Product Specifications

The IPM9 provides fast, thorough body monitoring with outstanding capabilities. It detects radioactive emissions over the whole body, including head, hands and feet.

IPM9

Installed Personnel Monitor

- Fast monitoring with total coverage
- Very high whole body sensitivity
- Easy to operate, calibrate and maintain
- Advanced detection algorithm
- Automatic background subtraction
- Robust construction, comfortable for users
- Minimal training for staff and users

The IPM9 is available in two physical formats - the closed cubicle IPM9A and the open IPM9D. A choice of thin window, gas flow detectors or rugged, sealed gas detectors is available, together with gamma scintillation detector options.

The two-stage monitoring procedure provides consistent body sensitivity for all user sizes. Users are guided by external traffic lights, internal LEDs, a colour graphic display and (optionally) voice prompts. Comfortable, easy to operate sensors ensure correct positioning and guarantee monitoring integrity. Large area detectors, with minimum 'dead' areas between adjacent detectors, give optimal body coverage. Hex-grills ensure maximum transmission and strength. Spring-loaded hand detectors, for maximum efficiency, monitor both sides of the hand simultaneously.

The instrument simultaneously maintains high sensitivity and maximum user throughput. A proprietary detection algorithm continuously calculates and applies the minimum monitoring time to achieve the preset sensitivity. It adapts automatically to background changes, enforces high preset confidence levels, gives very low false alarm rates and recognizes detector contamination.

Other standard features include menu-driven setup (no PC required), customizable alarm messages, modular plug-in circuit boards for easy maintenance, data-logging of results and radon rejection facility.

Options & Specifications

Detector Types

Gas Flow detectors (Standard, α & β)
These Ar/CH_4 detectors are extremely sensitive and have no internal dead areas. Their thin windows are protected by strong, fine hex-mesh grills, giving maximum strength vs. sensitivity factor, with 75% transmission. Flat plateau responses to all normally encountered α or β emitters guarantee stable long-term sensitivity and maximum gamma background rejection.
Sensitivities:

α	(^{241}Am)	240 dpm	0.04 Bq/cm^2
β	(^{137}Cs)	2400 dpm	0.4 Bq/cm^2
β	(^{60}Co)	5000 dpm	1.0 Bq/cm^2

Figures are averaged over the body.
Detection is based on: 100 cm^2 sources, 12 s monitoring time, 0.1 µSv/h (10 µR/h) background, 95% probability of detection, <0.005% false alarms per detector, i.e. <0.1% system false alarms.

Sealed Gas detectors (Optional)
These Ar/CO_2 detectors are mechanically interchangeable with standard gas flow detectors. They are permanently sealed and rugged, with 5 mg/cm^2 titanium windows. Their beta energy response extends down to ^{14}C energies (157 keV). Ar/CO_2 detectors are insensitive to alpha, less affected by radon, and have high gamma background rejection.
Efficiencies: (% surface emission, from large sources placed on the detector grille)

Radionuclide	Body	Hand	Foot
^{90}Sr/^{90}Y	39	37	31
^{36}Cl	37	32	30
^{60}Co	25	21	20
^{14}C	6	6	4
^{133}Ba	1.6	1.6	1.4
^{55}Fe	0.3	0.4	0.35

Integrated Gamma detectors (Optional)
There are two available configurations of additional gamma scintillation detectors. The passive internal monitor (PIM) option provides a lung/nasal/pharyngeal/gut gamma detector, plus lead shielding, mounted behind the body detector array. The 'full' gamma option provides six large-area body detectors with lead shielding behind the standard body detectors, plus a gamma foot detector. On the IPM9A, two additional hand detectors are installed in the back wall.

Options

Small Articles Monitor
This option provides convenient self-monitoring of tools, personal items, etc., and is available in both alpha/beta and alpha/beta/gamma versions.

Alpha-On-Body
Extra alpha channels analyze the body and head detector signals, providing whole body alpha monitoring.

Barrier Control (IPM9A only)
Full-height, polycarbonate glazed doors (illustrated overleaf) offer increased control, security and quality assurance of monitoring workers and personal items. Available as solo exit door or entrance and exit pair. Handing and window options are available. Turnstile operation is also supported.

Alpha Overhead Detector (IPM9A only)
The IPM9 auto-retracting overhead detector increases top-of-the-head sensitivity to alpha and beta emissions. The user pulls the counter-balanced detector down to suit their height. It retracts automatically when monitoring is complete.

Additional Gas Flow Foot Detector
Increased probability of detection, by monitoring each foot twice. Foot coverage can be maintained, even with one damaged foot detector.

Voice Prompts and Display Languages
Spoken user prompts are available in many languages, either as a single language or selectable multiple languages.
English, French, Spanish, Portuguese and Czech display languages are included as standard, but others can be installed on request. Display languages can be selected, from up to four installed languages, via the optional push-buttons or rotary switch kits.

Last Results Recall
This option provides a 'hot button' that will recall the last measurement result and display it by detector (as opposed to the standard mannequin display). This saves valuable time during daily source check and when confirming or quantifying alarms.

Networked Data-logging & Control system
The IPM9 Surveillance system remotely monitors IPM status and live measurement results, providing on-screen display and data-logging facilities. Multiple IPMs can be connected, via RS-485 network, to the PC, and can be grouped and named in the software. IPM monitoring results are displayed 'live' by detector layout. Results can be selectively logged and stored in a standard database (.mdb) file. Individual IPM setup menus can be viewed on-screen and set-up parameters can be remotely edited.

External LCD
An externally-mounted LCD display is available for the IPM9A.

Check sources
A range of point sources and check source jigs are available to aid setup and routine checking.

Key Specifications

Gas Flow detectors
18 body detectors, 4 for hands, 1 (or 2) for feet and 1 for the head (IPM9A option only).
Window: 0.9 mg/cm^2
Gas: 92.5% Argon, 7.5% Methane. Other gases possible. Connection via a bulkhead fitting to accept a 3 mm internal diameter tube.

Sealed Gas detectors
18 body detectors, 4 for hands, 1 (or 2) for feet and 1 for the head (IPM9A option only).
Window: 5 mg/cm^2
Gas: Argon/CO_2.

Scintillation Gamma detectors
Lead shielding: 20 mm (0.75")

Monitoring time
Autotime: 1 to 100 s in 1 s steps

Background Update Time
100 s rolling average

Precision
Defined by keypad-entered parameter.
Probability of false alarm: between 0.1 and 10 standard deviations.
Probability of detection: between 0 and 10 standard deviations.

Construction
Self-contained free-standing metal cubicle with fork truck lifting points.

Power Requirements
85 to 264 VAC, autoranging. 47 to 63 Hz, 360 VA max.

EMC Compatibility
IPM9s are CE marked and LVD compliant

Dimensions
IPM9A: 2290 H x 1130 W x 1000 D mm
(90" H x 44.5" W x 39.5"D)
plus 160 mm (6.3") per door.
IPM9D: 2250 H x 1100 W x 875 D mm
(88.5" H x 43.5" W x 34.5" D)

Weight
410 kg (900 lb) approx. net without gamma or scintillation options. Shipping weight, 580 kg (1280 lb) approx.

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