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Pendulum with recorder connection

02816.00

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Operating instructions

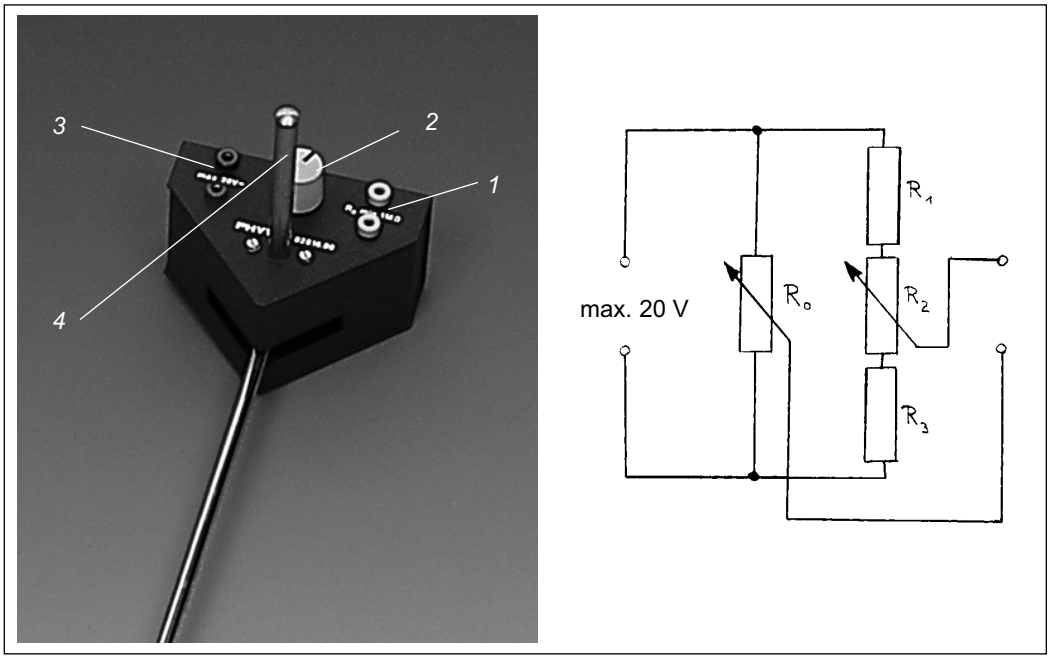

Fig. 1: Pendulum with recorder connection 02816.00.

1 SAFETY PRECAUTIONS

- Carefully read these operating instructions completely before operating this instrument. This is necessary to avoid damage to it, as well as for user-safety.
- Do not start up this instrument in case of visible signs of damage to it.
- Only use the instrument for the purpose for which it was designed.

2 PURPOSE

The pendulum with pen recorder connection is used in conjunction with a pen recorder to investigate the oscillation process of a single pendulum or a system of coupled pendulums.

3 DESCRIPTION

The shaft of the pendulum is permanently connected to the wiper of a low-friction potentiometer R_0. In parallel with this is a second potentiometer R_2, the setting range of which is limited by the resistances R_1 and R_3. A DC voltage of a maximum of 20 V is applied to this arrangement (*3*). The voltage between the two wipers is brought out to a pair of sockets (*1)* and is a measure of the pendulum deflection if the voltage for the pendulum rest position is set to zero on the potentiometer R_2 using control knob (*2)*.
The pendulum is fitted with a 10 mm round stem (*4)* which can be used to hold it in a tripod support.

4 OPERATION

- Secure the pendulum with the holding stem using tripod supporting components.
- For experiments with a number of coupled pendulums do not join the tripods electrically, because the wipers on the pendulum potentiometers are connected to the housing ground; with the usual arrangement of supplying all pendulums from a single power source, this type of undesired electrical connection between the wipers of differ ent potentiometers leads to the joining of the individual output voltages, giving unusable measurement results.
- Join a number of pendulums with insulated coil springs or thread with suspended masses.
- Set the length of the pendulum by rotating the weight; one full turn corresponds to a change in length of 1 mm.
- Set the pendulum in motion: Push it to and fro, contacting the pendulum on the weight. Avoid transverse oscillations.
- Best pendulum deflection: 15 cm.
- To quantitatively investigate the dependence of the oscillation period of a physical pendulum on the amplitude: Deflection up to 90 degrees.

Important:

- Keep a safe distance from the oscillating pendulum.
- Before the experiment, check that the pendulum mass is screwed onto the shaft by at least three turns.
- The connected cables may not be longer than 3 m.

5 TECHNICAL SPECIFICATIONS

Mass of pendulum weight	1 kg
Mass of pendulum shaft	approx. 100 g
Length of pendulum	1 m ± 2 cm
Setting range for oscillation period	1.96 s to 2.04 s
Input resistance	approx. 5 kΩ
Maximum operating voltage	20 V (approx. 4 mA)

6 ASSOCIATED EQUIPMENT

For the power supply:
e.g. Power Supply, universal 13500.93
or other power supplies with a smoothed DC voltage.
Measurement and recording devices:
All voltmeters, *yt* recorders, *xyt* recorders, COMEX System (basic unit with universal module or analogue measurement module)
COBRA System

7 NOTES ON THE GUARANTEE

We guarantee the instrument supplied by us for a period of 24 months within the EU, or for 12 months outside of the EU. Excepted from the guarantee are damages that result from disregarding the Operating Instructions, from improper handling of the instrument or from natural wear.
The manufacturer can only be held responsible for the function and technical safety characteristics of the instrument, when maintenance, repairs and alterations to the instrument are only carried out by the manufacturer or by personnel who have been explicitly authorized by him to do so.

8 WASTE DISPOSAL

The packaging consists predominately of environmentally compatible materials that can be passed on for disposal by the local recycling service.
Please contact your municipal administration for information on the disposal of instruments.