

# Installation and Adjustment

## BA-1 Bench Top Vibration Isolation Platform

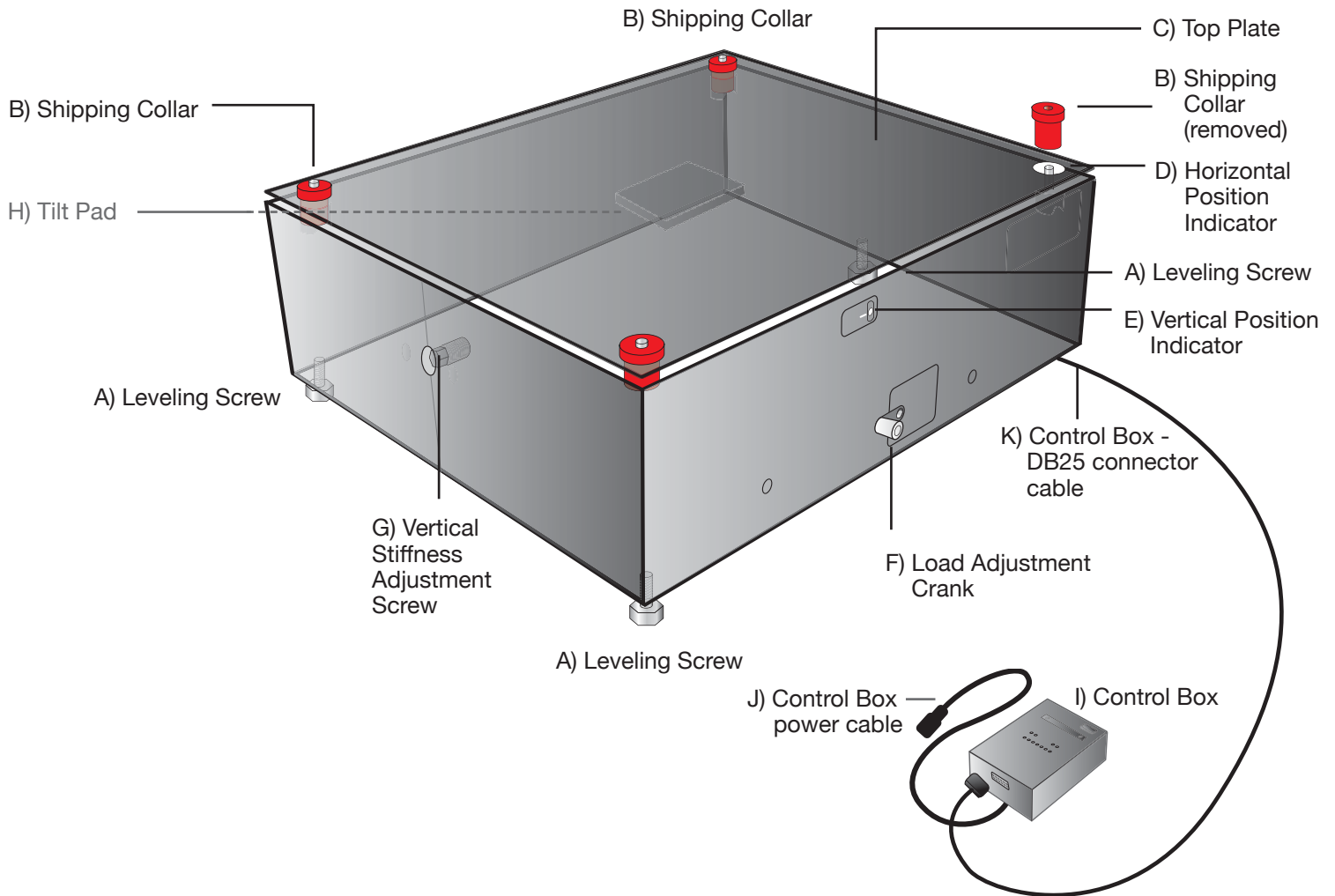
Isolator Dimensions: 24" W x 22.5" D x 9" H (310mm W x 310mm D x 117mm H) Control Box Dimensions: 7.25" W x 4.5" D x 2" H (184mm W x 114mm D x 51mm H)	
Approximate payload weight range:	
Model	Payload Range
100BA-1	60 - 100 lb (27 - 45 kg)
150BA-1	90 - 155 lb (40 - 70 kg)
250BA-1	180 - 270 lb (82 - 122 kg)
350BA-1	290 - 370 lb (132 - 168 kg)
500BA-1	360 - 525 lb (163 - 238 kg)
650BA-1	500 - 680 lb (227 - 308 kg)
Weight: Approximately 90 lb (41 kg) - Dimensions - an additional 0.675" taller than the above units	
850BA-1	630 - 900 lb (286 - 408 kg)
1000BA-1	890 - 1050 lb (404 - 476 kg)

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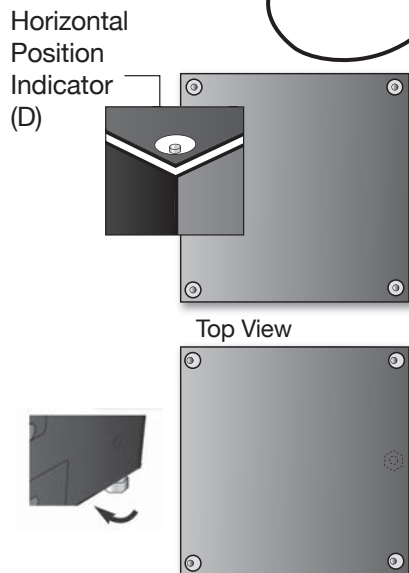
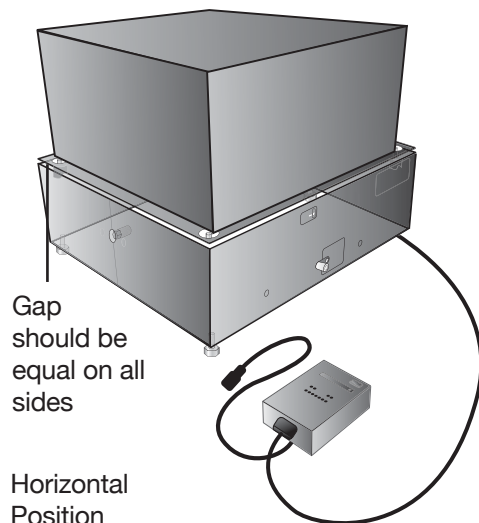
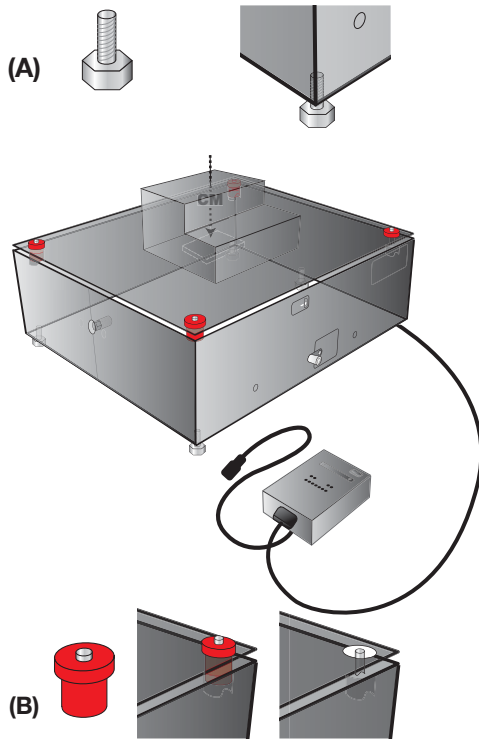
## *Installation and Adjustment*

**Required tools:**

- 3/16 hex key
- 1/2 inch open-end wrench
- 1/2 inch socket wrench



DO NOT REMOVE SHIPPING COLLARS UNTIL INSTRUCTIONS INDICATE. SHIPPING COLLARS MUST BE USED WHEN MOVING ISOLATOR.



**Warning: Do not turn on the auto-adjust system until the payload has been installed and the isolator has been floated manually in the horizontal, tilt and vertical directions.**

1. Make sure you have the correct model for your payload. Payload weight MUST be within the recommended range.
2. Locate the three (3) leveling screws (A). Insert the leveling screws into the bottom of the isolator and place on a solid, level surface. Place the bubble level on the top plate and use the leveling screws to level the isolator.
3. Carefully position payload on top plate so its center-of-mass (CM) is as close to center as possible.
4. Remove the four (4) red shipping collars (B). STORE SHIPPING COLLARS IN A SAFE PLACE AS THEY MUST BE USED WHENEVER MOVING ISOLATOR. Replace the screws into the holes to serve as Horizontal Position Indicators.

**CAUTION: If payload covers shipping collar holes, collars must be removed before placing payload. Take extra care when placing payload without shipping collars attached. Do not replace screws as they may interfere with payload.**

5. Check the level of the top plate. The gap between the top plate and the isolator cover should be approximately equal on all sides.
6. Reposition the payload, as necessary, to level the top plate. It is recommended that you re-install the red shipping collars if you need to re-position the payload (see Step 3). However, it is not necessary if you take extra care repositioning the payload. Do not use leveling screws to level the top plate.

NOTE: Cables, hoses, etc. connected to the payload can affect the horizontal and vertical position. If possible make the following adjustment without attaching the cables.

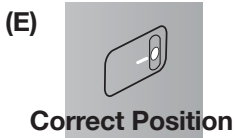
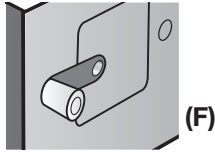
### FLOATING ISOLATOR HORIZONTALLY

7. Internal stops limit the horizontal motion. The isolator must be “floated” horizontally between the stops by adjusting the leveling screws. Horizontal Position Indicator screws (D) should be approximately centered within holes.

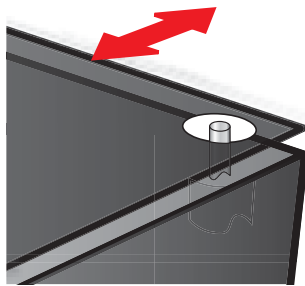
Example: If screws are too far to the left of center, turn right leveling screw clockwise (as viewed from above).

8. IF HORIZONTAL POSITION INDICATOR SCREWS ARE NOT VISIBLE, check positioning by pushing the top plate gently front to back then side to side. If it does not float freely and independently front to back and side to side then adjust accordingly.

E) Vertical Position Indicator



1/2 Hz = 3 cycles in 6 secs.



**HORIZONTAL NATURAL FREQUENCY**

9. The horizontal natural frequency can only be changed by varying the payload weight. 1/2 Hz is achieved when payload is near nominal weight (i.e. 150 lb. for the 150BA-1). Increasing the weight lowers the frequency. Decreasing the weight raises the frequency. Ballast weights can be used for fine adjustments to frequency.

Check the horizontal frequency by pushing horizontally on the edge of top plate to create small horizontal oscillations, then count cycles (one back and forth movement). For example, 3 cycles in 6 seconds is 1/2 Hz. Depending on the damping, the isolator may only cycle 2 or 3 times.

**FLOATING ISOLATOR VERTICALLY**

The isolator comes from the factory adjusted to support the nominal weight, i.e., 100 lb for the 100BA-1, 150 lb for the 150BA-1, etc. Internal stops limit vertical motion. The isolator must be "floated" between the stops.

10. Check Vertical Position Indicator (E). The pin should be approximately centered on the horizon line. Turn Load Adjustment Crank (F) only clockwise when pin is below the line, and only counterclockwise when it is above the line. If the payload weight varies from nominal weight by a few pounds/kilograms it may take many turns (approximately 10 turns per payload pound/kilogram).

**NOTE: To avoid damage never force the Load-Adjustment Crank. If pin cannot be easily centered on line, turn Vertical Stiffness Adjustment Screw slightly counterclockwise and readjust vertical position. Repeat as necessary. This is a very sensitive adjustment. Turn the screw only a few degrees each time.**

**PRELIMINARY ADJUSTMENT OF VERTICAL POSITION**

Configure the payload so that it is at its proper operating weight. If the weight will be varying during operation (e.g., due to variations in specimen weight) configure the payload for a mean or average weight, if possible. The final adjustment of vertical position will be achieved with the auto-adjust system.

**FINAL ADJUSTMENT OF VERTICAL POSITION**

Locate control box cable on the inside right side of the isolator (when facing the unit). Remove cable tie from control box cable and connect to the auto-adjust control box (K). Connect the control box power cable (J).

Turn on the auto-adjust system. The auto-adjust system compensates automatically for approximately +/-7 lb. variation in weight and it maintains the isolator at the optimum vertical position within a narrow dead-band where 1/2 Hz or less is achieved. This optimum position within the dead-band is indicated by a blinking "Status" light on the control box. When the isolator position is too low, as indicated by the green "-" or "--" light, or too high, as indicated by the green "+" or "++" light, the auto-adjust system operates to restore the isolator to its optimum position within the dead-band.

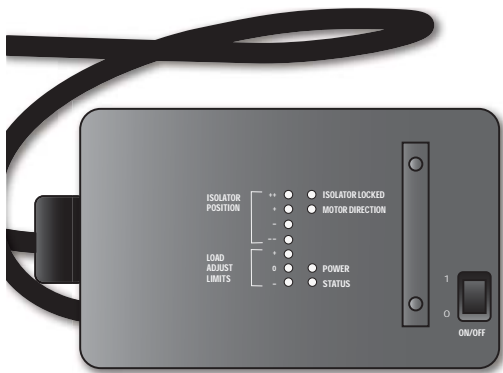
Each time the isolator passes into the dead-band further action is delayed for about 5 seconds to prevent the system from oscillating as a result of the very low stiffness. After the 5 second time delay there might be a small adjustment in the opposite direction to finally reach the optimum position. The blinking status light will turn on to let you know that the auto-adjust has stopped controlling. The auto adjust has a high and a low speed. If the weight mismatch is (cont)

J) Control Box - power cable



K) Control Box - DB25 connector cable





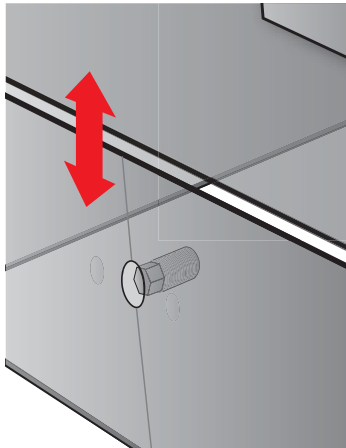
large (greater than one or two lb.), the auto-adjust system will control at high speed as indicated by the green “++” or “--” light on the control box, depending on which direction the box is adjusting. The controller will again run at low speed when the isolator is back in to range, as indicated by a “+” or “-” light. The blinking status light will turn on to let you know that the auto-adjust has stopped controlling. The next section describes the lights to the right of the “Load Adjust Limits” bracket on the control panel.

The green “0” light indicates the auto-adjust controller is at its mid-point and can accommodate approximately +/- 7 lb. change in payload weight. It does not have to be on for the system to operate properly. The controller has reached its maximum ability to adjust when a green “+” or “-” light goes on. If the “+” light is on, remove weight or turn the load adjustment clockwise; if the “-” light is on, add weight or turn the load adjustment counter-clockwise.

If the auto-adjust mid-point position is lost (“0” light off), it can be re-set as follows: with the desired payload weight on the isolator, turn the load adjustment clockwise until “-” light comes on. At that point, turn it counter-clockwise until the “0” light comes on. Many turns may be required. Keep in mind the 5-second delay during these adjustments.

### VERTICAL NATURAL FREQUENCY

1/2 Hz = 3 cycles in 6 secs.



11. Turn off the auto-adjust system and check the vertical frequency by pushing down vertically on top plate to create small vertical oscillations, then count cycles (one up and down movement). 1/2 Hz is equal to one cycle in 2 seconds.

The vertical natural frequency can be changed using the vertical stiffness adjustment screw (G), although this adjustment is seldom necessary. This adjustment requires a 1/2 inch socket wrench. Turning the screw clockwise reduces the natural frequency, counterclockwise increases the frequency. This is a sensitive adjustment. Turn only a few degrees each time then check the vertical position and frequency.

After each adjustment, activate the auto-adjust system by adding or removing weight or displacing it manually and let the system stabilize. Then, turn off the auto-adjust system and check the vertical natural frequency. Excessive clockwise rotation of the stiffness adjustment screw is indicated when the auto-adjust system does not stabilize after it is activated. If this happens, i.e., the system keeps adjusting, turn the stiffness adjustment screw slightly counter-clockwise.

**Note: Run any cables to the instrument with plenty of slack. Do not tie cables together as this will make them stiffer. Stiff and taut cables can stop the isolator from providing vibration isolation.**

Before moving the isolator after it is set up: 1) turn off the auto-adjust system, 2) remove the four screws in the holes at the corners of the top plate, 3) relocate the shipping collars (stored in holes at the rear corners) in these holes, 4) and secure with them with the screws. If the payload is covering these holes, carefully remove it then install the four shipping collars.