

BETA-GAMMA PORTAL MONITOR

Model # PPM-21L

FEATURES:

- LIGHTWEIGHT MOBILE PORTAL MONITOR
- MEETS AND EXCEEDS FEMA STANDARD OR RADIOLOGICAL EMERGENCY RESPONSE (Federal Register Vol. 60 No. 56)
- DYNAMIC BACKGROUND SUBTRACT 8 CHANNELS OF COUNTING ELECTRONICS
- SAFE LIGHT
- SYSTEM FAILURE LIGHT
- AUDIO AND VISUAL RADIATION ALARMS
- SCALER OPERATION FOR GREATER SENSITIVITY AND DEPENDABILITY
- SINGLE BUTTON OR AUTO RESET
- PANEL LIGHT INDICATES AREA OF CONTAMINATION AT A GLANCE
- LIGHT BEAM OCCUPANCY SENSOR
- RESET AND RECOUNT LIGHT INDICATES A PERSON LEAVING PORTAL TOO SOON

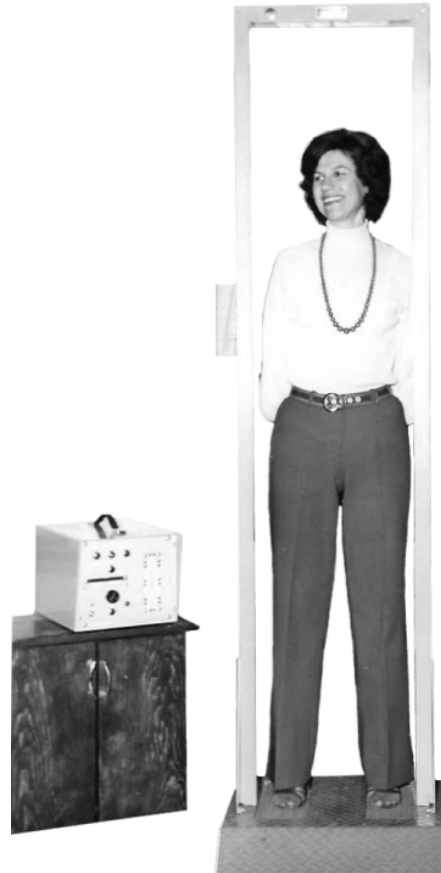


Figure 1: PPM-21L

DESCRIPTION: The PPM-21L is a Portable Doorway Monitor consisting of an arch portal, with a foot-deck to completely check each person passing through, and a console with connecting cables. System checks entire body, including head, shoulders, sides, and bottom of shoes. The portal includes eight channels of GM detectors with eleven GM tubes. All electronics are housed in the console and include Power Supply, fully redundant readouts, alarm and system failure indicator. A light beam switch senses the presence of a person in the portal and starts a counting cycle.

At the end of the time preset on the console, (1 to 99 seconds, settable in 1 second increments), a green light is illuminated if preset count limit has not been exceeded; or a red flasher beeper is activated if preset count is reached within the preset time. In the latter event, individual lights on the console show the location of excessive contamination. Should the person being checked leave the portal prior to the preset count time, a reset and recount light so indicates.

OPERATION: No skill is required by the person being monitored. The person enters the portal, pauses, and then walks on. Radiation above a preset level (1 to 99 counts/channel above background) causes an alarm to sound and indicator light to show the location of the contamination on the person.

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\$Revision: 1.3 \$

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SPECIFICATIONS:

PORTAL FRAME AND SHOE DECK

Detectors:	Eleven halogen quenched, infinite life stainless steel GM tubes (T/A Model T-1120) in frame in positions indicated on DETECTOR POSITION SILHOUETTE. Each tube 5/8" diameter x 7" long with 30 mg/cm ² stainless steel wall.
Mobility:	5" wheels and 2" lifting eyes.
Dimensions:	(overall) 88" high x 25" wide x 29" deep - for flush mount on floor, height is 83".
Weight:	PPM-21L - 98 lbs.
Shipping Weight:	165 lbs.

CONSOLE

Dimensions:	9" high x 10-1/4" wide x 13" deep.
Weight:	18 lbs.
Shipping Weight:	26 lbs.
Open Controls:	Power: On-Off
Covered Controls:	Time Constant:1-99 thumbwheel switch.
Alarm Reset:	Single Pushbutton
Counts to Alarm:	1 - 99 thumbwheel switch

INDICATORS

Safe:	Steady Green
System Failure:	Steady Amber
Alarm:	Flashing Red plus 2900 Hz beeper
Power On:	Green
Contamination Indicator:	8 pairs of solid state LEDs about person silhouette

OPTIONS: Inverter for operation with automotive battery .

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RADIATION MONITORING FOR CONTAMINATION AT RELOCATION CENTERS

When large numbers of people must be relocated due to a serious incident, each person must be monitored for Radioactive Contamination. This monitoring must be performed in a fast, reliable manner. Prior to evaluating hardware, one should take into consideration the type of contamination found in this situation. Contamination would result from fission products distributed via a dust plume. This results in several energies of Beta and Gamma Contaminations (with the ratio of Betas to Gammas of 1 to 1). The primary points for contamination collection on the human body are hair, shoulders and shoes.

It is generally accepted that Cs^{137} is an acceptable reference standard for test and calibration. It should be remembered, however, that Cs^{137} when packaged in a check source disk is typically covered with plastic, which drastically attenuates the Betas emitted from the Cs^{137} . This is in contrast to the high concentration of Beta energies, which would be found on a person contaminated with fission products.

The Technical Associates Model **PPM-21L** was designed as a reliable, cost effective instrument to monitor this specific type of contamination, and compared to other brands, has a significantly lower LLD due to its lower background. The **PPM-21L** utilizes thin wall (30 mg/cm^2) GM tubes, which are lightweight, rugged, and highly sensitive to fission products. The **PPM-21L** can monitor one person every 10 seconds when tested with a Cs^{137} check source, having an activity of 1 uci and placed adjacent to the detector in the portal. In practice, however, one could expect to monitor a significantly higher rate if the unaltered Beta energies in fission products are taken into consideration.

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