VenusX Advanced (A)
Medical Linear Accelerator

Specification List

VenusX-Advanced Configuration Specification List

Configuration:

Model: VenusX -Advanced				
Item No.	**Product Category**	**Product Name**	**Product Description**	**Qty**
1	Medical Linear Accelerator	Linear accelerator host system	Orthogonal Dual-Layer MLC	1
			High-efficiency standing wave accelerating tube	1
			High dose rate microwave system	1
			Motion system	1
			Safety interlock system	1
			Water cooling system/water chiller (closed internal circulation)	1
			UPS	1
			CCTV patient monitoring system	1
		Patient treatment couch	4D treatment couch	1
		MV EPID image guidance system	Control box	1
			Amorphous silicon flat panel detector	1
			Telescopic robotic arm	1
			Software license	1
		kV CBCT image guidance system	X-ray tube	1
			Amorphous silicon kV detector	1
			kV high voltage generator	1
			kV control system	1
			Software license	1
2	Treatment Planning System	Treatment Planning System	GPU Monte Carlo workstation	1
			DICOM import and export module	1
			CT/MRI/PET/SPECT and other patient image fusion modules	1
			Patient organ and target area contour module	1
			Plan design module	1
			Plan evaluation module	1
			Patient data management module	1
			Machine data management module	1
			Color laser printer	1
		Doctor Workstation	Computer workstation	2
			DICOM import and export module	2
			CT/MRI/PET/SPECT and other patient image fusion modules	2
			Patient organ and target area contour module	2
			Data management module	2
			Plan evaluation module	2
3	Hospital Information	Radiation Therapy	Computer workstation	1
			Login module	1

	System(HIS/OIS)	Information and Image Management Software	Patient registration	1
			Patient information	1
			Treatment scheduling	1
			Hospital management	1
			System settings	1

Specifications:

No.	Content	Description
One	**Medical Linear Accelerator**	
1	Linear accelerator host system	
1.1	Basic requirements	The system is capable of achieving three-dimensional conformal radiotherapy, static/dynamic intensity-modulated radiotherapy, MV EPID and kV CBCT image guidance functions.
1.2	Control mode	The accelerator control system is with fully digital system, providing clinical application modes, special treatment application modes, physics mode, and maintenance mode.
1.3	Safety interlock	It feature a unique collision avoidance interlock system.
1.4	Indoor data display	A data display monitor should be installed in the treatment room, displaying all treatment parameters including mechanical parameters during treatment.
1.5	System response time	System response time should be ≤50ms.
1.6	System networking capability	It have DICOM RT interface, compatible with corresponding radiotherapy planning systems, radiotherapy information systems, and other radiotherapy Products.
1.7	Supporting equipment and apparatus	One voltage stabilizer; one water chiller; one monitoring system ensuring no blind spots in the treatment room, meeting health law inspection standards; one intercom system; one set of maintenance tools; one set of user manuals.
1.8	Remote maintenance	During the warranty period, remote login, diagnosis, and maintenance services is provided to users.
1.9	Working Voltage	380V (Three phase)
2	**Treatment Mode**	
2.1	Treatment mode	Supports three-dimensional conformal radiotherapy (3D-CRT), static intensity-modulated radiotherapy(Step-and-shoot IMRT), dynamic intensity-modulated radiotherapy (Sliding Window IMRT), dynamic conformal arc therapy, 4D radiotherapy, MV EPID and kV CBCT image-guided radiotherapy (IGRT).
2.2	Treatment Area	Whole Body
2.3	Bidirectional arc rotation	Has bidirectional arc rotation treatment capability (≥±180 degrees).
2.4	Rotation angle error	Rotation angle error is ≤0.5°.
2.5	Volumetric modulated arc therapy based on dual-layer collimators	Provided
2.6	Maximum field size during rotational intensity-modulated radiation therapy	≥40cm×40cm
3	**Beam Delivery System**	
3.1	X-ray tube	Standing wave

3.2	Microwave power source	Magnetron
3.3	Maximum output power of the microwave power source	≥2.6MW
3.4	Structure of the dose monitoring system	Closed ionization chamber
3.5	X-ray energy	Photon 6MV FFF (Flattening Filter-Free)
3.6	Maximum dose rate of X-rays	1000 MU/min
3.7	Number of standard X-ray dose rate levels	Multi-level adjustable
3.8	X-ray field size	1×1cm to 40×40cm continuously adjustable
3.9	Output dose error	≤1% or 1MU
3.10	Stability of dose rate	±1%
3.10.1	Variation in gantry angle for radiation output constancy with fixed energy	3%
3.10.2	Radiation (MU) output linearity	±2%
3.11	Percentage depth dose of X-rays at 10cm underwater	63.0±0.5%
3.12	Symmetry of X-rays	≤2% (at 10cm underwater)
3.13	Maximum depth of dose build-up for X-rays	1.4±0.1cm
3.14	Dose monitoring system	Equipped with a dual-channel dose monitoring system and a timer system
3.15	Safety interlock	Equipped with dose rate safety interlock control functions
3.16	Comply with IEC standard for beam characteristics.	
4	**Mechanical Motion System (Gantry)**	
4.1	Rotational range of the gantry	≥370° (±185°), rotatable clockwise and counterclockwise
4.2	Gantry rotation angle error	≤0.5°
4.3	Gantry rotation speed	1 rpm
4.4	Treatment space from isocenter to gantry head	≥45cm
4.5	Isocenter posotion accuracy	±0.5mm radius sphere
4.6	ODI Accuracy	2mm
4.7	Mechanical front pointer accuracy	2mm
4.8	Gantry Rotation Isocentre diameter Sphere	± 1mm
4.9	Isocenter height	≤135cm
4.10	SAD	90cm

4.11	Comply with IEC specifications for mechanical accuracy and stability.	
4.12	Conform to IEC requirements both in performance and standards regarding movement readouts.	
4.13	Locally hand controller and remotely control	
5	**Orthogonal Dual-layer Multileaf Collimator Precision Treatment Head System**	
5.1	System structure	Utilizing orthogonal dual-layer structure to prevent radiation leakage and protect critical organs.
5.2	Minimum projected width of the leaves at the isocenter	4mm
5.3	Maximum field size at the isocenter	≥400 mm×400 mm
5.3.1	Minimum field size at the isocenter	30 mm×30 mm
5.4	Number of leaves	204 Leaves
5.5	Leaf travel distance	≥30cm
5.6	Distance over the isocenter	22 cm
5.7	Leaf movement speed	≥6.5 cm/s
5.8	Interleaf/transmission ratio	≤0.1%
5.9	Leaf position repeat accuracy	≤0.25mm
5.10	Leaf material	Tungsten alloy
6	**ITC Integrated Treatment Console**	
6.1	Control keyboard	Compact design with a small footprint, occupying minimal space in the operating area. Integrated control of accelerator, treatment couch, MV, and kV imaging systems for ease of operation. Equipped with safety keys and an integrated "Emergency" stop switch.
6.2	Treatment techniques	
6.2.1	Three-dimensional conformal radiotherapy 3D-CRT	Through MLC shaping, the dose distribution shape is made consistent with the shape of the target area in three-dimensional space. The surrounding normal tissues receive minimal dose during the treatment.
6.2.2	Static intensity-modulated radiotherapy IMRT	During treatment, each irradiation field is divided into several subfields with different weight shapes using MLC. Each subfield is independently irradiated, and the final intensity distribution is obtained by weighting, satisfying the requirement of high dose to the tumor and low dose to the organs at risk.
6.2.3	Dynamic intensity-modulated radiotherapy IMRT	During the irradiation of each field, the pairs of leaves undergo variable speed motion to achieve the desired intensity distribution. The combination of various fields ultimately forms a satisfactory dose distribution.
6.2.4	Conformal rotational radiotherapy ARC	During treatment, when the gantry rotates, the MLC performs conformal radiotherapy according to the tumor shape at different angles, reducing the dose to normal tissues.
6.2.5	3D Image Guided Radiation Therapy (IGRT)	MV and kV 3D image-guided radiotherapy (IGRT), more precise treatment, and satisfying the requirement of high dose to the tumor and low dose to the organs at risk.
6.2.6	Console mode	Operational modes include clinical application mode, plan verification mode, quality control mode, and service maintenance mode.

6.3	Console functions and display	
6.3.1	Display of patient information and patient identity	
6.3.2	Loading and management of patient treatment data	
6.3.3	Display of treatment process status for patients	
6.3.4	Display of treatment machine data and management of treatment machine status	
6.3.5	Display connection to the main camera inside the treatment room, real-time display of the situation in the treatment room	
6.3.6	Display of patient images and reference images	
6.3.7	Display of system interlock information and interlock status	
6.3.8	Display of treatment process guidance information	
6.3.9	Patient plan sorting and adjustment, support for manual/intelligent automatic sorting of fields	
6.3.10	Automation of treatment process settings, support for fully automatic/half-automatic/manual completion of treatment plans	
6.3.11	Patient identity and bolus verification	
6.3.12	Verification and recording of treatment and image guidance	
7	**MV EPID Image Viewing System**	
7.1	Composition	Using a flat-panel digital imaging detector made of "amorphous silicon" that can be remotely controlled for contraction.
7.2	Motion mode	The detector is mounted on the support system, and its support arm can freely open and close and move back and forth.
7.3	Repeatability of support arm movement	≤0.5mm
7.4	Collision avoidance	The support arm movement should have collision avoidance interlock functionality.
7.5	Imaging mode	Utilizes amorphous silicon X-ray digital flat-panel detector
7.6	Scintillator of the detector	Cesium iodide(Csl/GOS)
7.7	Effective image sensing area	43cm×43cm
7.8	Effective image sensing area at the isocenter	40cm×40cm
7.9	Spatial resolution	2816×2816 pixels
7.10	Physical pixel size	≤154μm
7.11	Image acquisition	Supports single and dual exposures
7.12	Dynamic image acquisition speed	≥25 frames per second
7.13	Coincidence of image center and beam center	≤1mm
7.13.1	kV and MV imagers alignment accuracy	⩽0.5mm
7.14	Minimum exposure dose	≤0.5MU
7.15	Software functional requirements:	
7.15.1	Simultaneous display of acquired images and reference images (e.g., DRR)	
7.15.2	Overlay display of multi-leaf collimator field shapes on images	
7.15.3	Automatic image enhancement processing after image acquisition	
7.15.4	Automatic shutdown of radiation output after image acquisition	
7.15.5	Automatic/manual adjustment of window width/window level	
7.15.6	Zoom in/zoom out of image display	
7.15.7	Image editing functions: distance, area, angle	

7.15.8	Geometric measurement functions: grid overlay display	
7.15.9	Manual and automatic registration of acquired images and reference images; provision of marker points, marker line drawing for assisted registration; overlapping view and adjustment of image registration results	
7.15.10	Positioning matching function: detection of boundary and anatomical structure positioning matching of reference images and real-time imaging, with measurement of displacement to determine positioning errors of the radiation field	
7.15.11	MV image quality detection function	
7.15.12	MV CBCT, Achieving the functionality of MV CBCT through the rotational imaging mode of MV EPID.	
7.15.13	In-vivo 3D EPID to verify dose distribution and treatment positioning in real time.	
8	**Integrated kV-CBCT Image Guidance System 4D**	
8.1	System basic structure	The kilovoltage X-ray imaging system is integrated with the accelerator and shares the same rotating gantry.
8.2	Robotic arm	The mechanical arm supporting the tube can extend and retract, without affecting positioning when retracted.
8.3	Robotic arm positioning accuracy	Positioning accuracy: ±1mm
8.4	Dual-focus X-ray tube, maximum power of X-ray tube	≥53kW
8.4.1	Kilovoltage range	40-140kV
8.5	Composition	Utilizes amorphous silicon X-ray digital flat-panel detector
8.6	Effective image sensing area of the detector	43cm×43cm; equipped with collision avoidance functionality
8.7	Detector resolution	2816×2816 pixels
8.7.1	Spatial accuracy	⩽ 0.32mm
8.8	Pixel grayscale resolution	≥16 bit/pixel
8.9	Dynamic image acquisition speed	≥25 frames per second
8.10	Imaging mode	Supports X-ray radiography, fluoroscopy, and volumetric imaging (cone-beam CT) modes
8.11	Two-dimensional imaging	Equipped with two-dimensional kilovoltage X-ray imaging functionality
8.12	Two-dimensional registration	Capable of acquiring static two-dimensional kV images and registering them with reference images
8.13	Three-dimensional imaging	Equipped with three-dimensional X-ray volumetric imaging functionality
8.14	Three-dimensional reconstruction	Can complete a 360° gantry rotation, image acquisition, and synchronous image reconstruction within 1 minute, and can quickly complete X-ray volumetric imaging with less than 360° rotation
8.15	Coincidence of imaging and treatment centers	Coincidence of kV-CBCT isocenter and radiotherapy isocenter, with a tolerance of ≤1mm
8.16	Number of image acquisition frames	≤360 frames
8.17	Image reconstruction Field-of-View (FOV)	≥35cm
8.17.1	Slice Thickness	0.5mm
8.18	Image reconstruction time	≤15s

8.19	System interfaces:	
8.19.1	Interface with the accelerator	When a patient is selected on the accelerator, the imaging system also points to the same patient simultaneously.
8.19.2	Interface with the treatment couch	Correction vectors for treatment couch positioning can be transmitted to the treatment couch, and the couch position can be automatically controlled from the console.
8.20	Requirements for image guidance application software	
8.20.1	Presets	The system provides preset templates for automatically setting appropriate acquisition parameters, including a series of templates for kV continuous fluoroscopy modes. Presets are available for reference human body parts imaging parameters, including voltage, current-time product, full arc scanning, etc.
8.20.2	Image processing functions	Support multi-plane image reconstruction, image display tools, window width/window level adjustment, zoom in/zoom out, etc.
8.20.3	Image registration	Manual and automatic registration of planned images and CBCT images can be performed. During automatic registration, at least bone anatomical structures or grayscale (CT) values within the region of interest can be registered.
9	**Positioning Image Verification Mode**	
9.1	Can acquire orthogonal MV images through the MV image guidance system for position verification; registration accuracy: ±1mm	
9.2	Can acquire orthogonal kV images through the integrated kV image guidance system for position verification; registration accuracy: ±1mm	
9.3	Can acquire orthogonal MV and kV images separately through the MV and kV image guidance systems for position verification; registration accuracy: ±1mm	
9.4	Can acquire volumetric images through the integrated kV image guidance system for position registration; registration accuracy: ±1mm	
9.5	After image registration, the system can automatically generate the movement vectors of the treatment couch, including three-dimensional translation vectors and three-dimensional rotation vectors; the rotation vectors can be automatically converted into translation vectors.	
9.6	The registration results can be transmitted to the motion control system for real-time adjustment of positioning.	
10	**Treatment Couch System**	
10.1	Motion Control	Treatment couch top can translate and rotate in four degree, suitable for automatic positioning and facilitating automatic positioning correction for IGRT.
10.2	Couch Material	Made of full carbon fiber, minimal absorption of X-rays and electrons, does not affect dose distribution and build-up depth; does not produce artifacts in kV-level X-ray cone-beam CT imaging.
10.3	Load Capacity	Load capacity ≥250 kg, maximum horizontal displacement of the couch top ≤0.5 mm when the couch top is raised or lowered by 20cm.
10.4	Vertical Movement Range	≥50cm
10.5	Longitudinal Movement Range	≥130cm
10.6	Lateral Movement Range	±25cm
10.7	Isocentric Rotation of Treatment Couch (Base)	±95°, with rotation isocenter error not exceeding ±0.5mm.
10.8	Mechanical Displacement	≤0.5 mm

	(Movement) Accuracy	
10.9	Movement after Locking	After locking the treatment couch in any position, the movable range in the front-to-back and left-to-right directions is ≤0.5mm, and the rotatable range is ≤0.5°.
10.10	Automatic Positioning	After identifying positioning errors through the image guidance system, automatic correction parameters are sent to the treatment couch.
11	**OIS Oncology Information System**	
11.1	It enables networking of the accelerator, treatment planning system, doctor's workstation, etc. It ensures compatibility and connection with the hospital's existing unified radiotherapy information system, facilitating functions such as data storage, treatment, and data management.	
11.2	Server and network requirements	
11.2.1	Network protocol	Ethernet structure, supporting TCP/IP communication protocol
11.2.2	Network data transfer speed	1000Mbps
11.3	Software functionalities	
11.3.1	Database management system	Patient data, including text information, image information, plan data, and data generated during treatment, are all stored in the server database. It provides an "automatic recording and verification" function with treatment parameters.
11.3.2	Permission management	It offers management functionality to set access permissions for each staff member.
11.3.3	Recording and verification	It provides an "automatic recording and verification" function with treatment parameters.
11.3.4	Connection control	It facilitates full automatic operation of the accelerator, multileaf collimator system, and imaging system.
11.3.5	Statistical analysis	It offers statistical chart drawing functionality, automatically analyzing equipment operating conditions.
TWO	**TPS Treatment Planning System**	
1	Overall configuration of the treatment planning system: It is from the same manufacturer as the accelerator, including one set of physicist workstations and two sets of doctor workstations, as well as supporting software and hardware necessary for operation, capable of designing three-dimensional conformal, intensity-modulated radiotherapy plans, and volumetric modulated arc therapy plans, supporting Monte Carlo-based dose calculation algorithms.	
2	Physicist workstation features data management, patient modeling, dose calculation, dose evaluation, optimization, image fusion, organ and target contouring, automatic organ contouring, conventional three-dimensional conformal planning, IMRT planning, VMAT planning, stereotactic planning, intensity modulation, volumetric modulation, plan evaluation, plan QA, etc.	
3	Provide collection, fitting, and input of beam data for linear accelerators, and conduct verification work.	
4	The physicist workstation hardware requirements are:	
4.1	Processor i7, memory 16GB, graphics card: discrete graphics card, hard disk 1TB, operating system: Windows 10 or higher, monitor 27".	
4.2	Provide one color laser printer for report output	
4.3	Software configuration requirements for planning system	
4.3.1	Software configuration requirements	
4.3.1.1	Data import and export requirements	
4.3.1.2	Support DICOM 3.0/RT format data; support CT/MRI/PET DICOM image import and export; support radiotherapy image, contouring, plan, dose import and export;	

4.3.1.3	Support DICOM data network transmission
4.3.1.4	Support output and printing of treatment plan results
4.3.2	Image fusion requirements
4.3.2.1	Support fusion of multiple images such as CT/MRI/PET
4.3.2.2	Have three-dimensional rigid, elastic automatic registration function
4.3.2.3	Have plane, marker point, three-dimensional automatic fusion mode
4.3.2.4	Support manual movement, rotation, fine adjustment of registered images
4.3.2.5	Support saving of fused images; support contouring based on fused registration images
4.3.3	Contouring function requirements
4.3.3.1	Support automatic extraction of organ contours based on artificial intelligence algorithms: no less than 30 key organ contours are automatically extracted
4.3.3.2	Provide a package of tools for patient organ and target contouring
4.3.3.3	Provide organ Boolean operation function, and support Boolean operation script setting
4.3.3.4	Support contour generation based on dose
4.3.4	Plan design function requirements
4.3.4.1	Support conventional three-dimensional conformal planning, static intensity-modulated planning, dynamic intensity-modulated planning, volumetric modulated arc therapy planning
4.3.4.2	Support single-layer grid, double-layer grid planning
4.3.4.3	Support FF and FFF linear accelerator planning
4.3.4.5	Support SSD, SAD, ARC irradiation mode design
4.3.4.6	Support combined photon and electron beam planning
4.3.4.7	Support multi-isocenter planning
4.3.4.8	Support multi-prescription planning
4.3.5	External irradiation plan display requirements
4.3.5.1	Support CT digital image reconstruction (DRR), able to adjust the BEV view display arbitrarily
4.3.5.2	Support three-dimensional rendering of tissue images, three-dimensional display of beam field and dose
4.3.5.3	Full-screen or partial-screen screenshot function
4.3.5.4	Support volume dose histogram (DVH) calculation and display, including integral DVH
4.3.5.5	Support real-time update of DVH
4.3.5.6	Have TCP/NTCP/HI/CI analysis tools
4.3.5.7	Have 3D anti-collision indication function
4.3.6	Dose calculation algorithm requirements
4.3.6.1	Advanced photon three-dimensional full-scatter convolution dose algorithm
4.3.6.2	Three-dimensional pencil beam dose algorithm
4.3.6.3	Dose calculation based on Monte Carlo algorithm
4.3.7	Three-dimensional conformal planning design function requirements
4.3.7.1	Support the addition of accessories such as wedges, cones, lead blocks, and grids
4.3.7.2	The position of the grid leaf can be automatically or manually set
4.3.7.3	Edit MLC position and field shape and size on images or BEV images
4.3.7.4	Support one wedge synthesis plan
4.3.7.5	Three-dimensional non-uniform tissue dose calculation
4.3.7.6	Three-dimensional coplanar, non-coplanar, and arc field dose calculation
4.3.7.7	Three-dimensional point dose calculation
4.3.7.8	Correct tissue inhomogeneity point by point based on CT pixel
4.3.7.9	Reset the beam weight, update and display the new dose in real-time without calculation
4.3.7.10	Support multiple normalization methods: such as point normalization and target dose normalization
4.3.8	Intensity-modulated planning design function requirements
4.3.8.1	Dose constraint setting: based on physical dose or volume-based objective function, parameters such as maximum dose, minimum dose, dose per unit volume of CTV, PTV, and

	critical organs can be optimized, including corresponding weight settings, etc.
4.3.8.2	Have intensity map optimization mode
4.3.8.3	Design dose transition zone directly or optimize region dose with contour optimization
4.3.8.4	Support flux map adjustment function
4.3.9	VMAT plan function requirements
4.3.9.1	Support volumetric modulated arc therapy, when designing volumetric modulated arc therapy plan, the starting angle of the gantry, couch rotation angle, number of arcs, etc. can be set as needed.
4.3.9.2	Can perform single-arc, multi-arc, and non-coplanar plan design
4.3.9.3	Support fixed field and arc mixed plan design
4.3.10	Plan evaluation function requirements
4.3.10.1	Support multiple plan superposition
4.3.10.2	Plan dose subtraction
4.3.10.3	Comparison of multiple plans on the same interface
4.3.11	Plan QA function requirements
4.3.11.1	Support automatic creation of validation phantom models
4.3.11.2	The patient's plan is transplanted to the validation phantom model
4.3.11.3	Output verification plan and dose data
4.3.11.4	Verification data can be output in DICOM RT format, compatible with common third-party verification systems
4.3.12	Data management requirements
4.3.12.1	Patient data management function
4.3.12.2	Patient data backup and restore function
4.3.13	User management module: support creation of multiple login accounts and permission settings, such as doctor, physicist, administrator permissions
4.3.14	Machine data management function: machine data import, export; machine data check confirmation; support creation of CT-density/CT-electron density tables;
4.3.15	Network requirements: Comply with DICOM 3.0 protocol, support domestic common CT\MR\PET data transmission
4.4	Provide professional physicist and engineer from the original factory to conduct application training and technical support for users of the hospital
4.5	Provide TPS original factory data collection and Monte Carlo-based data modeling
5	Doctor workstation hardware requirements:
5.1	Processor i7, memory 8GB, hard disk 1TB, operating system: Windows 10 or higher, monitor 27"
5.2	Doctor workstation system software configuration requirements
5.2.1	DICOM import and export module
5.2.1.1	Import and export of CT, MRI, PET, RT Image and other DICOM standard images
5.2.1.2	Importation of RT Plan, RT Dose, RT Structure format data
5.2.1.3	Export structure set, plan, dose file as DICOM file
5.2.2	Registration module
5.2.2.1	Multi-modal rigid and non-rigid registration
5.2.2.2	Support multi-modal image fusion (CT-CT, CT-MR, CT-PET)
5.2.2.3	Manually adjust the image registration relationship
5.2.2.4	Visual observation of matching results
5.2.3	Contouring module
5.2.3.1	Selection of multiple manual contouring tools
5.2.3.2	Contour area density setting
5.2.3.3	Add organs via template
5.2.3.4	Contour generation based on dose
5.2.3.5	Support cross-sectional, coronal, sagittal, BEV, and 3D window display of patient contouring
5.2.3.6	Contours can be drawn based on fused images.

5.2.3.7	Contour copying and pasting based on fused images	
5.2.3.8	Support virtual treatment couch	
5.2.3.9	Customizable ROI color	
5.2.3.10	Support organ Boolean operation	
5.2.3.11	Support automatic extraction of organ contours based on artificial intelligence algorithms: no less than 30 key organ contour automatic extractions	
5.2.3.12	Customizable automatic contouring template	
5.2.4	Plan evaluation module	
5.2.4.1	Support evaluation of single plan	
5.2.4.2	Support superimposed display of plan dose	
5.2.4.3	Supports comparison of multiple plans.	
5.2.4.4	Simultaneous display of two sets of DVH distributions	
12	**HIS Hospital Information System**	
12.1	It enables networking of the accelerator, treatment planning system, doctor's workstation, etc. It ensures compatibility and connection with the hospital's existing unified radiotherapy information system, facilitating functions such as data storage, treatment, and data management.	
12.2	Server and network requirements	
12.2.1	Network protocol	Ethernet structure, supporting TCP/IP communication protocol
12.2.2	Network data transfer speed	1000Mbps
12.3	Software functionalities	
12.3.1	Database management system	Patient data, including text information, image information, plan data, and data generated during treatment, are all stored in the server database. It provides an "automatic recording and verification" function with treatment parameters.
12.3.2	Permission management	It offers management functionality to set access permissions for each staff member.
12.3.3	Recording and verification	It provides an "automatic recording and verification" function with treatment parameters.
12.3.4	Connection control	It facilitates full automatic operation of the accelerator, multileaf collimator system, and imaging system.
12.3.5	Statistical analysis	It offers statistical chart drawing functionality, automatically analyzing equipment operating conditions.