

DRINKING WATER & WASTE WATER GAMMA RADIATION MONITOR

饮用水&废水伽马辐射监测器

Model – NEXGAMMA-2 & NEXGAMMA-2-G

FEATURES: 产品特点

- MEASURES AT OR BELOW EPA/DHS PAG LEVELS
- 测量限值符合或低于EPA/DHS保护行动纲领标准
Protective Action Guideline levels and MILITARY DRINKING water limits
保护行动纲领标准和军队饮用水限值
- RUGGED REAL TIME, CONTINUOUS, IN-LINE or TRANSPORTABLE
- 坚固实时、连续、在线或可移动
- ISOTOPE IDENTIFIER – DETECTOR TYPE: NaI (TI) or HPGe
- 核素识别-探测器类别: NaI (TI) 或 HPGe
- HIGHLY SENSITIVE GAMMA SPECTRUM (MCA)
- 高灵敏伽马能谱 (多道分析仪)
- HIGH SENSITIVITY & WIDE RANGE
- 高灵敏&宽量程
- NO REAGENT TANKS TO FILL, NO WASTE STREAM
- 无需填充试剂盒, 无污水流
- ALARM - AUDIO / VISUAL – USER SETTABLE, EASY CALIBRATION
- 报警-声音/视觉-用户设定, 容易校准
- WORLD'S ONLY PAG-LEVEL GAMMA water monitor
- 世界上唯一一台PAG-保护行动纲领标准 γ 水监测器
- Full SCADA compatibility
- 全SCADA系统兼容
- OPTIONAL – ALPHA, BETA, TRITIUM, RADON DETECTION
- 可选- α , β , 氚, 氡探测
- OPTIONAL – SUBMERSIBLE GAMMA PROBE
- 可选-水下 γ 探头



APPLICATION: 应用

Monitor water against Radioactive Gamma contaminants

监测水中辐射伽马污染物

- Drinking Water
- 饮用水
- Waste Water
- 废水
- Ground or surface water
- 地表水



**TECHNICAL ASSOCIATES
OVERHOFF TECHNOLOGY**

7051 Eton Ave., Canoga Park, CA 91303
818-883-7043 (Phone) 818-883-6103 (Fax)

tagold@nwc.net

WWW.TECH-ASSOCIATES.COM

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- Liquid-waste-stream from laboratory or plant
- 实验室或电站的液态流出物
- Industrial Process Water
- 工业用水

PROBLEM – 问题

Drinking water and waste water sources are vulnerable to accidental or knowing contamination by individuals, groups, industry, medical labs, terrorists and from naturally occurring radioactive materials (NORM). As yet very few water and waste water districts have real-time radiation monitors in place to protect the water and the public. The NexGamma-2 is helpful because **discharge permits require data analysis of waste water.**

饮用水源易受到来自个人、团体、工业、化学实验室、恐怖分子和自然存在的辐射材料(NORM)事故污染。然而极少有供水部门实时监测水中辐射来保护水源和公众。NexGamma-2 可以帮助解决问题因为排放许可要求对废水进行数据分析

REAL-TIME RADIATION MONITORING OF INDUSTRIAL PROCESS WATER HAS NOT BEEN AVAILABLE UNTIL NOW. 实时工业废水辐射监测直到现在才可以实现

SOLUTION – 解决办法

For the first time in a **Continuous Real Time radiation monitor** the TA's **NEXGAMMA-2** solves this problem by continuously monitoring water using Gamma radiation scintillation detectors with (NaI) crystals.

TA公司连续实时辐射监测器NEXGAMMA-2使用碘化钠晶体闪烁探测器，通过连续监测水中辐射，首次解决了此问题。

- Information is analyzed and displayed in units of picoCuries per liter. User settable measurement units.
- 信息显示及分析单位pCi/L,用户可设定测量单位
- Calculations are updated every minute, every hour and every day.
- 计算每分钟、每小时、每天更新
- Longer update times correspond with greater precision and increased sensitivity.
- 更新时间越长，精度和灵敏度越高
- Sensitivities meet or exceed DHS protective Action Guideline Levels.
- 灵敏度符合或超过“美国国土安全局”保护行动指南标准
- TA Tried and True sample collection & measurement technology measures Gamma from any radioactive liquids.
- TA公司“Tried and True”采样和测量技术测量辐射液体中伽马
- Measurements of radiation concentration and total discharge are logged 24 hr/day, 7 day/week.
- 测量辐射浓度和总排放一天24小时记录
- Determines and identifies individual radionuclides.
- 确定并识别单个辐射核素

DESCRIPTION: 描述

The **NEXGAMMA-2** is a multi-channel water monitor/controller for measuring of Gamma-emitting radionuclides. It simultaneously measures individual Gamma isotopes. The electronics are microprocessor with color LCD display. The pre-amps are plug in modules allowing change or addition of functions at a later date, and allow rapid repair by module



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replacement in the field. The modular system is covered by TA's unique exchange warranty system in addition to the full one year warranty. On-site warrantees available in many areas.

NEXGAMMA-2是一款多通道水监测器测量伽马发射辐射核素，并同时测量单个伽马同位素。电子学为彩屏微处理器，前置放大器模块式允许将来功能改变或扩展及通过更换模块进行快速现场维修。除了一年保修期外，此模块系统还享有TA公司包换服务，许多地区提供现场维修。

Detector shields are made of (2") lead encased in welded housing for long useful life and easy decontamination. Gamma Spec shield can be opened for cleaning with little effort. All connections are sealed against leaks. The standard water moving system is based on a high precision pump with a 2.5 liter flow through helix or optional 20 liter tank.

探头屏蔽铅制(2")，装在焊接箱中以便延长使用寿命和去污， γ 规格屏可以轻易打开清理，所有连接部分都密封防泄漏。高精度泵保证了标准水动系统，2.5升螺旋结构系统或选择20升水箱。

THREE WAYS FOR CONTINUOUS REAL-TIME MONITORING OF GAMMA RADIATION IN WATER

三种方式进行连续、实时监测水中伽马辐射

HOW TO SELECT THE OPTIMUM METHOD 如何选择最佳方法

1. Put submersible probe directly into the river or lake. - OPTIONAL

直接将水下探头放入河流或湖-可选

PRO: 优点:

- It is simple, No pump needed, the lake acts like a very high volume tank, so system sensitivity will be good.
简单，无需泵，湖就像一个大水箱，因此灵敏度非常好。

CON: 缺点:

- Submersible probes cost more, can break or leak or be contaminated easily, and a valuable detector may be subject to theft.
- 水下探头费用高，可以损坏或漏水，容易被污染，昂贵的探测器可能被盗。
- User must do his measurement next to the lake or install special signal transmission.
- 用户必须在湖边测量或安装专用信号传输系统
- Submersible probe only works if there is a river, lake, or sump. It is not useful for water flowing in a pipe.
- 水下探头只适用于江河湖泊，不适用于水管中流动水。

2. Pump water into a tank with a probe in the center. – OPTIONAL

将水抽进水箱中，水箱中间装有探头-可选

PRO: 优点

- A big tank can give good sensitivity
- 大水箱可提供很好灵敏度



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CON: 缺点

- A big tank can have slow "wash-out" characteristics. This means that the 'new' tank water currently being measured may contain residual water from previous measurement activity.
- 大水箱可能存在“测量失败”问题，即正在测量的“新”水可能混有先前残留水。
- Overtime the tank may collect sand, algae or other contaminants. Therefore an uncontaminated/CLEAN tank may be difficult to thoroughly clean and expensive to replace.
- 随着时间推移，水箱会有泥沙或其它污染物沉积，因此本来干净的水箱可能很难彻底清理而且更换很昂贵。

3. **OPTIMUM METHOD - Pump the water in through a TA Helix Hose; one that twines (spirals) around the detector and returns back to the source of the water. – STANDARD**

优化选择 将水泵进 TA 公司螺旋状管子中，螺旋管缠绕在探测器上，最后样品返回水源中-**标准**

PRO: 优点

- There is no mixing of old water with new water. All water is fresh assuring accurate measurement. In case of contamination, replacement of spiral tube is quick and inexpensive.
- 新水样中不会混杂旧水样，所有水样新鲜确保测量精确；如果收到污染，可更换螺旋管，快速经济。

CON: 不足:

- The volume of water in the spiral tube is less than the water volume in a big tank or in the lake.
- 螺旋管中水样容量小于大池子或湖水容量。

A wide range of pump capacities are available to meet user specific needs. The entire system is mounted in a wheeled, self-contained rugged cabinet. The **NEXGAMMA-2** comes complete with all cabling tubing and connectors in place and is ready to operate. 115 Volt 60Hz is standard; 220 Volt 50/60 Hz is optional.

提供各种容量泵以满足用户具体需求，整个系统安装在带轮、一体、结实机柜中。**NEXGAMMA-2**带全部所需缆线，管子及连接件，标准电源115 Volt 60Hz， 可选220 Volt 50/60 Hz

Isotope Identification System

同位素识别系统

The water is measured for Gamma-emitter content, using an advanced high resolution MCA analyzer. The energy range is user settable. For example the MCA can be set for Gamma energy of 10 KeV to 3 MeV or above.

测量水中伽马发射物，使用高分辨率多道分析仪，能量范围用户设定，例如MCA可设定 γ 能量10 KeV -3 MeV或更高。

Peak Detection and Isotope Identification **TA SMART-PEAK™** Software detects radiation peaks even at very low Gamma concentration, In the event of high activity and during system calibration, the isotope identifier function takes over and displays the exact radioactive nuclides in the water.

峰值探测和核素识别软件 **TA SMART-PEAK™**能测到非常低浓度伽马辐射，在高活度情况下和系统校正期间，同位素识别器功能发挥作用并显示水中确切辐射核素。



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		DETECTION LIMITS 探测限				
ISOTOPE 核素	LOW 低	LOW 低	HIGH 高	SENSOR METHOD 探测方法		
GAMMA 伽马				RESPONSE RATE – SLOW 响应率-慢	RESPONSE RATE – FAST 响应率-快	
⁵⁸ Co	3.7 x 10 ⁻¹ KBq/m ³	10 pCi/L	1 x 10 ⁷	3" x 3" NaI (TI) Crystal 碘化钠晶体	Intrinsic HPGe 高纯锗	
⁶⁰ Co	1 x 10 ⁰ KBq/m ³	27 pCi/L	1 x 10 ⁷	3" x 3" NaI (TI) Crystal	Intrinsic HPGe	
¹³¹ I	5 x 10 ⁻¹ KBq/m ³	13.5 pCi/L	3 x 10 ⁶	3" x 3" NaI (TI) Crystal	Intrinsic HPGe	
¹³⁷ Cs	6 x 10 ⁻¹ KBq/m ³	16.2 pCi/L	6 x 10 ⁶	3" x 3" NaI (TI) Crystal	Intrinsic HPGe	
OPTIONS 可选						
TRITIUM	0.2 µCi/l		1 x 10 ⁶	Bed of Crushed Scintillation Crystals 碎闪烁晶体床		
RADON	100 pCi/l		2,000 pCi/l	Expel Radon Gas into Ion chamber 排氡气体电离室		
ALPHA – ²³⁸ U	3,000 pCi/l		2 x 10 ⁷	5" Dia Dual PM Tube 1,000 ml chamber 直径 5"双 PM 管, 1,000 ml 气室		
²¹⁰ Po	3,000 pCi/l		2 x 10 ⁷	5 " Bed of Crushed Scintillation Crystals 5 "碎闪烁晶体床		
BETA – ⁴⁰ K	3,000 pCi/l		2 x 10 ⁷	5" Dia Dual PM Tube 1,000 ml chamber 直径 5"双 PM 管, 1,000 ml 样品室		
¹³⁷ C	3,000 pCi/l		2 x 10 ⁷	1100 cm ² Beta Scintillator β 闪烁体 1100cm ² 样品室		
⁹⁰ Sr	200 pCi/l		1 x 10 ⁶	1100 cm ² Beta Scintillator β 闪烁体 1100cm ² 样品		



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GAMMA-MCA ISOTOPE IDENTIFIER



DATA:-Analysis-Display-Hard-Copy-Archive

In each peak or area of interest, the net counts are automatically converted to user settable units, of picoCuries/liter or KBq/m^3 (using the detector efficiencies automatically measured and stored previously by **NEXGAMMA-2** semi-automatic self-calibration procedure).

在每个峰值或兴趣区，净计数自动转换为浓度单位 pCi/L 或 KBq/m^3 (用先前由 **NEXGAMMA-2** 半自动半自标定程序测量并储存的效率)

The concentration and total activity released and MDA levels are continuously calculated and recorded. This real time information will alert the notification system. All data is saved to the hard drive in spreadsheet format.

Historical data is easily displayed on-screen and may be printed out with optional graphics printer in tabular or graphical format, showing quantitative information as well as trends. Data is recorded frequently providing excellent time-resolution.

Ethernet and USB ports (with security) provides easy access for archiving and further data analysis.

浓度,释放的总活性和 MDA 值持续计算并记录。这些实时信息将提醒通知系统。此外,所有的数据都以电子表格格式保存到硬盘驱动器中。历史数据很容易地在屏幕上显示出来并可以以表格或图形格式用图形打印机打印出来,显示定量信息以及发展趋势。数据频繁记录因此时间分辨率高。

以太网和USB接口(带保护)使得存档和进一步分析数据很容易。

Continuous, Reliable Data – YES, False Alarms – NO

连续可靠数据-是,虚报-无

Our systems have multiple layers of protections and redundancy in both the software and the physical act of reporting an alarm which prevents false alarms. This can include an optional alarm voting system providing activation of alarms only if all the data is consistent and conclusive. Data is continuously recorded to allow user interpretation.

Each alarm activates fail-safe relays. Relay contacts are available to user.

我们系统在软件和实际报警中带多层保护和多余度,防止假报警。包括报警表决系统,只有所有数据一致的和确凿的才报警,数据持续被录入以便用户解读。

每一次报警激活安全故障继电器。向提供用户继电器触片



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Optional

选择项

Triggered Aliquot: This feature automatically collects and stores a small water sample for independent analysis whenever an alarm or event of interest occurs.

触发等分: 在报警事件发生时此功能自动收集和储存小部分水样以独立分析。

Submersible Probe: For easy measurement in lake, river, or sump.

水下探头: 容易测量江河湖泊里的水

Sample Tank: Nominal 20 liter tank, please see list of **Pros and Cons - HOW TO SELECT THE OPTIMUM METHOD**

样品罐: 标出容量20升, 请见列出的优点和缺点-**如何选择最优方法**

SYSTEM INCLUDES: 系统包括:

UV Lamp: Used on inlet as algae-cide.

UV灯: 在入口处作为除藻剂

Flat Screen Monitor: LCD High Color Graphics

平面显示器: LCD高清晰彩色图像

Hard Drive: 1 Terabyte

硬驱: 1 TB

DATA Acquisition: Board and All Cables

数据采集: 卡和数据线

High Speed Ethernet access: LAN or SCADA hookup.

高速以太网: LAN或SCADA接口

Specialized software: Designed for Gamma Spectrum Detection; user friendly adaptability for your needs.

专用软件: 专为伽马图谱探测设计, 用户友好界面适合用户需要

Optional: MODBUS or other protocols.

可选择: MODBUS或其它协议

System flow rate 系统流量

Optional: Per Customer Requirement:
Very wide range of flow rates is available

可选: 用户订货时提出
不同流量供用户选择

Sample temperature standard: Up to 80° F liquid. (optional to higher temperatures)

样品温度标准: 液体80° F (可选更高温度)

Ambient temperature: 65° F - 100° F (wider temperatures ranges optional)

环境空气: 65° F - 100° F (可选更宽温度范围)

Optional: Cooler model Cool-33 for detector & sample is used in case of higher sample or ambient temperatures AND/OR for increased precision measurements.

选择: 更高样品或环境温度探头和样品, 或者增加测量精度可使用冷却器Cool-33。



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NOTE FOR SELECTION OF *INTRINSIC HPGe* DETECTOR ~ NEXGAMMA-2-G:

高纯锗 (HPGe) 探测器- NPP-H₂O-G or NPP-GAMMA-2-G:

NEXGAMMA-2-G System includes an installed Dewar to maintain HPGe crystal at proper temperature range.

此系统包括一个杜瓦保温器以确保HPGe在正常温度内

OPTIONAL: An electronic cryo-cooler is available.

选择: 电子低温器

A sample pre-Cooler-33-G is installed in the **NEXGAMMA-2-G** system.

此系统包含样品预冷器Cool-33-G

SIZE AND WEIGHT:

尺寸和重量

Dimensions:

One cabinet: 23" wide X 31" deep X 36" high including wheels

尺寸:

机箱 23" 宽X 31" 深 X 36" 高, 包括轮子

Wheels:

5" dia, high capacity, rugged wheels with lock & rubber tires.

轮子:

直径5", 带锁和橡胶胎高承重结实轮子

Shipping weight:

Standard unit: 250kg / 550 lbs - excluding shielding

邮寄重量:

标准: 380kg/837磅-不含屏蔽

NOTE:

Lead Shot for shielding can be shipped with instrument or shipped separately. Overseas customers may wish to buy locally.

注:

铅粒屏蔽可随仪器邮寄, 也可单独邮寄, 海外用户可就地购买

SPECIFICATIONS 规格	PARTICULATE DETECTOR 粒子探测器	PRINCIPAL DETECTOR CHOICES 主要探头	
Monitoring 监测	Pre-Filter 前置过滤器	Sample Flow 样品流	Sample Flow 样品流
Radiation Detected 探测辐射	GAMMA γ	GAMMA	GAMMA
Materials Monitored 检测物	Particulates 粒子	Water Borne Radioactivity 水中辐射物	Water Borne Radioactivity 水中辐射物
Scintillator Shape 闪烁体形状	2" x 2"	3" x 3"	3" x 3"
Scintillating Crystal 闪烁晶体	Nal (TI) Spectroscopic Grade	Nal (TI) Spectroscopic Grade 光谱级 Nal (TI)	Intrinsic HPGe 高纯锗
Shielding 屏蔽	None – Standard ½" Recommended 推荐½"	2" Standard 标准 2"	2" Standard 标准 2"



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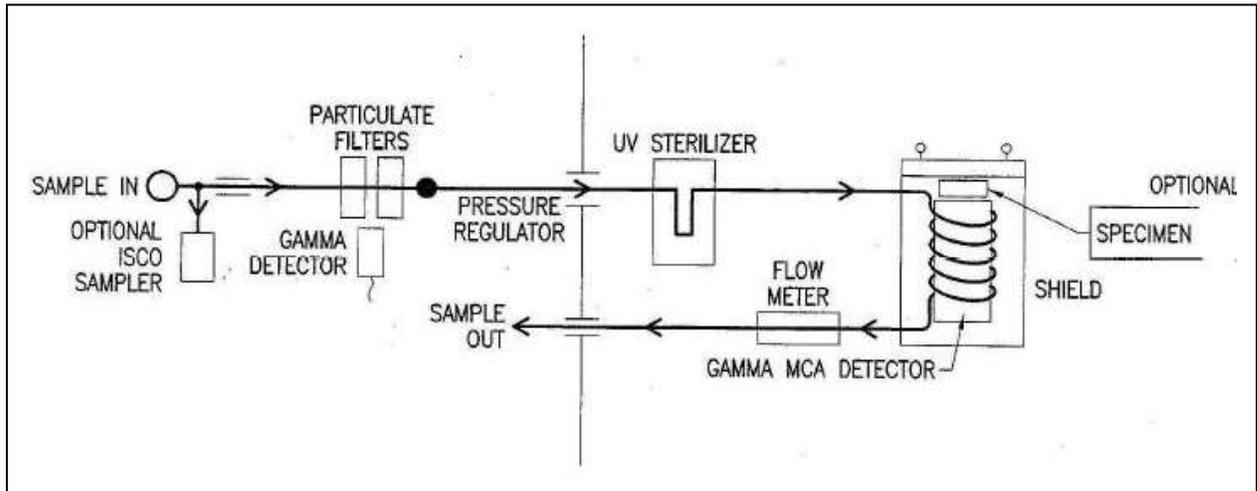
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MAIN SYSTEM FLOW CHART

系统主要流程图

FLOW PATH – STANDARD METHOD

流路-标准方法

1. Water Inlet port 进水口
2. ISCO Sampler (Optional) ISCO采样器 (选购)
3. Particulate Filter (with Gamma Detector)
粒子过滤器 (γ 探头)
4. Pressure regulator 压力调节器
5. Ultra Violet Sterilizer 紫外线杀菌器
6. Gamma spec shield 伽马屏蔽
7. Main Gamma Detector with MCA 多道分析仪伽马探头
8. Mass Flow Meter 流量计
9. Metering pump 计量泵
10. Discharge water is clean
and can go back into drinking water line.

排放水干净，可以排回到饮用水管路

- No liquid scintillant or reagents are added
- 无需添加液体闪烁体或试剂
- No toxic or radioactive waste of any kind.
- 无有毒或辐射废物



STANDARD – HELIX HOSE MODEL
标准-螺旋管



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