RESONANCE TUBE – STANDING WAVE

AKD 04.01

Material:

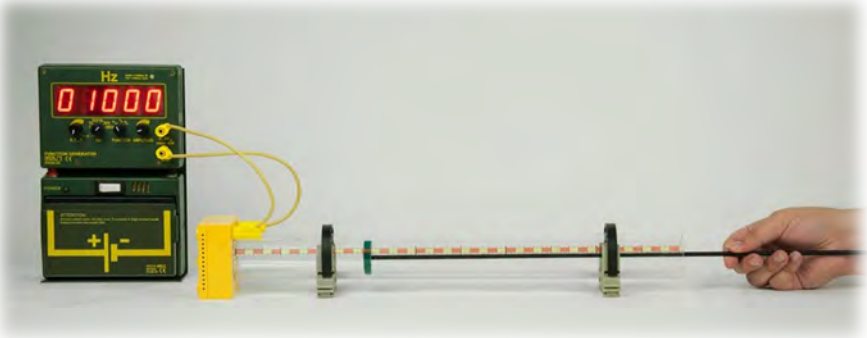
Item Code	Qty	Description
P1350-2K	1	Resonance tube "compact"
P3120-4A	1	L-shaped assembly platform
P1350-2S	1	Piston for resonance tube
P1351-2H	2	Holder for resonance tube, small
MB240-1LS	1	MBC Loudspeaker with nose
P3120-1G	1	Function generator with digital display "inno"
P3120-1B	1	Rechargeable battery, "inno", 6V/10 Ah
	2	Connecting lead

RESONANCE TUBE – STANDING WAVE

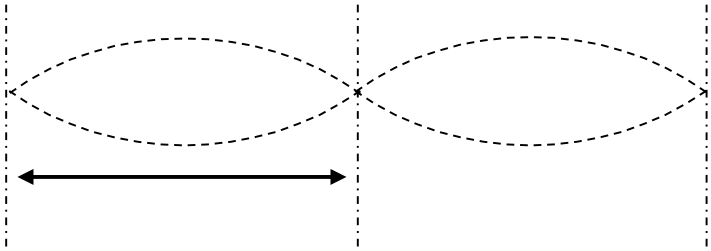
AKD 04.01

Setup:
The holders are pushed onto the resonance tube so that the tube can stand on the table. The loudspeaker is placed at one end of the resonance tube and connected to the function generator, which was plugged together with the battery. The piston is inserted into the resonance tube.

Experiment:
The function generator is switched on. A frequency of 1000 Hz is set on it (see note). The piston is now moved slowly through the tube. Listen carefully to where the sound becomes louder.



Result:
By adjusting the length of the air column with the piston, resonance can be generated in each case. So-called standing waves are created. The scale on the tube can be used to measure half the wavelength λ from minima/maxima to minima/maxima.



Measurement: $\frac{\lambda}{2}$ = 17 cm

From this the speed of sound can be calculated:

$$c = \lambda * f = 2 * 17 * 1000 = 340 m/s$$

Note:
The resonance tube has a length of 50 cm, which means that the frequency must be at least 670 Hz so that a whole oscillation (three minima/two maxima) takes place inside the tube.