HALCYONICS_VARIO

ACCURION

solutions for science

_Active Vibration Isolation Elements
halcyonics_vario series
halcyonics_variobasic series

Active Vibration Isolation Elements
halcyonics_vario/variobasic series

ABSTRACT

The Vario systems are element based modular vibration isolation systems, consisting of two isolation elements and external control unit. The product groups in two models: Vario and VarioBasic.

The Vario isolation elements come with automatic load adjustment. They are ideal for changing loads or applications that do not offer access to the isolation system. This model is limited to two isolation elements for loads up to 360 kg.

The second version available is the VarioBasic, which has especially been designed as a cost-effective isolation system for high static loads. In contrast to the Vario, it can consist of more than two isolation elements. A set-up of six elements for example is able to isolate loads of up to 900 kg. This isolation system needs to be manually adjusted prior to the use. Later on there is no further tuning or adjusting required.

The compact dimensions and versatile options of usage make this product series ideal for installations in customer-specific applications. An example of use is the combination with an optical breadboard. It serves as mechanical link between the isolation elements and can be used for laser set-ups for instance. There are virtually no limits in applications offered by Vario systems.

Floating monolayer of Ethylstearate on a water surface with active vibration isolation—image taken with Brewster angle microscope

Floating monolayer of Ethylstearate on a water surface without active vibration isolation—image taken with Brewster angle microscope

APPLICATIONS

- Laser set-ups
- Interferometers
- Ellipsometers
- Patch-Clamp applications
- UHV scanning tunneling microscopes
- Scanning electron microscopes
- Langmuir-Blodgett troughs
- Nanoindenter
- Optical profilers
- LCD manufacturing
- Disc mastering

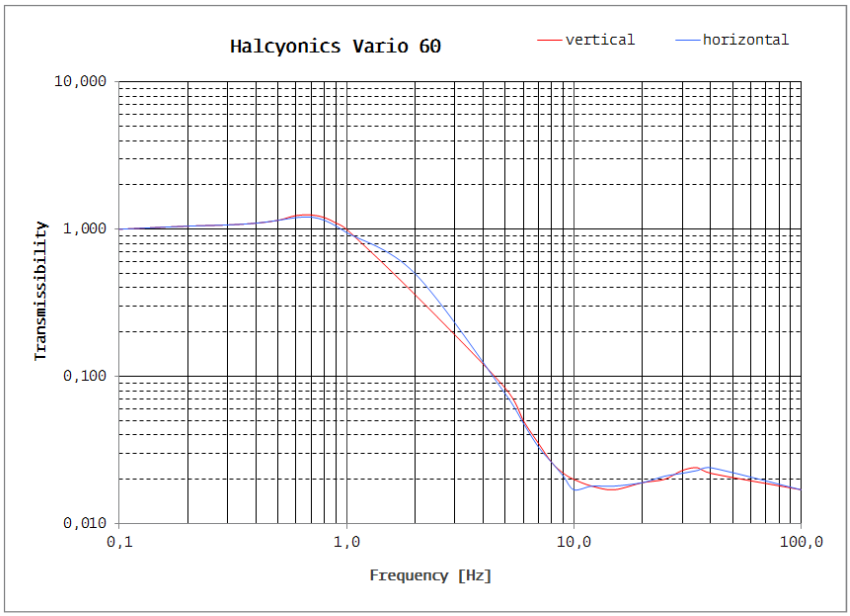
FEATURES & BENEFITS

- Active vibration isolation starts at 1 Hz (passive isolation above 200 Hz)
- Isolation in all six degrees of freedom
- Wide range of standard sizes and customizations available
- Automatic load adjustment and transportation lock for the Vario systems
- Comfortable manual load adjustment for the VarioBasic
- Modular design
- External control unit
- No maintenance required
- No natural low frequency resonance and, as a result, excellent vibration characteristics also in frequency ranges below 5 Hz
- Flexile to use
- No compressed air supply is needed, AC power from an electrical outlet is sufficient
- Excellent position stability and stiffness
- Low voltage electromagnetic actuators
- Two-year warranty
- Long term tests and quality control procedures

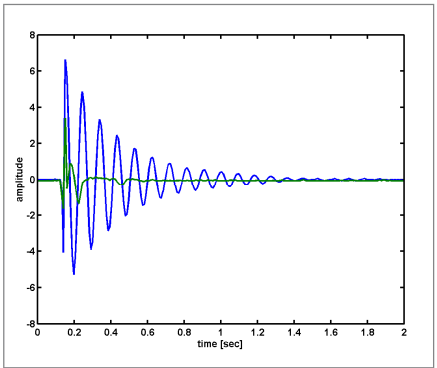
VarioBasic_40 with Brewster angle microscope nanofilm_ultrabam

Breadboard on Vario_45

VarioBasic_60 on welded steel frame with breadboard table top



Transmission graph of the halcyonics_vario_60 measured at a velocity of 100 µm/s with a payload of 50 kg (110 lbs)



Typical settling time below 0.3 sec

VarioBasic_40 load adjustment

ACCESSORIES AND OPTIONS

- Acoustic enclosures
- Various breadboards with or without mounting holes (M6/25 or 1/4-20")
- Steel support frame
- Rack mountable external control unit
- Custom versions available

Technical Specifications
halcyonics_vario/halcyonics_variobasic

AVAILABLE STANDARD VERSIONS HALCYONICS_VARIO			
	Vario_45-100	Vario_45-360	
	Vario_60-100	Vario_60-360	
	Vario_90-100	Vario_60-360	
AVAILABLE STANDARD VERSIONS HALCYONICS_VARIOBASIC			
	VarioBasic_40-100	VarioBasic_40-300	VarioBasic_40-600*
	VarioBasic_60-100	VarioBasic_60-300	VarioBasic_60-600*
	VarioBasic_90-100	VarioBasic_60-300	VarioBasic_90-600*
PERFORMANCE SPECIFICATIONS			
ISOLATION TECHNOLOGY:	halcyonics_active vibration isolation technology based on piezo-electric type acceleration pickup, fast signal processing and electro-dynamic force transducers.		
CONTROL ELECTRONICS VARIO:	Easy-to-navigate menue for all settings, second graphics display for vibration level sensor		
CONTROL ELECTRONICS VARIOBASIC:	External control unit with sensor and actuator LEDs, corresponding to force directions		
FORCE DIRECTIONS:	Active compensation in all six degrees of freedom		
ISOLATION PERFORMANCE:	>5 Hz = 25 dB (94.4%) >10 Hz = 38 dB (98.7%)	>5 Hz = 25 dB (94.4%) >10 Hz = 35 dB (98.2%)	>5 Hz = 25 dB (94.4%) >10 Hz = 35 dB (98.2%)
ACTIVE BANDWIDTH:	1.0 - 200 Hz**	1.0 - 200 Hz**	1.0 - 200 Hz**
SETTLING TIME:	300 ms***	300 ms***	300 ms***
STROKE OF THE ACTUATOR:	1 mm	1 mm	1 mm
MAXIMUM CORRECTION FORCES: (V = Vertical, H = Horizontal)	V ± 8 N H ± 4 N	V ± 8 N H ± 4 N	V ± 16 N H ± 8 N
MAXIMUM COMPENSATION LEVEL:	550 µm/s at 6 Hz + 60 kg (132 lbs)***	550 µm/s at 8 Hz + 150 kg (330 lbs)***	550 µm/s at 8 Hz + 300 kg (660 lbs)***
LOAD CAPACITY VARIO:	0 - 100 kg (0 - 220 lbs)	0 - 360 kg (0 - 790 lbs)	
LOAD CAPACITY VARIOBASIC:	0 - 100 kg (0 - 220 lbs)	0 - 300 kg (0 - 660 lbs)	0-600 kg (0 -1320 lbs)
REPEATABILITY OF LOAD ADJUSTMENT VARIO:	60 µm		

Technical Specifications

halcyonics_vario/halcyonics_variobasic

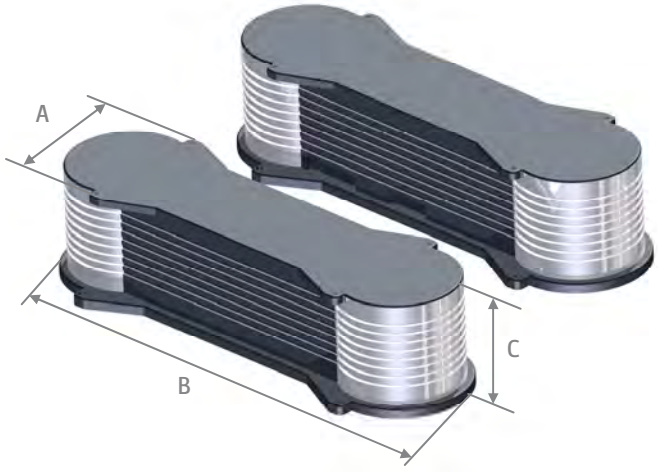
OTHER SPECIFICATIONS	
WEIGHT VARIO	
VARIO_45:	10 kg (22 lbs per isolation element)
VARIO_60:	11 kg (24 lbs per isolation element)
VARIO_90:	13 kg (28 lbs per isolation element)
VARIO_CONTROLLER:	5 kg (11 lbs)
WEIGHT VARIOBASIC	
VARIOBASIC_40:	7 kg (15 lbs per isolation element)
VARIOBASIC_60:	9 kg (19 lbs per isolation element)
VARIOBASIC_90:	10 kg (22 lbs per isolation element)
VARIOBASIC_CONTROLLER:	5 kg (11 lbs)
INTERFACE VARIO:	USB service interface
INTERFACE VARIOBASIC:	BNC analog diagnostic output - 50 Ω
ENVIRONMENTAL AND OPERATIONAL REQUIREMENTS	
ELECTRICAL VOLTAGE:	100 - 250 V / 47 - 63 Hz
POWER CONSUMPTION VARIO:	Typically 35 - 50 W; max. 70 W
POWER CONSUMPTION VARIOBASIC:	Typically 10 - 20 W; max. 50 W
OPERATING TEMPERATURE:	10 - 40°C / 50 - 104 °F
RELATIVE HUMIDITY:	0 - 60 %
OPERATING ALTITUDE:	< 2500 m / 8100 ft
CERTIFICATION	
ELECTRICAL SAFETY:	CE certified according to directive 2006/95/EC
EMC:	CE certified according to directive 2004/108/EC

* Consists of four isolation elements and a 4-port control unit.

** Floating table top is supported by steel springs; low-pass characteristics of spring-mass combination dominates the dynamic behavior above 200 Hz.

*** The settling time and maximum compensation level depend on several conditions, such as payload, frequency, load distribution and height of the payload. For that reason this value should be considered as an estimation.

Technical Dimensions
halcyonics_vario

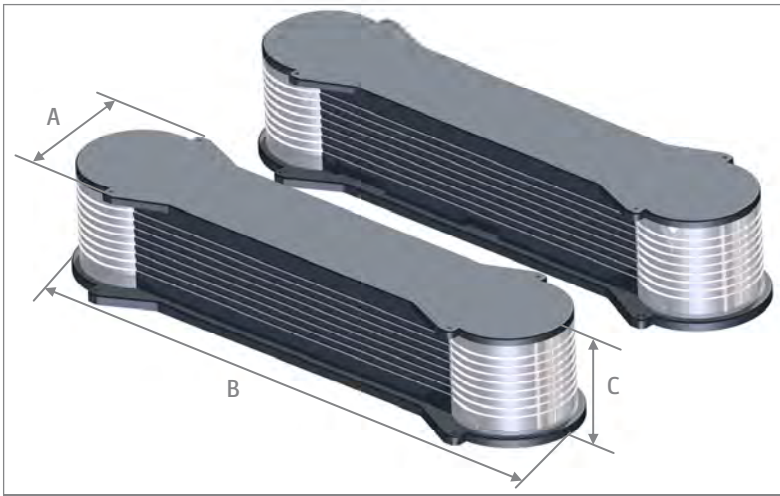


A = 165 mm | 6.5”

B = 481 mm | 18.9”

C = 114 mm | 4.5”

Vario_45



Vario_60:

A = 165 mm | 6.5”

B = 600 mm | 23.6”

C = 114 mm | 4.5”

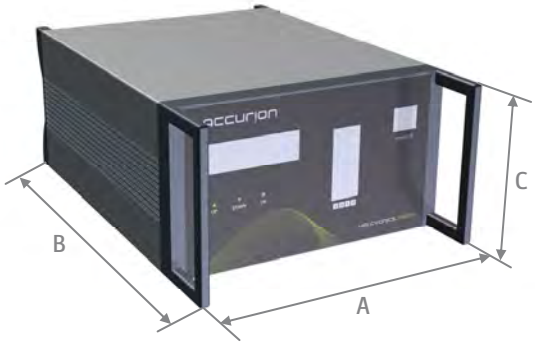
Vario_90:

A = 165 mm | 6.5”

B = 900 mm | 35.4”

C = 114 mm | 4.5”

Vario_60 / Vario_90



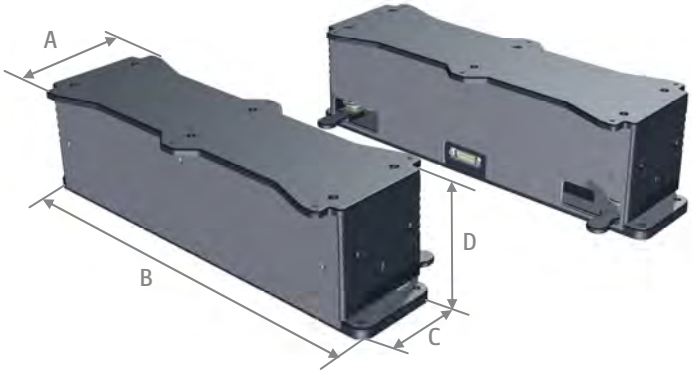
A = 237 mm | 9.3”

B = 345 mm | 13.6”

C = 135 mm | 5.3”

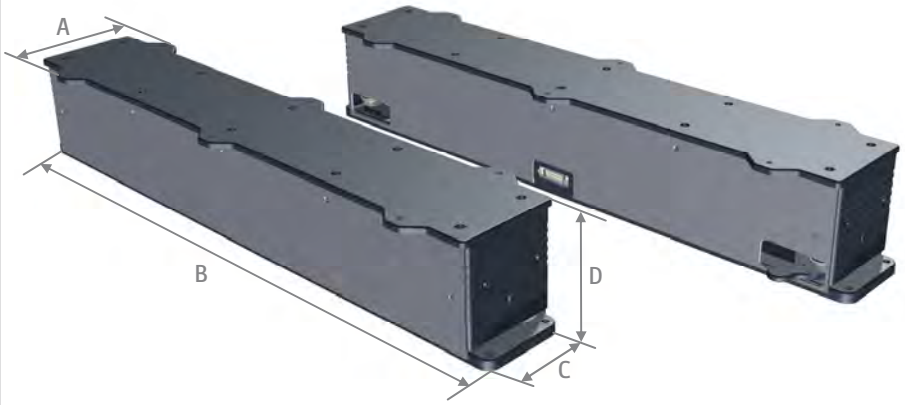
Vario_Control

Technical Dimensions
halcyonics_variobasic



A = 120 mm | 4.7”
B = 396 mm | 15.6”
C = 84 mm | 3.3”
D = 111 mm | 4.4”

VarioBasic_40



VarioBasic_60:
A = 130 mm | 5.1”
B = 636 mm | 25.0”
C = 84 mm | 3.3”
D = 111 mm | 4.4”

VarioBasic_90:
A = 130 mm | 5.1”
B = 932 mm | 36.7”
C = 84 mm | 3.3”
D = 111 mm | 4.4”

VarioBasic_60 / VarioBasic_90

2-port control unit:
A = 237 mm | 9.3”
B = 345 mm | 13.6”
C = 135 mm | 5.3”

4-port control unit:
A = 450 mm | 17.7”
B = 345 mm | 13.6”
C = 135 mm | 5.3”

VarioBasic_Control

HALCYONICS_HEAVYLOADS

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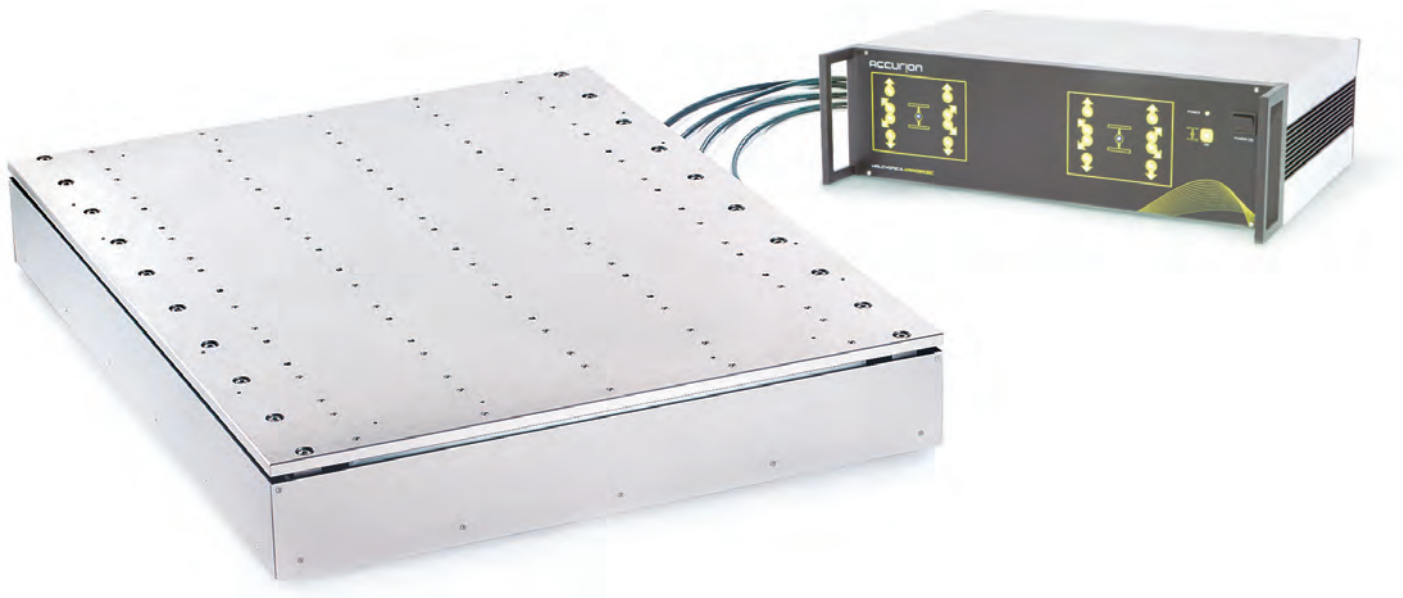
_active vibration isolation for heavy loads

halcyonics_sandwich

and halcyonics_duo series



Active Vibration Isolation Heavy Loads
halcyonics_sandwich / halcyonics_duo series

ABSTRACT

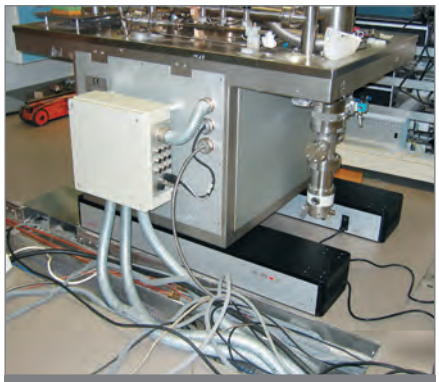
The compact and solid construction of the halcyonics_sandwich Series is used with many different sensitive heavy load systems throughout the world. Its load range, beginning at 600 kg | 1.320 lbs allows, e.g. the use of SEMs up to their highest possible magnifications even under severe environmental conditions like building vibrations by machinery, nearby traffic, air conditioning units, etc. As an alternative to the Sandwich Series, Accurion offers the versatile heavy load halcyonics_duo Series. They carry up to 400 kg | 880 lbs per element. Two or more of these independent elements are combined to carry loads of 800 kg | 1.760 lbs or more. Only a standard AC wall outlet is necessary to run the system with its integrated control electronics. It provides vibration isolation unmatched by bulky pneumatic isolators. The manual adjustment procedure is the precondition for optimum isolation performance.

APPLICATIONS

Applications for the halcyonics_sandwich Series include:

- SEM
- UHV STM
- Semiconductor Machinery
- UNV Chambers
- … and many more

Halcyonics_Sandwich with Zeiss Supra 40VP



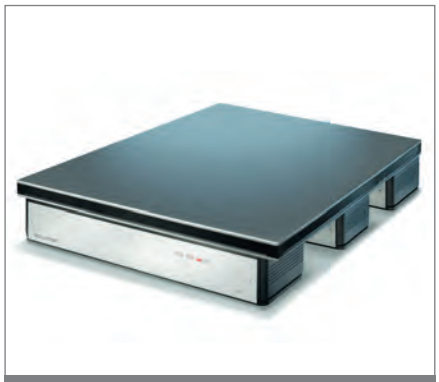
Halcyonics_Duo elements supporting an UHV STM

FEATURES

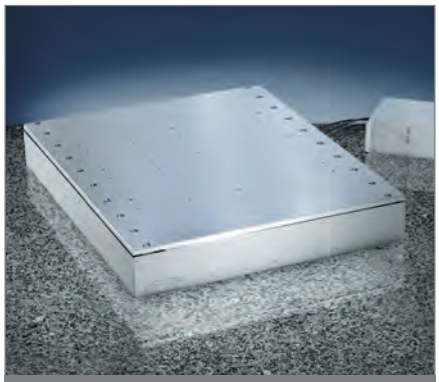
- Modular design: two different Sandwich sizes – five load ranges
- Standard AC power is sufficient – no compressed air neccessary
- Isolation starts at 1.0 Hz – reaching > 98.2 % at 10 Hz
- Separate controller – no heat dissipation interferes with the experiment
- Active Control eliminates resonance frequencies – settling time only 0.3 s

BENEFITS

- Supreme performance even under severe environmental conditions
- Active isolation with the halcyonics_sandwich Series starts from 1.0 Hz and is active until 200 Hz (and passive above 200 Hz)
- ideal to dampen building vibrations
- SEM lifting tools available
- Reliable systems: after passing specific quality control procedure
- Two year guarantee
- Qualified service: for standard and customized solutions factory trained personnel will support you in finding the optimal solution for your application and assist you with the installation
- Low voltage electromagnetic actuator avoid high voltage used for many Piezo systems = no interference with your delicate instrumentation
- Rapid delivery allow you to start your work right away and shorten the time to publish your results
- Service hubs in Europe, US and Asia for fast support

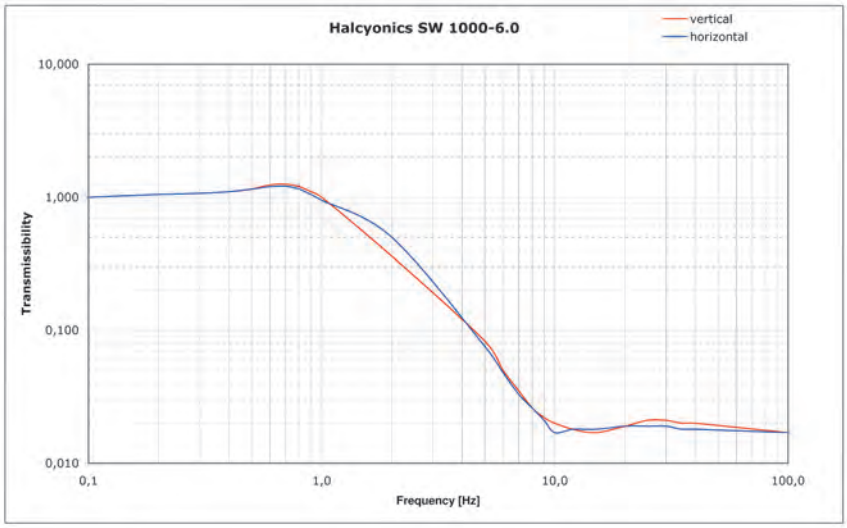


Breadboard supported by 3 Duo elements

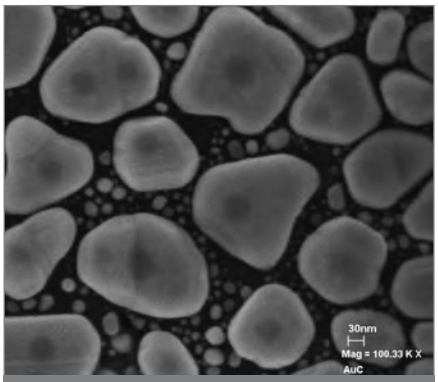


Halcyonics_Sandwich with Controller

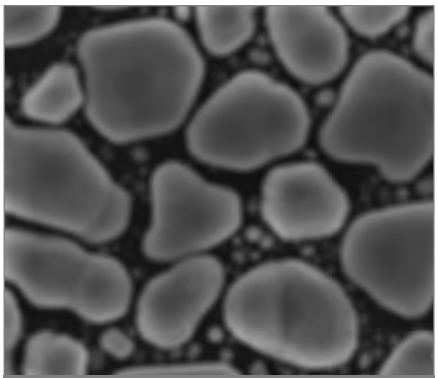
UHV Experiment on Halcyonics_Sandwich



Transmission graph of SW 1000-C.o - measured at a velocity of 100 µm/s, with a payload of 100 kg | 132 lbs



SEM image of Au particles with …



… and without Duo active isolation

RECOMMENDED ACCESSORIES

- SEM Lifting Tool
- Customer specific size and load range
- Site vibration survey to estimate improvement
- Factory trained on-site setup assistance

HALCYONICS_HEAVYLOADS

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Technical Specifications:

_active vibration isolation for heavy loads

halcyonics_duo

Technical Specifications:

_AVAILABLE STANDARD VERSIONS

	DUO_73

_PERFORMANCE SPECIFICATIONS

ISOLATION TECHNOLOGY:	halcyonics_active vibration isolation technology based on piezoelectric type acceleration pickup, fast signal processing and electro-dynamic force transducers.
FORCE DIRECTIONS:	Active compensation in all six degrees of freedom
ISOLATION PERFORMANCE:	> 5 Hz = 25 dB (94.4 %) >10 Hz = 35 dB (98.2 %)
ACTIVE BANDWIDTH:	1.0–200 Hz*
SETTLING TIME:	300 ms**
STROKE OF THE ACTUATOR:	1.000 µm
MAX. CORRECTION FORCES: V. = Vertical H. = Horizontal	 V. ± 16 N (for Duo_73 – 2 isolator configuration) H. ± 8 N (for Duo_73 – 2 isolator configuration)
LOAD CAPACITY:	0–400 kg | 0–880 lbs per element

_OTHER SPECIFICATIONS

WEIGHT:	26 kg | 57.3 lbs per element
TOP PLATE MATERIAL:	Powder coated aluminum alloy
MAXIMUM COMPENSATION LEVEL:	350 µm/s at 9 Hz and 300 kg | 661 lbs**
INTERFACE:	BNC analog diagnostic output – 50 Ω

_ENVIRONMENTAL AND OPERATIONAL REQUIREMENTS

ELECTRICAL VOLTAGE:	100–250 V~ | 47–63 Hz
POWER CONSUMPTION:	10–50 W per element
OPERATING TEMPERATURE:	10–40 °C | 50–104 °F
RELATIVE HUMIDITY:	0–60 %
OPERATING ALTITUDE:	< 2,500 m | 8,100 ft

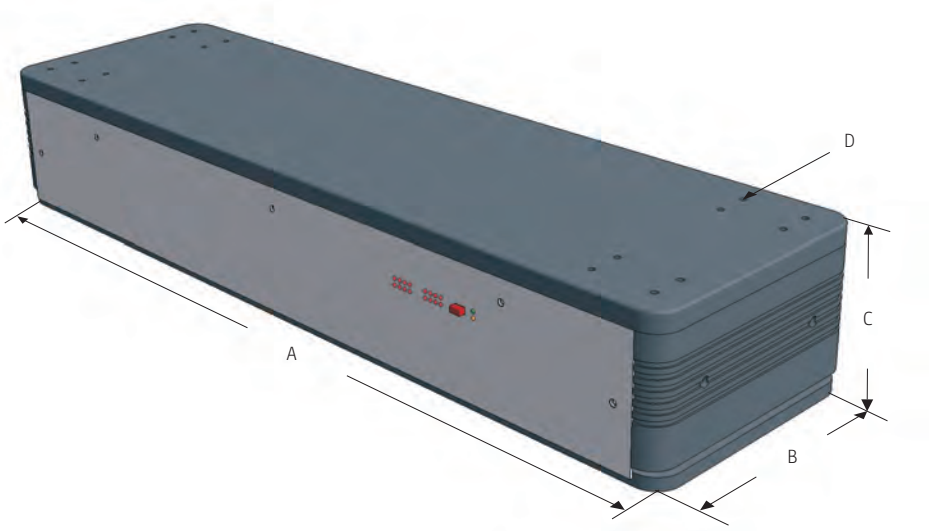
_CERTIFICATION

ELECTRICAL SAFETY:	CE certified according to directive 2006/95/EC
EMC:	CE certified according to directive 2004/108/EC

* Floating table top is supported by steel springs; low-pass characteristics of spring-mass combination dominates the dynamic behaviour above 200 Hz.

** The settling time and maximum compensation level depend on several conditions, such as payload, frequency, load distribution and height of the payload. For that reason this value should be considered as an estimation.

Technical Dimensions:



A = 730 mm | 28.7"
B = 210 mm | 8.3"
C = 125 mm | 4.9"
D = M6 (16 x)

Duo_73

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