ANSI N42.17A-1989 TEST RESULTS

MODEL 177-61 ALARM RATEMETER with MODEL 44-9 PANCAKE G-M DETECTOR

TEST NOTES

- Test groups included five or more instrument sets.
- NT = Not Tested
- N/A = Not Applicable

GENERAL CHARACTERISTICS

Characteristics Under Test	Range of Values of Influence Quantities	Limits of Variation	Pass / Fail
AC Power	102-132 VAC 178-238 VAC	Reading cannot vary by more than plus or minus 5%	Pass
Battery Power	0 - 100 hours	Reading cannot vary by more than plus or minus 10%	N/A
Battery Power Indicator	Test performed at the voltage that triggers the battery failure indication	Reading cannot vary by more than plus or minus 10%	Pass
AC powered instrument with battery backup	Instrument must be marked for battery endpoint		Pass
	Test performed at the voltage that triggers the battery failure indication	Readings cannot vary by more than plus or minus 10%	Pass

ELECTRONIC AND MECHANICAL TESTS

Characteristics Under Test	Range of Values of Influence Quantities	Limits of Variation	Pass / Fail
Check Circuits	Per manufacturer's recommendations		
Alarms (reset)	Dose rate to activate alarm	See section 5.2.1	NT
Alarms (delay)	Dose rate to activate alarm	Alarm must be indicated within 1 - 60 seconds	NT

Alarm (threshold drift)	Dose rate to activate alarm	Alarm setpoint must not drift more than plus or minus 10% over a 500 hour period	NT
Stability	3 hours (battery powered instruments)	Reading cannot change by more than plus or minus 6%	N/A
Stability	24 hours (AC powered instruments)	Reading cannot change by more than plus or minus 6%	Pass
	500 hours (AC powered instruments)	Reading cannot change by more than plus or minus 15%	Pass
Geotropism	Tested in three mutually perpendicular orientations	Reading cannot vary by more than plus or minus 6%	Pass
Response Time	See Table 1 of Standard	See Table 1 of Standard	Pass
Coefficient of Variation	Greater than or equal to 1 mR/h, 1 mrd/h, 10 mrem/h, 2000 dpm	Reading cannot change by more than plus or minus 10%	Pass
	Less than or equal to 1 mR/h, 1 mrd/h, 10 mrem/h, 2000 dpm	Reading cannot change by more than plus or minus 15%	Pass*
Line Noise Susceptibility	See table 2 of standard	Reading cannot change by more than plus or minus 15%	NT

RADIATION RESPONSE

Characteristics Under Test	Range of Values of Influence Quantities	Limits of Variation	Pass / Fail
Accuracy (photon dose rate)	0.1 mrd/h - 1000 rd/h	Cannot vary by more than plus or minus 15% of conventionally true value	NT
Accuracy (count rate and contamination monitors)	50 dpm/square cm to 100,000 dpm/square cm	Cannot vary by more than plus or minus 15% of conventionally true value	NT
Accuracy (beta or neutron dose rate)	0.1 mrem/h - 1000 rem/h	Cannot vary by more than plus or minus 15% of conventionally true value	NT
Probe surface sensitivity	Stated by manufacturer		NT
Photon energy dependence	80 keV - 1.25 MeV	See equation in section 6.3 of standard	NT
	20 keV - 3.0 MeV		NT
Beta Energy Dependence	0.5 MeV - 3.5 MeV (Emax)	See equation in section 6.3 of standard	NT
	0.2 MeV - 3.5 MeV (Emax)		NT
Neutron Energy Dependence	0.025 eV - 14 MeV	See equation in section 6.3 of standard	N/A
Photon Radiation Overload	100X upper limit less than or equal to 10 rd/h	Correct response within 2 minutes	NT

	10X upper limit greater than 10 rd/h		NT
Angular Dependence	0 - 45 degrees (photon)	Instrument reading must not vary by more than plus or minus 20%	NT
	45 - 90 degrees	Instrument reading must not vary by more than plus or minus 50%	NT
	0 - 45 degrees (beta)		NT

INTERFERING RESPONSE

Characteristics Under Test	Range of Values of Influence Quantities	Limits of Variation	Pass / Fail
Extracameral Response	Range of instrument	Reading cannot change by more than plus or minus 5%	NT
RF Fields	Per user requirements	Readings cannot change by more than plus or minus 15%	NT
	100 V/m, 0.3 - 35 MHz		NT
	100 V/m at approx. 140 MHz		NT
Microwave Fields	Per user requirements		NT
	100 W/square meter at 915 MHz, 2450 MHz		NT
Electric Fields	5000 V/m		Pass
	100 V/m at 60 Hz, 400 Hz		Pass
Magnetic Fields	800 A/m		Pass
Interfering Radiation	See Table 3 of Standard		NT

ENVIRONMENTAL FACTORS

Characteristics Under Test	Range of Values of Influence Quantities	Limits of Variation	Pass / Fail
Temperature	0 to 40 degrees C	Reading cannot vary by more than plus or minus 15% of reading at 22 degrees C	Pass
	-10 to +50 degrees C	Reading cannot vary by more than plus or minus 20% of reading at 22 degrees C	Pass
	10 to 35 degrees C	Reading cannot vary by more than plus or minus 15% of reading at 22 degrees C	Pass
Temperature Shock	From -10% to 22 degrees C		Pass
	From 50 to 22 degrees C		Pass
Humidity	40 to 90% RH at 22 degrees C	Readings cannot vary by more than plus or minus 15% of the reading at 40% RH	Pass

Mechanical Shock	50 g acceleration of 18 ms, half sine wave, test on 3 orthogonal axes (10 times)	Reading cannot vary by more than plus or minus 15%	NT
Vibration	2 g acc., 10 - 33 Hz, test on 3 orthogonal axes for 15 min.		NT
Ambient Pressure	70 - 106 kPa		NT
Splashproof	2 min. fine spray (4 L/min at 2 meters from nozzle)		NT

*Due to the relationship of the response time and the coefficient of variation, readings on the lowest scale were taken using SLOW response time (manufacturer's suggestion).

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