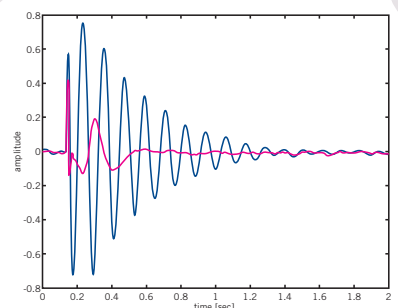


## Active Vibration Isolation Elements – Vario Basic Series

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

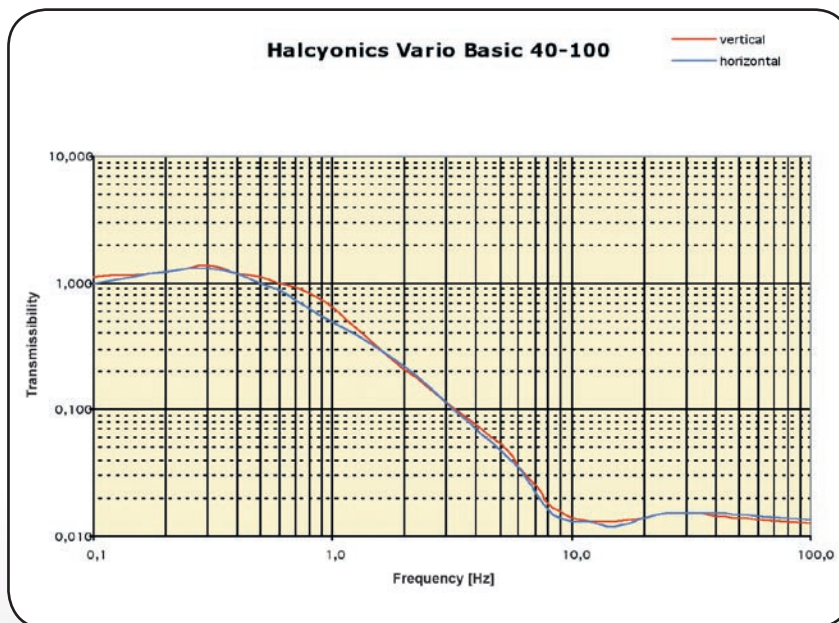


## Halcyonics Vario Basic – the OEM solution for applications with static load

The new Vario Basic series has replaced the well known Halcyonics MOD-2 system. It has especially been designed as a cost-effective isolation system for applications with high static load and only slight load changes during the operation. This isolation system needs to be manually adjusted prior to use. Later on, there is no further tuning or adjusting required. The isolation effect of the Vario elements starts

right at 0.7 Hz and, above 10 Hz, attains more than 38 dB (Vario Basic 40-100). A major advantage of Halcyonics active systems is that they eliminate interfering natural low-frequency resonance generated by passive systems with a more or less marked natural resonance, typically in the range of 1 to 4 Hz. These passive systems cannot suppress vibration in this frequency range, they tend rather to increase

it. Compared to passive systems, our 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. Vario Basic elements are always used in pairs; each matched pair must be operated in parallel alignment. You can also configure 2, 4, 6 or more isolation elements.



▲ Fig. 1: Transmission graph of Vario Basic 40-100 measured at a velocity of 100  $\mu\text{m/s}$ , with a payload of 50 kg (110 lbs)

### Features and benefits

- Modular design, three different standard sizes available
- Two different load versions available
- AC power from an electrical outlet is sufficient; no compressed air supply is needed
- Provides better vibration isolation (> 98.75% 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

## Area of applications: Vario Basic 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.

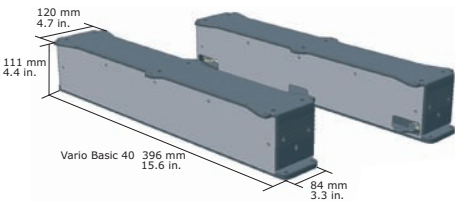
A major application example for Vario Basic systems is the combination of isolation ele-

ments 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-throughput screening technologies in modern biotechnology.

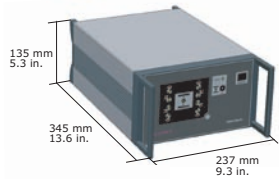


▲ Halcyonics Vario Basic 40 with optical breadboard

## Vario Basic 40



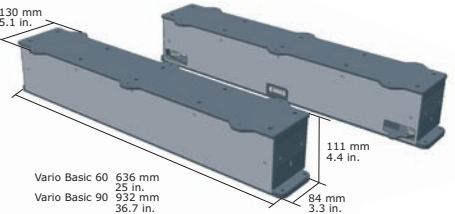
## 2 port control unit



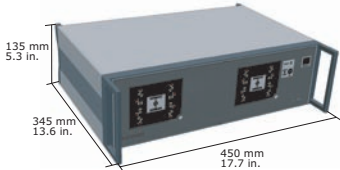
## 4-element configurations



## Vario Basic 60 and 90



## 4 port control unit



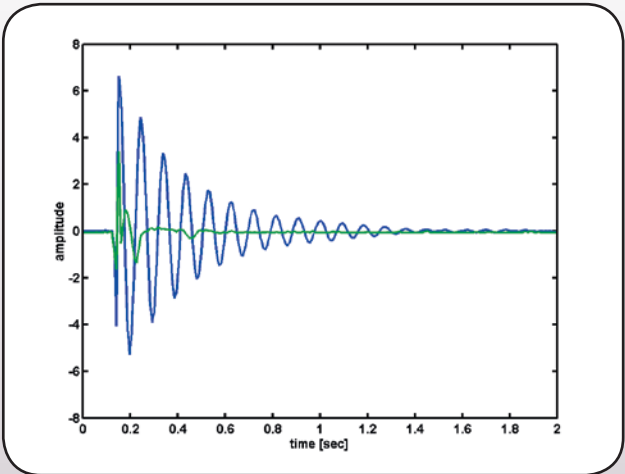
▲ Fig. 2: Dimensions of Vario Basic system and controller

## Halcyonics Vario Basic – modular and easy to integrate

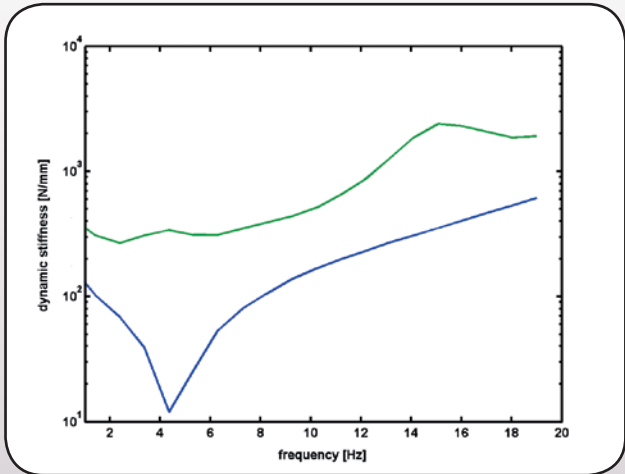
Vario Basic is available in six different versions as a standard. It comes in three different element lengths as well as two different load versions: max. 100 kg (220 lbs) and max. 300 kg (660 lbs). Installation of a Vario Basic system is exceptionally easy; the isolation elements are

attached to the application and connected to the controller. Once the load adjustment setting has been done, the Vario Basic system does not require any further operator attendance or maintenance and can remain in the continuous operating state indefinitely.

Vario Basic units feature a new user friendly load adjustment mechanism. This setting can be easily accessed from the side of each isolation element. It's no longer necessary to open the housing. The whole procedure takes only a few minutes to setup.



▲ Fig. 3: Settling time of a Halcyonics Vario Basic 40-100 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 Basic 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

	Vario Basic 40-100	Vario Basic 40-300	Vario Basic 40-600*
	Vario Basic 60-100	Vario Basic 60-300	Vario Basic 60-600*
	Vario Basic 90-100	Vario Basic 90-300	Vario Basic 90-600*

### Performance Specifications

Isolation technology:	Halcyonics active vibration isolation technology based on piezoelectric type acceleration pickup, fast signal processing and electro-dynamic force transducers.		
Control electronics:	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 (98.75%)	> 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:	0.7 – 200 Hz**	1.0 – 200 Hz**	1.0 – 200 Hz**
Settling time:	100 ms	300 ms	300 ms
Max. Correction forces:	Vertical $\pm$ 8 N; horizontal $\pm$ 4 N	Vertical $\pm$ 8 N; horizontal $\pm$ 4 N	Vertical $\pm$ 16 N; horizontal $\pm$ 8 N
Load capacity:	0 – 100 kg (0 – 220 lbs)	0 – 300 kg (0 – 660 lbs)	0 – 600 kg (0 – 1,320 lbs)

### Other Specifications

Dimensions:	See figure 2		
Weight:	Vario Basic 40: 6,8 kg (15 lbs) per isolation element Vario Basic 60: 8,6 kg (19 lbs) per isolation element Vario Basic 90: 10,4 kg (23 lbs) per isolation element Vario Basic control unit: 4,5 kg (10 lbs)		
Maximum compensation level:	550 $\mu$ m/s at 6 Hz and 60 kg (132 lbs)***	500 $\mu$ m/s at 8 Hz and 150 kg (330 lbs)***	500 $\mu$ m/s at 8 Hz and 300 kg (660 lbs)***
Interface:	BNC analog diagnostic output – 50 Ohms		

### Environmental and Operational Requirements

Electrical voltage:	100 – 250 V/47 – 63 Hz
Power consumption:	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 certificated according to directive 89/336/EC
EMC:	CE certificated according to directive 73/23/EEC

\* 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 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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