



Wide Range Area Monitor

Model FM-9W Series

FM-9W Read Out Hub

Features

- Single or Multi-Detector System
- Single Read Out Serves Multiple Detectors
- Detects Beta, Gamma, X-Ray
 - » Optional Neutrons
- Plug In Modular System
- On-board Data Archive and Retrieval
- Wall Mount Case
- Highly Sensitive
- Local or Remote Monitoring
- User Settable A / V Alarm
- USB and Ethernet Ports
- Relay Control Can Lock Doors, Trigger Siren or Send Alert

Application

For use in and around nuclear reactors, hot cells, irradiators, and other facilities handling radioactive materials or x-ray equipment.

Description

TA's FM-9W Area Monitor Series are rugged and ideal for either laboratory or industrial application. AC Operation. These versatile radiation control instruments fill a varied list of applications and placement needs.

The FM-9W Area Monitor Series utilize a variety of probes including Technical Associates P & S series, Geiger, and Scintillation. The many choices in probes provide instrumentation will fit your need.

- User settable to preferred engineering units: mR/h; Sv/h, cpm, etc.

MODEL	DETECTOR	TYPE	DETECTS ~~~ DETAILED DESCRIPTION OF EACH FOLLOWS
FM-9W-I-1	IC-1	Ion Chamber	Beta & Gamma OPTIONAL - Neutron
FM-9W-I-2	IC-2	Ion Chamber	Gamma Only
FM-9W-G-13	PG-13	GM Detector	Beta & Gamma
FM-9W-G-15	PG-15	GM Detector	Alpha, Beta, Gamma, X-Ray
FM-9W-G-21	P-21	GM Detector (T-1219)	Gamma Only (High Range)
FM-9W-G-24S	P-24	GM Detector (Submersible)	Gamma Only (High Integrity Vapor Tight)
FM-9W-S-3	PGS-3	Scintillation Detector	Gamma
FM-9W-S-3L	PGS-3L	Scintillation Detector	Gamma



TECHNICAL ASSOCIATES OVERHOFF TECHNOLOGY

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DIVISIONS OF



USNUCLEARCORP

OTCQB-UCLC

Wide Range Area Monitor

Model FM-9W Series

Ion Chamber

Advantages:

- Energy Independent:
- Reads out directly in True Dose Rate in (mR/h or Sv/h)
- Very wide operating range
- Long life
- Can be used to very high dose rates, some to 106 R/h

Disadvantages:

- Tends to cost more
- Does not see low ranges

MODEL	DETECTS	DETECTOR	RANGE / SENSITIVITY
FM-9W-I-1	Beta	Ion Chamber IC-1	0.1 – 10,000 mR/h 5 Decades is Standard, Other ranges available up to 5 Decades Down to 0.15 MeV Energy independent ($\pm 25\%$) 0.4 KeV to 7 MeV ~~~~~
	Gamma		0.1 – 10,000 mR/h Down to 2 KeV; Energy independent ($\pm 15\%$) 4 KeV to 6 MeV
FM-9W-I-2	Gamma	IC-2	Down to 10 KeV; Energy independent ($\pm 15\%$) 20 MeV to 7 MeV

IC-1 & IC-2

Operating range between -30°C and 65°C; drift less than -0.4% per°C at room temperature. 0-95% humidity non-condensing.

Detector: Air equivalent ion chamber. Standard systems use **Model IC-2** (for Gamma) or **Model IC-1** (for Beta-Gamma).

Both models have graphite lined phenolic walls and an active free air volume of 2 liters.

Optional high range systems use smaller chambers. Detector is supplied with 8 ft. cable (up to 500 ft. of cable can be supplied as an option).

Optional Neutron detector **IC-1-N**



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Wide Range Area Monitor

Model FM-9W Series


Ion Chamber

Advantages:

- Inexpensive
- Reasonably Rugged
- Not subject to noise or signal interference
- Measures down to background and below

Disadvantages:

- Only goes to 4 Decades
- Energy dependent unless used with an energy compensator

MODEL	DETECTS	DETECTOR	RANGE / SENSITIVITY
FM-9W-G-13	Beta & Gamma	GM Detector P-13	20 µR/h – 200 mR/h (±20%) 40 KeV to 1.25 MeV
<p>Side-viewing, energy compensated GM Probe with a 30 mg/cm² wall. Energy response: ±40 KeV to 1.25 MeV ±20%. Housing: High impact plastic, which is splashproof and rugged. Dimensions: 1-3/8" dia. x 6" long.</p>			
FM-9W-G-15	Alpha, Beta, Gamma, X-Ray	P-15	20 µR/h – 100 mR/h Background normally 50-60 cpm Alphas - >4.5 MeV Betas – >50 KeV X-Rays – >5 KeV
FM-9W-G-21	Gamma Only	T-1219 - P-21	T-1219
FM-9W-G-24	Gamma Only Submersible	P-24	High Integrity, Vapor Tight
			
<p>Alpha, Beta, Gamma Probe (GM) for rapid checking of laboratory bench and equipment surfaces and for checkout of personnel. Dimensions: 1-3/4" diameter mica window, 1.5 mg/cm² <u>pancake tube</u>. Window: Protected by a 79% open, grill to prevent puncture or other damage while presenting minimum absorption to incoming radiation. Background: Normally 50 to 60 counts per minute. Extremely sensitive to Alphas >4.5 MeV (Betas > 50 KeV). Detects 5 KeV X-Rays and above</p>			



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PGS-3 & PGS-3L

Scintillation Probe

Advantages:

- Ultra-Sensitive to low levels – FM-9W all models
- Can be used for energy spectrum readings:
 - with single channel analyzer (with FM-9W-SCA) or
 - multi-channel analyzer (with FM-9W-MCA)
 - with or without isotope identification.

Disadvantages:

- More expensive
- Contains fragile elements including:
 - scintillation crystal
 - photomultiplier tube
- GAMMA only due to packaging constraints

MODEL	DETECTS	DETECTOR	RANGE / SENSITIVITY
FM-9W-S-3	Gamma X-Ray	Scintillation Probe PGS-3	1 uR/h to 10 mR/h 25 KeV
Gamma Scintillation Probe High Gamma sensitive crystal (NaI(Tl)). Crystal Size: 1" diameter x 1" long hermetically sealed crystal optically coupled to photomultiplier tube. Gamma Sensitivity: 100 times greater than GM tubes Additional Sensitivity: X-rays > 25KeV Recommended Electronics: FM-9W			
FM-9W-S-3L	Gamma X-Ray	PGS-3L	0.5 uR/h to 5 mR/h 25 KeV
Gamma Scintillation Probe High Gamma sensitive crystal (NaI(Tl)). Crystal Size: 2" diameter x 2" long hermetically sealed crystal optically coupled to photomultiplier tube. Gamma Sensitivity: 8 times greater than PGS-3 . High sensitivity dictates use of instruments allowing high count rates, or having background suppress circuits, or a pulse height selection circuit. Additional Sensitivity: X-rays > 25KeV Recommended Electronics Enhancements: FM-9W-SCA or FM-9W-MCA			



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SCINTILLATION PROBE AREA MONITOR ELECTRONICS			
MODEL (Recommended Electronics)	FM-9W GM	FM-9W-SCA SCINITLLATION ONLY	FM-9W-MCA
HIGH SENSITIVITY	YES	YES	YES
ENERGY WINDOW (Area of Interest)	NO	YES	YES
FULL SPECTRUM DISPLAY	NO	NO	YES
ISOTOPE IDENTIFICATION	NO	SINGLE ISOTOPE	MULIPLE ISOTOPE (Optional)
RECOMMENDED PROBE	PGS-3	PGS-3 or PGS-3L	PGS-3L

Specifications

Electronics:

Engineering Units:

User can input correct conversion factor and change to any units.

Controls: Front Panel:

On-Off, Alarm-mute, Rate, Integrate, Reset, Digital

Recessed or Internal:

Discriminator level, high voltage. Other adjustable settings: See calibration.

Input Sensitivity:

Adjustable from less than 1 millivolt to 100 millivolt

Anti-saturation and Dead-time Corrections are available.

Alarm:

2000 Hz audio tone with Audio "mute" switch + RED LIGHT

High current relay. 0-100% of full scale.

Alarm Set Point:

User settable to any point on detector range.

Serial Output:

Two way USB standard, Ethernet optional.

Power:

105-125 volts, 50-60 Hz (220 V optional)

Construction:

Gasketed aluminum case.

Cables:

User Specified

Dimensions and Weight:

13.5" W X 11" H X 3.6" D (25 cm x 18 cm x 10cm), excluding probe holder, feet, and knobs.
3 pounds (1.4 kg) including batteries and hardware, excluding probe.

Detectors:

Probe Holder: Probe Holder is provided for probe purchased.

Any GM (such as P-13, P-15, P-6LB, etc.) or



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Alpha, Beta, Gamma or Neutron Scintillator (such as PAS-8, PAS-9, PGS-3, PNS-19, etc.).
Choose Any TA or Compatible Probe



•Over 50 different T/A probes and sample counter detectors
Probe holder supplied - no charge if probe and FM-9W purchased together


DESCRIPTION	RADIATION DETECTOR
A. PG-LB. Low Background GM	Alpha, Beta, Gamma, X-ray
B. PAS-9. 100 cm ² Scintillator	Alpha
C. PGS-3 Scintillator	Beta, Gamma
D. COL-3S Collimator	NA
E. PLS-04. Wound Monitor	Pu-239
F1. IC-1 Ion Chamber F2. IC-2 Ion Chamber F3. DMU-1000. Submersible Ion-Chamber	Beta, Gamma, X-Ray Gamma Area Monitor Nuclear Plant Fuel Rods
G. P-15. Surface Monitor GM	Alpha, Beta, Gamma, X-ray
H. STB-TF-6. Sample Counter	Tritium, C-14
I. TS-26. Surface Monitor	Tritium, C-14
J. PN-13. Rem Ball	Neutrons
K. Silicon (Not Shown)	High Flux Beta - Gamma



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