

Micro Rem/Sievert

Tissue Equivalent Survey Meter



The Micro Rem and Micro Sievert models are lightweight, portable survey meters for applications where accurate dose rate measurements of low radiation levels are required. Accurate down to background levels, the Micro Rem and Micro Sievert read absorbed dose rate directly so no conversion from mR/h is required.

The tissue-equivalent scintillator used in the Micro Rem and Micro Sievert gives them a nearly flat, rem energy response. This rem response is based on the deep dose equivalent index for 1 cm (0.39") depth, uniparallel directional beam as calculated on the ICRU standard sphere.

These instruments give tissue equivalent photon response for x-ray and gamma radiation from environmental levels of 0-20 $\mu\text{rem/h}$ (0-0.2 $\mu\text{Sv/h}$) full scale up to normal survey levels of 200 mrem/h (2 mSv/h) full scale.

Rugged construction and quality components make the Micro Rem and Micro Sievert durable, and they are easy to service. Internal components are laid out on modular circuit boards. Span, HV and calibration pots (one for each range) are clearly marked.

The HV check assures you that the high voltage required for proper operation of the detector is supplied. This is important for accurate readings.

Two 9-volt batteries power the instrument. You can check their condition with a control switch setting.

APPLICATIONS

- Routine low/medium level gamma dose rate surveys
- Confirming radiation boundaries
- Monitoring items for unrestricted release
- X-ray surveys, using the expanded low energy range option

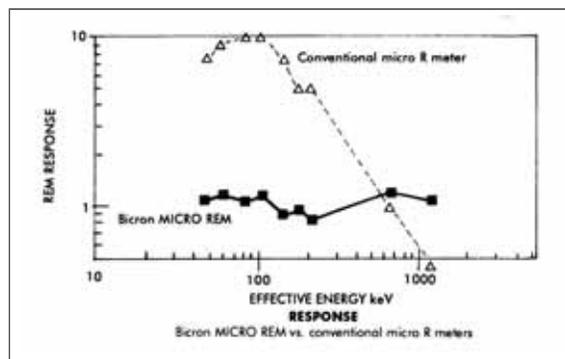
Options

You can "customize" your instrument with practical options to match the requirements of your survey situation. Options can be combined for maximum versatility.

The expanded low energy response option extends the instruments low energy cutoff to 17 keV (vs 40 keV for the standard instruments).

The extended detector option mounts the internal detector so that its sensitive area extends out from the front of instrument case bottom. This makes it easier for you to survey certain hard-to-reach locations.

- Flat energy response
- Tissue equivalent scintillator
- Gamma and x-ray detection
- Optional audio counts and alarms
- Extended detector option
- Expanded low-energy response option
- HV/ battery check



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The rem response and accuracy set the Micro Rem and Micro Sievert apart from conventional "micro R" meters which use NaI(Tl) detectors. NaI(Tl) detectors over-respond to low energies and produce erroneously high readings. Also, with conventional "micro R" meters the user must to convert $\mu\text{R}/\text{h}$ readings to $\mu\text{rem}/\text{h}$ to get absorbed dose.

SPECIFICATIONS

Power Reactors:	Because of its sensitivity and accurate readings, you can use the instrument for setting the boundaries of specific dose rate areas. The over-response of micro R meters often leads to unrealistic boundaries (through buildings, past a fence line, etc.).	
X ray Device Monitoring:	A MICRO REM or MICRO SIEVERT, with its expanded low energy response option, meets or exceeds the instrumentation requirements of 21 CFR 1020.10 and 21 CFR 1020.40. You can use one to survey color TV monitors and all cabinet X-ray systems.	
Uranium Processing/ Mining Cleanup Operations:	The tissue equivalency (rem response) of a MICRO REM or MICRO SIEVERT produces much more accurate environmental measurements than do micro R meters.	
Additional Applications:	The instrument has many uses for environmental measurement companies, consultants, geophysical companies, laboratories and accelerators.	
Radiation Detected:	Gamma and x-ray, 40 keV to 1.3 MeV	
Detector:	Internal, tissue equivalent, organic scintillator.	
Range: Five linear ranges:		
	MICRO REM:	MICRO SIEVERT:
Range:	$\mu\text{rem}/\text{h}$	$\mu\text{Sv}/\text{h}$
X0.1	0 to 20	0 to 0.2
X1	0 to 200	0 to 2
X10	0 to 2000	0 to 20
X100	0 to 20,000	0 to 200
x1000	0 to 200,000	0 to 2000
Accuracy:	Within 10% of reading for ^{137}Cs between 20% and 100% of full scale on any range.	
Energy Response:	See energy response curve.	
High Voltage:	Electronically stabilized, factory set during calibration, with check band on the meter.	
Warmup Time:	None.	
Response Time:	Optimized for each range, 0 to 90% of final reading as follows:	
	Range:	Time:
	X0.1	<15 seconds
	X1	<15 seconds
	X10	<5 seconds
	X100	<2 seconds
	x1000	<2 seconds
Temperature:	Operational from $-20\text{ }^{\circ}\text{C}$ to $50\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$ to $122\text{ }^{\circ}\text{F}$).	
Humidity:		
Battery Complement:	Two 9-volt, MN1604 or equal.	
Battery Life:	>100 Hours.	
Geotropism:	Within + 2% of full scale.	
Shock:	100 g per lightweight machine of MIL-STD 202 C, method 202 B.	
Vibration:	5 g in each of three mutually orthogonal axes at one or more frequencies from 10 to 33 Hz.	
Meter Reset Button:	Allows meter to reset to "0" for repeat measurement.	
Display:	Ruggedized, recessed, high-torque 1 mA meter protected by impact resistant Lexan polycarbonate window with 85.1 mm (3.35") scale marked: MICRO REM: 0-200 $\mu\text{Sv}/\text{h}$, with 'Bat. ok', 'HV ok' check bands. MICRO SIEVERT: 0-2.0 $\mu\text{Sv}/\text{h}$, with 'Bat. ok', 'HV ok' check bands.	
Control:	Eight position rotary switch: Off; Bat. (checks the condition of the batteries); HV (Audits the detector high voltage); X1000, X100, X10, X1, X0.1 (Counting ranges = multiply the meter reading by these figures).	

