The RAM DA 2000 Meter

Portable Radiation Survey Meter with external probes for all kinds of Radiation

Features
- Large, easy to read, illuminated, digital & analog custom made LCD
- Unique algorithms to achieve fast response and stable readings
- Optional Bar code laser for location identification of reading
- Built-in memory to store measurements data
- RS232 communication port
- SMARTS and RMV software compatibility
- Automatic self-test of meter and detector
- Various types of external detectors
- Automatic detector identification
- No need for re-calibration with each detector change
- Wide range internal gamma detection tubes
- Autoranging
- Automatic recording of dose accumulation
- Freeze mode to record highest dose rate
- Manually set threshold alarm
- Low battery, overflow and failure alarms
- Two alarm relay contacts for external interface
- Versatile: Can function either as ratemeter or scaler
- CC marked

Description

RAM DA-3-2000 is a further development of the RAM series, a family of versatile, user friendly meters and detectors designed to give highly reliable alpha, beta, gamma and X-ray measurements. The RAM DA-2000, a microprocessor based meter, includes an internal detector with two energy compensated GM tubes 2P1201 and 2P1313 (Air kerma dose equivalent) or 2P1202 and 2P1314 (Ambient dose equivalent (H+10)) for wide range gamma fields measurement, from 0.5 µSv/h to 1 Sv/h (50 µR/h to 100 R/h). Meters are available in either Sievert or Roentgen measuring units.

The RAM DA-2000 provides a straightforward, fast and reliable method to collect and store monitoring data on site for later use. The measurements’ data, date and time, are stored in a built-in memory. The stored data records can be downloaded by the SMARTS (Survey Mapping Automatic Radiation Tracking System) or the RMV (ROTEM Meter View) software packages. The RAM DA-2000 is ideal for use in nuclear power plants, nuclear medicine, radiography and radiotherapy facilities, life science laboratories, nuclear research centers and in other industrial applications.

Technical Data

Display
- LCD readout showing:
  - 20-segments autotransfering analog scaled bargraph
  - Four digits for accurate and easy readout
  - Two digits for identifying type of detector connected
  - Operating conditions, including:
    - measuring units
    - freeze, dose, or count modes
    - detector failure, exceeding of threshold, low battery
    - display illumination on/off
    - audible indicator on/off

Measuring units
- cps, cpn, counts, Sv/h, Sv (R/h, R), other units upon request.
- The measuring unit and display range are set automatically for each type of detector, and the measuring unit can be also changed manually.

Power source
- Three 1.5 V C-type cells
- 150 hours minimum continuous operation with alkaline batteries (excluding display lighting), using internal detector: 100 hours with all other external detectors
- Automatic battery check under full load
- Option: 3 rechargeable C-type cells & charger, or 4.5 VDC external adapter

Temperature range
- Operation: -10ºC to +50ºC (15ºF to 122ºF)
- Storage: -20ºC to +60ºC (-5ºF to +140ºF)

Humidity range
- 10% to 95% RH (non-condensing)

Casing
- Splash-proof plastic case

Dimensions
- Width: 142 mm (5.6”)
- Length: 244 mm (9.6”)
- Height: 115 mm (4.5”)

Weight
- 1.5 Kg (3.3 lb) including batteries and internal detectors

Data logging
- 347 data records (1415 with extended memory)

Communication
- Serial communication port (RS232)

Laser scanner
- Class II, maximum power 1.0 mW

Relays
- Two relay contacts: fail alarm, threshold alarm

Memory
- E2EPROM for the meter parameters

Internal Detector (RAM DA-3-2000)

Measuring range
- 0.5 µSv/h to 1 Sv/h (50 µR/h to 100 R/h)

Display range
- 0.01 µSv/h to 1 Sv/h (1 µR/h to 100 R/h)

Accuracy
- ±10% of reading
- * Energy response
  - ±30% over the range of 50 keV to 1.3 MeV
  - ±20% over the range of 60 keV to 1.3 MeV
- Angular dependence
  - ±20% for ±45º of preferred direction

* related to 137Cs

Ordering #
- RAM DA-2000: 2-0030-10
- RAM DA-3-2000: 2-0033-10

ROTEM INDUSTRIES reserves the right to change specifications without advance notice.
### RAM DA-2000 Series - Multi-Purpose Survey Meter

The RAM DA-2000 series was developed to solve the problem of rapid instrumental obsolescence. The flexibility and modularity of the RAM DA makes it possible to meet the highest standards of safety, by using different types of detectors for different applications.

#### Main Detectors for RAM DA-2000

**PM-11 Detector**
- **Applications:** Nuclear Power Plants, nuclear and medical research centers, H.P. departments, radiology clinics, radiation and environmental protection offices.
- **Specifications:**
  - Gamma (320 cpm/Bq/cm)
  - Beta (40 cpm/Bq/cm)
  - Neutron (90 cpm/Bq/cm)
  - Optional: Infrared and Ultraviolet.
  - **Measuring Range:**
    - Surface: 0 to 50,000 cps
    - 0.5 µSv/h to 10 mSv/h (50 µR/h to 100 R/h)

**PM-10 Detector**
- **Applications:** The PM-10 Detector is specifically designed for the measurement of fast neutrons and gamma rays. It is ideal for monitoring neutron contamination.
- **Specifications:**
  - Gamma (800 cpm/Bq/cm)
  - Neutron (200 cpm/Bq/cm)
  - **Measuring Range:**
    - Surface: 0 to 42,000 cps
    - 1 µSv/h to 500 mSv/h (0.1 mR/h to 50 R/h)

**PA-100 Detector**
- **Applications:** The PA-100 Detector is designed for the measurement of low-level gamma rays and neutrons. It is ideal for monitoring neutron contamination.
- **Specifications:**
  - Gamma (200 cpm/Bq/cm)
  - Neutron (50 cpm/Bq/cm)
  - **Measuring Range:**
    - Surface: 0 to 10,000 cps
    - 0.5 µSv/h to 10 mSv/h (0.05 mR/h to 1 R/h)

### GM-40 Series (GM-41, GM-42)

**GM-40 Detector**
- **Applications:** The GM-40 is a multi-range, “SMART” survey meter. It is designed for the measurement of gamma rays and neutrons. It has a wide range of applications, including nuclear power plants, nuclear and medical research centers, and radiation and environmental protection offices.
- **Specifications:**
  - Gamma (5 mR/h to 100 R/h)
  - Neutron (25 mR/h to 1000 R/h)
  - **Measuring Range:**
    - Surface: 0 to 50,000 cps
    - GM-40: 250 µSv/h to 10 Sv/h
    - GM-41 Area Monitoring Channel
    - GM-42 Area Monitoring Channel
  - **Applications:** Used in the Cyclotron vault and in the Hot Cells. Can be set to report activity and is ideal for monitoring the area before the material is removed from the hot cell into the punched containers.
  - **Measuring Range:**
    - Surface: 0 to 50,000 cps
    - GM-40: 250 µSv/h to 10 Sv/h
    - GM-41: 0.5 µSv/h to 10 mSv/h (0.5 mR/h to 10 R/h)
    - GM-42: 0.1 μSv/h to 10 mSv/h (0.01 mR/h to 1 R/h)

### GM-10 Detector
- **Applications:** The GM-10 Detector is designed for the measurement of gamma rays and neutrons. It is ideal for monitoring neutron contamination.
- **Specifications:**
  - Gamma (40 cpm/Bq/cm)
  - Neutron (10 cpm/Bq/cm)
  - **Measuring Range:**
    - Surface: 0 to 10,000 cps
    - 0.5 µSv/h to 10 mSv/h (0.05 mR/h to 1 R/h)

### TelePole: GM-40 Meter on an extendable pole

The TelePole is a microprocessor-based telescopic radiation meter. It is designed for the measurement of gamma rays and neutrons. It has a wide range of applications, including nuclear power plants, nuclear and medical research centers, and radiation and environmental protection offices.
- **Applications:** Used in the Cyclotron vault and in the Hot Cells. Can be set to report activity and is ideal for monitoring the area before the material is removed from the hot cell into the punched containers.
- **Features:**
  - Energy-compensated GM tube.
  - High sensitivity.
  - Automatic detector identification and selection of readout units.
  - Two output relay contacts for threshold and failure alarm.
  - Automatic detector identification and selection of readout units.
  - **Measuring Range:**
    - Surface: 0 to 42,000 cps
    - GM-40: 1.0 µSv/h to 250 mSv/h
    - GM-41 Area Monitoring Channel
    - GM-42 Area Monitoring Channel
  - **Applications:** Used in the Cyclotron vault and in the Hot Cells. Can be set to report activity and is ideal for monitoring the area before the material is removed from the hot cell into the punched containers.
  - **Measuring Range:**
    - Surface: 0 to 42,000 cps
    - GM-40: 1.0 µSv/h to 250 mSv/h
    - GM-41: 0.1 μSv/h to 10 mSv/h (0.01 mR/h to 1 R/h)
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### PET Monitoring and Nuclear Medical Departments

Our Area Radiation Monitoring is based on the proven, highly reliable radiation detectors, Data Processing Units and Universal Computer Software. The system provides real-time or time-lapse data collection. The data is used for both radiation safety and improving the site operation.

- **Features:**
  - Stack Monitoring with quantitation activity release measurement.
  - Production Monitoring.
  - Area Monitoring.
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**TeleMap Online Monitoring System**
A modular system, used in nuclear power plants, to collect radiation levels on-line for instant appraisal. The TeleMap system is designed to measure and collect radiation data automatically and continuously from cyclotron facilities, radionuclidemetry laboratories, treatment rooms and PET Centers. Radiation is monitored using different types of detectors and results are transmitted through a series of monitoring channels to a central computer located in the control room.
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- Energy response ±30% over the range of 50 keV to 1.3 MeV
- Angular dependence ±20% for ±45° of preferred direction

Internal Detector (RAM DA-3-2000)
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- Display range 0.01 µSv/h to 1 Sv/h (1 µR/h to 100 R/h)
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