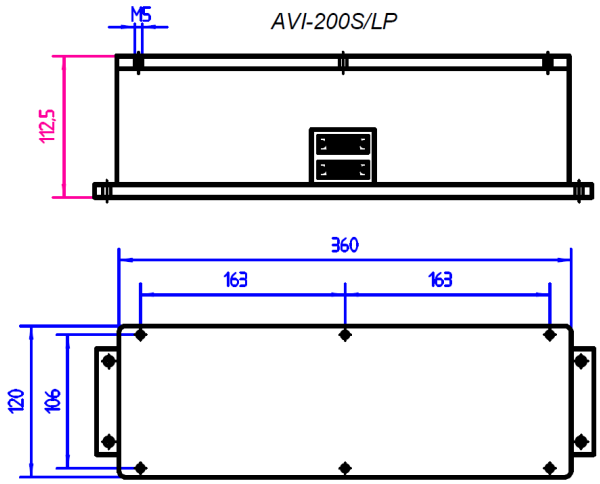
Technical Specifications

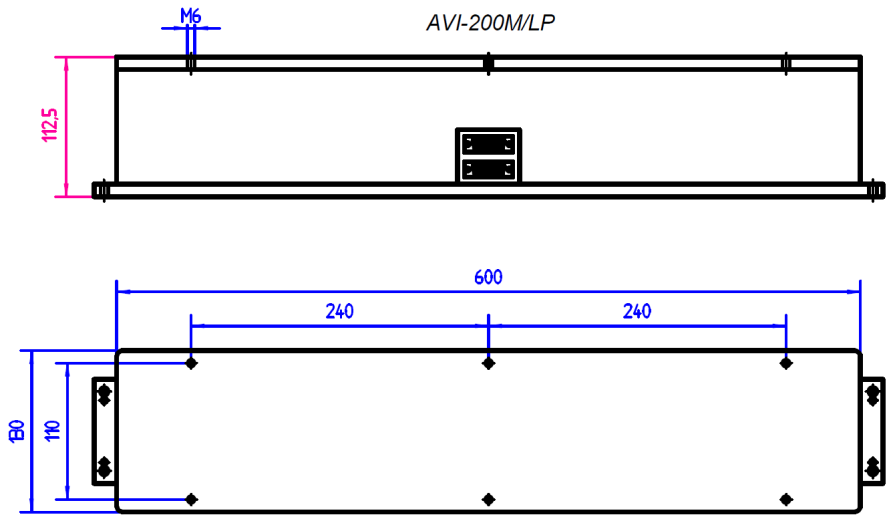
SPECIFICATION		AVI-200S	AVI-200M	AVI-200XL
Dimensions (W x D x H) *(Single Isolator Dimensions)*	*Imperial*	4.7 x 14.1 x 4.4 inches	5.1 x 23.6 x 4.4 inches	5.1 x 32.3 x 4.4 inches
	Metric	120 x 360 x 112.5 mm	130 x 600 x 112.5 mm	130 x 820 x 112.5 mm
Load Capacity *(Two Isolator Platform)*	*Imperial*	700 Lbs	1,000 Lbs	1,000 Lbs
	Metric	318 Kgs	455 Kgs	455 Kgs
System Weight *(Two Isolator Platform)*	*Imperial*	43 Lbs	52 Lbs	52 Lbs
	Metric	19.5 Kgs	23.5 Kgs	23.5 Kgs
Isolation Technology		Piezoelectric sensors, actuators, and control electronics		
Force Directions		Active vibration isolation in all six degrees of freedom		
Required Floor Flatness		2 millimeters per meter		
Isolation Characteristics		Dynamic 1 Hz to 200 Hz, Passive beyond 200 Hz		
Transmissibility		See transmission curve and product highlights section for more details. Above 10 Hz transmissibility <0.017 decreasing rapidly		
Correction Forces		Maximum 4N horizontally, 8N vertically		
System Noise		Less than 50nG/√Hz from 0.1 - 200Hz in any direction		
Static Compliance		Approx. 3.5µm/N vertically, 7µm/N horizontally		

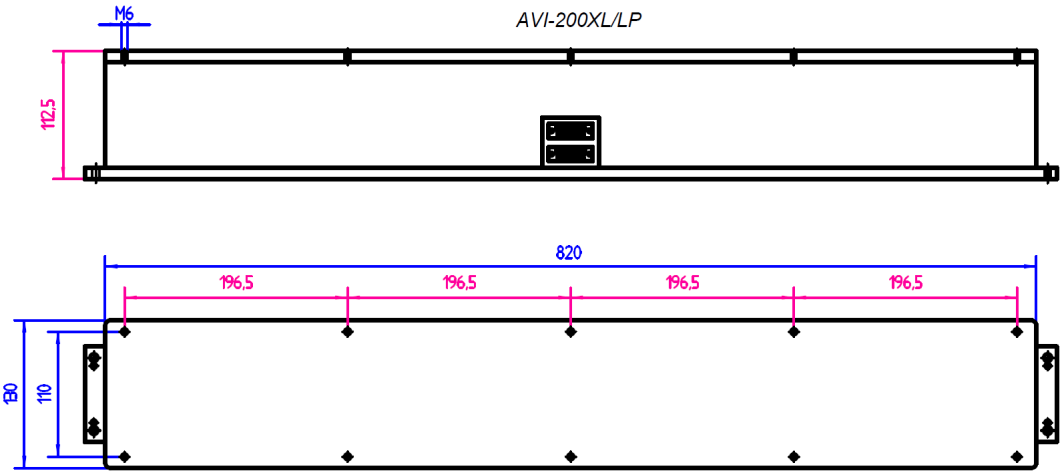
SPECIFICATION	AVI-200 CONTROLLER
Safety Class	1
Power Consumption	Typically 9W
Input Voltage	90-125VAC / 200-250VAC, 50-60Hz
Fuses	2 x 1.6A/250V slow. Located in the power socket on the rear side of the controller.
Overload Indication	8 LEDs indicate overload condition in input stage.
Monitor Signal	A multiplexed signal for display on oscilloscope shows vibration levels with and without isolation.

Product Drawings

Individual Isolator Dimensions (Values In Millimeters)





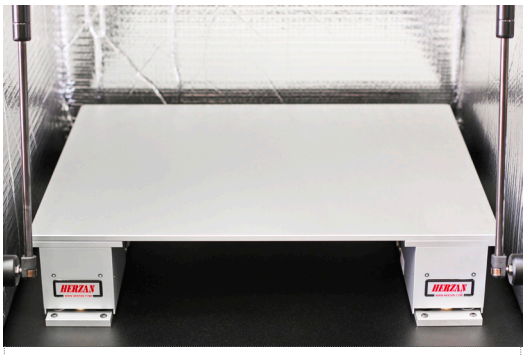


Popular Upgrades

The design of the AVI-200 Series enables the platform to integrate seamlessly with a variety of upgrades that improve the user experience and overall effectiveness of the platform. These upgrades relate to improvements in performance, form factor, operation, and more.

LFS-3 System

The LFS-3 System is a low-frequency performance upgrade for the AVI-200 Series, enabling the platform to isolate vibrations at 0.5 Hz and beyond. The LFS-3 System is a dedicated feedforward sensor with internal temperature stability, providing absolute reliability and unparalleled low-frequency vibration isolation performance.



Acoustic Enclosures

The AVI-200 Series can easily integrate with any Herzan acoustic enclosure, providing comprehensive environmental control by targeting vibration and acoustic noise. Herzan acoustic enclosures can be entirely customized to fit the needs of a customer's application, ensuring maximum protection for their research instrument.

NanoDamp Workstations

NanoDamp Workstations provide the AVI-200 Series with an optimal support surface to maximize the vibration isolation performance offered by the platform. NanoDamp workstations also provide a comfortable working area for users operating sensitive instrumentsments.

Exciter Box

The Exciter Box transforms the AVI-200 Series into a shaker system (in X, Y, and Z), making the platform a multi-faceted tool for researchers needing to introduce vibrations at exact frequencies and amplitudes. No separate power supply is required, but a sin wave generator will be needed for operation.

Rack Mount Controllers

The AVI-200 Series can include rack mount controllers to save space in the lab when dedicated racks are available. The rack mount controller is designed in a 1U con-figuration, which is the most compact and common style for servers.

External Load Capacity

External load bearing springs extend the relevance of any AVI-200 Series platform when a customer's instrument closely exceeds the standard load capacity or when the load is abnormally distributed. Each load bearing spring provides 40 Kg / 88 Lbs of additional load capacity.

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