

MadMotor™-UHV piezo motor stage

Features

- ▶ UHV compatible
- ▶ Travel range: 10mm
- ▶ Encoder resolution: 500 nm
- ▶ Proprietary MadMotor™ technology
- ▶ Mad-Drive™ DSP controller
- ▶ LabVIEW compatible

Typical Applications

- ▶ Precision alignment in UHV
- ▶ Sample and probe positioning
- ▶ UHV sample transfer

Product Description

The MadMotor™-UHV is a precision, piezo motor driven, micropositioning system for high precision alignment over long travel ranges. The MadMotor™-UHV stages use our proprietary MadMotor™ piezo motor technology allowing travel up to 10mm per axis with high resolution and excellent repeatability. Optional eddy current sensors provide 500nm sensitivity over the entire travel range.

Leveraging Mad City Labs extensive experience in engineering and manufacturing ultra-high vacuum (UHV) instrumentation, the MadMotor™-UHV is vacuum compatible to 1×10^{-11} mbar. Our experienced engineering staff have carefully designed the MadMotor™-UHV stages to account for the rigorous requirements for UHV operation. Mad City Labs' practical experience with UHV instrumentation informs our choice of materials with only the best materials, that meet our practical and technical criteria, making the grade. The MadMotor™-UHV stages have been designed to withstand the rigors of sample transfer that can often damage more delicate piezo motor designs. In addition, our MadMotor™-UHV stages are able to withstand extensive periods of baking with temperatures up to 150°C. As a result, the MadMotor™-UHV is a robust and reliable stage as required by UHV applications.



The MadMotor™-UHV2 stage is ultra-high vacuum compatible and suitable for high precision alignment or positioning. The MadMotor™-UHV is available in single and multi-axis configurations.

The MadMotor™-UHV includes the Mad-Drive™ which is a 1, 2, or 3 axis piezo motor driver with an integrated DSP and USB interface. The Mad-Drive™ can be programmed to perform complex motion functions via the MadMotor™ DLL interface (supplied). Unlike other piezo motors the MadMotor™ DLL allows the user to treat the MadMotor™-UHV as a simple stepper motor with variable step size and stepping distance. The Mad-Drive™ controller is LabVIEW compatible and the system is provided with a LabVIEW motion control examples. Optional wireless joystick control is also available.

The MadMotor™-UHV stages are designed for flange mount or freestanding configurations and are compatible with a variety of Mad City Labs vacuum nanopositioning systems. The MadMotor™-UHV can be customized for your application. Contact our engineering staff for more information.

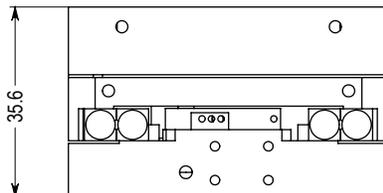
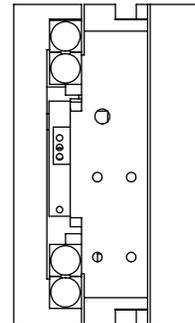
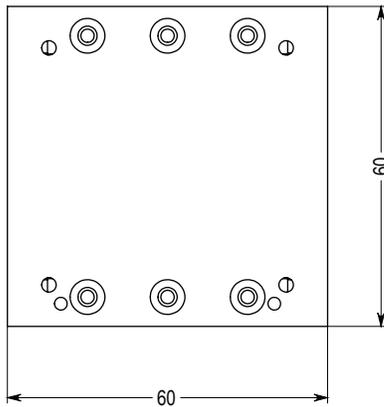
Technical Specifications

Range of motion (per axis)	10 mm
Encoder Resolution (optional).....	500 nm
Step Size (minimum)	100 nm
Maximum Speed	1 mm/sec
Available configurations.....	1, 2 or 3 axis
UHV compatibility	1×10^{-11} mbar
Bakeable temperature	150°C
Recommended max. load*.....	6 kg
Body Material	Aluminum
Stage motor.....	MadMotor™ piezo motor
Controller	Mad-Drive™

* Larger load requirements should be discussed with our engineering staff.

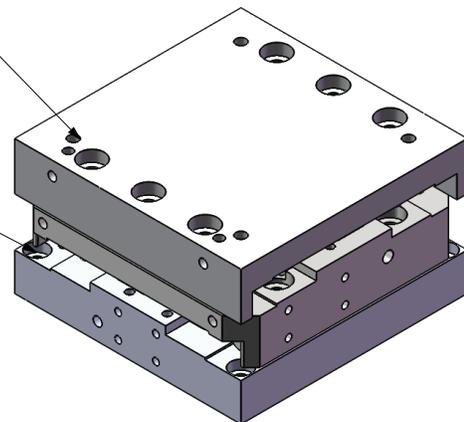


Mad-Drive™ controller used to operate the MadMotor™-UHV stage. A standard USB port allows direct connection of the Mad-Drive™ controller to a PC.



The MadMotor™-UHV can be used for coarse positioning of UHV nanopositioners such as MCL's Nano-HS3.

4 x C-bored for M2.5 SHCAP on a 54mm x 54mm square



MadMotor™-UHV2 shown in drawing. All dimensions in millimeters.