

Detector Options

for Scan-RAM™ and Flow-RAM™



Scan-RAM system detectors for radio-TLC applications

- 1. PN-FXX-03 – 1" NaI PMT** (collimator on Scan-RAM has shielding)
SPECT isotopes (Tc-99m: 140keV, Tl-201: 167keV, In-111: 171keV, etc.)
- 2. PN-FXX-06 – Plastic PMT** (collimator on Scan-RAM has shielding)
PET (F-18, C-11, Ga-68: 511keV)
High Energy Beta (Lu-177, Y-90, I-131, Re-188, Re-186 etc)
- 3. PN-FXX-02 – .04" NaI PMT** (collimator on Scan-RAM has shielding)
For I-125 only.

Scan-RAM dual system detectors for radio-HPLC applications

- 1. PN-FXX-03 – 1" NaI PMT with 2" lead shielding** (PJ-FXX-47)
PET (F-18, C-11, Ga-68, Rb-82: 511keV)
SPECT (Tc-99m: 140keV, Tl-201: 167keV, In-111: 171keV)
Most common detector. Ideal for quality control and research applications of clinical tracers.
- 2. PN-FXX-04 – 2" NaI PMT with 2" lead shielding** (PJ-FXX-16)
PET (F-18, C-11, Ga-68, Rb-82: 511keV)
Higher energy gamma isotopes such as Zr-89 (909 keV)
Not recommended for SPECT (Tc-99m: 140keV, Tl-201: 167keV, In-111: 171keV)
- 3. PN-FXX-06 – Plastic PMT with 1" or 2" lead shielding**
Beta (Lu-177, Y-90, I-131, Re-188, Re-186 etc.)
- 4. PN-FXX-02 – .04" NaI PMT with 1" or 2" lead shielding**
For I-125 only.
- 5. PN-FXX-14 – Well-Type NaI PMT with 2" lead shielding** (PJ-FXX-15)
For use with either PET or SPECT isotopes when using low amounts of activity, i.e. small animal imaging applications and measuring very low-level impurities (for research not clinical QC work).
- 6. PP-FXX-07 – PIN Diode detector with lead shield** (PJ-FXX-17)
For use in semi-prep HPLC applications for purification of radio-tracer after synthesis.
- 7. PP-FXX-08 – CsI PIN Diode detector with lead shield** (PJ-FXX-17)
For use in semi-prep HPLC applications for purification of radio-tracer after synthesis.
More sensitive than PP-FXX-07. Occasionally used for quality control of clinical PET tracers.

PLEASE NOTE:

- For dual Scan-RAM 1B, please use application guide above to determine second detector and necessary lead shield for radio-HPLC applications.
- The Scan-RAM and Flow-RAM are not suitable for H-3 or C-14 measurements.

Flow-RAM detectors for radio-HPLC applications

1. PN-FXX-03 – 1" NaI PMT with 2" lead shielding (PJ-FXX-47)

PET (F-18, C-11, Ga-68, Rb-82: 511keV)

SPECT (Tc-99m: 140keV, Tl-201: 167keV, In-111: 171keV)

Most common detector. Ideal for quality control and research applications of clinical tracers.

2. PN-FXX-04 – 2" NaI PMT with 2" lead shielding (PJ-FXX-16)

PET (F-18, C-11, Ga-68, Rb-82: 511keV)

Higher energy gamma isotopes such as Zr-89 (909 keV)

Not recommended for SPECT (Tc-99m: 140keV, Tl-201: 167keV, In-111: 171keV)

3. PN-FXX-06 – Plastic PMT with 1" or 2" lead shielding

Beta (Lu-177, Y-90, I-131, Re-188, Re-186 etc.)

4. PN-FXX-02 – .04" NaI PMT with 1" or 2" lead shielding

For I-125 only.

5. PN-FXX-14 – Well-Type NaI PMT with 2" lead shielding (PJ-FXX-15)

For use with either PET or SPECT isotopes when using low amounts of activity, i.e. small animal imaging applications and measuring very low-level impurities (for research not clinical QC work).

6. PP-FXX-07 – PIN Diode detector with lead shield (PJ-FXX-17)

For use in semi-prep HPLC applications for purification of radio-tracer after synthesis.

7. PP-FXX-08 – CsI PIN Diode detector with lead shield (PJ-FXX-17)

For use in semi-prep HPLC applications for purification of radio-tracer after synthesis.

More sensitive than PP-FXX-07. Occasionally used for quality control of clinical PET tracers.

PLEASE NOTE:

1. The Flow-RAM is not suitable for H-3 or C-14 measurements.

Detector Options for Flow-RAM™ and Scan-RAM™

PN-FXX-02

Application

The PN-FXX-02 scintillation detector probe is a low energy gamma detector used primarily for detection of gamma radiation (primarily I-125) in the energy range from 10 - 60 keV. The window area is approximately 5 cm² and is covered by a thin plastic entrance window (14 mg/cm²).

Voltage requirements:	600 - 1000 (max.) V
Scintillator:	1" diameter x 0.04" thick NaI (TI)
Detector:	PM tube 1.5" diameter
Detection geometry:	2 pi
Recommended energy range:	10 - 60 keV gamma
Typical background:	200 - 300 cpm
Size:	2" diameter x 7"
Weight:	1 lb.

Shielding

PJ-FXX-47 with adjustable volume flow cell is recommended to reduce normal environmental background to 200 - 400 cpm.

For radio-TLC SPECT applications, the lead collimator supplied with the Scan-RAM is suitable.



PN-FXX-03

Application

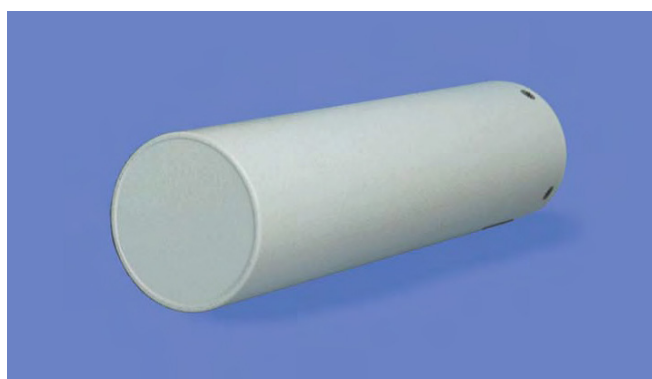
The PN-FXX-03 scintillation detector is a medium- high energy gamma detector used primarily for the detection of gamma radiation in the energy range above 60 keV in both radio-TLC and radio-HPLC applications. The window area is approximately 5 cm² and is covered by a 10 mm aluminium entrance window. This detector is used in the PET area for purity analysis by radio-HPLC.

Voltage requirements:	600 - 1000 (max.) V
Scintillator:	1" diameter x 1" thick NaI (TI)
Detector:	PM tube 1.5" diameter
Detection geometry:	2 pi
Recommended energy range:	60 keV - 1.5 MeV
Typical background:	1500 - 2000 cpm
Size:	2" diameter x 8"
Weight:	1 lb.

Shielding

PJ-FXX-47 with adjustable volume flow cell is recommended to reduce normal environmental background to 200 - 400 cpm.

For radio-TLC SPECT applications, the lead collimator supplied with the Scan-RAM is suitable.



PN-FXX-14

Application

The PN-FXX-14 scintillation detector is a wide range gamma detector with a minimum efficiency of 75% for ^{125}I and around 40 - 50% for PET radionuclides. Its 1.5" NaI (T1) detector provides useful detection efficiencies for energies exceeding 500 keV. It has built-in lead shielding to reduce environmental background and a well configuration which gives 4 pi counting geometry. This detector is ideal for low-level SPECT and PET counting applications.

Voltage requirements:	600 - 1000 (max.) V
Scintillator:	1.5" diameter x 1.5" thick NaI (TI), well type
Detector:	PM tube 1.5" diameter
Detection geometry:	4 pi
Recommended energy range:	>20 keV gamma
Typical background:	300 - 400 cpm
Size:	12" x 4" x 5"
Weight:	15 lb.

Flow Cell and Shielding

Recommended Flow-Cell: Supplied with the instrument PJ-FXX-15. Seven part, 2" thick lead shield for 2" NaI/PMT well type detector PN-FXX-14 with a large anodised base holder. Includes flow cell holder and five fixed volume flow cells of the following volumes 10 μL , 25 μL , 50 μL , 100 μL and 200 μL .

PP-FXX-07

Application

The PP-FXX-07 PIN Diode detector has high count-rate capability and low sensitivity to provide linear pulse counting from 10 μCi to 1 Ci. It is compact and easy to shield for use in high radiation environment applications that require pulse counting for accurate linear measurements. This unit produces approx. 5000 cpm per mCi. It is ideal for PET prep applications, in areas where the PN-FXX-03 detector is not suitable/too sensitive.

Voltage requirements:	20 V
Scintillator:	None
Detector:	PIN Diode, 4 mm ²
Detection geometry:	2 pi
Recommended energy range:	>25 keV gamma
Typical background:	0 cpm (unshielded)
Size:	1.5" x 1.25" diameter
Weight:	0.2 lb.

Shielding

PJ-FXX-17



PP-FXX-08

Application

The PP-FXX-08 scintillation detector uses a PIN Diode for compactness. As with the PP-FXX-07, this unit is easy to shield in a high radiation environment, however the CsI (NaI) crystal gives it increased sensitivity down to levels below 10^{-3} μ Ci. Suitable for places where the PP-FXX-07 does not provide the required sensitivity but the PN-FXX-03 is too sensitive.

Voltage requirements:	20 V
Scintillator:	CsI (NaI) 1 z 1 x 2 cm
Detector:	PIN Diode, 1 x 1 cm
Detection geometry:	2 pi
Recommended energy range:	> 100 keV gamma
Typical background:	100 cpm (unshielded)
Size:	2.5" x 1.25" diameter
Weight:	0.2 lb.

Shielding

PJ-FXX-17



PN-FXX-06

Application

The PN-FXX-06 scintillation detector probe is a beta detector used primarily for the detection of high-energy beta emitters and PET radionuclides by radio-TLC. The scintillator consists of a 1.7" diameter by 0.25 mm plastic scintillator, which has high efficiency for beta radiation but low efficiency for gammas. The window area is approximately 11.6 cm² and is covered by a thin aluminized Mylar entrance window (0.8 mg/cm²).

Voltage requirements:	600 - 1000 (max.) V
Scintillator:	1.7" diameter x 0.01" (0.25 mm) thick plastic
Detector:	PM Tube 1.5" diameter
Detection geometry:	2 pi
Recommended energy range:	> 30 keV beta
Typical background:	50 cpm
Size:	2" diameter x 7"
Weight:	1 lb.

Shielding

PJ-FXX-47 with adjustable volume flow cell is recommended to reduce normal environmental background to 200 - 400 cpm.

For radio-TLC SPECT applications, the lead collimator supplied with the Scan-RAM is suitable.



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