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Replace the complexity of using hand held probes

LAM12 large articles monitor

ThermoFisher SCIENTIFIC

LAM12 - large articles monitor

The Thermo Scientific LAM12 large articles monitor can measure to clearance levels less than 0.4 Bq/g for gamma emitting radionuclides. The units electronics allows for dynamic discrimination between natural and man-made radiations, as well as a unique feature for ^{60}Co monitoring.

Wide array of features

- Measures fixed, smearable, internal and external gamma contamination simultaneously
- Measures down to 200 Bq independent of methodology
- Excellent uniformity of response across the chamber
- Fast, easy and thorough with no special training or supervision required
- Equally effective for single particles or distributed contamination
- Discrimination of Natural Occurring Radioactive material via Natural Background Reduction (NBR)
- Cobalt coincidence monitoring
- Reduced time to count
- Ability to check for changing background during the measurement
- Self contained large touch-screen colour LCD display - no keyboard required
- Automated calibration and checking routines
- Easy upload and download via USB
- Viewpoint compatibility
- Optional weigher scale to enable specific activity of samples to be assessed and displayed

The inclusion of the Natural Background Reduction (NBR) feature minimises the possibility of false alarms due to the presence of naturally occurring radioactive material (NORM). Using NBR, the LAM12 discriminates between NORM and man-made radiations even in a fluctuating natural background.

Where ^{60}Co contamination is present, the LAM12 can monitor specifically for this radionuclide using Cobalt Coincidence monitoring (CCM). This technique is particularly insensitive to fluctuating gamma background radiation, even from a source of ^{60}Co. In this way, the performance of this monitor is superior to monitors without this feature with thicker shielding.

The use of the Reduced Time to Count (QuickScan) algorithm significantly reduces the counting time when articles clearly exceed, or are well below the alarm level. The monitor is constantly checking for changing background radiation conditions, both during background monitoring, and during the measurement cycle.

The low power consumption means there is no need for a cooling fan which might suck in dust and dirt. The modular 'X-channel' platform, with common controller boards and simple cabling, provides for easy, low cost maintenance. It also provides detector intelligence and powerful controller functionality - such as the automated calibration and source checking routines.

Sophisticated voltage scanning software is included which clearly displays the optimum voltage settings in order to optimize discrimination between man-made and NORM.

Mechanical specification	
Dimensions:	1400 H x 935 W x 975 D mm (55.1" H x 36.8" W x 38.4" D)
Weights:	1,350 kg (2980 lb) nett; 1,500 kg (3310 lb) packed (1" lead)
Detectors:	Four BC-412 plastic scintillation detectors, 600 mm x 300 mm x 50 mm (23.6" x 11.8" x 2") each. The LAM12 has detectors in the front door, back and two sides. Detectors are fitted with a magnetic shield
Detection Areas:	4 detectors, 1800 cm^2 (279 in^2)
Detection Volumes:	4 detectors, 36,000 cm^3 (2197 in^3)
Lead Shielding:	25 mm (1") lead shielding (4π)
Measuring Volume:	750 H x 600 W x 600 D mm; (29.5" x 23.2" x 23.2")
Doors:	One front access door
Switches:	Door switch for rolling average background collection Push-button to activate count cycle
Weigher Option:	0.5 to 60 kg Synectic strain gauge 570 x 570 mm (22.4" x 22.4") platform scale [0.02 kg resolution]
Electronic specification	
Power:	Integral 12 V power pack, 8 hours operation if AC supplies are lost. Integral continuous Dual State Float Charger, 85 to 264 VAC, 47 to 63 Hz 65VA
Display:	Colour LCD, with 31 cm (12.1") diagonal viewing area and touch sensitive overlay
EMC & LVD:	EMC Compliances: EN61326, EN55022 (emissions), EN61000-4 (immunity), LVD Compliances: EN 61010
Digital I/O connections:	Ethernet and 4 USB.
Pulse Height Thresholds:	Five thresholds with programmable setting, used for NBR and CCM Top threshold used for setting best signal over background ratio

Radiological specification		
Typical 4π Efficiency in centre of chamber:	4 detector version:	^{60}Co: 24%; ^{137}Cs: 12%
	Low energy option:	^{241}Am: 2.5%
	CCM	^{60}Co: 0.2%
Minimum Detectable Activity where Probability of false alarm is 0.1% (3.1σ), Probability of Detection is 95% (1.65σ) and 30 s monitoring time, with 25 mm (2") lead shielding including floor shield		
In a 0.1 µSv/h (10 µR/h) background:	4 detector version:	^{60}Co: 95 Bq (5700 dpm), ^{137}Cs: 185 Bq (11100 dpm)
	Low energy option:	^{241}Am: 1600 Bq (96000 dpm)
In a 1 µSv/h (0.1 mR/h) background:	4 detector version:	^{60}Co: 300 Bq (18000 dpm), ^{137}Cs: 650 Bq (390000 dpm)
Minimum specific activity detectable:	< 0.1 Bq/g of ^{60}Co averaged over 5 kg	
Energy Range:	50 keV to 2 MeV	
Spatial Uniformity of Response:	±30% at 68% confidence, for ^{137}Cs	
Linearity:	Linear response in excess of 5 MBq (130 µCi) of ^{137}Cs	

Parameters settings	
Units:	1400 H x 935 W x 975 D mm (55.1” H x 36.8” W x 38.4” D)
Article monitoring time:	1,350 kg (2980 lb) nett; 1,500 kg (3310 lb) packed (1” lead)
Probability of False Alarm: Probability of Detection:	Four BC-412 plastic scintillation detectors, 600 mm x 300 mm x 50 mm (23.6” x 11.8” x 2”) each. The LAM12 has detectors in the front door, back and two sides. Detectors are fitted with a magnetic shield
Weigher option units:	4 detectors, 1800 cm^2 (279 in^2)
User options	
Language:	Various languages available, including changes to date format
Quickscan:	Faster monitoring for articles which are either clearly clean or clearly contaminated
CCM:	Alarms may be set on the basis of a separate counting channel that monitors coincidences due to ^{60}Co
NBR:	A Natural Background Reduction assessment is undertaken when pulse height criteria are met
Changing background:	The user may specify the minimum count rate deviation (in sigma) that will trigger a full reassessment of the background count rate
Changing conditions:	The user may specify the minimum count rate deviation (in sigma) during the monitoring period, that will abort article monitoring and trigger a full reassessment of the background count rate
Residual contamination check:	A Residual contamination check may be undertaken after a contaminated article is removed from monitor
Calibration integrity checking:	The monitor takes itself out of service if the required calibration interval is exceeded
Background Monitoring:	The background count rates on each detector are logged to the database at a frequency prescribed by the user
Environmental specification	
Operational temperature:	0°C to +45°C
Storage temperature:	-10°C to +60°C
Humidity:	Up to 95% RH non-condensing, Rating IP50
Order codes	
LAM12A-E	4 detectors, 1 inch of lead shielding and 1 door
LAM12AL-E	LAM12A incorporating Low Energy Copper and Aluminium filter set
LAM12AW-E	LAM12A incorporating weigher scale
LAM12ALW-E	LAM12A incorporating Low Energy Copper and Aluminium filter set and weigher scale
Accessories	
LAM12AUP	Electronics upgrade for a 4 detector, 1 door LAM4
LAM12AWUP	Electronics plus weigher electronics upgrade and software for LAM4 (excluding weigh scale) NOTE: Contact Thermofisher regarding AWM1B upgrades
AE0208A	CCM option
AE0214A	Weigher scale upgrade kit for LAM12A or LAM12AL
AE0035A	Base lead kit (Recommended for use with Low Energy Filter sets)
LAM12 JIG CO-60	Locating jig and reference source for LAM12 – 370 kBq ^{60}Co
702829KM	LAM12/SAM12 barcode reader - USB
AE0219A	LAM12/SAM12 high resolution thermal printer - USB

Find out more at **thermofisher.com/radiationmeasurement**

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