

GAMMA SILT & PARTICULATE RAW WATER MONITOR for DRINKING WATER FILTRATION & WASTEWATER SYSTEMS

Model Series– RAWA-GP (Gamma) & RAWA-BGP (Beta Gamma)

FEATURES:

- MEASURES **RAW WATER** AT OR BELOW EPA/DHS **PAG LEVELS** - *Protective Action Guideline Levels and Military Drinking Water Limits*
- DETECTS GAMMA SPECTRUM (MCA) Isotope Identifier
- AVAILABLE IN PORTABLE OR INSTALLED VERSION
- REAL TIME, IN-LINE, CONTINUOUS MONITOR
- HIGH SENSITIVITY IN SILT & PARTICULATES
 - ❖ DESIGNED FOR DRINKING WATER FILTRATION & WASTEWATER SYSTEMS
- NO REAGENT TANKS TO FILL
- NO WASTE STREAM
- EASY CALIBRATION
- PREVENT ACUTE HEALTH EFFECTS
- REDUCE RISK OF CHRONIC EXPOSURE

NOTE:

- THE WORLD'S ONLY PAG-LEVEL **RAW WATER** GAMMA MONITOR
- ADDITIONAL BETA DETECTOR (RAWA-BGP)
- FULL SCADA COMPATIBILITY



APPLICATION:

- ❖ Install **RAWA-GP** on your water inlet pipe of your water filtration system to automatically and continuously monitor drinking water 24/7 for any GAMMA radioactive contamination.
- ❖ Install **RAWA-BGP** on your water inlet pipe of your water filtration system to automatically and continuously monitor drinking water 24/7 for any BETA/GAMMA radioactive contamination.
- ❖ Monitor for contamination in silt and particulates of ground or surface **RAW WATER**.
- ❖ Monitor liquid waste stream from laboratory or plant **to maintain regulatory compliance**.
- ❖ Available as an add-on for TA's State-of-the-Art
NexGen-SSS Finished Water Monitor System.



**TECHNICAL ASSOCIATES
OVERHOFF TECHNOLOGY**

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Divisions of



US NUCLEAR CORP

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PROBLEM:

RAW WATER such as Wastewater and effluent streams potentially carry radioactive materials. Up until now direct measurement entailed pulling samples, taking them or sending them to a lab, waiting for results, and paying a high monetary price for the results. This is a labor intensive, not timely, and not cost effective manner in which to detect radiation in water.

SOLUTION:

For the first time in a **Continuous Real Time water monitor** the **RAWA-GP** solves this problem by continuously monitoring **RAW WATER** using a sensitive Gamma radiation detector. Monitor for both Beta and Gamma contamination with the **RAWA-BGP**.

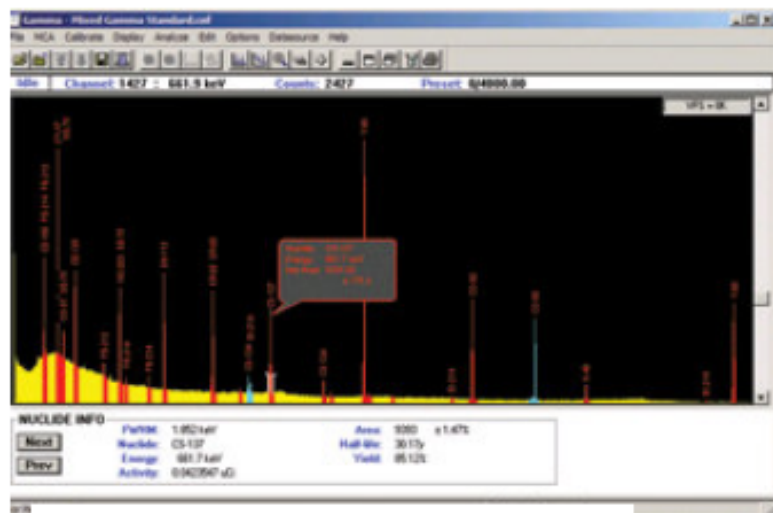
The information from this detector is analyzed and displayed in units of picoCuries per liter or other units of choice. The count times are user settable. Calculations are automatically updated every minute, every hour and every day. Measurements of radiation concentration and total discharge are logged 24 hr/day, 7 day/week. The longer update times correspond with greater precision and increased sensitivity. Using TA Tried and True sample collection & measurement technology this detector measures Gamma from silt & particulates in any radioactive liquids.

Both the **RAWA-GP** and the **RAWA-BGP** give high sensitivity measurement of Gamma and Beta emitting silts & particulates in **RAW WATER** with a built in Isotope Identifier.

Sensitivities in the daily updates meet or exceed the DHS **PAG (Protective Action Guideline Levels)** for drinking water.

GAMMA-MCA ISOTOPE IDENTIFIER

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DESCRIPTION:

Model **RAWA-GP** is a single detector water monitor /controller for measuring Gamma emitting radionuclides in **RAW WATER**. Model **RAWA-BGP** is a dual detector water monitor measuring both Beta and Gamma contamination in **RAW WATER**. The electronics are microprocessor with a full color monitor. The system is modular allowing changes or additions of functions at a later date, and allowing rapid repair by module replacement in the field. The system is covered by TA's full one year warranty. On-site service contracts available in many areas.

Optional detector shields have rugged housing for long useful life and easy decontamination. The Gamma detector is easily changed via disconnect fittings. All connections are sealed against leaks. The standard water moving system is based on a high precision pump. It has a 10 liter per minute capacity. System can also be operated using available water pressure in which case no pump is required.

A wide range of pump capacities are available to meet user specific needs. The entire system is typically mounted on the wall. A cart-mounted system is an available option. **Model Series RAWA-GP** 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 or battery operation is optional. The system's **RAW WATER** detectors and electronics are ruggedly built.

Detector:

RAW WATER is measured for Gamma or both Beta/Gamma-emitter content using a scintillation detector and an MCA analyzer with greater than 1,000 channels. The energy range is user settable. For example the MCA can be set for Gamma energy of 10 KeV to 3 MeV.

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 water.



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FLOW PATH:

- Water Inlet port
- Pressure relief valve
- Ultra Violet Sterilizer (Optional)
- Particulate Filter with Gamma Detector
- Flow Meter

FLOW PATH FEATURES:

- No liquid scintillate or reagents are added
- No additional toxic waste is generated.
- Tested water is clean and returns to the water source.

SAMPLE FLOW RATE:

System Flow Rate: 10 liters per minute
Optional: Wide range of flow rates is available

TEMPERATURE

System Sample: Up to 90° F liquid (optional to higher temperatures)
 Ambient: 65 - 100 ° F (wider temperatures ranges optional)
Optional: Cooler model **Cool-33** for detector & sample is used in case of Higher sample or ambient temperatures.



RAWA-GP Series is typically wall mounted as is the **NexGen-SSS** filtration system pictured above.

SPECIFICATIONS	RAWA-GP (Gamma Only)	RAWA-BGP (Beta & Gamma)
Radiation Detected	Gamma	Beta
Materials Monitored	Silt & Particulates	Silt & Particulates
Scintillator Shape	2" x 2" dia.	2" dia. x .02" thick
Scintillating Crystal	NaI TI (Sodium Iodide) Spectroscopic Grade or Optional LaBr ₃ (Lanthanum Bromide)	Beta Scintillation
Standard Shielding	None	None
Additional Shielding – Optional	½" Thick Coverage	½" Thick Coverage
Multi-Channel Analyzer	SmartPeak Detection Software	N/A



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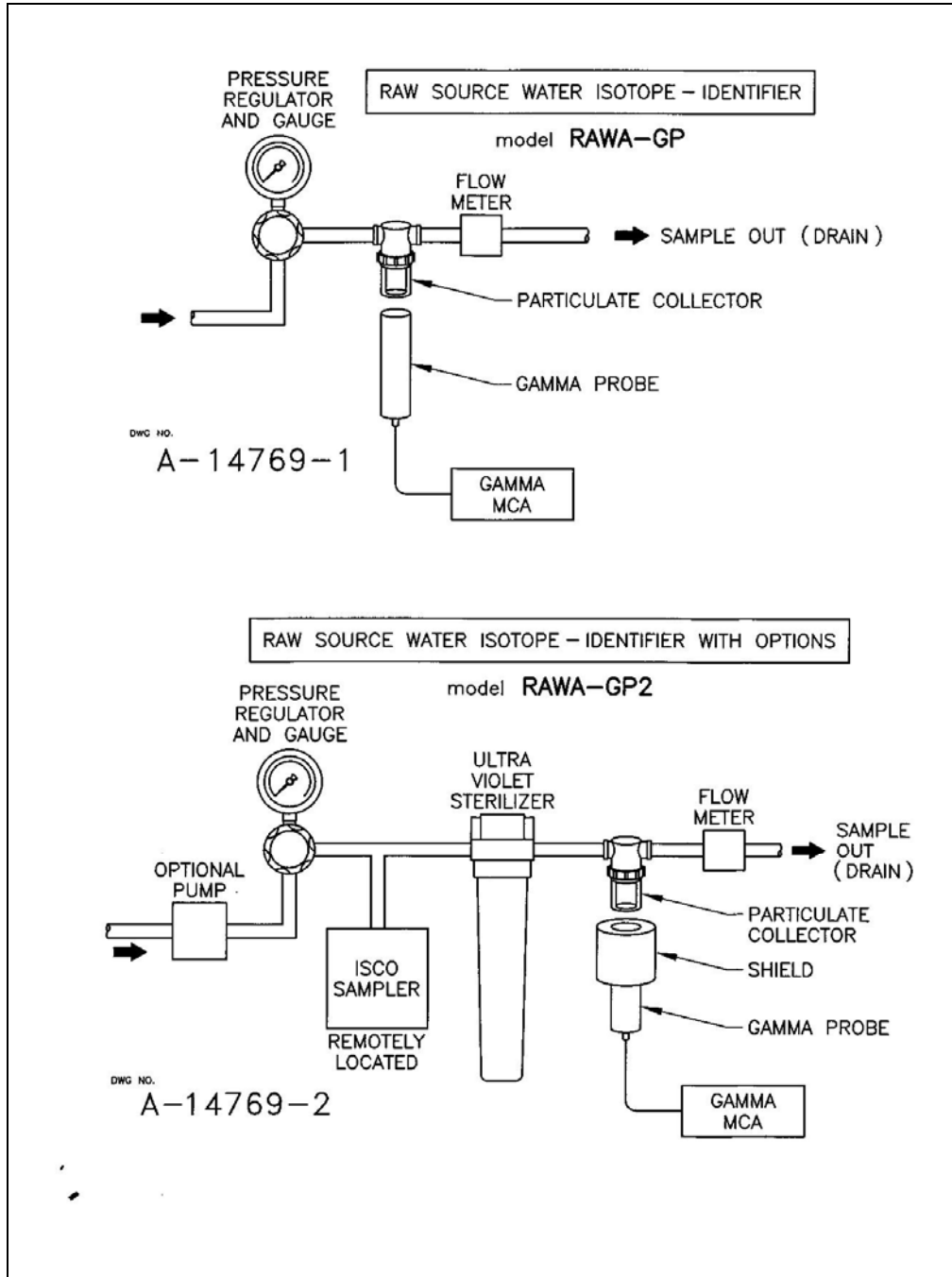
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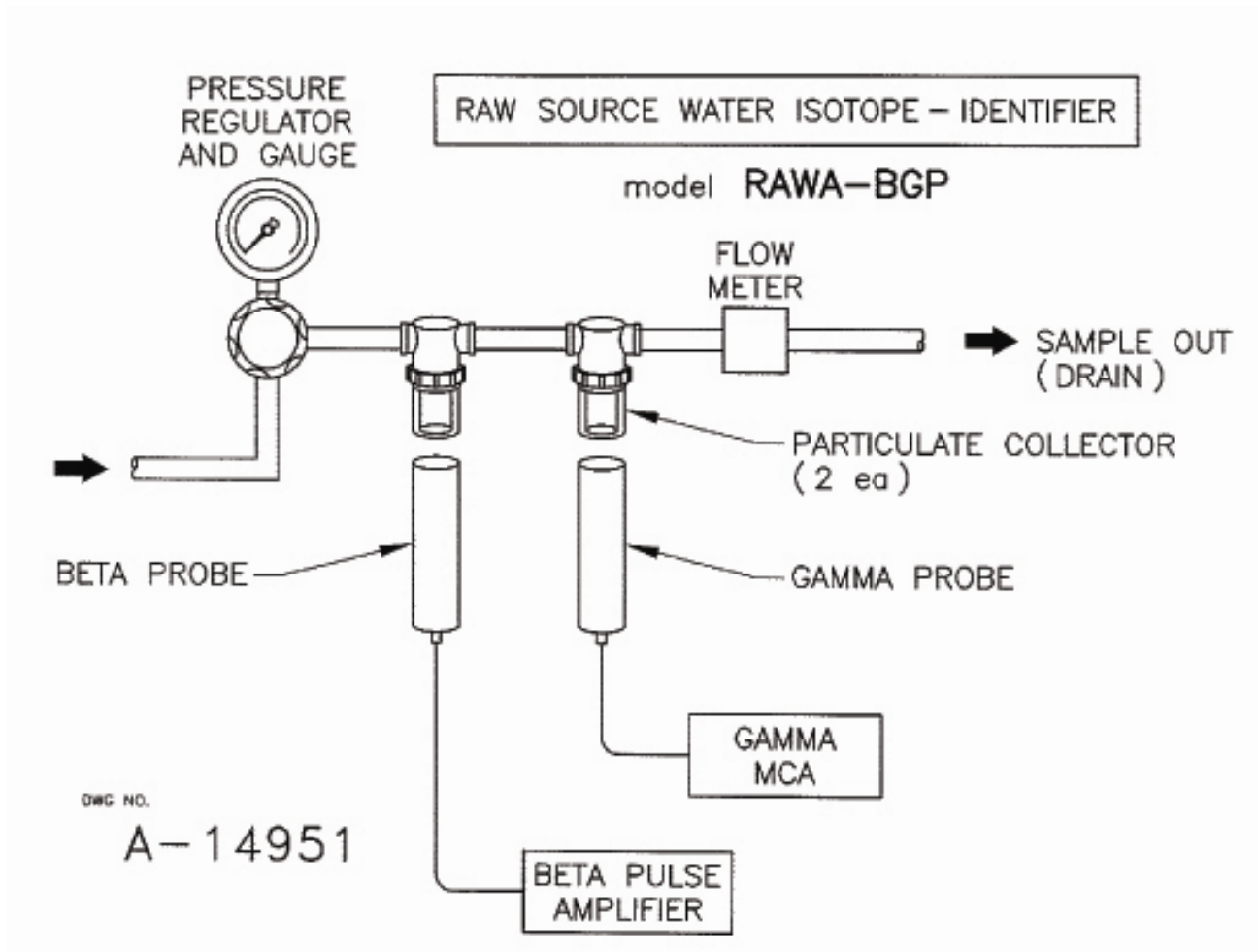
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DATA:-Analysis-Display-Data Storage & Transmission

- At each peak or area of interest, net counts are converted automatically to concentration units of picoCuries/liter (using the detector efficiencies automatically measured and stored previously by **RAWA-GP Series** semi-automatic self-calibration procedure.)
- 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 hard drive in spreadsheet format.
- Historical data is easily displayed on-screen and/or available for print in tabular or graphical format, showing quantitative information as well as trends. Data is recorded every minute providing excellent time resolution.
- On Board Data Storage
- USB / Ethernet Ports (with security) make it easy to archive and further analyze data.
- Continuous, Reliable Data – **YES** False Alarms – **NO**

ALARMS:

- Our systems have multiple layers of protections and redundancy in both the software and the physical act of reporting an alarm, preventing false alarms. An optional alarm voting system is available so that alarms will come on only if all the data is consistent and conclusive. The data is continuously recorded to allow human interpretation.
- **Alarms:** Each alarm activates fail-safe relays. Relay alarms are available to the user.

OPTIONAL:

- **Triggered Aliquot:** This feature automatically collects and stores a small water sample for independent analysis whenever an alarm or event of interest occurs.
- **UV Lamp:** Used on inlet as algacide.

3 GHz COMPUTER INCLUDES:

Ultra fast 3 GHz CPU

1 Terabyte

Flat Screen Color Monitor

High Speed Ethernet access for LAN hookup.

Specialized software designed for Gamma Spectrum Detection and user friendly adaptability for your needs.

Data from the 1024 channel MCA-Multi-channel analyzer is interfaced with a USB or Ethernet port.

Full SCADA compatibility.

Optional MODBUS or other protocols.

Stand alone system is standard.

Also available as an add-on for TA's State-of-the-Art NexGen-SSS Finished Water Monitor System.



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DIMENSIONS, WEIGHT, SHIPPING INFORMATION:

Dimensions: 31" wide x 8" deep x 30" high

Shipping Weight: Standard unit: 20 Kg -

SENSITIVITY CHART:

GAMMA DETECT	PAG LEVEL	LOWER LIMIT of SENSITIVITY TIME 30 Min 24 Hr	TOP OF RANGE	MAINTENANCE TIME	MAINTENANCE ACTION
Co-58	247,000 pCi/l	1,000 pCi/l 250 pCi/l	2×10^7 pCi/l	3-6 mos	Simple MCA check Replace Particulate Filter as needed
C-60	54,000 pCi/l	400 pCi/l 100 pCi/l	2×10^7 pCi/l	3-6 mos	Simple MCA check Replace Particulate Filter as needed
I-131	8,500 pCi/l	600 pCi/l 150 pCi/l	2×10^7 pCi/l	3-6 mos	Simple MCA check Replace Particulate Filter as needed

BETA DETECT	PAG LEVEL	LOWER LIMIT of SENSITIVITY TIME 30 Min 24 Hr	TOP OF RANGE	MAINTENANCE TIME	MAINTENANCE ACTION
Cs-137	13,600 pCi/l	1,200 pCi/l 200 pCi/l	2×10^7 pCi/l	3-6 mos	Replace Particulate Filter as needed
K-40	30,000 pCi/l	600 pCi/l 100 pCi/l	2×10^7 pCi/l	3-6 mos	Replace Particulate Filter as needed
Sr-90	6,500 pCi/l	200 pCi/l 15 pCi/l	2×10^7 pCi/l	3-6 mos	Replace Particulate Filter as needed

PARTICULATE FILTER MAINTENANCE:

- ❖ A full particulate filter will alarm the flow meter and need to be flushed, cleaned, or replaced.
- ❖ During periods of exceptionally high turbidity the particulate filter will need to be flushed, cleaned, or replaced daily.



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