

- **Easy to handle**  
– one button!
- **Short measuring time**  
– about 10 minutes
- **Battery powered**
- **Compensates for different air permeability of the soil**

The Markus 10 is a portable, battery-powered instrument for determining the radon content in the soil. It is designed to be as simple as possible to operate.

In the initial measuring phase, air from the soil is pumped up through a sounding tube into a measuring cell. The pumping time (about 30 sec) has been chosen to ensure that all fresh air in the system is pumped out.

A pressure sensor stops the pump if the pressure in the tube drops below a given value. When the pressure rises, the pump starts again. The pump's effective running time is always the same, which guarantees a certain minimum volume of air to be measured. The uninterrupted pumping time is about 30 seconds.

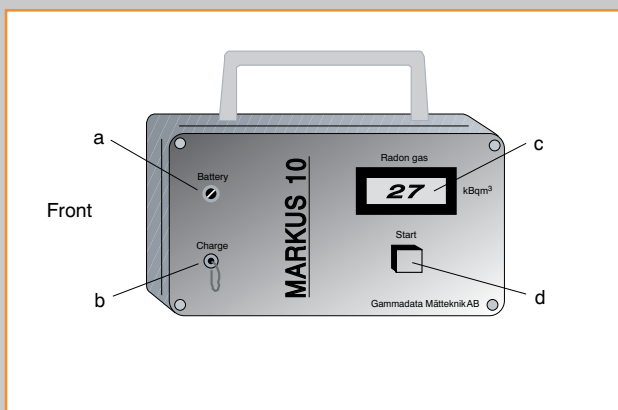
After the pumping phase the measuring phase begins. The detector is activated and the voltage to the measuring chamber is switched on. The charged radon daughters, formed by the decaying radon gas, are driven towards the detector by an electric field in the chamber. The detector registers the alpha radiation originating from the radon daughters.



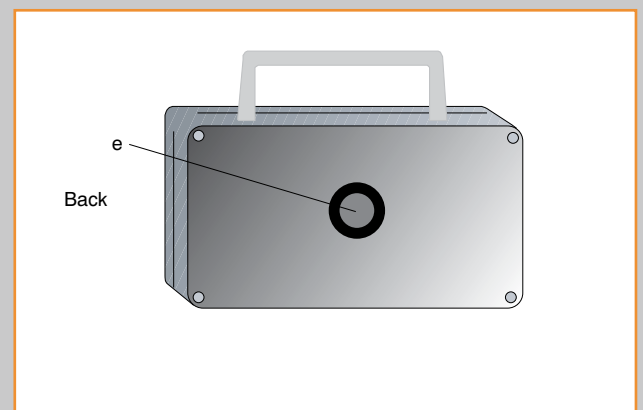
The detector pulses are amplified and filtered in a single channel analyser that only accepts pulses from the short-lived radon daughter polonium 218 (with a half-life of about 3 minutes). This eliminates the slow variations in the background from polonium 214.

The pulses are counted and the result is shown in plain text on the instrument's display (kBq/m<sup>3</sup> radon-gas activity).

The display flashes during the measuring phase, and becomes steady when the measurement is completed. As the instrument only counts pulses from the short-lived nuclide polonium 218, a new measurement can be started after just 18 minutes. In that time, activity from the previous measurement will have decayed sufficiently.



- Battery indicator
- Connection for battery charger
- Display
- Start button



- Connection for watersealed and sounding tube

# MEASUREMENTS OF RADON IN SOIL

## MARKUS 10

### TECHNICAL SPECIFICATION

**Pump capacity**

1.8 lit/min

**Effective pumping time**

30 sec.

**Lower pressure limit**

0.95 Atm.

**Type of detector**

Ortec Ultra Silicon detector.

**Active area of detector**

100 mm<sup>2</sup>.

**Window thickness**

200 µm.

**Energy resolution of detector**

< 16 keV (in vacuum).

**Battery capacity**

About 70 measurements.

**Recharging time**

8 hours.

**Accuracy of measurement**

About 10 % at 50 kBq/m<sup>3</sup>  
(1350 pCi/l).

**Measurement time**

Typically 10 minutes.

**Measurement range**

1 – 9999 kBq/m<sup>3</sup>

**Option**

Detection limit of 0.1 kBq/m<sup>3</sup>  
can be offered on request.

**Dimensions (L x H x D)**

220 x 122 x 80 mm.  
(8.7 x 4.8 x 3.1 inches)

**Vikt**

Weight 3 kg  
(6.6 lbs)

### Working principle

