



# Argos™ -3 Modular

## Transportable Body Contamination Monitor



**The Argos-3 Modular monitor is an easily transportable body contamination monitor. Part of the Argos family of whole body contamination monitors, the system boasts proven user-friendly operation, with thorough and reliable detection of external contamination on personnel working in nuclear environments.**

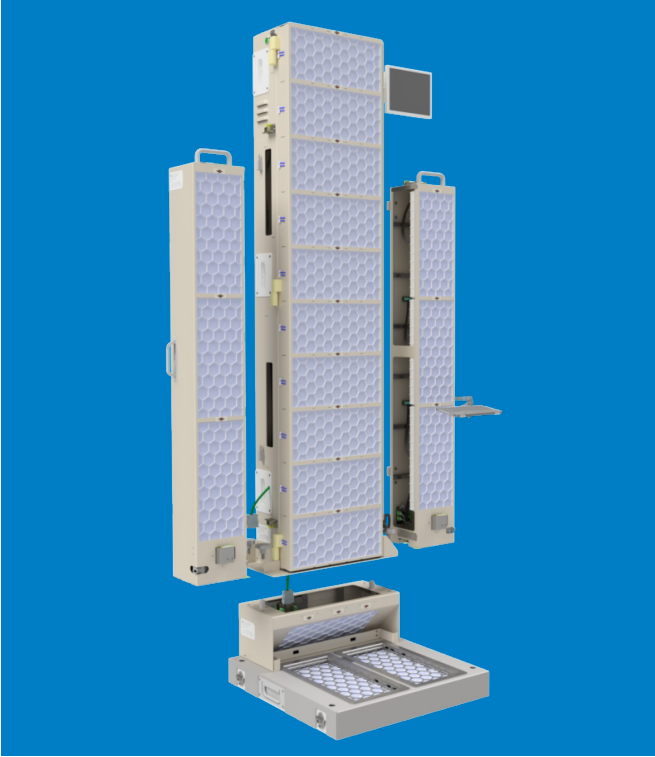
The Argos-3 Modular monitor is designed for mobility, allowing for swift assembly or disassembly into several subcomponents. These parts can then be transported and stored in individual transport cases. Assembly of the monitor takes only ~15 minutes. With compact dimensions, the Argos-3 Modular monitor is well suited for locations with size constraints.

The system includes 19 detectors arranged in a configuration that is easy to transport, while still covering the most critical parts of the body, including head, legs, arm, hands and feet.

### FEATURES

- ✓ Easily transportable
- ✓ Assembly/disassembly of multiple sub-components in ~15 minutes
- ✓ Compact dimensions ~78.8 x 203.0 x 61.0 cm (~31.0 x 79.9 x 24.0 in.) (W x H x D)
- ✓ 19 detectors for coverage of body, head, legs, arm, hands and feet
- ✓ Detector combinations available:
  - Beta plastic scintillation detectors (TPS-B-579)
  - Alpha/beta plastic scintillation detectors (TPS-AB-579)
  - Beta/gamma plastic scintillation detectors (TPS-BG-579)
- ✓ Detachable 8" touch screen display
- ✓ Same comprehensive monitor software platform used on the other Argos™-3/5, Sirius™-5, Cronos®-1/4/11 and GEM™-5 contamination monitors
- ✓ Based on Windows 10 IoT operating system

## ARGOS-3 MODULAR TRANSPORTABLE BODY CONTAMINATION MONITOR



The Argos-3 Modular system is available in three versions:

- **Argos-3PB Modular monitor**, equipped with TPS-B-579 thin plastic scintillation detectors for measurement of beta contamination — no need for a gas supply
- **Argos-3PAB Modular monitor**, equipped with TPS-AB-579 thin plastic scintillation detectors, with state-of-the-art, gas-free alpha and beta detection capability (with discrimination)
- **Argos-3PBG Modular monitor**, equipped with TPS-BG-579 plastic scintillation detectors, featuring a unique gas-free beta and gamma detection capability (with discrimination)

### DETECTOR TECHNOLOGY

The Argos-3 Modular monitor is available in three different versions, which feature different detector technologies.

#### TPS-B-579 Thin Plastic Scintillation Detectors

TPS-B-579 thin plastic scintillation detectors are gas-free detectors, specifically designed for the best possible beta response and minimal sensitivity to gamma background radiation.

The need for counting gas is eliminated by using scintillation detectors with an embedded PMT to minimize dead space between detectors. The design of the TPS-B-579 detectors provides excellent signal-to-noise ratios and, furthermore, the detection capability both across and along the detectors is extremely uniform. There is virtually zero edge effect degradation.

The improvements in both geometry and detector design result in significantly reduced count times compared to other systems.

#### TPS-AB-579 Thin Plastic Scintillation Detectors

TPS-AB-579 thin plastic scintillation detectors are state-of-the-art gas-free detectors with **alpha and beta measurement capability**, and separate alpha and beta measurement channels for each detector.

The detectors do not require any counting gas and feature an extremely uniform detector response.

#### TPS-BG-579 Plastic Scintillation Detectors

TPS-BG-579 plastic scintillation detectors are unique gas-free detectors with **beta and gamma measurement capability**, and separate beta and gamma measurement channels for each detector. Additionally, the beta channels work in anticoincidence mode with the gamma channels, which significantly reduces the sensitivity of the beta channel to elevated background. This allows for excellent measurement performance for beta radiation, also in elevated gamma backgrounds.

TPS-BG-579 detectors are identical in form factor to TPS-B-579 and TPS-AB-579 detectors.

TPS-BG-579 detectors require minimum maintenance and repairs. Plus, their detector windows can be easily replaced in the field.

## ARGOS-3 MODULAR TRANSPORTABLE BODY CONTAMINATION MONITOR

### MODULARITY

All detector types are identical in form factor. They are interchangeable the Mirion Sirius-5 hand, cuff and foot monitors and the Mirion Argos-3/-5 whole body monitors, minimizing management of spares and reducing maintenance costs for facilities where both hand, cuff and foot and whole body monitors are required.

### ELECTRONICS

The High Voltage (HV) preamplification, amplification, discrimination, counting, test pulse generation and other processing electronics are mounted right on the detectors.

Direct-current and low-voltage cables between the detectors and computer feature adequate connectors between the different subcomponents.

The digital signal processing and alarm evolution is performed by a computer, which operates on Windows 10 IoT and uses SSD for data storage. Data may be retrieved via USB or a LAN.

### SETTING PARAMETERS

Parameter settings, testing, calibration and maintenance functions are accomplished locally or from a remote location using the included WebRemote™ software. WebRemote software enables tablet or PC connection to the Argos system via LAN or direct link.

Alternatively, the operator can use the standard monitor software, pre-installed on all Argos contamination monitors, to provide local monitor access and functionality.

The following parameters are adjustable by users:

- Sensitivity of detection by detector and/or detection zone
- Alpha, beta, and/or gamma alarm activity levels be set in units of Bq, Bq/cm<sup>2</sup>, dpm, dpm/cm<sup>2</sup>, μCi, μCi/cm<sup>2</sup>, nCi, nCi/cm<sup>2</sup>, pCi, pCi/cm<sup>2</sup>
- False alarm and alarm confidence probability
- HV Optimization using Figure-of-Merit (FOM) calculations
- Fixed or variable count times (calculated and optimized as a function of the alarm level setpoint, local background levels and desired accuracy of measurement)

### MONITORING ASSISTANCE VIA USER INTERFACE

The LCD touch screen display indicates when the monitor is ready to use. While the occupant is being monitored, messages and a countdown are delivered both audibly (multiple languages available) and visually on the LCD touch screen.

Occupant positioning is verified and corrected with the aid of photoelectric sensors, visual messages and voice prompts.

Visible and audible alarms are given if contamination is detected. A “Contaminated” result is shown on the color touch screen display with voice reinforcement, and an LED lights up beside each contaminated detector.

The display shows the type (alpha or beta), quantity and location of the contamination based on which detector(s) is alarming. The system records data and date/time stamped logs showing the number of times the unit was used, parameters used, calibration settings, fault messages, etc. Up to four contact closure relays are available for remote signaling of the monitor’s status (e.g. “In Operation”, “Contaminated”, “Clean”, “Fault”, etc. or a combination).

### REMOTE STATUS MONITORING

A user-friendly dashboard enables status monitoring (i.e., in service, contaminated, out of service, maintenance) of multiple contamination monitors over the LAN. The dashboard is accessible from a tablet or PC web browser and requires no proprietary software installation.

## ARGOS-3 MODULAR TRANSPORTABLE BODY CONTAMINATION MONITOR

### MAINTENANCE

A separate LED on each detector shows which detector is alarming and/or being addressed on the touch screen.

For ease of diagnostics, numerous test screens are available to enable precision monitoring and changing of parameters, including high voltage and discrimination thresholds for each detector. To provide further assistance, rate meters show counts seen by each detector in real time.

Calibration and alarm testing of all detectors can be done in less than 30 minutes. Testing can be easily completed by just one person and is highly automated.

### EFFICIENCY

Typical  $4\pi$  efficiency, rounded to the nearest whole number, is measured with a 10 cm x 10 cm planar source placed in the center of the detector and in contact with the detector mesh. For comparison with instruments specifying  $2\pi$  efficiency or % of emission surface rate, multiply the efficiencies in the tables by two.

### ARGOS-3PB MODULAR

Typical Efficiency	TPS-B-579 detectors, on contact, with 0.25 mm thick fine mesh	TPS-B-579 detectors, on contact, with 0.5 mm thick fine mesh	TPS-B-579 detectors, on contact, with foot grill, 0.25 mm thick fine mesh
C-14 ( $\beta$ )	5%	5%	3%
Tc-99 ( $\beta$ )	16%	15%	10%
Co-60 ( $\beta$ )	14%	14%	11%
Cs-137 ( $\beta$ )	24%	25%	18%
Cl-36 ( $\beta$ )	25%	24%	20%
Sr-90/Y-90 ( $\beta$ )	32%	31%	23%
Am-241 ( $\alpha$ )*	16%	15%	9%
Pu-239 ( $\alpha$ )*	14%	12%	7%

\* Indicates no Alpha/Beta discrimination.

### ARGOS-3PAB MODULAR

Typical Efficiency	TPS-AB-579 detectors, on contact, with 0.25 mm thick fine mesh	TPS-AB-579 detectors, on contact, with 0.5 mm thick fine mesh	TPS-AB-579 detectors, on contact, with foot grill, 0.25 mm thick fine mesh
C-14 ( $\beta$ )	2%	2%	1%
Tc-99 ( $\beta$ )	10%	9%	6%
Co-60 ( $\beta$ )	11%	10%	8%
Cs-137 ( $\beta$ )	20%	18%	13%
Cl-36 ( $\beta$ )	22%	20%	16%
Sr-90/Y-90 ( $\beta$ )	27%	25%	18%
Am-241 ( $\alpha$ )	14%	13%	7%
U-235 ( $\alpha$ )	11%	10%	4%
Pu-239 ( $\alpha$ )	12%	11%	6%

## ARGOS-3 MODULAR TRANSPORTABLE BODY CONTAMINATION MONITOR

### ARGOS-3PBG MODULAR

Typical Efficiencies (§ = No Alpha/Beta separation)	TPS-BG-579 detectors, on contact, with 0.25 mm thick fine mesh	TPS-BG-579 detectors, on contact, with 0.5 mm thick fine mesh	TPS-BG-579 detectors, on contact, with foot grill, 0.25 mm thick fine mesh
C-14 (β)	2%	2%	2%
Tc-99 (β)	10%	9%	7%
Co-60 (β)	8%	7%	6%
Cs-137 (β)	17%	15%	12%
Co-60 (γ)	18%	16%	17%
Cs-137 (γ)	8%	7%	7%
Cl-36 (β)	16%	14%	13%
Sr-90/Y-90 (β)	19%	17%	14%
Am-241 (α)*	13%	12%	7%
U-235 (α)*	8%	7%	2%
Pu-239 (α)*	11%	10%	5%

\*Indicates no Alpha/Beta discrimination.

## SPECIFICATIONS

### MECHANICAL

- Size: 78.8 x 203.0 x 61.0 cm (31.0 x 79.9 x 24.0 in.)
- Weight: approx. 120 kg (260 lb) depending on configuration

### ENVIRONMENTAL

- Temperature Range:
  - Operating (exceeds IEC 61098): from 0 to +45 °C (+32 to +113 °F)
  - Storage: 0 to +50 °C (+32 to +122 °F)
- Relative Humidity:
  - Operating (per IEC 61098): ≤ 85% non-condensing at +35 °C (+95 °F) maximum
  - Storage: ≤ 95% non-condensing

### ELECTRICAL

#### Power Requirements:

- 115/230 (±10%) VAC, 50/60 Hz, 2/1 A nominal mains
- 3 m (~10 ft) standard cable with IEC 60320 C13 plug supplied (other mains cables are available; specify any special cable requirements - contact local Mirion Service/Sales affiliate for more information).

#### Power Consumption:

- Average: 50 W
- Maximum: 90 VA (Typical)

### Certifications

- ISO 11929:2019 compliant

## ORDERING INFORMATION

- 7097339 Argos-3PBG Modular, two-step compact, modular body contamination monitor, with 19x TPS-BG-579 beta-gamma plastic scintillation detectors
- 7099032 Argos-3PB Modular, two-step compact, modular body contamination monitor, with 19x TPS-B-579 beta thin plastic scintillation detectors
- 7099031 Argos-3PAB Modular, two-step compact, modular body contamination monitor, with 19x TPS-AB-579 alpha/beta thin plastic scintillation detectors

## OPTIONS

- 7097809 Transportation case set for Argos-3 Modular, including: 1x transportation case for main post 195.6 x 83.8 x 66.7 cm (77.0 x 33.0 x 26.3 in.); 1x transportation case for base 94.0 x 77.5 x 40.0 cm (37.0 x 30.5 x 15.8 in.); 1x transportation case for arm detector elements and accessories 143.5 x 69.9 x 38.9 cm (56.5 x 27.5 x 15.3 in.)



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