



Temperature Organ

65983.93

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Operating Instructions



The unit complies with the corresponding EC guidelines.

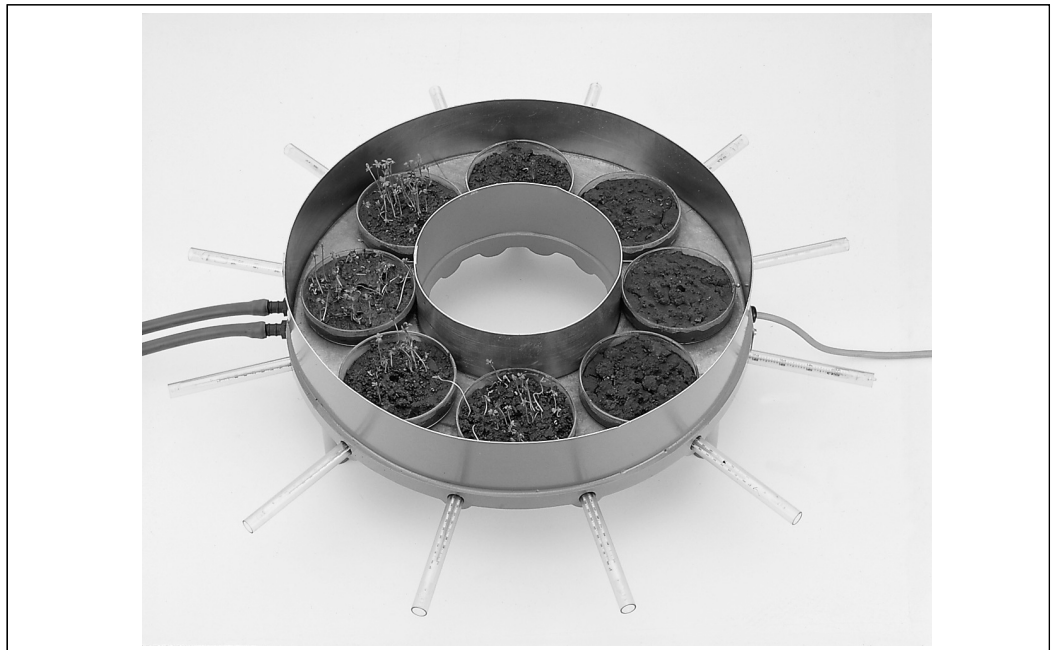


Fig. 1: Temperature organ 65983.93.

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.
- 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 DESCRIPTION

With the temperature organ, biological functions of plants and animals - such as, for example, metabolic activities, germination, growth, development, behaviour - at different temperatures can be observed and investigated. The apparatus is therefore a valuable aid in the experimental acquisition of knowledge on the subjects of metabolism and energy exchange, ecology, physiology of stimuli and the senses and behaviour.

The main constituent of the temperature organ is a ring-shaped, 110 mm wide metal strip in which a temperature gradient between approx. 45°C and 12 - 15°C can be produced by means of a built-in electric heater and through-flow cooling (water pipe). The heating and cooling connections are arranged diametrically opposite to each other; the temperature gradient is therefore symmetrical in the two halves of the strip. On its outer circumference the strip is provided with 12 equally spaced radial holes to insert thermometers.

The strip, which stands on three feet, has annular walls and can be covered with a Plexiglas plate; in this way animals are prevented from escaping from the enclosed annular experimental area.

The cover plate is divided by printed markings into 12 equal, consecutively numbered sectors which serve to fix positions in the experimental area.

The apparatus is made ring-shaped so that experimental animals can pass through the cold region unimpeded and will not, as in the case of a linear organ, suffer from hypothermia at the cold end.

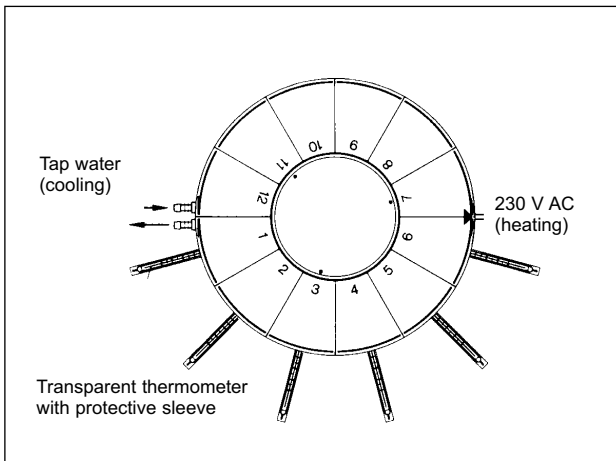


Fig. 2: Temperature organ 65983.00 with cover plate.

3 MANIPULATION

To put the temperature organ into service, the heater lead is connected to the mains (230 V AC) and one of the two cooling unions is connected to the water main; the outflowing cooling water is taken to the drain.

(If it is intended that the temperature should go as low as 0°C, a cooling thermostat is required).

A -10... +50°C thermometer is inserted as far as it will go into each of the 6 holes in one of the two halves of the strip between the heater and cooling connections and safeguarded against damage due to accidental knocks by slipping a transport protective sleeve over it. Because of the symmetry of the temperature distribution the thermometers need to be fitted in only one half of the strip.

The heating and cooling must be left running until the temperature readings remain constant; this is the case after some 30 to 60 minutes, depending on the situation at the start. Then the actual experiment can be begun.

4 EXAMPLES OF EXPERIMENTS

4.1 Determination of the preferred temperatures of insects

Some 20 insects of various kinds, of which there should be 3 of each kind, are marked with coloured dots (e.g. nail varnish) and put into the temperature organ. The cover plate is laid on top so that the heater lead is between sectors 6 and 7. The temperature of each pair of sectors 6/7, 5/8...1/12 is read off on the thermometers and noted.

After an acclimatization time of 30 minutes the positions of the individual creatures are recorded at 5 minute intervals.

After one hour the experiment is discontinued. From the individual test values the average value for each creature is calculated. From the average values of all individuals of one kind their preferred temperature is obtained.

4.2 Effect of the soil temperature on the germination and growth of plants

Five Petri dishes (diameter 100 mm) are filled to the brim with garden soil. The soil in each dish is well moistened with the same amount of tap water. 70 seeds of garden cress (*Lepidium sativum*) are uniformly distributed on each and the dishes are placed uncovered in the temperature organ. The temperature in the region of the individual dishes is monitored daily and the development of the cress plants (breaking open of the seed husk, emergence of root and

shoot, etc.) is recorded each time. The soil is to be kept uniformly moist for all the plants. After 4 - 6 days the experiment is discontinued and the length of the cress plants in the individual Petri dishes is determined. The results of the experiment are best documented by means of a photograph and a graph (abscissae: temperature; ordinates: length of the cress plants).

5 NOTES ON OPERATION

This high-quality instrument fulfills all of the technical requirements that are compiled in current EC guidelines. The characteristics of this product qualify it for the CE mark.

This instrument is only to be put into operation under specialist supervision in a controlled electromagnetic environment in research, educational and training facilities (schools, universities, institutes and laboratories).

6 EXPERIMENT LITERATURE

Laboratory Experiments Physiology 00151.72

7 TECHNICAL DATA

Outside diameter	400 mm
Annular strip	Width 110 mm
Thermometer holes	d = 12.5 mm
Cooling unions	for tubing, d = 8 mm
Mains supply voltage	230 V AC
Power consumption	60 VA
Weight	approx. 6 kg

8 LIST OF APARATUS

Temperature organ	65983.93
Chemical thermometer -10... +50°C	(6x) 38055.00
Rubber tubing, $d_i = 8$ mm	(2x) 39283.00

9 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. This guarantee does not cover natural wear nor damage resulting from improper handling.

The manufacturer can only be held responsible for the function and technical safety characteristics of the instrument, when maintenance, repairs and changes to the instrument are only carried out by the manufacturer or by personnel who have been explicitly authorized by him to do so.

10 WASTE DISPOSAL

The packaging consists predominately of environmentally compatible materials that can be passed on for disposal by the local recycling service.



Should you no longer require this product, do not dispose of it with the household refuse. Please return it to the address below for proper waste disposal.

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