

**GAMMA AREA MONITOR
TYPE : GA720S
(0.01 – 100mSv/hr)**

Technical Data



- FEATURES :**
- Performance specifications confirm to ANSI N42.17A
 - EMI/EMC compliance as per IEC 61000.
 - Structural design seismic qualified confirming to IEEE-344 STD.
 - Instrument enclosure and detector assembly are IP-54 compliant.
 - Radiation tolerant upto 10^4 Rads cumulative.
 - Microcontroller based design has been employed.
 - Dose rate range covered 0.01–100 mSv/hr.
 - Auto ranging & auto TC selection in the range of 16 sec to 0.5 sec depending upon dose rate.
 - Large size 6x7 segment LED indication for dose rate is provided.
 - Large size WINDOWS for NORMAL & ACTIVE alarm condition.
 - 4 to 20 mA current loop / 0-5V analog. Output is available for remote indication on a I/O connector (optional).
 - 16x2 LCD dotmatrix display for visualization of other parameters.

Gamma Area Monitor type GA 720S, manufactured by NUCLEONIX SYSTEMS employs based design and is primarily meant to serve as a Gamma Zone Monitor to indicate dose rates and give alarm, visual and aural, once the dose rates exceed the preset level fixed by the user. Also relays will be activated on alarm.

This unit will be useful for monitoring Gamma dose rate levels in working areas of various Radiological / Nuclear facilities which may include reactor building, Atomic power stations, Radiochemical / Reprocessing plants, waste immobilization plants & other similar facilities.

This unit indicates the dose rate digitally on a 6 x 7 segment LED display. Each of the annunciator windows for NORMAL and ACTIVE conditions has LED array. Once alarm triggers ACTIVE window starts blinking.

Unit can be programmed / configured using front panel keypad which can be deactivated after completion of programming. Configuring the unit namely setting preset level, setting reset mode - AUTO/MANUAL etc are achieved by this keypad.

Unit also performs self-diagnostics for HV failure, pulse processing electronics failure and detectors failure on power up.

Alarm acknowledge and reset pins are provided on the circular I/O connector for remote acknowledge & reset.

All these products/accessories are seismic tested to qualify as per IEEE standard :344



Electronic unit wall mounting bracket



Detector wall mounting clamp



Area Gamma Monitor GA720



Floor mounting stand for Electronic unit



Detector probe with 5 pin MS connector (male)

SPECIFICATIONS

Radiation to be detected :
X -ray & Gamma Radiation.

Range :
0.01–100 mSv/hr
0.1-10000mR/hr
0 – 100000 CPM
0 – 10000 CPS
Range and Unit are configurable

Detector : Energy compensated Halogen quenched G.M.Tube. GM130E

Energy Dependence : Within +/- 25% of true dose rate from 100 Kev to 1.33 MeV gamma rays.

Accuracy : +/- 10% with Cs 137

EHT : 400 V to 700 V DC adjustable (Typical 500V)

Display : Auto ranging direct reading, 6 digit 7 segment LED display & 16x2 LCD display. 6x7 LED display is interfaced using multiplexed display driver. 4x7 segment display is used for display of dose-rate and hardware status indication & 16x2 LCD for visualization of preset alarm and other parameters.

Display Resolution: 0.01mR/hr / 0.1µSv/hr / 1 CPS / 1 CPM

Overload : Senses overload above 200% of full scale and upto 10R/h & indicates "OL" on display.

Over-range : Senses if the radiation field being measured has exceeded the measurement range of the instrument above 200% of the higher range and displays "OFI"

Recorder output : 4 to 20 mA, with 600 ohm load.

Time Constant : First reading on Power ON within 5 secs.

Normal (Slow) : 30 sec to 0.5 sec automatically varying inversely with the radiation level (Count rate).

Abrupt detection : Updates the current reading within 2 sec and returns to normal mode.

Calibration Accuracy : +/- 10% through out the range

Instrument "ON" Indication : RED Neon indicating A.C. lamp.

Alarm range : 0.01-10.00 mSv/hr OR 1-9999 mR/hr to 100000 CPM
The alarm level setting can be set through front panel keypad or RS-485 Serial port using handheld configurator or PC provided with password protection. Front panel keypad is provided with DIP switch de-activation.

Alarm Indication :

- a) Red (LED) flashing large area window display
- b) Loud audio tone (dual frequency tone)

Alarm annunciation scheme : As tabulated below

Parameter Status	Visual indication (Red LED)	Audio
Normal	OFF	OFF
Abnormal (Active)	Flashing	ON
On ACK After being abnormal	Steady Red	OFF
Reset after returning to Normal	OFF	OFF

Instrument Controls:

- a) Acknowledgement switch for muting audio
- b) Reset switch for resetting the Alarm indication and alarm relay.
- c) Power ON/OFF switch (This is inside the cabinet) with Power ON indication

Instrument Fault indication:

- a) EHT failure: Visual alarm with flashing RED LED indication & "EHT" message on display
- b) Detector failure: Visual alarm with flashing red LED & "d-FL" message on display.
- c) Microprocessor / microcontroller failure: Visual alarm with flashing green lamp.
- d) Fault indications shall be cleared automatically if normal status is resumed.

Detector Housing:

- a) The G. M. Detector is located external to the Monitor.
- b) It is housed in a suitable, air-tight **SS** shell with built-in pre-amplifier to drive upto 50 mtrs long cable.

Lead Shielding (Optional) : Lead Shielding (20mm thickness) for detector probe to reduce background can be supplied optionally on request.

Monitor Enclosure:

- a) Vapor-tight, rugged & elegant.
- b) The door is provided with lock and key arrangement
- c) The enclosure is designed to qualify minimum industrial protection Class IP-54.

Mounting : Detector housing is mounted using clamps on top of the monitor. The monitor is wall mountable type. Brackets for the monitor & detector housing are supplied along with the equipment.

Remote /External Console :

- a) 4 - 20 mA linear, proportional to full scale display output. Current output will be able to drive load of 600 ohms. (Output circuitry shall be able to drive 200 mtrs. of twisted pair of wires).
- b) Two sets of potential free contacts of Alarm relay (Change over). Contact rating 3 Amp at 250 VAC. The relay gets energized on NORMAL condition and de-energized under ALARM condition.

- c) Remote alarm acknowledgement and reset signals for the field instruments (Normally open contact).
- d) Indication of instrument fault condition (detector, EHT and LV supplies), over range & overload conditions by up-scale 4-20 mA. (22.5 mA)
- e) All these signals are terminated on a 17 pin I/O connector (Allied Connectors). The corresponding mating plug with 5 mtr cable is supplied with the monitor
- f) RS-485 serial port. This is provided, on a pair of D-type connectors (male & female).

Computer Interface :

This monitor has a RS-485 Serial Communication port for interfacing with a PC. The PC and the monitor operate in a host-slave configuration in a multi-drop network through this interface. The PC, as the host will give commands and send queries. The monitor will carry the various functions as per the required information in response to the queries.

The firmware of the monitor sends the instrument data like Instrument ID, Instrument type, Input range, Display range, alarm settings, alarm status, current reading, diagnostic status of EHT/GM tube etc. to the Host PC on demand. The firmware receives commands from Host PC and carries out the setting of different parameters like Instrument ID, Instrument type, Input range, Display range, alarm settings, Ack, Reset, EHT setting, Instrument address etc. The configuration settings are password protected and the password is user defined.

The detailed specifications for the interface are as follows:-

Type : RS-485 Multi-drop Serial Communication Port, Half Duplex Bi-directional communication.
 Character Format : ASCII
 Protocol : MODBUS/RTU
 Bit Rate : User configurable to 9600 or 19200 bits per sec.
 Address : User configurable from 0 to 255.
 Connector : 9-pin D-type connectors (2 connectors connected in parallel for daisy chaining a number of instruments). The mating connectors with cover are supplied.

Self Diagnostics:

The monitor has built-in self diagnostics. On being powered it performs tests to ensure that all components and sub-systems are functioning properly. It checks for the Power supply, High Voltage Supply, Detector and pulse processing electronics.

Input Power:

90-265 VAC, 50/60Hz, single phase supply. Power ON/OFF switch is provided with a neon indicator. Spike suppressor and line filter are also provided.

Environment : This instrument can withstand temperature upto 50 deg C and relative humidity upto 90% in radiation areas.

Environmental compliance : As per IS 9000 / ANSI N 42.17

The instrument enclosure and detector assembly are IP-54 compliant.. Electronic unit will withstand cumulative radiation dose of 10000 Rad. (30 years of operation).

Seismic qualification : Electronic unit, its wall mounting bracket, detector probe, wall mounting clamp and floor mounting stand are seismic qualified confirming to IEEE-344

EMI / EMC compliance: As per IEC 61000 / ANSI N42.17

Mechanical Enclosure:

Size : 357H x 380W x 140D

Weight : 8.5kg approx