

Irwin Vibration Generator – Code L1009KIT

Carefully unpack the product, checking that you remove the small plug from the packaging. On observing the unit you will note that there is a slider labelled Unlock/Lock. Ensure this is set to Unlock before using the unit. Always set to Lock after use. You may need to manually adjust the post height to achieve this.

Connect the unit to a power signal generator using 4mm plugged leads, set the signal generator to sine wave output at about 3-5Hz and turn up the amplitude. You should see that the post rises and falls at the set frequency. If you see nothing, check that the fuse holder is tightened properly and check that the fuse is conducting. Replacement fuse is a 1A quick blow 20mm glass fuse, which is readily available.

Vibration on a string – transverse wave - Push the attachment into the post and fit a thin string into the top, securing with the screw. Run the string over a fixed pulley and hang a 100g mass hanger from it. Now increase the frequency of the sine wave until a vibration is seen on the string. Finely adjust the frequency until you achieve a standing wave. Measure the wavelength using a metre rule and make a note of the frequency. Calculate the velocity of the wave for that particular string tension. Now add a 100g mass to the hanger and repeat. Repeat for additional 100g masses. Please note that you should compare like with like i.e. the same number of nodes on the string. Does the velocity or wavelength change with increasing mass?

Accessories kit

Standing waves on a spring – longitudinal wave - Set a spring vertically between the vibration generator and a retort stand, making sure that the spring is lightly extended. Increase the frequency until you have a single antinode on the spring. Note the frequency and then increase the frequency until the next standing wave occurs. Plot a graph of no. of antinodes against frequency.

Standing waves on a spring – transverse wave - Tread a post into the threaded insert in the base and mount the unit horizontally in a retort stand. Connect the spring to the actuator and anchor the other end to another retort stand, adjusting the tension so that the spring is stretched to about 1.25 times its unstretched length. Slowly increase the frequency starting at about 1Hz until you observe the first standing wave. Note the frequency and then increase the frequency to get the second, third and fourth waves.

Resonant Frequency - Plug the metal strip apparatus into the top of the actuator post. Increase the frequency from 1Hz until one of the strips shows a standing wave. Increase the frequency until another strip show a standing wave. Compare the frequency with the length of the strip.

Electromagnetic Compatibility

The use of this apparatus outside the classroom, laboratory, study area or similar such place invalidates the conformity with the protection requirements of the Electromagnetic Compatibility Directive (89/336/EEC) and could lead to prosecution.