Voluson™ S8 with Touch Panel

A HEALTHIER FUTURE FOR WOMEN

Product description

The Voluson S8 with Touch Panel is designed to help streamline imaging procedures - from the intuitive user interface to the built-in automation and advanced software tools, helping you make the most of every day and every exam.

Highlights

- Lightweight and maneuverable
- High resolution LCD LED display 23 inches
- 4 active probe ports
- Automatic optimization
- Auto TGC
- 3D multiplanar display
- Realtime 4D
- SonoRenderlive
- HD*live*™
- Advanced VCI
- TUI (Tomographic Ultrasound Imaging)
- SonoBiometry
- HD-Flow™
- SonoAVC™
- Sono L&D
- SonoVCAD™*heart*
- SonoNT™
- SonoIT
- Wide sector (max angle)
- B-Flow™
- Battery pack
- Report editor
- On board archive including preview and pre-selection
- Probe favorites
- Sleep mode-fast wake
- 3D print file export
- Advanced security package

General Specifications

Dimensions and weight	
Height – adjustable	• Min : 1310 mm (51.6 in) • Max : 1730 mm (68.1 in)
Width	620 mm (24.4 in)
Depth	865 mm (34.1 in)
Weight	• No peripherals: 198 lbs/90kg • Maximum: 267 lbs/121 kg

Power supply	
Voltage	100 – 120, 220 – 240 VAC
Frequency	50/60 Hz (±2%)
Sleep mode (low power state) – wake and scan in 15 seconds	

Console design	
4 active imaging probe ports	
Integrated HDD	500 GB
Operating system: Windows® 10 IoT enterprise 64 bit	
Integrated DVD+R(W)/CD-R(W) drive	
On-board storage for peripherals	
Front and rear handles	

User Interface

Operator keyboard
Back-lit alphanumeric keyboard and trackball
Ergonomic hard key layout
Interactive back-lighting
6 programmable print/store/export keys for printing, archiving and exporting
Adjustable user interface: • Rotation: ± 30° from center • Height: 740 mm (29.1 in) – 1010 mm (39.8 in)

Touch screen
10.1 in high resolution color LCD screen
Multi touch interactive dynamic software menu
Brightness adjustable

Monitor
23" high resolution LCD LED display with DVI interface
Resolution: Full HD 1920 x 1080 pixel

Monitor *(cont.)*
Image size: 1136 x 786
Fully Articulating Monitor Arm • Tilt angle: +30°/-90° • Rotate: +90°/-90° • Horizontal range of motion: >250 mm (9.8 in) • Vertical range of motion: >100 mm (3.9 in)
Digital back-light and color temperature adjustment. Ten default settings available: • Warm: Extra Dark, Dark, Semi Dark, Light, Extra Light • Cold: Extra Dark, Dark, Semi Dark, Light, Extra Light

System Overview

Exam types
Obstetrics
Gynecology
Abdominal
Small Parts
Breast
Vascular
Pediatrics
Cardiology
Transrectal
Cephalic
Musculoskeletal (MSK)

Operating modes
Brightness Mode (B-Mode) (2D)
Motion Mode – M-Mode (conventional M-Mode)
Pulsed wave Doppler (PW) with HPRF
Color Flow Doppler Mode (CFM)
Power Doppler Mode (PD)
High Definition Power Doppler (HD-Flow)
Tissue Doppler mode (TD)
B-Flow (BF)
Combination modes: M/CF, M/HD-Flow, M/TD
Extended View (XTD View)
Volume Mode (3D/4D): • 3D Static • 4D Real Time • VCI-A • VCI-OmniView • 4D Biopsy

System Overview *(cont.)*

Scanning methods

- Electronic Convex
- Electronic Linear
- Electronic Sector
- Mechanical Volume Sweep

Transducer types

- Convex Array
- Microconvex Array
- Linear Array
- Sector Array
- Active Matrix Linear Array (1.5D)
- Volume probes 4D
  - Convex Array
  - Microconvex Array

User management and logging functionality

- Multiple users with individual log on credentials
- Different and adjustable access levels
- LDAP Interface
- Audit trail and usage log

Privacy and security functionality

- Hard disk AES Encryption with 256 bit length
- Whitelisting
- Encrypted DICOM® Communication Capability (TLS)
- Encryption and Data Anonymization Export Capability
- All ports, services and shared resources that are not required for the intended use are disabled
- Operating System Access disabled

System standard features

- Innovative user interface with high resolution 10.1 in LCD touch panel
- B-Mode
- M-Mode
- PW-Doppler
- CFM (Color Flow Doppler Mode)
- HD-Flow & Power Doppler Mode
- Tissue Doppler

System standard features *(cont.)*

- Coded Harmonic Imaging with Pulse Inversion Technology
- Automatic Tissue Optimization
- Auto TGC
- Coded Excitation (CE)
- Focus and Frequency Composite (FFC)
- Advanced Speckle Reduction Imaging (SRI II)
- CrossXBeam$^{CRI™}$ (Compound Resolution Imaging)
- SonoBiometry:
  - Biparetal Diameter (BPD)
  - Head Circumference (HC)
  - Humerus Length (HL)
  - Abdominal Circumference (AC)
  - Femur Length (FL)
- SonoNT
- SonoIT
- High Resolution Zoom (HD Zoom)
- Pan Zoom
- Steering
- Virtual Convex
- Wide Sector (Max Angle)
- Beta-View
- Patient information database
- Image Archive on hard drive
- 3D/4D data compression (lossy/lossless)
- Real-time automatic Doppler calculations
- Measurement and calculations including worksheets/report for:
  - OB
  - Cardio
  - Transrectal
  - Cephalic
  - GYN
  - Musculoskeletal (MSK)
  - Abdominal
  - Vascular
  - Small Parts
  - Pediatrics
- Multigestational Calculations
- Report Editor
- DICOM 3.0 Connectivity
- Integrated uplink for Cloud-based data storage (Tricefy™)
- Integrated Video Converter (S-Video & Composite BNC)
- 3D/4D activation
  - Static 3D
  - 4D Realtime
  - SonoRender*live*
- HD*live*
- SonoVCAD*heart*

System Overview *(cont.)*

System standard features *(cont.)*

XTD

TUI

4th Probe port activation

3D Print File Export

GYN IOTA LR2 and simple rules model

Advanced security features

Peripheral options

Integrated printers:
- B&W thermal printer
- Color thermal printer

External color desktop printer with network printing capabilities & connection kits

Barcode scanner

Foot switch, with programmable functionality

Battery pack

Isolated gigabit ethernet connection

Isolated USB connection

Power filter

Isolation transformer

External patient monitor set

WLAN adapter

System options

Advanced VCI with Omniview

VOCAL II

SonoAVC
- SonAVC*follicle*
- SonoAVC*antral*

Sono L&D

Inversion

4D Biopsy

B-Flow

Integrated software DVR
- Digital recording
- One drive for data export and recording
- DVD Formats: DVD+R, -R, +RW, -RW for recording, DVD and CD support for data export
- USB support: FAT32 compatibility

System options *(cont.)*

Scan Assistant
- Includes measurements, annotations and fetal anatomy and gynecology worksheet entries
- Performs predefined mode changes, preset selection and screen layout changes
- Supports display of user selected reference images
- Standardize image sequence upon DICOM transfer

Display modes

Simultaneous capability in combination with SRI and/or CRI:
- B+PW
- B+M
- B+3D, B+4D
- B+SRI
- B+CRI/3D+CRI
- B+CRI+SRI/3D+CRI+SRI
- B+CRI/4D+CRI
- B+CRI
- B/B+SRI
- B/CFM+CRI
- B/CFM+CRI+SRI
- B/PD+SRI
- B/HD-Flow+CRI
- B/HD-Flow+CRI+SRI
- HD-Flow+CRI+SRI
- B+CFM, B+PD, B+TD, B+HD-Flow
- B+CRI
- B+CRI+SRI
- B+SRI/3D+SRI
- B+CRI+SRI/4D+CRI+SRI
- B+SRI/4D+SRI
- B/B+CRI
- B/B+SRI+CRI
- B/CFM+SRI
- B/PD+CRI
- B/PD+CRI+SRI
- B/HD-Flow+SRI
- BF+SRI

Real-time Triplex Mode:
- B/CFM/PW
- B/PD/PW
- B/HD-Flow/PW

Selectable alternating modes:
- B+PW
- B/PD+PW
- B/HD-Flow+PW
- B/CFM+PW
- B+CFM or PD or HD-Flow

Multi-image (split, quad):
- Live and/or frozen
- Split: B+B, B/CFM+B/CFM or B/PD+B/PD or B/TD+B/TD or B/HD-Flow + B/HD-Flow or BF+BF
- Split simultaneous: B+B/CFM or B+B/PD or B+B/HD-Flow
- Split: B+PW or M
- Split: Frame Review/XTD-View
- Quad: B+B+B+B or BF, B/CFM+B/CFM+B/CFM+B/CFM or B/PD or B/TD or B/HD-Flow
- Independent Cine playback
- Quad: A+B+C+3D or 4D
- TUI: 1x1, 1x2, 2x2, 3x2, 3x3, 3x4, 4x4
- Segmentation: quad (A/B/C/Segm. Object), single (Segm. Object)
- Split: TUI Overview+1 slice

Zoom Read/Write (with or without overview image)

Image Size:
- Standard format
- XL format

System Overview *(cont.)*

Display modes *(cont.)*

Colorized image:
- Colorized B
- Colorized M
- Colorized PW
- Colorized 3D

Time line display:
- Independent Dual B/PW Display
- Display Formats
- Top/Bottom selectable format (Size: 1/2:1/2; 1/3:2/3; 2/3:1/3)

Display annotation

Patient name:
- Last: Max 62 characters
- First: Max 62 characters
- Middle: Max 62 characters

ID: Max 32 characters

Secondary patient ID (citizen service number)

Accession #: Max 16 characters

Hospital name: Max 30 characters

Sonographer

Gestational age (OB) or LMP (GYN)

Birth date

Date: Three types selectable:
- MM/DD/YYYY
- DD/MM/YYYY
- YYYY/MM/DD

Time display selectable: 12/24 hours

Probe name

Application name

Gray scale bar

Depth scale

Focal zone marker

Frame rate

Zoom start/depth

B-Mode:
- User Preset
- Gain
- Gray Map
- Persistence
- Probe Orientation
- Receiver Frequency
- Dynamic Control
- Edge Enhance
- SRI, CRI

M-Mode:
- Gain
- Edge Enhance
- M-Cursor
- Dynamic control
- Reject
- Time Scale

Display annotation *(cont.)*

Doppler Mode:
- Acoustic Power
- Angle
- Wall Motion Filter
- Doppler Frequency
- Spectrum Inversion
- PRF
- Gain
- Sample Volume Depth and Width
- Velocity or Frequency Scale
- Time Scale
- HPRF

Color Flow Imaging modes (CFM, PD, TD, HD-Flow):
- Acoustic Power
- Color Balance
- Quality
- PRF
- Color Scale: kHz, cm/s, m/s
- Color Velocity Range
- Spectrum Inversion
- Color Gain
- Color Balance Marker
- Wall Motion Filter
- Color Map
- Power and Symmetrical Velocity Imaging

3D/4D Mode:
- 3D/4D Sub Program
- Quality
- Mix
- Compression
- Orientation Markers
- TUI: slice position in overview image
- Threshold
- Volume Box Angle
- Acquisition Mode
- VCI: slice thickness
- TUI: slice distance (0.5 – 10 mm)
- SonoVCAD*heart*

TGC curve

Cine frame number

Recorder status

Body pattern: 117 types organized in 10 anatomical groups

Measurement results

Displayed acoustic output:
- TIS: Thermal Index Soft Tissue
- TIC: Thermal Index Cranial (Bone)
- TIB: Thermal Index Bone
- MI: Mechanical Index

Predefined biopsy guide line

Trackball function (trackball and trackball buttons)

Zoom overview image (zoom box position)

GE logo

System Parameters

System setup

User Programmable Preset Capability, User program etc.

Languages: English, French, German, Spanish, Italian, Danish, Dutch, Finnish, Norwegian, Swedish, Russian, Japanese, Simplified Chinese

Keyboard Languages (Keycap Kits): English

System Parameters *(cont.)*

System setup *(cont.)*

EUM Languages: English, German, Spanish, Italian, French, Russian

Free programmable Scan Assistant lists including Add, Delete, Edit and Reorder of checklist items

Up to 800 programmable annotations organized in 10 anatomical groups

Six programmable Px buttons (single press) for documentation preferences like Save, DICOM Send, Print, Check, Cine length, jpeg, etc.

Four programmable Px buttons (press and hold) for probe favorites – immediate access to frequently used probes, applications, and modes

Several user configurable functions:
- Clinic name
- Trackball speed
- Zoom overview window
- Dim function
- Patient info display
- Title bar settings
- Display (TGC curve, Screen Lock, Screensaver, Auto Scan Stop, Beeper, 3D/4D Screen Controls)
- Start Exam and End Exam configuration

Measure setup

M&A setup including Add, Delete, Edit and Reorder of measure items

Application setup including several parameters of Measurement, Doppler Trace and Calculation presets

Global setup including several parameters of Measurement, Cursor and Result window presets

Magnifier available to help place precise measurements

Post assign measurements

Biopsy setup

User programmable needle guidelines

Pre-processing

Write zoom up to 8x

B/M-Mode:
- Gain
- Dynamic Range
- Transmission Focus Position
- Transmission Frequency
- Line Density Control
- Sweep Speed
- TGC
- Acoustic Output
- Transmission Focus Number
- Persistence Control
- Reject
- M-Cursor position

Pre-processing *(cont.)*

PW-Mode:
- Gain
- Acoustic Output
- PRF
- Sample Volume Gate
- Velocity Scale
- Dynamic Range
- Transmission Frequency
- Wall Motion Filter
- Length, Depth, Pos
- Sweep Speed

Color Flow Imaging Modes (CFM, PD, TD, HD-Flow)
- Gain
- PRF
- Line density
- Dynamic
- Frequency
- Line Filter
- Artifact Suppression
- Acoustic Output
- Wall Motion Filter
- Ensemble
- Smooth (Rise and Fall)
- Balance
- Quality

Post-processing

Read Zoom: 0.8x – 3.4x Zoom (with HD-Zoom functionality up to 22x Zoom)

B-Mode:
- 2D Gain
- Gray Map
- Colorized B
- Dynamic Contrast
- Edge Enhance
- Advanced SRI (SRI II)

M-Mode:
- Gray Map
- Display Format
- Colorized M
- Sweep Speed
- Edge Enhance

PW-Mode:
- Gray Map
- Colorized D
- Invert
- Baseline Shift
- Scale (kHz, m/s, cm/s)
- Angle Correction
- Trace
- Sweep Speed

Color Flow Imaging Modes (CFM, PD, TD, HD-Flow):
- Display Threshold
- Color Map
- Scale (CFM and HD-Flow)
- Display Mode (V, V-T, T, P, PT) (CFM only)
- Baseline

B-Flow
- Gray map
- Advanced SRI (SRI II)
- Colorized B-Flow
- Dynamic Contrast

Image processing and presentation

Digital Beamformer

1,714,833 system processing channel technology

Minimum Depth of Field: 1 cm (Zoom, probe dependent)

Maximum Depth of Field: 42 cm (probe dependent)

Transmission Focus: 1-5 Focus Points selectable (probe and application dependent)

Focal Zone position, up to 10 steps

System Parameters *(cont.)*

Image processing and presentation *(cont.)*

Continuous Dynamic Receive Focus/Continuous Dynamic Receive Aperture

256 shades of gray

16.8 million colors 24 bit

Up to 265 dB Dynamic Range

Image reverse: Right/Left

Rotation: 0°, 180°

2D Cine features

Cine features:
- Dual/Quad image CINE Display
- CINE Gauge and CINE image number display
- CINE Review Loop
- Selectable CINE Sequence for CINE Review (by Start Frame and End Frame)
- Side Change in dual CINE Mode
- Measurements/Calculations & Annotations on CINE

Length:
- 512 MB: up to 10 min and 13,200 frames (depending on B-image size & FPS); typical: about 3 min/4000 images (with curved array: 15 cm depth, angle 81°, 22 FPS)
- M-Mode: 32 MB: up to 1 min motion time (depending on sweep and depth)
- PW-Mode: 32 MB: up to 1 min motion time (depending on sweep speed)

Cine operation:
- Manual: image by image
- Auto run: speed: 25 to 200% of real-time rate, play repeat mode: forward-forward, forward-backward-forward

Image/volume storage (archive)

Standard and fully anonymized archive available

Image to data stored as:
- Raw Data file (proprietary format)
- DICOM file (Single-or Multi-Frame)

Volume file stored as:
- Raw Data file (proprietary format)
- DICOM file
- Size: typically: 0.8 – 5 MB (depending on probe and adjusted volume size)

Compression:
- 2D: JPEG, Lossless, high, mid low
- 3D/4D: Lossy and lossless compression available. Typical compression rates are 50% with lossless compression, 15% with lossy compression but maximum quality and 5% with lossy compression and reduced quality (approximate values)

Image/volume storage (archive) *(cont.)*

Review of current Exam and archived data sets (Single Images and Cine Clips). View format: Raw data, DICOM data. Display Formats: 1x1, 2x2, 3x3

Reload of current/archived data sets: 2D Raw Data (incl. Color Doppler, Spectral Doppler and M-mode). 3D Raw Data (single Volume incl. Calc. Cines). 4D Raw Data (Volume Cine)

Export as:
- Bitmap files: BMP, TIFF, JPEG;
- Raw files: RAW (2D), VOL (Volume data), 4DV (RAW, VOL incl. Patient data)
- Video File Format: AVI, MP4
- DICOM Files: DCM, DICOM Files with DICOMDIR
- 3D Raw Date: conversion to Cartesian format possible
- Surface Formats: STL, OBJ, PLY, 3MF, XYZ (with projected and full 3D export capabilities)

AVI Codec: MS Video 1, Full Frames

Export to: DVD+R(W), CD-R(W), Network, USB devices, email

Export Anonymous function: available for following image types: AVI, BMP, TIFF, JPEG, MP4

Backup function to: DVD+R(W)/CD-R(W), Network, USB devices

Repro function: Settings recall (e.g. Geometry, Gain, Color Map, etc.) from a stored or reloaded picture

Exam History: direct access to images from previous exams; direct access to Measure Reports images from previous exams; Image compare window on screen to compare images from previous exams with current exam image

Hard Drive Data Storage size: about 450 GB

Connectivity

Ethernet network connection

WLAN network connection

USB for USB devices

DICOM support:
- Verify
- Store
- Structured Reporting
- MPPS (Modality performed procedure step)
- Query/Retrieve
- TLS
- Print
- Modality Worklist
- Storage Commitment
- Media Exchange
- Off network/mobile storage queue

Scanning Parameters

B-Mode	
B acoustic power	1 – 100%
Scan angle	5° increments (probe dependent)
Frequency range	1 to 18 MHz depending on the probe, adjustable in 3 fundamental steps (penetration, normal, resolution) and up to 4 Harmonic steps (penetration, low, mid, high)
Frame rate	>1200 fps (depending on probe and application)
Gain range	+15 to -20 dB
Gray scale values	8 bit
SRI	5 steps: 1 – 5
CRI	8 steps: 1 – 8
CRI filter	4 steps: off, low, mid, high
CE	On/off (probe dependent)
FFC	On/off (probe dependent)
Persistence filter	8 steps: (pre)
Line filter	3 steps: (pre) off, low (12.5/75/12.5%), high (25/50/25%)
Line density	3 steps: (pre) low, norm, high
Reject	51 steps: (pre) from 0 to 225
Enhance	6 steps: (pre) 0, 1, 2, 3, 4, 5
Gray maps	18 basic maps + 3 user defined
Tint maps	10
Dynamic	12 different dynamic curves C1 – C12
Display modes	B, XTD

Screen formats
- 2D Imaging: Single (B), Dual (B+B), Quad (B+B+B+B)
- XTD View: Single (XTD), Dual (B+XTD)

M-Mode	
Working modes	M (conventional M-Mode)
Frequency range	1 – 18 MHz (depending on the probe, 3 steps high, mid, low)
M acoustic power	1 – 100%
M gain	+15 to -25 dB range, 1 dB steps

M sweep speeds:
- 900/450/300/225/150/100 pixels/sec;
- 26.44/13.22/8.81/6.61/4.40/2.94 cm/s in relation to system monitor

M-Mode *(cont.)*	
Review (memory times)	>60 s (32 MB)

Signal processing M:
- Dynamic range: 1 to 12
- Enhance: 0 to 5
- Tint maps: 10
- Reject: 0 to 255
- Gray maps: 18

Display modes:
- M: 2D+M, 2D+M/CFM, 2D+M/HD-Flow, 2D+M/PD, 2D+M/TD

Screen formats (window arrangement):
- 2D+M: up/down (horizontal): three different sub formats 40/60, 50/50, 60/40% left/right (vertical): 50/50%

M-Color flow mode	
Acoustic MCFM power	1 – 100%
Frequency range	1 – 18 Mhz (depending on the probe, 3 steps: high, mid, low)
MCFM color maps	8 maps
CFM gain	±15 dB range, 0.1 dB steps
CFM velocity scale range	PRF: 100 Hz to 18 kHz
Wall motion filter	8 – 3000 Hz
Ensemble (color shots per line)	8 – 16, step size 1
Gentle color filter	
Smooth filter:	Rise: 12 steps, Fall: 12 steps
CFM spectrum inversion	
CFM baseline shift	17 steps
Pre-settable and independently adjustable B-, M- and MCFM gain	
CFM threshold	1 – 255 steps
Balance	25 – 225, step size 5
Artifact suppression	On/off

Color display mode:
- V (Velocity)
- V-P (Velocity + Power)
- P-T (Power + Turbulence)
- V-T (Velocity + Turbulence)
- T (Turbulence)

Real-time triplex mode: B + M + MCFM in any depth

Scanning Parameters *(cont.)*

Spectral Doppler mode (PW)

Operating modes: PW (Pulsed Wave Doppler, single gate)	
Transmit frequencies: PW-Doppler: 1.75...18 MHz	
Pulse Repetition Frequency (PRF): PW-Doppler: 0.9...22.0 kHz	
Sample volume (Doppler gate): • Length: 0.7, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15 mm • Position: 5 mm to B-scan end • Angle correction: -85°... 0°... +85°	
Power control range	1 – 100%
GAIN range: PW +15 to -25 dB	
WMF (Wall Motion Filter): PW: 30...500 Hz	
Baseline shift: ±PRF/2, ±8 steps	
Spectrum Analyzer	FFT (Fast Fourier Transformation), max. 256 channels, 256 amplitude levels
PW sweep speeds: • Simplex (26, 44/13.22/8.81/6.61/4.40/2.94 cm/s) • Duplex/Triplex (8.81/6.61/4.40/2.94 cm/s)	
Review (memory times)	>60 s (32 MB)
Measurable flow velocities: PW: 1 cm/s – 8 m/s (a = 0°, 2.0 MHz, max. zero shift) 1 cm/s – 16 m/s (a = 60°, 2.0 MHz, max. zero shift)	
Signal processing: • Dynamic range: 15 steps: (10 to 40) • Gray maps: 18 basic curves • Tint maps: 11	
Scale display: • Vertical: kHz, cm/s, m/s (selectable) • Horizontal: 1 s marker (big), ½ s marker (small)	
Screen formats: 2D/D: up/down (horizontal): three different sub formats 40/60, 50/50, 60/40% left/right (vertical): 50/50%	
Display formats: 2D/D (duplex update); 2D+CFM/D, 2D+HD-Flow/D, 2D+PD/D, (triplex update, PW). 2D+CFM/PW, 2D+PD/PW, 2D+HD-Flow/PW, (triplex simultaneous, PW only)	
Audio-modes	Stereo (both directions separately in both channels)
Audio volume	Adjustable, control digipots

Color Doppler mode

Screen formats	2D+CFM (single, dual, quad)
Frequency range	1 – 16 Mhz (depending on the probe, 3 steps: high, mid, low)
Display modes: • Simultaneous dual mode: 2D/2D+CFM • Triplex mode: 2D+CFM/PW, 2D/M+MCFM • Volume Mode: 3D+CFM	

Color Doppler mode *(cont.)*

Color coding
- Steps: 65536 color steps
- Display modes: V-T (Velocity + Turbulence), V (Velocity), V-P (Velocity + Power), T (Turbulence), P-T (Power + Turbulence)

Depth range	• Axial: 0 to B scan range • Lateral: 0 to B scan range
Baseline shift	17 steps (independent from spectral Doppler)
Inversion of color direction	Yes
Wall motion filter	8 steps: low1, low2, mid1, mid2, high1, high2, max1, max2
Smoothing filter	12 steps rise time, 12 steps fall time
Gain control	+15 dB to -15 dB, 0.2 dB step
Line density (color line density)	10 steps
Ensemble (color shots per line):	CFM: 7 to 31, MCFM: 8 to 16
Flow resolution	4 steps: low, mid1, mid2, high
Pulse repetition frequency:	CFM: 100 Hz to 20.5 kHz, MCFM: 100 Hz to 20.5 kHz
Color map	8 different color codes for each probe
Balance	From 25 to 225
Max. meas. velocity	4.23 m/sec
Min. meas. velocity	0.3 cm/sec
Scale	kHz, cm/s, m/s
Automatic moving tissue suppression	Yes
Max. Color Doppler frame rate	>450 frames/sec

Power Doppler mode (PD)

Screen formats	2D+PD (single, dual, quad)
Frequency range	1 – 16 Mhz (depending on the probe, 3 steps: high, mid, low)
Display modes: • Simultaneous dual mode: 2D/2D+PD • Triplex mode: 2D+PD/PW • Volume mode: 3D+PD	
PD coding	256 color steps
PD window size	Lateral: max. to min. B-Mode scan angle. Axial: B-scan range

Scanning Parameters *(cont.)*

Power Doppler mode (PD) *(cont.)*	
Display mode	P (Power)
Wall motion filter	8 steps: low1, low2, mid1, mid2, high1, high2, max1, max2
Smoothing filter	Rising edge: 12 steps, Falling edge: 12 steps
Gain control	+15 dB to -15 dB, 0.2 dB steps
PD ensemble	7 to 31
PD line density	10 steps
Pulse repetition frequency	100 Hz to 20.5 kHz
PD map	8 different color codes for each probe
Flow resolution	4 steps: low, mid1, mid2, high
Balance	From 25 to 225 in 41 steps
Artifact suppression	Yes

HD-Flow	
Screen formats	2D+HDF (single, dual, quad)
Frequency range	1 – 16 Mhz (depending on the probe, 3 steps: high, mid, low)
Display modes: • Simultaneous dual mode: 2D/2D+HDF • Triplex mode: 2D+HDF/PW, 2D/M+MHDF • Volume mode: 3D+HDF	
HD-Flow coding	256 color steps
HD-Flow window size	Lateral: max. to min. B-mode scan angle, Axial: B-scan range
Display mode	H (HD Flow)
Wall motion filter	8 steps: low1, low2, mid1, mid2, high1, high2, max1, max2
Smoothing filter	Rising edge: 12 steps, Falling edge: 12 steps
Gain control	+15 dB to -15 dB, 0.2 dB steps
HD-Flow ensemble	7 to 31
HD-Flow line density	10 steps
Pulse repetition frequency	100 Hz to 20.5 kHz
HD-Flow map	8 different color codes for each probe
Flow resolution	4 steps: low, mid1, mid2, high
Balance	From 25 to 225
Artifact suppression	Yes

Tissue Doppler Mode (TD)	
Screen Formats	2D+TD (Single, Dual, Quad)
Frequency range	1 – 16 Mhz (depending on the probe, 3 steps high, mid, low)
Display Modes • Simultaneous dual mode: 2D/2D+TD • Triplex mode: 2D+TD/PW, 2D/M+MTD	
TD coding steps	65536 color steps
Depth range	Axial: 0 to B-scan range, Lateral: 0 to B-scan-range
Zero line shift	17 steps
Inversion of color direction	Yes
Smoothing Filter	12 steps rise time, 12 steps fall time
Gain control	+15 dB to -15 dB, 1 dB steps
Line Density (color line density)	10 steps
Ensemble (color shots per line)	3 to 31
Flow Resolution	4 steps (low, mid1, mid2, high)
Pulse repetition frequency	100 Hz to 20.5 kHz
TD Map	4 different color codes for each probe
Balance	From 25 to 225
Max. meas. Velocity	4.23 m/sec
Min. meas. Velocity	0.3 cm/sec
Display Mode	V (Velocity)
Scale	kHz, cm/s, m/s

Volume Scan Module
Vol. scan size: max. 64 MB for gray volumes, max. 90 MB for color volumes; The required memory space depends on scan parameters (VOL-box size and quality (low, mid1, mid2, high1, high2, max). Typical: 0.8 – 5 MB
Lines/2D-image: max. 1024 (typ. 80 to 350)
2D-images/volume: Up to 4096 (acquisition mode dependent)
VOL-Frames/sec.: max. 46 (typ. 4 – 8); The frame rate depends on scan parameters: VOL-box size, quality and probe
4D volume cine: up to 400 volumes, up to 512 mb

Scanning Parameters *(cont.)*

Volume Scan Module *(cont.)*

Display of sectional plane images: synchronous with control seeing, arbitrary movement in volume, monitored position in volume

Rotation: 360°, 1° or 3° increments (X-, Y- and Z-axis)

Magnification. Adjustable form 0.3 to a factor of 4.00

Acquisition modes:

- 3D static:
  - 3D (2D incl. CRI)
  - 3D/PD (incl. CRI)
  - 3D/CFM (incl. CRI)
  - 3D B-Flow
  - 3D/HD-Flow incl. CRI
- 4D:
  - 4D Real Time
  - 4D Biopsy
  - VCI-A
  - VCI-OmniView

Visualization modes:

- Render
  - 3D/4D rendering (diverse surface and intensity projection modes)
  - SonoRender*live*
- Sectional planes
  - Multiplanar
  - OmniView, actual and projected view
  - Niche
- TUI (Tomographic Ultrasound Imaging) (overview image + parallel slices)
  - TUI standard
  - SonoVCAD*heart*
- Volume analysis
  - VOCAL: semi-auto/manual segmentation tool (segmentation using touch screen), (3D Static only) + Threshold Volume: measure volume below and above a threshold
  - SonoAVC*follicle* (Sono Automated Volume Count)
  - SonoAVC*antral*
  - SonoAVC*general*
- VCI (Volume Contrast Imaging)
- Free movable light source around following 3D Objects:
  - 3D Rendered Image
  - VOCAL object
  - SonoAVC object

Render modes:

- HD*live*
- Mix Mode of two render modes
- Surface Smooth
- Transparency modes: max- min- and X-ray
- Glass Body
- Color
- Surface Texture
- Surface Enhanced
- Gradient Light
- Inversion
- Light

Display graphics:

- Rotation axis, center point
- ROI box, 3D frame
- Temporary display of on screen controls (rotation, translation)

Volume Scan Module *(cont.)*

Gray maps: Slices: 21 (18 basic curves and 3 user-defined (pre, post) 3D image: one general map adjustable with bright (-50 to +50) & contrast (-50 to +50))

Tint maps: Slices: 10; 3D image: 10

Depth render maps: 3

BF (B-Flow)

Probes:

- RAB6-RS
- RIC5-9A-RS
- 9L-RS
- C1-5-RS
- IC9-RS
- 12L-RS
- 4C-RS
- 8C-RS

Screen formats	Single (BF), Dual (BF+BF), Quad (BF+BF+BF+BF)
Display modes	BF, Update: BF/PW
Acoustic power range	1 – 100%
Scan angle	Taken from 2D
GAIN range	+15 to -20 dB
Gray scale values	8 bit
SRI	Taken from 2D
Persistence filter	8 steps (pre)
S./PRI	1.00, 1.50, 2.00, 3.00, 4.00...15.00
Enhance	6 steps (pre) 0, 1, 2, 3, 4, 5
Quality	3 steps (pre) low, norm, high
Gray maps	18
Tint maps	10
Dynamic	12 different dynamic curves C1 – C12
Accumulation	Off, 0.20, 0.35, 0.50, 0.75, 1.00, 1.50, Infinite
Background	0, 1, 2

Scanning Features

Coded Excitation (CE)

Available on the following probes

- 12L-RS
- RIC5-9A-RS
- RAB6-RS

Coded Harmonic Imaging (CHI)

Available on all probes

Scanning Features *(cont.)*

Harmonic Imaging Penetration Setting (HI Pen)

- RAB6-RS
- C1-5-RS

Focus Frequency Composite (FFC)

Available on all probes except 12L-RS, 3Sc-RS and 12S-RS

Compound Resolution Imaging (CRI)

Available on all probes except 3Sc-RS and 12S-RS

Advanced Speckle Reduction Imaging (SRI III)

Available on all probes

Virtual convex

Available on all linear and sector probes

Wide sector (max angle)

- RAB6-RS
- RIC5-9A-RS
- 12S-RS
- 4C-RS
- IC9-RS
- 3Sc-RS
- C1-5-RS
- 8C-RS

Measurements Tool

Generic measurements

Distance:
- Distance (Point to Point)
- 2D Trace (Trace Length)
- Stenosis (% Dist.)
- Distance (Line to Line)
- 2D Trace (Point Length)
- Ratio D1/D2

Area/circumference:
- Ellipse
- Stenosis (%Area)
- Trace (Line)
- Area (2 Dist.)
- Trace (Point)
- Ratio A1/A2

Volume: following methods:
- 1 Distance
- 1 Dist. + Ellipse
- 3 Distance
- 1 Ellipse
- Multiplane-Planimetric Volume (3D only)

Angle:
- Angle (3 point)
- Angle (2 line)

M-Mode:
- Distance (Point to Point)
- Slope
- Ratio D1/D2
- Stenosis (% Dist.)
- Stenosis Diam.
- Time
- Vessel Diam.
- HR
- IMT

Generic measurements *(cont.)*

PW Doppler Mode:
- Auto & manual trace:
  - PS (Peak Systole)
  - ED (End Diastole)
  - MD (Mid. Diastole)
  - S/D (Ratio)
  - TAmax
  - HR
  - PI (Pulsatility Index)
  - RI (Resistance Index)
- Vol. flow
- PGmax, PGmean
- TAmax (Time Avg. max. Velocity)
- TAmean (Time avg. mean velocity)
- VTI (Velocity Time Integral)
- Heart rate

Vessel:
- R/L Vessel area
- R/L Stenosis area
- R/L Vessel diam.
- R/L Stenosis diam.
- R/L IMT
- R/L Flow diam.

Single measurements:
- Velocity
- PS/ED
- Acceleration
- Time
- RI
- HR
- PI
- PS
- ED

Abdomen calculations

Liver

Gallbladder

Pancreas

Spleen

Kidney (right/left)

Renal artery (right/left)

Aorta (proximal, mid, distal)

Portal vein

Vessel

Bladder volume

Summary reports

Small part default calculations

Thyroid (right/left)

Testicle (right/left)

Dorsal penile artery (right/left)

Vessel

Summary reports

Small part breast calculations

Lesion 1 – 5 (right/left)

Summary reports

Measurements Tool *(cont.)*

Obstetrics calculations

- Fetal Biometry
- Early Gestation
- Fetal Long Bones
- Fetal Cranium
- NT Method: SonoNT/Manual
- AFI
- Uterus
- Ovary right/left
- Umbilical Vein
- Placenta Volume
- Ductus venosus: S, D, a, PI, PLI, PVIV
- Doppler measurements: Ductus Art., Ductus Ven., Ao, Carotid, MCA, Celiac Artery, Superior Mesenteric Artery, Umbilical Art., Umbilical Vein, FHR, Uterine Art.
- Gestational Age Calculation
- Gestational Growth Calculation
- Fractional limb Volume
- Fetal Weight (FW) Estimation
- Fetal Trend Graph
- Multi-Gestational Calculation & Fetal Compare
- Calculation and Ratios
- Fetal Qualitative Description (Anatomical survey)
- Fetal Environmental Description (Biophysical profile)
- Summary Reports

Obstetrics fetal echo

- Chambers
- Thorax
- Aorta/LVOT
- Pulmonary/RVOT
- Venous
- FHR
- Tricuspid valve
- Mitral Valve
- Aortic
- Pulmonary

Obstetrics fetal echo *(cont.)*

- LPA
- RPA
- Ductus Art.
- Cardiac Output
- LT TEI
- RT TEI
- Ductus Ven.
- Umbilical Vein
- Pulmonary Veins
- Summary Reports

Obstetrics Z-scores

Calculation of Z-scores for:

- Long Axis
- Thorax
- Aortic Arch
- Obl. Short axis
- Short Axis
- 4 Chambers

- Summary reports

Cardiology calculations

2D Mode:

- LV Simpson (Single & Bi-Plane)
- LV-Mass (Epi & Endo Area, LV Length)
- RVOT Diameter
- TV (Diameter)
- PV (Diameter)
- Volume (Area Length)
- LV (RVD, IVS, LVD, LVPW)
- LVOT Diameter
- MV (Dist A, Dist B, Area)
- AV/LA (Aortic Valve/Left Atrium)

M-Mode:

- LV (IVS, LVD, LVPW, RVD)
- AV/LA (Ao Root Diam, LA Diam, AV Cusp Sep., Ao Root Ampl)
- MV (D-E, E-F Slope, A-C Interval, EPSS)
- HR (Heart Rate) Atrial HR

PW-Mode:

- MV (Mitral Valve)
- AV (Aortic Valve), TV (Tricuspid Valve)
- PV (Pulmonary Valve)
- LVOT & RVOT Doppler (Left & Right Ventricle Outflow Tract)
- Pulmonic Veins
- PAP (Pulmonary Artery Pressure measurement)
- HR (Heart Rate)
- TEI-Index

- C-Mode: PISA

Measurements Tool *(cont.)*

Cardiology calculations *(cont.)*

Others:

- Diast. Vol (Bi)
- Stroke Volume
- Cardiac Output
- Fractional Shortening
- LA/Ao Ratio
- Peak Gradient Acceleration
- Mean Gradient Acceleration
- TVA
- PHT
- AVA
- ERO
- Syst. Vol. (Bi)
- Volume Flow
- Ejection Fraction
- Myocardial Thickness
- E/A Peak
- Mean Gradient
- VTI
- PG
- MVA
- CVP (Cardio Vascular Profile) Score

Summary reports

Transrectal calculations

Prostate

Vessel

Summary reports incl. PSAD, PPSA(1), PPSA(2) calculation

Vascular

Left/right CCA (Common Carotid Artery)

Left/right ICA (Internal Carotid Artery)

Left/right ECA (External Carotid Artery)

Left/right vertebral artery

Left/right subclav.

Left/right bulb

Vessels

Summary reports

Gynecology calculations

Uterus

Right/left ovary

Right/left follicle

Fibroid

Endometrial thickness (dist, double dist.)

Cervix length

Left/right ovarian artery

Left/right uterine artery

Vessels

Gynecology calculations *(cont.)*

Pelvic floor

Left/right ovarian cyst

Left/right ovarian mass

Left/right adnexal cyst

Generic cyst

Left/right adnexal mass

Generic mass

Bladder (length/width/height/vol)

FHR

GYN IOTA LR2 and Simple Rules Model. May not be available in all countries (including USA, Japan)

Uterus classification (ESHRE/ESGE and ASRM)

Summary reports

Pediatrics calculations

Left/right hip joint

Pericallosal artery

Summary report

Cephalic

Left/right ACA (Anterior Cerebral Artery)

Left/right MCA (Middle Cerebral Artery)

Left/right PCA (Posterior Cerebral Artery)

Basilar artery

A-Com. A (Anterior Com. Artery)

P-Com. A (Posterior Com. Artery)

Left/right CCA (Common Carotid Artery)

Left/right ICA (Internal Carotid Artery)

Left/right vertebral artery

Vessels

Summary reports

Measurements Tool *(cont.)*

OB tables

Age tables:
- AC: ASUM, CFEF, Hadlock_82, Hadlock_84, Hansmann, Hobbins, Jeanty, JSUM, Kurmanavicius, Merz, Nicolaides, Shinozuka, Siriraj, Tokyo
- AD. Persson
- APAD: Merz
- APTD: Hansmann
- APTDxTTD: Shinozuka, Tokyo
- BOD: Jeanty
- BPD: ASUM, ASUM (old), Campbell, CFEF, Chitty (outerouter) (outer-inner), Eik-Nes, Hadlock_82, Hadlock_84, Hansmann, Hobbins, Jeanty, Johnsen, JSUM, Kurmanavicius, Kurtz, Leung, McLennanPersson, Merz, Nicolaides, OSAKA, Rempen, Sabbagha, Shinozuka, Siriraj, Tokyo, Verburg
- CEREB: Chitty, Goldstein, HILL, Hobbins, Nicolaides, Verburg
- CLAV: YARKONI
- CRL: ASUM, DAYA, Eik-Nes, Hadlock, Hansmann, Intergrowth, JSUM, McLennan, Persson, Pexters, Nelson, OSAKA, Rempen, Robinson, Robinson_BMUS, Sahota, Shinozuka, Tokyo, Verburg
- FL: ASUM, CFEF, Chitty, Eik-Nes, Hadlock_82, Hadlock_84, Hansmann, Hobbins, Hohler, Jeanty, JSUM, Kurmanavicius, Leung, Persson, Merz, Nicolaides, O'Brien, OSAKA, Shinozuka, Siriraj, Tokyo, WARDA, Johnsen
- FTA: OSAKA
- FIB: Jeanty
- GS: Hansmann, Hellman, Holländer, Rempen, Tokyo
- HC: ASUM, CFEF, Chitty, Hadlock_82, Hadlock_84, Hansmann, Jeanty, Kurmanavicius, Leung, Merz, Nicolaides, Siriraj, Johnsen
- HL: ASUM, Hobbins, Jeanty, Merz, OSAKA
- LV: Tokyo
- MAD: Eik-Nes, eSnurra, Kurmanavicius
- OFD: ASUM, Chitty, Hansmann, Jeanty, Kurmanavicius, Merz, Nicolaides
- RAD: Jeanty, Merz
- TIB: Jeanty Merz
- TAD: CFEF, Merz
- TTD: Hansmann
- ULNA: Jeanty, Merz

Growth tables:
- AC: ASUM, CFEF, Chitty, Hadlock, Hansmann, Jacot-Guillarmod, Jeanty, JSUM, Lai_Yeo, Kurmanavicius, Lessoway, Leung, Merz, Nicolaides, Shinozuka, Siriraj, Tokyo, Verburg, Johnsen, Medvedev, Stork, Intergrowth, WHO
- AD: Persson
- AFI: Moore
- Aorta: Vmax: Rizzo
- APAD: Merz
- APTD: Hansmann
- APTDxTTD: Shinozuka_SD
- AxT: Shinozuka, Tokyo
- BOD: Jeanty
- BPD: ASUM, Campbell, CFEF, Chitty, Eik-Nes, Hadlock, Hansmann, Jacot-Guillarmod, Jeanty, JSUM, Kurmanavicius, Lai_Yeo, Lessoway, Leung, Persson, McLenna, Merz, Nicolaides, OSAKA, Paladini, Sabbagha, Shinozuka, Siriraj, Tokyo, Verburg, Medvedev, Stork, Intergrowth, WHO

OB tables *(cont.)*

Growth tables *(cont.)*:
- CLAV: YARKONI
- CM: Nicolaides
- CRL: ASUM, Hadlock, Hansmann, Intergrowth, JSUM, McLennan, Persson, OSAKA, Robinson, Robinson 1993, Shinozuka, Tokyo, Pexters, Medvevev
- DV a/S: JSUM
- DV PI: Baschat, JSUM
- DV PLI: Baschat
- DV PVIV: Baschat
- DV S/a: Baschat
- FL: ASUM, CFEF, Chitty, Eik-Nes, Hadlock, Hansmann, Jacot-Guillarmod, Jeanty, JSUM, Kurmanavicius, Lessoway, Lai_Yeo, Lessoway, Leung, Paladini, Persson, Merz, Nicolaides, O'Brien, OSAKA, Shinozuka, Siriaj, Tokyo, Verburg, WARDA, Johnsen, Medvedev, Stork, Intergrowth, WHO
- FTA: OSAKA
- FIB: Chitty, Jeanty, JFFSD, Siriraj
- FWg: Alexander
- Foot: Chitty
- GS: Hellman, Nyberg, Rempen, Tokyo
- HC: ASUM, CFEF, Chervernak, Chitty, Hadlock, Hansmann, Jacot-Guillarmod, Jeanty, Kurmanavicius, Lai_Yeo, Lessoway, Leung, Merz, Nicolaides, Paladini, Siriraj, Verburg, Johnsen, Medvedev, Stork, Intergrowth, WHO
- HL: ASUM, Chitty, Jeanty, Lai_Yeo, Merz, JFFSD, OSAKA, Paladini, Siriraj, Medvedev
- IVC PLI: JSUM
- Lt.Tei(ICT,IRT), Lt.Tei(a,b): Bhorat
- Lung Area Left/Right: Peralta
- LV: Tokyo
- MCA CP: Ebbing
- MCA PI: Ebbing
- MCA PI, RI: JSUM, Bahlman
- MCA PV: Mari
- MAD: Eik-Nes, eSnurra, Kurmanavicius
- MV E/A: HARADA
- NBL: BUNDUKI, SONEK, Medvedev
- OFD: ASUM, Chitty, Hansmann, Jeanty, Kurmanavicius, Merz, Nicolaides, Medvedev, Intergrowth
- MainPA Vmax: Rizzo
- RAD: Chitty, Jeanty, JFFSD, Merz, Paladini, Sirirja
- SAG. AP: Malinger
- SAG. CC: Malinger
- TAD: CFEF, Jacot-Guillarmod, Merz
- TC: Chitkara
- TCD: Goldstein, Hill, Jacot-Guillarmod, Nicolaides, Verburg
- TIB: Chitty, Jeanty, JFFSD, Merz, Siriraj
- TTD: Hansmann
- TV E/A: HARADA
- ULNA. Chitty, Jeanty, JFFSD, Merz, Siriraj
- UmbArt PI: Ebbing, JSUM, Merz
- UmbArt RI: JSUM, Merz, Kurmanavicius
- UtArtPI: Gomez, Merz
- UtArtRI: Merz
- Vermis A: Malinger

Measurements Tool *(cont.)*

OB tables *(cont.)*

Growth tables *(cont.)*:
- Vermis C: Malinger
- Fractional Limb Avol/Tvol: Lee

Fetal weight estimation (EFW)

- Campbell (AC)
- Hadlock (AC, BPD)
- Hadlock 1 (AC, FL)
- Hadlock 2 (BPD, AC, FL)
- Hadlock 3 (HC, AC, FL)
- Hadlock 4 (BPD, HC, AC, FL)
- Hansmann (BPD, TTD)
- Intergrowth (AC, HC)
- Lee (AVOL; AC, AVOL; AC, BDP, AVOL; TVOL; AC, TVOL; AC, BDP, TVOL)
- Merz (AC, BPD)
- Osaka (BPD, FTA, FL)
- Persson (BPD, MAD, FL)
- Persson 2, Schild (HC, AC, FL)
- Shepard (AC, BPD)
- Shinozuka 1 (BPD, ADTP, TTD, FL)
- Shinozuka 2 (BPD, FL, AC)
- Shinozuka 3 (BPD, APTD, TTD, LV
- Tokyo (BPD, APTD, TTD, FL)

Gestational Age by EFW: Hadlock, JSUM 2001, Osaka, Shinozuka, Tokyo

Fetal Weight Growth FWG: Alexander, Ananth, Bourgogne, Brenner, CFEF, Doubilet, Ego, Eik-Nes, Hadlock, Hansmann, Hansmann (86), Hobbins/Persutte, Intergrowth, Johnsen, Jsum 2001, Kramer, Persson, Osaka, Shinozuka, Tokyo, Williams, Yarkoni

Fetal ratios

CI (BPD/OFD) (Hadlock)

FL/AC (Hadlock)

FL/BPD (Hohler)

FL/HC (Hadlock), (WHO)

HC/AC (Campbell)

Va/Hem (Nicolaides)

Va/Hem (Hansmann)

Vp/Hem (Nicolaides)

LHR (Peralta)

CVR (Peranteau)

Probes

RAB-6-RS

Wideband convex volume probe

Applications	Abdomen, Obstetrics, Gynecology, Pediatrics
Maximum bandwidth (-20 dB)	2 – 8 MHz
Number of elements	192
Convex radius	47 mm
Volume sweep radius	24.11 mm
FOV	63° (B), 85° x 63° (volume scan)
Wide	90° (B), 85° x 90° (volume scan)
Depth	Max. 26 cm
Footprint	62.2 x 34.0 mm
Centre frequency	4.4 MHz
B-Mode frequency	3.23 – 6.67 MHz
Doppler frequency	3.03 – 5.00 MHz
Harmonic frequency	2.63 – 3.33 MHz

C1-5-RS

Wideband convex probe

Application	Abdomen, Obstetrics, Gynecology
Maximum bandwidth (-20 dB)	2 – 5 MHz
Number of elements	192
Convex radius	56.1 mm
Volume sweep radius	N/A
FOV	69°
Wide	113°
Depth	Max. 42 cm
Footprint	69.3 x 17.2 mm
Centre frequency	3.4 MHz
B-Mode frequency	2.78 – 3.70 MHz
Doppler frequency	2.00 – 3.23 MHz
Harmonic frequency	2.13 – 2.13 MHz

Probes *(cont.)*

4C-RS	
Wideband convex probe	
Applications	Abdomen, Obstetrics, Gynecology
Maximum bandwidth (-20 dB)	2 – 5 MHz
Number of elements	128
Convex radius	60.0 mm
Volume sweep radius	N/A
FOV	58°
Wide	81°
Depth	Max. 42 cm
Footprint	68.7 x 18.3 mm
Centre frequency	3.1 MHz
B-Mode frequency	2.50 – 3.70 MHz
Doppler frequency	2.00 – 3.23 MHz
Harmonic frequency	2.00 – 2.08 MHz

RIC5-9A-RS	
Wideband micro-convex volume probe	
Applications	Obstetrics, Gynecology, Transrectal
Maximum bandwidth (-20 dB)	3.8 – 9.3 MHz
Number of elements	192
Convex radius	10 mm
Volume sweep radius	11.7 mm
FOV	146° (B), 120° x 146° (volume scan)
Wide	180° (B), 120° x 180° (volume scan)
Depth	Max. 16 cm
Footprint	26.2 x 27.8 mm
Centre frequency	6.5 MHz
B-Mode frequency	4.55 – 8.33 MHz
Doppler frequency	4.55 – 6.25 MHz
Harmonic frequency	3.57 – 3.87 MHz

IC9-RS	
Wideband micro-convex probe	
Applications	Obstetrics, Gynecology, Transrectal
Maximum bandwidth (-20 dB)	2.9 – 9.7MHz
Number of elements	192
Convex radius	9.2 mm
Volume sweep radius	N/A
FOV	146°
Wide	181°
Depth	Max. 16 cm
Footprint	19.6 x 13.6 mm
Centre frequency	6.25 MHz
B-Mode frequency	4.55 – 8.33 MHz
Doppler frequency	5.00 – 6.25 MHz
Harmonic frequency	3.57 – 3.57 MHz
Biopsy guide available	Single-Angle, reusable

9L-RS	
Wideband linear probe	
Applications	Small Parts, Obstetrics, Peripheral Vascular, Pediatrics, MSK
Maximum bandwidth (-20 dB)	3 – 8 MHz
Number of elements	192
Volume sweep radius	N/A
FOV	44 mm
Footprint	53.0 x 14.1 mm
Depth	Max. 14 cm
Centre frequency	5.3 MHz
B-Mode frequency	4.55 – 10.00 MHz
Doppler frequency	3.70 – 5.26 MHz
Harmonic frequency	2.86 – 2.86 MHz

Probes *(cont.)*

12L-RS	
Wideband Linear Probe	
Applications	Small Parts, Peripheral Vascular, Pediatrics, MSK, Breast
Maximum bandwidth (-20 dB)	4 – 12 MHz
Number of elements	192
Volume sweep radius	N/A
FOV	38 mm
Depth	Max. 11 cm
Footprint	47.2 x 13.8 mm
Centre frequency	7.7 MHz
B-Mode frequency	6.67 – 10.00 MHz
Doppler frequency	5.26 – 7.14 MHz
Harmonic frequency	4.55 – 5.00 MHz

8C-RS	
Wideband micro-convex probe	
Applications	Abdominal, Small Parts, Cardiology, Peripheral Vascular, Pediatrics
Maximum bandwidth (-20 dB)	4 – 10 MHz
Number of elements	128
Convex radius	11.4 mm
Volume sweep radius	N/A
FOV	80°
Wide	131°
Depth	Max. 16 cm
Footprint	22.0 x 12.0 mm
Centre frequency	6.5 MHz
B-Mode frequency	4.35 – 7.14 MHz
Doppler frequency	4.76 – 6.67 MHz
Harmonic frequency	4.17 – 4.17 MHz

3Sc-RS	
Wideband phased array probe	
Applications	Abdominal, Cardiology, Obstetrics, Pediatrics, Cephalic
Maximum bandwidth (-20 dB)	1 – 4 MHz
Number of elements	64
Volume sweep radius	N/A
FOV	90°
Depth	Max. 23.7 cm
Footprint	27.6 X 19.3 mm
Centre frequency	2.8 MHz
B-Mode frequency	2.44 – 3.33 MHz
Doppler frequency	1.85 – 2.50 MHz
Harmonic frequency	1.92 – 1.96 MHz

External inputs and outputs

Connectivity
- HDMI Out
- VGA port
- S-Video (integrated video converter option)
- Composite BNC (integrated video converter option)
- Network (RJ45)
- External Audio Out
- USB 2.0 (2x in monitor, 2x in front, 1x in rear)
- USB 3.0 (2x in front)
- AC Power Input
- Probe connector

Service tools

- Data Export capabilities for Asset Performance Analytics
- On-board probe quality assessment tool

Safety Conformance

The Voluson S8 with Touch Panel is:
Including national deviations
Classified to ANSIAAMI ES60601-1 2005 R1 2012 Medical Electrical Equipment, Part 1: General Requirements for Safety by a Nationally Recognized Test Lab
Certified to CSA CAN/CSA-C22.2 NO. 60601-1 :14 General requirements for safety
CE Marked to Council Directive 93/42/EEC on Medical Devices Conforms to the following standards for safety:
IEC/EN 60601-1 2nd Edition Medical electrical equipment – Part 1: General requirements for safety
IEC/EN 60601-1 3.1 Edition. Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
IEC/EN 60601-1-1 Medical electrical equipment – Part 1-1: General requirements for safety – Collateral Standard: Safety requirements for medical electrical systems
IEC/EN 60601-1-2 Medial electrical equipment – Part 1-2: General requirements for safety – Collateral Standard: Electromagnetic compatibility – requirements & tests
IEC/EN 60601-1-4 Medical electrical equipment Part 1-4: General requirements for safety – Collateral Standard: programmable electrical medical systems
IEC/EN 60601-1-6 Medical electrical equipment Part 1-6: General requirements for basic safety and essential performance – Collateral Standard: Usability
IEC/EN 60601-2-18 Medical electrical equipment – Part 2-18: Particular requirements for the basic safety and essential performance of endoscopic equipment
IEC/EN 60601-2-37 Medical electrical equipment – Part 2-37: Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment
IEC/EN 62366 Application of usability engineering to medical devices
IEC/EN 62304 Software Life Cycle Processes
IEC/EN 62359 Ultrasonic – Field characterization – Test methods for the determination of thermal and mechanical indices related to medical diagnostic ultrasonic fields
EN 980: Symbols for use in the labeling of medical devices
ISO 10993-1 Biological evaluation of medical devices – Part 1 Evaluation and testing
NEMA UD2 Acoustic output measurement standard for diagnostic ultrasound equipment

The Voluson S8 with Touch Panel is *(cont.)*:
NEMA UD3 Standard for real time display of thermal and mechanical acoustic output indices on diagnostic ultrasound equipment (MI, TIS, TIB, TIC)
EMC Emissions Group 1, Class B device requirements as per Sub clause 4.2 of CISPR 11
WEEE (Waste Electrical and Electronic Equipment)
ROHS according to 2011/65/EU

Imagination at work

August 2019
JB64406US(1)