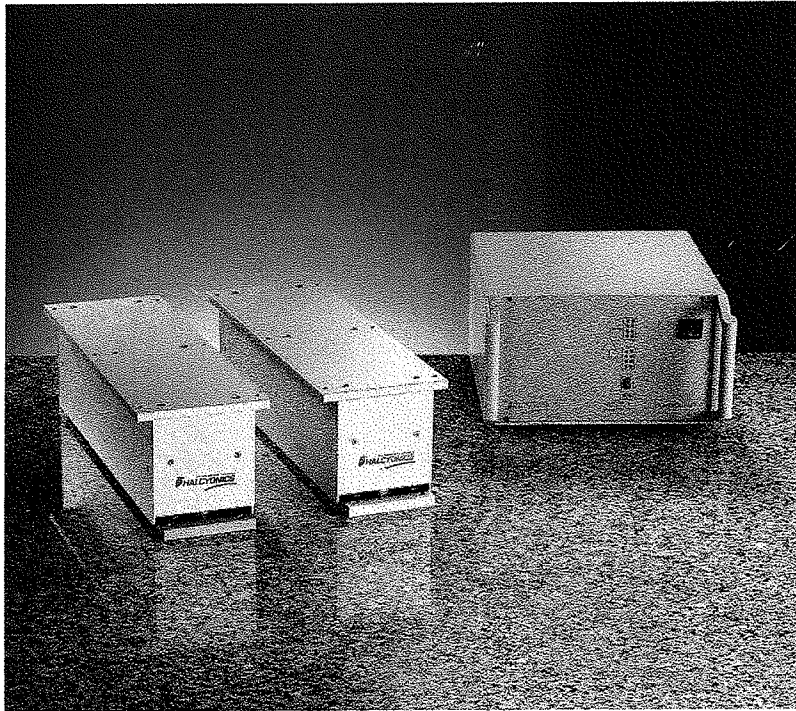


## **Operating Instructions**

MOD-2 Active Vibration Isolation Systems



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## **1 Introduction**

Thank you for purchasing the MOD-Sandwich platform. By deciding on a Halcyonics MOD unit, you have acquired a top-class active vibration isolation system. We are positive that this system will meet your expectations and provide you with the best possible performance in your application.

Please read these instructions before operating your new system. This manual contains important information and warnings to enable you to operate the MOD-2 system easily and safely.

## **2 Unpacking the MOD-2 System**

After unpacking the system, please check whether the package contains all components.

Equipment supplied for the MOD-2:

- 2 MOD-2 isolation elements
- controller device(s) according to the amount of elements and their ports
- 1 power cord for every controller device
- 1 Allen key 2 mm
- 1 Spanner 10 mm
- 1 MOD-2 instruction manual

## **3 Safety Information**

To prevent injury and damage to this system and other equipment connected to it, please observe the following safety information and warnings.

### **3.1 General Warnings**

Never operate this system in a potentially hazardous, wet or damp environment.

If there is visible damage to the system or you suspect that it is damaged in any way, do not operate it. If the system is connected to an electrical outlet, be sure to disconnect it from this outlet and contact your sales office responsible for your locale or directly notify Halcyonics.

### 3.2 Electrical Safety

This system may only be operated from a power source that has a protective grounding conductor. Under no circumstances may you disconnect the protective grounding conductor! If you happen to use a power cord that differs from the standard one supplied with this system, be sure that it is connected to the protective grounding conductor.

Before operating the system, check that your line voltage (mains supply) has the same rating as the system. For further information on the power requirements, please refer to the specifications on page 10.

Do not open the system housing on your own. If Halcyonics directs you to remove any cover plates or perform any other work on the system, be sure to disconnect the system from AC power before attempting to do so. Only qualified specialists authorized by Halcyonics may make repairs or service this system. Non-authorized repairs or tampering will void any claims under the Halcyonics warranty, and Halcyonics shall not assume any liability.

### 3.3 Mechanical Safety

Make sure the ventilation slits in the control unit are not covered and that air can freely circulate. Blocking the slits can lead to overheating which could cause a fire.

Please note that you need to lock the system before you transport it or move it to a new position! For further instructions, please refer to page 5.

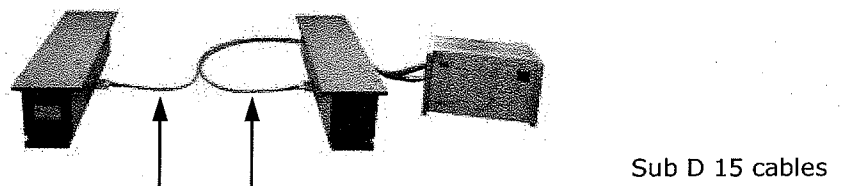
Use a lint-free cloth to remove dust from the outside of the system. To clean it, use a soft, moist cloth. Do not use any aggressive cleaning agents.

## 4 Installation

### 4.1 Electrical Connections

The MOD-2 system is supplied with control unit. The control unit is connected to the isolation elements by 2 m long (other lengths optional) Sub D 15 cables. Connect "output isolation A, B" of the control unit with isolation elements by Sub D 15 cables.

Never connect or disconnect the control unit from isolation elements while running system. Connect the control unit to the main supply by using line cord.



### 4.2 Mechanical Setup

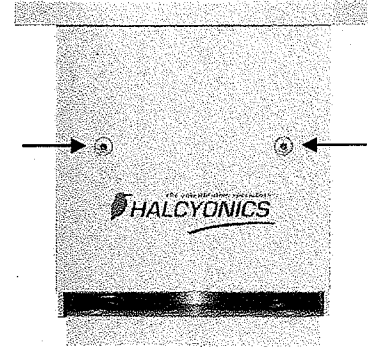
Place isolation elements to the required positions on rigid and plane surface (e.g. supporting frame, stiff tables, floor, etc.). Parallel orientation with minimum distance of 400 mm of isolation elements is recommended for optimal isolation performance.

Attach the table top or the device on top of the isolation elements. If possible fix the table top/device by screws or adhesive.

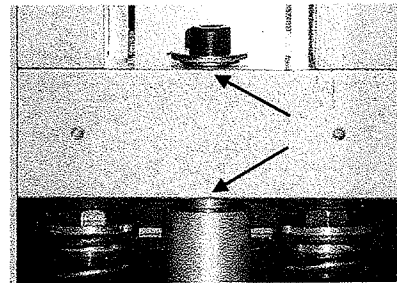
### 4.3 Adjustment for Change of Load

The MOD-2 system has to be adjusted to accommodate loads in the range 0 up to the maximum load of the system. The maximum load depends on the amount of isolation elements of the system. Each element can support a maximum load of 150 kg.

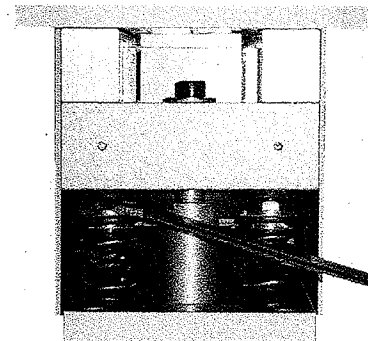
Each isolation element of a MOD-2 can be adjusted to accommodate loads in the range 0 to 150 Kg. For any setting the load on a single element may be varied +/- 30 Kg without having to reset the adjustments. To expose the adjustment nuts, remove the end covers shown by undoing the screws, using the provided 2 mm allen key.



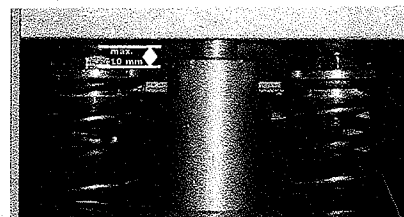
Under load the upper gap and the lower gap shown in fig. 2 should be approximately equal. (It is however not essential that the gaps be equal - either gap may be as small as 0.5 mm without affecting normal operation, but a small subsequent change of load might cause the unit to move against the stop).



If an adjustment is needed turn the M6 nuts using the spanner provided. Adjust all springs. Moving the spanner to the left raises the units and thus increases the maximum load.



Do not turn the nuts too far or you may damage the units. Under no circumstances should the gap indicated in fig. 4 be greater than 10 mm.



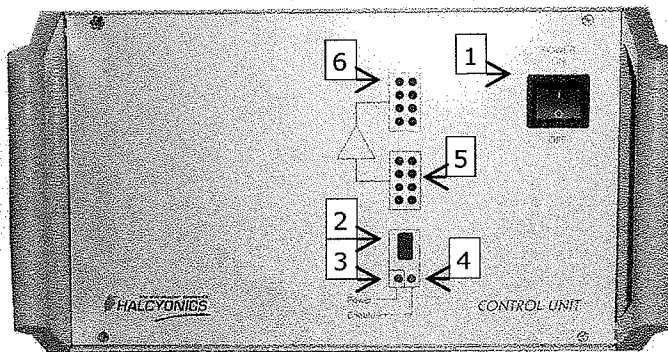
#### 4.4 MOD-2 Control Unit

The MOD-2 systems are supplied with control unit. For MOD-2 systems with more than two elements we supply the double width control unit.

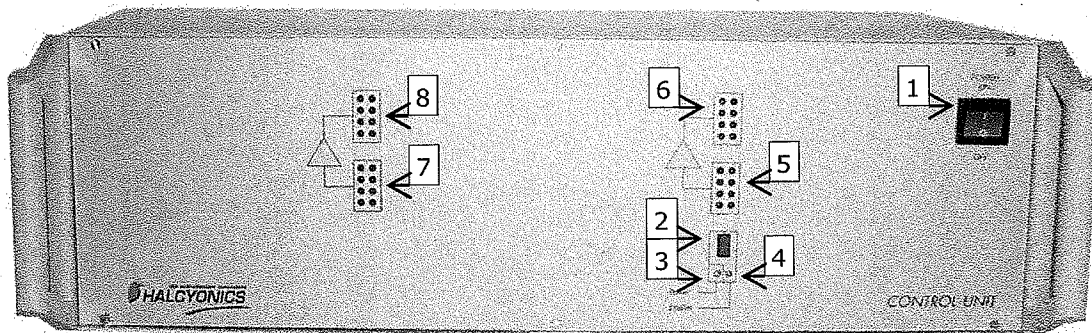
The control unit is connected to the isolation elements by 2 m long (other lengths optional) D-Sub 15 cables; each element requires one control cable. The standard MOD-2 control unit has two ports for the operation of up to 2 elements whereas the double width control unit has 4 ports for the connection of up to 4 elements.

It provides the power, and houses the power amplifiers for driving the isolation elements. Typically power consumption is 12 W for the standard control unit and 24 W for the double width control unit. In extreme environments this rises to a maximum of 50 W for the standard and to 100 W for the double width control unit.

The control unit has a universal input which may be connected to any AC power point between 115 and 230V  $\pm 10\%$ .



MOD-2 standard control unit



MOD-2 double width control unit

- Description:
- 1 .....Power Switch
  - 2 .....Isolation On/Off Switch
  - 3 .....Power On/Off Indicator
  - 4 .....Isolation On/Off Indicator
  - 5 .....Input (Detector) LEDs for Isolation Elements 1 & 2
  - 6 .....Output (Actuator) LEDs for Isolation Elements 1 & 2
  - 7 .....Input (Detector) LEDs for Isolation Elements 3 & 4
  - 8 .....Output (Actuator) LEDs for Isolation Elements 3 & 4

#### 4.5 Operation

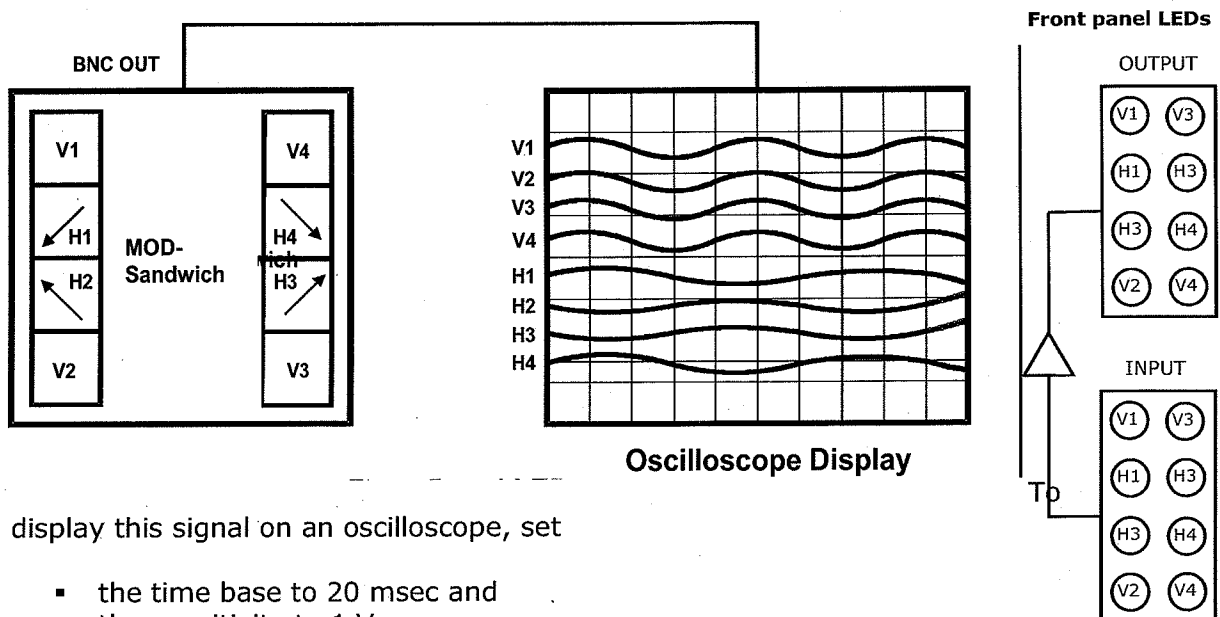
- Once you have started up the system, the green "Power" LED will light up and the 8 LEDs in the "input lamps" field will briefly light.
- If vibration is strong, or if you touch the system, a few or all LEDs will flash.
- Press the left red button on the front panel to enable active vibration isolation.
- Now the system initializes; the yellow LED (Enable) flashes at approx. 2 Hz during this process. Shortly afterwards, the LEDs will remain lit without flashing. This means that vibration isolation is now active.

##### 4.5.1 Function Test

- Generate vibration manually by touching the system. As soon as you induce movement or vibration in this manner, this will overmodulate the system, and the corresponding input and output LEDs will flash to show this overmodulation.
- Read off the LED display to determine how much force can be applied without causing overmodulation.
- During excessive overmodulation, the system will switch to the standby mode. This is indicated by the flashing yellow LED. As soon as this interference is eliminated, the yellow LED will show a steady glow.

#### 4.6 Analog Monitor Output

The analog monitor output (BNC connector on the rear panel of the system) is used for fast, reliable function testing of the sensors by Halcyonics service personnel; however, customers may also use this output to evaluate the vibration situation on-site. The output voltage is a time-multiplexed signal, which indicates the function of all 8 acceleration sensors (V1 – V4: vertical sensors, H1 – H4: horizontal sensors) and the oscilloscope signals.



display this signal on an oscilloscope, set

- the time base to 20 msec and
- the sensitivity to 1 V.
- Do not use any BNC cable that is longer than 2 meters.

## 5 Appendix

### 5.1 MOD-2 Specifications

#### 5.1.1 General Specifications

Frequency range:	1 Hz to $\infty$
Active corrective forces per isolation element:	vertical: maximum $\pm 4$ N horizontal: maximum $\pm 2$ N
System Noise:	less than 50 nG/ $\sqrt{\text{Hz}}$ from 0.1 - 200 Hz in any direction
Maximum load capacity:	150 kg per isolation element
Static compliance per isolation element:	approx. 7 $\mu\text{m/N}$ vertically, 14 $\mu\text{m/N}$ horizontally (at full load)
Element Dimensions:	MOD-2 S: 360 x 92 x 111 mm <sup>3</sup> MOD-2 M: 600 x 92 x 111 mm <sup>3</sup> MOD-2 L: 600 x 92 x 111 mm <sup>3</sup> MOD-2 XL: 600 x 92 x 111 mm <sup>3</sup>

#### 5.1.2 Electrical Specifications

#### 5.1.3 Ambient Conditions

Power Consumption:	typically 10 W, maximum 50 W (70 VA)
Input Voltage:	115-230V AC $\pm 10$ %, 50-60 Hz
Fuses:	2x 1.6A/250V slow located in the power socket on the rear side of the control unit
Overload Indication:	16 LEDs indicate overload condition in input and output stages
Monitor Signal:	A multiplexed signal for display on oscilloscope shows vibration levels with and without isolation

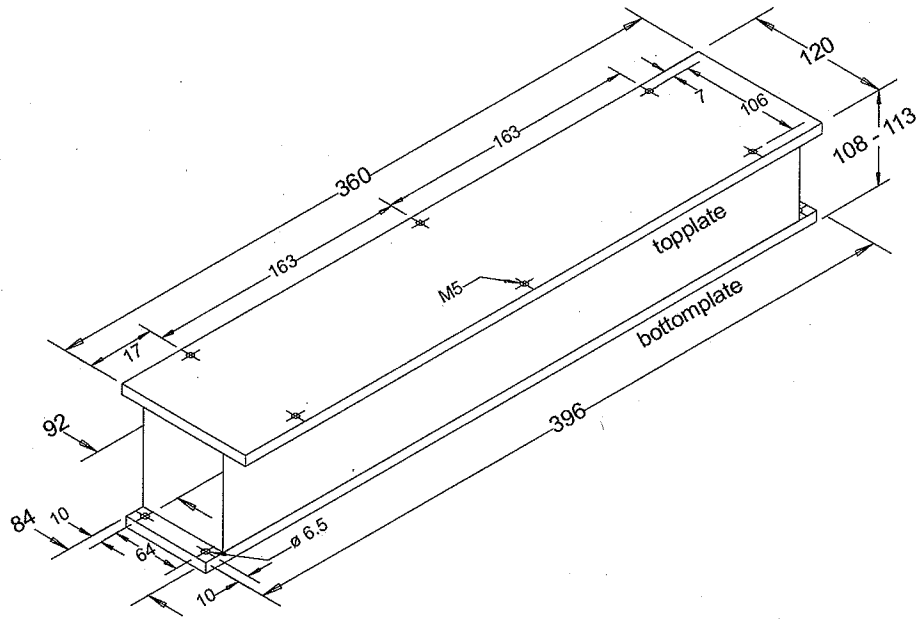
Allowable temperature range:	+ 5 C to + 60° C in operation
Humidity:	- 20° C to + 80° C when not operated + 40° C or below = 90 % relative humidity + 41° C to + 50° C = 60 % relative humidity



**5.2 Dimensions MOD-2 Elements**

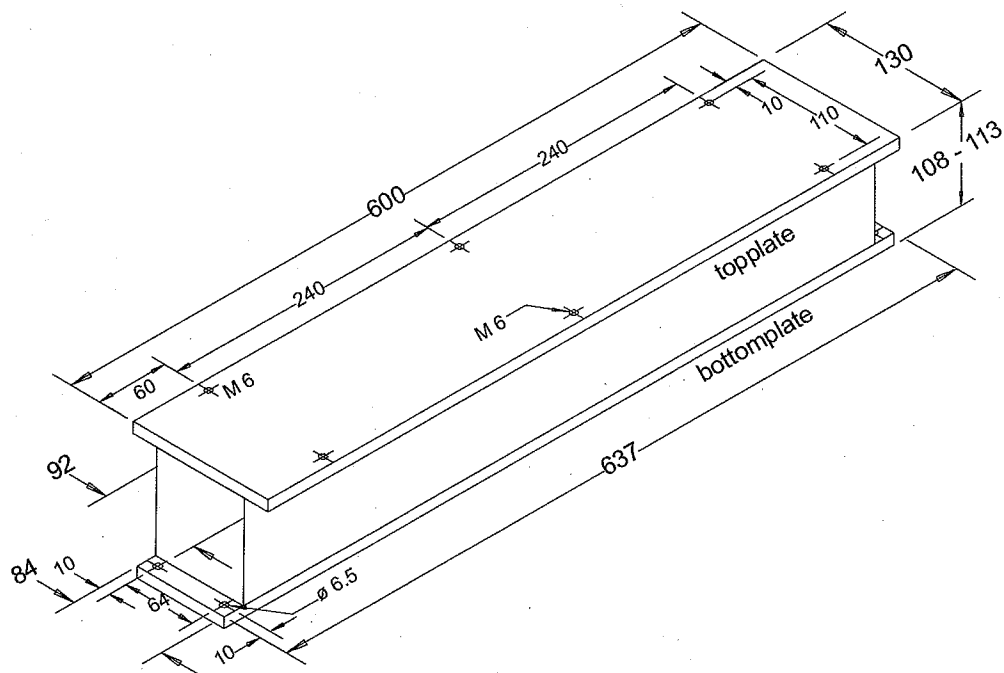
**5.2.1 MOD-2 S Element**

All units in mm

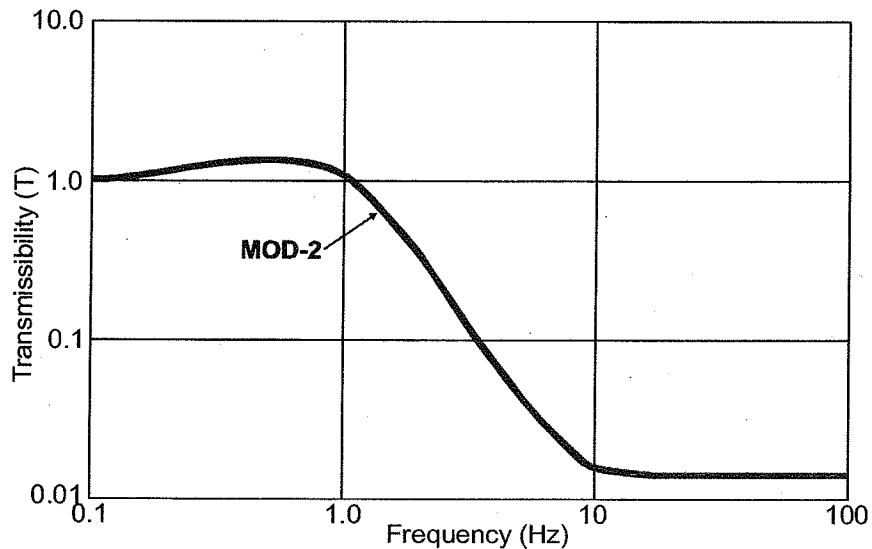


**5.2.2 MOD-2 M Element**

All units in mm



### 5.3 Transmissibility of MOD-2 systems



### 5.4 Technical Support

Should you require any support with installation questions, please notify Halcyonics in Goettingen, Germany. Halcyonics has a long year experience in successful installation of active vibration isolation systems. We would be glad to assist you with your specific application.

You can contact us at:

Halcyonics GmbH  
 Tuchmacherweg 12  
 D-37079 Goettingen, Germany

Monday through Friday from 8:00 am to 5:00 pm CET  
 Tel.: +49 - (0)551 - 999 062 - 0

or e-mail us at: [info@halcyonics.de](mailto:info@halcyonics.de)

#### 5.4.1 Exchanging the Electrical Fuses

The fuses are located in the control unit of the MOD-2 system. Before exchanging the fuses, be sure to unplug the power cord from the electrical outlet (mains supply)! Use only fuses of the same type for replacement. Never attempt to repair or short-circuit a fuse.

#### 5.4.2 DIN Standards and CE Directives

MOD-Sandwich platforms conform to the valid European legal requirements for electrical safety and electromagnetic compatibility. They meet the following DIN and European Standards valid: DIN EN 61326: 1997 + A1: 1998 + A2: 2001, EN 61000-3-2: 2000 and EN 61000-3-3: 1995 + A1: 2000.