Neusoft

NeuSight PET/CT64 Product Datasheet

沈阳东软医疗系统有限公司

NEUSOFT MEDICAL SYSTEMS CO., LTD

Neusoft

Product Name：Positron Emission Tomography (PET) and Computed Tomography (CT) System

Product Type: NeuSight PET/CT 64

Product Category：PET/CT System

1. NeuSight PET/CT 64 – Detailed Specifications：

NeuSight PET/CT 64 Basic Configuration:

1,PET Gantry

2, CT Gantry

3,Scan Couch

4,Host computer system

5,AVW workstation system

6,System Software

7, Image transfer/Networking

8,PET Image reconstruction

9, CT Image reconstruction

10,PET Acquisition

11,CT Acquisition

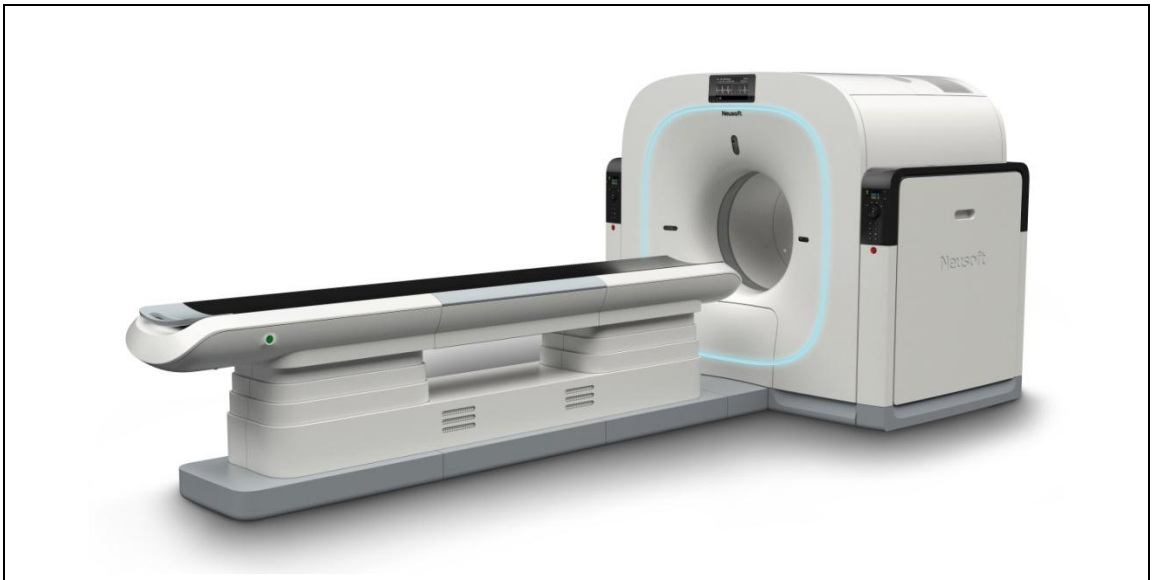
12,Heart Scan System

13,Raw data

14,PET Image Quality

15,CT Image Quality

16,Installation



1. PET Gantry

Aperture	720mm
Scan Field	700mm

PET Data acquisition system

Detector material	BGO
Detector size	4.7X4.7X30mm
Number of scintillators	17424
Number of PMT	576
Number of BLOCK	144
Number of rings	33
Ring diameter	856mm
Axial FOV	166mm
Transverse FOV	700mm

2. CT Gantry

Aperture	720mm
Scan Field	700mm
Rotation Time	0.5s、0.6s、0.8s、1.0s、1.5s、2.0s
Partial Scan Times (240°)	0.32s, 0.39s, 0.52s, 0.65s, 0.97s, 1.3s
TemporalResolution	Down to 83ms

Focus-to-isocenter Distance	570mm
Focus-to-detector Distance	1040mm
CT Data acquisition system	
Max. number of Slices/Rotation	64
Number of Detector Rows	32
Number of detector electronic channels (DAS) utilized for 64 slices/rotation acquisition	64
Number of Detector Elements	672X32
Total Channels per Slice	1344
Number of Projections	4640
Sequence Acquisition Modes	64x0.625, 32x0.625, 16x0.625, 8x0.625, 4x0.625,2x0.625
Spiral Acquisition Modes	64x0.625, 32x0.625, 16x0.625
Detector	Up to 30% SNR improvement compared to conventional CT detectors; Down to 1us~2us decay time for sub second scan application; Ultra low afterglow; Special design to minimize electronic noise; High geometric efficiency
X-ray Tube Assembly	
Tube	CTR2250
TubeCurrentRange	30mA ~ 420mA
Tube Voltage	80kV、100kV 、120kV、140kV
Tube Anode Heat Storage Capacity	5M
Cooling Rate	815 KHU/min

Focal Spot Size	0.6×1.2 (Small) 1.1×1.2 (Large)
Filter system	
Equivalent	Al Equivalent Tube: 1.5mm Al
Beam Limiting Device	Equivalent to 6.68mm Al
Generator	
Max. power	50kw
3. Scan Couch	
Max. table Load	227kg
Table Feed Speed	1mm/s-160mm/s
Vertical Table/Travel Range	600mm -1030mm
Vertical Travel Speed	12 mm/s
Scannable Range	1900mm
4. Host computer system	
The host computer workplace provides an intelligent and reliable workflow for data acquisition, image reconstruction, and routine post processing at the CT scanner.	
High-performance Computer	Host : Intel® Xeon® E5-1620 v2 PETRecon : Intel® Xeon® E5-1620 v2 CTRecon : Intel Xeon E5620 2.40GHZ *2 processor
Standard Monitor	Flat Screen Monitor 34” (86.5cm) 2560 x 1,080Resolution
RAM Storage	Host:≥16GB PETRecon:≥32GB CTRecon:≥32GB
Image Storage	Host:1TB*2 PETRecon:2TB + 1TB*2

	CTRecon: 250GB + 500GB * 3
Additional Storage	8X DVD+/-RW
DICOM Viewer	Included on each CD; Automatically started on the viewer's PC
5. AVW workplace system	
AVW workplace provides the unique advantage of an efficient multi-modality diagnostic workflow at a single workplace. It manages the clinical diagnostic workflow anywhere within the clinical environment	
High-Performance Computer	Dell Precision
Standard Monitor	Flat Screen Monitor 19"
RAM Storage	16GB
Image Storage	500GB + 1TB
Additional Storage	8X DVD+/-RW
DICOM Viewer	Included on each CD; Automatically started on the viewer's PC
6. System Software	
Basic function	
PET/CT Image Viewer	View PET images, CT images and fusion images on the PET/CT console and perform simpleMeasuring and marking of CT value and SUV value.
2D Image Display	Perform image viewing including image zoom and rotation, perform image displaying in cine loop and perform adjustment of window width and level. perform simple measuring and marking of CT value , SUV value and annotation. etc.
Patient Management	Perform database management of patient

	information and image data, which include data source switch, import/export, patient information modify/delete/search, etc.
PET/CT Scan Control	Control the PET/CT scanning process, including control the hardware when data acquiring, control data receiving and data processing of the reconstruction workstation. And it can provide the data for image reconstruction and system calibration.
Image Reconstruction	According to the reconstruction parameters to perform online or offline reconstruction to generate PET/CT image.
Data correction	According to the correction parameters to perform reconstruction to generate corrected PET/CT image.
DICOM	Get scheduled patient from RIS/HIS and set MPPS for the patient during scanning. Transmit the PET/CT images from the host computer to PACS server and laser imager, browse PET/CT images stored in other media by DICOMDIR. The DICOM service include the following: Verification: Provider/User Storage: Provider/User Storage Commitment: User Query/Retrieve: Provider/User DICOM Print: User Modality Worklist: User MPPS: User
Filming	*Digital film documentation, connection to a suitable digital camera. *Connection via DICOM Basic Print *Interactive Virtual film Sheet
Report*	Report has following features: Edit report document, save and print

	Manage report document, list, filter Support report template design Support multiple page Supply case management
Appliction	
MPR	Variable slice thickness anddistance withdefault values; Viewing perspectives • Sagittal • Coronal • Oblique • Double oblique • Freehand (curvilinear)
3D	Optional 3D display , according to the difference of different organs showed transparent effect
SSD (Surface Shaded Display)	Three-dimensional display of surfaces with different density values • Soft tissue • Bone • Contrast-enhanced vessels
Volume Calculation	Volume Measurements of segmented tissues
VR	Advanced 3D application package for the optimal display and differentiation of different organs through independent control of color, opacity
AutoVoice	A standard set of commands for patient communication; before, during and after scanning.

Networking	supports 100/1000Mbps
Bolus Tracking	An automated injection planning technique thatpermits the user to monitor actual contrastenhancement and initiate scanning at a predeterminedenhancement level. Combine with SASfor full automation and efficacy.
SAS	Spiral Auto Start integrates the injector with thescanner, allowing the technologist to monitor thecontrast injection to check for extravasation and toinitiate and stop the scan (with the pre-determineddelay) while in the scan room.
MIP	The user can use MIP function in Volume Application package
MinIP	The user can use MIP function in VolumeApplication package
AIP	AIP means Average Intensity Projection, The user can use AIP function in Volume Application package
CDViewer	The CDViewer application is included in each CD and can automatically started on theviewer's PC. The common 2D imagefunctions are supported in CDViewer.
ClearView·	Iterative reconstruction, with three levels: Slight, Standard, Ultra, the iterative portion will be increased from Slight to Ultra.
Bone Remove	One click bone removal function is supported in both Volume application and Vessel Analysis application.

Coronary Artery Analysis*	Coronary Artery Analysis application is used to analysis coronary artery disease from CT Scan data.
Free Match	Perform the PET/CT image registration by manual or automatic. It can improve the accuracy of attenuation correction and image fusion.
Dynamic Viewer	Perform the PET/CT dynamic image display and analysis, which can viewer the distribution of radioactivity of the position or time in the ROI.
PTCTVolViewer	Perform the PET/CT image fusion display, which include image registration, PET/CT volume viewer, image segment, etc.
Corridior 4DM*	Review the PET/CT cardiac images. Calculate the ejection fraction、ventricle chamber volumes 、systolic volumes、and diastolic volume information.
Cardiac Fusion*	Perform the PET/CT cardiac fusion. By browsing, display, analysis vascular anatomy and pathologic features cardiac function, it can assist doctors for coronary heart disease, coronary artery bypass surgery, provide a reference for doctors to diagnose. It hasfollowing features: Automatic Cardiac cage removal Automatic Cardiac Segmentation and Cardiac Artery tree extraction

	Manual Segment of cardiac artery Render modes: VR,MIP,MPR,CPR Reporting Stenosis measurement
Tumor Management*	Perform the PET/CT tumor analysis management application, which include analysis/extract tumor lesions, tumor measurement and contrast, etc.
Nerve Application*	Perform the PET/CT brain metabolism application. By registration brain image standardized and calculation SUV, it can compare the left and right brain hemispheres function in the same patients but different periods.
Advanced technology	
Low Noise Reconstruction(LNR)	An image reconstruction method, used to improve the signal-to-noise ratio of PET image.
Point Diffusion Restoration(PDR)	An image reconstruction method, used to improve the image resolution
Target Iterative Reconstruct(TIR)	An image reconstruction method, used for reconstruction of small target in image
CT Extended FOV	Expand the scope of attenuation correction, to improve the accuracy of attenuation correction by expanding the CT FOV
Low dose CT attenuation correction (LDCTAC)	By low dose CT scanning for PET images attenuation correction
4D GATE	PET/CT gated scanning technology, is used to get the information of cardiac gated and respiratory gating

Partial Volume Correction（PVC）	A correction technique for PET, is used for partial volume effect correction of PET images to improve image accuracy
Least Square Constrained Compressed Sensing(LSCCS)	With fewer doses or count can be obtained by PET image
＊Optional feature for AVW workplace only	

7. Image transfer/Networking

Interface for transfer of medical images and information using the DICOM standard. Facilitates communication with devices from different manufacturers.

DICOM Storage (Send/Receive)

DICOM Query/Retrieve

DICOM Basic print

DICOM Get Worklist (HIS/RIS)

DICOM MPPS

DICOM Storage Commitment

DICOM Viewer on CD

8.PET Image reconstruction

Scan Field	70 cm
Recon Field	5–70 cm
Recon Time	3D 1min/Frame 2D 30sec/Frame
Recon Matrix	128x128, 256x256,350x350,512x512
PixelSpacing	>=1mm
Recon Method	3D：FORE+FBP，FORE+OSEM，3DRP，3DOSEM 2D：FBP， OSEM

9.CT Image reconstruction

Real-Time Display	Real-time image display during spiral

	acquisition.
Scan Field	70 cm
Recon Field	5–70 cm
Recon Time	Up to 20 images/swith full cone beamreconstruction
Recon Matrix	512x512, 768x768, 1024x1024
HU Scale	–3,2768 to +3,2767
10. PET Acquisition	
Reconstructed Slice Widths	2.516mm
Scan Length	Max 1900
11.CT Acquisition	
CT Sequence Acquisition	
Reconstructed Slice Widths	0.625, 1.25, 2.5, 5, 10mm
Dynamic Multi-Scan:	Multiple (continuous) sequence scanning withouttable movement for fast dynamic contrast studieswith maximum slice thickness of 20 mm
Contrast studies with maximum slice thickness of 20 mm.	
CT Multi-slice Spiral Acquisition	
Reconstructed Slice Widths	0.625,0.8,1,1.25,1.5,2,2.5,3,4,5,6,7,8,9,10mm
Slice Increment	0.1–20 mm
Spiral Scan Time	Max. 100 s
Scan Length	Max. 1830mm
Pitch Factor	0.13 - 2.0
Automatic clustering of scans.	
12.Heart Scan System	

Heart-scan with ECG-synchronized true isotropic volume acquisition using prospective ECG triggered or retrospective ECG-gating mode.

The ECG signal used for gating the images is acquired by an ECG device. The ECG signal is displayed on the ECG device and the scan interface. Temporal resolution can reach down to 65High/83Low ms.

13. Raw data

Capacity	CT：800GB ； PET：2TB

14.PET Image Quality

Resolution

Position	**Transverse**	**Axial**
10mm	4.7mm	4.7mm
100mm	5.1mm	5.1mm

PDR Resolution

Position	**Transverse**	
10mm	2.7mm	
100mm	3.0mm	

Image Quality

Sphere`s Diameter	10mm	13mm	17mm	22mm	28mm	37mm
Percent Contrast	>20%	>24%	>50%	>60%	>40%	>45%

Sensitivity	7.0cps/kBq（3D）	1.5cps/kBq（2D）
NECR	40kcps（3D）	50kcps（2D）
ScatterFraction	45%（3D）	19%（2D）

AccuracyofAttenuation	18%

The error does not exceed 15%.

If no special statement, 3D and 2Dare consistent.

15.CT Image Quality

Low-contrast Resolution

Low-contrast resolution is the ability to see

• a small object (mm)

• with a certain contrast difference (HU)

• on a particular phantom

• at a certain mAs value (mAs)

• with a particular patient dose (mGy)

Spiral	
Phantom	Catphan 600
Object Size	4 mm
Contrast Difference	3 HU
Dose (CTDIw)	19.8 mGy
Technique	10 mm, 120 kV
Sequence	
Phantom	Catphan 600
Object size	4 mm
Contrast difference	3 HU
Dose (CTDIw)	19.8 mGy
Technique	10 mm, 120 kV
High-contrast resolution	
Isotropic high-contrast resolution in all three planes (x, y, and z).	
X-Y-plane	0%MTF 17lp/cm, 0.29mm
Z-Plane	0%MTF 15.4lp/cm, 0.32mm
Technique	Technique 245 mA, 120 kV, 1.0 s, 0.625 mm

Dose, CTDI100 Values(mGy)

Phantom	Position	80KV	100KV	120KV	140KV
16cm	A	4.7	9.5	15.3	22.0
	B	5.2	10.4	16.7	24.0
32cm	A	1.3	2.8	4.9	7.4

	B	2.5	5.5	9.6	14.4
* A: at center B: 1 cm below surface					

Technique	Technique : Collimation 32x0.625 mm 100 mAs 360° rotation PMMA-Phantom Absorbed dose for reference material air Max. deviation ± 20 % Typically less than 10 % Values according to IEC 60601-2-44

16. Installation

Outline Dimensions & Weight	
PET/CT Gantry Dimensions	2210mm (L) x 1915mm (W) x 1940mm (H)
PET/CT Gantry Weight	3520Kg
CT Gantry Package	2370mm (L) x 1030mm (W) x 2250mm (H)
PET Gantry Package	2320mm (L) x 1370mm (W) x 2270mm (H)
Dimensions	
Couch Dimensions	3460mm (L) x 630mm (W) x 1060mm (H)
Couch Weight	778Kg
Couch Package Dimensions	3600mm (L) x 760mm (W) x 1300mm (H)
Console Table Dimensions	1400mm (L) x 800mm (W) x 760mm (H)
Power Supply Requirements	
Power Capacity	100KVA
CT Input Voltage	380/400VAC 3-phase 5-line 3-phase 4-line(Export is equipped with isolate

	transformer), power supply from below options:190/200/208/220/230/240/380/400/415/440/460/480VAC)
PET Input Voltage	220VAC 1-phase 3-line
Voltage Variation	±10%
3-phase Unbalance	≤5%
Frequency	50/60Hz±1Hz
Grounding Resistance	4Ω (independent grounding system) ; 1Ω (complex grounding system)
Operating Room	
Recommended Room Size	Operating Room: 3000mm×4500mm Scanning Room: 8200mm×4500mm
Min. Area of Room Size	Operating Room: 3000mm×3600mm Scanning Room: 7700mm×3600mm
Min. Height of Ceiling	2500mm
Temperature of Scanning Room	Scan room 18℃~24℃ ; Control room 18℃~28℃
Humidity of Scanning room	Scan room 30%~60% ; Control room 20%~80%
Atmospheric Pressure	70kPa~106kPa
Temperature of Transportation and Storage	-20℃~+50℃
Humidity of Transportation and Storage	10%~90%, no-condensing
Running Noise	No more than 70dBA
Other Configurations	

Laser Camera	DICOM 3.0 Interface
High Pressure Injector	MEDRAD Stellant D (Double) MEDRAD Stellant SX (Single)
Power Conditioner	Optional configuration one type for domestic sale.
Isolation Transformer	Optional for export sale
UPS for Console	Optional (30min for power failure)

Revision History

VersionNo.	Author	Dept.	Revision History	Effective Date (MM/DD/YYYY)
V 1.0	李楠	RNM 综合技术研发部	首次发布	2015-4-22