





**Switch mode power supplies unit**

: An AC-DC converter generates the necessary PC voltages of +12, +24 & +5V necessary to the power the electronic sub-systems. It is also provided with a line filter & other EMC suppression components.

**13 channel pre-amplifier unit :**

This unit comprises of 13 individual pre-amplifier modules used for connecting the -ve tail pulses to TTL coming from each of the GM detectors. HV bias to the GM tubes is fed through the pre-amplifier unit.

• **Counting Range :**

- 0 to 9999 counts
- 0 to 9999 CPS
- 0 to 9999 Bq
- 0 to 99999 CPM

On overflow the display shall indicate 'OR'

• **Timing range :**

Pre-settable from 1 to 99 seconds in 1 sec steps for COUNTS, Bq, CPS or CPM modes for Hand and Foot monitoring. Time constant for checking the Clothing monitoring is 5 seconds with display being refreshed every second.

**HUMAN MACHINE INTERFACE:**

**Indications & controls:**

**Mains switch :** The mains switch shall be provided inside the cabinet of the monitor.

**Mains indication :** Red LED to indicate mains power ON is provided on the display panel.

**Optical sensor :** The monitor shall be provided with optical sensor inside the detector cavities for initializing the counting.

**Test switch :**

Through detachable keypad, provision to check the background is given.

**Visual alarm :**

Each channel visual mimic indication on LED indicators and additionally color mimics for each channel are provided on the colour LCD display.

**Audio Alarm :** Loud audio tone.

**Audio Instructions :**

Audio instructions shall be generated for clear, contaminated, instrument fault, monitoring in progress and incomplete operation.

Multi-lingual messages shall be played back in either Hindi / Tamil / Telugu/ Marathi based on the selection.

**Operational Guidance :**

Operational guidance messages shall be displayed Before monitoring, On Clear, On Contamination and On Incomplete operations shall be generated in either Hindi / Tamil / Telugu / Marathi apart from the primary language English.

**Incomplete operation :**

Yellow LED indicator along with Multi-lingual textual indication accompanied by audio alert are generated when counting is interrupted.

**Clear Indication :**

Green LED indicator and LCD mimic indicator will be ON when all the channels are clear.

**Counting in progress Indication :**

Busy LED indicator will be ON and Time left is displayed when counting is in progress.

**Visual display :**

7.5" colour LCD display.

Given below is a partial list of the functions being carried out by the visual display.

- Display normal status messages.
- Visual display of monitoring in progress (including count down of time in seconds)
- Display of individual channel readings
- Alarm annunciation
- Background checking and display
- Instructions for use.
- Self explanatory, language independent symbols / user instructions.

**Computer interface :**

The monitor shall have a RS485 serial & Ethernet 10/100 Mbps port for interfacing with a remote IBM PC-compatible computer. The features supported by Ethernet port are given below.

- The PC and the monitor shall operate in a host-slave configuration and the software protocol will be MODBUS/RTU or MODBUS / TCP
- The firmware of the monitor shall be able to send the instrument data like Instrument ID, Instrument type, Maximum counting range, Timer range, alarm settings, alarm status, current reading etc. to the Host PC on demand.
- The firmware shall be able to receive commands from Host PC and carry out the setting of different parameters like Instrument ID, Instrument type, Maximum counting range, Timer range, alarm settings, instrument address etc.
- The PC as the host shall give commands and send queries. The monitor will carry out various functions in response to the queries.

**Power supplies:**

The monitor shall have a High voltage power supply unit for the detectors and a low voltage power supply unit which supplies the DC power supplies required for the Electronic unit. It shall have a very good line voltage and load regulation for all the supplies. It shall be fitted with Mains line filters to avoid line interferences.

The High voltage output shall be adjustable by handheld configurator or host PC and EHT should be displayed on the display on demand. The EHT shall adjustable from 300 V to 1500 V DC.

**Instrument fault indication :**

Fault diagnostics are carried out periodically and any failures are reported on the display like LV, HV and detector failures. Fault indications shall be cleared automatically if normal status is resumed.

**HOUSING:**

- Most of the modules of the Electronic unit and detectors shall be integrated into a column shaped cabinet with castor wheels.
- The hand probes shall be fitted so that both the hands can be inserted and the optical sensors inside the cavities are activated when hands are placed to start monitoring.

- The modules shall be plug in type with all the controls and display on the front panel.
- The cabinet shall be rat-proof, rugged & elegant.

**Self diagnostics :**

The monitor shall have built-in self diagnostics. On being powered it shall perform tests to ensure that all components and sub systems are functioning properly.

It shall check for the Power supply, High Voltage Supply, Detector, Counting and measuring circuits, Alarm Systems, Display Systems and communication port.

The firmware should not halt monitoring / data acquisition function any time. The firmware shall be designed for high reliability and availability.

Test points shall be provided for checking the EHT voltage and for connecting external input pulse signals.

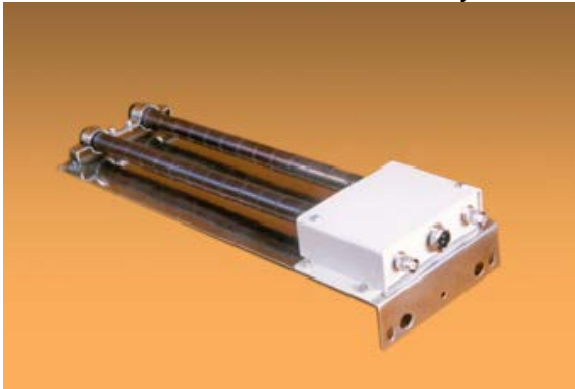
**Input Power :**

230VAC +/-10%, 50Hz, single phase supply. Power ON/OFF indication shall be provided with an indicator LED. Line filter and spike suppressor shall be provided.

**Environment :**

The instrument shall be able to withstand temperature upto 50°C and relative humidity upto 90% in radiation areas.

Hand Detector Assembly



Foot Detector Assembly



Foot Assembly Dust Tray



Pancake Detector Probe



Beta - Gamma Clothing Probe



Display Module



Clothing Probe with GM133 (LND 719)



Pancake Detector Probe

TYPICAL SCREEN SHOTS



**INSTRUMENT READY....**



<b>BOTH HANDS</b>	
कृपया दोनों हाथ रखिये	
	

<b>LEFT FOOT</b>	
कृपया बाँया पांव रखिये	
	

**ACQUISITION ON**

<b>TIME LEFT</b>	10	<b>Sec</b>
समय बाकी		सेकंद

<b>LEFT HAND</b> बाँया हाथ	COUNT	<b>RIGHT HAND</b> दाँया हाथ	COUNT
 UPPER	00100	 UPPER	00000
LOWER	00100	LOWER	00000


<b>LEFT FOOT</b> बाँया पांव	COUNT	<b>RIGHT FOOT</b> दाँया पांव	COUNT
	00100		00100



**ACQUISITION STOPPED**



<b>LEFT HAND</b>	बाँया हाथ
<b>RIGHT FOOT</b>	दाँया पांव

<b>REMOVED</b>
निकाल दिये


**ACQUISITION COMPLETE**



	<b>YOU ARE CLEAN</b>
CLEAN	आप शुद्ध है



<b>LEFT HAND</b> बाँया हाथ	COUNT	<b>RIGHT HAND</b> दाँया हाथ	COUNT
 UPPER	00500	 UPPER	00500
LOWER	00500	LOWER	00500

<b>LEFT FOOT</b> बाँया पांव	COUNT	<b>RIGHT FOOT</b> दाँया पांव	COUNT
	00500		00500

**ACQUISITION COMPLETE**

	<b>YOU ARE CONTAMINATED</b>
CONTAMINATED	<b>LEFT HAND BOTH FEET</b>
	आप संदूषित है
	बाँया हाथ दोनों पांव

<b>LEFT HAND</b> बाँया हाथ	COUNT	<b>RIGHT HAND</b> दाँया हाथ	COUNT
 UPPER	04600	 UPPER	00000
LOWER	04600	LOWER	00000

<b>LEFT FOOT</b> बाँया पांव	COUNT	<b>RIGHT FOOT</b> दाँया पांव	COUNT
	04600		04600