

# Next Generation Drinking Water Radiation Safety Monitor Model - NEXGEN-SSS

## FREQUENTLY ASKED QUESTIONS:

**Question:** Since the scintillation material is inside cell and contacts the water sample directly, is it OK to measure drink water by this way? What is done when contaminated water goes through? Does this mean when it is contaminated and background rises, then the whole detector should be replaced by a new one? Could customer replace by themselves on site, or a technician from your factory should travel to do this job?

You are correct, flow through style detectors can be subject to contamination.

Two points to consider (1) how susceptible is the Alpha flow cell to contamination and (2) how difficult is the corrective action.

**(1) Susceptibility when measuring drinking water with possible low level contamination.**

Please note that the NexGen-SSS system has particulate pre-filters that remove particulates from the water sample stream, so the Alpha emitters that flow through the Alpha detector are either dissolved (liquid phase) materials or else extremely fine (small) particles. Neither of these is likely to adhere to the scintillator material or the inner surfaces of the flow cell or to become trapped in the flow cell.

As you say, if over time, large amounts of Alpha emitters flow through the cell, the background level in the cell can increase enough to require detector replacement.

**(2) Alpha Detector assembly replacement**

Removal of the Alpha Detector assembly requires disconnection of two hoses, two quick disconnect (BNC) cables, four mounting bolts, draining or blowing out residual water and that is all. A fairly simple process.

**(3) Old detector can be returned to TA for a trade-in allowance or be refurbished and returned to the user as a back-up detector, if desired.**

However if one or more NexGen-SSS will be used in a laboratory that handles high levels of Alpha emitters and thus possibly requiring frequent replacement or decontamination; then please let us know. Our engineering department can explore any appropriate design changes.

**Question: About the Detectors**

**1. Alpha Detector Does Not Use a Particulate filter cartridge**

ALPHA: The NexGen-SSS Alpha Detector is a flow-through Alpha detection cell there is NO Alpha particulate filter to replace.

**2. There are two Beta detectors**

BETA-1: The NexGen-SSS main Beta Detector is a flow-through Beta detection cell with NO Beta particulate filter to replace.

BETA-2: The Detector labeled "Particulate Filters" also measures ENERGETIC Betas. This detector does use a filter.

**3. PAG Level**

The NexGen-SSS detector and software easily allows simultaneous display and records in 30 minute, 24 hour and 48 hour (or longer) readings for EACH detector.

**Question: Concerning long and short counting periods for radiation measurement for purpose of detecting extremely low contamination levels:**

Unlike measurement in many other fields that use analog sensors, radiation measurement consists of detecting, recording and analyzing a series of distinct pulses. This is why radiation measurement is often referred to as "counting."

The pulses we are interested in come from decay of a single radioactive atom in the water sample stream. Of course there are other pulses as well, that come from detector or circuit noise or from external radioactive materials.

The fact that we are counting pulses allows us to do statistical analysis and greatly improve our low end sensitivity, especially when we count for longer and longer periods.

Prior to computers and smart software, a water sample might be placed in a dish, and allowed to evaporate. Then the remaining solids were manually placed in drawer under a detector for one day, seven days or even longer.

The total counts were added up, and sometimes this process was repeated for another week etc. In this case the user had no information until the count was completed, a very frustrating, inefficient, time wasting and, depending on lab fees, costly process.

But now we have computers and smart programmers and we can do better. When water flows through a detector in the NexGen-SSS each pulse is recorded into multiple buffers that simultaneously count the pulses for different time periods.

The user can set these as he pleases, to 2 minutes, 1 hour, and 24 hours OR to 30 minutes, 24 hrs and 48 hrs OR other count times of their choice. The result is that the user gets a quick warning in case of high levels and also achieves excellent low end sensitivity over longer count times.

The on-screen display allows the user to view both the immediate count rate and the long term average which gives more and more precise value for the concentration of radioactivity in the water as each minute and each passes.