

Commodity Description

▶ 입찰서는 최소한의 기준사양을 알려드리오니 기준사양에 적합하거나, 그 이상의 규격을 가진 제품을 제시하여 주시기 바랍니다.

분류번호	등급	명칭	수량	단위
A13170.02	2	단일광자방출/전산화단층 엑스선 조합촬영장치 (SPECT/CT)	1	sys

A. FEATURES

1. This system is a premium hybrid SPECT/CT imaging system.
2. This system is a solide state, CZT-based Multi Detector, general purpose SPECT scanner combined with a CT scanner
3. Ring type design detector, completely integrated computer for camera control, data acquisition and processing.
4. This system provides both functional and anatomical information with high image quality with CT based attenuation correction.
5. High-resolution, high count rate, SPECT imaging of metabolic and physiologic processes.
6. High performance spiral CT applications Metabolic and anatomic image registration and fusion for optimal lesion.
7. Improved SPECT resolution enables sharp images for better visualization.

B. SPECIFICATIONS

1. System Gantry

1) Gantry Specification

- Gantry Size (Width x Length x Height) : 224cm x 176.2cm x 207cm OR 248cm x 224cm x 237cm
- Gantry Weight : 3240kg or 3300kg
- NM Bore Size : 80cm
- Crystal Material : CZT (Cadmium Zinc Telluride)
- Collimator type : Tungsten
- Number of Detector Columns : 12

2) Detector Performance

- Intrinsic energy resolution (FWHM) : 5.9% or less
- Energy range : 40 - 270kev or more
- Intrinsic Spatial Resolution : 2.46 mm
- Intrinsic Uniformity
 - Differential : $\leq 2\%$ or less
 - Integral : $\leq 3\%$ or less
- Volume Sensitivity : 520kcps/MBq/cm³ or equivalent
- Maximum count rate : 700 kcps or more
- SPECT Resolution with scatter (NEMA)
 - Central ≤ 4.5 mm or less
 - Radial ≤ 4.1 mm or less
 - Tangential ≤ 3.4 mm or less

2. CT Subsystem (A or B)

[A]

1) CT Scan Parameters

- CT X-Ray Tube : Performix Plus X-ray Tube
- Max. number of slice/ rotation : 32 slice
- Number of detector rows : 24
- Min. slice thickness : 0.625mm
- Min. rotation time : 0.5sec

- 2) CT Physical Assembly
 - X-ray generator : 53.2 KW
 - Gantry aperture(Bore Size) : 70cm
 - kVp range : 80-140kV
 - mA range : 10-440mA
 - Anode heat storage capacity : 6.3 MHU
- 3) Iterative reconstruction for noise reduction and dose reduction : ASiR

[B]

- 1) CT Scan Parameters
 - X-ray Detector Number of slice : 64
 - X-ray tube Heat capacity : 8MHU
 - Slice Thickness : 64 rows of 0.625mm
 - Scan Field of View : 50cm
 - Scan range: 170cm, with up to 200cm with table extender
 - Fastest rotation time in SPECT/CT: ≤ 0.4 sec
 - Temporal resolution : ≤ 120 ms
- 2) CT Physical Assembly
 - Generator power : 80kW
 - Generator kV Range kVp - 80,100,120,140
 - Resolution : ≤ 17.2 lp/cm
 - Detector Material - GOS Ceramic Scintillator
- 3) Reconstruction tool to reduce metal artifacts in the CT image : MAR
- 4) Iterative reconstruction for noise reduction and dose reduction : LISA
- 5) Extended Field of View Recon : to 85cm

3. Patient table (A or B)

[A]

- 1) Material of pallet : Carbon fiber
- 2) Attenuation at 140keV : 10%
- 3) Maximum patient load : 227kg

[B]

- 1) Max Patient Weight : 226kg
- 2) Deflection and horizontal accuracy of the table when extended = 0.5mm
- 3) Maximum coverage: SPECT continuous scanning range for total-body scan = 200cm
- 4) Maximum coverage: CT continuous scanning range for total-body scan = 200cm
- 5) One ECG trigger for both SPECT-gated acquisitions and CT-gated acquisitions
- 6) Maximum Table Height : 101cm
- 7) Minimum Table Height : 58cm

4. Acquisition Workstation System (A or B)

[A]

The SPECT/CT operator console consists of a high-performance CPU based computer with for acquiring patient data.

- Patient registration
- Protocol selection, review and edit for patient scan
- Image reconstruction
- Image viewing and Filming
- 3D image reslicing
- Auto transfer and Auto store

- 1) Hardware for SPECT/CT operator console
 - CPU : 3.6 GHZ
 - GB of RAM : 32GB
 - Hard Drive Storage : 2TB
 - Dual Monitor
- 2) Software for SPECT/CT operator console
 - SPECT/CT attenuation correction and iterative reconstruction
 - Simultaneous acquisition, reconstruction, display and archiving
 - Realtime reformat for volume navigation
 - Modality worklist shall be supplied
 - DICOM Print and DICOM worklist available
 - Patient scheduling and data entry
 - View, analyze and QC integrated SPECT/CT data
 - Archive, network and manual filming control
 - Automatic Printing, Archiving Networking to DICOM Workstations
- (1) SPECT Acquisition
 - a. Planar static and dynamic
 - b. Whole-body
 - c. SPECT, gated, non-gated or both
 - d. Whole-body SPECT
- (2) CT Acquisition
 - a. Topogram, Scanning perspectives
 - b. Spiral CT, Sequential CT

[B]

- 1) Windows 10 Professional with 16GB RAM with Dual 24" LCD Monitor
- 2) Integrated Operator's Console for acquisition, reconstruction, image review and post processing
- 3) Acquisition applications software - Single user interface for NM and CT
- 4) SPECT Modes - Focused or non-focused via Swivel detector for increase sensitivity
- 5) CT based Scan Optimization : CT based SPECT Focused acquisition mode for increased ROI
- 6) Total Body 3D imaging via automated bed and detector positioning and acquisition
- 7) Apply customized acquisition time per bed position in multi-bed scan, such as total body SPECT/CT
- 8) Simultaneous Dual Isotope Acquisition SDI
- 9) Customized protocols and toolkits

5. Processing & Review Workstation (A or B)

[A]

- 1) Hardware for SPECT Processing Workstation
 - CPU : 3.6GHz
 - GB of RAM : 32GB
 - Hard Drive Storage : 2TB
 - DVD, USB Archiving
 - Monitor : Dual 24" LCD
- 2) Software for SPECT Processing Workstation
 - DICOM Print and DICOM worklist available
 - Archive, network and manual filming control
 - Patient scheduling and data entry
 - OS : Windows 10
 - Image viewing and Filming
 - Auto transfer and Auto store
 - Image fusion
- (1) General Processing Software
 - a. Quality Control : Automatic and manual motion correction

- b. Tomo Reconstruction (Attenuation Correction, Scatter Correction)
- c. 3D Orientation : Free angle reorientation of reconstructed series
- d. Image Fusion (SPECT, CT, PET, MR Inc. External Dicom Image)
- e. Auto cardiac : Cardiac tomo reconstruction
- f. Flexible Display ; Customizable Displays

(2) Organ Specific Processing

- a. Lung Analysis
- b. Thyroid Analysis
- c. Renal Analysis
- d. Gastric Emptying Analysis
- e. Hepatobiliary
- f. Brain Analysis

(3) Additional Software

- a. Cedars SPECT Suite(Auto-Quant)
- b. General SPECT half-time imaging
- c. Cardiac SPECT half-time imaging
- d. 3D registration of fused SPECT-CT, PET-CT, MR images or equivalent

[B]

1) Hermia SMART Workstation

- Hardware Windows 11 Enterprise with 32GB RAM and Hermia GOLD Software
- SPECT/CT processing and review tools
- Advanced segmentation tools to facilitate measurements of activity concentration
- General nuclear medicine analysis programs for gallbladder EF, Renal MAG3, Gastric Emptying, 'Lung Quantification and MUGA exams
- Protocols to automate processing
- Customizable image display and serial exam review

2) S/W Cedars Deluxe Perfusion SPECT/CT+BP Standalone Fixed

- Automatic segmentation, quantification, analysis and display of gated (function) and un-gated(perfusion) myocardial SPECT images
- Global and regional LV function (EF, ESV, EDV, SV, wall-motion, wall-thickening)
- Global and regional perfusion quantification (visual scores-SSS, SRS, SDS, extent, TPD, severity)
- LV myocardial mass and RV volumes and EF
- Motion-Frozen images for improved resolution and contrast
- Phase Analysis to assess dyssynchrony using gated perfusion or blood pool images
- Change Perfusion Analysis comparing a stress/rest pair
- LV Shape Index analyses regional LV shape improving the identification of LV failure
- CFR/MBF for SPECT – Coronary Flow Reserve and Myocardial Blood Flow for dynamic SPECT TC-99m data

6. ECG Gate

7. Common options

- 1) Lung Quantitation Solution
- 2) Brain Quantitation Solution
- 3) Dosimetry Calculation Solution
- 4) Absolute Quantitation Function

8. Advanced options (A or B)

[A]

- 1) Scan protocol simulation tool for optimal scan protocol using Poisson re-sampling tool
- 2) Optimized Scan Setup at Bedside
- 3) Maintain AC quality at low CT dose.
- 4) Metal Artifact Reduction Solution: Robust single acquisition Metal Artifact Reduction technology
- 5) Liver Analysis Solution
- 6) NM digital processing and review platform: Designed with productivity in mind and enhance workflow

- 7) Energy window optimization and simultaneous dual isotope acquisitions and processing for multi isotope imaging (CZT data only)
- 8) Image processing method intended for Computed Tomography (CT) based corrections of Nuclear Medicine bone scintigraphy images.
- 9) The Block Sequential Regularized Expectation Maximization (BSREM) algorithm combined with noise reduction regularization allows reaching full convergence without the effects of noise development seen with OSEM algorithm.

[B]

- 1) List Mode Toolkit
- 2) Low dose imaging
- 3) Quantitative reconstruction: includes advanced algorithmn Penalty Likelihood (PL)
- 4) 4D Imaging Software
- 5) Perform advanced post processing analysis such as SUV quantification, lung & brain quantification (SUV Quant)
- 6) Advanced review & quantitation software platform integrated in Operator's Console
- 7) MIM SurePlan MRT LiverY90

9. General Accessories

- 1) Standard Patient immobilizers
- 2) Calibration QC source with shielded storage box
- 3) Calibration QC jig
- 4) Phantom & holder
- 5) Operation & Service Manual (CD)

10. Local Accessories

Refer to the addendum (입찰설명회 시 안내)

11. Full Site Solutions

인테리어 공사등(세부사항은 변경될 수 있음)

D. CONFIGURATIONS

1. System Gantry	1 Set
2. CT Subsystem	1 Set
3. Patient Table	1 Set
4. Acquisition Workstation System	1 Set
5. Processing & Review Workstation	4 Sets
6. ECG Gate	1 Set
7. Common Options	4 Lots
8. Advanced Option	1 Lot
9. General Accessories	1 Lot
10. Local Accessories	1 Lot
11. Full Site Solutions	1 Set

E. REMARKS

1. Supplier or contractor should be responsible for installation of this equipment.
2. The warranty for the equipment is three years after inspection (including all components except those specified as consumables).
3. An annual inspection of all components must be conducted at least once a year until the equipment is decommissioned, and the results must be submitted in writing to the medical engineering team.
4. The warranty period for parts supplied for a fee after the warranty period ends will be one year.
5. Before the end of the warranty period, a full inspection of the equipment must be carried out, and any defective parts and components must be restored to normal condition. The battery must be replaced regardless of its condition.
6. Service passwords, hardware keys, and other encryption systems necessary for using and maintaining the equipment must be provided. If encryption systems cannot be provided, technical support must be offered free of charge at any time.
7. All service activities, including preventive maintenance, must be reported to the medical engineering team before work, and confirmation from the medical engineering team must be obtained after work. Any service that is not confirmed by the proper procedures will be considered invalid.

8. The service manual must include circuit diagrams and information necessary for post-maintenance. If not submitted, the warranty period will be extended by one year. (If the circuit diagram is not included, alternative A/S information recognized by the medical engineering team must be provided.)
9. This configuration includes all options available from the supplier. Any additional or confirmed options before delivery must be included in the final delivery.
10. Maintenance training must be provided to the medical engineering team personnel at the supplier's expense, covering the following:
Theory + Practical Training (The training location and schedule will be mutually agreed upon.)
11. The supplier shall provide training necessary for the operation of the supplied equipment.
12. Supplier should provide upgrade service for free through GE FMI or Siemens Evolve Package.
13. Seller's liability to Purchaser shall not be limited to the contract price where damages result from Seller's breach, negligence, willful misconduct, violation of law, or infringement of third-party rights.
14. If the safe execution of the contract at site is genuinely and imminently endangered, Seller may suspend only the affected work after prompt notice to Purchaser, provided that Seller minimizes any delay and resumes performance without undue delay.