



HAND & FOOT MONITORING

Sirius™ -5 Compact

Compact Hand, Cuff and Foot Contamination Monitors

The Sirius-5 Compact is an evolution of the well-proven Sirius-5 and delivers the same exceptional performance in a compact form.

The Sirius-5 Compact provides thorough and reliable detection of external contamination on the hands and feet of personnel working in nuclear environments. The Sirius-5 Compact monitor is rugged and reliable for high traffic areas, compact for areas with size constraints and maneuverable with integrated casters and handle. Depending on your monitoring needs, Sirius monitors are designed to use either plastic scintillator (TPS) gasless detectors or patented* gas flow proportional detectors (LFP-579).

*Patent US 7,470,913 B1 High Efficiency and High Homogeneity Large-Area Gas-Filled Detectors

Efficient hand, cuff and foot monitoring in areas with size constraints.



FEATURES

- ✓ Compact footprint: suitable for confined locations, and maximizing available space
- ✓ Rugged and reliable: for high traffic areas – minimal downtime and service required
- ✓ Integrated casters and handle: easily movable. Can set up temporary stations, responding to situations quickly
- ✓ Excellent radiological performance: various detector combinations possible
- ✓ Optimized counting geometry: Measure both sides of the hands/cuffs and bottom of feet in one step operation – time saving and increased throughput
- ✓ Comprehensive and well-proven Monitor Program software platform, including WebRemote® software and Dashboard: Ergonomic and easy to use, touch screen software, intuitive – users with limited experience can easily locate parameter settings
- ✓ Designed for 365/24/7 operation: high uptime and minimum maintenance
- ✓ Same components and spare parts as for Argos™-3/-5, Sirius-5, GEM™-5 and Cronos®-1/-4/-11 contamination monitors
- ✓ Windows 10 IoT operating system with LAN capability and USB ports
- ✓ Compliant with IEC 61098 and ISO 11929:2019

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Sirius-5 Compact

WebRemote software offers an intuitive touch screen graphical user interface for industrial PC-based operation, as well as comprehensive remote monitoring and remote management capabilities. Users can easily locate parameter settings for improved health physics programs, better tracking of contamination, and faster, more thorough personnel throughput at boundary points.

As a common software platform for many Mirion contamination products, including Argos, Cronos, GEM-5 and Sirius monitors, no re-training is needed to learn the software.

Sirius monitors use a sophisticated “fast following” background trending and release-limit algorithm to provide the best performance in a stable or varying radiation field.

Excellent detector protection, modularity of components, and extensive diagnostics result in direct reductions in maintenance, repair, and operation costs. Furthermore, the Sirius-5 Compact features the same components and spare parts from all contamination monitors of the same family (Argos-3/-5, Sirius-5, GEM-5 and Cronos-1/-4/-11 contamination monitors). The Sirius-5 Compact will therefore not require a separate inventory of spare parts or service management, resulting in reduced cost of ownership.

DETECTOR CONFIGURATIONS

The Sirius-5 Compact is equipped with six detectors. It is available in four different configurations, which feature different detector technologies:

LFP-579 Gas Flow Detectors

LFP-579 gas flow detectors provide highly sensitive alpha and beta measurement capability with separate alpha and beta measurement channels for each detector. The patented detector design makes use of three independent counting sections which reduce background for an optimal detection capability. This design further enhances uniform detector response. The Sirius-5AB Compact is designed to inherently minimize gas usage. Therefore, no “gas management system” is required.

The overall benefit of the detector geometry and patented detector design is the reduction of count times by as much as 25% compared to similar systems.

TPS-B-579 Thin Plastic Scintillation Detectors

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

The need for counting gas is eliminated by using plastic scintillation 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.

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 with 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 with 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 background.

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MODULARITY

All detector types are identical in form factor. They are interchangeable between 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.

READ-OUT ELECTRONICS

The High Voltage (HV) preamplification, amplification, discrimination, counting, test pulse generation and other processing electronics are mounted right on the detectors. The cables between the detectors and computer are all direct current and low voltage.

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 either via USB or a LAN.

MAINTENANCE

The Sirius-5 Compact monitors simplify maintenance with easy access from the front and center of the unit and improved accessibility to the top part of the unit. Detectors can easily be replaced and repaired.

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 of all detectors and alarm testing can each be done in less than ten minutes.

SETTING PARAMETERS

Parameter settings, testing, calibration and maintenance is accomplished locally or from a remote location using Mirion WebRemote software. The WebRemote platform enables tablet or PC connection to the Sirius-5 Compact via LAN or direct link.

Alternatively, the operator can use the standard Monitor Software, pre-installed on all Sirius-5 Compact Contamination Monitors, to provide local monitor access and functionality.

The following types of parameters are available for adjustment:

- Sensitivity of detector by zone
- Alpha, beta, and/or gamma alarm activity levels set in units of Bq, Bq/cm², dpm, dpm/cm², nCi, nCi/cm², pCi, pCi/cm², μCi or μCi/cm²
- 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. The display shows the type (alpha or beta), the quantity and the 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. A relay closure is available for remote signaling of the monitor's status (e.g. "Contaminated", "Out of Service", "Fault", "Clean", etc.).

REMOTE STATUS MONITORING

A user-friendly dashboard enables the status monitoring (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.

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Table 1. Model-specific information

RADIOLOGICAL (TYPICAL)

Model	Sirius-5AB	Sirius-5PB/PAB/PBG
Detector Type and Quantity	LFP-579 x6	TPS x6
Two Moveable Hand Detectors	Yes	
Frisker Option Available	Mirion 100 cm ² alpha/beta CSP™ SMART probe*	
Detector Type (Hands, Cuff & Foot)	Gas Flow Proportional	Plastic Scintillator
Radiation Monitored	Alpha/Beta	Beta (PB), Alpha/Beta (PAB) or Beta/Gamma (PBG)
Window Area Per Detector	~ 579 cm ²	
Window	0.8 (±12%) mg/cm ² (Mylar); window assembly is field replaceable	1.2 mg/cm ² (Multilayer Aluminum coated Mylar); window assembly is field replaceable
Typical Gas Flow Rate	10 cm ³ /min	Not applicable as external gas is not required
Possible Gas Mixtures	P5, P7.5, P-10 (Argon-Methane), or Argon/CO ₂ (90/10)%	

Table 2. Typical 4π efficiencies, measured with 10 cm x 10 cm plate source placed in the center of the detector and in contact with the detector mesh. For comparison with instruments specifying 2π efficiency or % of emission surface rate, multiply these figures by 2.

Typical efficiencies:	LFP-579 detectors, on contact, with 0.5 mm fine mesh	LFP-579 detectors, on contact, with foot grill on 0.25 mm fine mesh	TPS-B-579 detectors, on contact, with 0.5 mm fine mesh	TPS-B-579 detectors, on contact, with foot grill on 0.25 mm fine mesh	TPS-AB-579 detectors, on contact, with 0.5 mm fine mesh	TPS-AB-579 detectors, on contact, with foot grill on 0.25 mm fine mesh	TPS-BG-579 detectors, on contact, with 0.5 mm fine mesh	TPS-BG-579 detectors, on contact, with foot grill on 0.25 mm fine mesh
¹⁴ C (beta)	8%	6%	4%	3%	2%	1%	2%	2%
⁹⁹ Tc (beta)	16%	14%	13%	10%	9%	6%	9%	7%
⁶⁰ Co (beta)	14%	14%	15%	11%	10%	8%	7%	6%
¹³⁷ Cs (beta)	25%	22%	21%	18%	18%	13%	15%	12%
⁶⁰ Co (gamma)	—	—	—	—	—	—	16%	17%
¹³⁷ Cs (gamma)	—	—	—	—	—	—	7%	7%
³⁶ Cl (beta)	25%	23%	23%	20%	20%	16%	14%	13%
⁹⁰ Sr/ ⁹⁰ Y (beta)	32%	26%	29%	23%	25%	18%	17%	14%
²⁴¹ Am (alpha)§	17%	13%	15%	9%	13%	7%	12%	7%
²³⁵ U (alpha)§	16%	11%	11%	4%	10%	4%	7%	2%
²³⁹ Pu (alpha)§	16%	12%	12%	7%	11%	6%	10%	5%

*See separate data sheets for CSP smart probes.

§ No Alpha/Beta discrimination for TPS-B-579 and no Alpha/Beta separation for TPS-BG-579.

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SPECIFICATIONS

PARAMETER ENTRY

- Parameters may be entered with the touch of a finger using the capability of the built-in touch screen and WebRemote software. Additionally, a USB connected keyboard/mouse may be used to enter parameters

MECHANICAL

Cabinet:

- Steel with rugged powder coat finish for column and top, stainless steel base and foot pan cover provide for ease of decontamination and minimum maintenance
- Approximate dimensions: (H x W x D) 1465 mm x 640 mm x 844 mm (57.7" x 25.2" x 33.2")
- Approximate weight is 110 kg (242.5 lb) without options

ELECTRONICS

Computer:

- The computer of the Sirius-5 Compact operates on Windows 10 IoT operating system with LAN capability and USB ports for transferring data. Data may be retrieved either via USB or a LAN
- High-quality digitized sound for prompts

Display Screen:

- ~23.4 cm (10.4 in.) touch screen LCD display, integrated onto top of unit

Easy access Input/Output and

Power Entry Ports panel at foot of pedestal:

- Two USB ports and one Ethernet port (RJ-45)
- Standard three-prong IEC 60320 power inlet socket (C14)
- Sirius-5AB Compact also includes a gas connector

Environmental:

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

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: 35 W
- Maximum: 60 VA (Typical)

Certifications:

- IEC 61098 compliant
- ISO 11929:2019 compliant



OPTIONS

Alpha/Beta Tool/Body Frisker Probe

The Sirius-5 Compact can be fitted with the optional 100 cm² external alpha/beta CSP frisker probe. The plastic scintillation probe provides gas-free monitoring in two separate measurement channels with discrimination between alpha and beta radiation.

Uninterruptible Power Supply (UPS)

The UPS allows autonomous operation for up to 30 minutes without external power. The UPS is mounted on a mounting bracket on the back of the Sirius-5 Compact. Please note: Default options are intended for the North American region only; contact local Mirion affiliate for other regions.

Dosimetry Reader Integration for DMC 3000™ Dosimeter

- Integration of LDM 320D dosimeter reader for use with DMC 3000 dosimeters
- Direct data-exchange between contamination monitor and DosiServ™ Dose Management Software (Requires DosiServ dose management system)

Card/Barcode Readers

This monitor includes integration of a barcode, magnetic card or proximity card reader. Information on card is stored together with measurement results from each measurement to allow identification of the person being monitored. Mirion recommends sending a sample of card to the factory to ensure compatibility.

CeMoSys™ Software Compatibility

Mirion contamination monitors can be integrated with the CeMoSys central monitoring system (version 2.0 or above) to provide comprehensive supervisory functionalities for all connected contamination monitors.

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Part Number	Description
SIRIUS-5ABCOMP	Sirius-5AB Compact: One step compact hand/cuff/foot monitor, with Alpha/Beta Discrimination, Gas Flow Proportional Detectors
SIRIUS-5PBCOMP	Sirius-5PB Compact: One step compact hand/cuff/foot monitor, for Beta, Thin Plastic Scintillator Detectors
SIRIUS-5PABCOMP	Sirius-5PAB Compact: One step compact hand/cuff/foot monitor, with Alpha/Beta Discrimination, Thin Plastic Scintillator Detectors
SIRIUS-5PBGCOMP	Sirius-5PBG Compact: One step compact hand/cuff/foot monitor, with Beta/Gamma Discrimination, Plastic Scintillator Detectors
SIRIUS-COMP-FSKPAB	Frisker with 100cm ² alpha/beta CSP frisker probe
SIRIUS5-COMP-UPS	Uninterruptible Power Supply (UPS) with a mounting bracket (shelf) for Sirius-5 Compact (for North America only)
7098537	Integrated LDM 320D dosimeter reader with direct data-exchange between contamination monitor and DosiServ. Requires DosiServ Dose Management System
0009CVMS0002	CeMoSys™ Client License for interfacing with CeMoSys™ Central Monitoring System (version 2.0 or above)
SIRIUS-COMP-BECS	Beacon/Light tower with sounder
SIRIUS5-PURGE-DET	Factory installed LFP-579 Purge Detector for Sirius-5AB Compact
SIRIUS5-COMP-BAR	Barcode card reader
Sirius5-MAG	Magnetic card reader
Sirius5-PROX	Proximity card reader
SIRIUS5-GASMON	Gas pressure monitor for low gas pressure check
7098218	Wood shipping crate

Many additional upgrade options are available for in-field upgrades to existing Sirius-5 Compact Monitors. Contact your Mirion sales and service affiliate for more information.



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