Voluson E8

Ultra sound future

Product description

The Voluson® E8 is a premier imaging system delivering a new generation of image quality combined with groundbreaking diagnostic tools and its unique leading volume ultrasound technology.

Highlights

- Matrix array volume technology
- SonoVCAD – Sonography-based Volume Computer Aided Diagnosis
- High resolution transvaginal probe
- High resolution flat panel display
- Electrical height adjustment
- Floating user interface
- TruScan™ architecture
- On-board archive including preview and pre selection

Figure 1. Voluson E8 with Volume Ultrasound technology
**General Specifications**

**Dimensions and Weight**
- Height: 1290 mm (50.8 in)
  - Adjustable: +200 mm (7.9 in)
- Width: 580 mm (22.8 in)
- Depth: 930 mm (36.6 in)
  - Adjustable: +200 mm (7.9 in)
- Weight (no Peripherals): 120 kg (265 lb)

**Electrical Power**
- Voltage: 100-130/220-240 Vac
- Frequency: 50/60 Hz
- Power: Max. 1000 VA with on-board peripherals
- Thermal Output: 3446 BTU/h

**Console Design**
- 3 Active Probe Ports
  - (plus 1 non-imaging port)
- Integrated HDD (160 GB)
- Integrated DVD+R(W) / CD-R(W) drive
- On-board storage for Peripherals
- Wheels
  - Wheel diameter 150 mm
- Integrated locking mechanism that provides rolling lock
- Integrated cable management
- Provides rolling lock
- Height adjustable +200 mm (7.9 in)
- Depth: 930 mm (36.6 in)
  - Adjustable: +200 mm (7.9 in)
- Width: 580 mm (22.8 in)
- Height: 1290 mm (50.8 in)
  - Adjustable: +200 mm (7.9 in)
- Front and rear handles

**User Interface**

**Operator Keyboard**
- Floating Keyboard:
  - Rotation: adjustable +/- 40° from center
- Height adjustable + 200mm
- Full-sized, backlit alphanumeric keyboard
- Ergonomic hard key layout
- Interactive back-lighting
- Integrated recording keys for remote control of up to 4 Peripherals or DICOM devices

**Touch Screen**
- 10.4 in High Resolution color LCD screen
- Interactive dynamic software menu
- Brightness adjustable

**Monitor**
- 15” LCD monitor
- High brightness with 350 cd/m²
- Tilt/Rotate Adjustable Monitor
  - Tilt Angle: + 10°/- 90°
  - Rotate Angle: 360°
- Digital brightness & contrast adjustment

**System Overview**

**Applications**
- Abdominal
- Obstetrical
- Gynecological
- Small parts
- Vascular / Peripheral
- Pediatric and Neonatal
- Urological
- Cardiology
- Neurology
- Orthopedic

**Operating Modes**
- B-Mode (2D)
- M-Mode (M)
- M-Color-Mode (MC)
- Power Doppler Imaging (PD)
- Tissue Doppler Imaging (TD)
- HD-Flow Imaging (HD-Flow)
- PW Doppler with high PRF (PW)
- B-Flow (BF)
- Extended View (XTD View)
- Coded Contrast Imaging
  - (Contrast Media)
- Volume Mode (3D/4D):
  - 3D Static
  - 4D Real Time
  - VCI-A, VCI-C
  - STIC / Color, Angio, HD-Flow, Contrast & B-Flow
  - 4D Biopsy

**Scanning Methods**
- Electronic Sector
- Electronic Convex
- Electronic Linear
- Mechanical Volume Sweep

**Transducer Types**
- Sector Phased Array
- Convex Array
- Microconvex Array
- Linear Array
- Volume probes ‘4D’:
  - Convex Array
  - Microconvex Array
  - Linear Array
  - 1.5D Convex array
  - 2.5D Convex Array
  - 1.25D Linear Array

**System Standard Features**
- State-of-the-art user interface with high resolution 10.4 inch LCD touch panel
- Automatic Tissue Optimization
- Tissue Doppler
- Coded Harmonic Imaging
- Coded Excitation (CE)
- HD-Flow
- XTD
- SRI III (Speckle reduction imaging)
- CrossXBeamCRI (Compound Resolution Imaging)
- Static 3D Mode:
  - B Mode only
- B + Power Doppler Mode
- B + CFM Doppler Mode
- B + HD-Flow Mode
- B + CRI
- B + CRI + CFM
- B + CRI + PD
- B + CRI + HD-Flow
- B + Contrast
- B + B-Flow

**Focus & Frequency Composite (FFC)**
- High Resolution Zoom
- Pan Zoom
- Steering
- Virtual Convex
- Beta-View
- Patient information database
- Image Archive on hard drive
- 3D/4D data compression (lossy/lossless)
- Inversion
- Real-time automatic Doppler calcs
- Measurement & Calculations including Worksheets/Report for:
  - OB
  - GYN
  - Vascular
  - Cardio
  - Abdominal
  - Small-Parts
  - Urology
  - Pediatrics
  - Ortho
  - Neurology
- Multigestational Calculations

**System Options**
- 4D Real Time
- VOCAL II
- VCI (Volume Contrast Imaging)
- SonoVCAD
- DICOM
- 4D – STIC:
  - STIC
  - STIC + Power Doppler Mode
  - STIC + CFM Doppler Mode
  - STIC + HD-Flow Mode
  - STIC + CRI
  - STIC + CRI + CFM
  - STIC + CRI + PD
  - STIC + CRI + HD-Flow
  - STIC + Contrast
  - STIC + B-Flow
  - B-Flow
- T.U.I – Tomographic Ultrasound Imaging
- Coded Contrast Imaging
- Foot Switch, with programmable functionality

**Peripheral Options**
- Integrated printers:
  - B&W thermal printer
  - Color thermal printer
- DVD Recorder
- ECG Digital Module
- External Color PC desktop printer & connection kits
Display Modes
- Simultaneous Capability
  - B+PW
  - B+CFM, B+PD, B+TD, B+HD-Flow
  - B+M
  - B+3D, B+4D
  - B+CRI
  - B+SRI
  - B+CRI+SRI
  - BF+SRI
  - Contrast+SRI
  - B+CRI/3D+CRI
  - B+SRI/3D+SRI
  - B+CRI+SRI/3D+CRI+SRI
  - B+CRI/4D+CRI
  - B+SRI/4D+SRI
  - B+CRI+SRI/4D+CRI+SRI
  - 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
  - Real-time Triplex Mode
    - B/CFM/PW
    - B/HD/Flow
    - B+HD-Flow/PW
  - Selectable alternating Modes
    - B+PW
    - B+CFM+PW
    - B+PD+PW
    - B+HD-Flow+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 or B/TD or B+HD-Flow or
        B+F+B, Contrast + Contrast
      - split: B+B/CFM or PD or HD-Flow
      - split: B+B/CFM or M
      - split: Frame Review / XTD-View
        quad: 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
      - Independent Cine playback
        Quad: A+B+C+3D or 4D
        3x3: T.U.I Overview + 8 parallel
        slices
        Quad: T.U.I Overview + 3 parallel
        slices
      - Split: T.U.I Overview + 1 slice
      - Zoom Read/Write (with or without
        overview image)
    - Colorized Image
      - Colorized B
      - Colorized M
      - Colorized PW
      - Colorized 3D
    - Time line display
      - Independent Dual B/PW Display
    - Zoom Start/Depth
      - B-Mode
        - User program
        - Receiver Frequency
        - Acoustic Power
        - Gain
        - Dynamic Contrast
        - Gray Map
        - Edge Enhance
        - Persistence
        - SRI, CRI
        - Focal Zone Markers
        - Depth Scale Marker
        - Probe Orientation
      - M-Mode
        - Gain
        - Dynamic Contrast
        - Edge Enhance
        - Reject
        - M-Cursor
        - Time Scale
      - Doppler Mode
        - Acoustic Power
        - Gain
        - Angle
        - Sample Volume Depth and Width
        - Wall Filter
        - Velocity or Frequency Scale
        - Spectrum Inversion
        - Time Scale
        - PRF
        - HPFR
        - Doppler Frequency
      - Color Flow Imaging Modes (CFM, PD,
        TD, HD-Flow)
        - Acoustic Power
        - Color Gain
        - Color Balance
    - Display Formats
      - Top/ Bottom selectable format
        (Size: 1/2:1/2, 1/3:2/3, 2/3:1/3)
      - Left/Right selectable format (Size:
        1/2:1/2, 1/3:2/3, 2/3:1/3)
    - Display Annotation
      - Patient Name:
        - Last: max 32 characters
      - First: max 15 characters
      - Middle: max 15 characters
      - ID: max 32 characters
      - Accession #: max 16 characters
      - Birth date (selectable)
        - MM/DD/YYYY
        - DD/MM/YYYY
        - YYYY/MM/DD
      - Date: 2 types selectable
        - 24 hours
        - 12 hours
      - Probe Name
      - Application Name
      - Gray Scale bar
      - Depth Scale
      - Focal Zone Marker
      - Frame Rate
      - Zoom Start/Depth
      - B-Mode
        - User program
        - Receiver Frequency
        - Acoustic Power
        - Gain
        - Dynamic Contrast
        - Gray Map
        - Edge Enhance
        - Persistence
        - SRI, CRI
        - Focal Zone Markers
        - Depth Scale Marker
        - Probe Orientation
      - M-Mode
        - Gain
        - Dynamic Contrast
        - Edge Enhance
        - Reject
        - M-Cursor
        - Time Scale
      - Doppler Mode
        - Acoustic Power
        - Gain
        - Angle
        - Sample Volume Depth and Width
        - Wall Filter
        - Velocity or Frequency Scale
        - Spectrum Inversion
        - Time Scale
        - PRF
        - HPFR
        - Doppler Frequency
      - Color Flow Imaging Modes (CFM, PD,
        TD, HD-Flow)
        - Acoustic Power
        - Color Gain
        - Color Balance
        - Color Map
        - Color Scale: 2 types
          - Power and Symmetrical Velocity
          - Imaging
        - Color Velocity Range
        - Spectrum Inversion
        - 3D/4D Mode
          - 3D/4D Sub Program
          - Threshold
          - Quality
          - Volume Box Angle
          - Mix
          - Acquisition Mode
          - Compression
          - Orientation Markers
          - T.U.I.: slice distance (0.5-10mm)
          - T.U.I.: slice position in overview
            image
          - Sonocorad
          - TGC Curve
          - Cine Frame Number
          - Recorder Status
          - Body Pattern: 111 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
          - Power output (%)
          - Biopsy Guide Line
          - ECG Line
          - Trackball function (Trackball and
            Trackball buttons)
          - GE Logo
          - Zoom overview image (zoom box
            position)

System Parameters

System Setup
- Pre-programmable Categories date
  format.
- User Programmable Preset
  Capability, User program etc.
- Languages: English, French, German,
  Spanish, Italian + additional
  languages loadable
- EUM Languages: English, German,
  Spanish, Portuguese, Italian, French,
  Mandarin Chinese, Japanese
- Up to 400 Programmable
  Annotations organized in 10
  anatomical groups

Measure Setup
- M&A Setup including Add, Delete,
  Edit and Recorder of measure items
- Application Setup including several
  parameters of Measurement,
  Doppler Trace and Calculation
  presets
Pre-Processing
- Write Zoom up to 8x
- B/M-Mode
  - Gain
  - TGC
  - Dynamic Range
  - Acoustic Output
  - Transmission Focus Position
  - Transmission Focus Number
  - Transmission Frequency
  - Edge Enhancement
  - Persistence Control
  - Line Density Control
  - Reject
  - Sweep Speed
  - M-Cursor position
- PW-Mode
  - Gain
  - Dynamic Range
  - Acoustic Output
  - Transmission Frequency
  - PRF
  - Wall Filter
  - Sample Volume Gate
  - Length, Depth, Pos
  - Velocity Scale
  - Sweep Speed
- Color Flow Imaging Modes (CFM, PD, TD, HD-Flow)
  - Gain
  - Acoustic Output
  - PRF
  - Wall Motion Filter
  - Line density
  - Ensemble
  - Dynamic
  - 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/M-Mode
  - Gray Map
  - Colorized B and M
  - Speckle Reduction Imaging (SRI III)
- PW Mode
  - Gray Map
  - Baseline Shift
  - Angle Correction
  - Colorized D
  - Scale (KHz, m/s, cm/s)
  - Trace
  - Invert
- Color Flow Imaging Modes (CFM, PD, TD, HD-Flow)
  - Color Map
  - Display Threshold
  - Display Mode (V, V-T, T, P, T, P-T) (CFM only)

Image Processing and Presentation
- Digital Beamformer
- 16896 system processing channel technology
- Displayed Imaging Depth: 0 – 30 cm
- Minimum Depth of Field: 0 – 1 cm
  (Zoom, probe dependent)
- Maximum Depth of Field: 0 – 30 cm
  (probe dependent)
- Transmission Focus
  - 1- 5 Focus Points selectable (probe and application dependent)
  - Focal Zone position, up to 7 steps
- Continuous Dynamic Receive Focus
  / Continuous Dynamic Receive Aperture
  - 256 shades of gray
  - 16,8 Mio Colors 24 bit
  - Up to 180 dB Dynamic. Range adjustable by selecting 12 Dynamic Contrast Curves
- Image Reverse: Right/ Left
  - Rotation: 0°, 180°

CINE Memory/Image Memory
- CINE Memory: up to 256 MB (up to 3000 2D images)
- Dual Image CINE Display
- Quad Image CINE Display
- CINE image number display
- CINE Review Loop
- CINE Review Speed: 4 speeds:
  - 25/50/100/200%
- Length of CINE Sequence Review selectable (start/end image)
- Measurements/ Calculations & Annotations on CINE Playback

Image/Volume Storage
- On-board data storage software:
  - Image data stored as:
    - Raw Data file (proprietary format)
    - DICOM file (Single- or Mulitframe)
  - Volume file:
    - Format: proprietary
    - Size: typically: 0.8 - 5MB (depending on probe and adjusted volume size)
  - 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).
- Cine Review

Scanning Parameters
B-Mode
- B Acoustic Power: 1-100%
- B Gain: +/- 15dB range, 1dB steps
- Slide pots: +/- 15dB
- Dynamic Range: max 180 dB, 12 dynamic Contrast curves
- Persistence: 8 steps
- B Gray Scale Map: 12 maps
- B Edge Enhancement: 5 steps
- Line Filter: 3 steps
- Reject: range 0-255, step size 5,
- Frequency Selection: 3 steps (multi-frequency, wideband probes)
- Quality (Line Density): 3 steps
- Scanning Size (FOV or Angle)
- Depending on probe
- B Colorization: 6 chroma maps
- BetaView (Volume probes only)
- 3 Display Formats (60:40, 50:50, 40:60)
M-Mode
- M Acoustic Power: 1-100%
- M Gain: +/-15dB range, 1dB steps
- Slide pots: +/- 15dB
- Dynamic Range: max. 180 dB, 12 Dynamic Contrast curves
- M Gray Scale Map: 12 maps
- M Edge Enhancement: 5 steps
- M Sweep Speed: 4 types
- M Colorization: 6 chroma maps
- M Reject: range 0-255, step size 5,

M-Color Flow Mode
- Acoustic MCFM Power: 1-100%
- Frequency range: 1-15Mhz
  (Depending on the probe, 3 steps high, mid, low)
- MCFM Color Maps: 8 maps
- CFM Gain: +/-15dB range, 1 dB steps
- CFM Velocity Scale Range:
  PRF: 100Hz to 13kHz
- Wall 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-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)
- Acoustic Power: 1-100%
- Transmit Frequency Range:
  - PW: 1 – 15Mhz
- Gain: +/-25dB range, 1dB steps
- Displayed Dynamic Range: 10 – 40 dB, 2 dB steps
- Gray Scale Map: 12 maps
- PW Wall Filter: 70 – 500Hz, 7 steps, PRF dependent
- Colorization: 6 chroma maps
- PW PRF: 1.3 – 22.0 kHz
- PW: Velocity Scale Range
  (Depending on the probe Frequency)
  - 2MHz, 0°, max. zero shift range: 1cm/s - 8m/s
  - 2MHz, 60°, max. zero shift range: 1cm/s - 16m/s
- PW Sweep Speed:
- Time Resolution:
  - Simplex 2.2, 3.3, 4.4, 6.6, 10 msec
  - Duplex/Triplex 4.4, 6.6, 10 msec.
- Sample Volume Length: (7mm, 1-10 (steps 1mm), 15mm)
- Spectrum Analyzer (FFT):
  - max: 256 channels
  - 255 amplitude levels
  - Angle Correction: ± 0-85°, 1° step
  - Available before Freeze and after Freeze
  - Steered Linear: 0° - 25°
  - (Depending on probe)
- Spectrum Inversion
- Baseline Shift: +/- 8 steps from center
- Doppler Auto Trace

Power Doppler Imaging (PD)
- Acoustic Power: 1-100%
- Frequency range: 1-15Mhz
  (Depending on the probe, 3 steps high, mid, low)
- PD Color Maps: 8 maps
- Gain: +/-15dB range, 0.2 dB steps
- Velocity Scale Range:
- PRF: 100Hz to 11kHz
- Wall Filter: 8 – 3000 Hz, 7 steps
- Ensemble (color shots per line) 7-31, step size 1
- Line Density: 10 steps
- HD Velocity Scale Range:
  - max: same as B-image size
  - Maximum Steer-able Angle
  - +/- 25 ° (probe dependent)
  - HD Spectrum Inversion
  - HD Baseline Shift: 17 steps
  - Pre-settable and independently adjustable B-M Mode Gain in B/CDFM-Mode
  - HD CFM Threshold: 1 – 255 steps
  - Balance: 25 – 225, step size 5
  - Artifact suppression: on/off
  - Color Display Mode:
    - V (Velocity)
    - V-T (Velocity + Turbulence)
    - V-P (Velocity + Power)
    - T (Turbulence)
    - P-T (Power + Turbulence)
  - Real-time Triplex Mode:
    - B + MCFM/PW in any depth
  - 5 Scales (kHz, cm/s, m/s)
  - HD Spectrum Inversion
  - HD Baseline Shift: 17 steps
  - Pre-settable and independently adjustable B-M Mode Gain in B/HDF-Mode
  - HD CFM Threshold: 1 – 255 steps
  - Balance: 25 – 225, step size 5
  - Artifact suppression: on/off
  - Real-time Triplex Mode:
    - B + HD-Flow/PW in any depth

Tissue Doppler Imaging (TD)
- Acoustic Power: 1-100%
- Frequency range: 1-15Mhz
  (Depending on probe, 3 steps high, mid, low)
- TD Color Maps: 4 maps
- Gain: +/-15dB range, 1 dB steps
- Velocity Scale Range:
  - PRF: 100Hz to 11kHz
  - Wall Filter: 8 – 3000 Hz, 7 steps
  - Ensemble (color shots per line) 7-31, step size 1
  - Line Density: 10 steps
• Gentle color filter
  • Line Filter: 8 steps
  • Smooth filter:
  • Rise: 12 steps
  • Fall: 12 steps
  • TD Window size:
  • Max: same as B-image size
  • CFI Spectrum Inversion
  • Pre-settable and independently adjustable B-Mode Gain in B/TD-Mode
  • TD Threshold: 1 – 255 steps
  • Balance: 25 – 225, step size 5
  • Real-time Triplex Mode:
    • B + TD/PW in any depth

**Auto Optimization**
- Available in:
  • B-Mode
  • PW Doppler

**Coded Excitation (CE)**
- Available on the following probes:
  • M6C-D
  • RAB4-8P
  • RIC6-12-D
  • RIC5-9-D

**Coded Harmonic Imaging**
- Harmonic Imaging
- Available on all probes

**Compound Resolution Imaging (CRI)**
- CRI
- 1–8 steps selectable
- Available on all probes

**Focus Frequency Composite (FFC)**
- Available on the following probes:
  • M6C-D
  • 4C-D
  • RAB2-5-D
  • RAB4-8-D
  • RIC6-12-D
  • RIC5-9-D

**Speckle Reduction Imaging (SRI III)**
- 1–12 steps selectable
- Available on all probes

**Volume Mode (3D/4D)**
- Acquisition Modes:
  - 3D Static: B-Mode (incl. CRI)
  - 3D B-Flow (optional)
  - 3D Angio: B/Power Doppler (incl. CRI)
  - 3D CFM: B/Color Doppler (incl. CRI)
  - 3D HD-Flow: B/HD-Flow (optional) (incl. CRI)
  - STIC B-Flow (optional)
- **Visualization Modes:**
  - 3D Rendering (diverse surface and intensity projection modes)
  - Sectional Planes (3 Section planes perpendicular to each other)
  - VCI Static (optional): 3D Static only
  - VCI Static (optional): Sectional planes with VCI
  - Sonography-based Volume Computer Aided Diagnosis
  - Render Mode:
    - Surface texture, Surface Smooth, max.-, min.- and X-ray (average intensity projection), Gradient, Inversion, Glass Body, Mix Mode of two render Modes
  - 3D Movie
  - Curved render start
  - SRI post-processing for A, B and C-Plane and rendered image
- MagiCut: 3D/4D Cut tool
- **Display Format:**
  - Quad: A-/B-/C-Plane/3D
  - Dual: A-Plane/3D
  - Single: 3D or A- or B- or C-Plane
  - TUI 3x3: Overview image + 8 slices
  - TUI Quad: Overview image + 3 slices
  - TUI Dual: Overview image + 1 slice
  - TUI Single: slice
- **4D Volume:**
  - Frames/sec max: 40
  - Cine: 128 Volumes

**Virtual Convex**
- Provides a convex field of view for all linear transducers
- SP10-16-D
- RSP6-16-D

**Measurements / Calculations**
- **Generic B-Mode and 3D**
  - **Distance**
  - Distance (Point to Point)
  - Distance (Line to Line)

**Real-time Doppler Auto Measurements / Calculations**
- PS (Peak Systole)
- ED (End Diastole)
- Mv (Mean Velocity)
- VTI (Velocity Time Integral)
- RI (Resistance Index)
- PI (Pulsatility Index)
- S/D (Ratio)
- HR (Heart Rate)

**Obstetrics Measurements / Calculations**
- Gestational Age by:
  - AC (Abdominal Circumference)
- APTD (Anterior Posterior Diameter)
- APAD (Anterior Posterior Abdomen Diameter)
- APDxTTD (Transverse Abdominal Diameter)
- BOD (Binocular Distance)
- BPD (Biparietal Diameter)
- CEREB (Cerebellum)
- CLAV (Clavicle)
- CRL (Crown Rump Length)
- EFW (Estimated Fetal Weight)
- FIB (Fibula)
- FL (Femur Length)
- FTA (Fetal Trunk Area)
- GS (Gestational Sac)
- HC (Head Circumference)
- HS (Hand Circumference)
- MAD (Middle Abdomen Diameter)
- MCA RI, PI
- NBL (Nasal Bone Length)
- OFD (Occipital Frontal Diameter)
- RAD (Radius)
- TAD (Transverse Abdominal Diameter)
- TCD (Transverse Cerebellar Diameter)
- TIB (Tibia Length)
- TTD (Transverse Thoracic Diameter)
- ULNA (Ulnea Length)
- Venosus)
- CRL (Crown Rump Length)
- EFW (Estimated Fetal Weight)
- FIB (Fibula)
- FL (Femur Length)
- FTA (Fetal Trunk Area)
- GS (Gestational Sac)
- HC (Head Circumference)
- HS (Hand Circumference)
- MAD (Middle Abdomen Diameter)
- MCA RI, PI
- NBL (Nasal Bone Length)
- OFD (Occipital Frontal Diameter)
- RAD (Radius)
- TAD (Transverse Abdominal Diameter)
- TCD (Transverse Cerebellar Diameter)
- TIB (Tibia Length)
- TTD (Transverse Thoracic Diameter)
- ULNA (Ulnea Length)

- Use measurement results from other systems for fetal trending (past exam)
- Estimated Fetal Weight (EFW) by:
  - AC
  - AC, BPD
  - AC, BPD, FL
  - AC, BPD, FL, HC
  - AC, FL
  - AC, FL, HC
  - BPD, FTA, FL
  - BPD, MAD, FL
  - BPD, TTD
  - BPD, APTD, TTD, FL
  - BPD, APTD, TTD, LV
- Calculations and Ratios
  - FL/BPD
  - FL/AC
  - FL/HC
  - HC/AC
  - CC/TC
  - CI (BPD/OFD) (Cephalic Index)
  - Va/Hem, Vp/Hem
  - AFI (Amniotic Fluid Index)
- Tables / Calculations by:
  - ASUM, Bahlman, Baschat, Brenner, Bunduki, Campbell, Crequat, Chitty, Daya, Doubilet, Eik-Nes, Goldstein, Hadlock, Hansmann, Hellman, Hill, Hobbins, Hohler, Holländer, Jeanty, Johnsen, JSUM, Kurmanavicius, Kurtz, Lessoway, Mari, Marsal, Merz, Nelson, Nicolaides, O’Brien, Okai, Osaka, Persson, Persutte, Rempen, Robinson, Sabbagha, Schild, Shephard, Shinozuka, Sonek, Tokyo University, Warda, Williams, Yarkoni
- Programmable OB Tables
- Programmable OB Formuals
- OB Report including:
  - Measure results (Calc)
  - Measure results (Generic)
  - Fetal Qualitative Description (Anatomical survey)
  - Fetal Environmental Description (Biophysical profile)
  - Fetal Graphical Trending
  - Fetal Compare

Gynecology

Measurements / Calculations
- Right/Left Ovary Length, Width, Height, Volume
- Right/Left Kidney Length, Width, Height, Volume
- Uterus Length, Width, Height, Volume
- END0 (Endometrial thickness)
- Cervix Length
- Follicular measurements (12)
- Ovarian Artery
- Uterine Artery
- Vessel
- Summary Reports
- Possibility to add OB measurements to Gyn application

Vascular

Measurements/Calculations
- CCA (Common Carotid Artery)
- ICA (Internal Carotid Artery)
- ECA (External Carotid Artery)
- Vertebral Artery
- Subclavia
- Bulb
- Vessels
- Summary Reports

Neurology

Measurements/Calculations
- ACA (Anterior Cerebral Artery)
- MCA (Middle Cerebral Artery)
- PCA (Posterior Cerebral Artery)
- Basilar Artery
- A-Com. A (Anterior Common Artery)
- P-Com. A (Posterior Common Artery)
- CCA (Common Carotid Artery)
- ICA (Internal Carotid Artery)
- Vertebral Artery
- Vessels
- Summary Reports

Cardiology

Measurements / Calculations
- 2D Mode:
  - Simpson (Single & Bi-Plane)
  - Volume (Area Length)
  - LV-Mass (Ep & Endo Area, LV Length)
  - LV (IVS, LVD, LVPW)
  - LVOT Diameter
  - RVOT Diameter
  - MV (Dist A, B, Area, PISA
  - TV (Diameter)
  - AV/LA (Ao & LA Diam.)
  - PV (Diameter)
- M Mode:
  - LV (IVS, LVD, LVPW, RVd)
  - AV/LA (Ao Diam, LA Diam, AV Sep., AoRoot Ampl.)
  - MV (D, E, E-F Slope, A-C Intervall, E-EPSS, E-S Dist)
  - HR (Heart Rate)
  - Spectral Doppler Mode:
  - MV (Mitral Valve)
  - AV (Aortic Valve)
  - TV (Tricuspid Valve)
Measurements/Calculations

Abdominal

Measurements/Calculations
- 2D Mode:
  - Liver
  - Gallbladder
  - Pancreas
  - Spleen
  - Left/Right Kidney
  - Renal Artery
  - Aorta
  - Portal Vein
  - Vessel
- M Mode:
  - Renal Artery
  - Aorta
  - Vessel
- Spectral Doppler Mode:
  - Renal Artery
  - Aorta
  - Vessel
  - Portal Vein
  - Summary Reports

Small Parts

Measurements/Calculations
- Thyroid
- Testicle
- Vessel
- Summary Reports

Urology

Measurements/Calculations
- Bladder
- Prostate
- Testicle
- Left/Right Kidney
- Renal Artery
- Vessel

Summary Reports including PSAD, PPSAI(1), PPSAI(2) calculation

Pediatric

Measurements/Calculations
- Hip Joint

Probes

- 4C-D Wide Band Convex Probe
  - Applications: Abdomen, OB, GYN
  - Maximum Band Width (-20dB): 1.5 – 4.6 MHz
  - Number of Elements: 128
  - Convex Radius: 60 mm
  - FOV: 58°
  - Foot Print: 60.8 x 13 mm
  - Doppler Transmission
    - Low Freq.: 2.00 MHz
    - Mid Freq.: 2.92 MHz
    - High Freq.: 3.33 MHz
  - Harmonic Transmission, Frequency:
    - Res: 2.32 MHz
    - Normal: 2.22 MHz
  - Penetration: 2.00 MHz
  - Biopsy Guide available: 4C, Multi-Angle, disposable with reusable bracket

- M6C Wide Band Convex Probe
  - Applications: Abdomen, OB, GYN, Pediatrics
  - Maximum Band Width (-20dB): 2.14 – 6.10 MHz
  - Number of Elements per row: 192
  - Number of rows: 5
  - Convex Radius: 50 mm
  - FOV: 60°
  - Foot Print: 55x18mm
  - Doppler Transmission
    - Low Freq.: 2.78 MHz
    - Mid Freq.: 3.45 MHz
    - High Freq.: 4.01 MHz
  - Harmonic Transmission, Frequency:
    - Res: 3.04 MHz
    - Normal: 2.78 MHz
  - Penetration: 2.44 MHz
  - Biopsy Guide available: M7C, Multi-Angle, disposable with reusable bracket

- SP10-16-D Wide Band Linear Probe
  - Applications: Small Parts, Peripherals, Vascular, Pediatrics, Ortho
  - Maximum Band Width (-20dB): 4.5 – 16.5 MHz
  - Number of Elements: 192
  - FOV: 33.7 mm
  - Foot Print: 38 x 5.0 mm
  - Doppler Transmission
    - Low Freq.: 7.70 MHz
    - Mid Freq.: 8.34 MHz
    - High Freq.: 9.10 MHz
  - Harmonic Transmission, Frequency:
    - Res: 6.45 MHz
    - Normal: 5.70 MHz

- RAB2-5-D Wide Band Convex Volume Probe
  - Applications: Abdomen, OB, GYN
  - Maximum Band Width (-20dB): 2 – 5 MHz
  - Number of Elements: 192
  - Convex Radius: 40.5 mm
  - Volume Sweep Radius: 20.15mm
  - FOV: 80° (B), 85° x 80° (Volume scan)
  - Foot Print: 53.2 x 40.6
  - Doppler Transmission
    - Low Freq.: 2.38 MHz
    - Mid Freq.: 2.95 MHz
    - High Freq.: 3.33 MHz
  - Harmonic Transmission, Frequency:
    - Resolution: 2.13 MHz
    - Normal: 2.00 MHz
  - Penetration: 2.00 MHz
  - Biopsy Guide available: PEC74, Single-Angle, Reusable

- RAB4-8-D Wide Band Convex Volume Probe
  - Applications: Abdomen, OB, GYN, Pediatric, Urology
  - Maximum Band Width (-20dB): 4 – 8.5 MHz
  - Number of Elements: 192
  - Convex Radius: 41.6 mm
  - Volume Sweep Radius: 19.95 mm
  - FOV: 70° (B), 85° x 70° (Volume scan)
  - Foot Print: 53.2 x 40.6 mm
  - Doppler Transmission
    - Low Freq.: 3.04 MHz
    - Mid Freq.: 3.45 MHz
    - High Freq.: 4.01 MHz
  - Harmonic Transmission, Frequency:
    - Resolution: 3.23 MHz
    - Normal: 2.78 MHz
  - Penetration: 2.57 MHz
  - Biopsy Guide available: PEC74, Single-Angle, Reusable

- RIC5-9-D Wide Band Convex Volume Probe
  - Applications: OB, GYN, Urology
  - Band Width (-20dB): 3.7 – 9.3MHz
  - Number of Elements: 192
  - Convex Radius: 11.6 mm
  - Volume Sweep Radius: 11.6 mm
  - FOV: 146° (B), 146°*90° (Volume scan)
  - Foot Print: 32 x 27 mm
  - Doppler Transmission
    - Low Freq.: 5.26 MHz
    - Mid Freq.: 5.88 MHz
    - High Freq.: 6.66 MHz
  - Harmonic Transmission, Frequency:
    - Resolution: 4.30 MHz
    - Normal: 4.30 MHz
  - Penetration: 3.84 MHz
  - Biopsy Guide available: PEC63, Single-Angle, Reusable
• RIC6-12-D Wide Band Convex Volume Probe
- Applications: OB, GYN, Urology
- Band Width (-20dB): 9 MHz
- Number of Elements: 256
- Convex Radius: 11.7 mm
- Volume Sweep Radius: 11.7 mm
- FOV: 151° (B), 151°*120° (Volume scan)
- Foot Print: 29.95 (B) x 27.68 (V) mm
- Doppler Transmission
  - Low Freq.: 6.67 MHz
  - Mid Freq.: 7.15 MHz
  - High Freq.: 8.34 MHz
- Harmonic Transm. Frequency:
  - Resolution: 5.89 MHz
  - Normal: 5.89 MHz
  - Penetration: 5.56 MHz
- Biopsy Guide Available: PEC63, Single-Angle, Reusable

• RSP6-16-D Wide Band Linear Volume Probe
- Applications: Small Parts, Peripherals, Vascular, Pediatrics, Ortho
- Maximum Band Width (-20dB): 5.6 – 18.4 MHz
- Number of Elements: 192
- Volume Sweep Radius: 33 mm
- FOV: 37.4 mm (B), 37.4 mm * 29° (Volume scan)
- Foot Print: 38.4 x 44.5 mm
- Doppler Transm. Frequency:
  - Low Freq.: 6.26 MHz
  - Mid Freq.: 7.15 MHz
  - High Freq.: 8.34 MHz
- Harmonic Frequency:
  - Resolution: 6.67 MHz
  - Normal: 6.26 MHz
  - Penetration: 5.89 MHz
- Biopsy Guide Available: PEC75, Single-Angle, Reusable

• USB (6x external, 5x internal for Dongles, etc)
• Parallel Port
• Remote BW Printer via USB
• Remote Color Printer via USB
• Remote VCR (RS232) via USB
  - External microphone via USB

External Inputs and Outputs
Connectivity on rear panel (direct access)
- VGA Out
- Footswitch via USB
- Network (RJ45)
- USB (2x)
- RS 232 (Optional, USB to RS232 converter)
Connectivity behind rear panel (access after opening):
- Video Out
  - RGB
  - S-Video (VTR)
- Video In:
  - S-Video
- Audio Out
  - Left/right
- Audio In
  - Left/right

Safety Conformance
The Voluson E8 is:
- Listed to UL 60601-1 by a Nationally Recognized Test Lab
- Certified to CSA 22.2, 60601.1 by an SCC accredited Test Lab
- CB-Test report by National Certification Body
- Conforms to the following standards for safety:
  - EN 60601-1 Electrical medical equipment
  - EN 60601-1-1 Electrical medical equipment
  - EN 60601-1-2 Electromagnetic compatibility
  - EN 60601-1-4 Programmable medical systems
  - EN 60601-2-37 Particular requirements for the safety of ultrasound medical diagnostic and monitoring equipment
  - IEC 601157 Declaration of acoustic output
  - ISO 10993 Biological evaluation of medical devices
  - NEMA UD3 Acoustic output display (MI, TIS, TIB, TIC)
  - WEEE (Waste Electrical and Electronic Equipment)