WAVE DEMONSTRATOR - SINGLE ITEMS

SWD 03.00

Purpose and use of the wave demonstrator

The wave demonstrator is used to demonstrate experiments on the behaviour of mechanical transverse waves and their properties.

The following experiments are described in this manual:

SWD 3.01 Propagation of transverse waves
SWD 3.02 Reflection at the fixed end
SWD 3.03 Reflection at the free end
SWD 3.04 Superposition of waves
SWD 3.05 Parameters of a transverse wave
SWD 3.06 Standing waves when reflected at the fixed end
SWD 3.07 Wavelengths as a function of the oscillation masses

The general setup of the wave demonstrator is based on a modular system:

DW405-1A	Oscillation module 1, with brake
DW405-1E	Wave demonstrator - Module II
DW405-2E	Wave demonstrator - Module III
DW405-2A	Wave demonstrator - Electrical driving unit
DW405-2D	Wave demonstrator - Mechanical damping unit

A few experiments can already be carried out with the Oscillation module 1.

If two oscillation modules are coupled we get a "wave machine" with a length of 80 cm.

The development and observation of the wave phenomena can be perfectly observed with the entire wave machine.

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SWD 03.00

DW405-1A Oscillation module 1 - set

21 double pendulums mounted on a special aluminum profile, each has a length of 21.5 cm. The cylindrical pendulum masses made from aluminum are rotatable mounted in horizontal position at a distance of 1.8 cm and coupled by two spiral springs - through this coupling the waves can be propagated.

Thanks to a built-in brake mechanism the pendulum movements can be stopped immediately, for example to measure the wavelengths.

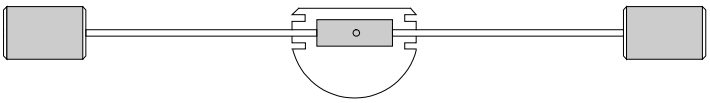
At the end with the long brake spring, the self-aligning bearing or the drive unit can be attached.

At the end with the short brake spring, the following elements can be added:.

- Plate for fixed end
- Pendulum bearings for dampening unit
- Wave demonstrator - Module II or
- Wave demonstrator - Module III

Included in the scope of delivery:

1 x DW405-1A1 Oscillation module 1 with brake
2 x P5312-1A Little base with damping
2 x DW405-3SK Coupling spring 38 cm, for wave demonstrator
1 x DW405-3F Fixed end plate for wave demonstrator
1 x DW405-3P Pendulum bearing for wave demonstrator
1 x P7230-4E Bearing pin
1 x DG205-1G Hook metal, with handle



The drawing shows one of the pendulums with the oscillation masses at the ends and the axis of rotation. The coupling springs with which the individual pendulums are coupled can be attached above or below the pendulum rotation axis.

The coupling springs with a length of 38 cm are used when only one module and the drive unit or the damping unit are required.

When coupling several vibration modules, the 80 cm long coupling l springs are used.

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SWD 03.00

DW405-1E Wave demonstrator - Module II

21 double pendulums mounted on a special 40 cm long aluminum profile, each has a length of 21.5 cm.

Used to extend module I - resulting in a unit with 42 double pendulums

Included in the scope of delivery:

1 x DW405-1E1 Oscillation module 2a with brake
1 x P5310-1S Rail bond SE, universal
2 x DW405-3SL Coupling spring 80 cm, for wave demonstrator

DW405-2E Oscillation module 2b, Set

21 double pendulums mounted on a special 40 cm long aluminum profile, each has a length of 21.5 cm.

Used to extend module I - resulting in a unit with 42 double pendulums

This module differs from module 2a only in the lower pendulum masses, which means that different wave propagation speeds can be achieved.

Included in the scope of delivery:

1 x DW405-1E1 Oscillation module 2b with brake
1 x P5310-1S Rail bond SE, universal
2 x DW405-3SL Coupling spring 80 cm, for wave demonstrator

WAVE DEMONSTRATOR - SINGLE ITEMS

SWD 03.00

DW405-2A Wave demonstrator - Electrical driving unit

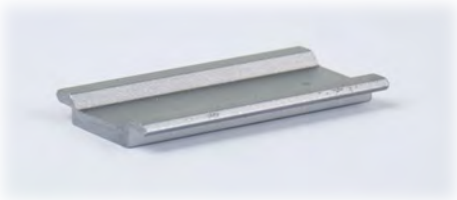
Aluminum case, 14 cm long, mounted on special aluminum profile with two 4-mm safety jacks for an adjustable DC voltage source (0 - 6 V DC / 0.5 A).

A DC motor with an attached cam and exciter plate regulates the speed of the pendulum motion. Increasing or decreasing the amount of DC input voltage likewise affects the pendulum frequency of the exciter plate.

The excitation of waves or pulses can also be done by hand, but for a standing wave for example the constant movement of the electric drive is essential.

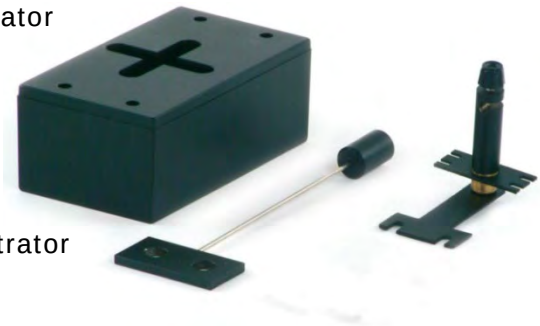
Included in the scope of delivery:

1 x DW405-2A1 Motor drive for wave demonstrator
1 x P5310-1S Rail bond SE, universal



DW405-2D Wave demonstrator - Mechanical damping unit

This unit is mounted at the end of the wave demonstrator and serves to prevent undesired reflection of waves by means of a damping plate submerged in water.



Included in the scope of delivery:

1 x DW405-3P Pendulum bearing for wave demonstrator
1 x DW405-2DP Pendulum for damping unit
1 x DW405-2DW Water trough for damping unit