

Portable measuring system

TP 62

for the determination of the temperature profile in compost materials

Composting

In the light of an increasing environmental consciousness and constantly decreasing landfill space, the composting of organic waste is becoming more and more important. As a result, the composting of green and bio-waste is carried out in almost all districts.

A pre-condition for the production of high-quality finished compost are optimal conditions for composting. Here, particular attention must be paid to the factors of oxygen content and **the temperature in the pile**.

In the aerobic process of decomposition, organic waste is converted by bacteria and fungi and the addition of oxygen into carbon dioxide and steam. Because this is an exothermic process, additional energy in form of heat is set free. Here, temperatures of more than 70°C can occur. When these temperatures can be maintained over a certain period of time, pathogens and seeds capable of germinating can be effectively killed and the **hygenisation** of the compost material is guaranteed. On the other hand, temperatures, that go beyond this value can lead to an overheating of the compost and would be a disadvantage for the process of degradation.

Too high temperatures thus decrease the degradation of organic substances and cause additionally an increased development of odour.

The composting factor of temperature can be controlled and supervised by the in the following described portable measuring system, that is independent of mains voltage. With it at the same time 6 measured values for temperature and thus the **temperature profile** of the pile can be determined. It is possible to find, for example, weak points in the run of the temperatures and to optimise the composting system by the application of equipment for measuring and control. In addition to the temperature profile, **the temperature point of 55°C is displayed in ... cm measuring depth**, which is relevant for the assessment of the hygenisation, according to the temperature protocol of the Federal Quality Community for Compost.



data storage
and
PC-interface

measurement of the temperature profile

The measurement of the temperature profile in the pile is carried out by a special pricking probe, which is made of corrosion-free high-grade steel. The pricking probe supplies six measured values, that are distributed over the whole length of the probe and that are transferred via a high quality special cable and a water-proof plug connection to the hand measuring device. Thus, a maximum in the functioning safety is guaranteed even when the system is in operation outdoors in extreme conditions. Because of its robust structure, the probe can also remain in the compost material.

The structure of the measuring device

The measuring device has a splash-proof, robust plastics cabinet with a high chemical resistance and the protection IP 65 (when the plug connection is closed). The operation of the device is carried out via a foil keyboard. The measured values are displayed on a clearly arranged LC-display. Additionally to the plug connection for the temperature profile probe, the device is equipped with a RS-232-interface for the data transfer to an external PC. When it is necessary to replace the battery, this is signalled in good time by the LC-display.

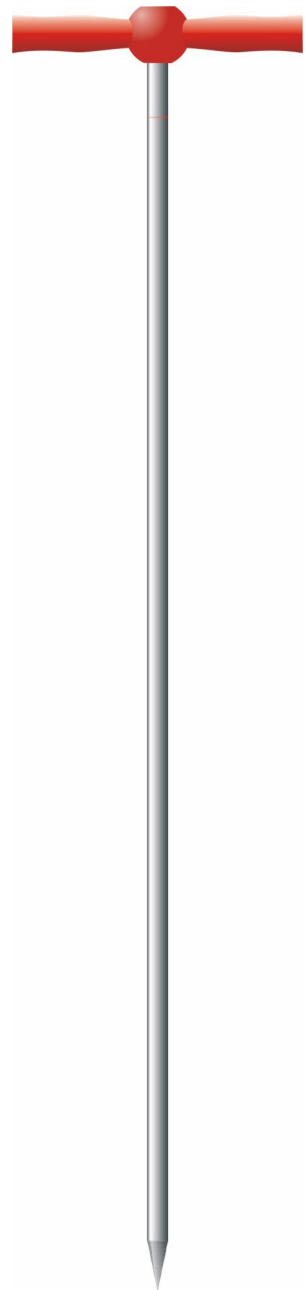
Additionally to the display of the measured values, the measured values can be stored in the measuring device. **One single measuring device can receive and store the data of up to 100 probes.**

Technical data:

Measuring device:

display of measured values:	6 measured values for temperature, 55°C-mark
processing of measured values:	10-bit-A/D-transformer
measuring range:	0...99°C
measuring error:	1 K ± 1 digit
functions of the device:	economic mode for energy (device switches off automatically when there is no keystroke after about 9 minutes) storage of up to 100 groups of measured values software for the adoption of the stored data in the PC RS-232-interface for the adoption of data Control and display of the battery voltage
display:	LCD, 2 lines a 16 characters, height of the characters about 7 mm
power supply:	9 Volt block (6LF22) / 500 mA
operation elements:	3 keys in front foil
operation hours of the battery:	about 100 h
range of the ambient temp.:	-10...50°C
dimensions:	210 mm x 95 mm x 40 mm (l x b x h)
weight:	about 0,25 kg (incl. battery)

<u>temperature profile probe:</u>	material high-grade steel WS 1.4571 (DIN 17440), diameter about 17 mm, length 1,2 m, weight about 2 kg, length of the connection cable: 9 m
operation temperature:	max. 100°C
adjustment time t_{90} :	about 10 min



edition 11/03. We reserve the right to alterations for the purposes of technical progress.