



## SPECIFICATION

### Automatic Gamma Counter for Radioactivity Measurement of Gamma Radionuclides

#### 1. Scope

This specification describes the requirements for an automatic gamma counter for radioactivity measurement of gamma radionuclides (Tc-99m, Y-90, Lu-177 and other radiometals) from ex vivo animal tissues of radiopharmaceutical biodistribution at different post injection times (hereinafter referred to as 'the System'). One of the expected outputs of SYR103 to apply techniques for reproducible and reliable radioactivity measurement including ex vivo tissues. The System will be used by the Atomic Energy Commission of Syria (AECS), Damascus, Syria (hereinafter referred to as 'the End-User').

#### 2. Definitions, Acronyms, and Abbreviations

The following definitions, acronyms, and abbreviations shall apply throughout this Specification unless defined otherwise hereinafter:

- CPM: count per million

#### 3. Requirements

##### 3.1. Technical Requirements

The System shall meet the following technical requirements:

- 3.1.1. shall include detectors of thallium activated sodium iodide crystals. Crystal height shall be 50 mm and diameter 32 mm. Counting geometry shall be  $4\pi$ ;
- 3.1.2. The detector assembly shall be surrounded by a minimum of 12 mm of lead shielding above and below;
- 3.1.3. shall include a sample changer for 55 racks, 10 samples per rack, tubes of 14 mm maximum diameter \* 90 mm maximum height, the maximum volume shall be 3.0 mL;
- 3.1.4. shall include a linear multichannel analyzer with 2048 channels. Dead time shall be 2.5  $\mu$ s;
- 3.1.5. the energy range shall be 15-1000 keV;
- 3.1.6. maximum count rate shall be 6 million DPM (5 million CPM) for 125I;
- 3.1.7. shall include a built-in LCD touch screen, built-in computer controlling with USB connection, and an alphanumeric keyboard; and
- 3.1.8. shall include a datalogger to allow to automatically store in a text file all assay results in a format compatible with Microsoft Excel.



#### **4. Marking**

The System shall have all safety markings in the English language.

#### **5. Packing**

The System, for the shipment by air to the End-User, shall be packed in accordance with international standards that are applicable for the shipment by air of this kind of equipment.

#### **6. Quality Requirements**

- 6.1. The System shall be manufactured, shipped and installed in accordance with the Contractor's ISO quality assurance system or an equivalent quality assurance system.
- 6.2. The Contractor shall document the compliance with this quality assurance system.

#### **7. Testing and Acceptance**

- 7.1 The System, prior to shipment, shall be tested for conformance of the System with manufacturer's performance specifications and the minimum requirements specified herein.
- 7.2. The results of the testing of the System shall be documented by the Contractor in an acceptance protocol that shall be signed by the End-User.

#### **8. Training**

The Contractor shall provide a one (1) day training for up to three (3) staff of the End-User in the operation and maintenance of the System, at the End-User's location or virtually.

#### **9. Deliverable Data Items**

The Contractor shall provide two (2) complete sets of operation and servicing manuals and technical drawings in the English language.