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Operating instructions

Fig. 1: 65976-00 Strobe drum

INHALTSVERZEICHNIS

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1 SAEFTY PRECAUTIONS

Caution!

- Carefully read these operating instructions completely before operating this instrument. This is necessary to avoid damage to it, as well as for user-safety.
- Check that your mains supply voltage corresponds to that given on the type plate fixed to the instrument.
- Install the instrument so that the on/off switch and the mains connecting plug are easily accessible.
- Only use the instrument in dry rooms in which there is no risk of explosion.
- Do not start up this instrument in case of visible signs of damage to it or to the line cord.
- Only use the instrument for the purpose for which it was designed.

2 PURPOSE AND CHARACTERISTICS

The strobe drum (Fig. 1) is used to produce moving stimuli with which the image resolution capacity of the eye is determined. The unit can also be used for testing human response capacity and as a type of centrifuge for investigating the effects of mass acceleration on plants and animals (and thus investigating their static sense organs). The equipment (Fig. 2) consists of a drum 1 (diameter 32 cm, circumference 100 cm, 20 cm high) mounted on a support rod 2 which can be rotated. A pattern 3 is stuck on to the inside of the drum. This is composed of black and white stripes of the same width, and there are 180 stripes per drum revolution, i.e. the experimental animal (roughly in the middle of the drum) sees each

stripe at an angle of 1°. At the base of the drum is a fixed specimen stage 4 of dia. 30 cm to take the subjects. A holder for insects can be attached to rod 5 screwed into the specimen stage near its edge. The equipment also includes a screen 6 with slit for response experiments and a drive belt 7, 115 cm long.

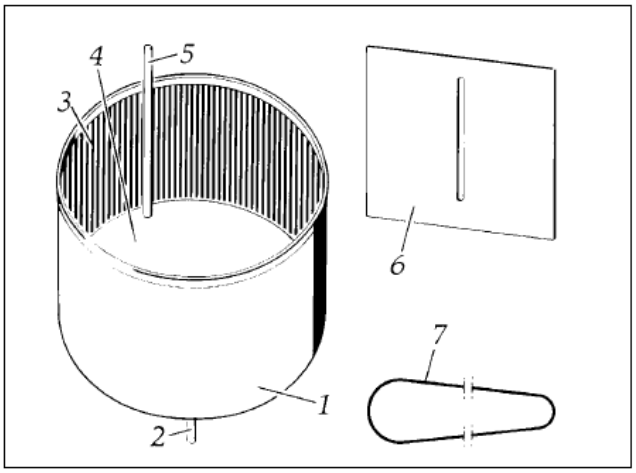

Fig. 2

3 HANDLING

The basic set-up of the strobe drum is shown in Fig. 3; its components are listed in the Equipment List. The strobe drum is driven by a geared motor which is fitted at the side: the drum is placed on a support base and the motor secured to the bench with a bench clamp, support rod and right angle clamp. A support rod with M 10 threated insert is also screwed into the support base (after the screw has been removed), the other end of this rod being secured into another right angle clamp on the motor rod. This arrangement serves to ensure that the distance between the drum and the motor is that at which the drive belt, running between the bottom edge of the drum and the motor pulley, is correctly tensioned. The drum and motor should also be set up in such a way that the belt is horizontal. Varying the power supply to the motor between 0 and 12 V d.c. sets the speed of rotation of the drum between 0 and 150 r.p.m. The exact speed is calculated from the number of revolutions in a given period of time (10 seconds is enough, for example, at fairly high speeds). A tag stuck to the edge of the drum, or a piece of cord which catches the hand every time one revolution is completed, makes counting easier.

4 EXAMPLES OF EXPERIMENTS

The effect of gravity and centrifugal force on plants
P4050200

3.1 Testing human response capacity (Fig. 3)
For this experiment we secure a response test sheet (65976-02) to the outside of the drum and then attach a screen with slit to the support base, using plateholder 02062.00, so the observers view of the drum is obstructed by the screen. The observer should follow the rectangular pattern on the paper on the drum (which is rotating slowly) with a felt pin inserted through the slit. Two different phases are clearly discernible here: the response time (delay) between the stimulus (steps in the rectangular pattern) and the start of the response, and the time taken until the new line has finally been attained. The transient responses occurring in the second phase can be explained with the aid of a control loop diagram.

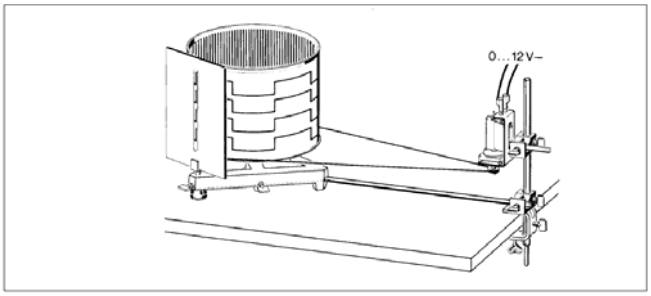

Fig. 3

3.2. The effect of mass acceleration on plants (Fig. 4)
The mains stem of a plant grows vertically upwards from the centre of the earth (negative geotropism), and the main root vertically downwards (positve geotropism). As plants perceive gravitational force and the centrifugal force produced by rotation in the same way (both cause mass acceleration), the position of stems and roots can be influenced by continuously moving the plants in a horizontal orbit. To do this we convert the strobe drum into a centrifuge apparatus by fitting the centrifuge attachment 65976-10 (first remove rod 5 from specimen stage 4). The centrifuge attachment is a disc with eight holes near the edge into which the 50 ml glass beakers (to hold the plants) can be placed. Young sunflower plants make suitable specimens.

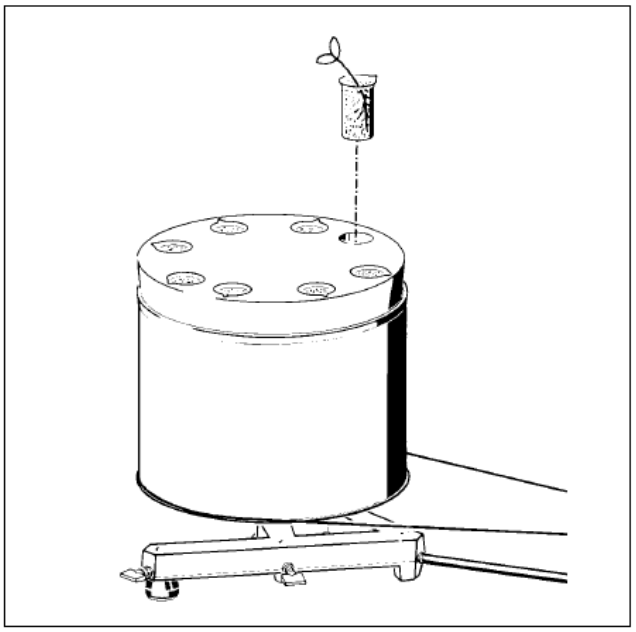

Fig. 4

5 ACCESSORIES

Insertion piece for centrifuge	65976-10
Reaction test sheets, set of 20	65976-02

6 WARRANTY

We give a warranty of 24 months for units that we have supplied inside the EU, and a warranty of 12 months outside the EU. The following is excluded from the warranty: damage that is due to non-compliance with the operating instructions, improper use or natural wear.

The manufacturer can only be held liable for the function and safety-relevant properties of the unit if the maintenance, service and modifications of the unit are performed by the manufacturer or by an institution that is expressly authorised by the manufacturer.

7 WASTE DISPOSAL

The packaging mainly consists of environmentally-friendly materials that should be returned to the local recycling stations.

Do not dispose of this product with normal household waste. If this unit needs to be disposed of, please return it to the address that is stated below for proper disposal.

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