



# Versana Premier™

## Ultrasound System

Specification sheet

Rev. 2

### Product description

Versana Premier ultrasound is designed to help you apply your clinical and imaging skills to deliver high-quality care to the wide range of patients you see daily. This high-quality system is well suited for general practice clinics, physical check-up centers, community healthcare centers, scanning center, and other facilities worldwide that offer basic medical care. Its versatility covers a broad range of examinations: abdominal, OB/GYN, cardiac, small parts, urology, vascular, pediatrics, MSK and thoracic.



# CONTENTS

1.	General specifications	3
1.01	Dimensions and weight	3
1.02	Electrical power	3
1.03	Console design	3
2.	User interface	3
2.01	Operator keyboard	3
2.02	LED Monitor	3
3.	System overview	3
3.01	Applications	3
3.02	Scanning methods	4
3.03	Transducer types	4
3.04	Operating modes	4
4.	System standard features	4
5.	System options	5
6.	Peripheral options	5
7.	Display modes	5
7.01	Live and stored display format	5
8.	Selectable alternating modes	6
9.	Display annotation	6
9.01	General user interface	6
9.02	B-Mode	6
9.03	Color Flow mode	6
9.04	PDI mode	6
9.05	B-Flow™/B-Flow Color mode	7
9.06	M-Mode	7
9.07	Doppler Mode	7
9.08	Elastography	7
9.09	3D/4D	7
9.10	Easy 3D	8
9.11	Advance 3D	8
10.	General system parameters	8
10.01	System Setup	8
10.02	System scanning parameters	8
10.03	B-Mode	9
10.04	Coded Harmonic Imaging	9
10.05	SRI-HD	9
10.06	CrossXBeam™	9
10.07	Color Flow mode	9
10.08	Power Doppler Imaging mode	10
10.09	Auto Optimization	10
10.10	M-Mode	10
10.11	Anatomical M-Mode (option)	10
10.12	Pulse Wave Doppler mode	10
10.13	Continuous Wave Doppler mode (option)	11
10.14	Cine memory/image memory	11
10.15	Image Storage	11
10.16	Connectivity and DICOM®	12
10.17	Virtual Convex	12
10.18	LOGIQ™ View (option)	12
10.19	Easy 3D (option)	12
10.20	Advanced 3D (option)	12
10.21	Static 3D/Real-time 4D (option)	12
10.22	B-Flow (option)	13
10.23	Elastography (option)	13
10.24	TVI (option)	13
10.25	TVM (option)	13
10.26	Stress Echo (option)	13
10.27	Follow-up tool (option)	14
10.28	Breast Care (option)	14
10.29	Needle recognition (option)	14
10.30	Scan Coach	14
10.31	My Trainer	14
10.32	Battery (option)	14
10.33	Scan assistant	14
10.34	CSD	14
10.35	Whizz	14
10.36	Whizz CF mode	14
10.37	Whizz Label	14
10.38	V-Live	14
10.39	Lateral gain compensation (LGC)	14
10.40	Controls available while "live"	14
10.41	Controls available on Freeze or Recall	15
11.	Measurements/calculations	15
11.01	General B-Mode	15
11.02	General M-Mode	15
11.03	General Doppler measurements/calculations	15
11.04	Real-time Doppler Auto measurements/calculations	16
11.05	OB measurements/calculations	16
11.06	GYN measurements/calculations	16
11.07	Vascular measurements/calculations	17
11.08	Urological calculations	17
11.09	Cardiac measurements/calculations	17
11.09.01	B-Mode measurements	17
11.09.02	M-Mode measurements	18
11.09.03	Doppler mode measurements	18
11.09.04	Color Flow mode measurements	20
11.09.05	Combination mode measurements	20
11.09.06	Cardiac worksheet	20
12.	Probes	20
12.01	4C-RS	20
12.02	L6-12-RS	20
12.03	12L-RS	21
12.04	E8C-RS	21
12.05	LK760-RS	21
12.06	E8Cs-RS	21
12.07	8C-RS	21
12.08	3Sc-RS	22
12.09	6S-RS	22
12.10	RAB2-6-RS	22
12.11	L8-18i-RS	22
12.12	BE9CS-RS	23
12.13	12S-RS	23
12.14	RIC5-9A-RS	23
12.15.01	E7C8L-C-RS	23
12.15.02	E7C8L-L-RS	24
12.16	9L-RS	24
12.17	L3-12-RS	24
13.	Inputs and outputs	24
14.	Safety conformance	25

# 1. General specifications

## 1.01 Dimensions and weight

Height with monitor	Less than 1780 mm
Width	Less than 620 mm
Depth	Less than 810 mm
Weight	Less than 70 kg without any probes or peripherals

## 1.02 Electrical power

Voltage 100 – 240 VAC

Frequency 50/60 Hz

Power consumption maximum of 450 VA with peripherals

## 1.03 Control design

Max 4 active probe ports

3 probe Ports standard

Integrated SSD (512 GB)

Integrated speakers

Probe holders, removable for cleaning and washing

Gel holder, removable for cleaning and washing

Gel warmer, switchable left/right (optional)

Front and rear handles

Probe cable management slots and hooks

Easily removable air filters

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

Paper tray (optional)

Accessory tray (optional)

# 2. User interface

## 2.01 Operator keyboard

Height adjustable

Full alphanumeric keypad covered with washable protection film

10 TGC pods

13.3" touch panel support multiple gesture recognition and user configured layout

## 2.02 LED monitor

21.5" (482.6 mm) high-resolution: 1920 x 1080

Fixed monitor arm

Tilt/Rotate

- Tilt angle: +45°/-90°
- Rotate angle: -90°/+90°

Articulating monitor arm (optional)

Tilt/Rotate/Pan

- Tilt angle: +25°/-90°
- Rotate angle: -130°/+50°
- Horizontal Pan: 650 mm
- Vertical Pan: 150 mm

Fold-down and lock mechanism for transportation

Brightness and contrast adjustment

# 3. System overview

## 3.01 Applications

Abdominal

Fetal/Obstetrical

Gynecological

Small parts (includes breast, testes, thyroid)

Urology

Pediatric

Cardiac Adult

Cardiac Pediatric

Vascular/peripheral vascular

Musculoskeletal Conventional

Musculoskeletal Superficial

Thoracic/Pleural

Transcranial

Transrectal

Transvaginal

Interventional guidance (includes tissue biopsy, fluid drainage, vascular and non-vascular access)

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

### 3.02 Scanning methods

Electronic convex

Electronic linear

Electronic micro convex

Electronic sector

Mechanical volume sweep

### 3.03 Transducer types

Convex array

Linear array

Microconvex array

Sector phased array

Volume probes (4D)

Bi-plane array, two convex transducers

Bi-plane array, one linear and one convex transducers

### 3.04 Operating modes

B-Mode

Coded Phase Inversion Harmonic Imaging

M-Mode

Anatomical M-Mode (option)

Color M-Mode

Color Flow Mode (CFM)

Power Doppler Imaging (PDI)

Directional PDI

B-Flow (B-Flow Color) (option)

PW Doppler with high PRF

CW Doppler mode (option)

TVI mode (option)

3D/4D volume modes (option)

Curve AMM (option)

Elastography (option)

## 4. System standard features

Installation wizard

Whizz B-Mode

Whizz CF Mode

Whizz Label (option)

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

CrossXBeam

SRI-HD (High Definition Speckle Reduction Imaging)

B-Steer

Hip dysplasia calculations

Virtual Convex

Patient information database

V-Live

Image Archive on integrated SSD

Raw data analysis

Voice comments

Real-time automatic Doppler calculations

OB calculations

Fetal trending

SonoBiometry (BPD/HC/AC/HL/FL)

Lateral gain compensation

Multi-gestational calculations

Gynecological calculations

Vascular calculations

Breast Productivity

Urological calculations (stepper volume calculation (prostate), joint use with stepper-grid system)

Renal calculations

Cardiac calculations

On-board reporting package

MPEGVue

Network storage

Remote capability: CSD

My Trainer

Scan Coach with Whizz Label function

Scan Assistant

Standby mode

## 5. System options

CW Doppler	
Anatomical M-Mode	
Curve AMM	
LOGIQ View	
Elastography	
Advanced 3D (Easy 3D)	
B-Flow (B-Flow Color)	
Tissue Velocity Imaging (TVI) with Q-Analysis	
TVM	
Stress Echo	
Auto EF	
Static 3D/ Real-time 4D	<ul style="list-style-type: none"> <li>• TUI</li> <li>• VOCAL</li> </ul>
Auto IMT	
Breast productivity	A package in breast measurement including measurement and relevant descriptions, including BI-RADS® protocol
Thyroid productivity	A package in thyroid measurement including measurement and relevant descriptions, including TI-RADS protocol
Needle Recognition	
Follow-up tool	
DICOM 3.0 connectivity	
Tricefy™ Uplink	

## 6. Peripheral options

Sony UP-D898MD B/W thermal printer
Sony UP-D898MD B/W thermal printer with fixture kit
Sony UP-898DC Printer
Sony UP-D25MD color thermal printer
1-pedal type footswitch 'Whanam FSU-1000'
3-pedal type footswitch 'MKF 2-MED USB GP26'
32 GB USB Stick
1 TB external USB HDD
DVD RW kit
USB ECG kits (AHA/IEC)
USB wireless adaptor (sales availability varies in different countries)
HP Office 200 printer
Bluetooth adaptor (option not available in all countries)

## 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/CFM or PDI</li> <li>• B/PW or B/M</li> <li>• B + CFM/M</li> <li>• Real-time triplex mode (B + CFM or PDI or B-Flow color+ PW)</li> </ul>
Zoom	Write (HD)/read 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>
Virtual convex	
LOGIQ View	
TUI (Tomography Ultrasound Imaging)	

## 8. Selectable alternating modes

B/M

B/PW

B + CFM/M

B + CFM (PDI)/PW (CW)

Freehand 3D-Mode

Freehand 3D-Mode Color

B/CW

B + CFM (PDI)/CW

Multi-image split screen (quad screen)

Live and/or frozen

B + B/CFM or PDI

PW/M

Independent CINE playback

## 9. Display annotation

### 9.01 General user interface

Patient name: First, Last (Max. 28 characters displayed per each; up to 64 total characters per each)

Patient ID (Max. 64 characters)

Other ID (Max. 64 characters)

Age, sex and date of birth

Hospital name (Max. 23 characters displayed)

Date format:  
3 types selectable

- MM/DD/YYYY
- DD/MM/YYYY
- YYYY/MM/DD

Time format:  
2 types selectable

- 24 hours
- 12 hours

Gestational age from

- LMP
- GA
- EDD
- BBT

Displayed acoustic output

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

% of maximum power output

Probe name

Map names

Probe orientation

Depth scale marker

Lateral scale marker

### 9.01 General user interface (cont.)

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

Whizz

### 9.03 Color Flow mode

Line density

Frame average

Packet size

Color velocity range and baseline

Color threshold marker

Color gain

Inversion

Doppler frequency

PDI

Color scale: 2 types

- Power
- Directional PDI

### 9.04 PDI mode

Line density

Frame averaging

Packet size

Directional PDI

Color velocity range and baseline

Color threshold marker

PDI gain

Inversion

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

### 9.05 B-Flow/B-Flow Color mode

Gain

Background

SRI-HD

Accumulation

Flow module

Rejection

Colorize

Edge enhance

Gray map

Frame average

Power output

Sensitivity/PRI

Dynamic range

Frequency

Suppression

Flash suppression

Enhance

Threshold

Map compress

Default map

Wall filter

Transparency

### 9.06 M-Mode

Gain

Dynamic range (use the dynamic range of B-Mode)

Time scale

AMM

Curve AMM

### 9.07 Doppler Mode

Gain

Angle

Sample volume depth and width length

Wall filter

Velocity and/or frequency scale

### 9.07 Doppler Mode *(cont.)*

Spectrum inversion

Time scale

Scale

Doppler frequency

### 9.08 Elastography

Frame reject

Axial smoothing

Noise reject

Sample volume

Lateral smoothing

Window

Map

Frame average

Line density

Frequency

Soft compress

Scale

### 9.09 3D/4D

Tile/mix

Active curve

Reset curve

Lower threshold

Volume angle

B quality

3D orient

Render mode

Colorize

Direction

Render 1 gray

Render 2 gray

Adv. Render

Transparency

Reference image

Cut mode

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

### 9.09 3D/4D *(cont.)*

Cut depth

Depth

Rotational angle

Step angle

Rotation axis

Start angle

End angle

Loop speed

V-Live

### 9.10 Easy 3D

Utilities

Texture

Gray surface

Render

Threshold 1

Threshold 2

Scan distance

Colorize

### 9.11 Advance 3D

Define axis

Group planes

Reslice

Tile

## 10. General system parameters

### 10.01 System setup

9 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

Patient workflow: Traditional/simplified

### 10.02 System scanning parameters

Digital agile beamformer architecture

301,056 system processing channels

Max. frame rate: 1789 fps, depending on probe and mode (Convex probe under whole view angle and 18 cm scanning depth, up to 46 fps; Sector probe under with view angle of 90° and 18 cm scanning depth, up to 81 fps)

Displayed imaging depth: 1 – 33 cm

Minimum depth of field: 0 – 1 cm (zoom), depending on probe

Maximum depth of field: 0 – 33 cm, depending on probe

Transmission focus: 1 – 8 focal points selectable, depending on probe and application

Quad beamforming

Continuous dynamic receive focus/aperture

Multi-frequency/wideband technology

Frequency range: 1.7 to 18 MHz

Shades of gray: 256

Systematic dynamic range: 275 dB

Adjustable Field of View (FOV): up to 168°, depending on probe

Image reverse: right/left

Image rotation of 0°, 90°, 180°, 270°



## 10. General system parameters *(cont.)*

### 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
Gray scale map	6 or 8 types, depending on probe
B colorization	9 types
Frequency	Up to 4 selectable, depending on probe
Line density	Max. 852, 5/6 steps, depending on probe
Line density zoom	5 steps
Thermal index	Tlc, Tls, Tlb
Image reverse	On/off
Focus number	8 steps
Focus width	3 types
Suppression	6 steps
Edge enhance	7 steps
Rejection	6 steps
Steered linear	$\pm 12^\circ$ , $\pm 15^\circ$ , depending on probe
FOV or angle, depending on probe	
SRI-HD	Up to 6 levels selectable
CrossXBeam	Up to 9 angles selectable, depending on probe
Depth	1 – 33 cm, 0.5 or 1 cm per step, depending on probe

### 10.04 Coded Harmonic Imaging

Coded Phase Inversion Harmonic Imaging

Available on all probes

Line density	5 or 6 steps, depending on probe
Line density zoom	5 steps
Suppression	6 steps
Edge enhance	7 steps
Gray scale map	7 types
Tint map	9 types
Gain	0 – 90 dB, 1 dB per step

### 10.04 Coded Harmonic Imaging *(cont.)*

Dynamic range	51 – 78 dB, 3 dB per step; 36 – 48/78 – 96 dB, 6 dB per step
Rejection	6 steps
Frequency	Up to 4 steps, depending on probe

### 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

### 10.06 CrossXBeam

Provides 3, 5, 7, 9 of spatial compounding

Live side-by-side DualView display

Compatible with	• Color Mode	• PW
	• SRI-HD	• Coded Harmonic Imaging
	• Virtual Convex	

Available on 4C-RS, L6-12-RS, E8C-RS, 8C-RS, RAB2-6-RS, L8-18i-RS, BE9CS-RS, E8Cs-RS, 12L-RS, LK760-RS, RIC5-9A-RS, C1-5-RS, 9L-RS and L3-12-RS probes

### 10.07 Color Flow mode

Baseline	0 – 100%, 10% per step
Invert	On/Off
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, $\pm 10^\circ$ , $\pm 15^\circ$ , $\pm 20^\circ$
Packet size	8 – 24, depending on probe and application
Line density	5 steps
Line density zoom	5 steps
Frame average	7 steps
PRF	0.1 – 25 KHz, 19 steps
Spatial filter	6 steps
Gain	0 – 40 dB, 0.5 dB per step

## 10. General system parameters *(cont.)*

### 10.07 Color Flow mode *(cont.)*

Wall filter	4 steps, depending on probe and application
Scanning size (FOV or angle)	Depending on probe
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, depending on probe
Color maps, including velocity-variance maps	20 types, depending on probe and application
Transparent map	5 steps
Color threshold	0 – 100%, 10% per step
Accumulation	8 steps
Flash suppression	

### 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, $\pm 10^\circ$ , $\pm 15^\circ$ , $\pm 20^\circ$
Packet size	8 – 24, depending on probe and application
Spatial filter	6 steps
Frame average	7 steps
PRF	0.1 – 25 KHz
Power threshold	0 – 100%, 10% per step
Gain	0 – 40 dB, 0.5 dB per step
Wall filter	4 steps, depending on probe and application
CF/PDI frequency	Up to 4 steps, depending on probe
Transparent map	5 steps
Invert	On/off
Accumulation	8 steps

### 10.09 Auto Optimization

Optimize B-Mode image to improve contrast resolution

Selectable amount of contrast resolution improvement

Auto-Spectral Optimize adjusts	<ul style="list-style-type: none"> <li>• Baseline</li> <li>• Invert</li> <li>• PRF (on live image)</li> </ul>
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### 10.10 M-Mode

Gain	-20 – 20 dB, 1 dB per step
Gray scale map	6 or 8 types, depending on probe
Colorization	9 types
Scanning size	FOV or angle, depending on probe
Rejection	6 steps
M/PW display format	V-1/3B, V-1/2B, V-2/3B, H-1/2B, H-1/4B, timeline only (Vert 1/3B, Vert 1/2B, Vert 2/3B, Horiz 1/2B, Horiz 1/4B, TL only)
Dynamic range	36 – 96 dB/36 – 48 dB/78 – 96 dB, 6 dB per step; 48 – 78 dB, 3 dB per step

### 10.11 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

Curved AMM

### 10.12 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	0.3 – 27.9 KHz
Transmit frequency	1.7 – 10 MHz, depending on probe
Wall filter	5.5 – 5000 Hz, 27 steps, depending on probe
PW colorization	Up to 6 types
Velocity scale range	<ul style="list-style-type: none"> <li>• 0.1 – 6670 cm/s</li> <li>• Sweep speed: 0 – 7, 8 steps</li> </ul>
Sample volume depth	0.1 – 33 cm, 0.1 cm per step, depending on probe

## 10. General system parameters *(cont.)*

### 10.12 Pulse Wave Doppler mode *(cont.)*

SV gate	1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 16 mm
Angle correction	-90° – 90°, 1° per step
Spectrum inversion	On/off
Duplex	Simultaneous: On/off (PW only)
PW angle steer	0°, ±10°, ±15°, ±20° (use angle steer of B-Mode)
Trace method	Off, Max, Mean
Baseline shift	11 steps
Doppler Auto Trace	
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

### 10.13 Continuous Wave Doppler mode (option)

Gray scale map	8 types
Baseline	11 steps
Angle correct	-90° – 90°, 1° per step
Spectral color	6 types
Invert	On/off
Spectral averaging	5 steps
Gain	0 – 85 dB, 1 dB per step
Wall filter	5.5 – 5000 Hz, 27 steps, depending on probe and application
CW-Mode includes	<ul style="list-style-type: none"> <li>• Transmit frequency: 1.9, 4.2, 5, 6.2 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: On/off</li> <li>• Trace method: Max, Mean, Off</li> <li>• Doppler Auto Trace: Frozen, Live, Off</li> <li>• Trace direction: Above, below, both</li> </ul>
Trace sensitivity	0 – 40, 2 per step

### 10.14 Cine memory/image memory

Cine memory: 384 MB
Selectable Cine sequence for Cine review
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%)

### 10.15 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, MPEGVue	
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: ~2.1 MB</li> <li>• Display format: full size, 4x4 and thumbnails</li> </ul>
Storage devices	<ul style="list-style-type: none"> <li>• Internal hard drive partition of 356 GB for image storage</li> <li>• External USB HDD and USB memory stick support for Import, Export, DICOM Read, SaveAs, and MPEGVue</li> <li>• CD-RW storage: 700 MB</li> <li>• DVD storage: -R (4.7 GB)</li> </ul>

## 10. General system parameters *(cont.)*

### 10.16 Connectivity and DICOM

Ethernet network connection	<ul style="list-style-type: none"> <li>• DICOM 3.0 (option)</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>• Remote capability InSite™ ExC</li> </ul>
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### 10.17 Virtual Convex

Provides a convex field of view

Compatible with CrossXBeam

Available on linear and sector transducers

### 10.18 LOGIQ View (option)

Extended field of view imaging

Available on 4C-RS, L6-12-RS, 8C-RS, 3Sc-RS, E8C-RS, E8Cs-RS, RAB2-6-RS, L8-18i-RS, 6S-RS, BE9CS-RS, LK760-RS, 12L-RS, 12S-RS, C1-5-RS, RIC5-9-RS, E7C8L-RS, L3-12-RS and 9L-RS probes

For use in B-Mode

CrossXBeam is available on linear probes

Auto detection of scan direction

Post-process zoom

Rotation

Auto fit on monitor

Measurements in B-Mode

Up to 60 cm scan length

### 10.19 Easy 3D (option)

Allows unlimited rotation and planar translations

3D reconstruction from Cine sweep

Utilities: Off/Average Light/Average Medium/Average Strong

Gray surface: 0 – 100%

Threshold1: 0 – 255

Threshold2: 0 – 255

Scan distance: 1.0 – 15.0

Colorize: 0 – 360

### 10.20 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

### 10.21 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> </ul>
Render Mode	Surface Texture, Surface Smooth, Max-, Min-, X-ray, Mix Mode of two render modes
Display format	<ul style="list-style-type: none"> <li>• Quad: A-/B-/C-Plane/3D</li> <li>• Dual: A-Plane/3D</li> <li>• Single: 3D</li> </ul>

#### Curved 3-point render start

3D Movie	<ul style="list-style-type: none"> <li>• Loop Speed: 6 – 400</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/UserDefine</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> <li>• Run/Stop</li> </ul>
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TUI: Tomographic Ultrasound Imaging	<ul style="list-style-type: none"> <li>• Display format: 1x1/1x2/2x2/3x3</li> <li>• Slices: 3 – 19</li> <li>• Slices distance: 0.5 – 40 mm</li> </ul>
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Real-time 4D	<ul style="list-style-type: none"> <li>• 4D Volume Cine</li> <li>• LoopSpeed: 6 – 400</li> <li>• Run/Stop</li> </ul>
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Niche

VOCAL (option) Virtual Organ Computer-aided Analysis

## 10. General system parameters *(cont.)*

### 10.22 B-Flow (option)

Available on 4C-RS, L6-12-RS, 12L-RS, C1-5-RS, 9L-RS and L3-12-RS probes

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 dB per step
Rejection	6 steps
Gain	0 – 90 dB range, 1 dB per step
B-Flow Color	
Accumulation	8 levels

### 10.23 Elastography (option)

Available on L6-12-RS, E8Cs-RS, 4C-RS, 12L-RS, C1-5-RS, 9L-RS and 12L-RS probes

Semi-quantification	<ul style="list-style-type: none"> <li>• Frame reject: 0 – 8</li> <li>• Axial smoothing: 0 – 4</li> <li>• Noise reject: 0 – 8</li> <li>• Sample Volume: 0 – 4</li> <li>• Lateral smoothing: 0 – 4</li> <li>• Window: 0 – 8</li> <li>• Map: 8</li> <li>• Frame average: 0 – 10</li> <li>• Line Density: 0 – 4</li> <li>• Soft compress: 0 – 10</li> <li>• Hard compress: 0 – 10</li> </ul>
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### 10.24 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

Q-Analysis: Multiple Time Motion trace display from selected points in the myocardium

### 10.25 TVM (option)

TVI with M-Mode active

Available on the sector probes

Provides both myocardium motion velocity and direction

### 10.26 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. General system parameters *(cont.)*

### 10.27 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 to the current exam.

### 10.28 Breast Care (option)

Breast care is a customizable workflow designed for breast scanning. With its guiding, user can complete various modes of imaging, measurement, BI-RADS lesion classification, and find positive area efficiently. That's an easy reference in the device when patient is in subsequent visit.

### 10.29 Needle recognition (option)

Needle recognition allows you to obtain precise needle imaging in the dashed box. It is available with probes on L6-12L-RS, 4C-RS, 12L-RS, C1-5-RS, 9L-RS and L3-12-RS.

### 10.30 Scan Coach

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

### 10.31 My Trainer

It lists out FAQs from customers and instructs customer how to solve problems by themselves timely.

### 10.32 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.

### 10.33 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.

### 10.34 CSD

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

### 10.35 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.

### 10.36 Whizz CF mode

Whizz CF is a feature to dynamically optimize CF mode parameter including gain and frequency in real time to help acquire consistently best possible images for a clear diagnosis.

### 10.37 Whizz Label

Whizz Label can simplify the workflow that need to label or annotate ultrasound images for documentation purposes similar to manual annotation of ultrasound images.

### 10.38 V-Live

V-Live is a technology that allow operator to rotate light source by tracking ball under 3D mode; Operator could adjust the light from different direction to highlight the cared area for a better clarity on targeted tissue.

### 10.39 Lateral Gain Compensation (LGC)

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

### 10.40 Controls available while "live"

Write Zoom

B/M/ CrossXBeam-Mode	<ul style="list-style-type: none"><li>• Gain</li><li>• TGC</li><li>• Dynamic range</li><li>• Acoustic output</li><li>• Transmission focus position</li><li>• Transmission focus number</li><li>• Line density control</li><li>• Sweep speed for M-Mode</li><li>• Number of angles for CrossXBeam</li></ul>
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## 10. General system parameters *(cont.)*

### 10.40 Controls available while “live” *(cont.)*

PW-Mode	<ul style="list-style-type: none"> <li>• Gain</li> <li>• Doppler Audio</li> <li>• Acoustic Output</li> <li>• Transmission Frequency</li> <li>• Scale</li> <li>• Wall Filter</li> <li>• Sample Volume Gate               <ul style="list-style-type: none"> <li>– Length</li> <li>– Depth</li> </ul> </li> <li>• Volume</li> </ul>
Color Flow mode	<ul style="list-style-type: none"> <li>• CFM Gain</li> <li>• CFM Velocity Range</li> <li>• Acoustic Output</li> <li>• Wall Filter</li> <li>• Packet Size</li> <li>• Line Density</li> <li>• CFM Spatial Filter</li> <li>• CFM Frame Averaging</li> <li>• Frequency/Velocity Base Line Shift</li> </ul>

### 10.41 Controls available on Freeze or Recall

Automatic Optimization

SRI-HD

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

3D reconstruction from a stored Cine loop

B/M/CrossXBeam Mode (CrossXBeam is disabled on Freeze or Recall)

TGC

Colorized B and M

Dynamic range

AT (Acceleration Time)

ACC (Acceleration)

Anatomical M-Mode

Gray map

Post gain

Baseline shift (PW, CW)

Sweep speed

Compression

Rejection

Colorized spectrum

Display format

### 10.41 Controls available on Freeze or Recall *(cont.)*

Angle Correct

Quick Angle Correct

Auto Angle Correct (can't adjust in Freeze)

Overall gain (loops and stills)

Color map

Transparency map

Frame averaging (loops only)

Flash suppression (disable in Freeze)

CFM display threshold

Spectral invert for Color/Doppler

## 11. Measurements/calculations

### 11.01 General B-Mode

Depth and distance

Circumference (ellipse/trace)

Area (ellipse/trace)

Volume (ellipsoid)

% Stenosis (area or diameter)

Angle between two 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/frequency ratio)

PS (Peak Systole)

ED (End Diastole)

PS/ED (PS/ED ratio)

ED/PS (ED/PS ratio)

# 11. Measurements/calculations *(cont.)*

## 11.03 General Doppler measurements/calculations *(cont.)*

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)

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

Estimated Fetal Weight (EFW) by	<ul style="list-style-type: none"> <li>• AC, BPD</li> <li>• AC, BPD, FL, HC</li> <li>• AC, FL, HC</li> <li>• BPD, APTD, TTD, FL</li> </ul>
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Calculations and ratios	<ul style="list-style-type: none"> <li>• FL/BPD</li> <li>• FL/HC</li> <li>• CI (Cephalic Index)</li> <li>• CTAR (Cardio-Thoracic Area Ratio)</li> </ul>
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SonoBiometry	<ul style="list-style-type: none"> <li>• BPD</li> <li>• HL</li> <li>• HC</li> <li>• FL</li> <li>• AC</li> </ul>
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Measurements/calculations by: ASUM, ASUM 2001, Berkowitz, Bertagnoli, Brenner, Campbell, CFEF, Chitty, Eik-Nes, Ericksen, Goldstein, Hadlock, Hansmann, Hellman, Hill, Hohler, Jeanty, JSUM, Kurtz, Mayden, Mercer, Merz, Moore, Nelson, Osaka University, Paris, Rempen, Robinson, Shepard, Shepard/ Warsoff, Tokyo University, Tokyo/Shinozuka, Yarkoni

Fetal graphical trending

Growth percentiles

Multi-gestational calculations

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. Measurements/calculations *(cont.)*

## 11.07 Vascular measurements/calculations

SYS DCCA (Systolic Distal Common Carotid Artery) DIAS

DCCA (Diastolic Distal Common Carotid Artery) SYS

MCCA (Systolic Mid Common Carotid Artery)

DIAS MCCA (Diastolic Mid Common Carotid Artery)

SYS PCCA (Systolic Proximal Common Carotid Artery)

DIAS PCCA (Diastolic Proximal Common Carotid Artery)

SYS DICA (Systolic Distal Internal Carotid Artery)

DIAS DICA (Systolic Distal Internal Carotid Artery)

SYS MICA (Systolic Mid Internal Carotid Artery)

DIAS MICA (Diastolic Mid Internal Carotid Artery)

SYS PICA (Systolic Proximal Internal Carotid Artery)

DIAS PICA (Diastolic Proximal Internal Carotid Artery)

SYS DECA (Systolic Distal External Carotid Artery)

DIAS DECA (Diastolic Distal External Carotid Artery) SYS

PECA (Systolic Proximal External Carotid Artery) DIAS

PECA (Diastolic Proximal External Carotid Artery) VERT

(Systolic 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

## 11.09 Cardiac measurements/calculations

### 11.09.01 B-Mode measurements

Aorta	<ul style="list-style-type: none"> <li>• Aortic Root Diameter (Ao Root Diam)</li> <li>• Aortic Arch Diameter (Ao Arch Diam)</li> <li>• Ascending Aortic Diameter (Ao Asc)</li> <li>• Descending Aortic Diameter (Ao Desc Diam)</li> <li>• Aorta Isthmus (Ao Isthmus)</li> <li>• Aorta (Ao st junct)</li> </ul>
Aortic valve	<ul style="list-style-type: none"> <li>• Aortic Valve Cusp Separation (AV Cusp)</li> <li>• Aortic Valve Area Planimetry (AVA Planimetry)</li> <li>• (Trans AVA)</li> </ul>
Left atrium	<ul style="list-style-type: none"> <li>• Left Atrium Diameter (LA Diam)</li> <li>• LA Length (LA Major)</li> <li>• LA Width (LA Minor)</li> <li>• Left Atrium Area (LAA(d), LAA(s))</li> <li>• Left Atrium Volume, Single Plane, Method of Disk (LAEDV A2C, LAESV A2C) (LAEDV A4C, LAESV A4C)</li> </ul>
Left ventricle	<ul style="list-style-type: none"> <li>• Left Ventricle Volume, Teichholz/Cubic (LVIDd, LVI Ds)</li> <li>• Left Ventricle Internal Diameter (LVIDd, LVI Ds)</li> <li>• Left Ventricle Length (LVLd, LVLs)</li> <li>• Left Ventricle Outflow Tract Diameter (LVOT Diam)</li> <li>• Left Ventricle Posterior Wall Thickness (LVPWd, LVPWs)</li> <li>• Left Ventricle Length (LV Major)</li> <li>• Left Ventricle Width (LV Minor)</li> <li>• Left Ventricle Outflow Tract Area (LVOT)</li> <li>• Left Ventricle Mass Index (LVPWd, LVPWs)</li> <li>• Ejection Fraction, Teichholz/Cube (LVIDd, LVIDs)</li> <li>• Left Ventricle Posterior Wall Fractional Shortening (LVPWd, LVPWs)</li> <li>• Mitral Valve</li> <li>• Mitral Valve Annulus Diameter (MV Ann Diam)</li> <li>• E-Point-to-Septum Separation (EPSS)</li> <li>• Mitral Valve Area Planimetry (MVA Planimetry)</li> </ul>
Pulmonic valve	Pulmonic Diameter (Pulmonic Diam)
Right ventricle	<ul style="list-style-type: none"> <li>• Right Ventricle Internal Diameter (RVIDd, RVIDs)</li> <li>• Right Ventricle Outflow Tract Diameter (RVOT Diam)</li> </ul>
System inferior vena cava	Systemic Vein Diameter (Systemic Diam)

# 11. Measurements/calculations (cont.)

## 11.09 Cardiac measurements/calculations (cont.)

### 11.09.02 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	<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>

### 11.09.03 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>
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## 11.09 Cardiac measurements/calculations (cont.)

### 11.09.03 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>

# 11. Measurements/calculations *(cont.)*

11.09 Cardiac measurements/calculations <i>(cont.)</i>		11.09 Cardiac measurements/calculations <i>(cont.)</i>	
11.09.03 Doppler mode measurements <i>(cont.)</i>		11.09.03 Doppler mode measurements <i>(cont.)</i>	
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> <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 Peak Pressure</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>	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> <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>
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>	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 (TVTrace)</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>

## 11. Measurements/calculations *(cont.)*

## 12. Probes

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

#### 11.09.04 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>

#### 11.09.05 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>

#### 11.09.06 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

### 12.01 4C-RS

Convex probe

Applications	Abdominal, Fetal/OB, GYN, Vascular/Peripheral Vascular, Urology, Pediatric, MSK Conventional, Thoracic/Pleural, Interventional Guidance
Number of elements	128
Convex radius	60 mmR
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

### 12.02 L6-12-RS

Linear probe

Applications	Vascular/Peripheral Vascular, Small parts, Pediatrics, MSK Conventional, MSK Superficial, Thoracic/Pleural, 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

## 12. Probes (cont.)

### 12.03 12L-RS

Linear probe

Applications	Vascular/Peripheral Vascular, Small parts, Pediatrics, MSK Conventional, MSK Superficial, Thoracic/Pleural, Interventional Guidance
Number of elements	192
Footprint	47.1 x 12.7 mm
B-Mode imaging frequency	6.0, 8.0, 10.0, 12.0 MHz
Harmonic imaging frequency	8.0, 10.0, 12.0, 13.0 MHz
CFM/PDI/PWD frequency	4.2, 6.3, 7.7 MHz
Steered angle	±20°
Biopsy guide	Multi-angle, reusable bracket

### 12.04 E8C-RS

Endo micro convex probe

Applications	Fetal/OB, GYN, Urology, Transvaginal, Transrectal, Interventional Guidance
Number of elements	128
Convex radius	8.73 mmR
FOV	168°
Footprint	18.6 x 13.9 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	4.0, 5.0, 6.0 MHz
Biopsy guide	Fixed angle, disposable or reusable bracket

### 12.05 LK760-RS

Linear probe

Application	MSK Conventional
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	±10°
Biopsy guide	Not available

### 12.06 E8Cs-RS

Endo micro convex probe

Applications	Fetal/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

### 12.07 8C-RS

Micro convex probe

Applications	Pediatric, MSK Conventional, Cardiac Pediatric, Transcranial, Interventional Guidance
Number of elements	128
Convex radius	10.73 mmR
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

## 12. Probes (cont.)

### 12.08 3Sc-RS

Phased array sector probe

Applications	Abdomen, Vascular/Peripheral Vascular, Cardiac Adult, Cardiac Pediatric, Thoracic/Pleural, Transcranial, Interventional 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

### 12.09 6S-RS

Phased array sector probe

Applications	Vascular/Peripheral Vascular, Pediatric, Cardiac Pediatric, Transcranial, 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	3.0, 4.0, 4.5 MHz
CWD frequency	4.2 MHz
Biopsy guide	Not available

### 12.10 RAB2-6-RS

Convex volume probe

Applications	Abdomen, Fetal/OB, GYN, Urology, Interventional Guidance
Number of Elements	128
Convex radius	47.1 mmR
FOV	70° (B), 84° x 70° (volume scan)
Footprint	62.2 x 34.0 mm
Volume sweep radius	24.11 mm
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

### 12.11 L8-18i-RS

Linear probe

Applications	Vascular/Peripheral Vascular, Small parts, MSK superficial, Interventional Guidance
Number of elements	168
Footprint	34.8 X 11.1 mm
B-Mode imaging frequency	8.0, 12.0, 14.0, 16.0 MHz
Harmonic imaging frequency	9.0, 15, 18.0 MHz
CFM/PDI/PWD frequency	6.7, 8.3, 10 MHz
Steered angle	±20°
Biopsy guide	Not available

## 12. Probes (cont.)

### 12.12 BE9CS-RS

Simultaneous bi-plane, micro convex probe

Applications	Urology, Transrectal, Interventional Guidance
Number of elements	96
Convex radius	9 mm
FOV	133°
Footprint	19 x 18.7 mm
B-Mode imaging frequency	6.0, 8.0, 10.0 MHz
Harmonic imaging frequency	8.0, 9.0, 10.0 MHz
CFM/PDI/PWD frequency	4.0, 5.0, 6.3 MHz
PW frequency	4.2, 5.0, 6.3 MHz
Biopsy guide	Fixed angle, disposable or reusable bracket

### 12.13 12S-RS

Phased array sector probe

Applications	Vascular/Peripheral Vascular, Pediatric, Cardiac Pediatric, Transcranial, Interventional Guidance
Number of elements	96
FOV	120°
Footprint	17.6 x 13.2 mm
B-Mode imaging frequency	6.0, 8.0, 10.0, 11.0 MHz
Harmonic imaging frequency	9.0, 10.0, 12.0 MHz
CFM/PDI/PWD frequency	4.5, 5.0, 5.6, 6.7 MHz
CW frequency	4.2, 5.0, 6.2 MHz
Biopsy guide	Not available

### 12.14 RIC5-9A-RS

Convex volume probe

Applications	Fetal/OB, GYN, Urology, Transvaginal, Transrectal, Interventional Guidance
Number of Elements	192
Convex radius	10.1 mmR
FOV	146° (B), 84° x 146° (volume scan)
Footprint	20.96 x 23.35 mm
B-Mode imaging frequency	5.0, 7.0, 9.0 MHz
Harmonic imaging frequency	7.0, 8.0, 10.0 MHz
CFM/PDI frequency	4.2, 5.0, 6.3 MHz
Biopsy guide	Fixed angle, disposable, or reusable bracket

### 12.15.01 E7C8L-C-RS

Micro curve part

Applications	Urology, Transrectal, Interventional Guidance
Number of Elements	128
Convex radius	8 mm
FOV	136°
Footprint	17.2 x 10.3 mm
B-Mode imaging frequency	6.0, 8.0, 10.0 MHz
Harmonic imaging frequency	8.0, 10.0 MHz
CFM/PDI/PWD frequency	5.0, 6.7 MHz
Biopsy guide	Multi-angle, reusable bracket

## 12. Probes (cont.)

### 12.15.02 E7C8L-L-RS

Linear part

Applications	Urology, Transrectal, Interventional Guidance
Number of Elements	128
Footprint	57.6 x 9.1 mm
B-Mode imaging frequency	6.0, 8.0, 10.0 MHz
Harmonic imaging frequency	8.0, 10.0 MHz
CFM/PDI/PWD frequency	5.0, 6.7 MHz
Steered angle	±20°
Biopsy guide	Multi-angle, reusable bracket

### 12.16 9L-RS

Linear probe

Applications	Abdomen, Vascular/Peripheral Vascular, Small parts, Pediatrics, MSK Conventional, MSK Superficial, Thoracic/Pleural, Interventional Guidance
Number of Elements	192
Footprint	53 x 14.1 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	4.0, 5.0 MHz
Steered angle	±20°
Biopsy guide	Multi-angle, reusable bracket

### 12.17 L3-12-RS

Linear probe

Applications	Vascular/Peripheral Vascular, Pediatric, Small parts, MSK Conventional, MSK Superficial, Thoracic/Pleural, Interventional Guidance
Number of Elements	256
Footprint	60.9 x 12.9 mm
B-Mode imaging frequency	5.0, 7.0, 9.0, 11 MHz
Harmonic imaging frequency	8, 10, 12 MHz
CFM/PDI frequency	3.6, 4.2, 5.0, 7.7, 9.1 MHz
PWD frequency	3.6, 4.2, 5.0, 7.7, 8.3 MHz
Steered angle	20°
Biopsy guide	Multi-angle, reusable bracket

## 13. Inputs and outputs

CVBS output (RCA)

S-Video output

VGA output (1920 x 1080 resolution)

HDMI output (1920 x 1080 resolution)

Audio line-out (RCA)

Ethernet (RJ45)

USB (3x in rear, 1 beside keyboard)



## 14. Safety conformance

The Versana Premier is CE marked to Council Directive 93/42/EEC on medical devices

Conforms to the following standards for safety

- IEC 60601-1 Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
- 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
- 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
- ISO 10993-1 Biological evaluation of medical devices – Part 1 Evaluation and testing within a risk management process
- EN 62366 Medical devices – Application of usability engineering to medical devices



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