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RaMonA is a radon gas accumulation level detection instrument designed for safe and comfortable use.

description

Radon detection method: **alpha particle spectrometry**.
RaMonA is compact, simple and safe to grip, with a weight of about 1.6 kg.
Suitable for domestic and industrial environments. Indoor/outdoor use.

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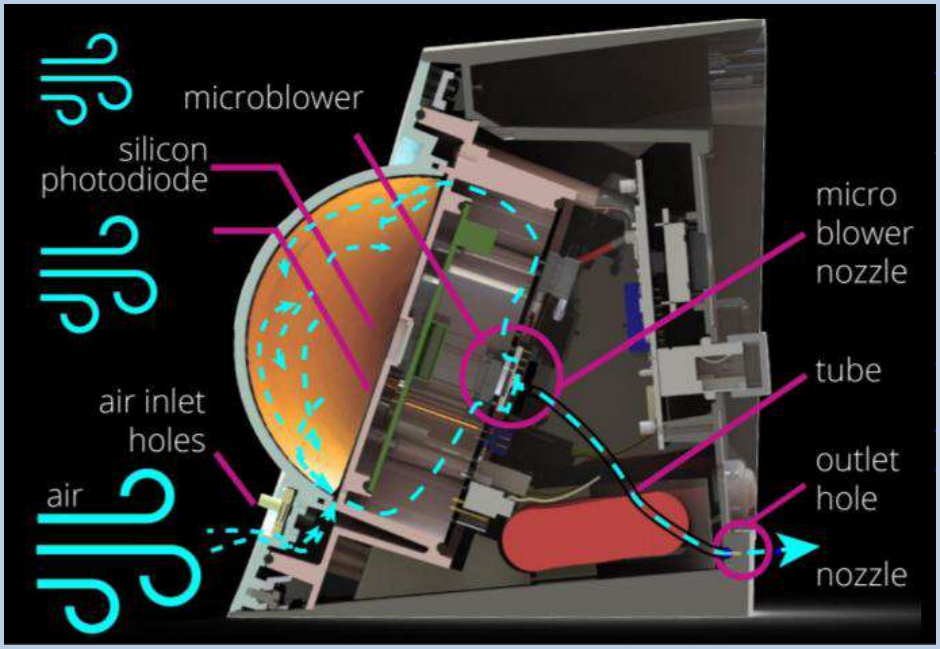
radon monitoring and acquisition

ingresso flusso d'aria



The amount of radon entering a measuring chamber, either by diffusion or transported by an air stream, is monitored by detecting the alpha particles emitted by the radioisotope's descendants. This detection technique is the only one that allows the independent observation also of the 220 isotope of radon, called thoron.

A silicon detector allows observation of the energy spectra of 218Po and 214Po (radon descendants) and 216Po, 212Bi, and 212Po (thoron descendants).

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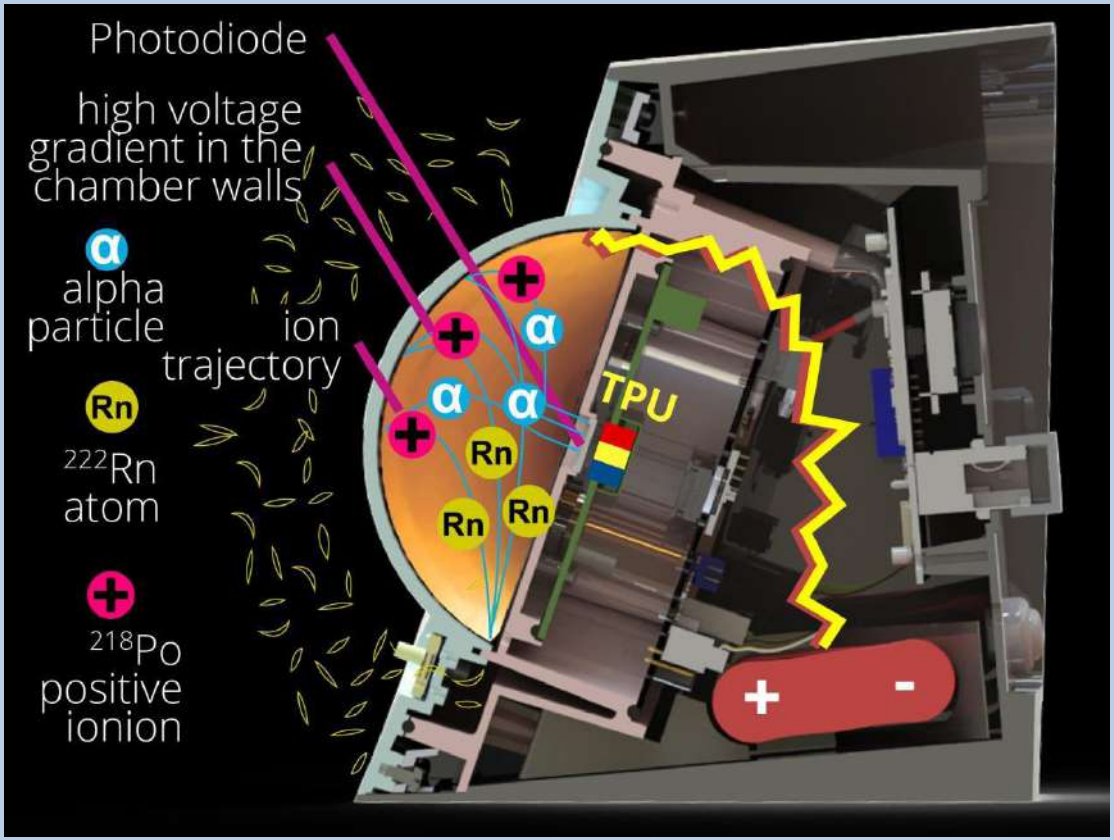
A voltage gradient between the chamber walls and the silicon detector mounted at its center causes the ionized fraction of 218Po and 216Po atoms to reach the detector before decaying.



Due to their mobility, most ions decay on the detector.

The number of possible recombinations depends on air pressure, humidity and temperature.

Measuring these parameters within the cell allows the response of the device to be normalized to standard values.

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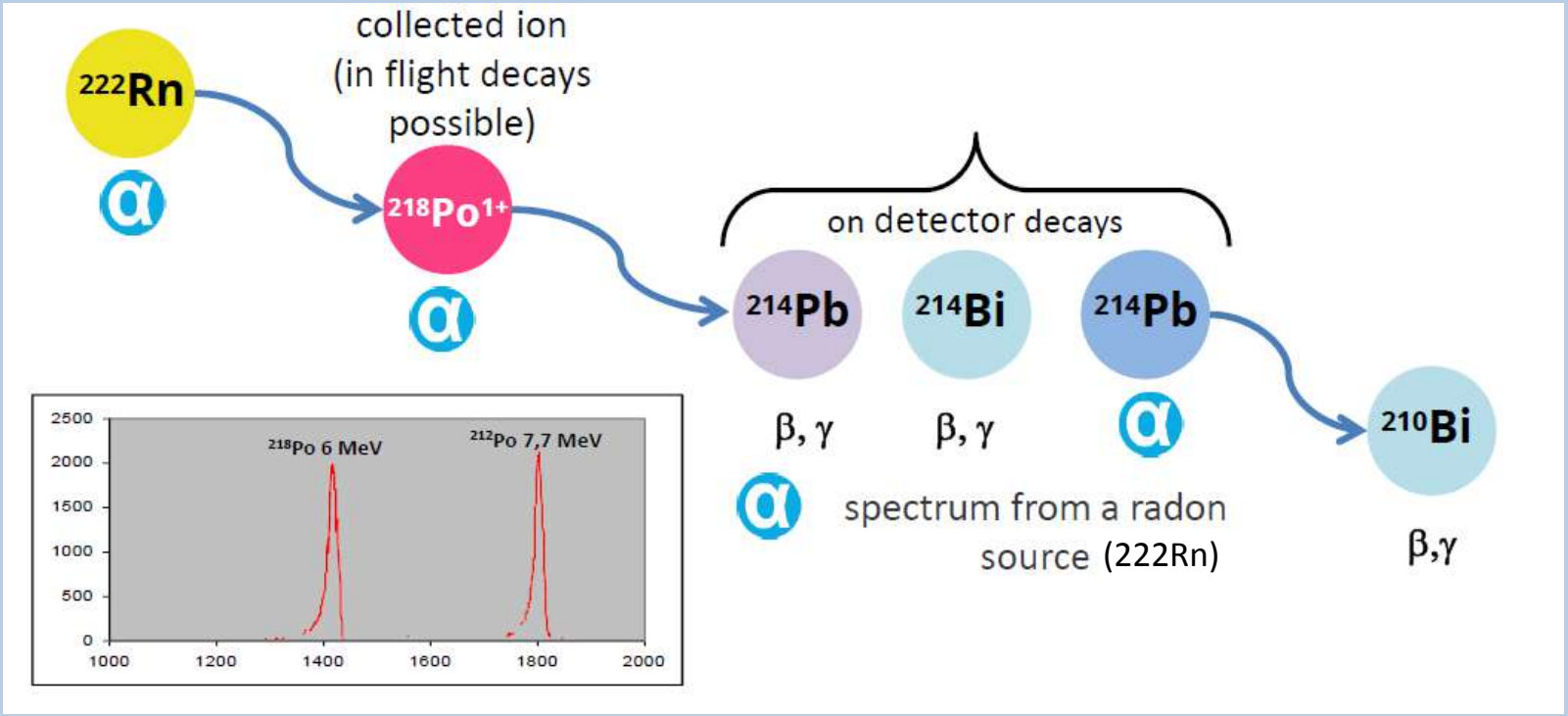
alpha spectroscopy

ion collected (possible in-flight decays)



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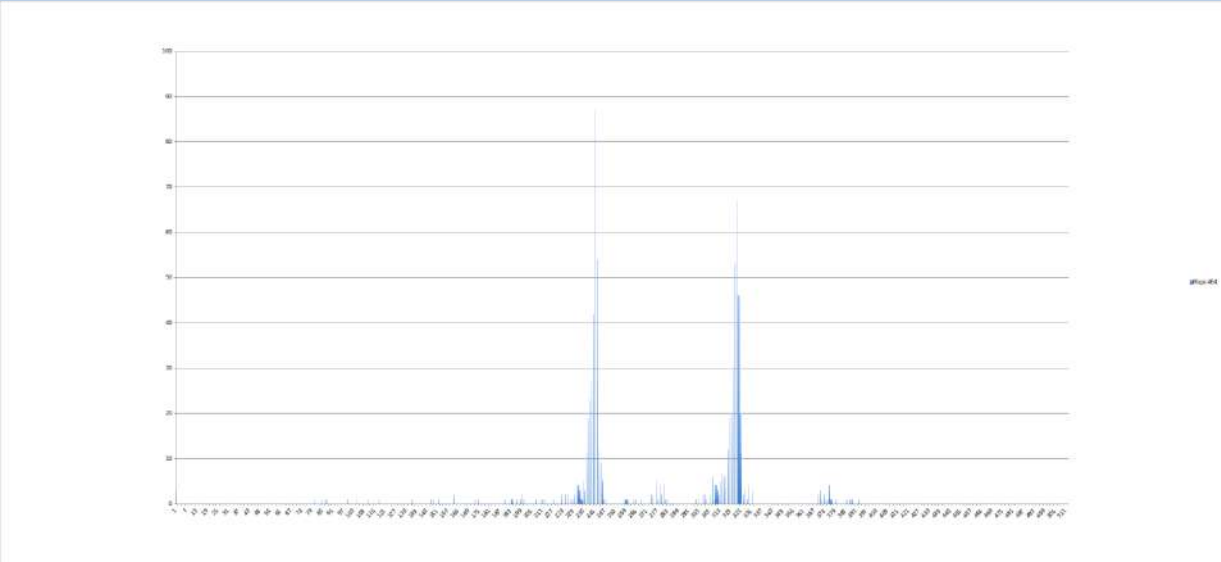
alpha spectroscopy

Features:
Energy calibration, scale change setting and display of ROIs (the entire spectrum and ROIs are stored during cycles), peak area and position determination.



Spectrum collected by RaMonA by drawing air from the ground. The 222Rn and 220Rn α- lines can be observed. The main peculiarity of the system is the possibility to separate, thanks to α-spectroscopy, the two most abundant isotopes of radon. The energy resolution is 20 keV

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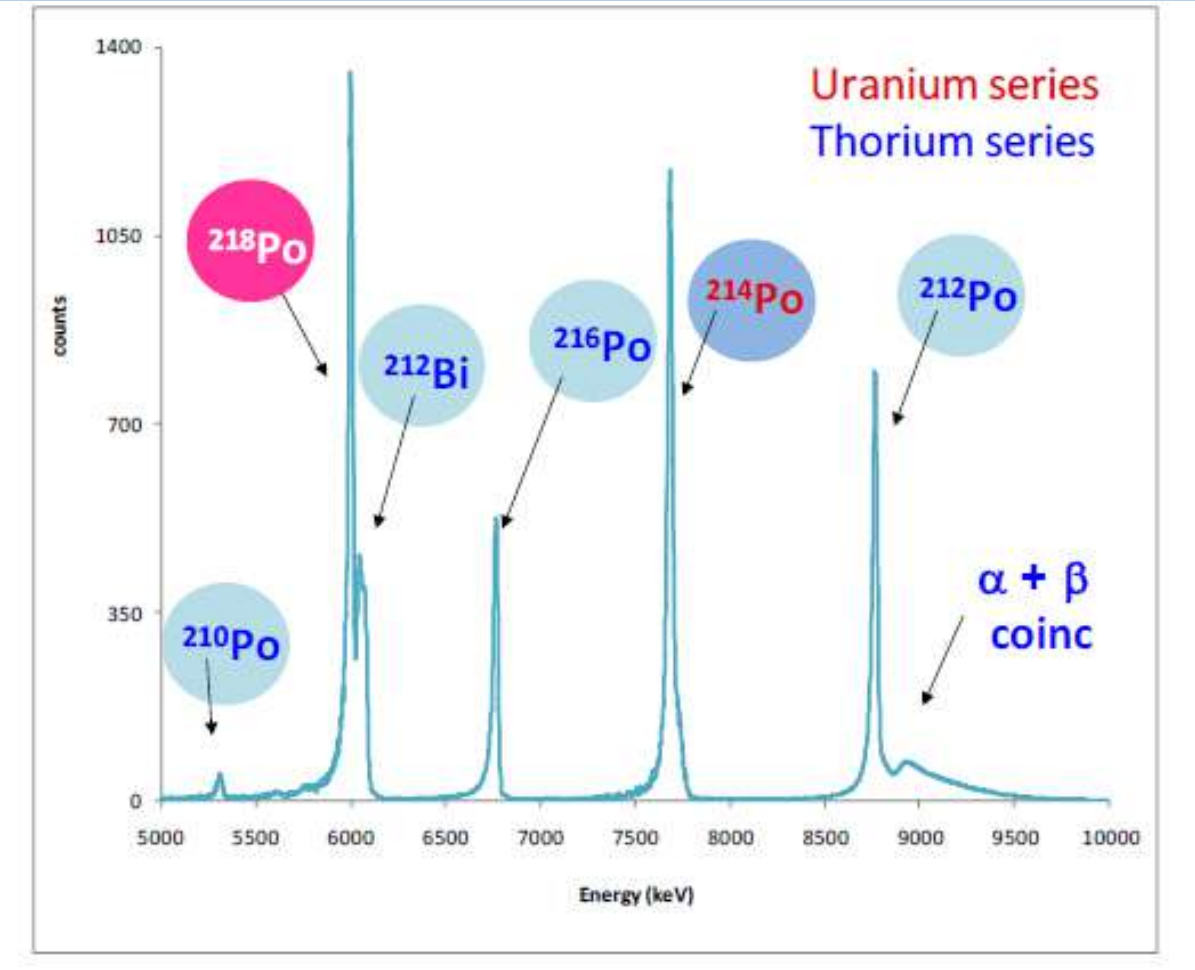
alpha spectrum of radon and thoron descendants in an air stream from the soil



All operations typical of spectroscopic observation techniques are permitted

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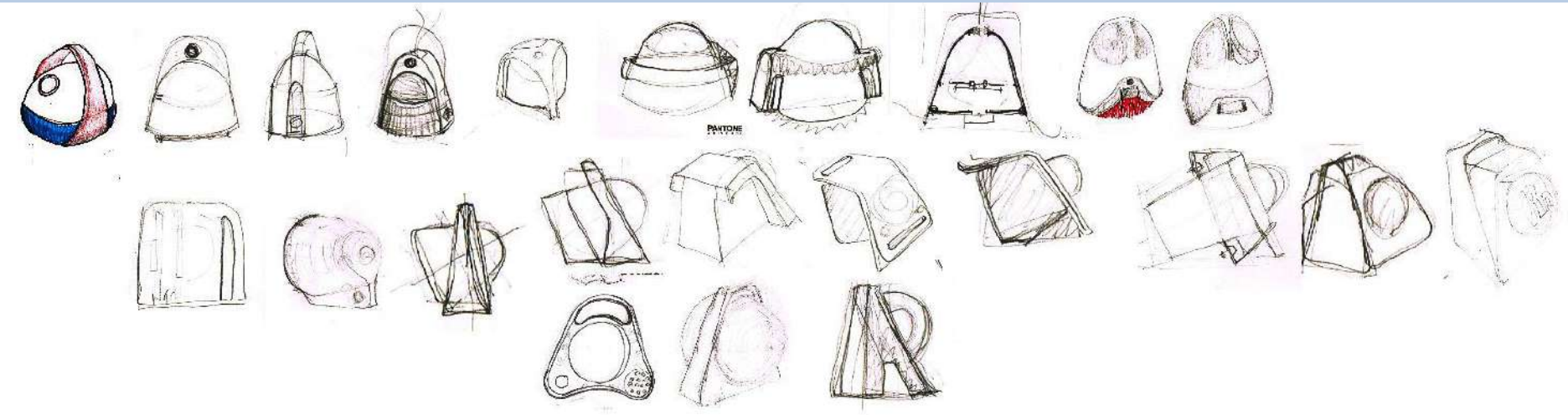
from concept to engineering



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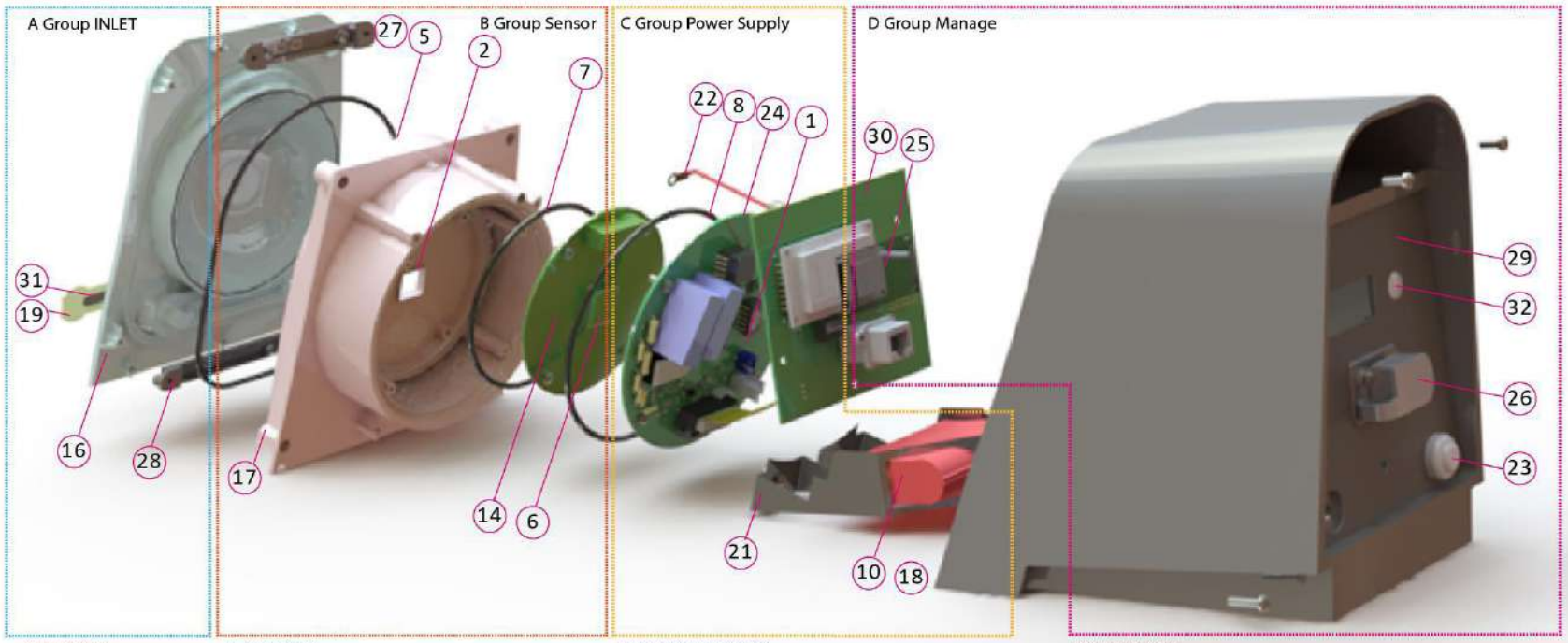

3.Tyvek filter
4. magnet
16. Outer half-sphere
19. air inlet flap
28. bottom fixing
31. cover

2. Photodiode
5. o'ring
6. sheet metal cap
7. o'ring
14. SENSOR Board
17. Inner chamber
27. Upper fixing

1. microblower MURATA
8. power supply board - O'ring
10. Rechargeable Lithium Battery Pack
18. Outer Case
21. battery fixed sheet metal
22. welding cable eye - high voltage
24. POWER SUPPLY Board

23. power switch
25. display glass
26. power connector socket
29. adhesive mask of the management panel
30. MICROPROCCESOR Board
32 Selector

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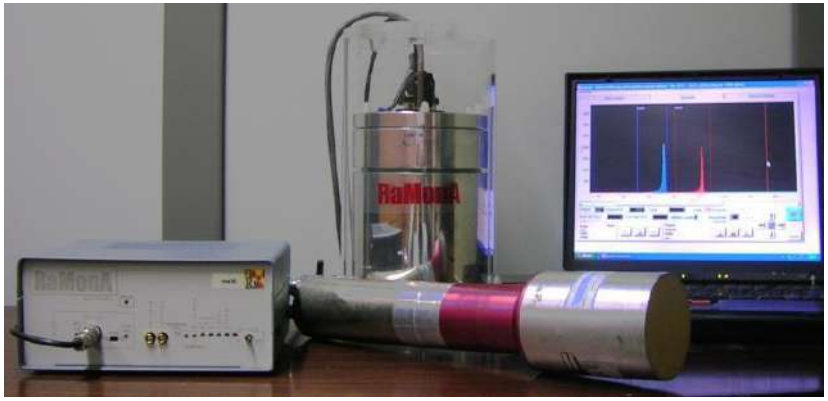
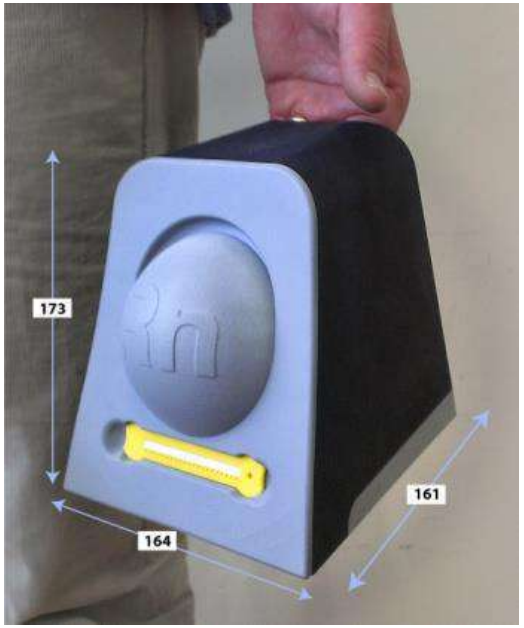
intellectual property



Italian Patent
Patent PD2008A000204
Method and apparatus for the detection of the fraction of remote origin of radon present in a measurement site
Inventors: Vincenzo Roca , Carlo Sabbarese, Mariagabriella Pugliese
Owner: National Institute Of Nuclear Physics
License: License agreement signed on February 6, 2013 with INFN

Italian design registration
Model 0000103543
Device for radon detection
Designer: Glenda Torres Guizado
Applicant: Promete srl



Dimensions
164 x 161 x 173 mm
Weight
1.6 Kg
Volume
0,7 lt

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comparison with other active radon detectors

Alpha spectrometry using an electrostatic collection chamber allows separation of the radon isotopes thus providing high accuracy in measuring the concentration of both isotopes.

Other systems using alpha spectrometry for radon monitoring make use of a ionization chamber with “air sampled”, something that does not provide the same measurement accuracy of an electrostatic collection chamber.

The system provides an specific software to manage a network of stations for continuous monitoring of Radon levels.

No others active Radon measurement tool is arranged for the creation of a monitoring network.

The independent observation of 218Po alpha line allows to follow the radon detection with a delay of less than 30 minutes.

Other systems declaring similar capability use non direct observation techniques, but only approximated numerical methods .

Internal and external measurement of environmental parameters (T, P, H). These data are needed for normalization of results to standard conditions.

Only the spectroscopic technique allows complete separation between the two most abundant radon isotopes.

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Potential target

any situation where the continuous monitoring of radon is necessary

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Project co-financed by the European Union, the Italian State and the Campania Region, under the POR Campania FESR 2014-2020. POR CAMPANIA FESR 2014 - Axis III - Thematic Objective 3 - Specific Objective 3.4 Action 3.4.2 "Incentives for the purchase of internationalization support **services for SMEs**".

Promete Srl (INFM-CNR) spin-off company of the National Institute for the Physics of Matter
Piazzale Tecchio 45 80125 **Napoli** Tel: +39 081 056850 Tel: +39 081 056851 Fax: +39 081 056851 www.promete.it