

LAUNDRY MONITOR SYSTEM

Model #LIM-OH-4
Model #LIM-OH-8

FEATURES:

- AUTOMATIC OVERHEAD CONVEYOR FOR LAUNDRY ON HANGERS
- AUTOMATICALLY SEPARATES "CLEAN" VERSUS "CONTAMINATED" CLOTHES
- CONTAMINATION TRIGGER POINT IS CONTINUOUSLY ADJUSTABLE
- MANUAL OVERRIDE
- COUNTS BOTH SIDES OF GARMENT SIMULTANEOUSLY VIA TWO SHIELDED DETECTOR TOWERS



Figure 1: LIM-OH Conveyor

SYSTEM DESCRIPTION: The **LIM-OH** Monitors laundry including pants, shirts, overalls, coats, etc., while they are traveling on hangers along an overhead track.

Model LIM-OH Laundry Contamination Monitor is sturdy, dependable, long life mechanical system, with advanced computer and data processing.

Model **LIM-OH** is suitable for use in Nuclear Power Plants. Two Shielded detector columns contain 2 or 4 large detectors in each cabinet.

The 4 or 8 detectors each have 600 cm² active area and each has its own electronics to give greatest sensitivity.

Garments are stored and measured while on hangers. Shirts, pants, coveralls, and other garments are accurately measured.

Garments are carried by a conveyor mounted from the ceiling. The garments pass into the narrow space between the two detector columns where they pause for 1 to 20 seconds for measurement.

Garments are physically sorted onto separate conveyors, one for CLEAN and one for CONTAMINATED garments.

Numerical measurement results are saved to the 60 gig hard drive and are easily accessible for all garments: CLEAN and CONTAMINATED.

Color LCD Monitor shows measurement values from all 4 or 8 detectors, and status or step of operation and background. Also, time remaining in count time period, etc...

Operational steps are also shown on the computer:

- Ready to Count
- New Garment Moving into Position
- Count in Progress
- Count OK-CLEAN or Count ALARM-CONTAMINATED

The date, time and results of each garment measured in that batch, the week, day and year are available for display, print-out and safe storage.

TA **TECHNICAL ASSOCIATES**
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\$Revision: 1.2 \$

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BATCH MODE: Authorized user sets alarm level, count time, motor speed, location where clothing was used, work group who wore them, etc.; number of garments to be measured at this time, with these parameters. Batch size can be from one to seventy garments (more if requested). Each garment in turn is automatically moved by the computer controlled stepper motor, from the INPUT RAIL into the shielded DETECTOR ASSEMBLY, where it is examined for the preset time (1 to 20 sec.) by all detectors simultaneously. If contamination is detected above the alarm setting, the garment is automatically placed onto the output rail/track for CONTAMINATED clothing. The batch measurement report prints out showing count rate and clean/contaminated status of each garment in the batch.

Also date, time, parameters and the location where clothing was used, work group that wore them, etc...

Then the identifying information is typed in on the computer keyboard for the next batch. At this time, the test parameters can be changed by an authorized technician, if appropriate. Now click on "START" and the next batch of garments will be automatically processed, and report printed.

AUTOMATIC MODE: This mode is very similar to the batch mode, but in automatic mode the garments are checked automatically, all day, or until there are no more garments on the in-put rack. The test parameters can be changed in automatic mode, at the beginning of the day, or by activating the manual override.

OPTIONAL ACCESSORIES: One set of calibration sources is supplied with the LIM-OH Monitor. This consists of one each: Ba¹³³, Cs¹³⁷, and Co⁶⁰ calibration source standards. Each source comes with NIST Traceable calibration certificate, test data, and Calibration Factors.

LIM-OH-4: Total of 4 Detectors, sensitive height 36" for shirts, jackets, pants, etc..

LIM-OH-8: Total of 8 Detectors, sensitive height 70" for all garments including coveralls and jumpsuits.

SPECIFICATIONS:

Detectors:	Clothing passes between two shielded columns of two(2) or four(4) detectors each. Clothing is physically sorted into "CONTAMINATED" and "CLEAN" tracks. Two vertical columns each with large area gamma scintillation detectors.
Detector Active Area:	4 or 8 detectors each 600 cm ² x 5 cm.
Count Time:	Settable 1 to 20 sec. Adjustable in 1 second increments.
Counting Sensitivity:	Sees 22,000 d/m/100cm ² in less than 20 sec, with Optional shielding steel or lead.
Background:	Automatically subtracted.
Optional Shielding:	2 cm lead over greater than 2π Lead shield is modular and easy to assemble (no piece is over 65kg). Please see Figure 2 for shield geometry.
Electronics:	Each plastic scintillator has it's own PM tube, PMT base (dynode string circuit) Independent Modular, high voltage pre-amp and discriminator. This provides improved sensitivity and easier maintenance if a PM tube is replaced.
Alarms:	Alarm threshold is continuously adjustable.
Status Lights:	Status Display shows step by step progress of clothing being monitored.
Operation:	Selectable: Continuous Mode or Batch Mode.
Computer System:	Pentium 1 GHz or better. Color LCD Display.
Record Keeping:	All data automatically stored on a 60 gig hard drive. Data can be transmitted to other PCs by built in Ethernet connection (telephone modem is Optional).

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PHYSICAL DIMENSIONS:

- System Weight:** 175 kg plus shielding. (Shielding Weight: **LIM-OH-4** 700 kg, **LIM-OH-8** 1250 kg)
- Conveyor System:** 3 each 12 foot conveyor rack operated by computer controlled stepper motor. Batches of up to 70 garments are hung on conveyor hangers (more with **Optional** extensions). Each garment is transferred from rack to detection system, kept for preset time and advanced and guided to CLEAN conveyor or CONTAMINATED conveyor.
- Conveyor Speed:** Infinitely variable user controlled.
- Environmental Conditions:** 32° to 104°F, (0° to 40°C).
10% to 95% relative humidity, non-condensing.
- Power Supply:** Available 110VAC or 220VAC, 50 or 60 Hz.
- Pulse Height Threshold:** Continuously adjustable for each detector.
- Electronics Functions:** Photomultiplier tube and base.
Detector HV.
Amplifier with adjustable energy threshold.
Data sent to and acquired by PC.
Data Analysis.
Alarm Trigger
Data Storage.
Data Printout.
Conveyor Control.
Conveyor Status Indicators.

- Options:** Conveyor Extensions.
Outlet Annunciator Panel.
Spare Detector.
Inlet Annunciator Panel.
Calibration Jig.
Accessory Control Panel.
Data Transmission (Ethernet).
Uninterruptable "UPS" Battery back-up.
Statistical Reports.

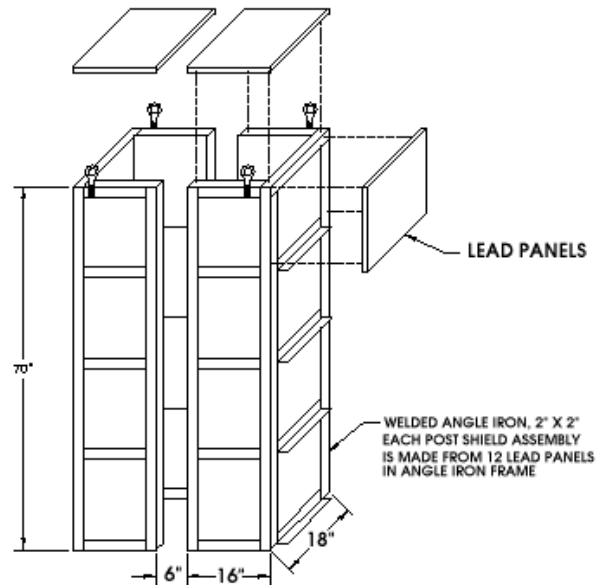


Figure 2: Detector Drawing

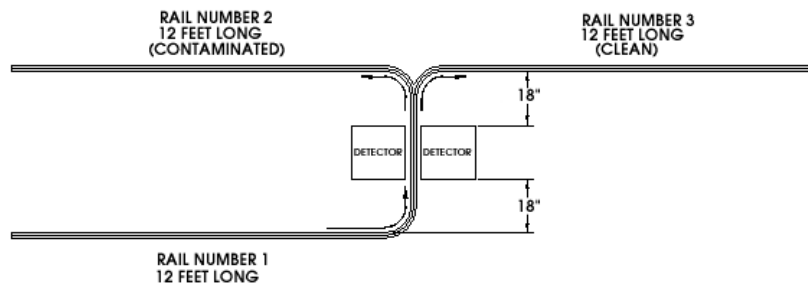


Figure 3: Overhead view of Assembly

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