

HORIBA
Process & Environmental

**DESIGNED
with
plant-based
plastic material**

Helping to reduce petroleum
consumption

**EASY
MEASUREMENT**
— by Anyone,
Anytime,
Anywhere



**MEASURING
the presence
of environmental
radiation
around
us**

Environmental Radiation Monitor
PA-1000 Radi

The HORIBA Radi:

Able to measure the environmental
radiation (gamma rays) in our daily lives
starting from **0.001 μ Sv/h**



Every day, wherever we go, we are exposed to minute amounts of environmental radiation.* This environmental radiation is emitted continuously, day and night, from various objects and substances in the natural world and our living environment. Most environmental radiation consists of three types: alpha rays (α), beta rays (β) and gamma rays (γ). HORIBA's handy PA-1000 "Radi" environmental radiation monitor makes it easy for non-specialists to measure even minute levels of gamma rays.

* Environmental radiation, also known as natural radiation, includes radiation emitted from space, soil, stones, the ground and the air, as well as from manmade objects such as concrete and buildings

High performance detection with a CsI (TI) scintillator

The Radi can measure radiation levels ranging from normal natural radiation to levels 100 to 200 times that intensity. Even non-specialists will find it easy to accurately measure radiation of 0.001 - 9.999 $\mu\text{Sv/h}$.

Types of radiation

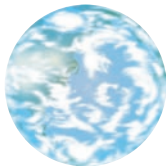
- **Alpha rays (α):** Alpha rays are streams of positively charged particles made up of two neutrons and two protons (helium nucleus). In the natural world, alpha rays are given off by radium 226. In air, the particles cannot travel more than a few centimeters.
- **Beta rays (β):** Beta rays are streams of electrons. In air, the particles can travel several dozen centimeters in a zigzag pattern.
- **Gamma rays (γ):** Gamma rays, the most penetrating type of radiation, are electromagnetic waves. They can pass through the human body. X-rays that are used in X-ray machines are also electromagnetic waves.

Radiation units

- **Becquerel (Bq):** The becquerel (Bq) is the unit of radioactivity. The radioactivity of a substance measured in becquerels is the number of its nuclei that decay each second.
- **Gray (Gy) and Sievert (Sv):** These units express the effect of radiation. The gray expresses the amount of radioactive energy received, while the sievert expresses the effect on a human being. Normally the gray and the sievert are used to express quantities per hour; the units are Gy/h and Sv/h, respectively.

The International Commission on Radiological Protection (ICRP) has recommended exposure to the general public of no more than 1 mSv per year to manmade radiation (not including natural radiation). This does not include exposure from medical checkups (such as X-rays).
 (1 mSv = 1000 μSv)

HORIBA continues contributing to the preservation of the global environment through analysis and measuring technology.



Radiation measurement is displayed in large LCD display.

Unit: microsieverts per hour ($\mu\text{Sv/h}$)

Sievert (Sv): a radiation unit used to quantify the effect of radiation on the human body.

Starts measurement.

Automatic power off function after 3 hours.

- **Splash-resistant construction (JIS water resistance protection grade IPX4)** The Radi can be used with confidence even if there are water droplets on the surface.
- **Handy unit is both compact and lightweight.**
- **Uses two AA batteries.** Battery life 50 hours or more (when manganese dry cell batteries are used)

[Selectable] Audible beep when radiation is detected.

Specifications

Detection method	Scintillation
Type of radiation measured	Gamma rays (γ)
Sensitivity	Min. 1000 counts per minute (1000 cpm) for 1 $\mu\text{Sv/h}$
Relative error of indication	$\pm 10\%$
Indicator value variation	Max. 0.1 coefficient of variation
Energy range	More than 150 keV
Energy properties	0.5 - 3* (150 keV - 1250 keV)
Effective measurement range and display	0.001 - 9.999 $\mu\text{Sv/h}$ 4-digit digital display (count value converted into $\mu\text{Sv/h}$)
Sampling time	60 seconds
Display interval	60-second integrated value (moving average) displayed every 10 seconds
External dimensions	68 (W) \times 28 (D) \times 121 (H) mm [Inch size : 2.7 (W) \times 1.1 (D) \times 4.8 (H)]
Weight (without batteries)	Max. 175 g (6.2 oz)
Accessories	Instruction manual, two AA dry cell batteries, neck strap

* Relative sensitivity with 1 as the sensitivity to cesium 137 (^{137}Cs) (662 keV).

Note: This unit is designed only to measure the quantity of radiation at the measurement location. It does not determine the safety or danger posed by that quantity of radiation.