

**GEIGER COUNTING SYSTEM**

**TYPE: GC 602A**



**FEATURES:**

- Ideal choice for swipe sample / planchet sample counting for Beta activity.
- 20 x 2 LCD dot-matrix display for counts, elapsed time and HV.
- Single Board Design Approach.
- Counts capacity 999999, preset time 9999 sec.
- Variable HV (0-1500V), 1mA.
- Built –in parallel port for direct data printing.
- Built –in serial port for data downloading into PC.
- Store and Recall facility for data counts..

Geiger Counting system type GC602A manufactured by NUCLEONIX is an Advanced Technology based versatile integral counting system designed around eight bit microcontroller chip. This system is highly recommended for research work, apart from, its usefulness in the academic fields for teaching. This system along with wide end window G.M. Tube Type GM125 and Lead Castle will serve as an excellent Beta Counting System useful for swipe sample counting by Health Physics Labs.

**SPECIFICATIONS**

**G.M. Input (From G.M.Counter) :**

- (a) Polarity : Negative
- (b) Amplitude : 250 mV (min)

**Resolving Time** :6 micro sec (approx)

**EHT Output :**

Variable EHT using ten turn pot upto a maximum of 1500 volts at 1mA. Line and load regulation better than 0.05%. Ripple less than 200mV(rms).

**Display :**

20x2 LCD dot-matrix display has been provided to indicate data counts, Elapsed Time and EHT.

**Modes of operation:** Preset count & Preset time modes.

**Counts Capacity:**999999 counts

**Preset time :**( 0-9999) sec.

**Data Storage** :Upto 1000 readings

**Command Buttons:** START, STOP, PROG, STORE, INC & DEC command buttons have been provided on the front panel key pad.

**Programmability:** Includes selection of Preset Time, Storing / Recalling of data, Starting and stopping of acquisition, lable assignment for data countsBG(Background),ST (Standard) & SP (sample) etc.,

**Printer Port:** Built-in centronics port facilities connection to a printer for direct data printing selectively.

**USB Serial Port:** Built-in USB serial port facilitates data down loading into PC.

**Paralysis Time:** A choice of three paralysis times 250, 350 and 550 micro sec plus OFF position selected through PROG key.

**G.M. Socket:** MHV connector for connecting to G.M. Detector.

**Power: Unit** is powered works on 230V, AC, 50Hz through power / adapter which delivers +12V input to unit.

**Mechanical Dimensions :**

256mm (W)X 135mm (H) X324mm( D)

**TYPICAL BETA SAMPLE COUNTING REPORT GENERATED BY OUR SYSTEM**

BGD CPM : 0038 PTIME (BG) : 0060  
 CPM OF STD : 019995 PTIME (ST) : 0060  
 DPM OF STD : 150000 PTIME (SP) : 0060  
 EFF. OF STD : 013.3  
 \*FLOW RATE : 210.0 (lit/min)

SL.NO	LABEL	DATA	DPM	ACTIVITY (Bq)	Bq/m <sup>3</sup>
0000	SP	002975	022082	00368.0	0029.2
0001	SP	004052	030180	00503.0	0040.0
0002	SP	007223	054022	00900.3	0071.5
0003	SP	007851	058744	00979.0	0077.8
0004	SP	008321	062278	01037.9	0082.5
0005	SP	008849	066248	01104.1	0087.8
0006	SP	009199	068879	01147.9	0091.2
0007	SP	009513	071240	01187.3	0094.4
0008	SP	009710	072721	01212.0	0096.3
0009	SP	009791	073330	01222.1	0097.1
0010	SP	010044	075233	01253.8	0099.7

\* Flow Rate is to be entered by the user into the system.

Systems built-in code supports sample activity calculations.

- a. in Bq or DPS
- b. Bq/m<sup>3</sup> (Air sample activity)

System facilitates the user to label the samples as indicated in the above report.

BG - Background, ST - Sample, SP – Sample.

**Recommended Accessories for G.M counter kit:** G.M Stand, wide end window detector / pancake detector, Radioactive source kit, Lead shielding.

**ACCESSORIES FOR GEIGER COUNTING SYSTEM**

**TYPE: GC602A**

**(a) End window G.M. Detector [Type : GM 125]**

GM 125 is a Halogen Quenched, wide End Window GM Detector, supplied by NUCLEONIX. It is highly recommended for planchet / swipe sample counting of Beta samples by health Physics labs. Its operating voltage is typically 500V. It has good plateau length and plateau slope. It is enclosed in a PVC cylindrical enclosure for protection. An MHV socket provided on top side of the PVC enclosure facilitates one to connect to detector socket on rear panel of the counting system.



**SPECIFICATIONS**

**Application :** Suitable for Beta sample Counting

**Operating Voltage :** Range : 450 - 750 V

**Tube Dimensions :** Max. over all length 1.93 inches.

**Gamma Sensitivity :** 50 cps / mR/hr with Co-60

**Background with 40mm lead shielding :** < 20cpm

**Efficiency at (1 cm) :** (typical) (a) TI-204 - 5% (b) Sr-90 + Y-90 : 15% (combined).

**Max. Diameter :** 1.13 inches

**Gas filled :** Ne + Hal

**End Window :** mica 2.0 mg/cm sq. density

**(b)Pancake detector with stand**

Pancake detector of St. Gobain or LND, USA make will be supplied with a suitable detector stand, fabricated in black PCV which is precisely milled.

**Detector Specifications: Type:**

Pancake G.M. **Effective dia:** 1.75"

**Window thickness:** 2mg/sqcm

Efficiency with calibrated reference source Sr90 / Y-90 (Procured from Eckert & Ziegler Nuclitec GmbH, GERMANY) at 1cm from window : 40% (Total efficiency for Sr-90+Y-90).

Efficiency with (sr-90) at 1cm from window : 20%.

Efficiency with (Sr-90+Y-90) at 2cm from window : 17%

Efficiency with(Sr-90) at 2cm from window :8%



**(c) Stand For G.M. Detector [Type : SG200]**

Stand for G.M. tube type SG 200 has been designed to hold end window G.M. tubes. This stand can be housed inside the lead shielding if required. It has both sample and absorber trays. The position of these trays can be adjusted from the end window of the detector. The stand made up of acrylic sheet is precisely milled for sliding-in of sample and absorber trays.

Sample tray is designed to hold planchets or disc type radioactive standard source (Beta or Gamma).

This stand is an essential accessory for connecting end window G.M. tube to any of the GM. counting systems manufactured by NUCLEONIX.



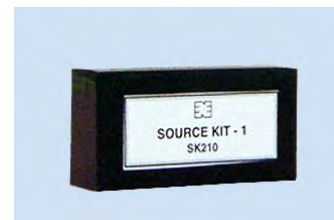
**(d) Stand for Pan cake detector :**

Stand for Pancake detector, is fabricated using precisely milled Black PVC parts. The detector holder is made of Aluminium with Cylindrical depression, to hold the detector. It is additionally provided with sample & absorber trays. Sample tray facilitates one to place 25mm dia planchets / filter paper of 50mm disk for sample counting.



**(e) SOURCE KIT – 1 [Type: SK 210]**

Source Kit-1 type SK 210 offered by NUCLEONIX contains one each of Beta and Gamma sources. These are low active disc sources of the order of 2 to 10 micro curie for Gamma & Beta. Gamma source disc is evaporated and sealed on 25mm dia X 5mm thick plastic disc. Whereas Beta source disc is evaporated & sealed on 25mm X 10mm thick plastic disc and covered with 10mg/ sq.cm aluminized mylar film. This source kit is an ideal choice along with G.M. counting system for educational institutions & Research labs. Source kit containing the disc sources is offered in an acrylic box of dimensions 86mm X 46mm X 25mm (approx).



**(f) Lead castle with door for G.M detector LS- 240**

This consists of 40mm lead shielding cylindrical rings assembly with required number of lead assembly parts. There is a hinged door in the bottom ring through which sample can be loaded in to the G.M stand / Pancake stand sample tray.

A 1mm aluminum lining is provided on the inside surface of the lead shielding. When it is dispatched from here usually it is packed in wooden boxes. So, on unpacking these parts could be assembled as shown in the enclosed drawing.



Head of the Dept.

*MPrashantk*

Approved By

*[Signature]*