Technical Data

NXG_AGM1_E

Features :

❑ Uses SoC, based on ARM Cortex A5 400MHz ,1.5MB SRAM,128MB Flash,extensive use of peripheral devices & Ethernet interface has been employed.
❑ Uses Microcontroller for counting radiation pulses, fault diagnostics, setting HV etc.
❑ Dose rate, range covered is (0.01 - 1000.00) mR/hr by default, with option of selection of other three 'units' namely µSv/hr, CPS & CPM. Range is extend-able to 10R/h on request.
❑ Auto ranging & auto TC selection in the range of 30 sec to 0.5 sec depending upon detector count rate.
❑ 5" TFT display indication for dose rate, alarm status & configuration settings.
❑ Designed using GM tube type LND 713 or its equivalent.
❑ Large size WINDOW indication on TFT display for NORMAL & ACTIVE alarm condition.
❑ Alarm set point & ACK / RST through touchscreen.

Area Gamma Monitor Type NXG_AGM, manufactured & supplied by Nucleonix Systems is primarily designed to indicate dose rates in the measuring unit selected & produces audio/visual alarms, if the dose rate exceeds preset value. By default the unit is set to be in mR/hr & the range is (0.01 - 1000mR/hr). It uses latest state-of-art electronic devices including SoC based on ARM cortex A5 400MHz CPU with associated peripheral devices and other discrete ICs & components. Use of these devices makes it compact & highly reliable. Powerful embedded code adds-up and enhances its performance and gives extra advantage from the angle of fault diagnostics, programmable features & measurement of dose rate & data communication under networked environment.

This Area Gamma Monitor type NXG_AGM will be useful for monitoring Low Gamma dose rate levels in µR/hr working areas of Radio Isotope Laboratories, Radiotheraphy departments, Medical & Industrial Radiological installations apart from its usefulness in Atomic Power Stations, radiochemical plants, waste immobilization plants etc.,

With power ON, initialization of SoC, peripheral devices, 5" TFT display/timers, counter etc, takes place. Followed by this, dose rate, calculation takes place in the selected unit such as mR/hr. Additionally, hardware & fault diagnostic check will be carried out. Display updating will take place every 1 sec. Time constant (TC) for doserate will be computed depending upon the detector output count rate.

Area Gamma Monitor NXG_AGM indicates dose rate digitally on TFT display. There are a visual annunciator window GREEN & RED for NORMAL & ACTIVE conditions respectively, shown on TFT display. The entire screen flashes, when the dose rate alarm occurs and in normal condition the NORMAL window glows.

For NXG_AGM1, User interface is through **Touch Screen**. Data can be transferred to USB pendrive. For NXG_AGM2, User interface is through NI-Configurator Software by using Ethernet Communication.

For NXG_AGM3, User interface is through Radgrid Software by using Ethernet Communication, Multiple Units can be networked.

The user interface is through Radgrid Software by using Ethernet Communication.

In Application that require External probe a Smart Probe is provided with RS485 interface. It can be installed in the measurement area, where as the display unit can be in the Operations / Control Room.

Head of the Dept.

Manohar Rao

Approved By

SPECIFICATIONS

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

Range :
0.01 −1000 mR/hr
0.1- 10mSv/hr
0- 50000 CPM
Range and Unit are configurable.
Range extend-able to 10R/h on request.

Detector : Energy compensated Halogen -quenched G. M. Tube LND713 or equivalent having a sensitivity of 7.5 cps / mR/ hr.

Energy response : +/-25% from 100keV upto 1.25MeV.

Accuracy : +/ - 10% Full scale with Cesium source.

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

Display : 5"TFT is used for display of doserate, hardware status information & also for visualization of preset alarm and other parameters.

Overload : Senses overload above 200% of full scale and upto 1 R/ h & indicates on display "OFL".

Over-range : Senses if the radiation field being measured has exceeded the measurement range of the instrument and upto 200% of the instrument and displays "OVR".

Time Constant: First Stable reading on Power ON within 1 min.

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

Abrupt detection : Update the current reading within 2 sec.

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

Alarm range :
0.01 mR/Hr to 99.99 mR/hr.
0.1 μSv/Hr to 999 μSv/hr.
1-50000 CPM .
The alarm level setting will be carried out through Radgrid Software by Ethernet Communication.

Alarm Indication:
a) Red Mimic flashing large area on TFT display.
b) Loud alternating audio tone (Dual frequency tone)

Alarm annunciation scheme
As tabulated below:

Parameter Status	Visual indication (Red MIMIC)	Audio
Normal	OFF	OFF
Abnormal	Flashing	ON
On ACK	Steady Red	OFF
Back to normal	Steady Red	OFF
Reset on abnormal	Steady Red	OFF
Reset on normal	OFF	OFF

Instrument Controls:

a) Acknowledgement icon for muting audio alarm.
b) Reset icon for resetting the Alarm indication and alarm relay.

Instrument Fault indication:
HV failure: Visual alarm with flashing red MIMIC indication & "HV" message on display.

Detector failure : Visual alarm with flashing red MIMIC & "Detector Failure" message on display. Fault indications shall be cleared automatically if normal status is resumed.

Detector Housing: (In case of External Probe).

a. The Smart Probe is located external to the Display Unit.

b. It is housed in a suitable, air-tight Aluminium / SS shell with built-in pre-amplifier, HV & Microcontroller with RS485 interface.

c. The instrument is provided with 10 mtr cable between Smart Probe and the monitor.

d. The detector housing qualifies industrial protection Class IP-54.

e. A separate mounting bracket for detector housing is provided.

External Console:

RJ 45 connector for Ethernet port

Computer Interface : The monitor (NXG_AGM2 or AGM3 only) has a Ethernet 10/100Mbps port for interfacing with a remote Windows PC. The features supported by Ethernet port are given below.

- The PC and the NXG_AGM unit shall operate in a Client/Server configuration and the software(RADGRID) protocol will be TCP.
- The PC software shall give commands and send queries. The NXG_AGM unit will carry out various functions in response to the queries.

The firmware of the monitor shall be able to send the instrument data like instrument IP, 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 shall be able to receive commands from Host PC and carry out the setting of different parameters like instrument IP, instrument type, input range, display range, alarm settings, Ack, Reset, instrument address etc.

- It can store data for every second. Last 60 Days data will be stored in the Instrument.

Input Power: 230V AC +/-10%.

Environment : The instrument is designed to be able to withstand temperature up to 50^0 C and relative humidity upto 90% in radiation areas.

Environmental compliance: As per IS 9000 Part III & IV

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

Mechanical Enclosure:

Size: 180H x 178W x 38D.

Weight: 1Kg approx.

NXG_AGM1_I

Ordering Info:

Part No	Key Features
NXG_AGM1_I	Area Gamma Monitor, Touchscreen for ACK & RESET, USB pendrive interface for configuration, data download, Internal probe.
NXG_AGM1_E	Same as above, but External probe.
NXG_AGM2_I	Area Gamma Monitor with Ethernet Port works with NI Configurator Software for Configuration, Download of stored data to PC, Internal probe.
NXG_AGM2_E	Same as above, but External probe.
NXG_AGM3_I	Area Gamma Monitor with Ethernet Port, Networkable works with Radgrid Software for configuration, Remote display of data every sec, Remote ACK & RESET from Radgrid Software etc, Internal probe.
NXG_AGM3_E	Same as above, but External probe.
Eth_Switch_12 or Eth_Switch_24	12 or 24 port Ethernet Switch.
Eth_Cable	UL approved CAT6 Ethernet Cable.
Eth_Cable laying	Laying & Networking of Ethernet Cable as per site requirements.
SW_RADGRID_5	PC Software based on LAN that networks multiple NXG Series Radiation instruments of Nucleonix make & display the Radiation data, fault diagnostics, Calibration due etc. networks upto 5 instruments.
SW_RADGRID_15	Same as above, networks upto 15 instruments.
SW_RADGRID_100	Same as above, networks upto 100 instruments.
SW_NI Configuration	PC Software based on Ethernet that communicates with NXG series Radiation instrument of Nucleonix make to configure & download radiation data.