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Title

S22 Technical Specifications

Specifications for S22 Digital Color Doppler Ultrasound System

SonoScape

THE PIONEER OF DOPPLER ULTRASOUND IN CHINA

Product Overview

1. General Specification

S22 digital color Doppler ultrasound system adopts the advanced ultrasonic Doppler technologies, including the Full Digital Super-wide Band Beam Former, Digital Dynamic Focusing, Variable Aperture and Dynamic Tracing, Wide Band Dynamic Range, Multi-beam Processing, etc. The ultrasound diagnostic software in ergonomic design can be customized and easily performed by users.

Based on the computer technology and Linux operating system, this ultrasound system is reliable and stable. System maintenance and upgrade can be completed by updating software to achieve product improvements and advanced technology.

Complied with the international standards and regulations, this ultrasound system is safe and effective.

2. Advanced Technologies

- Digital front-end technology
- Multi-beam forming technology
- Compound imaging
- μ-scan image processing
- Tissue harmonic imaging
- High pulse repetition frequency
- Panoramic imaging
- Contrast imaging
- Elastic imaging
- Phase-inversion harmonic imaging
- 4D imaging
- Exam-type icons
- Touch screen

3. Standard Configurations

- B mode
- Color mode
- PW mode
- CW mode
- THI mode
- TDI mode
- DPI mode
- DDPI mode
- 3D imaging
- Cardiology measurement package
- Gynecology measurement package
- Urology measurement package
- Vascular measurement package
- Small parts measurement package
- Orthopedic measurement package
- IMT measurement
- Myocardial performance index
- Spectral Doppler auto trace
- Color flow calculation
- MLA transducer
- Phased array transducer
- Multi-beam
- μ-scan
- Tissue characteristic index
- 5-band adjustable frequency in B mode
- High pulse repetition frequency
- Triplex imaging
- Panoramic imaging
- Compound imaging
- Trapezoidal imaging
- DVD RW

- ECG Module
- Steer M
- Color M
- Image rotation

4. Optional Functions

- 4D Imaging
- Panoramic imaging
- Contrast imaging
- Elastic imaging
- Phase-inversion harmonic imaging
- TEE Transducer
- DICOM Transmission
- Storage committee
- DICOM Worklist
- MPPS

5. Optional Accessories

- Biopsy guide brackets
- Color ink jet printer
- B/W video printer
- Color video printer
- Transducer cable hanger
- Batteries
- Remote control
- Barcode scanner

6. Probe Scan Ranges

- Curved transducer: ≥70°
- Phased array transducer: ≥90°
- Micro-Curved transducer: ≥193°

7. Scan Methods

- Electronic curved array
- Electronic linear array
- Electronic phased array

8. Applications

- Abdomen
- Vascular
- Cardiology
- Gyn/OB
- Urology
- Musculo-skeletal
- Invasive
- Small Parts
- Anesthesia
- Trans-cranial
- Pediatric

9. Imaging Modes

- B mode
- M mode
- THI mode
- Color mode
- DPI mode
- TDI mode
- PW mode
- CW mode
- 3D/4D imaging
- Color M
- Steer M

10. Display Formats

- B
- 2B
- 4B
- B+PW
- B+CW
- B+M
- B+Color
- Real-time Dual (B/Color)
- B+Color+PW
- B+Color+CW
- B+Color M
- Panoramic imaging
- Trapezoidal imaging

11. System Configuration Menu

- Exam History
  - New Exam
  - Pause/Continue
  - Review
    - Select All
    - Store to DICOM
    - Store to USB
    - Delete
    - Print
    - Report
    - Exit
  - Delete
  - Store
  - DICOM Print
  - Commit
  - Exit
- System Info
  - Control Number
  - Software Version
- System Settings
  - General Settings
    - Facility Name
    - Set Date/time
    - Language
      - English
      - Simplified Chinese
      - Russian
      - Spanish
      - French
      - German
    - Screen Saver
    - Trackball Sensitive
    - Caps Lock
    - Print Size
    - Clip Format
      - MP4, AVI
    - Still Format
      - JPG, BMP, TIFF
    - Screen Save: adjustable
    - Color of ROI
      - Green, Yellow
      - Orange, Cyan
    - Display Format: H1/2, H1/4, V1/3, V1/2, V2/3, O1/4
    - One Key Save: On/Off
    - EFW Unit: selectable
    - Date Format
      - mm /dd/yyyy

- yyyy/mm/dd
- dd/mm/yyyy

➢ Report Format
- PDF, TEXT

➢ Save Frame Number: adjustable

➢ Monitor Type: TV-NTSC, TV-PAL, VGA, DVI

■ Set Printer

➢ Printer Driver

➢ Video Invert

➢ Insert Driver

■ Set Calculation Menu

➢ 2D Mode
- Angle
- Volume
- Volume L×W×H
- Doppler Area
- Color Flow
- IMT
- Vascular
- Small Part
- Orthopedic
- Gyn/OB
- Left Ventricle
- Urologic
- Mitral Valve Diameter
- Lv Outflow Diameter
- Pul.Valve Diameter
- Aorta Diameter

➢ PW Mode
- Flow Velocity
- Acceleration
- Time
- Heart Rate
- Cardiac
- Gyn/OB
- Vascular

➢ M Mode
- Distance
- Time
- Slope
- Heart Rate
- Left Ventricle
- Mitral Valve
- Aortic Valve

■ Set Measurement Method

➢ BSA setting
- Eastern
- Western

➢ Area Measure Method
- Ellipse
- Trace

➢ Package
- All Packages

➢ Continue Dist: On/Off

➢ Dop Auto
- AUTO
- SEMI-AUTO

➢ Focal Auto: On/Off

➢ EFW Method
- WEI/SAB HC, AC, FL
- Shepard AC, BPD
- Hadlock1 AC, FL
- Hansman AC, FL, HC

- Tokyo BPD, APTD, TTD, FL
- Hadlock2 HC, AC, FL
- Hadlock3 BPD, AC, FL
- Hadlock4 HC, AC
- Hadlock5 BPD, HC, AC, FL
- Shinozuka BPD, AC, FL
- Warsof FL,AC
- Campbell AC
- Mediscan FL, AC
- Mediscan BPD, AC

➢ BPD Method

- Hadlock
- Jeanty
- Crespigeny
- Kurtz
- Hansmann
- Sabbagha
- Campbell
- Tokyo
- Merz
- Osaka

➢ FL Method

- Hadlock
- Hohler
- Jeanty
- Hansmann
- Tokyo
- Merz
- Chitty
- Osaka
- Campbell

➢ CRL Method

- Robinson
- Hadlock
- Nelson
- Jeanty
- Hansmann
- Mediscan
- Tokyo
- Osaka

➢ AC Method

- Hadlock
- Hansmann
- Tokyo
- Merz
- Campbell

➢ TAD Method

- Hansmann

➢ OFD Method

- Hansmann

➢ HC Method

- Hadlock
- Jeanty
- Chitty (M)
- Chitty (D)
- Merz
- Campbell

➢ GS Method

- Nyberg
- Hansmann
- Hellman
- Tokyo
- China

➢ Fibula Method

- Merz
- Radius Method
  - Merz
  - Mediscan
- Humerus Method
  - Jeanty
  - Merz
  - Osaka
- Ulna Method
  - Jeanty
  - Merz
  - Mediscan
- Tibia Method
  - Jeanty
  - Merz
- AUA Result by
  - Average
  - Last
- User defined OB Method
  - Replace
  - Save
  - Cancel

■ Annotation Edit
- Insert
- Delete
- Edit
- Save

■ Define Quick Key (0-9)
- OB measurement
- Cardiac measurement

■ Load Default
- Load
- Create
- Retrieve
  - Copy user setting to USB
  - Copy user preset to USB
  - Load USB user setting to system
  - Load USB user preset to system

■ DICOM Settings
- Local
- Store
- Worklist
- Print
- MPPS
- Commit

12. System Parameters

- Frame rate: max. 1066fps
- Grayscale level: 256
- Transducer elements: 128/256

13. B Mode

- Gain: 1-255
- Scan depth: 32.9cm
- Zoom: 0.8-10x
- Time Gain Control: 8 slider controls
- Image orientation: left/right, up/down
- Panoramic imaging
- Compound imaging: adjustable
- Focal zones: max. 12 focal span and depth adjustable
- Frequency: 5 bands

- Chroma: 13 types
- Adaptive image fusion: 16 types
- μ-Scan: adjustable
- Line density: low/medium/high
- Persistence: 0-95
- Biopsy guide function: On/Off
  - Biopsy lines angle adjustable
  - Biopsy lines offset adjustable
- Dynamic Range: 20-280 (may vary with transducer type)
- Grayscale curve: 7
- Sector width/position: adjustable
- Power: 1%-100%. min. step size: 1%
- Tissue acoustic characteristics: 1400-1700
- Trapezoidal imaging: On/Off (for linear array transducer)
- Sector angle (for linear array transducer)

14. Color Doppler

- Gain: 0-255
- Frame rate: 50fps
- Sample box location and size adjustment
- Focal zone auto-adjustment with scan depth
- Image orientation: left/right, up/down
- Flow Invert: On/Off
- Frequency: 5 bands
- Wall filter: 25-750
- PRF:0.5-12kHz (vary with transducer)
- Line density: low/medium/high/max-high
- Color/Direction energy: 11 types
- Color baseline adjustment: ±15 levels
- Persistence: 0-80 (vary with transducer)
- B Reject: 0-255
- Steer (for linear transducer only): 0, ±16, ±20
- Color Flow: available in the frozen mode

15. M Mode

- Steer M: max. 3 lines
- Video invert: On/Off
- Chroma: 5 types
- Display Format: H1/2, H1/4, V1/3, V1/2, V2/3, O1/4
- Sweep speed: 6 levels
- M process: switch between average and peak values
- Power: 30-100

16. Spectral Doppler

- Doppler methods
  - PW (pulsed wave) Doppler
  - CW (continuous wave) Doppler
- 2D Refresh: On/Off
- Sample volume and position for PW Doppler: 0.75-20.5mm adjustable
- Video invert: On/Off
- Spectrum invert
- θ angle correction: On/Off (correction range: 0°-72°)
- Spectral real-time trace
- Baseline: 17 levels
- Frequency: 5 bands

- Wall filter: 25-750
- PRF: 1~16kHz (PW)
- PRF: 1~48kHz (CW)
- Speed Range
  - 0.0012-16.9 m/s (PW)
  - 0.0013-65.0 m/s (CW)
- Sweep speed: 2, 4, 6, 8 s/frame
- Chroma: 5 types
- One-key auto optimization
  - Auto adjusting baseline
  - Auto adjusting PRF
  - Auto correcting angle
- Dynamic Range: 10 levels
- Display Format: H1/2, H1/4, V1/3, V1/2, V2/3, O1/4
- Steer angle: 0,±16, ±20

17. 3D Imaging

- Display Mode:
  - Dual Planes
  - Quad Planes
  - 3D Full Display
- Crop: in/out/off
- ROI show: on/off
- Clip Plane: On/Off
- Adjust Slice
- X Rotation
- Y Rotation
- Z Rotation
- Horizontal Movement: Left/Right
- Vertical Movement: Up/Down
- Trace Cut: off/in/out
- Undo Cut
- Opacity Threshold: 0-255
- Render Mode: Vol, MaxIP, X ray
- Auto Rotate: 45°, 90°,180°, 270°, 360°
- Zoom In/Out
- Sweep Mode: linear, Sector
- Z Scale: 01.-3.0
- Z Axis Angle: 10°-170°
- Color Map: 0-6
- Multi-Slice: Ref A, Ref B, Ref C
- Slice Spacing: 0.5-2.0
- Storage: 3D Image/Volume Storage
- Measurement: Distance, Area, Ellipse
- Print

18. 4D Imaging

- Display Mode:
  - Dual Planes
  - Quad Planes
  - 3D Full Display
  - 2D Full Display
- Cutting Line Curvature and position: adjustable
- Copy Frame Size and Position: adjustable
- Scan Angle: 20°-75°
- Image Quality: Low/Medium/High
- Stability: On/Off
- Rescan: On/Off
- Crop: in/out/off
- ROI show: on/off
- Crop: on/off
- Clip Plane: On/Off

- Adjust Slice
- X Rotation
- Y Rotation
- Z Rotation
- Horizontal Movement: Left/Right
- Vertical Movement: Up/Down
- Zoom In/Out
- Opacity Threshold: 0-255
- Crop: off/in/out
- Undo Cut
- Volume review: 0-31
- Auto Rotate: 45°, 90°,180°, 270°, 360°
- Color Map: 0-6
- Volume playback: 0-5
- Multi-Slice: Ref A, Ref B, Ref C
- Slice spacing: 0.5-2.0, adjustable
- Storage: 3D Image/Cine/Volume Storage
- Print

19. Physiological Signal Display

- ECG Pulse wave
- ECG three-lead system
- ECG Gain: adjustable
- ECG Position: adjustable
- ECG Invert: On/Off
- R-Trigger: On/Off
  - Trigger Delay: adjustable
  - Frame Count: adjustable

20. Integrated Data Management System

- Digital Channel: 1024
- Hard Disk Memory Capacity: More than 320G
- USB Interface: 4

21. Image Storage and Playback

- Cine playback: up to 500 frames in B mode
- Cine playback time: ≥50s
- Static and Dynamic image storage
- Freely view stored data on PC
- Clipboard function
- Doppler cine playback: speed is adjustable, sound can be played back

22. DICOM Communication

- Storage: freely transmits images with patient information to a DICOM server
- Storage Commitment: confirm the data completeness by requesting the server
- Worklist: acquire patient information from the server
- MPPS: Send patient exam status to the server
- Print: freely print by using a DICOM compatible printer
- Medical digital images and communication DICOM 3.0 interface

23. Preset Function

For different transducers and exam types, you can customize the presets, optimize imaging parameters and adjust imaging modes.

24. Patient Data Management

- Patient information: name, ID, gender, date of birth, height, weight, LMP, EDD and GA.
- Patient data, report, images can be stored, reviewed and printed

25. Annotation and Bodymark

- Bodymark icons: ≥52
- Annotation can be selected from the preset library
- Customizable annotation: up to 20

26. Physical Specification

- L×W×H(mm): 726×559×1389
- Weight: approx. 65kg

27. Transducer connector

- general transducer connectors: 4 identical connectors
- Pencil transducer connector: 1

28. Monitor

- 18.5-inch widescreen and high-resolution color LCD monitor, anti-flickering and vertically and horizontally rotatable
- Contrast and brightness: 0-100

29. Safety Standards

- Complies with IEC60601-1, Class I, Type BF Applied Parts

30. Environmental Requirement

- For operating
  - Temperature: 0 ℃ -40 ℃ (except VC6-2)
  - Relative humidity: 30%-85% (no condensation)
  - Pressure: 700hPa-1060hPa
- For storage and transport
  - Temperature: -20℃-55℃
  - Relative humidity: 20%-90% (no condensation)
  - Pressure: 700hPa-1060hPa
- Power supply requirement
  - 100/220 Volts AC, 5.0Amps
  - 50/60Hz

31. Optional transducers

- Phased array transducers

  2P1 （1.0-6.0 MHz）

  5P1 （3.0-9.0 MHz）
- Linear transducers

  L741 （4.0-16.0 MHz）

  L742 （4.0-16.0 MHz）

  10L1 （4.0-16.0 MHz）

  10I2 （4.0-16.0 MHz）

  L752 （4.0-16.0 MHz）
- Curved transducers

  C344 （2.0-6.8 MHz）

  C354 （2.0-6.8 MHz）

C353 （2.0-6.8 MHz）

C322 （2.0-6.8 MHz）

C542 （4.0-7.0 MHz）

- Micro-Curved transducers

  6V1 （3.0-15.0 MHz）

  6V1A （3.0-15.0 MHz）

  6V3 （3.0-15.0 MHz）

  C611 （4.0-13.0 MHz）

  C613 （4.0-13.0MHz）

  EC9-5 （5.0-9.0 MHz）

- Volume transducers

  VC6-2 （2.0-6.8 MHz）

- Biplane transducers

  BCL10-5 （5.0-10.0 MHz）

  BCC9-5 （5.0-9.0 MHz）

- Other transducers

  MPTEE

  MPTEE mini

  CWD2.0

  CWD5.0

  PWD2.0

  LAP7

32. Measurement and Calculations

- Basic Measurements and Calculations (applicable on real time and frozen images)
  - B Mode
    - Distance (real time/freeze)
    - Angle
    - Volume (L×W×H, Ellipse Area × L)
    - Area and circumference (Trace, Ellipse methods) (real time/freeze)
    - Area ratio
  - M Mode
    - Distance
    - Speed
    - Time
    - Heart rate
    - Slope
  - Spectral Doppler
    - Time
    - Heart rate
    - Flow velocity
    - Velocity ratio
    - Acceleration
    - Resistivity index
    - Pulsatility index
    - Peak velocity
    - Pressure gradient
    - Manual trace
    - Semi-auto trace
    - Auto-trace
    - Velocity-time integration
    - Average pressure
    - End diastole velocity
    - Peak systolic velocity
    - Pressure half-time
    - Average flow velocity
    - Proximal isovelocity surface area
  - Color Doppler
    - Color flow velocity

- Doppler area
- Proximal isovelocity surface area

■ 4D Mode

- Distance
- Area and circumference
- Volume

● Gyn/OB Measurements and Calculations

■ B Mode

- GS
- CRL
- BPD
- HC
- AC
- FL
- CER
- OFD
- Fibula
- Foot
- AA
- APAD
- HA
- Humerus
- Kidney
- APTD
- OOD
- Radius
- TAD
- TC
- THD
- Tibia
- TTD
- Ulna
- Umb VD
- NT
- LV
- UT L
- UT H
- UT W
- Cx
- En-T
- Rt OV L
- Rt OV H
- Rt OV W
- Lt OV L
- Lt OV H
- Lt OV W
- AFI
- Follicle
- EFA
- EDD
- EFW
- AUA
- GA

■ PW Mode

- Umb A
- MCA
- Rt Uterine A
- Lt Uterine A
- Fetal AO

● Cardiology Measurements and Calculations

■ B Mode

- Left ventricle measurement
  - Single ellipse method

- End diastole left ventricle long-axis area
- End diastole left ventricle long-axis length
- End systole left ventricle long-axis area
- End systole left ventricle long-axis length

- Biplane ellipse method
  - End diastole left ventricle long-axis area
  - End systole left ventricle long-axis area
  - End diastole left ventricle short-axis area at the level of mitral valve
  - End systole left ventricle short-axis area at the level of mitral valve
  - End diastole left ventricle short-axis length
  - End systole left ventricle short-axis length
- Bullet method
  - End diastole left ventricle short-axis area at the level of mitral valve
  - End systole left ventricle short-axis area at the level of mitral valve
  - End diastole left ventricle long-axis length
  - End systole left ventricle long-axis length
- Simpson
  - End diastole left ventricle short-axis area at the level of mitral valve
  - End systole left ventricle short-axis area at the level of mitral valve
  - End diastole left ventricle short-axis area at the level of papillary muscles
  - End systole left ventricle short-axis area at the level of papillary muscles
  - End diastole left ventricle long-axis length
  - End systole left ventricle long-axis length
- Cube
  - End diastole inter ventricular septum dimension
  - End diastole left ventricle short-axis length
  - End diastole left ventricular posterior wall dimension
  - End systole inter ventricular septum dimension
  - End systole left ventricle short-axis length
  - End systole left ventricle posterior wall dimension
- Teichholz
  - End diastole left ventricle short-axis length
  - End systole left ventricle short-axis length
- Gibson

- End diastole left ventricle short-axis length
- End systole left ventricle short-axis length

- Biplane Disk
  - Diastole 2CH
  - Diastole 4CH
  - Systole 2CH
  - Systole 4CH

- Mitral valve diameter
- Left ventricle out flow tract diameter
- Pulmonary valve diameter
- Aorta valve diameter

- M Mode
  - Left ventricle
    - Cube
      - End diastole left ventricle short-axis length
      - End systole left ventricle short-axis length
      - End diastole left ventricular posterior wall dimension
      - End systole left ventricle posterior wall dimension
    - Gibson
      - End diastole left ventricle short-axis length
      - End systole left ventricle short-axis length
    - Teichholz
      - End diastole left ventricle short-axis length
      - End systole left ventricle short-axis length
  - Mitral valve measurement
  - Aortic valve measurement
- PW Mode
  - Mitral valve measurement
  - Aortic valve measurement
  - Tricuspid valve measurement
  - Pulmonary valve measurement
  - TEI Index Measurement

- Vascular Measurements and Calculations
  - ICA
  - ECA
  - CCA
  - INT IL
  - EXT IL
  - ILIAC
  - CFA
  - PROFUN
  - LT CIR
  - SFA
  - POP
  - PTA
  - PERON
  - ATA
  - DR PED
  - %A REDUC
  - %D REDUC
  - PI
  - RI
  - VTI
  - S/D

- Pg
- PV
- IMT
- Flow Vol

- Urology Measurements and Calculations
  - Left kidney
  - Right kidney
  - Left renal cortex
  - Right renal cortex
  - Left adrenal gland
  - Right adrenal gland
  - Bladder volume
  - Residue urine
    - Bladder area
    - Bladder height
  - Prostate whole volume
  - Left seminal vesicle
  - Right seminal vesicle
  - Left testicle
  - Right testicle
  - Prostate transition zone volume
- Small Parts Measurements and Calculations
  - Left thyroid
  - Right thyroid
  - Thyroid isthmus
  - Left upper parathyroid gland
  - Left lower parathyroid gland
  - Right upper parathyroid gland
  - Right lower parathyroid gland
- Orthopedic Measurements and Calculations
  - HIP
- Measurement and Calculation Report
  - Gyn/OB report (editable)
    - Obstetrical Curve: 4 planes
    - Fetal Anatomy
    - Fetal Biophysical Evaluation
    - Fetal Compare (Quadruplets)
    - Image Insertion: 6 planes
    - Comment
  - Cardiac function report (editable)
  - Vascular report
  - Urology report
  - Small Part report
  - IMT report

NOTE:

- The specifications of this system may change without any prior notification.
- Some products or features may not be available in some countries.
- Please contact your local SonoScape sales representative for more information.

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