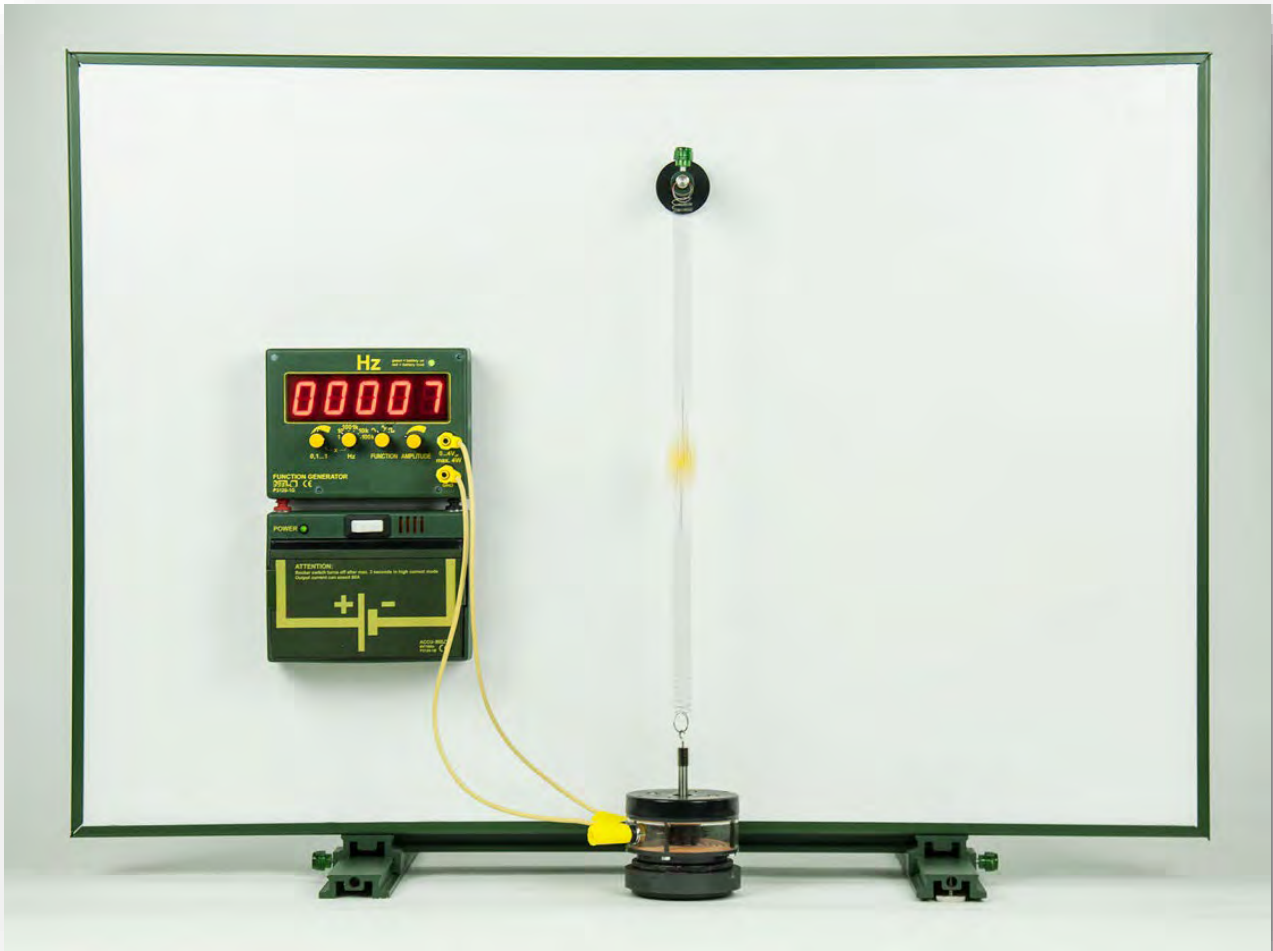


RESONANCE OF A SPRING PENDULUM

SWD 01.10



Material:

Item Code	Qty	Description
DS101-1G	1	Support base, large, L=500 mm
DS600-6G	1	Board holders, pair, magnetic
DS103-1P	1	Panel, green/white, 900x610mm
DW452-2S	1	Vibration generator
DM281-1H	1	Hook with plug
DS110-43	1	Magnetic base, d=43 mm, with tube and pin
P1810-2S	2	Coil spring 10 N/m, D=approx. 16 mm
DM121-2A	1	Weight on hook 10 g, profi
P3120-1B	1	Rechargeable battery, "inno", 6V/10 Ah
P3120-1G	1	Function generator with digital display "inno"
DG507-37	2	Safety connecting lead, 37 cm, yellow

RESONANCE OF A SPRING PENDULUM

SWD 01.10

Goal:

Excitation of oscillations of a spring pendulum or oscillator with two springs - forced oscillations. Resonance at excitation with the (with one) natural frequency

Setup:

The two board holders are mounted in front of the center rail on the foot cheeks of the large support base.

The panel is stapled to the board holders.



The magnetic base with tube is attached to the board approximately in the center.

The vibration generator is placed on the table centrally in front of the plate.

The hook with plug is inserted into the sleeve of the metal cylinder (the cylinder must be locked in place).

A coil spring 10 N is hooked into the bearing bolt of the magnetic base.

The hook weight 10 g is hooked into the coil spring.

The second coil spring 10 N is hooked to the lower hook of the hook weight

The lower end of the coil spring is hooked into the attachment of the vibration generator (hook with plug).

The magnetic base is now moved to a height where both coil springs are slightly stretched.

The "inno" function generator is plugged onto the "inno" battery and both devices are tacked to the mounting plate.



The function generator is connected to the vibration exciter with two connection lines.

The following settings are selected on the function generator:

10 Hz
„Sine ~“

The amplitude is chosen very low.



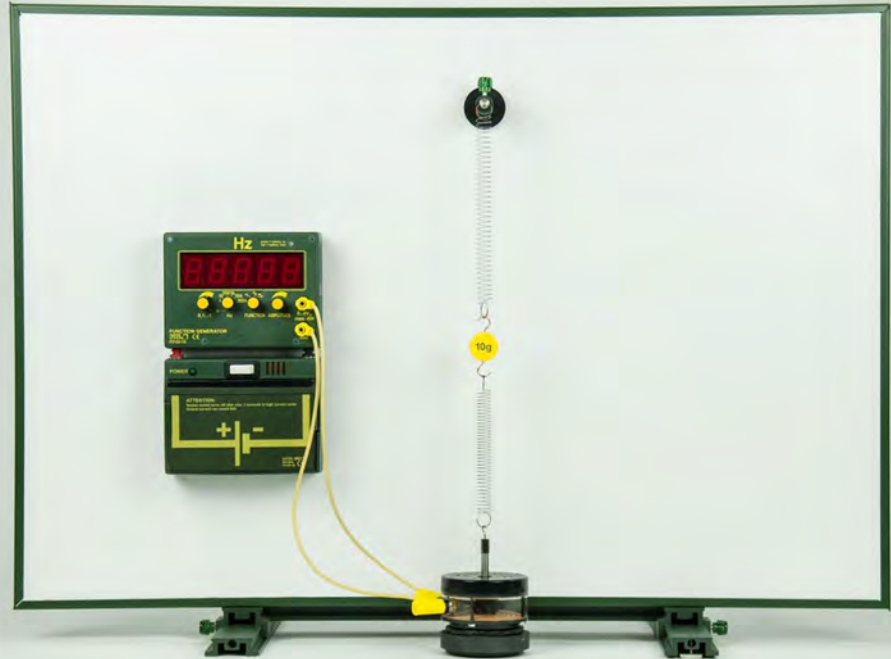
RESONANCE OF A SPRING PENDULUM

SWD 01.10

Experiment:

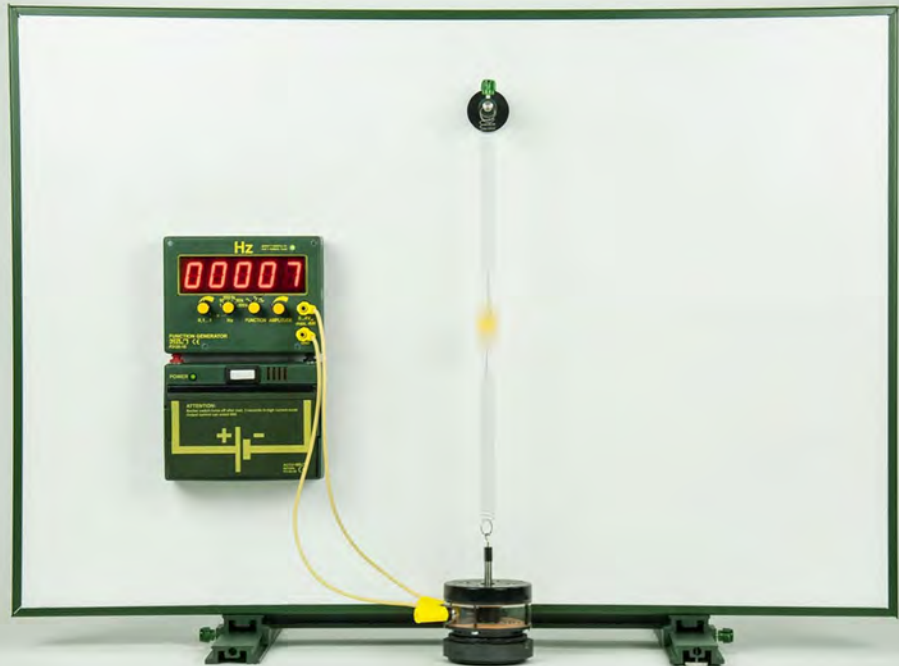
The battery is switched on.

The frequency is turned up with the (left) control for fine adjustment. If necessary, the amplitude can also be adjusted up a bit.



Result:

At an excitation frequency of about 6 - 7 Hz, the hook weight of the "double spring pendulum" should reach the maximum amplitude (up and down movement), thus violent oscillations occur.



Attention:

If the amplitude is too high, it can throw the weight and the coil springs out of the suspensions! In this case, quickly regulate the amplitude back.

RESONANCE OF A SPRING PENDULUM

SWD 01.10



If the excitation frequency is increased further, it is no longer the vibrations of the hook weight that are excited (it moves up and down only a little), but often transverse and longitudinal vibrations of the springs.

Note:

The occurrence of oscillations other than those of the spring pendulum can be perceived as undesirable but also as realistic and as an indication of the many possibilities of oscillations, e.g. molecular oscillations.