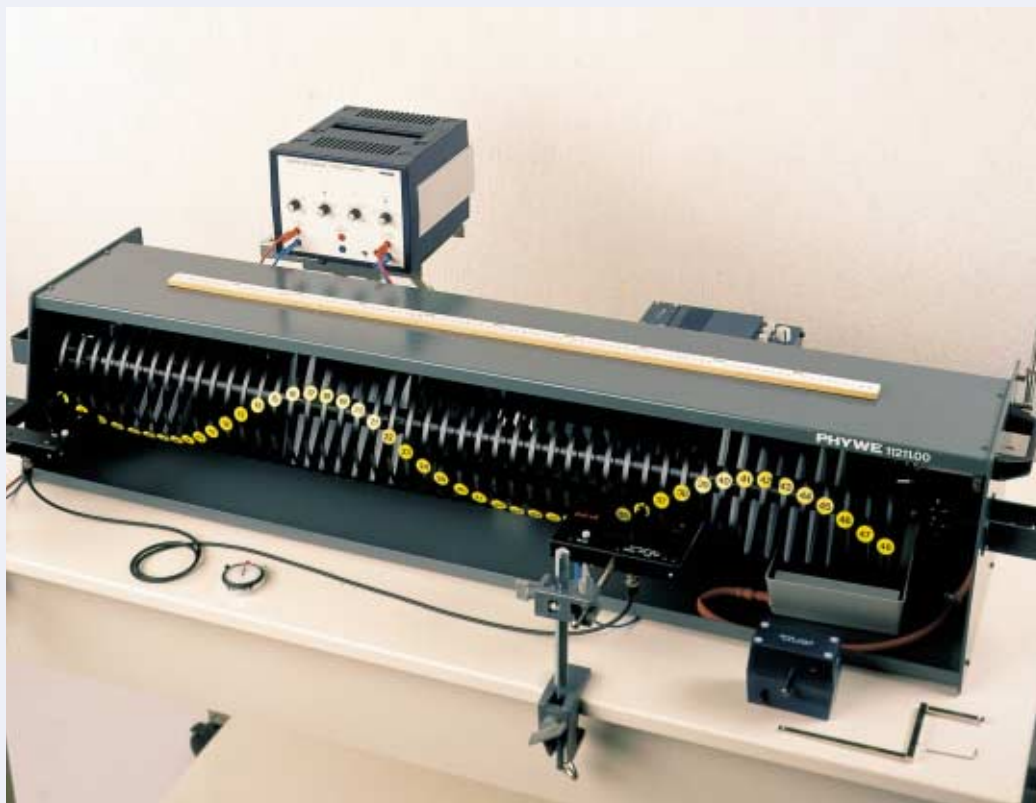


The propagation of a periodically excited continuous transverse wave 1.3.32-00



What you can learn about ...

- Periodic motion
- Frequency
- Wavelength
- Phase velocity
- Standing waves
- Natural frequency
- Free and fixed end
- Damping of waves

Principle:

The periodicity of connected stationary oscillators is demonstrated on the example of a continuous, harmonic transverse wave generated by a wave machine. The number of oscillations carried out by different oscillators within a certain time is determined and the velocity of propagation is measured. A relation between frequency, wavelength and phase velocity is established. The formation of standing waves is demonstrated and studied.

What you need:

Wave machine	11211.00	1
Power supply -2op-, 2×15 V/2 A	13520.93	1
Light barrier with Counter	11207.30	1
Light barrier	11207.20	1
Laboratory motor, 220 V AC	11030.93	1
Gearing 30/1, for 11030.93	11029.00	1
Gearing 100/1, for 11030.93	11027.00	1
Stop watch, interruption type	03076.01	1
Screened cable, BNC, l = 1500 mm	07542.12	1
Bench clamp -PASS-	02010.00	3
Meter scale, demo, l = 1000 mm	03001.00	1
Right angle clamp -PASS-	02040.55	2
Support rod -PASS-, square, l = 400 mm	02026.55	2
Connecting cord, l = 2000 mm, red	07365.01	2
Connecting cord, l = 2000 mm, blue	07365.04	2

Complete Equipment Set, Manual on CD-ROM included
The propagation of a periodically excited continuous transverse wave P2133200

f_k Hz	k	f_k k	λ
0.38	1	0.38	$2L/1$
0.74	2	0.37	$2L/2$
0.94	3	0.31	$2L/3$
1.43	4	0.36	$2L/4$

The resonance frequencies measured with increasing speed of rotation.

Tasks:

1. The frequency of the oscillators 1, 10, 20, 30 and 40 is to be determined with the electronic counter of the light barrier and the stop-watch for a particular frequency of excitation.
2. By means of a path-time measurement the phase velocity of a transverse wave is to be determined.
3. For three different frequencies the corresponding wavelengths are to be measured and it is to be shown that the product of frequency and wavelength is a constant.
4. The four lowest natural frequencies with two ends of the oscillator system fixed are to be detected.
5. The four lowest natural frequencies with one end of the oscillator system fixed and the other one free are to be detected.