ANSI N42.17A-1989 TEST RESULTS

MODEL 2241-2 DIGITAL SCALER/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%	N/A
Battery Power	0 - 100 hours	Reading cannot vary by more than plus or minus 10%	NT
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		N/A
	Test performed at the voltage that triggers the battery failure indication	Readings cannot vary by more than plus or minus 10%	N/A

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%	Pass
Stability	24 hours (AC powered instruments)	Reading cannot change by more than plus or minus 6%	N/A
	500 hours (AC powered instruments)	Reading cannot change by more than plus or minus 15%	N/A
Geotropism	Tested in three mutually perpendicular orientations	Reading cannot vary by more than plus or minus 6%	NT
Response Time	See Table 1 of Standard	See Table 1 of Standard	NT
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%	N/A

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	Pass
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	Pass
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	less than or equal to 5000 V/m		NT
	less than or equal to 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		Pass
Splashproof	2 min. fine spray (4 L/min at 2 meters from nozzle)		Pass

*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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