

# Versana Essential™

## Ultrasound system

### Specification sheet

Versana Essential ultrasound helps you provide world-class care with no compromise on quality. This practical, versatile system has broad applicability and is well-suited for clinicians of all experience levels who wish to upgrade their capabilities. Versana Essential is a good fit for private clinics, GP offices, OB/GYN offices and other primary care settings as it is affordable, enables comprehensive scanning capability with excellent image quality, and is built to perform reliably in busy care environments, day after day.



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# 1. General specifications

## 1.01 Dimensions and weight

|                         |                                                            |
|-------------------------|------------------------------------------------------------|
| Height with monitor     | • 1395 mm (54.9 in)                                        |
| Width                   | • Keyboard: 560 mm (22.0 in)<br>• Caster: 520 mm (20.5 in) |
| Depth                   | • Maximum: 620 mm (24.4 in)<br>• Caster: 610 mm (24.0 in)  |
| Weight (no Peripherals) | Less than 45 kg                                            |

## 1.02 Electrical power

Voltage 100 – 240 VAC

Frequency 50/60 Hz

Power consumption maximum of 350 VA with peripherals

## 1.03 Control design

Max 3 active probe ports

Integrated SSD (256 GB)

Integrated speakers

Probe holders, removable for cleaning and washing

Gel holder, removable for cleaning and washing

Front and rear handles

Probe cable management slots

Easily removable air filters

Wheels: Locking mechanism that provides rolling lock and caster swivel lock

Low Noise Design: less than 28dB (measured at 50cm far from console, 25°C room temperature)

# 2. User interface

## 2.01 Operator keyboard

Full alphanumeric keypad covered with washable protection film

6 TGC pods

21.5" (476.1 x 267.8 mm) 1920 x 1080 high-resolution LED backlit

## 2.02 Monitor

Fixed monitor arm

Tilt/Rotate/Pan

Tilt angle: +25° / -90°

Rotate angle: -90°, +90°

Brightness/contrast/color temperature adjustment

Fold-down for transportation

# 3. System overview

## 3.01 System specifications

|                   |              |
|-------------------|--------------|
| Operating system  | Windows® 10  |
| Fast boot up time | <25 seconds  |
| Cold boot up time | <100 seconds |

## 3.02 Applications

Abdominal

Obstetrical

Gynecological

Small parts

Musculoskeletal

Vascular/peripheral vascular

Urological

Pediatric

Cardiac

Thoracic

Transcranial

Transvaginal

Transrectal

Interventional Guidance

## 3.03 Scanning methods

Electronic convex

Electronic linear

Electronic micro convex

## 3. System overview *(cont.)*

### 3.03 Scanning methods *(cont.)*

Electronic sector

Mechanical volume sweep

### 3.04 Transducer type

Convex array

Linear array

Microconvex array

Sector phased array

Volume Probe (4D)

### 3.05 Operating modes

B-Mode

Coded Harmonic Imaging

M-Mode

Color M-Mode

Color Flow mode (CFM)

Power Doppler Imaging (PDI)

Directional PDI

PW Doppler with high PRF

## 4. System standard features

Installation wizard

Whizz

CrossXBeam™

SRI-HD (High Definition Speckle Reduction Imaging)

B-Steer

Coded Harmonic Imaging

Virtual Convex

Patient information database

Image Archive on integrated SSD

Raw Data Analysis

Real-time automatic Doppler calculations

OB Calculations

Fetal Trending

Multi-gestational calculations

Hip dysplasia calculations

Gynecological Calculations

Vascular Calculations

Breast Productivity

Urological Calculations

Renal calculations

Cardiac calculations

On-board reporting package

Network storage

Remote capability: RSVP

My Trainer

Scan Assistant

Standby

QAnalysis

## 5. System options

CW Doppler mode

Anatomical and Curved M-Mode (AMM and Curved AMM)

LOGIQView

Advanced 3D (Easy 3D)

B-Flow (B-Flow color)

Tissue Velocity Imaging (TVI)

TVM

Auto Bladder (Dynamic image optimization, Auto measurement and Auto annotation)

Stress Echo

Scan Coach

Auto EF

Sono Biometry (BPD/ HC/ AC/ HL/ FL)

Static 3D/Real-time 4D

Auto IMT

## 5. System options *(cont.)*

|                      |                                                                                                         |
|----------------------|---------------------------------------------------------------------------------------------------------|
| TUI                  |                                                                                                         |
| Thyroid productivity | A package in thyroid measurement including measurement and relevant description (Includes TI-RADS® ACR) |
| Needle recognition   |                                                                                                         |
| Follow-up tool       |                                                                                                         |
| Elastography         |                                                                                                         |
| BreastCare           |                                                                                                         |
| Vocal                |                                                                                                         |
| Contrast             |                                                                                                         |
| Li Rads              |                                                                                                         |

## 6. Peripheral options

|                                                                        |
|------------------------------------------------------------------------|
| Sony UP-D898MD B/W thermal printer                                     |
| Sony UP-D898DC B/W thermal Printer                                     |
| Sony UP-D25MD Color thermal printer                                    |
| Sony UP-D899MD B/W thermal printer**                                   |
| Sony UP-D899DC B/W thermal Printer**                                   |
| 1-Pedal and 3-Pedal type footswitch                                    |
| USB Stick                                                              |
| External USB HDD                                                       |
| DVD RW kit                                                             |
| USB wireless adaptor: Sales availability varies in different countries |
| ECG Module                                                             |
| HP Office 200 Printer                                                  |
| Bluetooth adapter                                                      |
| Barcode Scanner                                                        |

## 7. Display modes

| 7.01 Live and stored display format |                                                                                                                                                                                                                  |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Widescreen                          | <ul style="list-style-type: none"> <li>Full size and split screen</li> <li>Both with thumbnails for still and Cine</li> </ul>                                                                                    |
| Review image format                 | 4x4 and thumbnails for still and Cine                                                                                                                                                                            |
| Simultaneous capability             | <ul style="list-style-type: none"> <li>Dual B (B/B)</li> <li>B + PW/M</li> <li>Real-time triplex mode (B + CFM/ PDI + PW)</li> <li>B + CFM/PDI</li> <li>B + CFM + M</li> <li>B + B-Flow/ B-Flow Color</li> </ul> |

\*\*Not available for China

### 7.01 Live and stored display format *(cont.)*

|                                     |                                                                                                                                                                                                                                                                                                        |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Zoom                                | Write (HD)/read up to 67X                                                                                                                                                                                                                                                                              |
| Colorized Image                     | <ul style="list-style-type: none"> <li>Colorized B</li> <li>Colorized M</li> <li>Colorized CW</li> <li>Colorized 4D</li> <li>Colorized B-Flow</li> <li>Colorized PW</li> <li>Colorized 3D</li> </ul>                                                                                                   |
| Timeline display                    | <ul style="list-style-type: none"> <li>Independent dual B/PW or CW display</li> <li>Display Format <ul style="list-style-type: none"> <li>Top/bottom selectable format (Size: 1/2:1/2; 1/3:2/3; 2/3:1/3)</li> <li>Side/side selectable format (Size: 1/2:1/2; 1/4:3/4; TL only)</li> </ul> </li> </ul> |
| LOGIQ View                          |                                                                                                                                                                                                                                                                                                        |
| VirtualConvex                       |                                                                                                                                                                                                                                                                                                        |
| TUI (Tomography Ultrasound Imaging) |                                                                                                                                                                                                                                                                                                        |

## 8. Selectable alternating modes

|                                        |
|----------------------------------------|
| B/M/PW/CW/CF/PDI/TVI/TVD               |
| B + B                                  |
| B + M                                  |
| B + PW/CW                              |
| B + CFM/PDI                            |
| B + CFM /PDI + PW /CW                  |
| B + TVI                                |
| B + TVI + TVD                          |
| Multi-image split screen (quad screen) |
| Live/Frozen                            |
| Independent CINE playback              |

## 9. Display annotation

| 9.01 General user interface                           |                                                                                                                          |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Patient name: First, last (up to 64 total characters) |                                                                                                                          |
| Patient ID (Up to 64 characters)                      |                                                                                                                          |
| Other ID (Up to 64 characters)                        |                                                                                                                          |
| Age, gender and date of birth                         |                                                                                                                          |
| Hospital name                                         |                                                                                                                          |
| Date format:<br>4 Types selectable                    | <ul style="list-style-type: none"> <li>MM/DD/YYYY</li> <li>DD/MM/YYYY</li> <li>YYYY/MM/DD</li> <li>YYYY-MM-DD</li> </ul> |

## 9. Display annotation *(cont.)*

### 9.01 General user interface *(cont.)*

|                                    |                                                                                                                                                                                               |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Time format:<br>2 types selectable | <ul style="list-style-type: none"><li>• 24 hours</li><li>• 12 hours</li></ul>                                                                                                                 |
| Gestational age<br>from            | <ul style="list-style-type: none"><li>• LMP</li><li>• EDD</li><li>• GA</li><li>• BBT</li></ul>                                                                                                |
| Displayed Acoustic<br>Output       | <ul style="list-style-type: none"><li>• TIs: Thermal Index Soft Tissue</li><li>• TIc: Thermal Index Cranial (Bone)</li><li>• TIb: Thermal Index Bone</li><li>• MI: Mechanical Index</li></ul> |

% of maximum power output

Probe name

Map name

Probe orientation

Depth scale marker

Lateral scale marker

Focal zone marker

Image depth

Zoom depth

### 9.02 B-Mode

Gain

Dynamic range

Imaging frequency

Edge enhance

Frame average

Frame rate

Gray map

SRI-HD

CrossXBeam

### 9.03 Color Flow Mode

Line density

Frame average

Packet size

Color velocity range and baseline

Color threshold marker

Color gain

Inversion

Frequency

### 9.04 PDI mode

Line Density

Frame Average

Packet Size

Directional PDI

Color Velocity Range and Baseline

Power Threshold Marker

PDI Gain

Inversion

### 9.05 B-Flow/B-Flow color Mode

Gain

Background

SRI HD

Accumulation

Flow Type/Model

Rejection

Colorize

Edge Enhance

Gray Map

Frame Average

Power Output

Sensitivity/PRI

Dynamic Range

Frequency

Suppression

Flash Suppression

Edge Enhancement

Threshold

Map Compress

Map

Wall Filter

Transparency

## 9. Display annotation *(cont.)*

### 9.06 M-Mode

Gain

Dynamic Range (Use the Dynamic Range of B-Mode)

Time Scale

AMM

### 9.07 Doppler Mode

Gain

Angle Correct

Sample Volume Depth and Sample Volume Length

Wall Filter

Baseline

Spectrum Inversion

Time Scale/Sweep Speed

Scale

Doppler Frequency

### 9.08 3D/4D

Tile/Mix

Active Curve

Reset Curve

Lower Threshold

Volume Angle

B Quality

3D Orient

Render Mode

Colorize

Direction

Rend 1 Gray

Rend 2 Gray

Adv. Rend

Transparency

Ref Image

Cut Mode

Cut Depth

Depth

Rotational Angle

### 9.08 3D/4D *(cont.)*

Step Angle

Rotation Axis

Start Angle

End Angle

Loop Speed

### 9.09 Easy 3D

Utilities

Texture

Gray Surface

Render

Threshold1

Threshold2

Scan Distance

Colorize

### 9.10 Advanced 3D

DefineAxis

Group Planes

Reslice

Tile

## 10. General system parameters

### 10.01 System setup

10 Pre-programmable Categories

User Programmable Preset Capability

Factory Default Preset Data

|           |                                                                                                                                                           |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Languages | English, Latin American Spanish, French, German, Italian, Brazilian Portuguese, Chinese (simplified), Swedish, Russian, Norwegian, Danish, Dutch, Finnish |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|

OB Report Formats

Tokyo Univ., Osaka Univ., USA, Europe, and ASUM

User defined annotations

Body patterns

Customized comment home position

# 10. General system parameters

(cont.)

## 10.02 System scanning parameters

Digital Agile Beamformer Architecture

5,558,857 system processing channels

Max. Frame Rate: 1790 fps, probes and modes dependent

Displayed Imaging Depth: 1 – 33 cm

Minimum Depth of Field: 0 – 1 cm, probe dependent

Maximum Depth of Field: 0 – 33 cm, probe dependent

Transmission Focus: 1 – 8 Focal Points selectable, probe and application dependent

Quad Beamforming

Continuous Dynamic Receive Focus/Aperture

Multi-Frequency/Wideband Technology

Frequency Range: 1.7 to 13 MHz

256 Shades of Gray

266 dB systematic Dynamic Range

Adjustable Field of View (FOV): Up to 168 degree, probe dependent

Image Reverse: Right/Left

Image Rotation of 0° 90° 180° 270°

## 10.03 B-Mode

Acoustic power output 0 – 100%, 2, 5 and 10 steps

Gain From 0 – 90 dB, 1 dB per step

Adjustable dynamic range 36 – 96 dB, 3 or 6 dB per step

Frame averaging 8 steps

Maximum frame rate ≥ 1449 fps

Gray scale map 6 or 8 types, probe and application dependent

B colorization 9 types

Frequency Up to 4 selectable, probe dependent

Line density 992, 5 – 7 steps, probe dependent

Line density zoom 5 – 7 steps, probe dependent

Thermal index TIC, TIS, TIB

Image reverse On/off

Focus number 8 steps

## 10.03 B-Mode (cont.)

Focus width 3 types

Suppression 6 steps

Edge enhance 7 steps

Rejection Up to 9 steps, probe dependent

Steered linear ±12°, ±15°, probe dependent

Scanning size (FOV or angle, probe dependent)

SRI-HD Up to 8 levels selectable

CrossXBeam Up to 9 angles selectable, probe dependent

Depth 1 – 33 cm, 0.5, 1 or 2 cm per step, probe dependent

## 10.04 Coded Harmonic Imaging

Available on all probes

Line density 5 or 6 steps, probe dependent

Line density zoom 5 or 6 steps, probe dependent

Suppression 6 steps

Edge enhance 7 steps

Gray map 6 or 8 types, probe and application dependent

Tint map 9 types

Gain 0 – 90 dB, 1 dB per step

Dynamic range 51 – 78 dB, 3 dB per step; 36 – 48 dB/ 78 – 96 dB, 6 dB per step;

Rejection Up to 9 steps, probe dependent

Frequency Up to 4 steps, probe dependent

## 10.05 SRI-HD

High Definition Speckle Reduction Imaging provides multiple levels of speckle reduction

Compatible with side-by-side DualView display

Compatible with all linear, convex and sector transducers

Compatible with B-Mode, 3D/4D imaging

# 10. General system parameters

(cont.)

## 10.06 CrossXBeam

Provides 3, 5, 7, 9 of spatial compounding

Live side-by-side DualView display

|                 |                                                                                                            |                                                                                          |
|-----------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Compatible with | <ul style="list-style-type: none"> <li>• Color Mode</li> <li>• SRI-HD</li> <li>• Virtual Convex</li> </ul> | <ul style="list-style-type: none"> <li>• PW</li> <li>• Coded Harmonic Imaging</li> </ul> |
|-----------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|

Available on 4C-RS, L6-12-RS, E8C-RS, E8Cs-RS, 8C-RS, RAB2-6-RS, LK760-RS

## 10.07 Color Flow mode

|                                              |                                                                         |
|----------------------------------------------|-------------------------------------------------------------------------|
| Baseline                                     | 0 – 100%, 10% per step                                                  |
| Invert                                       | Off/on                                                                  |
| CF/PDI focus depth                           | Default pre-settable for 10 – 100% of ROI in depth, 15% or 20% per step |
| CF/PDI flash suppression                     | 5 steps                                                                 |
| CF/PDI angle steer                           | 0, $\pm 10^\circ$ , $\pm 15^\circ$ , $\pm 20^\circ$ , probe dependent   |
| Packet size                                  | 8 – 24, probe and application dependent                                 |
| Line density                                 | 5 steps                                                                 |
| Line density zoom                            | 5 steps                                                                 |
| Frame average                                | 7 steps                                                                 |
| Maximum frame rate                           | $\geq 1449$ fps                                                         |
| PRF                                          | 0.1 – 22.3 KHz                                                          |
| Spatial filter                               | 6 steps                                                                 |
| Gain                                         | 0 – 40 dB, 0.5 dB per step                                              |
| Wall filter                                  | 4 steps, probe and application dependent                                |
| Scanning size (FOV or angle)                 | Probe dependent                                                         |
| CF/PDI vertical size (mm) of ROI             | Default pre-settable                                                    |
| CF/PDI center depth (mm) of ROI              | Default pre-settable                                                    |
| CF/PDI frequency                             | Up to 4 steps, probe dependent                                          |
| Color maps, including velocity-variance maps | 19 types, probe and application dependent                               |
| Transparent map                              | 5 steps                                                                 |
| Color threshold                              | 0 – 100%, 10% per step                                                  |
| Accumulation                                 | 8 steps                                                                 |

## 10.08 Power Doppler Imaging mode

|                        |                                                                         |
|------------------------|-------------------------------------------------------------------------|
| PDI map                | 14 types                                                                |
| CF/PDI focus depth     | Default pre-settable for 10 – 100% of ROI in depth, 15% or 20% per step |
| CF/PDI acoustic output | 0 – 100%, 2%, 5% or 10% per step                                        |
| CF/PDI angle steer     | 0, $\pm 10^\circ$ , $\pm 15^\circ$ , $\pm 20^\circ$ , probe dependent   |
| Packet size            | 8 – 24, probe and application dependent                                 |
| Spatial filter         | 6 steps                                                                 |
| Frame average          | 7 steps                                                                 |
| PRF                    | 0.1 – 22.3 KHz                                                          |
| Power threshold        | 0 – 100%, 10% per step                                                  |
| Gain                   | 0 – 40 dB, 0.5 dB per step                                              |
| Wall filter            | 4 steps, probe and application dependent                                |
| CF/PDI frequency       | Up to 4 steps, probe dependent                                          |
| Transparent map        | 5 steps                                                                 |
| Invert                 | On/off                                                                  |
| Accumulation           | 8 steps                                                                 |

## 10.09 M-Mode

|                                                                         |                                                                  |
|-------------------------------------------------------------------------|------------------------------------------------------------------|
| Gain                                                                    | -20 – 20 dB, 1 dB per step                                       |
| Gray scale map                                                          | 6 or 8 types, probe dependent                                    |
| Colorization                                                            | 9 types                                                          |
| Scanning size (FOV or angle, probe dependent, see probe specifications) |                                                                  |
| Rejection                                                               | 6 steps                                                          |
| Compression                                                             | 13 steps                                                         |
| Sweep Speed                                                             | 8 steps                                                          |
| M/PW display format                                                     | Vert 1/3B, Vert 1/2B, Vert 2/3B, Horiz 1/2B, Horiz 1/4B, TL only |

## 10.10 Anatomical M-Mode (option)

M-Mode cursor adjustable at any plane

Can be activated from a Cine loop from a live or stored image

Measure and analysis capability

Available with Color Flow mode

## 10. General system parameters

(cont.)

### 10.11 Pulse Wave Doppler mode

|                               |                                                                  |
|-------------------------------|------------------------------------------------------------------|
| Acoustic power                | 0 – 100%, 2, 5 and 10 steps                                      |
| Gain                          | 0 – 85 dB, 1 dB per step                                         |
| Gray scale map                | Up to 8 types                                                    |
| PRF                           | 0.6 – 27.9 KHz                                                   |
| Transmit frequency            | 1.7 – 6.3 MHz, probe dependent                                   |
| Wall filter                   | 5.5 – 5000 Hz, 27 steps, probe dependent                         |
| PW colorization               | Up to 6 types                                                    |
| Velocity scale range          | 0.1 – 7011 cm/s                                                  |
| Sample volume depth           | 0.1 – 33 cm, probe dependent                                     |
| Sweep speed                   | 0 – 7, 8 steps                                                   |
| SV gate                       | 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 16 mm                        |
| Angle correction              | -90° – 90°, 1° per step                                          |
| M/PW display format           | Vert 1/3B, Vert 1/2B, Vert 2/3B, Horiz 1/2B, Horiz 1/4B, TL only |
| Spectrum inversion            | Off/on                                                           |
| Simultaneous                  | Off (PW only)/on                                                 |
| PW angle steer                | 0, ±10°, ±15°, ±20° (use angle steer of B-Mode), probe dependent |
| Trace method                  | Off, Max, Mean                                                   |
| Baseline shift                | 11 steps                                                         |
| Auto Calcs/Doppler Auto Trace | Off, Frozen, Live                                                |
| Compression                   | 0.5 – 2.4 (0.5, 0.7, 0.9, 1, 1.1, 1.4, 1.6, 2, 2.4)              |
| Trace direction               | Above, Below, Both                                               |
| Trace sensitivity             | 0 – 40, 2 per step                                               |

### 10.12 Continues Wave Doppler mode

|                                          |                          |
|------------------------------------------|--------------------------|
| Gray scale map                           | 8 types                  |
| Baseline                                 | 11 steps                 |
| Angle correct                            | -90° – 90°, 1° per step  |
| Spectral color                           | 6 types                  |
| Invert                                   | Off/on                   |
| Cycles to average/<br>Spectral averaging | 5 steps                  |
| Gain                                     | 0 – 85 dB, 1 dB per step |

### 10.12 Continues Wave Doppler mode (cont.)

|                                       |                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wall filter                           | 5.5 – 5000 Hz, 27 steps, probe and application dependent                                                                                                                                                                                                                                                                                                                |
| CW-Mode includes                      | <ul style="list-style-type: none"> <li>• Transmit frequency: 1.9, 4.2 MHz</li> <li>• CW colorization: Tint map A/B/C/D/E/F</li> <li>• Velocity scale range: 0.2 – 6105 cm/s</li> <li>• Spectrum inversion</li> <li>• Trace method: Max, Mean, Off</li> <li>• Auto Calcs/Doppler Auto Trace: Frozen, Live, Off</li> <li>• Trace direction: Above, Below, Both</li> </ul> |
| Trace sensitivity: 0 – 40, 2 per step |                                                                                                                                                                                                                                                                                                                                                                         |

### 10.13 Cine memory/image memory

384 MB of Cine memory

Selectable Cine sequence for Cine review

|                              |                                                                                                                                                                                                              |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum number of cine loops | 410691 images                                                                                                                                                                                                |
| Cine loop capacity           | <ul style="list-style-type: none"> <li>• B-Mode: 919 seconds</li> <li>• M-Mode: 423 seconds</li> <li>• CFM Mode: 4978 seconds</li> <li>• PW Mode: 27983 seconds</li> <li>• CW Mode: 27962 seconds</li> </ul> |

Prospective Cine mark

Measurements/calculations and annotations on Cine playback

Scrolling timeline memory

Dual image Cine display

Quad image Cine display

Cine gauge and Cine image number display

Cine review loop

|                   |                                                           |
|-------------------|-----------------------------------------------------------|
| Cine review speed | 11 steps (11, 13, 14, 17, 22, 25, 31, 48, 100, 200, 400%) |
|-------------------|-----------------------------------------------------------|

### 10.14 Image storage

On-board database of patient information

|                       |                |
|-----------------------|----------------|
| Conversion to formats | JPEG, AVI, WMV |
|-----------------------|----------------|

Live image and stored image side-by-side display

Reload of archived data sets

Network storage support for Import, Export, DICOM Read, SaveAs

# 10. General system parameters

(cont.)

## 10.14 Image storage (cont.)

|                 |                                                                                                                                                                                                                                                                                                                                             |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Storage formats | <ul style="list-style-type: none"> <li>DICOM – compressed/uncompressed, single/multi-frame, with/without Raw Data</li> <li>Export JPEG, WMV (MPEG 4) and AVI formats</li> <li>DICOM still image storage size: ~3.9 MB</li> <li>Display format: Full size, 4 x 4 and thumbnails</li> </ul>                                                   |
| Storage devices | <ul style="list-style-type: none"> <li>Internal Solid State drive partition of 100 GB for image storage</li> <li>Optional internal SSD of 256GB for image storage</li> <li>External USB HDD and USB memory stick support for Import, Export, DICOM Read, SaveAs</li> <li>CD-RW storage: 700 MB</li> <li>DVD storage: -R (4.4 GB)</li> </ul> |

## 10.15 Connectivity and DICOM

|                             |                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ethernet network connection | <ul style="list-style-type: none"> <li>DICOM 3.0</li> <li>Verify</li> <li>Print</li> <li>Store</li> <li>Modality worklist</li> <li>Storage commitment</li> <li>Modality Performed Procedure Step (MPPS)</li> <li>Query/retrieve</li> <li>Structured reporting template (Can be compared to vascular and OB standard)</li> <li>RSVP Remote capability</li> </ul> |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 10.16 Virtual Convex

Provides a convex field of view

Compatible with CrossXBeam for linear transducers

Available on linear and sector transducers

## 10.17 LOGIQView (Option)

Extended Field of View Imaging

Available on 4C-RS, L6-12-RS, 8C-RS, 3Sc-RS, E8C-RS, E8Cs-RS, 6S-RS, LK760-RS, RAB2-6-RS probes

For use in B-Mode

CrossXBeam is available on linear probes

Auto detection of scan direction

## 10.17 LOGIQView (Option) (cont.)

Post-process zoom

Rotation

Auto fit on monitor

Measurements in B-Mode

Up to 60 cm scan length

## 10.18 Easy 3D (Option)

Allows unlimited rotation and planar translations

3D reconstruction from Cine sweep

Threshold1: 0 – 255

Utilities: Average off/Average light/Average medium/Average Strong

Grey surface: Off/On

Scan distance: 1.0 – 15.0

Threshold2: 0 – 255

Colorize: 0 – 360

## 10.19 Advanced 3D (Option)

Define axis: Select 2 points as start and end point of long axis

Group planes: Off/Main/Parallel/Angular

Reslice: Cube/Virtual Rescan/Cubic Plane

Tile: 1/2/4/6

## 10.20 Static 3D/Real-time 4D (option)

Available on RAB2-6-RS

|                     |                                                                                                                                                                                                       |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acquisition modes   | <ul style="list-style-type: none"> <li>Static 3D</li> <li>Real-time 4D</li> </ul>                                                                                                                     |
| Visualization modes | <ul style="list-style-type: none"> <li>3D rendering (diverse surface and intensity projection modes)</li> <li>Sectional planes (3 section planes perpendicular to each other)</li> <li>TUI</li> </ul> |
| Render Mode         | Surface Texture, Surface Smooth, Transp. Max, Transp. Min, Transp. X-ray, Mix Mode of two render modes                                                                                                |
| Display format      | <ul style="list-style-type: none"> <li>Quad: A/B/C 3D or 4D</li> <li>Dual: A/ 3D or 4D</li> <li>Single: 3D or 4D</li> </ul>                                                                           |

Curved 3-point render start

# 10. General system parameters

(cont.)

## 10.20 Static 3D/Real-time 4D (option) (cont.)

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3D Movie | <ul style="list-style-type: none"> <li>• Loop Speed: 6 – 400</li> <li>• Run/stop</li> <li>• Scalpel: 3D cut tool</li> <li>• Cut mode: Inside Contour/Outside Contour/Inside Box/Outside Box/Small Eraser/Big Eraser</li> <li>• Cut depth: Full/User Defined</li> <li>• Depth: 0 – 1000</li> <li>• 3D rotation Cine</li> <li>• Rotational angle: 30 – 360°</li> <li>• Step angle: 1 – 15°</li> <li>• Rotation axis: X/Y</li> <li>• 3D volume review</li> <li>• Start frame: Define start frame</li> <li>• End frame: Define end frame</li> </ul> |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                     |                                                                                                                                                           |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| TUI: Tomographic Ultrasound Imaging | <ul style="list-style-type: none"> <li>• Display format: 1x1/1x2/2x2/3x3/4x4</li> <li>• Slices: 3 – 19</li> <li>• Slices distance: 0.5 – 40 mm</li> </ul> |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|

|              |                                                                                                                    |
|--------------|--------------------------------------------------------------------------------------------------------------------|
| Real-time 4D | <ul style="list-style-type: none"> <li>• 4D Volume Cine</li> <li>• LoopSpeed: 6-400</li> <li>• Run/Stop</li> </ul> |
|--------------|--------------------------------------------------------------------------------------------------------------------|

Niche

VOCAL (Option): Virtual Organ Computer-aided Analysis

## 10.21 B-Flow (option)

Available on 4C-RS, L6-12-RS

|                 |                                |
|-----------------|--------------------------------|
| Background      | On/off                         |
| Sensitivity/PRI | 1 – 50, 17 steps               |
| Line density    | 5 steps                        |
| Edge enhance    | 7 steps                        |
| Frame average   | 0 – 7, 8 steps                 |
| Gray scale map  | 8 maps                         |
| Tint map        | 5 maps                         |
| Dynamic range   | 36 – 96 dB, 16 steps           |
| Rejection       | 6 steps                        |
| Gain            | 0 – 90 dB range, 1 dB per step |
| B-Flow Color    |                                |
| Accumulation    | 8 levels                       |

## 10.22 TVI (option)

Myocardial Doppler imaging with color overlay on tissue image

Available on the sector probes

Tissue color overlay can be removed to show just the 2D image, still retaining the tissue velocity information

QAnalysis: Multiple Time Motion trace display from selected points in the myocardium

## 10.23 TVM (option)

TVI with M-Mode active

Available on the sector probes

Provides both myocardium motion velocity and direction

## 10.24 Stress Echo (option)

Advanced and flexible stress echo examination capabilities

- Provides exercise and pharmacological protocol templates
- 8 default templates
- Template editor for user configuration of existing templates or creation of new templates
- Reference scan display during acquisition for stress level

Comparison (dual screen)

- Baseline level/Previous level selectable
- Raw data continuous capture
- Over 87.5 seconds available
- Wall motion scoring (bullseye and segmental)
- Smart stress: Automatically set up various scanning parameters (geometry, frequency, gain, etc.) according to same projection on previous level

## 10.25 Follow-up tool (option)

The follow-up tool is intended to more accurately perform serial scans on a patient, and compare the images of a previous ultrasound exam with the current exam.

## 10.26 Needle recognition (option)

Needle recognition allows you to obtain precise needle imaging in the dashed box. It is available with probes on L6-12-RS, 4C-RS.

## 10. General system parameters

(cont.)

### 10.27 Scan Coach (option)

Scan Coach is a contextual reference tool. It is with clinical guidance for scan plane acquisition and references for anatomical structures. It can be displayed on-demand by the user. Clinical reference images and animations to depict information related to each step. It covers five applications.

- Abdomen
- Obstetrics
- Gynecology
- Cardiology
- Vascular

### 10.28 My Trainer

Abstracted from basic user manual, it lists out FAQs from customers and instructs customer how to solve problems by themselves timely.

### 10.29 Battery (option)

The lithium ion battery provides power when an AC power source is not available. About 15 minutes of battery life can be expected with fully charged battery in use to supply power to the system.

### 10.30 Scan Assistant

Scan Assistant provides an automated exam script that moves you through an exam step-by-step. This allows you to focus on performing the exam rather than on controlling the system and can help you to increase consistency while reducing keystrokes.

### 10.31 RSVP

RSVP is a direct link with a GE Online Service Engineer or Applications Support Engineer or a Request for Service.

### 10.32 Whizz

Whizz will continuously optimize the brightness, contrast and uniformity of B-Mode images when scanning different tissues. Whizz in PW/CW Doppler Mode optimizes the spectral data. Auto adjusts the Velocity Scale/PRF (live imaging only), baseline shift, and invert (if preset). Upon deactivation, the spectrum is still optimized.

### 10.33 Whizz CF mode

Whizz CF mode dynamically optimizes CF mode parameters in real time, enabling optimal, consistent image quality and measurements.

### 10.34 V-live

V-Live offers the ability to customize light source directions in 3D mode, enabling focused clarity, on targeted region of interest.

### 10.35 Lateral gain compensation (LGC)

To set Lateral Gain Compensation values based on LGC curves defined by a user; By laterally adjusting the received signal intensity, the uniformity of a B-Mode image intensity is optimized in lateral direction.

### 10.36 Elastography (option)

Available on  
L6-12-RS

- Frame reject: 0 – 8
- Axial smoothing: 0 – 4
- Noise reject: 0 – 8
- Sample Volume: 0 – 2
- Lateral smoothing: 0 – 4
- Window: 0 – 8
- Map: 8
- Frame average: 0 – 10
- Line Density: 0 – 4
- Soft compress: 0 – 10
- Hard compress: 0 – 10

### 10.37 LI-RADS® ACR (Option)

The Ultrasound Liver Imaging Reporting And Data System (US LI-RADS) is a standardized system for imaging technique, interpretation, reporting, and data collection for screening or surveillance ultrasound exams in patients at risk for developing hepatocellular carcinoma (HCC).

### 10.38 e-Delivery

Electronic software delivery. As part of the product lifecycle management, GE regularly analyzes and integrates software updates into our products.

### 10.39 Probe Check

Probe assessment tool that evaluates probe elements to monitor potential probe deterioration over probe life cycle.

## 10. General system parameters

(cont.)

### 10.40 Contrast agency detection (option)

Available on 4C-RS

- Line density: 0, 1, 2, 3, 4
- SRI HD: 0, 1, 2
- Suppression: 0, 1, 2, 3, 4, 5
- Frame average: 0, 1, 2, 3, 4, 5, 6, 7
- Dynamic range: 36 – 96 dB
- Rotation: Up/down
- Modes: General, Resolution and Penetration, Frequencies
- Display tissue image and contrast-enhanced image simultaneously in split screen
- 2 contrast timers
- Time delay: 0.3 – 10 seconds
- Accumulation mode: 8 steps
- Maximum Enhance Mode: On/Off
- Gray scale map: 10 types
- Colorization: On/Off, 6 steps
- Flash
- Time Intensity Curve (TIC) Analysis
- Auto MI control
- Time trigger scan: 0.3 – 10 seconds; from 0.5 seconds to 10 seconds, 0.5 seconds per step
- Flash/burst mode
- Contrast tech: AM
- Single view/dual view
- Visualization: Contrast, Tissue
- Hybrid Contrast
- Hybrid map: 6 types

### 10.41 Controls available while “live” (cont.)

Color Flow Mode

- CFM Gain
- Acoustic Output
- Wall Filter
- Line Density
- CFM Frame Average
- CFM Velocity Range
- Packet Size
- CFM Spatial Filter
- Frequency/Velocity Baseline Shift

### 10.42 Controls available on Freeze or Recall

SRI-HD

CrossXBeam – Display non-compounded and compounded image simultaneously in split screen

Easy 3D reconstruction from a stored Cine loop

CrossXBeam is disabled on Freeze or Recall

TGC

Colorized B and M

Frame average (loops only)

Dynamic range

Anatomical M-Mode

Gray Map

Post gain

Baseline shift (PW, CW)

Sweep speed

Compression

Rejection

Colorized spectrum

Display format

Angle Correct

Quick Angle Correct

Overall gain (loops and stills)

Color map

Transparency map

CFM display threshold

Invert for Color/Doppler

### 10.41 Controls available while “live”

Write Zoom

B/M-Mode

- Gain
- Dynamic Range
- Transmission Focus Position
- Line Density Control
- Sweep Speed for M-Mode
- TGC
- Acoustic Output
- Transmission Focus Number
- Number of Angles for CrossXBeam

PW-Mode

- Gain
- Acoustic Output
- Transmission Frequency
- Scale
- Wall Filter
- Sample Volume Gate
- Length
- Depth
- Volume

# 11. Measurements/calculations

## 11.01 General B-Mode

Depth and distance

Circumference (ellipse/trace)

Area (ellipse/trace)

Volume

% Stenosis (area or diameter)

Angle between 2 lines

## 11.02 General M-Mode

M-Depth

Distance

Time

Slope

Heart rate

## 11.03 General Doppler measurements/calculations

Velocity

Time

A/B ratio (velocities)

PS (Peak Systole)

ED (End Diastole)

PS/ED (PS/ED ratio)

ED/PS (ED/PS ratio)

AT (Acceleration Time)

ACCEL (Acceleration)

TAMAX (Time Averaged Maximum Velocity)

Volume Flow (TAMEAN and vessel area)

Heart Rate

PI (Pulsatility Index)

RI (Resistivity Index)

## 11.04 Real-time Doppler Auto measurements/calculations

PS (Peak Systole)

ED (End Diastole)

MD (Minimum Diastole)

PI (Pulsatility Index)

RI (Resistivity Index)

## 11.04 Real-time Doppler Auto measurements/calculations (cont.)

AT (Acceleration Time)

ACC (Acceleration)

PS/ED (PS/ED Ratio)

ED/PS (ED/PS Ratio)

HR (Heart Rate)

TAMAX (Time Averaged Maximum Velocity)

PVAL (Peak Velocity Value)

Volume Flow (TAMEAN and Vessel Area)

## 11.05 OB measurements/calculations

|                    |                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gestational age by | <ul style="list-style-type: none"> <li>• GS (Gestational Sac)</li> <li>• CRL (Crown Rump Length)</li> <li>• FL (Femur Length)</li> <li>• BPD (Biparietal Diameter)</li> <li>• AC (Abdominal Circumference)</li> <li>• HC (Head Circumference)</li> <li>• APTD x TTD (Anterior/Posterior Trunk Diameter by Transverse Trunk Diameter)</li> </ul> |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trunk Diameter | <ul style="list-style-type: none"> <li>• FTA (Fetal Trunk Cross-sectional Area)</li> <li>• HL (Humerus Length)</li> <li>• BD (Binocular Distance)</li> <li>• FT (Foot Length)</li> <li>• OFD (Occipital Frontal Diameter)</li> <li>• TAD (Transverse Abdominal Diameter)</li> <li>• TCD (Transverse Cerebellum Diameter)</li> <li>• THD (Thorax Transverse Diameter)</li> <li>• TIB (Tibia Length)</li> <li>• ULNA (Ulna Length)</li> </ul> |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                 |                                                                                   |                                                                     |
|---------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------|
| Estimated Fetal Weight (EFW) by | <ul style="list-style-type: none"> <li>• AC, BPD</li> <li>• AC, FL, HC</li> </ul> | <ul style="list-style-type: none"> <li>• AC, BPD, FL, HC</li> </ul> |
|---------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------|

|                         |                                                                                                            |                                                                                       |
|-------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Calculations and ratios | <ul style="list-style-type: none"> <li>• FL/BPD</li> <li>• FL/HC</li> <li>• CI (Cephalic Index)</li> </ul> | <ul style="list-style-type: none"> <li>• CTAR (Cardio-Thoracic Area Ratio)</li> </ul> |
|-------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|

|              |                                                                                     |                                                                      |
|--------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| SonoBiometry | <ul style="list-style-type: none"> <li>• BPD</li> <li>• AC</li> <li>• FL</li> </ul> | <ul style="list-style-type: none"> <li>• HC</li> <li>• HL</li> </ul> |
|--------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|

Measurements/calculations by: ASUM, ASUM 01, Berkowitz, Bertagnoli, Brenner, Campbell, CFEF, Chitty, Eik-Nes, Eriksen, Goldstein, Hadlock, Hansmann, Hellman, Hill, Hohler, Jeanty, JSUM, Kurtz, Mayden, Mercer, Merz, Moore, Nelson, Osaka, Paris, Rempen, Robinson, Shepard, Shepard/Warsoff, Tokyo, Tokyo/Shinozuka, Yarkoni

Fetal graphical trending

Growth percentiles

Multi-gestational calculations

## 11. Measurements/calculations (cont.)

### 11.05 OB measurements/calculations (cont.)

Fetal qualitative description (anatomical survey)

Fetal Environmental Description (Biophysical profile)

Programmable OB tables

Over 20 selectable OB calculations

Expanded worksheets

### 11.06 GYN measurements/calculations

Right ovary length, width, height

Left ovary length, width, height

Uterus length, width, height

Cervix length, trace

Ovarian volume

ENDO (Endometrial thickness)

Ovarian RI

Uterine RI

Follicular measurements

### 11.07 Vascular measurements/calculations

DCCA (Distal Common Carotid Artery)

MCCA (Mid Common Carotid Artery)

PCCA (Proximal Common Carotid Artery)

DICA (Distal Internal Carotid Artery)

MICA (Mid Internal Carotid Artery)

PICA (Proximal Internal Carotid Artery)

DECA (Distal External Carotid Artery)

PECA (Proximal External Carotid Artery)

VERT (Vertebral Velocity)

SUBCLAV (Systolic Subclavian Velocity)

Automatic IMT

### 11.08 Urological calculations

Volume (Auto Bladder volume)

Prostate volume

Left/right renal volume

Generic volume

Post-void bladder volume

## 12. Cardiac measurements/calculations

### 12.01 B-Mode measurements

Aorta

- Aortic Root Diameter (Ao Root Diam)
- Aortic Arch Diameter (Ao Arch Diam)
- Ascending Aortic Diameter (Ao Asc)
- Descending Aortic Diameter (Ao Desc Diam)
- Aorta Isthmus (Ao Isthmus)
- Aorta (Ao st junct)

Aortic valve

- Aortic Valve Cusp Separation (AV Cusp)
- Aortic Valve Area Planimetry (AVA Planimetry)
- (Trans AVA)

Left atrium

- Left Atrium Diameter (LA Diam)
- LA Length (LA Major)
- LA Width (LA Minor)
- Left Atrium Area (LAA(d), LAA(s))
- Left Atrium Volume, Single Plane, Method of Disk (LAEDV A2C, LAESV A2C) (LAEDV A4C, LAESV A4C)

Left ventricle

- Left Ventricle Volume, Teichholz/Cubic (LVIDd, LVI Ds)
- Left Ventricle Internal Diameter (LVIDd, LVI Ds)
- Left Ventricle Length (LVLd, LVLs)
- Left Ventricle Outflow Tract Diameter (LVOT Diam)
- Left Ventricle Posterior Wall Thickness (LVPWd, LVPWs)
- Left Ventricle Length (LV Major)
- Left Ventricle Width (LV Minor)
- Left Ventricle Outflow Tract Area (LVOT)
- Left Ventricle Mass Index (LVPWd, LVPWs)
- Ejection Fraction, Teichholz/Cube (LVIDd, LVIDs)
- Left Ventricle Posterior Wall Fractional Shortening (LVPWd, LVPWs)
- Mitral Valve
- E-Point-to-Septum Separation (EPSS)
- Mitral Valve Area Planimetry (MVA Planimetry)

Pulmonic valve

Pulmonic Diameter (Pulmonic Diam)

Right ventricle

- Right Ventricle Internal Diameter (RVIDd, RVIDs)
- Right Ventricle Outflow Tract Diameter (RVOT Diam)

System inferior vena cava

- Systemic Vein Diameter (Systemic Diam)

## 12. Cardiac measurements/ calculations *(cont.)*

### 12.02 M-Mode measurements

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aorta                       | <ul style="list-style-type: none"> <li>• Aortic Root Diameter (Ao Root Diam)</li> <li>• Aortic Valve Diameter (AV Diam)</li> <li>• Aortic Valve Cusp Separation (AV Cusp)</li> <li>• Aortic Valve Ejection Time (LVET)</li> </ul>                                                                                                                                                                                                           |
| Left atrium& Left ventricle | <ul style="list-style-type: none"> <li>• Left Atrium Diameter to AoRoot Diameter Ratio (LA/Ao Ratio)</li> <li>• Left Atrium Diameter (LA Diam)</li> <li>• Left Ventricle Volume, Teichholz/Cubic (LVIDd, LVI Ds)</li> <li>• Left Ventricle Posterior Wall Thickness (LVPWd, LVPWs)</li> <li>• Left Ventricle Ejection Time (LVET)</li> <li>• Left Ventricle Pre-Ejection Period (LVPEP)</li> <li>• Interventricular Septum (IVS)</li> </ul> |
| Mitral valve                | <ul style="list-style-type: none"> <li>• E-Point-to-Septum Separation (EPSS)</li> <li>• Mitral Valve Anterior Leaflet Excursion (D-E Excursion)</li> <li>• Mitral Valve D-E Slope (D-E Slope)</li> <li>• Mitral Valve E-F Slope (E-F Slope)</li> </ul>                                                                                                                                                                                      |
| Pulmonic valve              | <ul style="list-style-type: none"> <li>• QRS complex to end of envelope (Q-to-PV close)</li> <li>• Right Ventricle Internal Diameter (RVIDd, RVIDs)</li> <li>• Right Ventricle Outflow Tract Diameter (RVOT Diam)</li> <li>• Right Ventricle Ejection Time (RVET)</li> <li>• Right Ventricle Pre-Ejection Period (RVPEP)</li> </ul>                                                                                                         |
| Tricuspid valve             | <ul style="list-style-type: none"> <li>• QRS complex to end of envelope (Q-to-TV close)</li> </ul>                                                                                                                                                                                                                                                                                                                                          |

### 12.03 Doppler mode measurements

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aortic valve | <ul style="list-style-type: none"> <li>• Aortic Valve Mean Velocity (AV Trace)</li> <li>• Aortic Valve Velocity Time Integral (AV Trace)</li> <li>• Aortic Valve Mean Pressure Gradient (AV Trace)</li> <li>• Aortic Valve Peak Pressure Gradient (AR Vmax)</li> <li>• Aortic Insufficiency Peak Velocity (AR Vmax)</li> <li>• Aortic Insufficiency End-Diastolic Velocity (AR Trace)</li> <li>• Aortic Valve Peak Velocity (AV Vmax)</li> <li>• Aortic Valve Deceleration Time (AV Trace)</li> <li>• Aortic Valve Ejection Time (AVET)</li> <li>• Aortic Valve Area according to PHT</li> </ul> |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 12.03 Doppler mode measurements *(cont.)*

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Left ventricle | <ul style="list-style-type: none"> <li>• Left Ventricle Outflow Tract Peak Pressure Gradient (VLOT Vmax)</li> <li>• Left Ventricle Outflow Tract Peak Velocity (LVOT Vmax)</li> <li>• Left Ventricle Outflow Tract Mean Pressure Gradient (LVOT Trace)</li> <li>• Left Ventricle Outflow Tract Velocity Time Integral (LVOT Trace)</li> <li>• Left Ventricle Ejection Time (LVET)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Mitral valve   | <ul style="list-style-type: none"> <li>• Mitral Valve Regurgitant Mean Velocity (MR Trace)</li> <li>• Mitral Regurgitant Mean Pressure Gradient (MR Trace)</li> <li>• Mitral Regurgitant Velocity Time Integral (MR Trace)</li> <li>• Mitral Valve Mean Velocity (MR Trace)</li> <li>• Mitral Valve Velocity Time Integral (MR Trace)</li> <li>• Mitral Valve Mean Pressure Gradient (MR Trace)</li> <li>• Mitral Regurgitant Peak Pressure Gradient (MR Vmax)</li> <li>• Mitral Valve Peak Pressure Gradient (MR Vmax)</li> <li>• Mitral Regurgitant Peak Velocity (MR Vmax)</li> <li>• Mitral Valve Peak Velocity (MR Vmax)</li> <li>• Mitral Valve Velocity Peak A (MV A Velocity)</li> <li>• Mitral Valve Velocity Peak E (MV E Velocity)</li> <li>• Mitral Valve Area according to PHT (MV PHT)</li> <li>• Mitral Valve E-Peak to A-Peak Ratio (A-C and D-E) (MV E/ARatio)</li> <li>• Mitral Valve Acceleration Time (MV ACC Time)</li> <li>• Mitral Valve Deceleration Time (MV Dec. Time)</li> <li>• Mitral Valve Acceleration Time/Deceleration Time Ratio (MVAcc/Dec. Time)</li> </ul> |
| Pulmonic valve | <ul style="list-style-type: none"> <li>• Pulmonic Insufficiency Peak Pressure Gradient (PR Vmax)</li> <li>• Pulmonic Insufficiency End-Diastolic Pressure Gradient (PRTrace)</li> <li>• Pulmonic Valve Peak Pressure Gradient (PV Vmax)</li> <li>• Pulmonic Insufficiency Peak Velocity (PR Vmax)</li> <li>• Pulmonic Insufficiency End-Diastolic Velocity (Prend Vmax)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## 12. Cardiac measurements/ calculations *(cont.)*

### 12.03 Doppler mode measurements *(cont.)*

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pulmonic valve  | <ul style="list-style-type: none"> <li>• Pulmonic Valve Peak Velocity (PV Vmax)</li> <li>• Pulmonary Artery Diastolic Pressure (PV Trace)</li> <li>• Pulmonic Insufficiency Mean Pressure Gradient (PR Trace)</li> <li>• Pulmonic Valve Mean Pressure Gradient (PV Trace)</li> <li>• Pulmonic Insufficiency Mean Square Root Velocity (PR Trace)</li> <li>• Pulmonic Insufficiency Velocity Time Integral (PR Trace)</li> <li>• Pulmonic Valve Mean Velocity (PV Trace)</li> <li>• Pulmonic Valve Velocity Time Integral (PV Trace)</li> <li>• Pulmonic Insufficiency Pressure Half Time (PR PHT)</li> <li>• Pulmonic Valve Flow Acceleration (PV Acc Time)</li> <li>• Pulmonic Valve Acceleration Time (PV Acc Time)</li> <li>• Pulmonic Valve Ejection Time (PVET)</li> <li>• QRS complex to end of envelope (Q-to-PV close)</li> <li>• Pulmonic Valve Acceleration to Ejection Time Ratio (PV Acc Time, PVET)</li> </ul> |
| Right ventricle | <ul style="list-style-type: none"> <li>• Right Ventricle Outflow Tract Peak Pressure Gradient (RVOT Vmax)</li> <li>• Right Ventricle Outflow Tract Peak Velocity (RVOT Vmax)</li> <li>• Right Ventricle Outflow Tract Velocity Time Integral (RVOT Trace)</li> <li>• Right Ventricle Ejection Time (RV Trace)</li> <li>• Stroke Volume by Pulmonic Flow (RVOT Planimetry, RVOT Trace)</li> <li>• Right Ventricle Stroke Volume Index by Pulmonic Flow (RVOT Planimetry, RVOT Trace)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                              |
| System          | <ul style="list-style-type: none"> <li>• Pulmonary Artery Peak Velocity (PV Vmax)</li> <li>• Pulmonary Vein Velocity Peak A (reverse) (P Vein A)</li> <li>• Pulmonary Vein Peak Velocity (P Vein D, P Vein S)</li> <li>• Systemic Vein Peak Velocity (PDA Diastolic, PDA Systolic)</li> <li>• Ventricular Septal Defect Peak Velocity (VSD Vmax)</li> <li>• Atrial Septal Defect (ASD Diastolic, ASD Systolic)</li> <li>• Pulmonary Vein A-Wave Duration (P Vein A Dur)</li> <li>• IsoVolumetric Relaxation Time (IVRT)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                          |

### 12.03 Doppler mode measurements *(cont.)*

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System <i>(cont.)</i> | <ul style="list-style-type: none"> <li>• IsoVolumetric Contraction Time (IVCT)</li> <li>• Pulmonary Vein S/D Ratio (P Vein D, P Vein S)</li> <li>• Ventricular Septal Defect Peak Pressure Gradient (VSD Vmax)</li> <li>• Pulmonic-to-Systemic Flow Ratio (Qp/Qs)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Tricuspid valve       | <ul style="list-style-type: none"> <li>• Tricuspid Regurgitant Peak Pressure Gradient (TR Vmax)</li> <li>• Tricuspid Valve Peak Pressure Gradient (TV Vmax)</li> <li>• Tricuspid Regurgitant Peak Velocity (TR Vmax)</li> <li>• Tricuspid Valve Peak Velocity (TV Vmax)</li> <li>• Tricuspid Valve Velocity Peak A (TV A Velocity)</li> <li>• Tricuspid Valve Velocity Peak E (TV E Velocity)</li> <li>• Tricuspid Regurgitant Mean Pressure Gradient (TR Trace)</li> <li>• Tricuspid Valve Mean Pressure Gradient (TV Trace)</li> <li>• Tricuspid Regurgitant Velocity Time Integral (TR Trace)</li> <li>• Tricuspid Valve Mean Velocity (TV Trace)</li> <li>• Tricuspid Valve Velocity Time Integral (TV Trace)</li> <li>• Tricuspid Valve Time to Peak (TV Acc/Dec Time)</li> <li>• Tricuspid Valve Ejection Time (TV Acc/Dec Time)</li> <li>• Tricuspid Valve A-Wave Duration (TV A Dur)</li> <li>• QRS complex to end of envelope (Q-to-TV close)</li> <li>• Tricuspid Valve Pressure Half Time (TV PHT)</li> <li>• Tricuspid Valve E-Peak to A-Peak Ratio (TV E/A Velocity)</li> </ul> |

### 12.04 Color Flow mode measurements

|              |                                                                                                                                                                                                                                                                              |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aortic valve | <ul style="list-style-type: none"> <li>• Proximal Isovelocity Surface Area: Regurgitant Flow (AR Trace)</li> <li>• Proximal Isovelocity Surface Area: Regurgitant Volume Flow (AR Trace)</li> <li>• Proximal Isovelocity Surface Area: Aliased Velocity (AR Vmax)</li> </ul> |
| Mitral valve | <ul style="list-style-type: none"> <li>• Proximal Isovelocity Surface Area: Regurgitant Flow (MR Trace)</li> <li>• Proximal Isovelocity Surface Area: Regurgitant Volume Flow (MR Trace)</li> <li>• Proximal Isovelocity Surface Area: Aliased Velocity (MR Vmax)</li> </ul> |

## 12. Cardiac measurements/ calculations *(cont.)*

### 12.05 Combination mode measurements

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aortic valve   | <ul style="list-style-type: none"> <li>Aortic Valve Area (Ao Diam., LVOT Vmax, AV Vmax)</li> <li>Aortic Valve Area by Continuity Equation by Peak Velocity (Ao Diam, LVOT Vmax, AV Vmax)</li> <li>Stroke Volume by Aortic Flow (AVA Planimetry, AV Trace)</li> <li>Cardiac Output by Aortic Flow (AVA Planimetry, AV Trace, HR)</li> <li>Aortic Valve Area by Continuity Equation VTI (Ao Diam, LVOT Vmax, AV Trace)</li> </ul> |
| Left ventricle | Cardiac Output, Teichholz/Cubic (LVIDd, LVI Ds, HR)                                                                                                                                                                                                                                                                                                                                                                             |
| Mitral valve   | <ul style="list-style-type: none"> <li>Stroke Volume by Mitral Flow (MVA Planimetry, MV Trace)</li> <li>Cardiac Output by Mitral Flow (MVA Planimetry, MV Trace, HR)</li> </ul>                                                                                                                                                                                                                                                 |

### 12.06 Cardiac worksheet

Parameter: Lists the mode, the measurement folder and the specific measurement

Measured Value: Up to six measurement values for each item. Average, maximum, minimum, or last

Generic study in cardiology

## 13. Probes

### 13.01 4C-RS

Convex probe

|                            |                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------|
| Applications               | Abdominal, OB, GYN, Vascular, Urology, Thoracic, Pediatric, MSK, Interventional Guidance |
| Number of elements         | 128                                                                                      |
| Convex radius              | 60 mm                                                                                    |
| FOV                        | 58°                                                                                      |
| Footprint                  | 66.2 x 18.3 mm                                                                           |
| B-Mode imaging frequency   | 2.0, 3.0, 4.0, 5.0 MHz                                                                   |
| Harmonic imaging frequency | 3.0, 4.0, 5.0 MHz                                                                        |
| CFM/PDI/PWD frequency      | 2.0 MHz (CFM/PDI) 2.5, 2.8, 3.3 MHz                                                      |
| Biopsy guide               | Multi-angle, reusable bracket                                                            |

### 13.02 L6-12-RS

Linear probe

|                            |                                                                          |
|----------------------------|--------------------------------------------------------------------------|
| Applications               | Vascular, Pediatric, Small Parts, MSK, Thoracic, Interventional Guidance |
| Number of elements         | 128                                                                      |
| Footprint                  | 47 x 11.4 mm                                                             |
| B-Mode imaging frequency   | 6.0, 8.0, 10.0, 11.0 MHz                                                 |
| Harmonic imaging frequency | 8.0, 10.0, 12.0, 13.0 MHz                                                |
| CFM/PDI frequency          | 4.0, 5.0, 6.0 MHz                                                        |
| PWD frequency              | 4.0, 4.5, 5.0 MHz                                                        |
| Steered angle              | ±20°                                                                     |
| Biopsy guide               | Multi-angle, reusable bracket                                            |

### 13.03 LK760-RS

Linear probe

|                            |                              |
|----------------------------|------------------------------|
| Applications               | MSK, Interventional Guidance |
| Number of elements         | 128                          |
| Footprint                  | 67.0 x 13.0 mm               |
| B-Mode imaging frequency   | 5.0, 7.0, 9.0 MHz            |
| Harmonic imaging frequency | 6.0, 8.0, 10.0 MHz           |
| CFM/PDI/PWD frequency      | 3.5, 4.2, 5.0 MHz            |
| Steered angle              | ±12°                         |
| Biopsy guide               | Not available                |

### 13.04 E8C-RS

Endo micro convex probe

|                            |                                                                      |
|----------------------------|----------------------------------------------------------------------|
| Applications               | OB, GYN, Urology, Transvaginal, Transrectal, Interventional Guidance |
| Number of elements         | 128                                                                  |
| Convex radius              | 10.73 mm                                                             |
| FOV                        | 128°                                                                 |
| Footprint                  | 16.9 x 21.2 mm                                                       |
| B-Mode imaging frequency   | 6.0, 8.0, 10.0 MHz                                                   |
| Harmonic imaging frequency | 7.0, 8.0, 10.0 MHz                                                   |
| CFM/PDI/PWD frequency      | 4.2, 5.0, 6.3 MHz                                                    |
| Biopsy guide               | Fixed angle, disposable or reusable bracket                          |

## 13. Probes *(cont.)*

### 13.05 8C-RS

Micro convex probe

|                            |                                                                                |
|----------------------------|--------------------------------------------------------------------------------|
| Applications               | Pediatric, MSK, Cardiac<br>Pediatric, Transcranial,<br>Interventional Guidance |
| Number of elements         | 128                                                                            |
| Convex radius              | 10.73 mm                                                                       |
| FOV                        | 131°                                                                           |
| Footprint                  | 22.0 x 12.0 mm                                                                 |
| B-Mode imaging frequency   | 6.0, 8.0, 10.0 MHz                                                             |
| Harmonic imaging frequency | 6.0, 7.0, 8.0, 10.0 MHz                                                        |
| CFM/PDI/PWD frequency      | 4.2, 5.0, 6.3 MHz                                                              |
| Biopsy guide               | Not available                                                                  |

### 13.06 3Sc-RS

Phased array sector probe

|                            |                                                                                        |
|----------------------------|----------------------------------------------------------------------------------------|
| Applications               | Cardiac, Abdominal,<br>Vascular, Transcranial,<br>Thoracic, Interventional<br>Guidance |
| Number of elements         | 64                                                                                     |
| FOV                        | 120°                                                                                   |
| Footprint                  | 23.7 x 18.4 mm                                                                         |
| B-Mode imaging frequency   | 2.0, 3.0, 4.0 MHz                                                                      |
| Harmonic imaging frequency | 3.0, 3.2, 3.5, 4.0 MHz                                                                 |
| CFM/PDI/PWD frequency      | 1.7, 2.0, 2.5, 3.3 MHz                                                                 |
| CWD frequency              | 1.9 MHz                                                                                |
| Biopsy guide               | Multi-angle, reusable bracket                                                          |

### 13.07 6S-RS

Phased array sector probe

|                            |                                                                                     |
|----------------------------|-------------------------------------------------------------------------------------|
| Applications               | Cardiac Pediatric, Vascular,<br>Pediatric, Transcranial,<br>Interventional Guidance |
| Number of elements         | 64                                                                                  |
| FOV                        | 120°                                                                                |
| Footprint                  | 23.5 x 16.8 mm                                                                      |
| B-Mode imaging frequency   | 4.0, 5.0, 6.0 MHz                                                                   |
| Harmonic imaging frequency | 4.0, 5.0, 6.0, 7.0 MHz                                                              |
| CFM/PDI/PWD frequency      | 2.5 (CFM/PDI), 3.0, 4.0, 4.5 MHz                                                    |
| CWD frequency              | 4.2 MHz                                                                             |
| Biopsy guide               | Not available                                                                       |

### 13.08 RAB2-6-RS

Convex Volume Probe

|                            |                                                            |
|----------------------------|------------------------------------------------------------|
| Applications               | Abdominal, OB, GYN,<br>Urology, Interventional<br>Guidance |
| Number of elements         | 128                                                        |
| Convex radius              | 47.1 mm                                                    |
| Footprint                  | 62.2 x 34.0 mm                                             |
| Volume sweep radius        | 24.11 mm                                                   |
| FOV                        | 70° (B), 84° x 70° (volume scan)                           |
| B-Mode imaging frequency   | 3.0, 4.0, 5.0 MHz                                          |
| Harmonic imaging frequency | 4.0, 5.0, 6.0 MHz                                          |
| CFM/PDI/PWD frequency      | 2.0, 2.5, 3.0, 4.0 MHz                                     |
| Biopsy guide               | Multi-angle, reusable bracket                              |
| Sweep speed                | 426 °/s                                                    |

### 13.09 E8CS-RS

Endo micro convex probe

|                            |                                                                            |
|----------------------------|----------------------------------------------------------------------------|
| Applications               | OB, GYN, Urology,<br>Transvaginal, Transrectal,<br>Interventional Guidance |
| Number of elements         | 128                                                                        |
| Convex radius              | 8.73 mm                                                                    |
| Footprint                  | 18.6 x 13.9 mm                                                             |
| FOV                        | 168°                                                                       |
| B-Mode imaging frequency   | 6.0, 8.0, 10.0 MHz                                                         |
| Harmonic imaging frequency | 7.0, 8.0, 10.0 MHz                                                         |
| CFM/PDI/PWD frequency      | 4.0, 5.0, 6.0 MHz                                                          |
| Biopsy guide               | Fixed angle, disposable or<br>reusable bracket                             |

## 14. Inputs and outputs

|                                             |
|---------------------------------------------|
| HDMI output (1920 x 1080 resolution)        |
| S-Video output (via optional video adapter) |
| CVBS output (via optional video adapter)    |
| Ethernet (RJ45)                             |
| USB-A (2x in rear, 1 beside keyboard)       |
| USB-C (1x in rear)                          |

## 15. Safety conformance

|                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Versana Essential is CE marked to Council Directive 2017/745 on medical devices |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Conforms to the following standards for safety                                      | <ul style="list-style-type: none"><li>• IEC 60601-1 Medical electrical equipment – Part 1: General requirements for basic safety and essential performance</li><li>• IEC 60601-1-2 Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance – Collateral Standard: Electromagnetic disturbances – requirements and tests EMC Emissions Group 1 Class A device requirements as per CISPR 11</li><li>• IEC 60601-2-37 Medical electrical equipment – Part 2-37: Particular requirements for the basic safety and essential performance of ultrasonic medical diagnostic and monitoring equipment</li><li>• ISO 10993-1 Biological evaluation of medical devices – Part 1 Evaluation and testing within a risk management process</li><li>• EN 62366-1 Medical devices –Part 1: Application of usability engineering to medical devices</li></ul> |