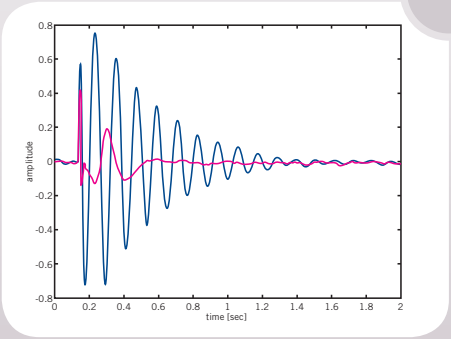
ACTIVE VIBRATION ISOLATION

HALCYONICS
the anti-vibration specialists

Vario 45/60/90

Active Vibration Isolation Elements – Vario Series

Modular, multifunctional vibration isolation systems – the Halcyonics Vario series consist of active vibration isolation elements and external controller exactly matched for these elements.



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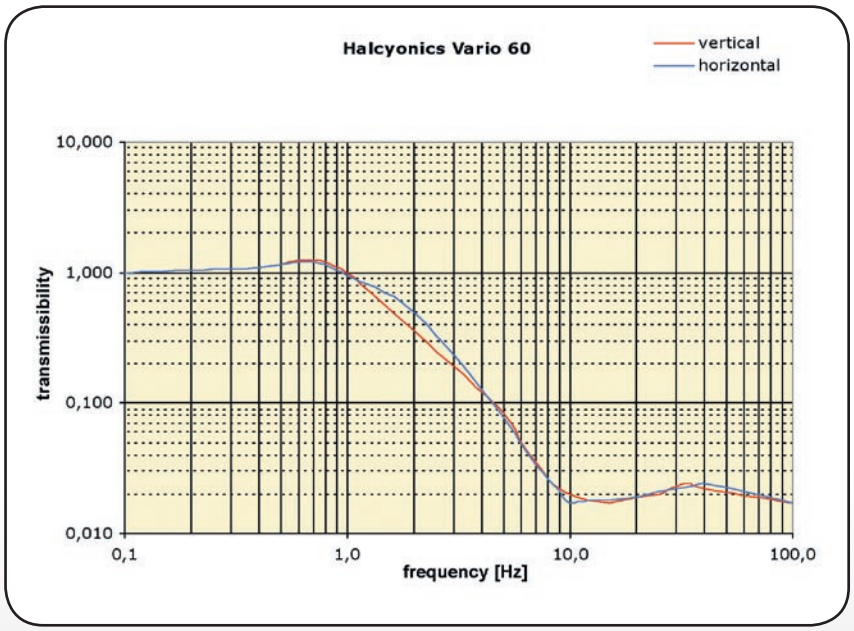
Halcyonics Vario – the versatile solution for various applications

Halcyonics offers three different element lengths (Vario 45, Vario 60 and Vario 90). Each element has a maximum load capacity of 180 kg (397 lbs). A standard Vario system can thus handle up to 360 kg (794 lbs). The isolation effect of the Vario elements starts right at 1 Hz and, above 10 Hz, attains more than 35 dB (98,2 %). Vario elements are always used in pairs; each matched pair must be operated in parallel alignment with respect to one another. A major advantage of Halcyonics active systems is that they eliminate interfering natural low-frequency resonance that is generated by passive systems. The latter systems have a more or less marked natural resonance, typically in the range from 1 to 4 Hz. These passive systems cannot suppress vibration in this frequency range, rather they typically increase it. Compared with passive systems, Halcyonics active systems deliver excellent vibration isolation characteristics right at exceptionally low frequencies of 2-3 Hz. They actively isolate vibration for all the 6 existing degrees of freedom.



▲ Fig. 1: Transmission graph of Vario 60 - measured at a velocity of 100 µm/s, with a payload of 50 kg (110 lbs)

Features and benefits

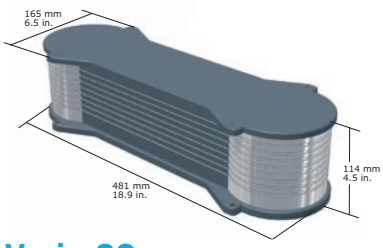
- Modular design, three different standard sizes available
- Automated auto-leveling and transportation lock
- AC power from an electrical outlet is sufficient; no compressed air supply is needed
- Provides better vibration isolation (> 98.22% isolation above 10 Hz) than is normally possible with complicated, 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
- USB 1.1 port and evaluation software for Microsoft Windows PCs

Area of applications: Vario isolation elements

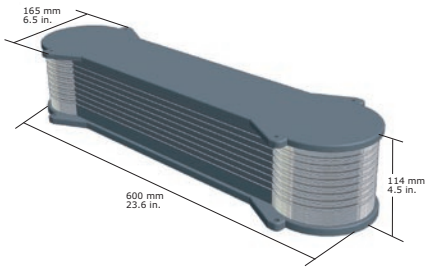
The compact dimensions and versatile application options of this product series make it ideal for OEM installation in customer-specific applications and for configuration of active vibration isolation work areas and platforms in the lab. There are virtually no limits when it comes to the range of uses offered by Vario systems.
A major application example for Vario systems is the combination of isolation elements with optical breadboards, to be used for Laser applications such as interferometers, holographic assemblies and more. Other examples can be found in many different markets: optical profilers in nanotechnology, UHV scanning tunneling microscope chambers for materials research, smaller 3D coordinate measuring machines (CMM) in production-related metrology as well as high-througput screening technologies in modern biotechnology.

▲ Halcyonics Vario 45 with optical breadboard

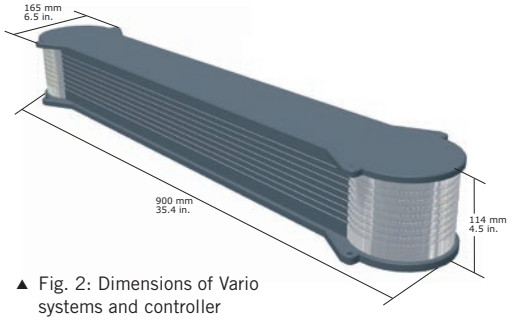
Vario 45



Vario 60



Vario 90



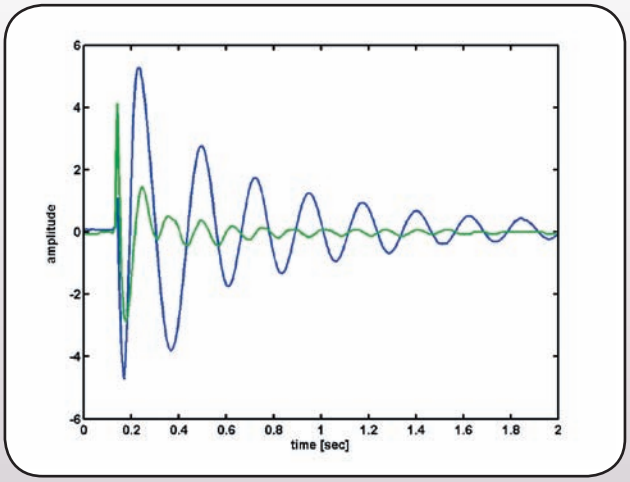
VarioControl

▲ Fig. 2: Dimensions of Vario systems and controller

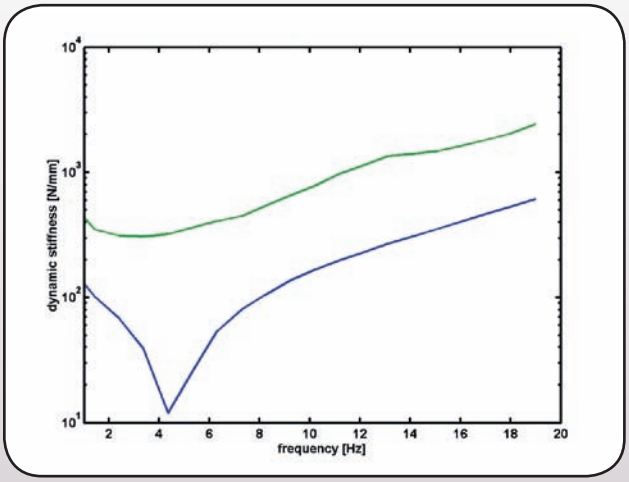
Halcyonics Vario – modular and easy to integrate

Installation of a Vario system is exceptionally easy; the isolation elements are attached to the application and connected to the controller. The latter requires only an AC power output; no compressed air or other media are necessary. Automatic load adjustment settings and other functions are simply selected on the Vario controller using the convenient operating menu. After installation and selection of the settings, the Vario system does not require any further operator attendance or maintenance and can remain in the continuous operating state indefinitely.

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 other passive system; which is a great advantage at many applications. Thanks to automatic load adjustment, Halcyonics Vario units allow a wide load range of 0 – 360 kg (0 – 794 lbs) with just one version – this offers good flexibility also for future applications.



▲ Fig. 3: Settling time of a Halcyonics Vario 45 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 Vario 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.

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Technical Specifications

Available Standard Versions	
Vario 45	
Vario 60	
Vario 90	
Performance Specifications	
Isolation technology:	Halcyonics VarioControl technology based on piezoelectric type acceleration pickup, fast signal processing and electro-dynamic 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 = 35 dB (98.2%)
Active bandwidth:	1.0–200 Hz*
Settling time:	300 ms
Max. correction forces:	Vertical ± 8 N; horizontal ± 4 N
Load capacity:	0–360 kg (0–794 lbs)
Other Specifications	
Dimensions:	See figure 2
Weight:	Vario 45: 9.9 kg (21.8 lbs) per isolation element Vario 60: 11.0 kg (24.3 lbs) per isolation element Vario 90: 12.5 kg (27.6 lbs) per isolation element VarioControl unit: 4.8 kg (10.6 lbs)
Maximum compensation level:	550 µm/s at 9 Hz and 160 kg (353 lbs)**
Repeatability of load adjustment:	60 µm
Interface:	USB 1.1 standard
Software: (for Microsoft Windows based PCs)	• 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:	Typically 35–50 W; max. 70 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 as well as the distance between the isolation elements. For that reason this value should be considered as an estimation.

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