Smart Radon Detector for Home Owners

Radon Eye

OPERATION MANUAL

Model : RD200

Your purchase of this Smart Radon Detector, **"Radon eye"** marks a step forward for you into the field of Indoor Air Quality Monitoring for your home care. Although this detector has a complex inside hardware and delicate measurement algorithm, its smart function will allow easy use if proper operating techniques are developed. Please read the following instructions carefully and always keep this manual within easy reach.

www.radonftlab.com

CONTENTS

1. FEATURES

High Sensitivity & Accurate

Radon Eye is a smart & real time radon detector for Home owner which has the high sensitivity 0.5cpm/pCi/l (13.5cpm/1000Bq/$m^{3)}$, about 20~30 times more than conventional radon detector by FTLAB's high stable circuit technology shown Fig. 1.

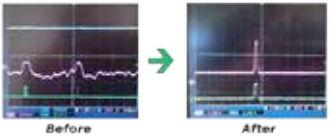
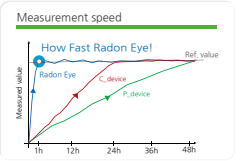


Fig. 1 enhanced detection waveform

Real Time Measurement



Its first reliable data out below 1hour from measurement start shown Fig. 2. Also the accuracy is <10% at 10pCi/l (370Bq/m^3). (The accuracy and reproducibility spec were tested by the KTL(Korea Testing Laboratory) administrated by KOREAN government)

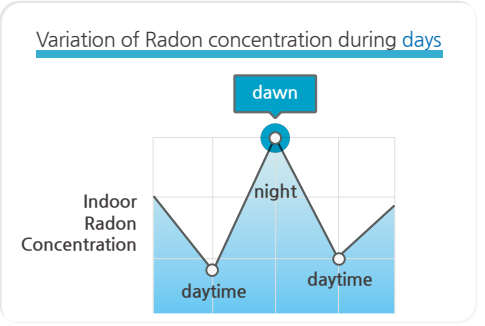
Fig. 2 comparison the measurement speed of Radon detectors

Smart Function

- Bluetooth connection with smart phone (Android & IOS)
- 1 hour step data logger, data storage 1 year
- Built-in microprocessor circuit assures excellent performance and accuracy.
- Individually calibrated by equipments which are already calibrated to traceable international standard.

2. Why the Real Time Measurement?

Radon level is usually highest in the dawn when everyone slept deeply. In the middle of day, when children go to school and their parents go to the work that no one in the house, Radon level is the lowest. So the average of Radon level of all day would be meaningless. And If you neglect ventilation even for a few days during the winter time, Radon level can be as high as several times more than usual although radon levels are usually the lower house. This is the main reason for measuring radon in real time. And when the high Radon level would be detected in your house by Radon sensor, it is recommended to equip the facilities that can immediately mitigate the radon level.



3. SPECIFICATIONS

- Sensor Type : pulsed ion chamber
- First reliable data out : < 1hour
- Data display interval : 10min update (1hour moving average)
- Sensitivity : 0.5cpm/pCi/l (1.35cpm/100Bq/㎥)
- Operating range : 10℃ ~ 40℃, RH < 90%
- Range : 0.1 ~ 99.99 pCi/l (1~3700Bq/㎥)
- Precision : < 10% at 10pCi/l (370Bq/㎥)
- Accuracy : < ±10% (min. error < ±0.5pCi/l (±15Bq/㎥))
- Power consumption : DC 12 ± 0.1V, 65mA (12V DC adapter)
- Size : Φ80(mm) x 120(mm) , 240g
- Data communication : Bluetooth LE (Android / IOS)
- Data log : max 1year (1hour step)
- Display : 0.96 inch OLED
  (All test data have been measured at 25℃ ± 2℃)

– Comparison the price & performance of Radon gas Detector with other devices –

Contents	Home owner		For professional					NEW
	Pro3	CANARY	CANARY Pro	SUN NUCLEAR 1028	RAD7	Alpha Guard	CRM510	RadonEye
Type	photodiode 	photodiode 	photodiode 	photodiode 	photodiode 	ion chamber 	ion chamber 	ion chamber 
Country	USA	Norway	Norway	USA	USA	German	Canada	KOREA
Sensitivity (cpm/1000Bq/㎥)	–	–	–	1.35	13.5	50	8.1	13.5
Minimum measuring time (h)*	48	24	1	10	0.5	0.2	1	1
Data logger	X	X	O	O	O	O	O	O
Precision(%)	±20	±20	±12	±25	±5	±3	±10	±10
Price(US$)	150	199	1,310	1,200	9,000	18,000	5,000	250

* The minimum measuring time refers to the time it takes to reach a reliable measured value. The shorter means the faster the resoponse speed of the measuring equipment.

* This chart is reported just for reference and may differ from the true. If is not responsible for regal issues resulting from the use of this data.

4. Display

4-1. Bluetooth connection sign : It is displayed when connected to a smart phone by BLE communication.

4-2. Vibration sign : It is displayed when the vibration from external shock is detected by the internal sensor and the measurement is ignored during a vibration displayed.

4-3. Radon concentration value : measured Radon level at every 10min update.

4-4. Unit : Bq/㎥ or pCi/l. Unit change is possible through the smart phone app.

4-5. Information : SN(serial number), peak value, 1 day & 1 month average, measured time, detection count during 10min (present/ old)

4-6. LED sign : It flashes when the Bluetooth connection and the radon concentration is exceeded the warning level.

5. MEASURING PROCEDURES

5-1. Measurement preparation
- close the window and door of house
- place the Radon Eye on the table or desk
- avoid strong wind from the fan

5-2. Power on/off
- connect the 12V adapter at Radon Eye
- automatically start
- Power off : Separate the adapter from unit

5-3. Measuring
- After measurement starting, do not touch the unit if possible
- first data out 10min after start
- data update every 10 min
- reliable data will be got about 1hour
- Radon levels are generally highest in the house at dawn. Please try at least 48 hours continuous measurement and check the peak value of your house. If the peak value is bigger than 100Bq/㎥, your house is in warning position.

5-4. Data Down Load & Saving
- It is possible by smart phone App, “Radon Eye”
- See the next chapter
- Measured Radon data is displayed on the screen
- press LOG button and Data Load, you can see the variation of radon concentration as a graph
- Clear button is for delete of all measured data
- Save As button is for the saving the down loaded data to the memory of smart phone

6. SMART PHONE APP

6-1. “Radon Eye” App download and Run

- Search “ Radon Eye” in play store or App store
- download the app and install in your smart phone
- Please allow Bluetooth consent
- After logo display, you can see the current searched Radon Eye
- Click on the connect button, it is connected to Radon Eye by Bluetooth communication with a loud "beep"
- one smart phone to connect with one Radon Eye
- If the connectionis not smooth, please try again
- If it is still trouble, turn off the Bluetooth function and turn on again

6-2. Radon level display

- After Bluetooth connection, the radon concentration value would be displayed.
- If the measurement time is below 10min, you have to wait up to 10min
- Various information is also displayed, 1day & 1month average, measurement time, serial number, peak value, pulse count during 10min (new/old)

6-3. Graph mode and data save

- If you tap LOGO in the bottom of display, you can see the graph mode
- Toap on the data load, the measured data which saved every 1hour would be displayed as a graph
- If you want to save this data in your smart phone, tap the save as button

- You can change the saving file name if you want.
- The position of saved data files is RadonFTLab folder in android user
- For I-phone user, please use I-tunes
- The saved file format is txt, simlple text file for Excel

6-4. Data logger

- Measured data would be automatically saved at every 1 hour
- The saved data does not vanish after turn off
- For data clear, tap on click the "CLEAR" in the graph mode (all data deleted)
- Without erasing the previous data you measured at the new location it will be stored so after the previous data. Therefore, when you start to measure in the new place, turn on the Radon Eye, immediately connect with smart phone (Bluetooth connection is possible even if waiting time period), previous data download and save, clear previous data and start a new measurement.
- Maximum data storage is 1year

6-5. Configuration change

- After running the App "Radon Eye", Tap on click the menu button.
- Unit and Alarm condition could be changed
- The Units are Bq/㎥ and pCi/l, 1pCi/l = 37Bq/㎥
- Default value of alarm condition is 148Bq/㎥ and 1hour interval
- After changing the alarm setting, you should click the "Alarm Set"

7. BATTERY OPERATION

- The power bank for smart phone is available for Radon Eye with step up cable
- The step up cable gives boost the 5V of battery output to 12V for Radon Eye input
- You can buy this step up cable with Radon Eye or buy in Aliexpress, searching “5V to 12V step up boost line adapter”
- If use 10AH power bank, Radon Eye can be operated during ~40hours

8. APPLICATIONS of RADON EYE

- Indoor real time radon monitoring for the homeowner
- Preliminary measurements of indoor radon concentrations multi-use facility
- IoT Radon sensor
- Automatic ventilation system
- Radon mitigation system

9. NOTE

- It must be used only for the specified DC12V adapter.
- Please don't touch the Radon Eye during measurement.
- All measurements are in principle to be made in the stationary state. It would not be measured accurately in the shaking car, in the bag, in subway trains, etc. When such vibrations and shocks detected by the internal vibration sensor of Radon Eye, it displays the vibration signs and stops the measurement for a moment. Therefore, this measurement does not be able in environments subjected to physical shock or shaking continuously.
- Best place for the Radon Eye is on the table, not on the floor.
- If the measured value is over the set value(normally 148Bq/㎥), the alarm is working during 30sec. Do not surprise, just open the windows for ventilation at least 10min.
- Do not operate the Radon Eye in 100% RH or outside
- Radon Eye should be used only indoors, 10℃ ~ 40℃(50F ~ 100F)
- Calibration values are valid for 2 years from date of manufacture.

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