

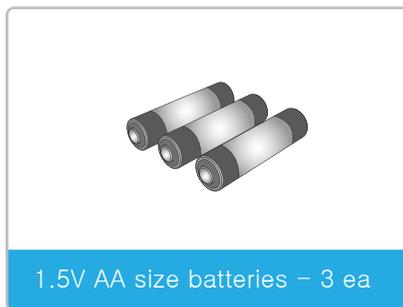
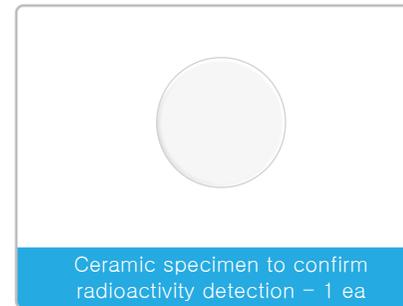
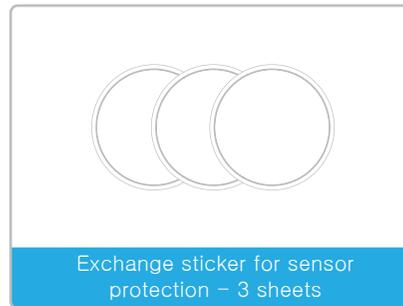
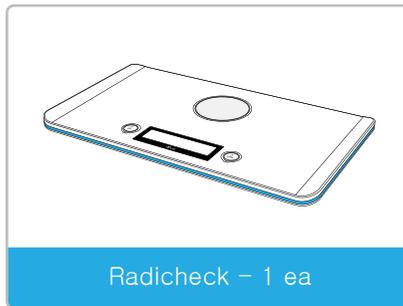
 English Manual

01 Cautions

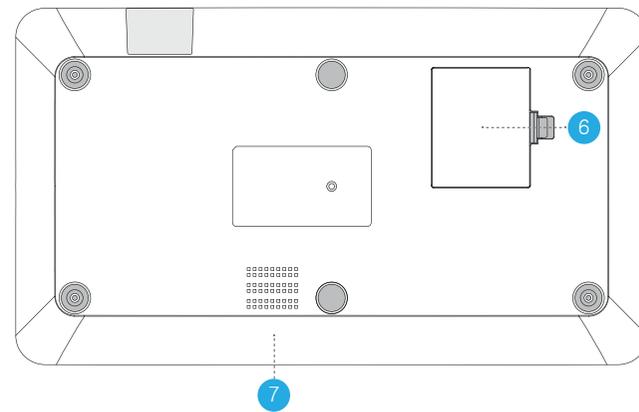
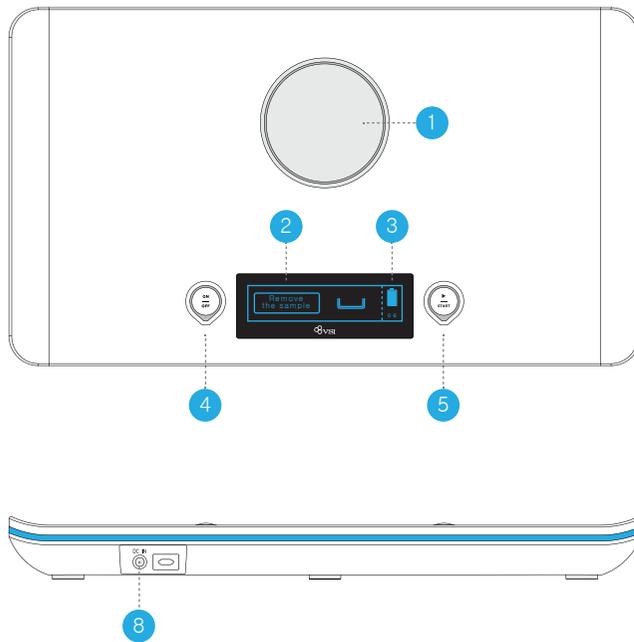
- Do not disassemble the case between operations of the Radicheck
- Please make terms consistent by using only one term.
- Ensure that things with electric conductivity such as metal are not connected in the USB port or DC jack of the detection device.
- Make sure to use the DC adaptor provided with the product and 1.5V AA size batteries.
- Do not use the product in high temperatures or humid places (-10℃~50℃).
- Do not place the Radicheck in water and microwave ovens.
- Do not disassemble the Radicheck or subject it to shock. Disassembly may result in high voltage induced electric shock.
- Store the Radicheck in places away from children's reach.
- Life time of the equipment may vary depending on temperature, usage period, the surrounding.
- Modifications to design and functions may be made without prior notice to users for product improvement.
- The company shall not be responsible for product damage or deterioration caused by user negligence.
- Upon occurrence of instrument errors, accurately identify the contents of the errors and notify our place of purchase or the service center to receive repairs.

✓ Take caution as you will not be eligible for free-of-charge or paid services warranted by the company in the occurrence of product

02 Product Contents



03 Names for Product Areas



1 GM radiation sensor	5 Start button
2 Information & results window	6 Battery cover
3 Battery level indicator	7 Buzzer sound output window
4 Power button	8 DC jack (5V, 1A)

04

Information on Radiation

Contamination standards for food radiation are measured in units of Bq/kg, which is based on Bq for per kg of food weight. Bq is measured in average number of decay for radioactive specimen during a unit time. Measuring unit for the Radicheck for foods radiation contamination is in cps(counts per second), which is the number of radiation measured per second. If the extent of foods radiation contamination is to be measured, the radioactivity may be estimated using the radioactivity conversion table(page 27) described within this manual.

In our environment, radiation is generated from household items, construction materials, land sites, foods, atmospheric spaces, etc. all of which are referred to as environmental radioactivity (background radioactivity). When the radioactivity of a specimen is measured, the radioactivity of not only the specimen, but environmental radioactivity becomes measured. To remove the effects of environmental radioactivity, Radicheck measures the environmental radioactivity once when the power turns on and remembers this radiation level which becomes automatically subtracted when measuring the radiation level of foods to enable accurate food radiation measurement.

$$\text{Specimen's radioactivity} - \text{Background radioactivity} = \text{Specimen's pure radioactivity}$$

Domestic & Overseas Limit on Radiative Cesium in Food(Bq/kg)

	Drinking water	Milk, Dairy products	Vegetables, Grains	Meats, Fishes, Egges, Etc.
Japan	10	50	100	100
Korea	370	370	370	370
USA	1,200	1,200	1,200	1,200
Europe	200	200	500	500
Codex	1,000	1,000	1,000	1,000

* The criteria are based on the October 2013 survey.

05 Using the Product

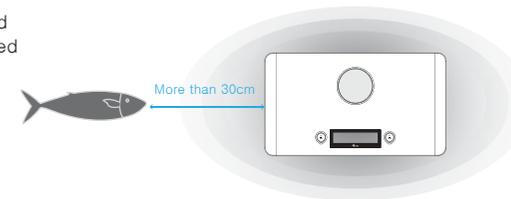
1 Turning power On

Radicheck has two buttons, including the power button to turn the power on and off and the start button to measure food radiation contamination. Applying excessive force to these buttons may result in instrument damage.

a Remove objects around Radicheck

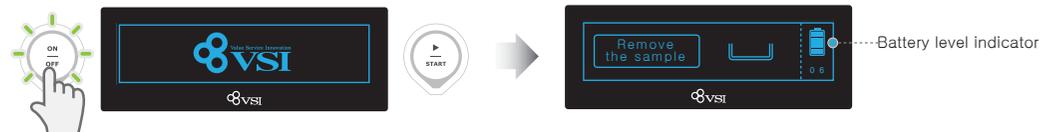
As the environmental radioactivity (background radioactivity) should be measured once before measuring the food specimen, removing food specimens placed on the Radicheck specimen tray and not placing any objects nearby the Radicheck (within 30cm radius) will facilitate accurate measurement.

(For instance, when porcelains, such as dishes are placed nearby the Radicheck, radioactive substances contained within the porcelain may increase environmental radioactivity levels and result in measurement errors.)



b Turning on the power

- While the power is turned off, press and hold the power button. To turn off the power, press and hold the power button for more than 3 seconds during any operation.
- When the power turns on, the VSI company logo and the message "food radiation checker" are consecutively displayed while a **buzzer is sounded once**.
- "Remove the sample" is displayed on the screen while the **wait time (10 seconds)** is indicated below the battery level icon.
- After 10 seconds, background measurement starts automatically.



2 Measuring Background Radioactivity

a Measuring background radioactivity

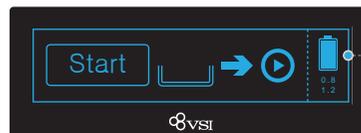
- On the left-side of the OLED, the message "Please Wait" is displayed and the background radioactivity (environmental radioactivity) is measured for 3 minutes.
- In the center of the OLED, the wait time and sandglass icon are displayed.
- On the right-side of the OLED, background radioactivity is measured every 5 seconds and shown as a Bar Graph (B).
- After the power is turned on, the background measurement is conducted only once, and the same background radioactivity value is applied to all radioactivity measurements for the specimen until the power is turned off.



Bar Graph
B (Background) : Measures environmental radioactivity
T (Test) : Measures food radioactivity

b Waiting for Measurement

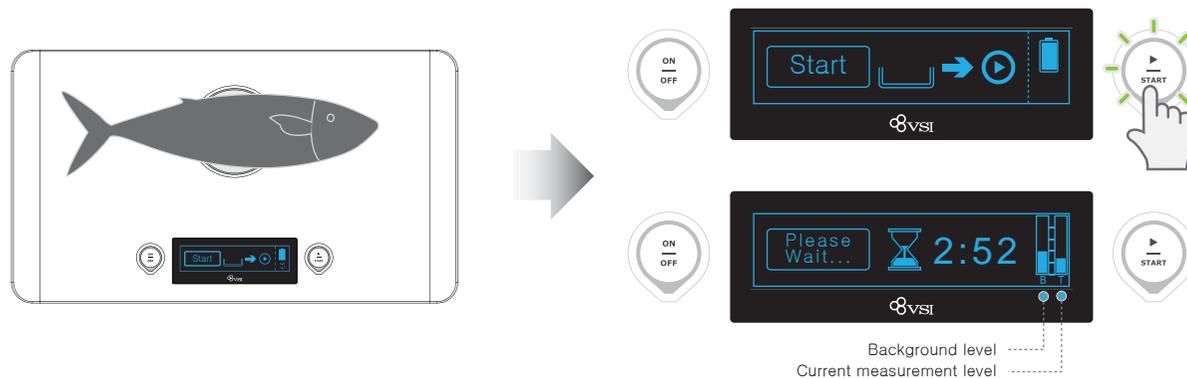
- Once background radioactivity measurement is complete, the message "Start" and a pattern are displayed on the left-side on the screen.
- From this point, the radioactivity of food specimens can be measured.



Meaning of Pattern:
Place the specimen on the tray and push the Start button.

3 Starting Measurement

- Place the food specimen on the circle in the center of the Radicheck specimen tray and push the **Start button**.
- On the OLED screen, the message **"Please Wait..."** and the wait time are displayed while food radioactivity is measured for 3 minutes.
- During measurement, the Bar Graph at the right-side of the OLED displays the **background radiation level (B)** and the **radiation contamination level (T)** of the food currently being measured.
- Once measurement is complete, the buzzer will sound and the measurement results are displayed.

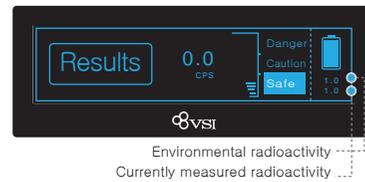


- ✓ If the Start button is pressed before the measurement is complete, the measurement results up to the current time are displayed. However, shorter measurement times will result in lower accuracy.

4 Measurement Result and Re-measurement

a Displaying measurement results

Measurement results are displayed in cps (count per second) and Safe/Caution/Danger states (cps indicates the number of radiations measured per second for the specimen and corresponds to specimen radioactivity).



Safe

Radioactivity of food specimen is **lower than 0.1 cps**
At the right-side of the OLED screen, the letter "Safe" blinks while the buzzer does not sound.

Caution

Radioactivity of food specimen is between than **0.1 cps ~ 1 cps**
At the right-side of the OLED screen, the letter "Caution" blinks while the buzzer sounds once per second.

Danger

Radioactivity of food specimen is **higher than 1 cps**
At the right-side of the OLED screen, the letter "Danger" blinks while the buzzer sounds once 0.5 seconds.

b Re-measuring

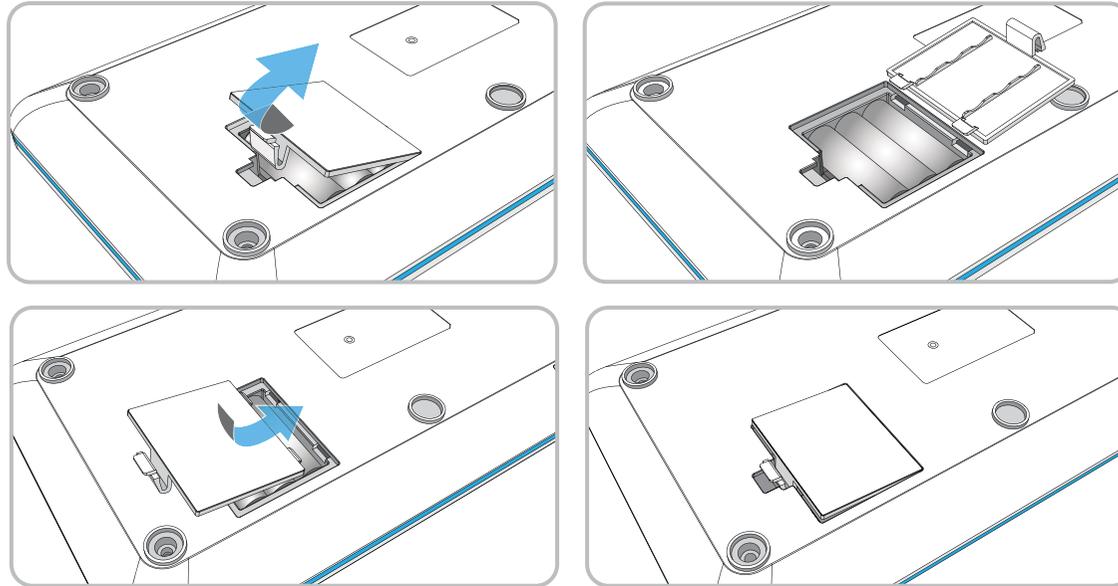
To measure another food specimen, press the Start button once to enter measurement wait state. Once the food specimen has been replaced, press the Start button again to begin measurement. The subsequence steps are the same.



5 Turning Off the Power

- To turn the power off, press and hold (3 seconds) the Power button. The power will turn off along with a buzzer sound.
- If **buttons are not pressed for more than 5 minutes** with the power on, the power will **automatically turn off** to save battery life.

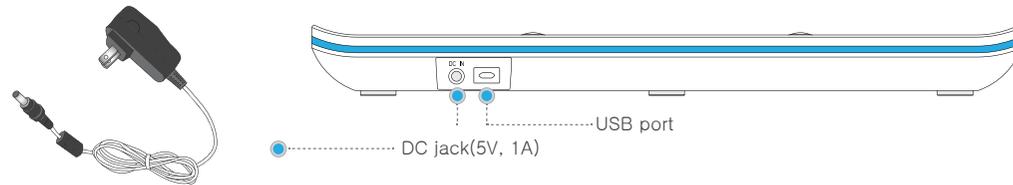
6 Replacing Batteries



- a Turn off the power and push the battery cover at the rear upwards to separate the cover with the case.
 - b Upon replacing batteries, insert batteries while paying attention to the electrode polarities. Push the battery cover into the hinge groove in the opposite way from the time of separation.
- ✓ Please make sure to use 1.5V AA size batteries.

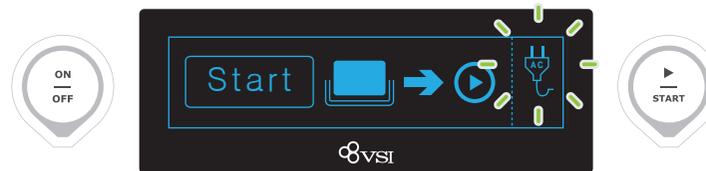
7 Using DC Adaptor

- a With the power turned off, connect the DC adaptor to the DC jack at the rear, place the Radicheck correctly and fit the plug on the DC adaptor side into the consent on a wall.



- ✓ Do not use the USB port, It is only for the manufacturer.

- b When the DC adaptor becomes connected, the battery icon at the right becomes changed to the adaptor icon.



- ✓ Please make sure to use the DC adaptor supplied with the product.

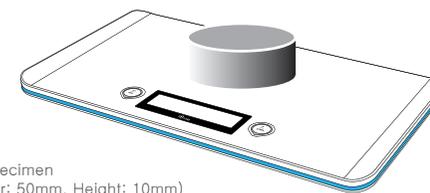
06 Radioactivity Conversion

Meaning of Table Conversion Values

Bq/Kg per 0.1 cps according to water contents of specimen subject to measurement

- The Radicheck can measure more accurately the radioactivity for the drier specimen.
- As specimens with higher water content will measure lower cps values, it is more beneficial to use dry specimens for accurate measurements.

Water Content(%)	cps	Bq/kg
0~10 (Dry specimen)	0.1	100~200
50 (Semi-dry specimen)	0.1	1000
100 (Wet specimen)	0.1	1500



Water specimen
(Diameter: 50mm, Height: 10mm)

ex If the value measured with a dry specimen of a shape similar to the above water specimen is 0.2cps, then the converted radioactivity is 200~400 Bq/kg.

- The subject of measurement is assumed to be water with a diameter of 50mm and thickness of 10mm with a uniform distribution of Cs-137 radioactive element within the water.
- Some foods may contain natural radionuclides, such as K-40.
- The above conversion value may vary depending on the radioactive element or specimen condition.

* The values shown in the table above are reference data and cannot be used as evidence for any legal responsibility related to the products of our company.

07 Q/A

Q1 Values differ upon measurement even though measurements were made in the same way.

A1 Measurement errors may occur to up to approximately 0.1 cps.

Q2 As a measuring instrument for food radiation contamination, why is the measurement unit not displayed in Bg/Kg?

A2 The specific radioactivity (radioactivity per mass) measurement in the unit of Bq/kg undergoes a complex pre-treatment process and must be measured for more than a few hours using high priced specialized measurement devices. There are significantly differences in measurement values depending on the pre-treatment state.

As a food contamination measurement device for use by the general public, this device has been designed for convenient use by bypassing the pre-treatment process. Therefore, in order to convert specific radioactivity into Bg/Kg units by using this device, please refer to the conversion chart within this manual. There may be differences in specific radioactivity value depending on the sample state.

Q3 What are the criteria for safe, warn and risk?

A3 The standard differs based on the cps value. Safe is below 0.1 cps and warn is 0.1~1 cps and risk is above 1 cps. This relevant standard is a standard as designated by our company to provide radiation information on foods to the general public without knowledge for radioactivity. If the reading is above 0.1 cps, then the radioactivity within the food exceeds contamination standards of the majority of countries and consumption of such foods is not recommended.

Q4 Why are there no test certificates?

A4 In relation to the relevant test, there are no domestic or overseas institutions issuing approved test certificates.

Q5 How are the sample specimens used?

A5 You may utilize the sample specimens to confirm whether performance of the present measuring instrument for food radiation contamination is normal. You can evaluate whether the cps value measured with the specimen placed in the center of sample tray of the measuring instrument and that recorded on the specimen are identical. (Radioactivity values on the front and the rear face of sample are different)

08 Specifications

<ul style="list-style-type: none"> ○ LCD display - Radioactivity(cps) - Waiting time - Radioactive contamination state (Safe, Caution, Danger) - Residual amount of battery - Instrument abnormality 	<ul style="list-style-type: none"> ○ Electrical - Power supply : AA battery 3 EA, DC jack - Battery life : 50 hours of continuous use (Continuous use upon using DC jack) - Charging time : 2~3 hour 	<ul style="list-style-type: none"> ○ Mechanical - Dimension : 320mm x 180mm x 25mm - Weight : 800g - Case : Plastic (ABS)
<ul style="list-style-type: none"> ○ Audio - Buzzer 	<ul style="list-style-type: none"> ○ Environmental - Operational temperature range: -10 ~ 50 ℃ 	<ul style="list-style-type: none"> ○ Standard - IEC 60325
<ul style="list-style-type: none"> ○ Measurement - Radiation sensor : Halogen quenched Geiger Muller (2 mg/cm² mica window) - Measurement area : 15.5cm² (44.5mm diameter) - Measured radiation : Beta, Gamma - Measuring unit : cps - Measurement range : 0.1 to 999 cps - Measured energy : Beta(0.1~3MeV), Gamma(0.01~3MeV) - Response time : 3minutes 		<ul style="list-style-type: none"> ○ Controls - Power button - Start button

09

Product Warranty

Consumer Damage Type	Compensation contents		
	Within warranty period		After warranty period
Repairable	Repair free of charge		Paid repair
Irreparable	Product exchange or purchase price refund (receipt to be submitted)		Exchange after depreciation of fixed sum
Product name	Radichack	Model name	FRC-G-001
Purchase date	yr. mo. date	Manufacturing No. (S/N)	
Purchase place		Warranty period	1 year from date of purchase

Free-of-charge service

You are eligible for free of charge services only for defects responsible for by the manufacturer and naturally-caused breakdowns that occur within the warranty period (1 year from the date of purchase).

Paid service

- When breakdowns were caused by consumer negligence (Drop, immersion, shock, damage, unreasonable motion, repairs outside the present company, intentional breaking by consumer, etc.)
- When breakdowns occurred due to natural disasters or life consumable parts (rechargeable battery, etc.) was expired.
- If the purchase date of the product cannot be verified, the quality assurance period begins after 3 months from the manufacturing date.

Nationwide representative telephone number for service center	070-4421-9267
Internet service(Inconvenient use and Inquiries)	www.vsi.co.kr

- Our company, VSI Co., Ltd, warrants the product as described above. In case of malfunction, please contact your place of purchase or an agency.