

Ultrasonic Michelson-Interferometer 1.5.22-00

NEW

What you can learn about ...

- Longitudinal waves
- Reflection of longitudinal waves
- Superposition of waves
- Interference
- Interferometer

Principle:

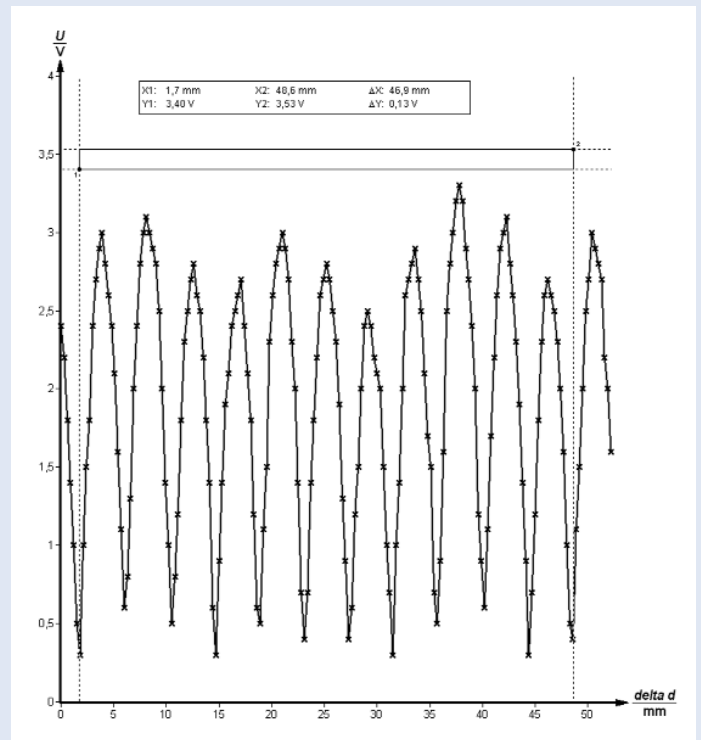
A "semi-permeable" membrane divides an ultrasonic wave into two partial packets which travel at right angles to each other. They are subsequently reflected at different hard metal reflectors, one of which is fixed in position, and the other of which can be displaced in the direction of the beam, before being reunited. Shifting the displaceable reflector changes the path length of the corresponding packet, so that superposition of the reunited partial packets gives maxima and minima of the alternating sound pressure according to the difference in the distance travelled. The wavelength of the ultrasound can be determined from these.



What you need:

Ultrasound operation unit	13900.00	1
Power supply 5 VDC/2.4 A with DC-socket 2.1 mm	13900.99	1
Ultrasonic transmitter	13901.00	1
Ultrasonic receiver on stem	13902.00	1
Multi range meter, analogue	07028.01	1
Optical profile bench, $l = 600$ mm	08283.00	1
Base for optical profile bench, adjustable	08284.00	2
Slide mount for optical profil bench, $h = 80$ mm	08286.02	2
Slide mount for optical profil bench, $h = 30$ mm	08286.01	1
Sliding device, horizontal	08713.00	1
Screen, metal, 300 mm x 300 mm	08062.00	2
Screen, translucent, 250 mm x 250 mm	08064.00	1
Barrel base -PASS-	02006.55	2
Stand tube	02060.00	2
Measuring tape, $l = 2$ m	09936.00	1
Connecting cable, 4 mm plug, 32 A, red, $l = 50$ cm	07361.01	1
Connecting cable, 4 mm plug, 32 A, blue, $l = 50$ cm	07361.04	1

Complete Equipment Set, Manual on CD-ROM included
Ultrasonic Michelson-Interferometer P2152200



Intensity of the alternating sound pressure as a function of the displacement Δd of reflector screen S_{C2} .

Tasks:

1. Determine the intensity of the alternating sound pressure in dependence on the displacement of one of the reflectors.
2. Calculate the wavelength of the ultrasound from the measurement curve.