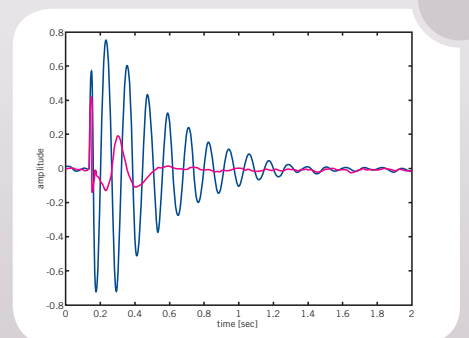


Benchtop Vibration Isolation Units – Micro Series

Compact, active vibration isolation systems – Micro 40, 60 and 80 are Halcyonics' intelligent benchtop solutions, which are the cost-effective active vibration isolation systems for various smaller applications.

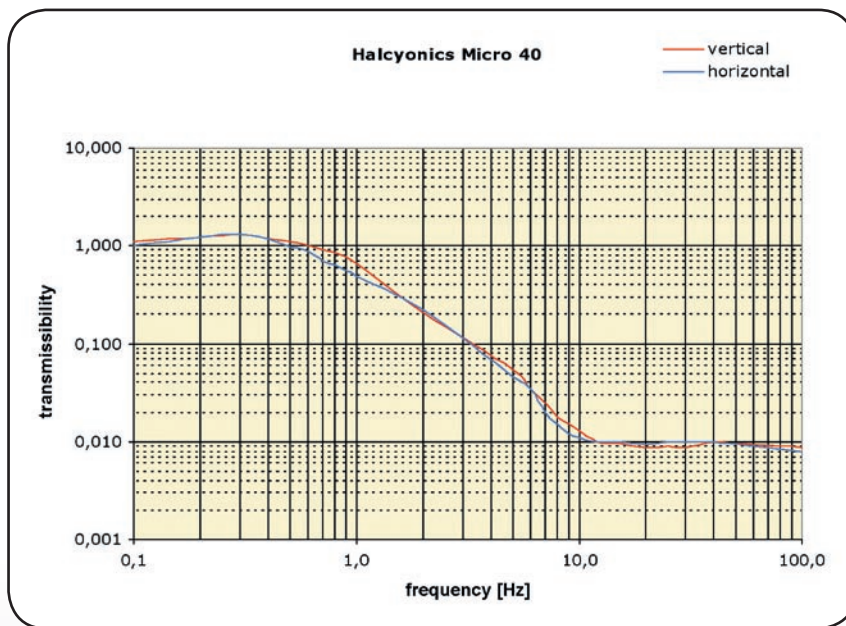


Halcyonics Micro units – user friendly, compact and portable

Based on Halcyonics' proven VarioControl technology, the new benchtop unit now offers the convenience of a digital easy-to-navigate menu. VarioControl units offer two digital displays; one for menu navigation and a second to obtain additional information on current

vibration levels. Vibration signals of sensors and actuators can be chosen and visualized as graphical bars. The user therefore always obtains summarized information on the current vibration condition of the application. Halcyonics Micro systems feature an automated

transport locking mode and fully automatic load adjustment; they take only a few seconds to start up. There is no further adjusting or tuning required. Thus, the Micro systems offer ideal portability for field measurements and presentations.



▲ Fig. 1: Transmission graph of a Halcyonics Micro 40 – measured at a velocity of 100 $\mu\text{m/s}$ with a payload of 20 kg (44 lbs)

Features and benefits

- Exceptionally compact dimensions
- Automated auto-leveling and transportation lock
- AC power from an electrical outlet is sufficient; no compressed air supply is needed
- Provides better vibration isolation (> 99.0% isolation above 10 Hz) than is normally possible with complicated, large optical tables
- No natural low-frequency resonance; as a result, excellent vibration characteristics also in frequency ranges below 5 Hz
- Active isolation in all six degrees of freedom
- Outstanding isolation of floor vibration and from other application-generated effects of vibration (thanks to AVI and AVC)
- USB 1.1 port and evaluation software for Microsoft Windows PCs

Application example: Active vibration isolation of AFM's

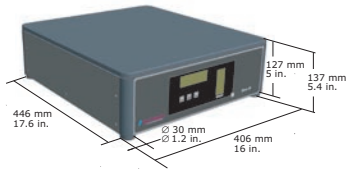
Benchtop systems, such as the Halcyonics Micro 40, 60 and 80, are the basis for compact scientific applications that require effective vibration isolation. The units optimally isolate equipment that is extremely sensitive to vibration, such as small interferometers, scanning probe microscopes, advanced equipment for cell biology and other high-resolution measur-

ing instruments, from building vibration and other effects caused by vibration.

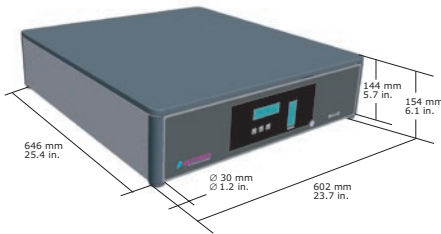
The images on the right show the result of an AFM measurement. Both measurements were performed on a normal standard wooden desk; the difference in image quality is due to the effect of Halcyonics Active Vibration isolation.



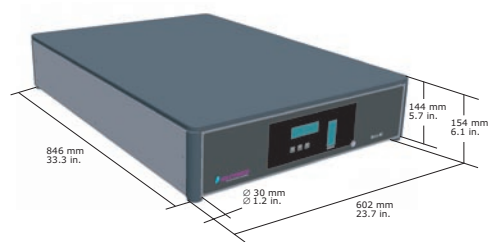
Micro 40



Micro 60



Micro 80



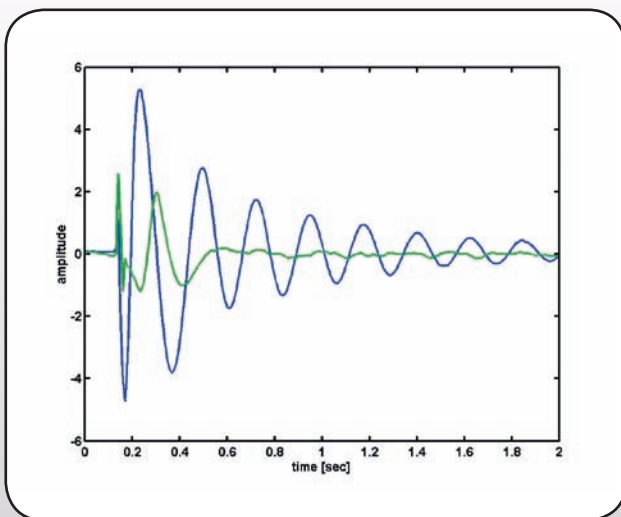
▲ Fig. 2: Dimensions of Micro systems

Micro 40, 60 and 80 – high-performance benchtop isolators

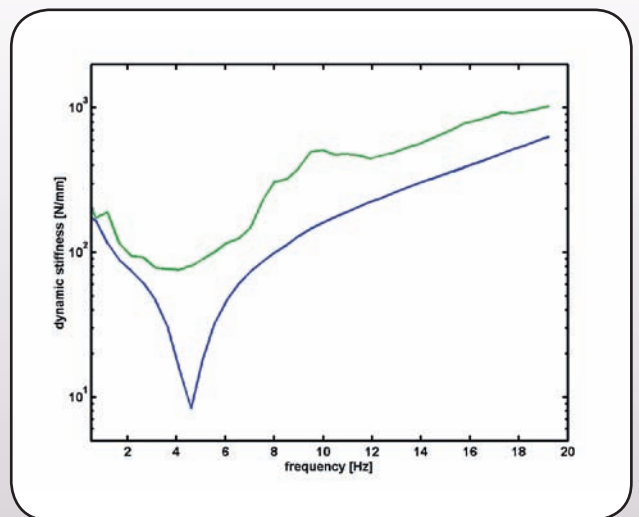
Thanks to Halcyonics VarioControl technology, active vibration isolation takes effect right at 0.6 Hz and considerably increases from this frequency upward. Above 10 Hz, Halcyonics Micro systems achieve an isolation of 40 dB – that means that 99.0% of the vibration is effectively isolated. In addition to their high isolation from floor vibration through AVI (active vibration isolation), Micro systems also dampen application-generated vibration by AVC (active vibration control), e.g., vibration caused when the user touches the equipment.

A major advantage of active Halcyonics systems is that they do not have any natural low-frequency resonance, which is responsible for problems encountered with passive vibration isolation systems in low-frequency ranges below 5 Hz. Micro systems isolate vertical and horizontal vibration as well as vibration generated around the vertical axis of rotation as well as both horizontal axes of inclination. The degree of freedom of the active isolation system is thus six.

The inherent stiffness of Halcyonics systems is typically 20–30 times higher than that of a 1 Hz passive isolator. For this reason, the Halcyonics active isolation technology provides much better position stability than with any passive system; which is a great advantage at many applications. Thanks to automatic load adjustment, Micro 40, 60 and 80 units allow a wide load range with just one version – this offers good flexibility also for future applications.



▲ Fig. 3: Settling time of a Halcyonics Micro 40 system (green) compared to a conventional air-damped vibration isolation system (blue), made by one of the major manufacturers of optical tables and vibration isolated laboratory desks. Halcyonics active vibration isolation systems provide quick and effective compensation of disturbing vibrations.



▲ Fig. 4: Dynamic isolator stiffness (green) of Halcyonics Micro systems compared to a commercially available passive air damped isolation system (blue). Due to their higher dynamic stiffness, Halcyonics systems are less sensitive to direct forces that affect the isolated platform. As a result, Halcyonics active vibration isolation systems offer excellent position stability.

Technical Specifications

Available Standard Versions

Micro 40	
Micro 40 M6/25	Special top plate with M6 tapped holes on a 25 mm pitch
Micro 60	
Micro 60 M6/25	Special top plate with M6 tapped holes on a 25 mm pitch
Micro 80	
Micro 80 M6/25	Special top plate with M6 tapped holes on a 25 mm pitch

Performance Specifications

Isolation technology:	Halcyonics VarioControl technology based on piezoelectric type acceleration pickup, fast signal processing and electro-dynamic type force transducers.
Control electronics:	Easy-to-navigate menu for all settings, second graphics display for vibration levels
Force directions:	Active compensation in all six degrees of freedom
Isolation performance:	> 5 Hz = 25 dB (94.4%); > 10 Hz = 40 dB (99.0%)
Active bandwidth:	0.6–200 Hz*
Settling time:	300 ms
Max. correction forces:	Vertical ± 8 N; horizontal ± 4 N
Load capacity:	0–100 kg (0–200 lbs)

Other Specifications

Dimensions:	See figure 2
Weight:	Micro 40: 27.8 kg (61.3 lbs) Micro 60: 43.3 kg (95.5 lbs) Micro 80: 55.0 kg (121.3 lbs)
Table top material:	Micro 40: powder coated aluminium Micro 60: powder coated aluminium, honey-comb structure Micro 80: powder coated aluminium, honey-comb structure
Top plate surface flatness:	Micro 40: ± 0.10 mm over complete surface Micro 60: ± 0.15 mm over complete surface Micro 80: ± 0.15 mm over complete surface
Maximum compensation level:	500 μ m/s at 6 Hz and 60 kg (132 lbs)**
Repeatability of load adjustment:	120 μ m
Interface:	USB 1.1 standard
Software: (for Microsoft Windows based PCs)	<ul style="list-style-type: none"> • Activate/deactivate active vibration isolation by remote control • Monitor function – display sensor signals • Spectrum analyzer function – guidance to locate disturbing vibration sources • Location finder – guidance to find the ideal installation location in the lab

Environmental and Operational Requirements

Electrical voltage:	100–250 V/47–63 Hz
Power consumption:	40–55 W
Operating temperature:	10–40°C (50–104 F)
Relative humidity:	0–60%
Operating altitude:	< 2500 m (8100 ft)

Certification

Electrical Safety:	CE certificated according to directive 89/336/EC
EMC:	CE certificated according to directive 73/23/EEC

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

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