Specifications for S20 High-Performance Color System

THE PIONEER OF COLOR DOPPLER ULTRASOUND IN CHINA

Product Overview
### General Specification

The high performances of the SonoScape S20 stem from the advanced ultrasound Doppler imaging technologies that include full digital beam-former, wide dynamic range, multi-beam processing, Modularized touchscreen human-machine interaction system etc.

The ergonomic user-friendly design enables user to customize the system according to the specific application needs, and the graphic exam icon assure you familiar with the system in few minutes.

### Advanced Technologies

- Digital Front-End
- Dual-Beam Processing
- Compound Imaging
- Micro Scan Processing
- Harmonic Imaging
- High Pulse Repetition Frequency
- Panoramic Imaging
- 4D Imaging
- Graphic Exam Icon
- Modularized touchscreen human-machine interaction technology

### System Overview

**Applications**

- Abdominal

### Scanning Methods

- Electronic Convex Sector
- Electronic Linear
- Electronic Phased Array Sector

### Sweep Angle

- Curved Probe: 70 degree or more
- Phased Array Probe: 90 degree or more
- Micro-curved Probe: 193 degree or more

### Transducer Types

- Convex Array
- Micro convex Array
- Linear Array
- Phase Array

### Operating Modes

- B-Mode
- M-Mode
- TDI-Mode
Specifications for S20 High-Performance Color System

- Color Flow Mode (CFM)
- Power Doppler Imaging (PDI)
- Pulse Wave Doppler (PWD)
- Continuous Wave Doppler (CWD)
- 3D/4D Imaging
- Color M Mode
- Steer M-Mode

Display Modes
- Gray-scale imaging
- Color: Color Doppler, Power Flow and Directional Power Flow Imaging, TDI
- THI (Tissue Harmonic Image)
- Dual B, Quad Display
- B and M, display format selectable
- B and Doppler
- B+Color
- Dual B (Flow)
- Triplex mode: B, Flow, and PW/CW Doppler
- B, Flow, and Color M
- Simultaneous Refresh Display
- Variable screen size: Change the screen ratio of 2D and Doppler/M in duplex or triplex mode
- Panoramic Imaging
- Compound Imaging
- Trapezoidal Imaging

Standard Features
- Frame Rate: 750 frames/sec or more
- Display Gray Scale: 256 levels
- Digital Channel Number: 1024
- Probe Elements: Up to 256

Media & Peripherals
- Color Desk Jet Printer (optional)
- B/W Video Printer (optional)
- Color Video Printer (optional)

System Menu Setting
- File Manager
  → Copy, Paste, Delete
  → Convert PC
  → Report Only
  → Image Only
  → Search
  → Select All
  → Send DICOM
  → DICOM Print
- Set Time/Date
- Facility Name
- Dicom
- System Information
  → Control Number
  → Software Version
- System Setting
  → General Setting
  → Language Setting
  - English
Specifications for S20 High-Performance Color System

- Screen Saver
- Trackball Sensitive
- Clip Format
  - CIN
  - WMV
  - AVI
- Date Format
  - mm/dd/yyyy
  - yyyy/mm/dd
  - dd/mm/yyyy
- Caps Lock: on/off
- Print Size
- Still Format
  - PPM
  - JPG
  - BMP
  - TIF
- 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: kg,g、lb,oz
- Print to DICOM
  - Set Printer
- Printer Driver

- Video Invert
- Insert Driver
  - Set Calculation Menu

- 2D Mode
  - Angle
  - Volume
  - Volume L×W×H
  - Doppler Area
  - Vascular
  - Small Part
  - Obstetrical/ Gynecological
  - Left Ventricle
  - Urologic
  - Mitral Valve Diam
  - Lv Outflow Diam
  - Pul. Valve Diam

- PW Mode
  - Flow Velocity
  - Acceleration
  - Time
  - Heart Rate
  - Cardiac
  - Obstetrical/ Gynecological
  - Vascular

- M Mode
  - Distance
  - Time
  - Slope
  - Heart Rate
  - Left Ventricle
Specifications for S20 High-Performance Color System

- Mitral Valve
- Aortic Valve

→ Set Measurement Method
- BSA setting
  - Eastern
  - Western
- Measure Method
  - Ellipse
  - Trace
- Package
  - All Package
  - Icon Driven
- 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
  - 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
Specifications for S20 High-Performance Color System

- 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
- Ulina Method
  - Jeanty
  - Merz
  - Mediscan
- Tibia Method
  - Jeanty
  - Merz
- AUA Result by
  - Average
  - Last
- Edit or Create user define table
  - Replace
  - Save
  - Cancel
- Annotation Edit
- Insert
- Delete
- Edit
- Save
- Define quick key
  - Allow all OB measurement in Quick
  - Key in user defined
- Load Default
  - Load
  - Create
  - Retrieve
  - Copy user setting to USB
Specifications for S20 High-Performance Color System

- Copy user preset to USB
- Load USB user setting to system
- Load USB user preset to system

**Copy user preset to USB**

**Post-Processing**
- RAW data digital processing
- Read Zoom up to 10x

**B Mode**
- GSC
- Chroma
- LT→RT
- Play/Stop
- Loop Speed
- Start
- End
- Frame By Frame

**Color Flow Mode**
- C Map
- B Reject
- Finv: Flow Invert
- Loop Speed
- Start
- End
- Play/Stop
- Frame By Frame

**PW/CW Mode**
- Chroma
- Video Invert
- Display Format
- Start

**M-Mode**
- Chroma
- Video Invert
- Display Format
- Start
- End
- Frame By Frame

**Scanning Parameters**

**B-Mode**
- Gain: 1-255 adjustable
- Depth: 32.9 cm Max (probe dependent)
- Zoom: Max. ≥ 10, Show zoom X value
- TGC (Time Gain Control) 8 slide controls
- Left and Right Inversion
- Up and Down Inversion
- 2B mode
- 4B mode
- Compound Image: ON/OFF
- Focus: Up to 12, focus span adjustable
- Frequency: 5 steps
- Chroma: Max. 13 selectable
- Adapt. IM Fusion: 15 kinds
- U-Scan: adjustable
- Line Density: 3 selections (high/med/low)
- Persist (Frame correlation): 0-95 (probe dependent)
Specifications for S20 High-Performance Color System

- Biopsy Guide: on/off
  - Biopsy Offset adjustable
  - Biopsy Angle adjustable
- Dynamic range-compression selections: 20-280 (probe dependent)
- GSC(gray scale curve) 7 steps selectable
- SEC.WIDTH: B Image width adjustable
- SEC.POS: B image lateral position adjustable
- Power%: 1 to 100 changeable
- Tissue acoustic: Adjustable according to tissue type (1400-1700, 10 steps each)
- Trapezoid Image: ON/OFF (liner array probe)
- B Steer Mode

**Color Flow Mode/TDI Mode**

- Gain: 0-255 adjustable
- Frame Rate: ≥50 frames/sec
- Color Area Size and Position: adjustable
- Single auto focus while color ROI movement
- Left / right: ON/OFF
- Up / Down: ON/OFF
- Zoom function
- 2B mode
- 4B mode
- B and B(Flow) Simultaneous Real-time Display
- Finv: Flow Invert (ON/OFF)
- Frequency Range: 5 steps

- Filter: Up to 750 Hz (exam dependent)
- Pulse Repetition Frequency: 0.5-12KHZ
- Line Density: 2 kinds (low and high)
- Color Map: 11 kinds (probe dependent)
- Baseline: ±15 steps
- Persist: 0-80(probe dependent)
- B Reject: 0-255
- Steer Angle: 5 kinds (linear probe)
  - Max. ±20 degrees,
  - 0, ±16, ±20 changeable
- Imaging Area and Position (adjustable)

**M-Mode**

- Steer M: 3 lines, Display Frame Rate,
  - Allow Steer M to store in user define preset
- Video Invert: ON/OFF
- Up and Down Inversion
- M Process: Switch average or peak detection processing for the M vector display.
  - sweep speed: 2, 4, 6, 8 sec/plane
- Chroma: 5 kinds selectable
- Display format: H1/2, H1/4, V1/3, V1/2, V2/3, O1/4
- Power% : 30 to 100 changeable

**Spectral Doppler**

- Doppler methods
  - PW (pulsed wave) Doppler
- CW Doppler
- 2D Refresh: on/off
- Sample Volume Size for PW Doppler:
  1 -20 mm, changeable in 1 mm step, display Doppler Sample Volume Size.
- Video Invert: on/off
- 2B Mode
- Finv: Spectrum Inversion
- Angle: 0-80 degrees
- Angle Correction: on /off
- Auto Trace function in Real time
- BaseLine Shift: Available up to 17 steps
- Frequency : 5 steps
- WF: 25-750
- High Pulse Repetition Frequency
  PW: 1-20KHz (exam dependent)
  CW: 1-48KHz
- Max velocity range:
  0.0004-40.9 m/s (pw)
  0.0013-49.1 m/s (cw)
- Sweep Speed: 2, 4, 6, 8sec/plane
- Power% : 30 to 100 changeable
- Chroma: Max.5 Kinds adjustable
- Dynamic Range: 10 steps selectable
- Display format: H1/2, H1/4, V1/3, V1/2, V2/3, O1/4
- Steer Angle: 5 kinds (linear probe)
  Max. ±20 degrees,
  0, ±16, ±20 changeable

3D/4D Mode
- 3 arbitrary sections simultaneously
- Display mode
  - Dual Display
  - Quad Display
  - Full Display 2D
  - Full Display 3D
  - Full Display 4D
- Clip Plane: on/off
- Undo Cut
- Rotate X
- Rotate Y
- Rotate Z
- Move L-R
- Move U-D
- Zoom
- Trace Cut: on/off
- Render Mode: Vol, MaxIP, X-ray
- Auto Rotate (45, 90, 180, 270, 360 degrees adjustable)
- Opacity Offset: 0-255 adjustable
- Opacity Slope: 0-255 adjustable
- Scan Method: Lin, Sec
- Z Scale: adjustable
- Z Angle: 10-170° adjustable
- Color Map: 4 kinds
- Multi-slice: Ref A, Ref B, Ref B
- Slice Spacing: 0.5-2.0 adjustable
- Clip Plane:
- Cine Review: on/off
Specifications for S20 High-Performance Color System

- Rescan: on/off
- Stabilization
- Sweep Angle: 20-75 degrees
- Image Quality: high, med, low
- Volume Review
- 4D Gain: adjustable
- Frame Rate: 5 frames/sec or more
- Print
  - full scan of the Region of interest
- Save images

**Integrated Data Management System**
- Hard Disk memory capacity: 320 G
- Storage media: USB Drive

**Storage of Images and Cine**
- Cine loop: 10000 frames or more
- Cine loop time: 60 seconds or more
- Real time single/dual static and dynamic Image storage
- Archived image can be viewed on PC
- Cropboard function: in Freeze Mode
- Cine play back mode for Dop.
- Doppler Cine Sound Play Back Function

**DICOM Network Communication**
- Conformity to DICOM Standard: Service class user of storage, (for details, please refer to the DICOM conformance statement issued by SonoScape.)
- Storage: Directly transmits image with patient information to a DICOM file server

**Physiological Signal Display**
- ECG, Pulse wave
- ECG Lead-three lead system
- ECG Gain: adjustable
- ECG Position: adjustable
- ECG Invert: on/off
- R-Trigger: on/off
  - Trigger Delay: adjustable
  - Frame Count: adjustable

**User Interface**

**Operator Keyboard**
- Shortcuts Keyboard
- Integrated Recording Keys for Remote Control of Peripheral Devices and DICOM Devices
- 8 TGC Pods
- Integrated function key

**Character and icon**
- Character Input Area: ID, Name, DOB, Sex, Weight, Height, LMP etc
- Body Mark: 52 kinds

**Electrical Power**
- Voltage: 100/220 Volts AC
- Current: 3.15 Amps
Specifications for S20 High-Performance Color System

- Frequency: 50/60 Hz

Environmental Requirements

In operation
- Temperature: +10 to +40 degrees C
- Relative Humidity: 30% to 75% (non condensing)
- Atmospheric pressure: 700 to 1060 hPa

In Storage/Transportation
- Temperature: -20 to +55 degrees C
- Relative humidity: 20%- 90% (non condensing)
- Atmospheric Pressure: 700 to 1060hPa

Probe Connectors
- Active Connectors: 3 connectors

Optional Probe
- Phased Array Probe (Cardiology)
  → 2P1 (1.9-6 MHZ)
  → 5P1 (4.2-11 MHZ)
- Linear Probe (Vascular, Small Part)
  → L741 (5-16 MHZ)
  → L742 (7-15 MHZ)
  → L743 (7-16 MHZ)
  → L752 (4.5-15 MHZ)
  → 10L1 (4.5-15 MHZ)
  → L541 (3.7-9 MHZ)
- Curved Probe (Abdomen, OB/GYN)
  → C344 (2-7 MHZ)

  → C362 (2-6 MHZ)
  → C542 (3.7-11 MHZ)
- Micro-curved Probe (Transvaginal)
  → 6V1 (3.9-15 MHZ)
  → 6V3 (3.9-15 MHZ)
- Micro-curved Probe (Cardiology)
  → C311 (2-6 MHZ)
  → C611 (4-13 MHZ)
- 4D Probe
  → VC6-2 (2-7 MHZ)
- Linear, Surgical (Surgery)
  → 10I2 (4.5-15 MHZ)

Measurements/Calculations

- General Measurements/Calculations

  On B-Mode
  → Distance (real time, freeze)
  → Area and circumference (Trace, Ellipse)
  (real time, freeze)
  → Volume (L×W×H, Area×L)
  → Angle

  On M-Mode
  → Velocity
  → Distance
  → Time
  → Heart rate
  → Slope

  On Spectral Doppler
  → Time Interval
  → Velocity
Specifications for S20 High-Performance Color System

→ Velocity Ratio
→ Velocity Time Integral
→ Heart Rate
→ Velocity
→ Acceleration
→ Resistance Index
→ Pulsatility Index
→ Pressure half time
→ PV(peak Velocity)
→ Mean Flow Velocity
→ End diastolic Velocity
→ PG((Pressure gradient)
→ Auto Trace
→ Manual trace

**On Color Mode**
→ Color Flow Velocity
→ Doppler Area
→ proximal Isovelocity surface area

**On 4D-Mode**
→ Distance
→ Area and circumference
→ Volume

**Obstetrical/ Gynecological Measurements & Calculations**

**B Mode**
→ GS (Gestational Sac diameter)
→ CRL (Crown Rump Length)
→ BPD (Biparietal Diameter)
→ HC (Head Circumference)
→ AC (Abdominal Circumference)
→ FL (Femur Length)
→ CER (Cerebellum)
→ OFD (Occipitofrontal Diameter)
→ Fibula (Fibula Length)
→ Foot (Foot Length)
→ AA (Abdominal Area)
→ APAD (Anteroposterior Abdominal Diameter)
→ HA (Head Area)
→ Humerus (Humerus Length)
→ Kidney (Kidney Length)
→ APTD (Anteroposterior Trunk Diameter)
→ OOD (Outer Orbital Diameter)
→ Radius (Radius Length)
→ TAD (Transverse Abdominal Diameter)
→ TC (Thoracic Circumference)
→ THD (Thoracic Diameter)
→ Tibia (Tibia Length)
→ TTD (Transverse Trunk Diameter)
→ Ulna (Ulna Length)
→ Umb VD (Umbilical Vein Diameter)
→ NT (Nuchal Translucency)
→ LV (Lateral Ventricle)
→ UT L (Uterus Length)
→ UT H (Uterus Height)
→ UT W (Uterus Width)
→ Cx (Cervix)
→ En-T (Endometriosis)
→ Rt OV L (Right Ovary Length)
→ Rt OV H (Right Ovary Height)
→ Rt OV W (Right Ovary Width)
→ Lt OV L (Left Ovary Length)
→ Lt OV H (Left Ovary Height)
→ Lt OV W (Left Ovary Width)
→ AFI (Amniotic Fluid Index)
→ Dominant Follicle
→ EFA (Estimated Fetal Age)
→ EDD (Estimated Date of Delivery)
→ EFW (Estimated Fetal Weight)
→ AUA (Average Ultrasound Age)
→ Fetal HR (Fetal Heart Rate)

**PW Mode**
→ Umb A (Umbilical Artery)
→ MCA (Middle Cerebral Artery)
→ Rt Uterin A (Right Uterine Artery)
→ Lt Uterin A (Left Uterine Artery)
→ Fetal AO (Fetal Aorta)

**Cardiac measurements**

**B-Mode**
→ Left Ventricular Function Measurement
  * Single Plane Ellipse Method
    ➢ LVALd: Left Ventricular Long-axis Area at end Diastole
    ➢ LVLd: Left Ventricular Long-axis Length at end Diastole
    ➢ LVALs: Left Ventricular Long-axis Area at end Systole
    ➢ LVLs: Left Ventricular Long-axis Length at end Systole
  * Biplane Ellipse Method
    ➢ LVAMd: Left ventricular short-axis area at end diastole
    ➢ LVIDd: Left ventricular short-axis diameter at end diastole
    ➢ LVAMs: Left ventricular short-axis area at end systole
    ➢ LVIDs: Left ventricular short-axis diameter at end systole
  * Bullet
    ➢ LVAMd: Left ventricular short-axis area at end diastole
    ➢ LVAMs: Left ventricular short-axis area at end systole
    ➢ LVLD: Left ventricular long-axis length at end diastole
    ➢ LVLs: Left ventricular long-axis length at end systole
  * Simpson Method
    ➢ LVAMd: Left ventricular short-axis area at end diastole
    ➢ LVAMs: Left ventricular short-axis area at end systole
    ➢ LVAPd: Left ventricular short-axis area at the level of the
Specifications for S20 High-Performance Color System

- **Gibson**
  - LVLDd: Left ventricular short-axis diameter at end diastole
  - LVIDs: Left ventricular short-axis diameter at end systole

- **Biplane Disk**
  - Diastole 2CH
  - Diastole 4CH
  - Systole 2CH
  - Systole 2CH
  - → Mitral Valve Diam
  - → LVA Outflow Diam
  - → Pul. Valve Diam

**M-Mode**

- → Left Ventricular Fuction Measurement

- **Cube**
  - LVIDd: Left ventricular short-axis diameter at end diastole
  - LVLDd: Left ventricular short-axis diameter at end diastole
  - IVSTd: Interventricular septal thickness at end diastole
  - IVLTs: Interventricular septal thickness at end systole
  - LVIDs: Left ventricular short-axis diameter at end systole
  - LVPWd: Left ventricular posterior wall thickness at end diastole
  - LVPWs: Left ventricular posterior wall thickness at end systole

- **Teichholz**
  - LVLDd: Left ventricular short-axis diameter at end diastole
  - LVIDs: Left ventricular short-axis diameter at end systole

- **Gibson**
  - LVLDd: Left ventricular short-axis diameter at end diastole
  - LVIDs: Left ventricular short-axis diameter at end systole
### Specifications for S20 High-Performance Color System

<table>
<thead>
<tr>
<th>Diameter at End Systole</th>
<th>Teichholz</th>
</tr>
</thead>
<tbody>
<tr>
<td>LVLDd: Left ventricular short-axis diameter at end diastole</td>
<td></td>
</tr>
<tr>
<td>LVIDs: Left ventricular short-axis diameter at end systole</td>
<td></td>
</tr>
</tbody>
</table>

- Mitral Valve Measurement
- Aortic Valve Measurement

**PW-Mode**
- Mitral Valve Measurement
- Aortic Valve Measurement
- Tricuspid Valve Measurement
- Pulmonary Valve Measurement
- TEI Index Doppler Measurement

**Vascular Measurements Calculations**
- ICA (Internal Carotid Artery)
- ECA (External Carotid Artery)
- CCA (Common Carotid Artery)
- INT IL (Internal iliac)
- EXT IL (External iliac)
- ILIAC (Common iliac)
- CFA (Common Femoral Artery)
- PROFUN (Profunda)
- LT CIR (Lateral Circumflex)
- SFA (Superficial Femoral Artery)
- POP (Popliteal Artery)
- PTA (Posterior Tibial Artery)
- PERON (Personal Artery)
- ATA (Anterior Tibial Artery)
- DR PED (Dorsalis Pedis)
- %A REDUC (Area reduction percent)
- %D REDUC (Diameter reduction percent)
- PI (Pulsatility Index)
- RI (Resistive Index)
- S/D (Systolic/Diastolic Ratio)
- PG (Pressure gradient)
- PV (peak Velocity)
- IMT

**Urological Measurements Calculations**
- Left Kidney
- Right Kidney
- Left-Renal Cortex
- Right-Renal Cortex
- Left-Adrenal Gland
- Right-Adrenal Gland
- Bladder Volume
- Residual Urine
  - Urine Area
  - Urine Height
- Whole Prostate Volume
- Trans Zone Volume
- Left-Seminal Vesicles
- Right-Seminal Vesicles
- Right-Testicle
- Left-Testicle

**Small Part Measurements**
Specifications for S20 High-Performance Color System

→L-Thyroid
→R-Thyroid
→Thyroid Isthmus
→L-Superior Parathyroid
→L-Inferior Parathyroid
→R-Superior Parathyroid
→R-Inferior Parathyroid

- Orthopaedic Measurements
  →HIP (Hip Joint)

- Report functions
  →Obstetrical /Gynecological report
    (revisability)
    • Obstetrical Curve
    • Fetal Anatomy
    • Biophysical Profile
    • Fetal Compare (quadruplets)
    • Picture
    • Comment
  →Cardiac function report (revisability)
  →Vascular report
  →Urological report
  →Small Part report
  →IMT report
Specifications for S20 High-Performance Color System

- The specifications are subject to change without notice.
- Not all the products are available in all countries.
- Please contact your local Sonoscape representative.

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