



FM-9 ELECTRONICS



# Neutron REM Area Monitoring System

Model: FM-9-REM

## Application

Neutron Area Monitoring in and around nuclear reactors, accelerators, neutron sources and generators, etc.

## Description

The FM-9-REM provides dependable, accurate digital Electronics and Readout, Power Supply, Alarm Module.

## Features

- On-Line, Real-Time Neutron Monitoring
- All Plug-In Modular
- Installed or Rack Mount
- Single or Multi-Channel
- Local or Remote Monitoring
- High Level Alarm, Solid State, Non-Contacting
- Data Archive and Retrieval
- RS-232 Output
- Remote Display
- On Board: Data Measurement and Display

The energy compensated  $\text{BF}_3$  Probe offers Neutron sensitivity from thermal to  $>100$  MeV, and close following of true REM response from thermal to  $>7$  MeV along with high Gamma rejection. The plug-in modular construction, allows for additional channels to be added.

The built-in anti-saturation circuit prevents the system readings from falling off scale during an over-range condition. High level alarm can be set at any point on the scale. Activation produces flashing red light on front panel and piercing intermittent 2000 Hz tone. Relay. It can also be closed (or opened) for activation of remote alarms.



## TECHNICAL ASSOCIATES OVERHOFF TECHNOLOGY

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## Specifications:

### Electronic Modules Include:

<b>MV-5.12.24:</b>	Power Supply
<b>MAC-9:</b>	Air Control Timer; Low Flow Alarm Flowmeter
<b>FM-9:</b>	On Board computer with color monitor
<b>M<math>\mu</math>P:</b>	Imbedded processor
<b>Readout:</b>	7" Color LCD monitor built-in for digital and graphic user data display.
<b>Power:</b>	110-220 AC (Optional 230 AC)

<b>Range:</b>	5 decades 0.1 mRem to 10 Rem/h.
<b>Accuracy:</b>	$\pm 10\%$ of decade. $\pm 1$ count.
<b>Controls:</b>	High Level Alarm Set                      High Voltage Adjust (internal) Intermediate Level Alarm Set      Power On-Off Switch Alarm Reset Push Button

**Time Constant:** Varies inversely with count rate.

**Output:** RS-232 - User Settable.

**Detector:** Moderated proportional BF3 neutron tube. Supplied with 8 ft. cable.

**Detector Response:** Neutrons from thermal to  $> 100$  Mev. Energy matched by LASL designed moderating sphere to ICRP tissue response curve from thermal to above 7 MeV.

**Energy Dependence:** Closely follows true REM curve from thermal to above 7 Mev.  
Sensitive to  $> 100$  Mev.

**Environmental Temperature:** Operating range between  $-30^{\circ}\text{C}$  and  $65^{\circ}\text{C}$ ; 0-95% humidity non-condensing.

**Data Processing:** Counts energy compensated pulses to give direct mRem/hr  
(or other presettable unit e.g.  $\mu$  Sv/h.) RS-232 output.

**High Level Alarm:** Activated when count rate exceeds set point.  
High-level red light on front panel goes on in addition to Beeper.  
(Latching or Unlatching)

**Intermediate Level Alarm:** Level settable below High Level Alarm to warn of unusual RAD level before alarm level is reached.

Amber light on front panel goes on in addition to sonalert. (Not latching)

**Anti-Saturation:** Circuitry prevents readings from falling below full scale in over-range conditions.

**Line Operation:** 105-125V (or 200-240 V), 50-60 Hz.

### Weight and Dimensions:

**Dimensions:** Electronics: 120" W x 13" H x 18" D (50 cm x 33 cm x 45 cm).  
Probe: 10" round by 16" H.

**Weight:** Console: 20 lbs.

Probe: 20 lbs.

**Mounting:** Electronics are normally furnished in FM-9 case but can be furnished uncased with mounting bars for rack or Nema 4 (hostile environment) cabinet.



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## Options:

**Emergency Power:** Stand-by batteries automatically take over providing approximately eight hours operation in the event of AC power failure. Battery life will be shortened in alarm conditions.

Multiple channel systems.	Standby batteries.
Solenoid activated check source for system calibration.	Cable to 500 feet.
Remote alarm-flasher-howler	Power Input 12V DC or 200-240V 50-60 Hz.
Remote readout with alarm.	



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