NeuViz 128

Product Datasheet

Neusoft Medical Systems

NeuViz 128

NeuViz 128 comes with advanced technology, optimizes the traditional procedure, and brings more convenient man-machine interaction experience, delivering a revolutionary impact on the CT industry. The intelligent workflow starts from the image acquisition to the results reporting, AI-enabled automated patient positioning, smart surview capture and image reconstruction to drive precision in dose, speed, and image quality. Ultra high-end Deep Learning Reconstruction(DLR) algorithm can yield highly accurate performance for radiologists. High sensitivity without loss of precision in detecting lesions enables to achieve perfect-clarity images at low dose. Clear and precise imaging goes through each specific anatomy, which is the gold standard for the output. Now, more practical and meaningful interactions with Neusoft Medical intelligence are ready to be involved in medical care.

Hardware

Gantry

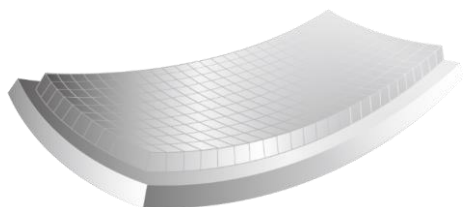|	
Aperture	720 mm
Focus to Isocenter Distance	570 mm
Focus to Detector Distance	1040 mm
Scan FOV	500mm; 250mm; 238mm (iHD)
Rotation Time (360°)	0.374s, 0.5s, 0.6s, 0.8s, 1.0s, 1.5s, 2.0s
Partial Scan Time(240°)	0.25s, 0.32s, 0.39s, 0.52s, 0.65s, 0.97s, 1.29s
Tilt	±30° (Accuracy 0.1°)
Temporal Resolution	25ms
Information Display System	LCD located on the top edge of the gantry for displaying system time, tube heat capacity, and patient information, including patient name, gender, patient ID and patient age. The displayed information includes Stand-by, Positioning, ECG, heart rate, Scanner Ready, etc.
Operation Panel	4 sets on the right and left sides of the front and back gantry
Laser Light	2 internal laser light localizers and 4 external laser light localizers with accuracy within ±1mm
Cooling Method	Air cooling
Slip Ring	Low voltage slip ring technology

Patient Table

Max. Table Load	Standard Couch: 211kg; Lengthened Couch: 211kg; Enhanced Couch: 300kg
Horizontal Travel Range	Standard Couch & Enhanced Couch: 1770mm; Lengthened Couch: 2000mm
Horizontal Travel Speed	Standard Couch & Enhanced Couch:1~225mm/s; Lengthened Couch:1~310mm/s
Vertical Travel Range	430mm~970mm
Max. Vertical Travel Speed	Standard Couch & Lengthened Couch: 50mm/s; Enhanced Couch: 15mm/s
Horizontal Movement Range	Standard Couch & Enhanced Couch: 1770mm; Lengthened Couch: 2000mm
Couch Step Movement Accuracy	±0.25mm
Table Material	Carbon Fiber

X-ray Tube

Anode Heat Storage Capacity	8.0 MHU
Max. Cooling Rate	11 kW (931 KHU/min)
Focal Spot Size	0.6 mm × 1.2 mm (Small) 1.1 mm × 1.2 mm (Large)

It enables increased raw data density and improved resolution via Quad-Sampling, delivering consistent image quality. The high cooling rate minimizes the waiting time to accommodate larger patient volume.

Generator

Max. Power	80 kW
Type	High frequency
Tube Current Range	10~667 mA
Tube Voltage	80 kV, 100 kV, 120 kV, 140 kV

Data Acquisition System

Max. Number of Slices/Rotation	128
Number of Detector Rows	64
Detector Coverage	40 mm
Detector Material	Solid-state, GOS
Detector Elements	672×64
Total Channels per Slice	1344
Number of Projections	4640

New designed Micro-Star detector with extremely low afterglow and high absorption improves the utilization of X-Ray and generates excellent image quality.

System Performance

Surview

Max. Scan Length	Standard Couch & Enhanced Couch: 1710mm Lengthened Couch: 1910mm
Views	A.P., Lateral, Dual
Acquisition mode	2x0.625mm
Real-time Surview	Yes

Axial Scan

Acquisition Mode	128x0.625 mm 64x0.625 mm 32x0.625 mm 16x0.625 mm 8x0.625 mm 2x0.625 mm 8×0.3125 mm(iHD)
Reconstruction Slice Thickness	0.3125mm (iHD) 0.625mm 1.25mm 2.5mm 5mm 10mm
Max. Scan Length	Standard Couch & Enhanced Couch: 1800mm Lengthened Couch: 2000mm
Dynamic Multi-Scan	Multiple (continuous) sequence scanning without table movement for fast dynamic contrast studies with maximum slice thickness of 40mm

Spiral Scan

Acquisition Mode	128x0.625 mm 64x0.625 mm 32x0.625 mm 16x0.625 mm 8x0.625mm 16x0.3125mm (iHD)
Reconstruction Slice Thickness	0.4mm (iHD) 0.625mm 0.8mm 1mm 1.25mm 1.5mm 2mm 2.5mm 3mm 4mm 5mm 6mm 7mm 8mm 9mm 10mm
Max. Scan Time	≤ 305s (uninterrupted)
Max. scan Length	Standard Couch & Enhanced Couch: 1750mm Lengthened Couch: 1950mm
Slice Increment	0.1~20 mm
Pitch Range	0.1~2.1 (continuous)

Image Reconstruction

Max. Speed	FBP: ≥60 images/s ClearView: ≥50 images/s ClearInfinity: ≥40 images/s
Recon FOV	50mm~500mm 700mm (Extension)
Recon Matrix	512x512, 768x768, 1024x1024
CT Value	-32768~32767
Display Matrix	1024x1024

Image Quality

High Contrast Resolution	The central dose of the head is not more than 40mGy, and the central dose of the body is not more than 20mGy.
	X-Y axis 0%MTF, 17 lp/cm
	X-Y axis (iHD) 0%MTF, 24 lp/cm
	Z axis 0%MTF, 17 lp/cm
Low Contrast Resolution	**Subjective measure** 4mm@0.3%, 3mm@0.5%, 2mm@1% the head CTDIvol dose ≤ 40mGy the body CTDIvol dose ≤ 20mGy
	Subjective measure(FBP) 2mm@0.3%, the body CTDIvol dose ≤ 18mGy
	Subjective measure(ClearView) 2mm@0.3%, the body CTDIvol dose ≤ 9mGy
	Subjective measure(ClearInfinity) 2mm@0.3%, the body CTDIvol dose ≤ 3mGy
Image Noise	≤0.27% (central dose of head ≤ 40mGy)
Uniformity of CT Value	Water CT number is ±4HU (the head CTDIvol ≤ 40mGy)
Accuracy of CT Value	Air: -990~-1010 HU Water: -4~4 HU

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Workplace Overview

Console Workplace System

Console workplace provides a smart and reliable workflow for data acquisition, image reconstruction, and routine processing at CT scanner console.

CPU	Host: ≥ 4-Core, ≥3.6 GHz Recon: ≥ 8-Core, ≥ 3.7 GHz
RAM Storage	≥ 144 GB
Image Storage	≥ 5 TB
Monitor	24 inches
	1920x1200 resolution
Dual Monitors	Yes

AVW Workplace System**

AVW workplace provides a unique advantage of an efficient multi-modality diagnostic workflow at a single workplace. It allows management of the clinical diagnostic workflow anywhere within a clinical setting.

CPU	≥ 6-Core, ≥ 3.3 GHz
RAM Storage	≥ 16 GB
GPU	≥ 6 GB
Data Disk	≥ 1 TB
Monitor	24 inches
	1920x1200 resolution
Dual Monitors	Option

Full Range Clinical Applications

Standard Applications

2D

2D application provides different layout options to display one more series. 2D supports zooming the image, drawing ROI and other basic operations.

Measurement Tools

ROI drawing	Rectangle, polygon, circle and irregular circle
Statistical Evaluation	· Standard deviation · Area/volume · Histogram · Min./max./mean value
Annotation	Text, arrow

3D

Includes following visualization functions: Volume Rendering, MIP, MinIP, SSD, AIP;
Supporting Image Cutting, Manual Segmentation, Tissue Management, Volume Calculation, Batch;
Volume Compare;
Saving and reading processing results

MPR

Multi-Planar Reformat (MPR):
Coronal, Sagittal, Axial Image Display;
Oblique MPR;
Defining CPR Image;
Batch;
CT Image Fusion: Providing fusion visualization of 2 CT images; Providing measurement tools

DICOM Viewer

DICOM Viewer is a standalone application burned on disc to help users view CT DICOM images in different layouts. Users can make operations and ROI measurements on images.
•Support multi-series layout and multi-image layout
•Annotating and measuring
•Zoom, pan, adjust window/level, enhance, smooth, etc.
•Rotate the images by any angle
•View DICOM information
•Cine Images

Auto Voice

A standard set of commands for patient communication before, during and after scanning is available in the following languages:

· Arabic	· Chinese	· English
· Danish	· Dutch	· French
· Georgian	· German	· Hebrew
· Italian	· Japanese	· Norwegian
· Russian	· Spanish	· Swedish
· Turkish	· Portuguese	

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

Report

Create report
Edit report
Confirm report
Save report
Manage report
Export report
Manage case template
Template management: create, delete and edit
Support structured reports

Film

Film Edit
Print Preview
Images Management
Basic gray and color DICOM Print Function
Normal Printing
Send Images to Report
Send Images to other Data Sources
Show surview lines
Allow users to set and store camera parameters

Dual Monitor

Console dual monitor support, and here is the advice. When scanning on the left monitor, the user can register on the right monitor, access the image information of the patients, and do the DICOM printing and sending (based on the current technical accumulation, a better resource reuse pattern to the vice monitor can be designed.)

Low Dose Solutions

It encompasses a set of techniques, programs and practices based on the ALADA (As Low As Diagnostically Acceptable) principle to support perfect image quality at low dose.

AutokV

Automatic kV setting optimizes CNR and minimizes radiation dose based on different organs and contrast scan.

240 Degree Exposure

Dose to patient and attending physician during CCT is reduced.

OrganSafe

In Axial Scan, organ safe function can selectively reduce the radiation dose of sensitive organs such as eyes, thyroid, thymus, breast, small intestine, gonads, etc. This function can reduce radiation doses of the chest or eyes and other sensitive organs without affecting the image quality.

3D Dose Modulation

Tube current is modulated based on the anatomy in the scan field.

Auto FOV

Select the surview image containing the part to be scanned, and automatically mark the FOV range based on AI technology, and the FOV range can be adjusted manually. Supported scan parts include head and lungs.

Pediatric Protocols

Specific for pediatric anatomy

Dose Check

Dose alarm prevents over-radiation of patients.

Dose Report

Dose report of the current is automatically generated, which can be printed or saved.

Advanced Clinical Applications

Bolus Tracking

Through the periodic low-dose scan, the CT value of certain ROI after countdown from contrast agent injecting is tracked, and the clinical scan is triggered when the monitored CT value goes into the preset CT value region. This can prevent patients from absorbing redundant ray especially in the initial period of contrast agent injection.

Spiral Auto Start (SAS)

For Bolus tracking and Timed scan, timing process of Tracker series or 1st series of Timed scan can be triggered by the injector. After the end of PID(Post Injection Delay), the scan will begin.

CCT Scan**

CCT Single: Pedal is pressed once to trigger one revolution half scan, and 1/3/5 images are generated.

CCT Continuous: While pedal is pressed, continuous half scans run, and one images is generated for every revolution.

CCT Fluoro: While pedal is pressed, continuous scans run, and images are reconstructed and displayed in cine mode.

ClearView

ClearView iterative reconstruction provides nine different recon levels, respectively corresponding to different levels of image noise.

Compared with FBP under the same image quality, the head dose can be reduced by up to 50%, and the body dose can be reduced by up to 60%;

Compared with FBP at the same dose, the head low-contrast resolution can be improved by no less than 25%, and the body low-contrast resolution can be improved by no less than 45%;

Compared with FBP under the same dose condition, the image noise can be reduced by no less than 68%.

ClearInfinity

ClearInfinity is a CT image reconstruction technology based on deep learning, which uses deep learning Convolutional Neural Networks (CNN: Convolutional Neural Networks) to achieve image noise reduction and image quality optimization.

Compared with FBP under the same image quality, the head dose can be reduced by up to 60%, and the body dose can be reduced by up to 85%;

Compared with FBP at the same dose, the head low-contrast resolution can be improved by no less than 60%, and the body low-contrast resolution can be improved by no less than 135%;

Compared with FBP under the same dose condition, the image noise can be reduced by no less than 90%;

Compared with FBP under the same noise conditions, the spatial resolution can be improved by no less than 88%.

iHD

The iHD function can improve the spatial resolution of the system, and the high reconstruction can be achieved 24lp/cm@0%MTF for options through iHD.

Vessel Analysis

Bone Removal function;
Vessel Extraction and Labeling;
Editing vessel centerline;
Vessel Measurement Tool;
Saving and reading processing results.

Virtual Endoscopy

Providing fly-through for colon, trachea, and vessel;
Define fly-through path;
Manual navigation mode;
Saving navigation results.

Cardiac Scan

Prospective ECG scan and multi-phase reconstruction
Retrospective ECG scan
Retrospective ECG scan mA modulation
ECG wave edit

Arrhythmia Handling**

Arrhythmia Handling will deal with abnormal R wave, which is not considered to trigger R wave during scanning.

Coronary Motion Clear**

Coronary motion artifacts could be corrected by Coronary Motion Clear and then a new reconstructed series would generate.

Cardiac Viewer

Can View cardiac images and provide measurement tools;
Providing MPR and 3D view;
Can switch data between different phases;
Comparing data of different phases;
4D playing;
Displaying three cardiac MPR images;
Providing Oblique MPR display;
Defining CPR.

Cardiac Calcium Scoring

Measuring Calcium Score and displaying Pseudo Color;
Displaying Vessel Name, Plaque Number, Pixel Number, Volume, Area Score, Continuous weight factor Score and Mass Score;
Can add vessel, delete vessel, rename and modify Vessel color;
Saving and reading processing results.

Coronary Analysis*

Vessel stenosis measurement;
Automatic coronary extraction and the main vessels labeling;
Plaque analysis;
Report;
Saving and reading processing results.

Contrast Dose Documentation**

A contrast medium dose report for the diagnosis is generated as the diagnosis is completed on the basis of the obtained injection information of the high pressure syringe during the diagnosis and the contrast medium information provided by the user.

Real-time MPR

Real-time MPR function supports coronal and sagittal plane reconstruction while scanning and doing axial reconstruction.

MAR+**

MAR+ is the most advanced patented metal artifact reduction
algorithm recon post processing technology.
It removes the artifacts caused by metal or high CT value.

AVW Ready for Reading***

The specified image data can be preprocessed before the user review them. For example, the following processing will be done before the user reviews the image data:
bone removal, couch removal, vessel extraction etc.

Dual Energy Imaging (Prism Imaging)**

The system should have a function for dual energy scan and reconstruction.

Prism Viewer*

Prism Viewer allows users to view images of 101 energy levels with a variety of parameters and visual tools to assist in accurate lesion detection.

Bone Density***

Bone density is an important indicator of bone mass, which could reflect the degree of osteoporosis and be an important basis for predicting the risk of fracture. Bone Density Analysis application allows measurement of bone mineral density, providing a powerful tool for the diagnosis of clinical osteoporosis and determination of fracture healing.

Lung Nodules ROI***

Automatic extraction of lung nodules shows the 3D shape, volume, and edges of the nodules. The magnified visualization of the 3D structures of the nodules clearly displays the neighboring nodules, as well as the relationship between the nodules, the blood vessels and the pleura. The follow-up function allows closer observation of the nodule changes to help determine the nature of the nodule.

Intelligent Positioning**

The system collects and displays the natural image information of the human body and automatically calculates the scanning position by combining the human body image according to the scanning protocol and using artificial intelligence technology. At the same time, the technician can manually adjust the scanning position on the human body image; automatically adjust the bed height according to the scanning protocol; Support patient position, attitude and collision detection.

Liver Analysis +***

The Liver Analysis+ software package assists doctors in analyzing liver and its lesion blood supply system. The main function includes liver segmentation, liver section, extraction of liver lesions, extraction of hepatic artery, hepatic vein, portal vein, multiphase image fusion, and the saving and transmitting of processing results.

Myocardial Perfusion***

CT Myocardial Perfusion enables visualization and analysis of perfusion deficits in the myocardium. Automated segmentation and registration, along with comparison layouts for rest and stress studies are available in a streamlined workflow.

Cardiac Function Analysis*

The CFA is a tool used to evaluate and analyze left ventricle. It can display three cardiac MPR images: Short axis (SA) Image, Horizontal long axis (HLA) image and Vertical long axis (VLA) image. It also can show LV Function Results Table, LV Volume Graph, VR image and Bull's-Eye Map. And it can switch the display between Wall Thickness Map, Regional Wall Thickness Map, and Wall Thickening Map. Saving and reading processing results
Can display the following values:
Ejection Fraction(%)
•ED Volume(ml)
•ES Volume(ml)
•Stoke Volume(ml/beat)
•Cardiac Output(L/min)
•Myocardial Volume(ml)
•Myocardial Mass(g)
•BSA(mm^2)

Virtual Colonoscopy*

Auto-segmentation Colon;
Extraction Colon centerline;
Editing segmentation result and centerline;
Fly-through;
Saving and reading processing results.

Lung Density Analysis*

Extraction of both lung, and displaying 3D image of the left and right lungs and the trachea;
Can calculate the volume of emphysema, left lung, right lung and trachea;
Can calculate the percentage of emphysema volume;
Saving and reading processing results.

Lung Nodule Analysis*

Visualization Lung parenchyma;
Can manually segment nodules and view lesions information;
Follow up support ;
Saving and reading processing results.

Nerve System DSA*

Can subtract CTA data between contrast and non-contrast;
Can remove bone;
Can display subtract results and generate new data series.

Dental Analysis*

Displaying Axial Image and 3D Image;
Define and edit curve;
Creating panoramic image and sectional images;
Creating true-size film images;
Saving and reading processing results.

Bone Measurement***

The Bone Measurement Software provides femur head segmentation and various bone data measurement functions, allowing you to observe bone growth. It can also send the measurement results to reports.

WholeHeartSeg***

WholeHeartSeg is a specialized application used for coronary analysis and cardiac function analysis. It provides tissue segmentation for the entire heart, including the coronary artery, left ventricle, right ventricle, myocardium, left atrium, right atrium, and aorta. It also provides heart function calculation, coronary stenosis measurement, and other analysis functions, which serve as references for the assessment of cardiovascular diseases.

ThreeDPrint***

The ThreeDPrint software package is used to import the segmentation results data from an application to the ThreeDPrint application. It uses algorithms to convert the segmentation results data into grid data and then displays it on the interface. The user can perform various operations on the grid data, which allows editing and optimization to obtain a high-quality grid data model. This grid data model is then saved in a file format the 3D printer can recognize and finally be printed out in 3D.

Super Fusion***

The Super Fusion software fuses the images of a patient taken with different devices. This gives physicians a comprehensive overview of all imaging results and helps in diagnosis.

Fat Analysis*

Be used to analyze the fat of abdomen, including calculating the area of Subcutaneous Fat, Abdomen Fat, Waist circumference, etc.
Segment the fat of Subcutaneous and Abdomen function;
Saving and reading processing results.

CFA+***

CFA+ segments the cardiac tissue automatically, including left ventricle, right ventricle, myocardium, left atrium, right atrium and ascending aorta.

TRO***

TRO (triple-rule-out) displays images for TRO scan data. It automatically removes bones, extracts cardiac and aortic tissue and extracts center lines. The MPR, VR, and CPR images for each tissue and organ provide a key reference for the diagnosis of patients suffering from chest pain.

BrainStroke***

The BrainStroke software package provides Brain Hemorrhage measurement, cerebral perfusion analysis and perfusion maps based on the threshold set. It helps physicians develop pre-operation and post-operation treatment plans and allows them to analyze patients' lesion sites better, providing an important reference for the formulation of clinical treatment plans.

Brain Perfusion*

Playing images;
Displaying time Maximum Intensity Projection (tMIP) image;
Defining reference vessel and displaying the TDC (Time Density Curve);
Calculating and displaying Cerebral Blood Flow (CBF), Cerebral Blood Volume (CBV), Mean transit time (MTT), and Time to Peak (TTP) images;
Defining Region of Interesting (ROI);
Saving and reading processing results.

Body Perfusion*

Liver Protocol, Display the following images:
tMIP: time Maximum Intensity Projection Average image
CBF: Cerebral Blood Flow
TTP: Time to Peak
HAP: Hepatic Artery Perfusion
HPP: Hepatic Portal Perfusion
HPI Hepatic Portal Perfusion Index
HAI: Hepatic Artery Perfusion Index
TLP: Total Liver Perfusion
Tumor Protocol, Display the following images:
tMIP: time Maximum Intensity Projection Average image
BF: Blood Flow
BV: Blood Volume
MTT: Mean Transit Time
PS: Permeability Surface
Saving and reading processing results.

Tumor Assessment*

Providing Manual definition lesions;
Displaying tumor measurement results, including RECIST Diameter, WHO Area, Lesion Volume, etc.;
Follow up and compare support;
Saving and reading processing results.

4D Scanning**

4D scan, to support shuttle scan with bi-direction table movement, and 4D imaging can be achieved.

4D Perfusion***

Through the perfusion of tissues and organs on the cellular level, 4D perfusion software package reveals diseases, including pathological and physiological changes in cirrhosis and tumors. It provides a multi-dimensional display of patient data through intelligent analysis method, which helps the formulation of pre-surgical and postsurgical treatment plans.

TAVR***

Transcatheter aortic valve replacement surgery plan is helpful to evaluate the preoperative aortic valve status and postoperative outcome. It provides comprehensive measurement templates, including size, area, angle, circumference and length, as well as automatic segmentation and positioning of aortic and aortic root centerline for assessment and surgical approach.

* Optional feature for Host workplace and AVW workplace
** Optional feature for Host workplace only
*** Optional feature for AVW workplace only

Accessories

Standard accessories

NMS Head Holder Assly	Head Holder Cushion	Couch Cushion	Knee Joint Cushion
Arm-Head Cushion	Couch Extension	Couch Extension Cushion	QA Phantom

Optional accessories

Cervical Vertebra Cushion	Coronal Cushion	Flat Head Holder Cushion	Coronal Head Holder
Arm Support	Head Side Cushion	Flat Head Holder	Cradle Handle
Infant Cradle	Belt		

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Site Planning

Dimensions & Weight

Gantry Dimension	2198mm (L) x 938mm (W) x 1910mm (H)
Gantry Weight	1800 kg
Gantry Package	2370mm (L) x 1030mm (W) x 2250mm (H)
Couch Dimension	2540mm (L) x 643mm (W) x 1055mm (H)
Couch Weight	360kg
Couch Package Dimension	2770mmmm (L) x 970mm (W) x 1230mm (H)
Console Dimension	600mm (L) x 800mm (W) x 675mm (H)

Environment

Temperature of Scan Room	18 °C~24 °C
Temperature of Operation Room	18 °C ~24 °C
Humidity of Scan Room	30%~60% (no condensation)
Humidity of Operation Room	20%~80% (no condensation)
Temperature of Transportation and Storage	-20 °C ~+55 °C
Humidity of Transportation and Storage	10%~90% (no condensation)
Running Noise	Less than 70 dB, A-weighted

Power Supply Requirements

Rated Power	100 kVA	**Input Voltage**	380/400 VAC
Voltage Variation	±10%	**3-phase Unbalance**	≤5%
Frequency	50/60 Hz±1 Hz	**Ground Resistance**	4Ω (independent grounding system) 1Ω (complex grounding system)

Note: All parameters mentioned above subject to change without notice.