Medical Digital X-ray Angiography System(Cath Lab)
ES-ANGIO SYSTEM

Applications	
1	It is suitable for providing X-ray fluoroscopy, radiography and digital subtraction images in angiography examination and interventional operation. It can meet the needs of angiography and interventional therapy in scientific research and clinic.
Environment requirement	
1	**Use environment**
1.1	Power requirements: three phase AC, voltage: 380V±10% frequency: 50/60Hz±1Hz
1.2	Ambient temperature:10℃~35℃
1.3	Relative humidity: 30%□75%
1.4	Atmospheric pressure: 700kPa~1060kPa
Technical specifications	
1	**High-voltage generator**
1.1	Power: 100KW
1.2	Maximum tube current:1000mA
1.3	Variable frequency high voltage generator, inverter frequency: 160KHz~400KHz
1.4	Maximum output voltage:125KV
1.5	Exposure time: 1ms□6300ms
1.6	Exposure current time product: 0.1mAs□1000mAs
1.7	Automatic exposure control without test exposure
2	**High-speed rotating anode tube**

2.1	Heat capacity of tube sleeve is 2.6MHU;The anode heat capacity is 2.1MHU
2.2	Dual focus: small 0.6mm, large 1.0mm
2.3	Small focus power: 43KW
2.4	Big focus power: 80KW
2.5	Anode maximum dissipation: 4.5kW
2.6	Tube cooling method: Air, Water, Oil
2.7	Anode rotate speed 9000r/min
2.8	Anode target material: Molybdenum rhenium
2.9	Target angle:11°
2.10	Inherent filter: 1.1mmAl 75KV
2.11	Advanced WAD multiple cooling technology
2.12	Liquid metal bearing technology
2.13	Grid control technology
3	**Dynamic digital flat panel detector**
3.1	Material: A-Si Cesium Iodide
3.2	Nominal area: 30cm × 30cm
3.3	A/D range: 16bit
3.4	Spatial frequency: 2.58LP/mm
3.5	Pixel pitch: 194μm
3.6	Visual filed:3
3.7	DQE: 77%
3.8	The collimator and flat panel detector synchronic servo to ensure the clinic imaging is always upright.
3.9	Flat panel detector rotation: ±90°
3.10	Digital imaging acquisition matrix: 1536×1536
3.11	Maximum acquisition rate:30fps
4	**Automatic collimator**
4.1	The automatic insertion technology is adopted to eliminate the soft rays of the tube without manual intervention.
4.2	Automatic switching filter: Air, 0.1mmCu, 1mmAl□ 0.2mmCu, 2mmAl
4.3	Electric lung field iris
4.4	Automatic X-ray field adjustment
5	**Gantry system**
5.1	The latest 7-axis gantry design covers small area, projects different surgical spot of patient easily and fully meet the installation requirements of compound intervention operating room.

5.2	There are more than 600 gantry preset position, the gantry could be move to emergency position or surgical "Park" position rapidly, and the gantry and table will be separated completely, which is easy to have rescue, specific treatment or surgical operation.
5.3	C-arm control system
5.3.1	The handle can be operated with one hand easily to realize the sliding, rotating and combined movement of the C-arm gantry
5.3.2	Easy to operate and learn
5.3.3	One-key emergency stop
5.4	Gantry movement
5.4.1	R-axis rotation range: 300°
5.4.2	P-axis rotation range : 316°
5.4.3	O-axis rotation range: 256°
5.4.4	A-axis: CRA/CAU105°
5.4.5	RAO120°
5.4.6	LAO180°
5.4.7	Vertical movement range: 220cm
5.4.8	C-arm rotation speed (rotational acquision) 70 degree/second
5.4.9	Vertical movement speed (Along the direction of the catheterization table movement): 10cm/s
5.4.10	Collimator and flat panel detector have automatic two-way tracking function.
5.4.11	Regardless of the projection angle of the C-arm gantry and the examination table, the flat panel detector always remains stationary relative to the examination table, and the real-time image is always upright and upward without deflection.
5.4.12	There is no dead angle in vessels examination, C-arm could rotates to any angle to project
5.4.13	Digital display C-arm rotation angle information
5.5	C-arm size
5.5.1	C-arm inner diameter : 179cm, outer diameter : 199cm
5.5.2	C-arm opening : 91cm
5.5.3	Distance from isocentric to ground: 107cm
5.6	Variable SID: 90□120cm
5.7	Movement safety
5.7.1	Anti-collision device on tube
5.7.2	Automatic laser positioning function
6	**Omnidirectional floating catheterization table**
6.1	Meet requirements of systemic examination & treatment; meet the requirements of interventional and hybrid surgery

6.2	Catheterization table specification
6.2.1	Full carbon fiber floating table surface
6.2.2	Length: 300cm (Exclude the length of extension board)
6.2.3	Width: 63.5cm
6.2.4	Maximum load-bearing : 450kg (250Kg+100KgCPR+100Kg accessories)
6.3	Catheterization table movement range
6.3.1	Vertical movement range: 140cm
6.3.2	Lateral movement range: 36cm
6.3.3	The lowest height: 72cm
6.3.4	Table surface rotation: 360° (±180°)
6.4	Table-side control system
6.4.1	Omnidirectional motion control of the table
6.4.2	Dust-proof & waterproof
6.4.3	Equip with touch screen in control module which is easy for doctor to operate
6.4.4	The LCD touch control screen can be placed beside the catheterization table to meet the needs of different clinical operation
6.4.5	Exposure parameter setting, high-pressure syringe parameter setting, rotation acquisition, stepping acquisition setting, subtraction function setting, and roadmap function setting control
6.4.6	The LCD touch control screen can be used for various clinical application parameter settings, and the number of settings up to 600 kinds.
6.5	Catheterization table accessory
6.5.1	Arm bracket
6.5.2	Mattress
6.5.3	Infusion support
6.5.4	Floor-standing protective shield
7	**Image acquisition & processing system**
7.1	Software function
7.1.1	Image acquisition
7.1.1.1	Acquisition mode □ CINE, DSA, rotating DSA/rotating acquisition, DA acquisition, Fluoroscopy, lower limb stepping DSA acquisition
7.1.1.2	CINE: maximum acquisition speed: 30 FPS; 1.5K matrix acquisition
7.1.1.3	Standard DSA model: maximum acquisition speed: 30 FPS; 1.5K matrix acquisition, real-time DSA.

7.1.1.4	Digital pulse has 6 kind different rate: 1,2,4,8,15,30 FPS
7.1.1.5	Subtraction & non-subtraction switching
7.1.2	Imaging processing
7.1.2.1	Dynamic image optimization and noise reduction
7.1.2.2	Adaptive edge enhancement
7.1.2.3	Window width/window level adjustment, sharpness adjustment, Gamma adjustment
7.1.2.4	Last image hold
7.1.2.5	Image display function: acquisition time, date display, image freezing, grayscale inversion, image annotation, left/right identification, text annotation, anatomical background
7.1.2.6	Subtraction post-processing function: configurable mask, subtraction degree adjustment, pixel shift etc.
7.1.2.7	Post-processing function: Automatic image window width/ position adjustment, additional annotations, image selection, zoom, image roaming, road sign image selection, electronic shutter, edge enhancement, image inversion, image rotation and mirroring functions, etc.
7.1.2.8	Image mosaic
7.1.2.9	Roadmap
7.1.2.9.1	The road navigation function can be used for cardiac intervention, which can superimpose the road map from any frame of the recorded acquisition sequence on the real-time image
7.1.2.9.2	Any subtraction image in the DSA acquisition sequence can be used as a road map
7.1.2.9.3	Roadmap overlay function
7.1.2.9.4	Radio contrast agent peak value automatic hold
7.1.3	Low-dose platform
7.1.3.1	Low-dose image acquisition
7.1.3.2	The position of the shading plate and filter can be adjusted without radiation on the last frame of the fluoroscopic image
7.1.3.3	Radiation dose monitoring function: surface dose rate during fluoroscopy; accumulated dose display.
7.1.3.4	Automatically non-ray patient projection field of vision change prompt
7.1.3.5	Automatic position matching function, the gantry automatically returns to the best position of the selected reference screen image
7.1.3.6	The X-ray penetrability of the part to be projected is automatically calculated from the anatomical thickness and density information. ABS calculates KV & mA according to different image effect.
7.1.4	Workstation hardware configuration
		Host memory: 8GB
		Host hard disk: 1TB

7.1.4.1	1*PC	CPU: E5
		1* 21.5' medical color LCD monitor, maximum brightness: 250 cd/m2, resolution: 1920×1080; 1* 19' grayscale medical LCD monitor, maximum brightness: 700 cd/m2, resolution: 1280×1080(above control room); 1* 58' color medical monitor(operation room)
7.1.4.2	With virtual collimator	
8	**Image post-processing system□ option□**	
8.1	Software function	
8.1.1	3D acquisition & reconstruction	
8.1.2	Cerebrovascular 3D DSA	
8.1.3	CT-like reconstruction	
8.1.4	3D image rendering	
8.1.5	Vascular tissues fluoroscopy function	
8.1.6	QCA	
8.1.7	3D QCA	
8.1.8	XA-M intervention: The workstation can simultaneously receive, display, and process international standard images of CT, MR, US and other types of equipment, as well as calibration, measurement and image processing of related image.	
8.1.9	left ventricular ejection analysis, vascular stenosis analysis, provide parameters of cardiac output, ejection fraction, wall motion analysis and vascular stenosis analysis.	
8.2	Post-processing workstation hardware configuration	
8.2.1	1*PC	Operational system: 64 bit□ WINDOWS10
		CPU: 6 core 3.2G
		Memory : 8G
		Display: 24' color LCD monitor
		Hard disk capacity: 1TB
9	**Interface**	
9.1	High Pressure Syringe interface	
9.2	Standard video output interface supports video broadcast and can be used for conferences, teaching, image browsing in waiting area for family members, etc.	
10	**Image storage and playback**	
10.1	Host hard disk images can be stored on CD/DVD, the storage capacity can reach: 1024×1024 matrix, 16bit, 1,000,000 images	
10.2	Manual playback frame by frame, loop playback, the playback rate: 1-60fps adjustable	

10.3	Acquisition sequence automatic playback
10.4	The speed and direction of the playback sequence are adjustable
10.5	Fluoroscopy image storage function: the maximum continuous storage time of one-way fluoroscopy image is 20S
11	**DICOM**
11.1	With DICOM connectivity detection function
11.2	With DICOM function to get patient information list
11.3	DICOM storage function
11.4	DICOM dose report function
11.5	DICOM print function
11.6	DOCOM CD/DVD burn function
11.7	DICOM USB export function
Others	
1	System can be upgraded
2	Intercom system
3	English operation interface
4	English user manual