

Voluson S8 BT22

Data Sheet

Product description

The Voluson™ S8 BT22 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
- 23" High resolution LCD LED Display
- 4 Active Probe Ports
- Battery Pack (Sleep Mode – Fast Wake)
- Probe Favorites
- Automatic Optimization
- Auto TGC
- Wide Sector
- HD-Flow™
- B-Flow™
- 3D Multiplanar Display
- STIC
- Anatomical M-Mode
- Real-Time 4D
- HDlive™
- 3D Print File Export
- Advanced VCI with OmniView
- Elastography (incl. Analysis)
- Coded Contrast Imaging[†]
- Sono-Automation Technology
 - SonoAVC™*follicle*
 - SonoAVC*antral*^{2.0}
 - SonoL&D
 - SonoVCAD™*labor*
 - SonoNT™ / SonoIT
 - SonoVCAD*heart*
 - SonoBiometry
 - SonoFHR
 - SonoRender*live*
- Scan Assistant
- Report Editor
- On Board Archive including preview and Pre-selection
- Education Videos



General Specifications

Dimensions and weight	
Height (minimum)	1310mm (51.6 in)
Height (maximum)	1730mm (68.1 in)
Adjustable	mechanical
Width (UI)	620mm (24.4 in)
Depth (overall)	850mm (33.5 in)
Weight (no Peripherals)	198 lbs / 90kg
Weight (max)	267 lbs / 121 kg

Power supply	
Voltage	100 – 240 VAC
Frequency	50/60 Hz (+/-2%)
Power	Max. 900 VA Including all options. Typical power consumption ~170VA
Thermal Output	Max. 3071 BTU/h (Typical 581 BTU/h)
Battery (Option)	20 min scanning, longer in standby
Sleep Mode (low power state) – Fast Wake in approximately 15 seconds	

Console design	
4 Active Universal Probe Ports (3 standard, 1 optional)	
Integrated HDD	500 GB
Integrated SSD (Option)	1 TB
Operating System: Windows** 10 IoT Enterprise 64 bit	
Integrated DVD+R(W)/CD-R(W) drive	
On-board storage for Peripherals	
4 Wheels	Diameter 125 mm (4.9 inch)
Integrated cable management	
Front & rear handles	

User Interface

Operator keyboard	
Adjustable User Interface:	
<ul style="list-style-type: none">• Rotation: adjustable +/- 30° from center• Height:<ul style="list-style-type: none">○ Standard cabinet: 710 mm (28.0 in) – 980 mm (38.6 in)○ High cabinet: 780 mm (30.7 in) – 980 mm (38.6 in)	
Ergonomic hard key layout (interactive back-lighting) with backlit alphanumeric keyboard and trackball	
4 programmable print/store/export keys for printing, archiving and exporting	
4 Programmable probe favorite keys for immediate access to frequently used probes, applications, and modes	
4 Integrated probe holders + Horizontal TV probe holder (Option)	

Monitor	
23" high resolution LCD LED Display with DVI interface	
Resolution: Full HD 1920 x 1080 pixel	
Image Size: 1136 x 786 (XL format 1604 x 786)	
Fully Articulating Monitor Arm	
<ul style="list-style-type: none">• 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 backlight 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)	
Anatomical M-Mode (AMM)	
Pulsed Wave Doppler (PW) with HPRF	
Continuous Wave Doppler imaging (CW)	
Color Flow Doppler mode (CFM)	
Power Doppler Mode (PD)	
High Definition Power Doppler (HD-Flow™)	
Tissue Doppler Mode (TD)	
B-Flow™ (BF)	
Compression Elastography	
Contrast Imaging Mode†, including Quantification Capabilities	
Combination modes: M/CFM, M/HD-Flow, M/TD, PW/CFM, PW/HD-Flow, PW/PD	
Extended View (XTD View)	
Volume Mode (3D/4D):	
<ul style="list-style-type: none">• 3D Static• Real-Time 4D• VCI-A• VCI-OmniView• Spatio-Temporal Image Correlation• 4D Biopsy	

Scanning methods	
Electronic Sector/Convex/Linear	
Mechanic Volume Sweep	

User Management and Logging Functionality	
Multiple Users with individual log on credentials	
Different and adjustable access levels	
LDAP Interface	
Enhanced Audit Trail and Usage Log	

Privacy and Security Functionality
Hard disc 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
Deactivation of USB ports possible
Transducer types
Convex Array
Microconvex Array
Linear Array
Sector Array
Active Matrix Linear Array (1.5D)
Volume probes 4D: Convex Array & Microconvex Array
Standard features <small>(may not be available in all countries)</small>
B-Mode
M-Mode
PW-Doppler
CFM (Color Flow Doppler Mode)
HD-Flow & Power Doppler Mode
Tissue Doppler
Automatic Optimization (B-Mode, PW Doppler)
Auto TGC
Auto PRF
Coded Excitation (CE)
Focus and Frequency Composite (FFC)
Coded Harmonic Imaging with Pulse Inversion Technology, operating on multiple frequencies, user selectable on/off
Advanced Speckle Reduction Imaging (SRI II)
CrossXBeamCRI™ (Compound Resolution Imaging), (CRI)
SonoBiometry (HC, BPD, AC, FL, HL, CM, Vp, Cerebellum)
SonoFHR, Fetal Heart Rate
SonoNT & SonoIT
HD Zoom & Pan Zoom
Steering
Virtual Convex (Trapezoid Image, also with CrossXBeamCRI)
Wide Sector (max. Angle)
BetaView
Patient information database
Image Archive on hard drive
3D/4D data compression (lossy/lossless)
Real-time automatic Doppler calculations
Measurement, Calculations and Worksheets/Report for: <ul style="list-style-type: none"> OB GYN Abdominal Transrectal Vascular Cardio Small Parts Cephalic Pediatrics Musculoskeletal
Multigestational Calculations
Integrated uplink for Cloud-based data storage (Tricefy™) <small>(may not be available in all countries)</small>
IOTA (International Ovarian Tumor Analysis): LR2, Simple Rules and ADNEX Model <small>(may not be available in all countries)</small>
IETA (International Endometrial Tumor Analysis) Report <small>(may not be available in all countries)</small>

IDEA (International Deep Endometriosis Analysis) Report <small>(may not be available in all countries)</small>
Report Editor
DICOM 3.0 Connectivity
Education Videos
Probe Check: On-board probe quality assessment tool

Software Options <small>(may not be available in all countries)</small>
<u>3D/4D Activation</u> <ul style="list-style-type: none"> Static 3D 4D Realtime SonoRender<i>live</i>
<u>Advanced 3D/4D Package</u> <ul style="list-style-type: none"> 3D/4D Activation TUI Inversion SingleView 4D Biopsy
HD <i>live</i>
B-Flow
Advanced VCI with OmniView
VOCAL II
<u>SonoAVC</u> <ul style="list-style-type: none"> SonAVC<i>follicle</i> SonoAVC<i>antral</i>
SonoVCAD <i>labor</i>
SonoL&D
SonoVCAD <i>heart</i>
Spatio-temporal image correlation (STIC)
Anatomical M-Mode (AMM)
TUI
XTD
Inversion
4D Biopsy
Elastography
Coded Contrast Imaging + 3D HyCoSy ⁺
CW Mode
4 th Probe Port Activation
Integrated Software DVR <ul style="list-style-type: none"> Digital recording 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
Advanced Security Features
Russian Language Support
3D Print File Export
Scan Assistant: <ul style="list-style-type: none"> 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

Hardware options <small>(may not be available in all countries)</small>
Drawer
High Cabinet
Gel Holder
Horizontal TV Holder
Vertical TV Holder Attachment
CW Option Kit
Battery Pack
Integrated SSD 1 TB
ECG Digital Module

Peripheral options <small>(may not be available in all countries)</small>
Integrated printers:
<ul style="list-style-type: none"> B&W Thermal Printer Color Thermal Printer
External Color desktop printer with network printing capabilities & connection kits for printing reports and images
Foot Switch, with programmable functionality (USB)
Barcode Scanner (USB)

Connectivity options <small>(may not be available in all countries)</small>
WLAN Adapter (USB)
Integrated Video Converter (S-Video, Composite BNC)
External patient monitor
Digital Expert

Accessories
Isolation Transformer
Isolated USB Connection
Isolated Ethernet Connection
Power supply noise filter (EMI Filter)
Universal Power Supply 220/230V (UPS)
Voluson Cleaning Cloth

Display modes

Simultaneous capability in combination with SRI and/or CRI:

<ul style="list-style-type: none"> • B+PW • B+CFM, B+PD, B+TD • B+HD-Flow • B+M, B+AMM • B+3D, B+4D • B+CRI • B+SRI • B+CRI+SRI • B/Contrast⁺ • Contrast⁺+SRI • B+CRI/3D+CRI • B+SRI/3D+SRI • B+CRI/4D+CRI • B+SRI/4D+SRI • B+CRI+SRI/3D+CRI+SRI • B+CRI+SRI/4D+CRI+SRI 	<ul style="list-style-type: none"> • B+CRI/STIC+CRI • B+SRI/STIC+SRI • B+CRI+SRI/STIC+CRI+SRI • B/B+CRI • B/B+SRI • B/B+SRI+CRI • B/CFM+CRI • B/CFM+SRI • B/CFM+CRI+SRI • B/PD+CRI • B/PD+SRI • B/PD+CRI+SRI • B/HD-Flow+CRI • B/HD-Flow+SRI • B/HD-Flow+CRI+SRI • HD-Flow+CRI+SRI • BF+SRI
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Real-time Triplex Mode (available on all probes):
<ul style="list-style-type: none"> B/CFM/PW B/PD/PW B/HD-Flow/PW
Selectable alternating modes:
<ul style="list-style-type: none"> B+PW or CW B/CFM+PW or CW B/PD+PW or CW B/HD-Flow+PW or CW B+CFM or PD or HD-Flow or CW

Multi-image (split, quad):
<ul style="list-style-type: none"> Live and/or frozen Independent Cine playback Split: <ul style="list-style-type: none"> B+B B/CFM+B/CFM B/PD+B/PD B/TD+B/TD B/HD-Flow + B/HD-Flow B+PW or M or CW BF+BF Contrast+ Contrast Frame Review/XTD-View TUI Overview+1 slice Split simultaneous: <ul style="list-style-type: none"> B+B/CFM B+B/HD-Flow B+B/PD Quad: <ul style="list-style-type: none"> B+B+B+B or BF or Contrast⁺ B/CFM+B/CFM+B/CFM+B/CFM or B/PD or B/TD or B/HD-Flow Quad - Volume Mode: <ul style="list-style-type: none"> A+B+C+3D or 4D TUI: 1x1, 1x2, 2x2, 3x2, 3x3, 3x4, 4x4 Segmentation: <ul style="list-style-type: none"> Quad (A/B/C/ Segm. Object) Single (Segm. Object)

Zoom Read/Write (with or without overview image)

Image Size:
<ul style="list-style-type: none"> Standard XL Format

Colorized Image:
<ul style="list-style-type: none"> Colorized B Colorized PW Colorized M Colorized 3D

Time line display:
<ul style="list-style-type: none"> 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: First/Middle/Last Name, 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: (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:
<ul style="list-style-type: none"> User Preset Receiver Frequency Gain Dynamic Control Gray Map Edge Enhance Persistence SRI, CRI Probe Orientation
M-Mode/AMM –Mode:
<ul style="list-style-type: none"> Gain Dynamic control Edge Enhance Reject M-Cursor, AMM-Cursor Time Scale

PW Doppler Mode:	
• Acoustic Power	• Velocity or Frequency Scale
• Gain	• Spectrum Inversion
• Angle	• Time Scale
• Wall Motion Filter	• PRF
• Doppler Frequency	• HPRF
• Sample Volume Depth & Width	
Color Flow Imaging Modes:	
• Acoustic Power	• Color Map
• Color Gain	• Color Scale: kHz, cm/s, m/s
• Color Balance	• Power and Symmetrical Velocity Imaging
• Color Balance Marker	• Color Velocity Range
• Quality	• Spectrum Inversion
• Wall Motion Filter	• Orientation Markers
• PRF	
3D/4D Mode:	
• 3D/4D Sub Program	• VCI: slice thickness
• Threshold	• TUI: slice distance (0.5-10mm)
• Quality	• TUI: slice position in overview image
• Volume Box Angle	• SonoVCADheart
• Mix	• STIC acquisition time
• Acquisition Mode	• Calculated STIC heart rate
• Compression	
• Orientation Markers	
Elastography Mode:	
• Acoustic Output	• Elasto Map
• Tx Frequency	• Persistence
• Transparency	• Line Density
• Velocity Range	
TGC Curve	
Cine Frame Number	
Recorder Status	
Body Pattern: >110 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	
ECG 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.
Display Languages: English, French, German, Spanish, Portuguese, Italian, Danish, Dutch, Finnish, Norwegian, Swedish, Russian, Japanese, Simplified Chinese
Keyboard Languages (Keycap Kits): English, French, German, Greek, Spanish, Portuguese, Italian, Danish, Finnish, Norwegian, Swedish, Russian, Swiss, South Slavic Latin
elFu (electronic Instructions for Use) Languages: Bulgarian, Croatian, Czech, Chinese Simplified, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Indonesian, Italian, Japanese, Kazakh, Korean, Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovakian, Slovenian, Spanish, Swedish, Turkish, Ukrainian, Vietnamese
Free programmable Scan assistant lists including Add, Delete, Edit and Reorder of checklist items

Up to 800 Programmable Annotations organized in 10 anatomical groups
4 programmable Px buttons (single press) for documentation preferences like Save, DICOM Send, Print, Check, Cine length, jpeg, etc.
4 programmable Px buttons (press and hold) for probe favorites - immediate access to frequently used probes, applications, and modes
Several user configurable functions:
• Clinic Name
• Display (TGC curve, Screen Lock, Screensaver, Auto Scan Stop, Beeper, 3D/4D Screen Controls)
• Trackball speed
• Zoom Overview window
• Dim function
• Patient Info display
• Title bar settings
• Start Exam and End Exam configuration

Image processing and presentation

Digital Beamformer
1,714,833 system processing channel technology
Minimum Depth of Field: 0 – 1 cm (Zoom, probe dependent)
Maximum Depth of Field: 0 – 42 cm (probe dependent)
Depth Steps: up to 29 (probe dependent)
Transmission Focus: 1-5 Focus Points selectable (probe and application dependent)
Focal Zone position, up to 10 positions selectable
Continuous Dynamic Receive Focus/ Continuous Dynamic Receive Aperture
256 gray levels
16.8 million Colors 24 bit
Up to 265 dB Dynamic Range
Image reverse: Right/Left
Rotation: 0°, 180°

Measure setup

M&A Setup: 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
Post assign measurements
Magnifier available to help place precise measurements
Auto Sequence measurements

Biopsy setup

User programmable needle guidelines

Pre-processing

Write Zoom up to 8x Magnification	
B/M-Mode:	
• Gain	• Transmission Frequency
• TGC	• Persistence Control
• Dynamic Range	• Line Density Control
• Acoustic Output	• Reject
• Transmission Focus Position	• Sweep Speed
• Transmission Focus Number	• M-Cursor position
PW-Mode:	
• Gain	• Wall Motion Filter
• Dynamic Range	• Sample Volume Gate

<ul style="list-style-type: none"> Acoustic Output Transmission Frequency PRF 	<ul style="list-style-type: none"> Length, Depth, Pos Velocity Scale Sweep Speed
Color Flow Imaging Modes (CFM, PD, TD, HD-Flow):	
<ul style="list-style-type: none"> Gain Acoustic Output PRF Wall Motion Filter Line density Ensemble Dynamic 	<ul style="list-style-type: none"> Smooth (Rise and Fall) Frequency Balance Line Filter Quality Artifact Suppression
Post-processing	
Read Zoom: 0.8x – 3.4x Zoom (with HD-Zoom functionality up to 22x Zoom)	
B-Mode:	
<ul style="list-style-type: none"> 2D Gain Dynamic Contrast Gray Map Edge Enhance 	<ul style="list-style-type: none"> Colorized B Advanced SRI II (Speckle Reduction Imaging)
M-Mode:	
<ul style="list-style-type: none"> Gray Map Colorized M Edge Enhance 	<ul style="list-style-type: none"> Display Format Sweep Speed
PW-Mode:	
<ul style="list-style-type: none"> Gray Map Baseline Shift Angle Correction Colorized D 	<ul style="list-style-type: none"> Scale (kHz, m/s, cm/s) Trace Invert Sweep Speed
Color Flow Imaging Modes (CFM, PD, TD, HD-Flow):	
<ul style="list-style-type: none"> Display Threshold Display Mode (V,V-T,T,P, P-T) (CFM only) 	<ul style="list-style-type: none"> Color Map Scale (CFM and HD-Flow) Baseline
B-Flow:	
<ul style="list-style-type: none"> Gray Map Colorized B-Flow 	<ul style="list-style-type: none"> Dynamic Contrast Advanced SRI II (Speckle Reduction Imaging)
Cine features	
Prospective or Retrospective Cine Mode	
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:	
<ul style="list-style-type: none"> 2D: 512MB: up to 10 min and 13,200 frames (depending on B-image size and FPS); typical: about 3 min/4000 images (with curved array: 15cm depth, angle 81°, 22 FPS) M-Mode: 32MB: up to 1 min motion time (depending on sweep and depth) PW/CW-Mode: 32MB: up to 1 min motion time (depending on sweep speed) 	
Cine operation:	
<ul style="list-style-type: none"> Manual: image by image Auto run: <ul style="list-style-type: none"> 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
Images stored as: <ul style="list-style-type: none"> Raw Data file (proprietary format) DICOM file (Single-or Multi-Frame)
Volume file stored as: <ul style="list-style-type: none"> Raw Data file (proprietary format) DICOM file Size: typically: 0.8 – 5MB (depending on probe and adjusted volume size)
Compression: <ul style="list-style-type: none"> 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 (approx. values)
Review of current Exam and archived data sets (Single Images and Cine Clips). <ul style="list-style-type: none"> View format: Raw data, DICOM data Display Formats: 1x1, 2x2, 3x3
Reload of current/ archived data sets: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> Bitmap files: BMP, TIFF, JPEG Raw files: RAW (2D), VOL (Volume data), 4DV (RAW, VOL incl. Patient data – password protected) Video File Format: AVI, MP4 DICOM Files: DCM, DICOM Files with DICOMDIR 3D Raw Data: export Cartesian format possible Surface formats: STL, OBJ, PLY, 3MF, XYZ (with projected and full 3D export capabilities)
AVI Codec: MS Video 1, FullFrame
Export to: <ul style="list-style-type: none"> Network USB devices DVD+R(W)/ CD-R(W) email Printer DICOM Tricefy
Export Anonymous function: available for following image types: AVI, BMP, TIFF, JPEG, MP4
Backup function to: <ul style="list-style-type: none"> Network USB devices DVD+R(W)/ CD-R(W)
Repro function: Settings recall (e.g. Geometry, Gain, Color map, etc.) from a stored or reloaded picture
Exam history: <ul style="list-style-type: none"> 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 space: approx. 450 GB

Connectivity	
Ethernet network connection	
WLAN network connection	
3 USB 2.0 + 2 USB 3.0 ports for USB devices	
DICOM support:	
<ul style="list-style-type: none"> • Verify • Print • Store • Modality Worklist • Structured Reporting • Storage Commitment • MPPS (Modality performed procedure step) • Media Exchange • Off network / mobile storage queue • Query/Retrieve • TLS 	
Tricify features:	
<ul style="list-style-type: none"> • Store • Patient Share • .pdf Report storage • Query Retrieve 	

Scanning Parameters

B-Mode	
B-Mode for all probes	
B Acoustic Power	1-100%
Scan Angle	5° (probe dependent)
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
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 255
Enhance	6 steps 0, 1, 2, 3, 4, 5
Gray maps	18
Tint maps	10
Dynamic	12 Steps: 1-12
Display Modes	B, XTD
Max. B-Mode Frame Rate	>2800 frames/sec (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)
Screen Formats:	
<ul style="list-style-type: none"> • 2D Imaging: Single (B), Dual (B+B), Quad (B+B+B+B) • XTD View: Single (XTD), Dual (B+XTD) 	
Coded Harmonic Imaging:	
<ul style="list-style-type: none"> • available on all probes 	
Compound Resolution Imaging (CrossXBeamCRI):	
<ul style="list-style-type: none"> • available on all probes, except: 3Sc-RS, 12S-RS 	
Advanced Speckle Reduction Imaging (SRI II):	
<ul style="list-style-type: none"> • available on all probes 	

Virtual Convex:

- available on all Linear & Sector probes

Wide sector:

- available on all probes, except Linear probes

Coded Excitation (CE): (not all probes may be available in all countries)

- available on following probes: 12L-RS, ML6-15-RS, RAB6-RS, RIC5-9A-RS

Focus Frequency Composite (FFC):

- available on all probes, except: 3Sc-RS, 12S-RS, 12L-RS, ML6-15-RS

HI Pen: (not all probes may be available in all countries)

- available on C1-5-RS, RAB6-RS

M-Mode

M-Mode for all probes

Working Modes	M (conventional M-Mode) AMM (Anatomical M-Mode)
Frequency Range	1 – 18 MHz (probe dependent, 3 steps high, mid, low)
Power control range	1-100%
M Gain range	+15 to -25 dB (1dB 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

Review (memory times)	>60s (32MB)
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Signal processing M:

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

Display Modes:

- M
- 2D+M
- 2D+M/CFM
- 2D+M/HD-Flow
- 2D+M/PD
- 2D+M/TD
- AMM
- 2D+AMM
- 2D/CFM+AMM/CFM
- 2D/HD-Flow+AMM/HD-Flow
- 2D/TD+AMM/TD

Screen Formats: (window arrangement)

- 2D+M and 2D+AMM:
 - up/down (horizontal): three different sub formats 40/60, 50/50, 60/40%
 - left/right (vertical): 50/50%
- 2D+AMM+AMM:
 - left/right-up/right-down: 50/25/25%

M-Color Flow Mode

M-Color Flow Mode for all probes, except Linear probes

Acoustic MCFM Power	1-100%
Frequency Range	1 – 18 MHz (probe dependent, 3 steps high, mid, low)
MCFM Color Maps	8 maps
CFM Gain	±15 dB range (0.1 dB steps)
CFM Velocity Scale Range	PRF: 100Hz to 18kHz
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:	<ul style="list-style-type: none"> • V (Velocity) • V-T (Velocity + Turbulence) • V-P (Velocity + Power) • T (Turbulence) • P-T (Power + Turbulence)
Real-time Triplex Mode	B + M + MCFM in any depth

Spectral Doppler Mode (PW, CW)

Pulsed Wave Doppler Mode for all probes	
Continuous Wave Doppler Mode only for 3Sc-RS, 12S-RS	
Operating Modes	PW (Pulsed Wave Doppler, Single Gate), Steerable CW (Continuous Wave Doppler)
Transmit Frequencies	PW-Doppler: 1.75-18 MHz CW-Doppler: 1.75-16 MHz
Pulse Repetition Frequency (PRF)	PW-Doppler: 0.9-22 kHz CW-Doppler: 1.3-41.7 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	+15 to -25 dB (PW) +15 to -15 dB (CW)
WMF (wall motion filter)	PW: 30...500 Hz, CW: 30...1000 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)	>60s (32MB)
Measurable flow velocities:	
<ul style="list-style-type: none"> • PW: 1cm/s – 8m/s (a=0°, 2.0MHz, max. Baseline shift) 1cm/s – 16m/s (a=60°, 2.0MHz, max. Baseline shift) • CW: 1cm/s – 15.4m/s (a=0°, 2.0MHz, max. Baseline shift) 1cm/s-30.80m/s (a=60°, 2.0MHz, max. Baseline 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: 1s 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, CW or PW)
- 2D+CFM/PW, 2D+PD/PW, 2D+HDFlow/PW (triplex simultaneous, PW only)

Audio Modes

- Stereo (both directions separately in both channels)

Audio Volume

- Adjustable

Color Doppler Mode

Color Doppler Mode for all probes

Screen Formats	2D+CFM (Single, Dual, Quad)
Frequency Range	1 – 16 MHz (probe dependent, 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 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)
Smooth filter	Rise: 12 steps Fall: 12 steps
Gain Control	+15 dB to -15 dB (0.2 dB steps)
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)

Power Doppler Mode for all probes

Screen Formats	2D+PD (Single, Dual, Quad)
Frequency range	1 – 16 MHz (probe dependent, 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: maximum to minimum B-scan angle; Axial: B-scan range
Display mode	P (power)
Wall motion Filter	8 steps (low1, low2, mid1, mid2, high1, high2, max1, max2)
Smooth filter	Rise: 12 steps Fall: 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

HD-Flow Mode for all probes	
Screen Formats	2D+HDF (Single, Dual, Quad)
Frequency range	1 – 16 MHz (probe dependent, 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 Steps	256 color steps
HD-Flow window size lateral	Lateral: maximum to minimum B-scan angle; Axial: B-scan range
Wall Motion Filter	8 steps (low1, low2, mid1, mid2, high1, high2, max1, max2)
Smooth filter	Rise: 12 steps Fall: 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)

Tissue Doppler Mode for all probes, except Linear probes & 8C-RS	
Screen Formats	2D+TD (Single, Dual, Quad)
Frequency range	1 – 16 MHz (probe dependent, 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
TD window size lateral	Lateral: 0 to B-scan range; Axial: 0 to B-scan range
Zero line shift	17 steps
Inversion of color direction	yes
Smooth filter	Rise: 12 steps Fall: 12 steps
Gain Control	+15 dB to -15 dB (0.2 dB steps)
TD Ensemble	3 to 31
TD Line Density	10 steps
Pulse repetition frequency	100 Hz to 20.5 kHz
TD Map	4 different color codes for each probe
Flow Resolution	4 steps (low, mid1, mid2, high)
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

Volume 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

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 from 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/HD-Flow (incl. CRI)
 - 3D/B-Flow
 - 3D Contrast[†] (Coded PI, CCIS)
- 4D
 - Real-Time 4D
 - 4D-Biopsy
 - VCI-A
 - VCI-OmniView
 - STIC

STIC:

- Fetal Cardio
- STIC Angio: B/Power Doppler (incl. CRI)
- STIC CFM: B/Color Doppler (incl. CRI)
- STIC HD-Flow: B/HD-Flow (incl. CRI)
- STIC B-Flow
- STIC TD

Visualization Modes:

- Render
 - 3D/4D Rendering (diverse surface and intensity projection modes)
 - SonoRender^{live}
- Sectional Planes
 - Multiplanar
 - OmniView, actual and projected view
 - Niche
 - SonoVCADlabor
- TUI (Tomographic Ultrasound Imaging) (overview image+parallel slices)
 - TUI Standard
 - SonoVCADheart
- Free movable light source around 3D objects
 - 3D Rendered Image
 - VOCAL object
 - SonoAVC object

Volume Analysis

- VOCAL: semi-auto/ manual segmentation tool , 3D Static only + Threshold Volume
- SonoAVC^{follicle} (Sono Automated Volume Count)
- SonoAVC^{antral}^{2.0}
- VCI (Volume Contrast Imaging)

Render Modes:

- HDLive
- Color
- Surface Enhanced
- Mix Mode of two render modes
- Surface Texture
- Surface Smooth
- Transparency modes: Max, Min, X-ray
- Gradient Light
- Light
- Inversion
- Glass Body

Display graphics:

- Rotation axis, center point
- ROI box, 3D Frame
- Temporary display of onscreen controls (rotation, translation)

Gray maps:

- Slices: 21 (18 + 3 user defined)
- 3D Image: one general map adjustable with brightness (-50 to +50) & contrast (-50 to +50)

Tint maps:

- Slices: 10
- 3D image: 10

Depth render maps: 3

BF (B-Flow)

B-Flow for all probes, except: 3Sc-RS, 12S-RS

Screen Formats	Single (BF), Dual (BF+BF), Quad (BF+BF+BF+BF)
Display Modes	BF, Update: BF/PW
Power control range	1 – 100%
Scan angle	Taken from 2D
Gain range	+15 to -25 dB
Gray scale values	8 bit
SRI	Taken from 2D
Persistence filter	8 steps (pre)
S./PRI	1.0, 1.5, 2.0, 3.0, 4.0, ..., 15.0
Quality	3 steps (pre) low, norm, high
Enhance	6 steps (pre) 0, 1, 2, 3, 4, 5
Gray maps	18
Tint maps	10
Dynamic	12 Steps: 1-12
Accumulation	Off, 0.05, 0.10, 0.20, 0.40, 0.60, 0.80, Infinite
Background	0, 1, 2

Contrast Imaging[†] (not available in all countries)

Probes:

- C1-5-RS
- 9L-RS
- RIC5-9A-RS
- ML6-15-RS
- 3Sc-RS
- 4C-RS

Screen Formats:

- Code PI: Single (B), Dual (B+B), Quad (B+B+B+B)
- CIS: Dual simultan (2D+Coded PI)
- CCIS: Single (B), Dual (B+B), Quad (B+B+B+B)

Low MI Contrast Capabilities

Power control range	1 – 100%
Scan angle	Taken from 2D
Gain range	+15 to -25 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
Quality	3 steps (pre) low, norm, high

Enhance	6 steps (pre) 0, 1, 2, 3, 4, 5
Gray maps	18
Tint maps	10
Dynamic	12 Steps: 1-12
Accumulation	Off, 0.20, 0.35, 0.50, 0.75, 1.00, 1.50, Infinite
Background	0, 1, 2
Time Delay	0, 0.5, 1, 2, 3, ...10
Display Modes:	
• Coded PI	
• Coded PI: CIS	
• Coded PI: CCIS	

Elastography

Probes

- 12L-RS
- ML6-15-RS
- RIC5-9A-RS
- IC9-RS
- IC9B-RS

Screen Formats

- Single (2D/Elasto)
- Dual (2D/Elasto+2D/Elasto)
- Quad (2D/Elasto + 2D/Elasto + 2D/Elasto + 2D/Elasto)

Acoustic Power Range	1 – 100%
Tx Frequency	3 (penet/norm/resol)
Transparency	51 steps 90, 5, 10, ..., 255
Soft compress:	<ul style="list-style-type: none"> • Range: 0 - 9 • Step Size: 1
Hard compress:	<ul style="list-style-type: none"> • Range: 0 - 9 • Step Size: 1
PRF	10, 15, 25, 40, 60, 85 Hz
Elasto Maps	8
Persistence:	<ul style="list-style-type: none"> • Range: 1 - 9 • Step Size: 1
Line Density:	<ul style="list-style-type: none"> • Range: 1 - 2
Filter Axial	<ul style="list-style-type: none"> • Range: 1 - 9 • Step Size: 1
Filter Lateral:	<ul style="list-style-type: none"> • Range: 1 - 21 • Step Size: 2
Window Length:	<ul style="list-style-type: none"> • Range: 8 - 25 • Step Size: 1
Elastography Analysis	
Elastography Ratio Measurements	

Measurements

Generic measurements		
Distance:		
• Distance (Point to Point)	• 2D Trace (Point Length)	
• Distance (Line to Line)	• Stenosis (% Dist.)	
• 2D Trace (Trace Length)	• Ratio D1/D2	
Area/Circumference:		
• Ellipse	• Stenosis (%Area)	
• Trace (Line)	• Area (2 Dist.)	
• Trace (Point)	• Ratio A1/A2	
Volume (following Methods):		
• 1 Distance	• 3 Distance	
• 1 Ellipse		
• 1 Dist. + Ellipse		
Angle:		
• Angle (3 Point)	• Angle (2 Line)	
M-Mode:		
• Distance (Point to Point)	• HR	
• Time	• Stenosis (% Dist.)	
• Slope	• IMT	
• Vessel Diam.	• Stenosis Diam.	
• Ratio D1/D2		
PW Doppler Mode:		
• Auto & Manual Trace:		
• PS (Peak Systole)		
• ED (End Diastole)		
• MD (Mid. Diastole)		
• S/D (Ratio)		
• TAmx		
• HR		
• PI (Pulsatility Index)		
• RI (Resistance Index)		
• Vol. Flow		
• PGmax, PGmean		
• TAmx (Time avg. max. Velocity)		
• TAmx (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
• PS	• PI	• 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 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	

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	
Fetal Weight (FW) Estimation	
Fetal Trend Graph	
Multi-Gestational Calculation & Fetal Compare	
Calculation and Ratios	
Fetal Qualitative Description (Anatomical assessment)	
Fetal Environmental Description (Biophysical profile)	
Summary Reports	

Obstetrics Fetal Echo	
Chambers	
Thorax	
Aorta/LVOT	
Pulmonary/RVOT	
Venous	
FHR	
Tricuspid valve	
Mitral Valve	
Aortic	
Pulmonary	
LPA	
RPA	
Ductus Art.	
Cardiac Output	
LT TEI	
RT TEI	
Ductus Ven.	
Umbilical Vein	
Pulmonary Veins	
Summary Reports	

Obstetrics Z-scores	
Long Axis	Obl. Short axis
Aortic Arch	4 Chambers
Short Axis	Summary Reports
Thorax	

Gynecology calculations
Uterus
Left/Right Ovary
Left/Right Follicle
Fibroid
Endometrial thickness (Dist, Double Dist.)
Cervix Length
Left/Right Ovarian Artery
Left/Right Uterine Artery
Vessels
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
IOTA LR2, Simple Rules and ADNEX Model. <small>(may not be available in all countries)</small>
IETA unenhanced ultrasound examination and enhanced ultrasound examination – Sonohysterography. <small>(may not be available in all countries)</small>
IDEA Protocol <small>(may not be available in all countries)</small>
Uterus classification (ESHRE/ESGE and ASRM)
Summary Reports

Cardiology calculations
2D Mode:
• LV Simpson (Single)
• LA Simpson (Single); RA Simpson
• Volume (Area Length)
• LV-Mass (Epi & Endo Area, LV Length)
• LV (RVD, IVS, LVD, LVPW)
• LVOT Diameter
• RVOT Diameter
• MV (Dist A, Dist B, Area)
• TV (Diameter)
• AV/LA (Aortic Valve/Left Atrium)
• PV (Diameter)
• LA/Ao; Ao/LA
• AoAsc (Diameter)
• PEd (Pericardial Effusion Diameter)
• SVI (Stroke Volume Index: SV/BSA)
• COI (Cardiac Output Index: CO/BSA)
• AVAI (AV Area Index: AVArea/BSA)
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
• TAPSE
PW-Mode:
• MV (Mitral Valve)
• E' as E' sept or E' lat. for MV
• E/e'
• dp/dt for MV & TV
• AV (Aortic Valve), TV (Tricuspid Valve)
• PV (Pulmonary Valve)
• LVOT & RVOT Doppler (Left & Right Ventricle Outflow Tract)
• Pulmonic Veins

<ul style="list-style-type: none"> • PAP (Pulmonary Artery Pressure measurement) • HR (Heart Rate) • TEI-Index 	
CW-Mode:	
• PISA	
Others:	
<ul style="list-style-type: none"> • Diast. Vol (Bi) • Syst. Vol. (Bi) • Stroke Volume • Volume Flow • Cardiac Output • Ejection Fraction • Fractional Shortening • Myocardial Thickness • LA/Ao Ratio • E/A Peak • Peak Gradient Acceleration 	<ul style="list-style-type: none"> • Mean Gradient • Mean Gradient Acceleration • VTI • TVA • PG • PHT • MVA • AVA • ERO • CVP (Cardio Vascular Profile) Score
Summary Reports	

Vascular calculations
2D/ M-Mode/ PW-Mode:
Carotid
• 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
UEA
• Innom. Artery
• Subclav. Artery
• Axill. Artery
• Brach. Artery
• Rad. Artery
• Ulnar. Artery
• SupPalm. Artery
• DeepPalm. Artery
• Graft
UEV
• Innom. Vein
• Subclav. Vein
• Jugular. Vein
• Axill. Vein
• Ceph. Vein
• Ceph. Vein
• Basilic Vein
• Brach. Vein
• Med. Cub. Vein
• Rad. Vein
• Ulnar Vein
Renal Artery
• Renal Artery
• Renal Vein
• Segm. Artery
• Interlob. Artery
• Arcuate Artery

LEA

- Com. Iliac Artery
- Ext. Iliac Artery
- Int. Iliac Artery
- Cim. Fem. Artery
- Prof. Fem. Artery
- Sup. Fem. Artery
- Popl. Artery
- Ant. Tib. Artery
- Post. Tib. Artery
- Peron. Artery
- Dors. Ped. Artery
- Graft

LEV

- IVC
- Com. Iliac Vein
- Ext. Iliac Vein
- Int. Iliac Vein
- Gr. Saph. Vein
- Popl. Vein
- Com. Fem. Vein
- Sup. Fem. Vein
- Prof. Fem. Vein
- Low Saph. Vein
- Ant. Tib. Vein
- Post. Tib. Vein

TCD

- MCA
- ACA
- PCA
- A com. Artey
- P com. Artey
- Vertebral
- Basilaris
- Summary Reports

Cephalic calculations

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

Pediatric calculations

Left/Right Hip Joint

Pericallosal Artery

Summary Report

Transrectal calculations

Prostate

Vessel

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

OB Tables

Age Tables

- AC: ASUM, BMUS, CFEF, CFEF 2006, Chitty, Hadlock_82, Hadlock_84, Hansmann, Hobbins, Jeanty, JSUM, Kurmanavicius, Leung, Merz, Nicolaides, Shinozuka, Siriraj, Tokyo
- AD: Persson
- APAD: Merz
- APTD: Hansmann
- APTDxTTD: Shinozuka, Tokyo
- BOD: Jeanty
- BPD: ASUM, ASUM (old), Campbell, CFEF, CFEF 2006, Chitty (outer-outer) (outer-inner), Eik-Nes, Hadlock_82, Hadlock_84, Hansmann, Hobbins, Jeanty, Johnsen, JSUM, Kurmanavicius, Kurtz, Leung, McLennan, Merz, Nicolaides, OSAKA, Persson, Rempen, Sabbagha, Shinozuka, Siriraj, Tokyo, UltraARG, Verburg
- CEREB: Chitty, Goldstein, Hill, Hobbins, Nicolaides, Verburg
- CLAV: Yarkoni
- CRL: ASUM, DAYA, Eik-Nes, Hadlock, Hansmann, Intergrowth, JSUM, McLennan, Nelson, OSAKA, Persson, Pexters, Rempen, Robinson, Robinson_BMUS, Sahota, Shinozuka, Tokyo, Verburg
- FL: ASUM, CFEF, CFEF 2006, Chitty, Eik-Nes, Hadlock_82, Hadlock_84, Hansmann, Hobbins, Hohler, Jeanty, Johnsen, JSUM, Kurmanavicius, Leung, Merz, Nicolaides, O'Brien, OSAKA, Persson, Shinozuka, Siriraj, Tokyo, UltraARG, WARDA,
- FTA: OSAKA
- FTA (rectangle) AxT: Shinozuka, Tokyo
- FIB: Jeanty
- GS: Hansmann, Hellman, Holländer, Nyberg, Rempen, Tokyo
- HC: ASUM, BMUS, CFEF, CFEF 2006, Chitty, Hadlock_82, Hadlock_84, Hansmann, Jeanty, Johnsen, Kurmanavicius, Leung, Merz, Nicolaides, Siriraj, Verburg
- 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_84, Hansmann, Jacot-Guillarmod, Intergrowth, Jeanty, Johnsen, JSUM, Lai_Yeo, Kurmanavicius, Lessoway, Leung, Merz, Medvedev, Medvedev_2014, Nicolaides, Paladini, Shinozuka, Siriraj, STORK dichorionic, STORK monochorionic, Tokyo, Verburg, WHO
- AD: Persson
- AFI: Moore
- Aorta: Vmax: Rizzo
- APAD: Merz
- APTD: Hansmann
- AxT: Shinozuka (APTDxTTD), Tokyo
- AVol: Lee
- BOD: Jeanty
- BPD: ASUM, Campbell, CFEF, Chitty (outer-outer), Eik-Nes, Hadlock_84, Hansmann, Intergrowth, Jacot-Guillarmod, Jeanty, JSUM, Kurmanavicius, Lai_Yeo, Lessoway, Leung, Persson, Medvedev, Medvedev_2014, McLennan, Merz, Nicolaides, OSAKA, Paladini, Sabbagha, Shinozuka, Siriraj, STORK dichorionic, STORK monochorionic, Tokyo, Verburg, WHO
- CLAV: YARKONI
- CM: Nicolaides

<ul style="list-style-type: none"> • CRL: ASUM, Hadlock, Hansmann, Intergrowth, JSUM, McLennan, Medvevev, OSAKA, Persson, Pexters, Robinson, Robinson_BMUS, Shinozuka, Tokyo • DV a/S: JSUM • DV Pl: Baschat, JSUM • DV PLI: Baschat • DV PVIV: Baschat • DV S/a: Baschat • FL: ASUM, CFEF, Chitty, Eik-Nes, Hadlock_84, Hansmann, Intergrowth, Jacot-Guillarmod, Jeanty, Johnsen, JSUM, Kurmanavicius, Lessoway, Lai_Yeo, Lessoway, Leung, Medvedev, Medvedev_2014, Merz, Nicolaides, O'Brien, OSAKA, Paladini, Persson, Shinozuka, Siriaj, STORK dichorionic, STORK monochorionic, Tokyo, Verbarg, WARDA, WHO • FTA: OSAKA • FIB: Chitty, Jeanty, JFFSD, Siriraj • Foot: Chitty • GS: Hellman, Nyberg, Rempen, Tokyo • HC: ASUM, CFEF, Chervernak, Chitty, Hadlock_84, Hansmann, Intergrowth, Jacot-Guillarmod, Jeanty, Johnsen, Kurmanavicius, Lai_Yeo, Lessoway, Leung, Medvedev, Medvedev_2014, Merz, Nicolaides, Paladini, Siriraj, STORK dichorionic, STORK monochorionic, Verbarg, WHO • HL: ASUM, Chitty, Jeanty, JFFSD, Lai_Yeo, Merz, Medvedev, Medvedev_2014, OSAKA, Paladini, Siriraj, WHO • IVC PLI: JSUM • Lt.Tei(ICT,IRT), Lt.Tei(a,b): Bhorat • Lung Area Left/Right: Peralta • LV: Tokyo • MCA CP: Ebbing • MCA Pl: Bahlmann, Ebbing, JSUM • MCA Ri: Bahlmann, JSUM • MCA PS: Mari • MAD: Eik-Nes, eSnurra, Kurmanavicius • MV E/A: HARADA • NBL: BUNDUKI, Medvedev, Orlandi, SONEK • NT: Nicolaides • OFD: ASUM, Chitty, Hansmann, Intergrowth, Jeanty, Kurmanavicius, Medvedev, Medvedev_2014, Merz, Nicolaides • 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, Verbarg • TIB: Chitty, Jeanty, JFFSD, Merz, Paladini, Siriraj • TTD: Hansmann • TV E/A: HARADA • TVol: Lee • ULNA. Chitty, Jeanty, JFFSD, Merz, Paladini, Siriraj • UmbArt Pl: Ebbing, JSUM, Merz • UmbArt Ri: JSUM, Merz, Kurmanavicius • UtArtPl: Gomez, Merz • UtArtRi: Merz • Vermis A: Malinger • Vermis C: Malinger

Fetal Weight Estimation (EFW)
<ul style="list-style-type: none"> • 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)

<ul style="list-style-type: none"> • Lee (AVOL; AC, AVOL; AC, BDP, AVOL; TVOL; AC, TVOL; AC, BDP, TVOL) • Merz (AC, BPD) • Osaka (BPD, FTA, FL) • Persson 1 (BPD, MAD, FL) • Persson 2, Schild (HC, AC, FL) • 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 <ul style="list-style-type: none"> • Hadlock, JSUM 2001, Osaka, Shinozuka, Tokyo Fetal Weight Growth FWG <ul style="list-style-type: none"> • Alexander, Ananth, Bourgogne, Brenner, Burgundy, Burgundy (m, f), CFEF, Doubilet, Duryea, Duryea (m, f), Ego, Ego (m, f), Eik-Nes, Hadlock, Hansmann, Hansmann_86, Hobbins/Persutte, Intergrowth, Johnsen(m, f), JSUM, Kramer (m, f), Osaka, Persson_96, Persson_98, Shinozuka, Tokyo, Williams, WHO, Yarkoni

Fetal Ratios
CI (BPD/OFD) (Hadlock)
FL/AC (Hadlock)
FL/BPD (Hohler)
FL/HC (Hadlock), (WHO)
HC/AC (Campbell)
LTR (Lung Area/ Thorax Area) (Hasegawa)
Va/Hem (Hansmann, Nicolaides)
Vp/Hem (Nicolaides)
LHR (Peralta)
CVR (Peranteau)

Probes (some probes may not be available in all countries)

C1-5-RS	
Wide Band Convex Probe	
Applications	Abdomen, Obstetrics, Gynecology
Max. Bandwidth (-20dB)	2 – 5MHz
Number of Elements	192
Convex Radius	56.1 mm
Volume Sweep Radius	n/a
FOV	70°
FOV (max)	114°
Foot Print	69.3 x 17.2 mm
Depth	Max. 42 cm
Center Frequency	3.4 MHz
B-Mode Frequency	2.78 – 3.70 MHz
Doppler Frequency	2.00 - 3.23 MHz
Harmonic Frequency	2.00 - 2.13 MHz
Biopsy Guide Available	Multi-Angle, disposable with reusable bracket

4C-RS	
Wide Band Convex Probe	
Applications	Abdomen, Obstetrics, Gynecology
Max. Bandwidth (-20dB)	2 – 5MHz
Number of Elements	128
Convex Radius	60.0 mm
Volume Sweep Radius	n/a
FOV	58°
FOV (max)	81°
Foot Print	68.7 x 18.3 mm
Depth	Max. 42 cm
Center 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
Biopsy Guide Available	Multi-Angle, disposable with reusable bracket

IC9-RS	
Wide Band Micro-Convex Probe	
Applications	Obstetrics, Gynecology, Transrectal
Max. Bandwidth (-20dB)	2.9 – 9.7MHz
Number of Elements	192
Convex Radius	9.2 mm
Volume Sweep Radius	n/a
FOV	150°
FOV (max)	185°
Foot Print	19.6 x 13.6 mm
Depth	Max. 16 cm
Center 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; disposable biopsy guide

IC9B-RS	
Wide Band Micro-Convex Probe	
Applications	Obstetrics, Gynecology, Transrectal
Max. Bandwidth (-20dB)	2.9 – 9.7MHz
Number of Elements	192
Convex Radius	9.2 mm
Volume Sweep Radius	n/a
FOV	150°
FOV (max)	185°
Foot Print	19.6 x 13.6 mm
Depth	Max. 16 cm
Center 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; disposable biopsy guide

8C-RS	
Wideband Micro-Convex Probe	
Applications	Abdominal, Small Parts, Cardiology, Peripheral Vascular, Pediatrics
Max. Bandwidth (-20dB)	4 - 10 MHz
Number of Elements	128
Convex Radius	11.4 mm
Volume Sweep Radius	N/A
FOV	80°
FOV (max)	131°
Foot Print	22.0 x 12.0 mm
Depth	Max. 16 cm
Center Frequency	6.5MHz
B-Mode Frequency	4.35 - 7.14 MHz
Doppler Frequency	4.76 - 6.67 MHz
Harmonic Frequency	4.17 - 4.17 MHz
Biopsy Guide Available	n/a

12L-RS	
Wide Band Linear Probe	
Applications	Small Parts, Pediatrics, MSK, Vascular, Breast
Max. Bandwidth (-20dB)	4 – 12 MHz
Number of Elements	192
Volume Sweep Radius	n/a
FOV	38.4 mm
Foot Print	47.2 x 13.8 mm
Depth	Max. 11 cm
Color Doppler Steering Angle	7°/14°/20°
Center 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
Biopsy Guide Available	Multi-Angle, disposable with reusable bracket

9L-RS	
Wide Band Linear Probe	
Applications	Small Parts, Obstetrics, Peripheral Vascular, Pediatrics, MSK
Max. Bandwidth (-20dB)	3-8 MHz
Number of Elements	192
Volume Sweep Radius	n/a
FOV	44 mm
Foot Print	53.0 x 14.1mm
Depth	Max. 14 cm
Color Doppler Steering Angle	7°/14°/20°
Center 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
Biopsy Guide Available	Multi-Angle, disposable with reusable bracket

ML6-15-RS	
Wideband Matrix Linear Probe	
Applications	Small Parts, Peripheral Vascular, Pediatrics, MSK, Breast
Max. Bandwidth (-20dB)	4-13 MHz
Number of Elements	1008
Volume Sweep Radius	n/a
FOV	50 mm
Foot Print	60.7 x16.0 mm
Depth	Max. 16 cm
Color Doppler Steering Angle	7°/14°/20°
Center Frequency	9.0 MHz
B-Mode Frequency	8.33 - 11.11 MHz
Doppler Frequency	6.25 - 9.09 MHz
Harmonic Frequency	5.00 - 6.25 MHz
Biopsy Guide Available	Multi-Angle, disposable with reusable bracket

12S-RS	
Wideband Phased Array Probe	
Applications	Small Parts, Cardiology, Pediatrics
Max. Bandwidth (-20dB)	4-12 MHz
Number of Elements	96
Volume Sweep Radius	n/a
FOV	90°
Foot Print	21.0 x 14.5mm
Depth	Max. 13.7 cm
Center Frequency	8 MHz
B-Mode Frequency	5.88 - 9.09 MHz
Doppler Frequency	5.00 - 6.67 MHz
Harmonic Frequency	4.76 - 5.00 MHz
Biopsy Guide Available	n/a

3Sc-RS	
Wide Band Phased Array Probe	
Applications	Abdominal, Cardiology, Obstetrics, Pediatrics, Cephalic
Max. Bandwidth (-20dB)	1 – 4 MHz
Number of Elements	64
Volume Sweep Radius	n/a
FOV	90°
Foot Print	27.6 X 19.3 mm
Depth	Max. 23.7 cm
Center 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
Biopsy Guide Available	Multi-Angle, disposable with reusable bracket

RAB6-RS	
Wide Band Convex Volume Probe	
Applications	Abdomen, Obstetrics, Gynecology, Pediatrics
Max. Bandwidth (-20dB)	2 – 8 MHz
Number of Elements	192
Convex Radius	47.0 mm
Volume Sweep Radius	24.11 mm
FOV	B-Mode: 63° Volume scan: 85° x 63°
FOV (max)	B-Mode: 90° Volume scan: 85° x 90°
Foot Print	62.2 x 34.0 mm
Depth	Max. 26 cm
Center Frequency	4.4 MHz
B-Mode Frequency	3.23 – 6.67 MHz
Doppler Frequency	3.03 – 5.00 MHz
Harmonic Frequency	2.56 – 3.33 MHz
Biopsy Guide Available	Multi-Angle, disposable with reusable bracket

RIC5-9A-RS	
Wide Band Micro-Convex Volume Probe	
Applications	Obstetrics, Gynecology, Transrectal
Max. Bandwidth (-20dB)	3.8 - 9.3 MHz
Number of Elements	192
Convex Radius	10.0 mm
Volume Sweep Radius	11.7 mm
FOV	B-Mode: 150° Volume scan: 120° x 150°
FOV (max)	B-Mode: 184° Volume scan: 120° x 184°
Foot Print	26.2 x 27.8 mm
Depth	Max. 16 cm
Center Frequency	6.5 MHz
B-Mode Frequency	4.55 - 8.33 MHz
Doppler Frequency	4.55 - 6.25 MHz
Harmonic Frequency	3.57 - 3.85 MHz
Biopsy Guide Available	PEC 63, Single-Angle, reusable; disposable biopsy guide

Connectivity

External Inputs and Outputs
External Connectivity <ul style="list-style-type: none">• HDMI• VGA port• S-Video (integrated video converter option)• Composite BNC (integrated video converter option)• Network (RJ45)• USB 2.0 (2x in monitor, 1x in rear)• USB 3.0 (2x in front)• External Audio Out• AC Power Input• Probe connector

Service Tools
OnWatch system monitoring and proactive diagnostics
InSite™ Remote diagnostic support

Safety Conformance

The Voluson S8 BT22 is:

- Including national deviations
- Classified to ANSI/AAMI 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 Regulation (EU) 2017/745 on Medical Devices Conforms to the following standards for safety:
 - IEC/EN 60601-1 3.1 Edition. Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
 - IEC/EN 60601-1-2 Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance - Collateral Standard: Electromagnetic disturbances - Requirements and tests
 - IEC/EN 60601-1-6 Medical electrical equipment Part 1 -6: General requirements for basic safety and essential performance – Collateral Standard: Usability
 - IEC/EN 60601-2-37 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/ISO15223-1 Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied - Part 1: General requirements
 - ISO 10993-1 Biological evaluation of medical devices – Part 1 Evaluation and testing
 - ISO14971 Medical devices - Application of risk management to medical devices
- EMC Emissions Group 1, Class B device requirements as per Sub clause 5 of CISPR 11
- WEEE (Waste Electrical and Electronic Equipment)
- ROHS according to 2011/65/EU
- Wireless equipment shall be certified to FCC, RED and Japan Radio Law.
- Medical Device Good Manufacturing Practice Manual issued by the FDA (Food and Drug Administration, Department of Health, USA)

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Germany

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Hino-shi, Tokyo 191-8503
Japan

North America GE Healthcare

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Wauwatosa, WI 53226
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