



Versana Essential™ Ultrasound System

Specification sheet

Versana Essential is a general purpose diagnostic ultrasound imaging system for use by qualified and trained healthcare professionals enabling visualization and measurement of anatomical structures and fluid.



General Specifications

Dimensions and weight

Height with 39.6 cm (15.6") LED back-lit monitors	Fixed 1360 mm (53.54")
Width	<ul style="list-style-type: none">• Keyboard: 550 mm (21.65")• Caster: 486 mm (19.13")
Depth	<ul style="list-style-type: none">• Maximum: 577 mm (22.71")• Caster: 640 mm (25.19")
Weight	<ul style="list-style-type: none">• With 39.6 cm/15.6" monitor – 35 kg (77 lb)

Electrical power

Voltage 100-240 VAC

Frequency 50/60 Hz

Power consumption maximum of 300 VA with peripherals

Console design

Standard 3 probe ports

Integrated SSD (128 GB) solid state drive

Integrated speakers

Four probe holders, removable for cleaning and washing

Gel holder, removable for cleaning and washing

Front and rear handles

Probe cable management hooks

Removable air filters

Wheels

Wheel diameter: 120 mm (4.7")

Locking mechanism that provides rolling lock and caster swivel lock

User interface

Operator keyboard

Ergonomic full-size keyboard

Six TGC slider segments

Monitor

40 cm (15.6") high-resolution LED back-lit monitors

Fixed monitor arm

Tilt/rotate

- Tilt angle: -90° to 30°
- Rotate angle: -90° to 90°

Fold-down for transportation

Brightness and contrast adjustment

Audio/volume adjustments

System overview

Applications

Abdominal

Obstetrical

Gynecological

Small Parts

Musculoskeletal (Conventional/Superficial)

Vascular/Peripheral Vascular

Urological

Pediatric

Transcranial

Adult cardiac

Transrectal

Scanning methods

Electronic convex

Electronic linear

Electronic micro convex

Electronic sector

Transducer types

Convex array

Linear array

Micro convex array

Sector phased array

System Overview *(cont.)*

Operating modes

B-Mode

M-Mode

Anatomical M-Mode (Option)

Color Flow Mode (CFM)

Power Doppler Imaging (PDI)

PW Doppler with High PRF

CW Doppler Mode (Option)

TVI Mode (Option)

System standard features

Whizz

Scan Coach

CrossXBeam™

SRI-HD (High Definition Speckle Reduction Imaging)

Coded Phase Inversion Harmonic Imaging

Virtual Convex

Patient information database

Image archive on integrated SSD

Raw data analysis (TruScan architecture)

My Trainer

Real-time automatic Doppler calculations

OB calculations

Fetal trending

Multigestational calculations

Hip dysplasia calculations

Gynecological calculations

Vascular calculations

Urological calculations

Renal calculations

Cardiac calculations

Remote capability: InSite™ ExC

On-board reporting package (Option)

Network storage

Software Options

In some systems and in some regions, the following options may be available

Coded phase inversion harmonic imaging

Color M-Mode

Directional PDI

CFM

PDI

CW Doppler

Anatomical M-Mode

Color M-Mode

LOGIQView

Easy 3D

Auto IMT

SonoBiometry

Scan Coach

Scan Assistant

On-board reporting (option)

DICOM® 3.0 connectivity

Peripheral options

Digital UP-D898DC b/w thermal printer

Digital UP-D898MD b/w thermal printer

898 printer paper

Digital UP-D25MD color thermal printer

1-pedal type footswitch 'Whanam FSU-1000'

Footswitch MKF 2-MED USB GP26

512G SSD

ECG Kits

USB Stick 8G

1TB mobile USB HDD

USB DVD RW kit

Bluetooth connectivity

USB wireless adaptor

Software Options *(cont.)*

Display modes

Live and stored display format

- Wide screen: full size and split screen – both with thumbnails for still and CINE
- Review image format: 4x4 and thumbnails for still and CINE

Live and Stored Display Format *(cont.)*

- Simultaneous capability
- Dual B (B/B)
 - B/CFM or PDI
 - B/PW or B/M
 - B + CFM/M
- Real-time Triplex Mode (B + CFM or PDI+PW)
- B or CrossXBeam/PW
- B or CrossXBeam/CFM or PDI
- B/CrossXBeam
- Real-time Triplex Mode (B or CrossXBeam + CFM or PDI/PW)

Selectable alternating probe dependent modes

B or CrossXBeam/PW

B or CrossXBeam + CFM (PDI)/PW (CW)

B + CFM (PDI)/PW (CW)

Easy 3D-Mode

B/CW

Multi-image split screen (quad screen)

Live and/or frozen

B or CrossXBeam + B or CrossXBeam/CFM or PDI

Independent CINE playback

PW/CW display formats

- Top/bottom selectable format
- Side/side selectable format

Virtual convex

Timeline only

Zoom: write (HD)/read

Colorized image

- Colorized B
- Colorized M
- Colorized PW
- Colorized CW – colorized 3D

Time line display

Independent dual B/PW or CW display

Display Formats

- Top/bottom selectable format (size: 1/2:1/2; 1/3:2/3; 2/3:1/3)
- Side/side selectable format (size: 1/2:1/2; 1/4:3/4; TL only)

Display Annotation

General user interface

Patient name: first, last (max 28 characters displayed per each patient, up to 64 total characters per each patient)

Patient ID (max 64 characters)

Other ID (max 64 characters)

Age, sex and date of birth

Hospital name (max 23 characters displayed)

Date format:
three types selectable

- MM/DD/YY
- DD/MM/YY
- YY/MM/DD

Time format:
two 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
- TIB: Thermal Index Bone
- MI: Mechanical Index

% of maximum power output

Probe name

Map names

Probe orientation

Depth scale marker

Focal zone markers

Image depth

Zoom depth

B-Mode

Gain

Dynamic range

Imaging frequency

Edge enhance

Frame averaging

Acoustic frame rate

Whizz on/off

SRI-HD

CrossXBeam

Display Annotation (cont.)

B-Mode (cont.)

Adjustable

- Acoustic power
- Gain
- Dynamic range
- Frame averaging
- Gray scale map
- Frequency
- Line density
- Scanning size (FOV or angle – probe dependent, refer to probe specifications)
- B colorization
- Reject
- Suppression
- SRI-HD
- Edge enhance
- Sound of speed

M-Mode

Acoustic power

Gray scale map

Sweep speed

M colorization

M display format

Rejection

Color Flow Mode

Line density

Frame average

Packet size

Color velocity range and baseline

Color threshold marker

Color gain

Inversion

PDI mode

Line density

Frame averaging

Packet size

Power, directional PDI

Color velocity range and baseline

Color threshold marker

PDI gain

PDI mode (cont.)

Inversion

Line density

Frame average

Doppler Mode

Gain

Angle

Sample volume depth and width

Wall filter

Spectrum inversion

Time scale

PRF

Doppler frequency

Anatomical M-Mode

M-Mode cursor adjustable at any plane or angle

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

Available with Color Flow Mode

Pulse Wave Doppler Mode

Adjustable

- Acoustic power
- Gain
- Gray scale map
- Transmit frequency
- Wall filter
- PW colorization
- Velocity scale range
- Sweep speed
- Sample volume
- Depth
- Angle correction
- Spectrum inversion
- Trace method
- Baseline shift
- Doppler auto trace
- Compression
- Trace direction
- Trace sensitivity

Display Annotation *(cont.)*

Color Flow Mode

Adjustable

- Acoustic power
- Color maps, including velocity-variance maps
- Gain
- Velocity scale range
- Wall filter
- Packet size
- Line density
- Spatial filter
- Steer angle
- Baseline shift
- Frame average
- Threshold
- Accumulation mode
- Sample volume control
- Flash suppression

Power Doppler Imaging

Adjustable

- Acoustic power
- Color maps
- Directional map
- Gain
- Velocity scale range
- Wall filter
- Packet size
- Line density
- Spatial filter
- Steering angle
- Frame average
- Threshold
- Accumulation mode
- Sample volume control
- Flash suppression

Continuous Wave Doppler

Adjustable

- Acoustic power
- Gain
- Gray scale map
- Transmit frequency
- Wall filter
- CW colorization
- Velocity scale range
- Sweep speed
- Angle correction
- Spectrum inversion
- Trace method
- Baseline shift
- Doppler auto trace
- Compression
- Trace direction
- Trace sensitivity

Whizz

Continuous auto-optimize B-Mode image gray scale, image brightness and image uniformity

Coded harmonic imaging

Coded phase inversion harmonic imaging

Available on all probes

LOGIQView

Extended Field of View imaging

Available on 3Sc-RS, E8C-RS, L5-11-RS, C2-5-RS

For use in B-Mode

Auto detection of scan direction

Post-process zoom

Auto fit on monitor

Measurements in B-Mode

Easy 3D

Allows unlimited rotation and planar translations, 3D reconstruction from CINE sweep

- Utilities
- Texture
- Grey surface
- Render
- Threshold1
- Threshold2
- ScanDistance
- Colorize

Scan Coach

Modules showing basic scanning techniques with graphic of beam formation, indicative probe position, schematic of anatomy and example clinical image

Scan Assistant

Factory programs

User defined programs

Steps include image annotations, mode transitions, basic imaging controls and measurement initiation

Display Annotation *(cont.)*

Virtual convex

Provides a convex field of view

Compatible with CrossXBeam

Available on linear and sector transducers

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, easy 3D

CrossXBeam

Provides four levels of spatial compounding (low, medium, high, max), probe dependent

Live side-by-side DualView display

Compatible with

- Color Mode
- PW
- SRI-HD
- Coded harmonic imaging
- Virtual convex

Available on L5-11-RS, E8C-RS, C2-5-RS

General System Parameters

System setup

Eight pre-programmable categories

User programmable preset capability

Factory default preset data

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

OB report formats including Tokyo, Osaka, USA, Europe, and ASUM

User defined annotations

Body patterns

Customized comment home position

CINE memory/image memory

384 MB of CINE memory

Selectable CINE sequence for CINE review

CINE memory/image memory *(cont.)*

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%)

Image storage

On-board database of patient information

Storage formats: DICOM

- Compressed/uncompressed
- Single/multi-frame
- With/without raw data

Export JPEG, WMV (MPEG 4) and AVI formats

DICOM still image storage size: ~2.1 MB

Display format: full size, 4x4 and thumbnails

Storage devices:

Internal hard drive partition of 55 GB for image storage

External USB HDD and USB memory stick support for Import, Export, DICOM Read, SaveAs, and MPEGVue

DVD storage: -R (4.7 GB)

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

Connectivity and DICOM

Ethernet network connection

- DICOM 3.0 (Optional)
- Verify
- Print
- Store
- Modality worklist
- Storage commitment
- Modality performed procedure step (MPPS)
- Query/retrieve
- Structured reporting template – which can be compared to vascular and OB standard values
- Remote capability InSite ExC

General System Parameters *(cont.)*

Scanning parameters

Digital agile beamformer architecture

112,500 system processing channels

Max. frame rate: 1228 F/s (probe and mode dependent)

Displayed imaging depth: 2-33 cm (0.78-13")/displayed imaging depth: 2-33 cm (0.78-13")

Minimum depth of field: 0-2 cm/0-0.78" (zoom) (probe dependent)

Maximum depth of field: 2-33 cm (0.78-13") (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: 1.7-13 MHz

256 shades of gray

263 dB systematic dynamic range

Adjustable dynamic range (36-96 dB)

Adjustable Field of View (FOV): up to 128 degrees (probe dependent)

Image reverse: right/left

Image rotation of 0°, 90°, 180° and 270°

B-Mode

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

Gain: from 0-90 dB, 1 dB steps

Dynamic range: 36-96 dB, 36~48/78~96, 6 dB step

Adjustable dynamic range: 36-96 dB, 3 or 6 dB steps

Frame average: 8 steps

Gray scale map: 6 or 8 types (probe dependent)

B colorization: 9 types

Frequency: up to 11 selectable (probe dependent)

Line density: 5 steps

Line density zoom: 5 steps

Thermal index: TIC, TIS, TIB

Image reverse: on/off

Focus number: 8 steps

Focus width: 3 types

Suppression: 6 steps

B-Mode *(cont.)*

Edge enhance: 7 steps

Rejection: 6 steps

Steered linear: $\pm 10^\circ$, $\pm 15^\circ$ (probe dependent)

Scanning size (FOV or angle – depending on the probe)

SRI-HD: up to 8 levels selectable

CrossXBeam: up to 9 angles selectable

Depth: 2-33 cm (0.78-13"), 0.5 or 1 cm (0.2 or -0.39") step, probe dependent

Color Flow Mode

Baseline: 0-100%, 10% steps

Invert: on/off

CF/PDI focus depth: default pre-settable for 10-100% of ROI in depth, 15% or 20% step

CF/PDI flash suppression: 5 steps

CF/PDI angle steer: 0, $\pm 10^\circ$, $\pm 15^\circ$

Packet size: 8-24, dependent on probe and application

Line density: 5 steps

Line density zoom: 5 steps

Frame average: 7 steps

PRF: 0.2-21 KHz/22 steps

Spatial filter: 6 steps

Gain: 0-40 dB, 0.5 dB steps

Wall filter: 4 steps, dependent on probe and application

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 16 steps, depending on probe

Color maps, including velocity-variance maps: 14 types depending on application

Transparent: 5 steps

Color threshold: 0-100%, 10% steps

Accumulation: 8 steps

Flash suppression

Power Doppler imaging

PDI map: 14 types

General System Parameters *(cont.)*

Power Doppler imaging *(cont.)*

CF/PDI focus depth: default pre-settable for 10-100% of ROI in depth, 15% or 20% step

CF/PDI acoustic output: 0-100%, 2%, 5% or 10% step

CF/PDI angle steer: 0, $\pm 10^\circ$, $\pm 15^\circ$

Packet size: 8-24, dependent on probe and application

Spatial filter: 6 steps

Frame average: 7 steps

PRF: 0.2-21 KHz/22 steps

Power threshold: 0-100%, 10% steps

Gain: 0-40 dB, 0.5 dB steps

Wall filter: 4 steps depending on probe and application

CF/PDI frequency: up to 16 steps, depending on probe

Transparent: 5 steps

Invert: on/off

Accumulation: 8 steps

M-Mode

Gray scale map: 6 or 8 types (probe dependent)

Colorization: 9 types

Scanning size (FOV or angle – depending on probe, see probe specifications)

Rejection: 6 steps

M/PW display format: V-1/3B, V-1/2B, V-2/3B, H-1/2B, H-1/4B, timeline only

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

Pulse wave Doppler Mode

Acoustic power: 0-100%, 2, 5, and 10 steps

Gain: 0-85 dB, 1 dB step

Gray scale map: up to 8 types

PRF: 0.5-26.8 KHz

Transmit frequency: 1.7~6 MHz, probe dependent

Wall filter: 6-3150 Hz, 25 steps, dependent on probe

Pulse wave Doppler Mode *(cont.)*

PW colorization: up to 6 types

Velocity scale range: 0.1~3631 cm/s

Sweep speed: 0~7, 8 steps

Sample volume depth: 0.2~33 cm, probe dependent

SV gate: 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 16 mm

Angle correction: -90~90, 1 step

M/PW display format: V-1/3B, V-1/2B, V-2/3B, H-1/2B, H-1/4B, timeline only

Spectrum inversion

Duplex: simultaneous: on/off (PW only)

PW angle steer: 0, ± 10 , 15

Sample volume depth: 206 steps default pre-settable, probe dependent

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 steps

Continuous Wave Doppler (option)

Gray scale map: 8 types

Baseline: 11 steps

Angle correct: $\pm 90^\circ$, 1° step

Spectral color: 6 types

Invert: on/off

Spectral average: 5 steps

Gain: 0-85 dB, 1 dB steps

Wall filter: 5.5-5000 Hz, 27 steps, dependent on probe and application

CW-Mode includes:

- Transmit frequency
- CW colorization
- Velocity scale range: 0.2-6105 cm/s (0.078-2403")
- Spectrum inversion
- Trace method
- Doppler auto trace
- Trace direction
- Trace sensitivity

General System Parameters *(cont.)*

Whizz

Auto-optimize B-Mode image gray scale, image brightness and image uniformity

Coded Harmonic Imaging

Coded phase inversion harmonic imaging

Available on all probes

Line density: 5 steps

Line density zoom: 5 steps

Suppression: 6 steps

Edge enhance: 7 steps

Gray scale map: 6 types

Tint map: 9 types

Gain: 0-90 dB, 1 dB step

Dynamic range: 36-96 dB, 3 dB step; 36-48/78-96, 6 dB step

Rejection: 6 step

Frequency: up to 4 steps, probe depended

LOGIQView

Extended Field of View imaging

Available on 4C-RS, L6-12-RS, C2-5-RS, 3Sc-RS, E8C-RS, L5-11-RS

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 160 cm (63") scan length

Easy 3D

Allows unlimited rotation and planar translations

3D reconstruction from CINE sweep

Utilities: average off/average light/average medium/average strong

Grey surface: 0-100%

Threshold1: 0-255

Threshold2: 0-255

Scan distance: 1.0-15.0 mm

Colorize: 0-360

Scan Coach

Scan Coach is a contextual reference tool. It provides 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.

Applications include, abdomen, obstetrics, gynecology, carotid and cardiac

My Trainer

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

Virtual Convex

Provides a convex field of view

Compatible with CrossXBeam

Available on linear and sector transducers

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

CrossXBeam

Provides 3, 5, 7 and 9 levels of spatial compounding

Live side-by-side DualView display

Compatible with

- Color Mode
- PW
- SRI-HD
- Coded Harmonic Imaging
- Virtual convex

Available on L5-11-RS, C2-5-RS, E8C-RS

General System Parameters *(cont.)*

Controls available while “live”

Write zoom

B/M/CrossXBeam mode

Gain

TGC

Dynamic range

Acoustic output

Transmission focus position

Transmission focus number

Line density control

Sweep speed for M-Mode

Number of angles for CrossXBeam

PW-Mode

Gain

Dynamic range

Acoustic output

Transmission frequency

Scale

Wall filter

Sample volume gate

- Length
- Depth

Color Flow Mode

CFM gain

CFM velocity range

Acoustic output

Wall echo filter

Packet size

Frame rate control

CFM spatial filter

CFM frame average

Frequency/velocity baseline shift

Controls available on “freeze” or recall

Automatic optimization

SRI-HD

CrossXBeam – display non-compounded and compounded

Controls available on “freeze” or recall *(cont.)*

Image simultaneously in split screen

3D reconstruction from a stored CINE loop

B/M/CrossXBeam mode

Gray map optimization

TGC

Colorized B and M

Frame average (loops only)

Dynamic range

Anatomical M-Mode

Sweep speed

Gray map

Baseline shift

Sweep speed

Invert spectral wave form

Compression

Rejection

Colorized spectrum

Display format

Doppler audio

Angle correct

Quick angle correct

Auto angle correct

Overall gain (loops and stills)

Color map

Transparency map

Frame average (loops only)

Flash suppression

CFM display threshold

Spectral invert for color/Doppler

Anatomical M-Mode on CINE loop

Measurements/Calculations

General B-Mode

Depth and distance

Circumference (ellipse/trace)

Measurements/Calculations *(cont.)*

General B-Mode

Area (ellipse/trace)

Volume (ellipsoid)

% stenosis (area or diameter)

Angle between two lines

General M-Mode

M-Depth

Distance

Time

Slope

Heart rate

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)

AT (Acceleration Time)

ACCEL (Acceleration)

TAMAX (Time Averaged Maximum Velocity)

Volume flow (TAMEAN and vessel area)

Heart rate

PI (Pulsatility Index)

RI (Resistivity Index)

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)

Real-time doppler auto measurements/calculations *(cont.)*

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)

OB measurements/calculations

Gestational age by

- GS (Gestational Sac)
- CRL (Crown Rump Length)
- FL (Femur Length)
- BPD (Biparietal Diameter)
- AC (Abdominal Circumference)
- HC (Head Circumference)
- APTD x TTD (Anterior/Posterior Trunk Diameter by Transverse Trunk Diameter)
- FTA (Fetal Trunk Cross-sectional Area)
- BD (Binocular Distance)
- FT (Foot Length)
- OFD (Occipital Frontal Diameter)
- TAD (Transverse Abdominal Diameter)
- HL (Humerus Length)
- TCD (Transverse Cerebellum Diameter)

Gestational age by *(cont.)*

- THD (Thorax Transverse Diameter)
- TIB (Tibia Length)
- ULNA (ULna Length)

Estimated fetal weight (EFW) by:

AC, BPD

AC, BPD, FL, HC

AC, FL, HC

BPD, APTD, TTD, FL

Calculations and ratios

FL/BPD

FL/HC

CI (Cephalic Index)

CTAR (Cardio-Thoracic Area Ratio)

Measurements/Calculations *(cont.)*

SonoBiometry

Includes four measurements – BPD, HC, AC, FL

Measurements/calculations by: ASUM, ASUM 2001, Berkowitz, Bertagnoli, Brenner, Campbell, CFEF, Chitty, Eik-Nes 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 (4)

Fetal qualitative description (anatomical survey)

Fetal environmental description (biophysical profile)

Programmable OB tables

Over 20 selectable OB calculations

Expanded worksheets

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

Summary reports

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)

Vascular measurements/calculations *(cont.)*

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

Summary reports

Urological calculations

Bladder volume

Prostate volume

Left/right renal volume

Generic volume

Post-void bladder volume

Cardiac measurements/calculations

B-Mode measurements

Aorta	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Aortic Valve Cusp Separation (AV Cusp)• Aortic Valve Area Planimetry (AVA Planimetry)• (Trans AVA)
Left atrium	<ul style="list-style-type: none">• Left Atrium Diameter (LA Diam)• LA Length (LA Major)• LA Width (LA Minor)• Left Atrium Diameter to AoRoot Diameter Ratio (LA/Ao ratio)• Left Atrium Area (LAA(d), LAA(s))• Left Atrium Volume, Single Plane, Method of Disk (LAEDV A2C, LAESV A2C) (LAEDV A4C, LAESV A4C)

Measurements/Calculations *(cont.)*

Cardiac measurements/calculations *(cont.)*

Left ventricle	<ul style="list-style-type: none"> • Left Ventricle Mass (LVPWd, LVPWs) • Left Ventricle Volume, Teichholz/Cubic (LVIDd, LVI Ds) • Left Ventricle Internal Diameter (LVIDd, LVI Ds) Left Ventricle Length (LVLd, LVLs) • Left Ventricle Mass (LVPWd, LVPWs) • 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 Area, Two Chamber/Four Chamber/Short Axis (LVA (d), LVA (s)) • Left Ventricle Endocardial Area, Width (LVA (d), LVA(s)) • Left Ventricle Epicardial Area, Length (LVAepi (d), LVAepi (s)) • Left Ventricle Mass Index (LVPWd, LVPWs) • Ejection Fraction, Teichholz/Cube (LVIDd, LVIDs) • Left Ventricle Posterior Wall Fractional Shortening (LVPWd, LVPWs) • Left Ventricle Stroke Index, Teichholz/Cube (LVIDd, LVIDs and Body Surface Area) • Left Ventricle Fractional Shortening (LVIDd, LVIDs) • Left Ventricle Stroke Volume, Teichholz/Cubic (LVIDd, LVIDs) • Left Ventricle Stroke Index, Single Plane, Two Chamber, Method of Disk (LVI Dd, LVIDs, LVSd, LVSs) • Left Ventricle Stroke Index, Single Plane, Four Chamber, Method of Disk (LVI Dd, LVIDs, LVSd, LVSs) • Left Ventricle Stroke Index, Bi-Plane, Bullet, Method of Disk (LVAd, LVAs) • Interventricular Septum (IVS) • Left Ventricle Internal Diameter (LVI D) • Left Ventricle Posterior Wall Thickness (LVPW)
Mitral valve	<ul style="list-style-type: none"> • Mitral Valve Annulus Diameter (MV Ann Diam) • E-Point-to-Septum Separation (EPSS) • Mitral Valve Area Planimetry (MVA Planimetry)
Pulmonic valve	<ul style="list-style-type: none"> • Pulmonic Valve Area (PV Planimetry) • Pulmonic Valve Annulus Diameter (PV Annulus Diam) • Pulmonic Diameter (Pulmonic Diam)

Cardiac measurements/calculations *(cont.)*

Right atrium	<ul style="list-style-type: none"> • Right Atrium Diameter, Length (RAD Ma) • Right Atrium Diameter, Width (RAD Mi) • Right Atrium Area (RAA) • Right Atrium Volume, Single Plane, Method of Disk (RAAd) • Right Atrium Volume, Systolic, Single Plane, Method of Disk (RAAs)
Right ventricle	<ul style="list-style-type: none"> • Right Ventricle Outflow Tract Area (RVOT Planimetry) • Left Pulmonary Artery Area (LPA Area) • Right Pulmonary Artery Area (RPA Area) • Right Ventricle Internal Diameter (RVIDd, RVIDs) • Right Ventricle Diameter, Length (RVD Ma) • Right Ventricle Diameter, Width (RVD Mi) • Right Ventricle Wall Thickness (RVAWd, RVAWs) • Right Ventricle Outflow Tract Diameter (RVOT Diam) • Left Pulmonary Artery (LPA) • Main Pulmonary Artery (MPA) • Right Pulmonary Artery (RPA)
System inferior vena cava	<ul style="list-style-type: none"> • Systemic Vein Diameter (Systemic Diam) • Patent Ductus Arteriosis Diameter (PDA Diam)
System inferior vena cava <i>(cont.)</i>	<ul style="list-style-type: none"> • Pericard Effusion (PEs) • Patent Foramen Ovale Diameter (PFO Diam) • Ventricular Septal Defect Diameter (VSD Diam) • Interventricular Septum (IVS) Fractional Shortening (IVSd, IVSs)
Tricuspid valve	<ul style="list-style-type: none"> • Tricuspid Valve Area (TV Panimetry) • Tricuspid Valve Annulus Diameter (TV Annulus Diam)

M-Mode measurements

Aorta	<ul style="list-style-type: none"> • Aortic Root Diameter (Ao Root Diam) • Aortic Valve • Aortic Valve Diameter (AV Diam) • Aortic Valve Cusp separation (AV Cusp) • Aortic Valve Ejection Time (LVET)
Left atrium	<ul style="list-style-type: none"> • Left Atrium Diameter to AoRoot Diameter Ratio (LA/Ao Ratio) • Left Atrium Diameter (LA Diam)
Left ventricle	<ul style="list-style-type: none"> • Left Ventricle Volume, Teichholz/Cubic (LVIDd, LVI Ds) • Left Ventricle Internal Diameter (LVIDd, LVI Ds) • Left Ventricle Posterior Wall Thickness (LVPWd, LVPWs) • Left Ventricle Ejection Time (LVET) • Left Ventricle Pre-Ejection Period (LVPEP)

Measurements/Calculations *(cont.)*

M-Mode measurements *(cont.)*

Left ventricle <i>(cont.)</i>	<ul style="list-style-type: none"> • Interventricular Septum (IVS) • Left Ventricle Internal Diameter (LVI D) • Left Ventricle Posterior Wall Thickness (LVPW)
Mitral valve	<ul style="list-style-type: none"> • E-Point-to-Septum Separation (EPSS) • Mitral Valve Leaflet Separation (D-E Excursion) • Mitral Valve Anterior Leaflet Excursion (D-E Excursion) • Mitral valve D-E Slope (D-E Slope) • Mitral Valve E-F Slope (E-F Slope)
Pulmonic valve	<ul style="list-style-type: none"> • QRS Complex to End of Envelope (Q-PV close)
Right ventricle	<ul style="list-style-type: none"> • Right Ventricle Internal Diameter (RVIDd, RVIDs) • Right Ventricle Wall Thickness (RVAWd, RVAWs) • Right Ventricle Outflow Tract Diameter (RVOT Diam) • Right Ventricle Ejection Time (RVET) • Right Ventricle Pre-Ejection Period (RVPEP)
System	<ul style="list-style-type: none"> • Pericard Effusion (PE (d))
Tricuspid valve	<ul style="list-style-type: none"> • QRS Complex to End of Envelope (Q-TV close)

Doppler Mode measurements

Aortic valve	<ul style="list-style-type: none"> • Aortic Insufficiency Mean Pressure Gradient (AR Trace) • Aortic Insufficiency Peak Pressure Gradient (AR Vmax) • Aortic Insufficiency End Diastole Pressure Gradient (AR Trace) • Aortic Insufficiency Mean Velocity (AR Trace) • Aortic Insufficiency Velocity Time Integral (AR Trace) • Aortic Valve Mean Velocity (AV Trace) • Aortic Valve Velocity Time Integral (AV Trace) • Aortic Valve Mean Pressure Gradient (AV Trace) • Aortic Valve Peak Pressure Gradient (AR Vmax) • Aortic Insufficiency Peak Velocity (AR Vmax) • Aortic Insufficiency End-Diastolic Velocity (AR Trace) • Aortic Valve Peak Velocity (AV Vmax) • Aortic Valve Peak Velocity at Point E (AV Vmax) • Aorta Proximal Coarctation (Coarc Pre-Duct) • Aorta Distal Coarctation (Coarc Post-Duct) • Aortic Valve Insufficiency Pressure Half Time (AR PHT) • Aortic Valve Flow Acceleration (AV Trace) • Aortic Valve Pressure Half Time (AV Trace)
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Doppler Mode measurements *(cont.)*

Aortic valve <i>(cont.)</i>	<ul style="list-style-type: none"> • Aortic Valve Acceleration Time (AV Acc Time) • Aortic Valve Deceleration Time (AV Dec Time) • Aortic Valve Ejection Time (AVET) • Aortic Valve Acceleration to Ejection Time Ratio (AV Acc Time, AVET) • Aortic Valve Area (VTI): AVA (Vmax) • Left Ventricle Outflow Tract Peak Pressure Gradient (LVOT Vmax) • Left Ventricle Outflow Tract Peak Velocity (LVOT Vmax) • Left Ventricle Outflow Tract Mean Pressure Gradient (LVOT Trace) • Left Ventricle Outflow Tract Mean Velocity (LVOT Trace) • Left Ventricle Outflow Tract Velocity Time Integral (LVOT Trace) • Left Ventricle Ejection Time (LVET)
Mitral valve	<ul style="list-style-type: none"> • Mitral Valve Regurgitant Flow Acceleration (MR Trace) • Mitral Valve Regurgitant Mean Velocity (MR Trace) • Mitral Regurgitant Mean Pressure Gradient (MR Trace) • Mitral Regurgitant Velocity Time Integral (MR Trace) • Mitral Valve Mean Velocity (MV Trace) • Mitral Valve Velocity Time Integral (MV Trace) • Mitral Valve Mean Pressure Gradient (MV Trace) • Mitral Regurgitant Peak Pressure Gradient (MR Vmax) • Mitral Valve Peak Pressure Gradient (MV Vmax) • Mitral Regurgitant Peak Velocity (MR Vmax) • Mitral Valve Peak Velocity (MV Vmax) • Mitral Valve Velocity Peak A (MV A Velocity) • Mitral Valve Velocity Peak E (MV E Velocity) • Mitral Valve Area According to PHT (MV PHT) • Mitral Valve Flow Deceleration (MV DecT) • Mitral Valve Pressure Half Time (MV PHT) • Mitral Valve Flow Acceleration (MV AccT) • Mitral Valve E-Peak to A-Peak Ratio (A-C and D-E) (MV E/ARatio) • Mitral Valve Acceleration Time (MV Acc Time) • Mitral Valve Deceleration Time (MV Dec Time) • Mitral Valve Ejection Time ((MVET) • Mitral Valve A-Wave Duration (MV A Dur) • Mitral Valve Time to Peak (MV TTP) • Mitral Valve Acceleration Time/Deceleration Time Ratio (MV Acc/Dec Time) • Stroke Volume Index by Mitral Flow (MVA Planimetry, MVTrace)

Measurements/Calculations *(cont.)*

Doppler Mode measurements *(cont.)*

Pulmonic valve	<ul style="list-style-type: none"> • Pulmonic Insufficiency Peak Pressure Gradient (PR Vmax) • Pulmonic Insufficiency End-Diastolic Pressure Gradient (PRTrace) • Pulmonic Valve Peak Pressure Gradient (PV Vmax) • Pulmonic Insufficiency Peak Velocity (PR Vmax) • Pulmonic Insufficiency End-Diastolic Velocity (Prend Vmax) • Pulmonic Valve Peak Velocity (PV Vmax) • Pulmonary Artery Diastolic Pressure (PV Trace) • Pulmonic Insufficiency Mean Pressure Gradient (PR Trace) • Pulmonic Valve Mean Pressure Gradient (PV Trace) • Pulmonic Insufficiency Mean Square Root Velocity (PR Trace) • Pulmonic Insufficiency Velocity Time Integral (PR Trace) • Pulmonic Valve Mean Velocity (PV Trace) • Pulmonic Valve Velocity Time Integral (PV Trace) • Pulmonic Insufficiency Pressure Half Time (PR PHT) • Pulmonic Valve Flow Acceleration (PV Acc Time) • Pulmonic Valve Acceleration Time (PV Acc Time) • Pulmonic Valve Ejection Time (PVET) • QRS Complex to End of Envelope (Q-to-PV Close) • Pulmonic Valve Acceleration to Ejection Time Ratio (PV Acc Time, PVET)
Right ventricle	<ul style="list-style-type: none"> • Right Ventricle Outflow Tract Peak Pressure Gradient (RVOT Vmax) • Right Ventricle Outflow Tract Peak Velocity (RVOT Vmax) • Right Ventricle Outflow Tract Velocity Time Integral (RVOTTrace) • Right Ventricle Ejection Time (RV Trace) • Stroke Volume by Pulmonic Flow (RVOT Planimetry, RVOTTrace) • Right Ventricle Stroke Volume Index by Pulmonic Flow (RVOT Planimetry, RVOT Trace)
System	<ul style="list-style-type: none"> • Pulmonary Artery Peak Velocity (PV Vmax) • Pulmonary Vein Velocity Peak A (Reverse) (P Vein A) • Pulmonary Vein Peak Velocity (P Vein D, P Vein S) • Systemic Vein Peak Velocity (PDA Diastolic, PDA Systolic) • Ventricular Septal Defect Peak Velocity (VSD Vmax)

Doppler Mode Measurements *(cont.)*

System <i>(cont.)</i>	<ul style="list-style-type: none"> • Atrial Septal Defect (ASD Diastolic, ASD Systolic) • Pulmonary Vein A-Wave Duration (P Vein A Dur) • IsoVolumetric Relaxation Time (IVRT) • IsoVolumetric Contraction Time (IVCT) • Pulmonary Vein S/D Ratio (P Vein D, P Vein S) • Ventricular Septal Defect Peak Pressure Gradient (VSD Vmax) • Pulmonic-to-Systemic Flow Ratio (Qp/Qs)
Tricuspid Valve	<ul style="list-style-type: none"> • Tricuspid Regurgitant Peak Pressure Gradient (TR Vmax) • Tricuspid Valve Peak Pressure Gradient (TV Vmax) • Tricuspid Regurgitant Peak Velocity (TR Vmax) • Tricuspid Valve Peak Velocity (TV Vmax) • Tricuspid Valve Velocity Peak A (TV A Velocity) • Tricuspid Valve Velocity Peak E (TV E Velocity) • Tricuspid Regurgitant Mean Pressure Gradient (TR Trace) • Tricuspid Valve Mean Pressure Gradient (TV Trace) • Tricuspid Regurgitant Mean Velocity (TR Trace) • Tricuspid Regurgitant Velocity Time Integral (TR Trace) • Tricuspid Valve Mean Velocity (TV Trace) • Tricuspid Valve Velocity Time Integral (TV Trace) • Tricuspid Valve Time to Peak (TV TTP) • Tricuspid Valve Ejection Time (TV Acc/Dec Time) • Tricuspid Valve A-Wave Duration (TV A Dur) • QRS Complex to End of Envelope (Q-TV Close) • Tricuspid Valve Pressure Half Time (TV PHT) • Stroke Volume by Tricuspid Flow (TV Planimetry, TV Trace) • Tricuspid Valve E-Peak to A-Peak Ratio (TV E/A Velocity)

Color Flow Mode Measurements

Aortic Valve	<ul style="list-style-type: none"> • Proximal Isovelocity Surface Area: Regurgitant Orifice Area (AR Radius) • Proximal Isovelocity Surface Area: Radius of Aliased Point (AR Radius) • Proximal Isovelocity Surface Area: Regurgitant Flow (AR Trace) • Proximal Isovelocity Surface Area: Regurgitant Volume Flow (AR Trace) • Proximal Isovelocity Surface Area: Aliased Velocity (AR Vmax)
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Measurements/Calculations *(cont.)*

Color Flow Mode Measurements *(cont.)*

Mitral valve	<ul style="list-style-type: none"> • Proximal Isovelocity Surface Area: Regurgitant Orifice Area (MR Radius) • Proximal Isovelocity Surface Area: Radius of Aliased Point (MR Radius) • Proximal Isovelocity Surface Area: Regurgitant Flow (MR Trace) • Proximal Isovelocity Surface Area: Regurgitant Volume Flow (MR Trace) • Proximal Isovelocity Surface Area: Aliased Velocity (MR Vmax)
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Combination Mode measurements

Aortic valve	<ul style="list-style-type: none"> • Aortic Valve Area (Ao Root Diam, LVOT Vmax, AV Vmax) • Aortic Valve Area by Continuity Equation by Peak Velocity (Ao Root Diam, LVOT Vmax, AV Vmax) • Stroke Volume by Aortic Flow (AVA Planimetry, AV Trace) • Cardiac Output by Aortic Flow (AVA Planimetry, AV Trace, HR) • Aortic Valve Area by Continuity Equation VTI (Ao Root Diam, LVOT Vmax, AV Trace)
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Left ventricle	<ul style="list-style-type: none"> • Cardiac Output, Teichholz/Cubic (LVIDd, LVI Ds, HR) • Cardiac Output Two Chamber, Single Plane, Area-Length/Method of Disk(Simpson) (LVAd, LVAs, HR) • Cardiac Output Four Chamber, Single Plane, Area-Length/Method of Disk (Simpson) (LVAd, LVAs, HR) • Ejection Fraction Two Chamber, Single Plane, Area-Length/Method of Disk (Simpson) (LVAd, LVAs) • Ejection Fraction Four Chamber, Single Plane, Area-Length/Method of Disk (Simpson) (LVAd, LVAs) • Left Ventricle Stroke Volume, Single Plane, Two Chamber/Four Chamber, Area-Length (LVAd, LVAs) • Left Ventricle Stroke Volume, Single Plane, Two Chamber/Four Chamber, Method of Disk (Simpson) (LVIDd, LVIDs, LVAd, LVAs) • Left Ventricle Volume, Two Chamber/Four Chamber, Area-Length (LVAd, LVAs) • Ejection Fraction, Bi-Plane, Method of Disk (LVAd, LVAs, 2CH, 4CH) • Left Ventricle Stroke Volume, Bi-Plane, Method of Disk (LVAd, LVAs, 2CH, 4CH) • Left Ventricle Volume, Bi-Plane, Method of Disk (LVAd, LVAs, 2CH, 4CH) • Left Ventricle Stroke Index, Single Plane, Two Chamber/Four Chamber, Area-Length (LVsd, LVsS and BSA)
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Combination Mode measurements *(cont.)*

Left ventricle <i>(cont.)</i>	<ul style="list-style-type: none"> • Left Ventricle Volume, Single Plane, Two Chamber/Four Chamber, Method of Disk (LVAd, LVAs) • Left Ventricle Volume, Apical View, Long Axis, Method of Disk (LVAd, LVAs)
Mitral valve	<ul style="list-style-type: none"> • Stroke Volume by Mitral Flow (MVA Planimetry, MV Trace) • Cardiac Output by Mitral Flow (MVA Planimetry, MV Trace, HR)
Pulmonic valve	<ul style="list-style-type: none"> • Stroke Volume by Pulmonic Flow (PV Planimetry, PV Trace) • Cardiac Output by Pulmonic Flow (PV Planimetry, PV Trace, HR)
Tricuspid valve	<ul style="list-style-type: none"> • Cardiac Output by Tricuspid Flow (TV Planimetry, TV Trace, HR)

Cardiac worksheet

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

Measured value: up to 100 measurement values for each item. Average, maximum, minimum, or last

Generic study in cardiology

Stroke Volume (SV)

Cardiac Output (CO)

Probes

C2-5-RS, convex probe

Applications: abdomen, obstetrics, gynecological, vascular, urology, musculoskeletal conventional

C2-5-RS, convex probe (cont.)

Number of elements: 96

Convex Radius: 49.1 mmR

FOV: 70.2°

Footprint: 19.32 x 66.66 mm (0.76 x 2.62")

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, 2.8, 3.6 MHz

Biopsy guide: multi-angle, reusable bracket

L5-11-RS, linear probe

Applications: vascular, small parts, pediatrics, musculoskeletal conventional and superficial

Number of element: 96

Footprint: 47.38 x 11.28 mm (1.87 x 0.44")

B-Mode imaging frequency: 7.0, 9.0, 11.0 MHz

Harmonic imaging frequency: 9.0, 11.0, 13.0 MHz

CFM/PDI/PWD frequency: 3.7, 4.4, 5.6 MHz

Steered Angle : ±15°

Biopsy guide: multi-angle, reusable bracket

E8C-RS, endo micro convex probe

Applications: obstetrics, gynecological, urology, transvaginal, transrectal

Number of elements: 128

Convex radius: 10.73 mmR

FOV: 128°

Footprint: 16.9 x 21.2 mm (0.66 x 0.83")

E8C-RS, endo micro convex probe (cont.)

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

3Sc-RS, phased array sector probe

Applications: cardiac, transcranial, abdominal

Number of elements: 64

FOV: 120°

Footprint: 27.6 x 19.3 mm (1.1 x 0.76")

B-Mode imaging frequency: 2.0, 3.0, 4.0 MHz

Harmonic imaging frequency: 3.0, 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

Inputs and outputs

Composit TV output

S-Video output

VGA output

HDMI output

100BASE-TX ethernet (RJ45)

USB ports

Safety Conformance

Safety conformance

The ULTRA 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 safety
- IEC 60601-1-2 Medial electrical equipment – Part 1-2 General requirements for safety – Collateral Standard: Electromagnetic compatibility – requirements and tests EMC Emissions Group 1 Class A device requirements as per CISPR 11

Safety Conformance *(cont.)*

Safety conformance *(cont.)*

Conforms to the following standards for safety *(cont.)*

- IEC 60601-2-37 Medical electrical equipment – Part 2-37: Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment
- ISO 10993-1 Biological evaluation of medical devices – Part 1 Evaluation and testing
- EN 62366 Medical devices – Application of usability engineering to medical devices



Imagination at work

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