

# ANSI N42.17A-1989 TEST RESULTS

## MODEL 177-41 ALARM RATEMETER

### TEST NOTES

- Test results are valid for instruments with serial number 91584 and greater.
- Test groups included five 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%	Pass
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

<b>Stability</b>	3 hours (battery powered instruments)	Reading cannot change by more than plus or minus 6%	Pass
<b>Stability</b>	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
<b>Geotropism</b>	Tested in three mutually perpendicular orientations	Reading cannot vary by more than plus or minus 6%	Pass
<b>Response Time</b>	See Table 1 of Standard	See Table 1 of Standard	Pass
<b>Coefficient of Variation</b>	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*
<b>Line Noise Susceptibility</b>	See table 2 of standard	Reading cannot change by more than plus or minus 15%	NT

### RADIATION RESPONSE

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

<b>Angular Dependence</b>	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

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

### ENVIRONMENTAL FACTORS

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

<b>Vibration</b>	2 g acc., 10 - 33 Hz, test on 3 orthogonal axes for 15 min.	NT
<b>Ambient Pressure</b>	70 - 106 kPa	Pass
<b>Splashproof</b>	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).



[Return to ludlums.com](http://www.ludlums.com)

Copyright © 2000 Ludlum Measurements, Inc.

For comments or suggestions please contact webmaster at: [rludlum@ludlums.com](mailto:rludlum@ludlums.com)

Page last updated: January 2001