

**RADIATION COUNTING SYSTEM WITH ACCESSORIES FOR
GAMMA SAMPLE COUNTING**

**RADIATION COUNTING SYSTEM
TYPE: RC 605A**

Technical Data



FEATURES :

- Manufactured conforming to ANSI N 42.17.
- Complies to IS -9000 part III & V, for climatic tests.
- Complies to Interference test as per IEC61000 or equ.
- State of art microcontroller based design.
- 20 x 2 LCD dotmatrix display for counts, elapsed time and HV.
- Counts capacity 999999, preset time 9999 sec.
- Variable HV (0-1500V), 0.5mA
- Built-in parallel port for direct data printing.
- Built-in USB serial port facilitates data transfer to PC.
- Programmability for label assignment for a sample.
- Facilitates connection to Alpha & Beta and gamma probes for sample counting.

Radiation Counting system, type **RC605A** manufactured by NUCLEONIX is a versatile state of art integral counting system designed around eight bit microcontroller chip for using with a variety of detector probes such as Alpha / Beta / Gamma scintillator detector probe or End window G.M detector probe. This system is suitable for counting Gamma samples with gamma scintillation detector probe.

Radiation Counting System essentially has a processor card and other electronic circuits to generate continuously variable HV upto 1500V to be applied to scintillation detector Probes (α , β or γ) or end window G.M.Tube or pancake detector, amplify the detector output and convert them to digital pulses for counting and displaying the recorded counts for a preset time.

Microcontroller design facilitates programmability for background, standard and sample counting. The data can be downloaded into PC or printed directly onto a printer. System facilitates counting of samples either on planchets or filter paper. This system will find applications for counting of air activity, wipe, environmental, geological and other samples for both beta, gamma and alpha activity. Activity report is generated for unit volume of sample.

SPECIFICATIONS

P.M. Input (From α, β, γ scintillation detector probe) :

- (a) Polarity : Negative
- (b) Amplitude : -100 mV (min)

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

- (a) Polarity : Negative
- (b) Amplitude : -500 mV (min)
- (c) Built-in load resistor : 4.7 or 3.3M Ohms

HV Output :

HV (0-1500V) @1mA continuously variable through front panel keypad in steps of 1 volt, ripple less than 20mV, line & load regulation better than 0.05%.

HV indication : On LCD dot-matrix provided.

Display : 20 x 2 LCD dot-matrix display has been provided to indicate data counts, Elapsed Time and HV.

Counts Capacity : 999999 counts

Preset time : 1 to 39999 secs.

Preset cycles / Iterations : 1 to 99

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

Paralysis Time :

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

Programmability :

Includes selection of Preset Time, Storing / Recalling of data, starting and stopping of acquisition, label assignment for data counts BG (Background), ST (Standard) & SP (sample) etc.,

Head of the Dept.

MP. Sashank

Approved By

[Signature]

RTC : Built in RTC provides real time clock information which is stamped in the activity report when printed. Built in Real time clock facilitates the user to generate sample analysis reports with RTC stamping. Both date month & time in hrs and minutes are printed.

Scintillation detector probe socket : This is a MHV socket for connecting to α, γ scintillation Probe. UHF socket for connecting to β scintillation probe.

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

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

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

Data Communication Software : **(Optional at extra cost)** Can be provided for serial transfer of data readings into PC.

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

Operating Temperature: 0 to 50° C
Relative Humidity : Upto 90%

Instrument will meet all requirements applicable to : Manufactured confirming to ANSI N 42.17.Complies to IS -9000 part III & V, for climatic test.Complies to Interference test as per IEC61000 or equ.

Mechanical Dimensions : 250mm(W) X135mm(H)X325mm(D) Approx.

TYPICAL ALPHA / BETA / GAMMA SAMPLE COUNTING REPORT

BGD CPM	:	0000	PTIME (BG)	:	0300
CPM OF STD	:	00092	PTIME (ST)	:	0300
DPM OF STD	:	00265	PTIME (SP)	:	0300
EFF. OF STD	:	034.7			
*FLOW RATE	:	01.00 (lit/min)			

SL.NO	LABEL	RTC	COUNTS	P.TIME	VOL()	Bq/VOL	iter
0001	BG	11:43 06-09	0000CPM	000180	---	----	---
0002	STD	11:52 06/09	000160CPM	000060	0010dps	26.56% Eff	
0003	SP1	11:47 06/09	000196	000060	0000 ml--	0000.00Bq/ml--	01
0004	SP2	11:48 06/09	000180	000060	0001ml--	0009.03Bq/ml--	01
0005	SP3	11:50 06-09	000187	000060	0010ml--	0000.93Bq/ml--	01

APPLICATIONS:

This system can be used for counting α, β or γ samples on a 25mm dia planchet or 47/50mm dia filter paper obtained from air samplers, or continuous air monitors in a Nuclear facility. System can also used for wipe sample counting in nuclear counting lab of a Nuclear power plant or similar facility. Also this system can be used in a University for teaching lab experiments in a physics department.

ACCESSORIES

(i) GAMMA SCINTILLATION PROBE WITH STAND TYPE: GSP-3

This essentially consists of a 2" x 2" NaI Integral detector, with PMT / HV bleeder wired & enclosed in a cylindrical shell with appropriate connector brought out for applying HV bias to PMT & also for taking signal output to the Radiation Counting System.

This probe with NaI crystal facing downwards is placed in a sample holder having slotted arrangement for placing sample tray. Samples either filter paper deposited air activity sample or in a SS planchet can be kept for gross gamma activity counting. This Radiation counting system cannot be used for selection of a specific energy band. For applications requiring counting for a specific energy band one has opt for Gamma ray spectrometer.

SPECIFICATIONS

Detector Material : NaI Scintillator screen

Operating voltage: 900 – 1000V

Efficiency for cs-137(Typical) in contact : 30%.

Background (Typical) with 40mm lead shielding: 15cps.

SS and aluminium planchets are required to place the prepared environmental samples for counting. These planchets are of 25mm dia & have a depth of 2mm. These are designed to fit into the sample / source holder / drawer of the detector assembly.



(ii) PLANCHETS (AL & SS)

