

With his co-conspirator he galloped to Montgomery where they bought four big jugs of whiskey, all that their horses could hold tied on like saddlebags. Then they began recruiting men with guns and powder. Although the whiskey was "unspeakably bad", it was a powerful aid in enlistment and soon there was a sizable posse of armed men ready to celebrate. Together they galloped from farm to farm shouting and shooting while dogs barked, women screamed, children cried and the men grabbed their guns first to repel an attack by Indians or bandits and then to join in the posse. By midnight there were 15 riders — most of the male population of the rural area and at one farm they were invited in to eat venison, cornbread and eggnog made with the last of the whiskey.

To the willing, but bewildered, Anglo settlers Gustau explained that in his home it was a tradition to "shoot in" Christmas as a part of the festivities of the season. In the early hours men found their way home declaring that Gustau was, indeed, a very special Dutchman.

Jeff Carroll, LEGENDARY TEXAS



Model 44-110 Tritium Detector



Dec 1994

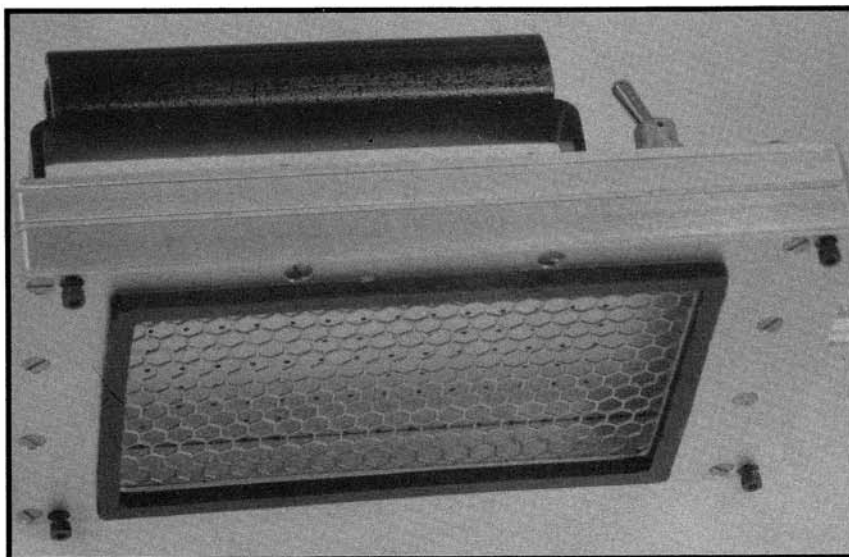
The Model 44-110 detector is designed to detect tritium contamination on flat surfaces. The 44-110 is a windowless gas detector having the open area of 100 cm². The detector features surface adjustable set screws, an On/Off gas switch, and a removeable stainless steel protective screen.

Set screws, located on the bottom of the detector, allow the detector to be adjusted for smooth or rough surfaces. The set screws help prevent a static electrical buildup when the detector is slid across a smooth surface. The set screws also prevent excessive wear of the gas seal and help reduce the likelihood of spreading contamination. On rough surfaces or spot measurements the set screws should be left fully retracted, so that the detector makes a good seal.

The On/Off switch, located on the top of the detector, allows the user to turn "on" or "off" the gas from the detector. Once the gas is turned "on"- purge time is typically 15 to 30 seconds. On smooth surfaces, the detector may be slid along the surface without repurging due to the gas seal. Gas may be turned "off" whenever the detector is removed from the surface.

Portable counting instruments such as the Model 12, 16, 18 and 2221 are compatible with the Model 44-110. Necessary operating requirements of an instrument to be compatible are: adjustable high voltage up to 1900 volts, and a threshold of 4 mV or less.

For more information about this product, please contact our Sales Department at (800) 622-0828.



LUDLUM MODEL 44-110

SPECIFICATIONS

INDICATED USE:	Tritium Survey
COUNTING GAS:	P-10 (10% methane, 90% argon)
WINDOW:	Windowless
WINDOW AREA:	Active - Approximately 126 cm ² Open - Approximately 100 cm ²
OPERATING VOLTAGE:	Typically 1700 volts
THRESHOLD SETTING:	4.0 mV
EFFICIENCY (2pi geometry):	Typically 85% for ³ H
BACKGROUND:	Typically 400 cpm
CONNECTOR:	Series "C" (others available on request)
GAS PURGE TIME:	Approximately 20 seconds (once purged, detector may be moved across surface without re-purging)
CONSTRUCTION:	Anodized aluminum body with removable stainless steel hex protective screen (79% open)
TEMPERATURE RANGE:	5°F (-15°C) to 122°F (50°C)
SIZE:	4.5" (11.4cm)H X 4.6" (11.7cm)W X 9.0" (22.9cm)L
WEIGHT:	2 lbs (0.9kg)
LMI PART NUMBER:	47-2585

Price
\$ 450.00

Coming Soon in '95

LMI will soon have available a NEW Product Catalog. The catalog features the current models along with several new instruments. The catalog is scheduled to become available in January of 1995. If you would like a copy of the new catalog, please call or fax.

Note: This is part 1 of a 3 part series covering MDA time constants. Part 1 addresses linear ratemeters controlled by conventional resistor-capacitor (RC) integration components. Part 2 encompasses logarithmic ratemeters. Part 3 addresses microprocessor controlled ratemeters.

DETERMINING LINEAR ANALOG RATEMETER TIME CONSTANTS FOR MDA EQUATIONS

The following information applies to the Minimum Detectable Activity (MDA) equation (95% confidence) for linear analog ratemeter instruments - portable friskers, hand-held contamination monitors, etc.

$$\text{MDA (dpm/100 cm}^2\text{)} = \frac{4.65 \sqrt{R_B / (2T)}}{E \cdot (A/100)}$$

where R_B = background rate (cpm), T = counter time constant (minutes), E = counter efficiency (counts/disintegration) and A is the probe area (cm^2)¹

DEFINITIONS

***response time:** the time interval required for the instrument reading to change from 10% to 90% of the final reading (or vice versa) following a step change in the radiation field (i.e., signal) at the detector.²

*Note: All LMI specified response times are measured by injecting a fixed pulse rate from a pulse generator.

time constant: the time involved in the charging or discharging of an inductor or capacitor. One time constant is the length of time required to reach 63 percent of the full charge or discharge.

The specification related to time constant in the counter instruction manual is specified as **response time** - 10% to 90% of final reading. There are 2 methods of calculating the required "counter time constant" for the MDA equation as shown below in Method A and Method B.

Method A

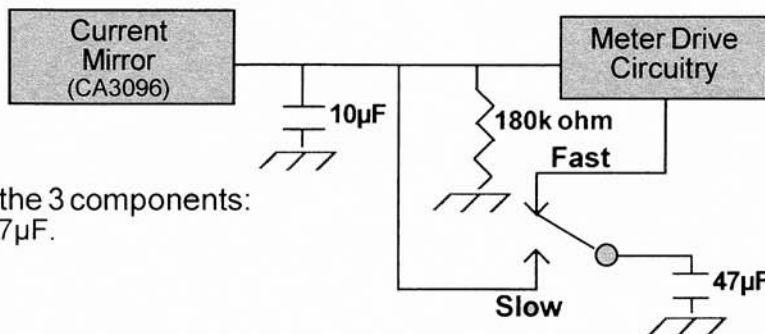
An approximate "rule of thumb" conversion from the specified response time to the required time constant is to multiply the response time data by 0.44.

Example: The Slow response position on a Ludlum Model 3 is specified at 22 seconds.
 $22 \times 0.44 \sim$ time constant of 9.7 seconds = 0.16 minutes for T .

Method B

The integration RC time constant can be calculated by multiplying $R \times C$. There are 3 components associated with this calculation.

Example: The illustration shows the 3 components: $10\mu\text{F}$, $180\text{k}\Omega$, and $47\mu\text{F}$.



In the Fast response position the RC time constant is $10\mu\text{F} (10 \times 10^{-6}) \times 180,000 \text{ ohms} = 1.8$ seconds or 0.03 minutes for T . For the Slow position, the $47\mu\text{F}$ parallels with the $10\mu\text{F} = 57\mu\text{F}$ (57×10^{-6}) $\times 180,000 \text{ ohms} = 10.3$ seconds or 0.17 minutes for T .

Locate the integration RC components by tracing the Fast/Slow response switch or current mirror to the components or by referring to the circuit "Theory of Operation" in the Instruction Manual.

References:

¹Gollnick, D. A.; *Basic Radiation Protection Technology*, 3rd Edition. Altadena, CA: Pacific Radiation Corporation; April, 1994.

²American National Standard Performance Specifications for Health Physics Instrumentation - *Portable Instrumentation For Use In Normal Environmental Conditions*. New York: Institute of Electrical and Electronic Engineers; ANSI N42.17A-1989.