

**SPECIFICATIONS**  
for  
**Diagnostic Ultrasound System**  
**ARIETTA 850**  
**ARIETTA 850 Endoscopic**



**MODEL: ALOKA ARIETTA 850**

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## **ARIETTA 850/850 Endoscopic**

ARIETTA 850/850 Endoscopic is the premium model of the ARIETTA series with a performance to match, that will meet users' expectations in every aspect: imaging quality; operability, and advanced applications.

### **Pure Image:**

Many confounding factors that prevent the creation of "clear" ultrasound images (including patient-, operator- and focal-dependencies) can be reduced by the latest technologies, and by an unlimited range of image parameter adjustments for tailoring to each customer's requirements.

### **Seamless Workflow:**

Ergonomic designs to reduce examiners' stress and various functions to streamline workflow, shorten examination time and result in more efficient examinations.

Additionally, reduced examination time improves patient comfort.

### **Your Application:**

Multiple advanced applications create new clinical benefits by supporting increased diagnostic confidence, guide treatment and offering research opportunities.

## Scanning Method

- Electronic Convex
- Electronic Linear
- Electronic Phased Array Sector
- Electronic Radial

## Operating Modes

- B-mode
- BiPlane-mode
- M-mode
- D: Spectral Doppler mode (PW, CW, HPRF-PW)
- Dual Gate Doppler mode
- Color Flow mode
- Power Doppler mode (Directional Power Doppler)
- eFLOW mode (Directional eFLOW)
- Cardiac 3D mode  
(3D Zoom , Active 3D , Wide Angle 3D) \*

\* Option: SOP-ARIETTA850-129, EU-9183 and PEU-LISENDO880

## Image Display Modes

- B: gray-scale imaging
- Dual B
- Quad B
- M
- B and M
- D: Spectral Doppler (PW, HPRF PW, and CW)
- B and D
- B(Color Flow)
- B(Power Doppler)
- B(eFLOW)
- Dual B(Color Flow)
- Quad B(Color Flow)
- Dual B(Power Doppler)
- Quad B(Power Doppler)
- Dual B(eFLOW)
- Quad B(eFLOW)
- M(Color Flow)
- M(Power Doppler)
- M(eFLOW)
- B(Color Flow) and M (Color Flow)
- B(Power Doppler) and M(Power Doppler)
- B(eFLOW) and M (eFLOW)
- B(Color Flow) and D
- B(Color Flow) and Dual
- B(Power Doppler) and D
- B(Power Doppler) and Dual
- B(eFLOW) and D
- B(eFLOW) and Dual

- B(Color Flow) and D simultaneous real-time display (Triplex mode)
- B(Power Doppler) and D simultaneous real-time display (Triplex mode)
- B(eFLOW) and D simultaneous real-time display (Triplex mode)
- B and B(Color Flow) simultaneous real-time display (Dual Flow)
- B and B(Power Doppler) simultaneous real-time display (Dual CF)
- B and B(eFLOW) simultaneous real-time display (Dual Flow)
- Dynamic Slow-motion Display  
(Real-time image/Slow-motion image, side by side display)
- Real-time Biplane\*<sup>1</sup> (Display real time image in 2 cross-sections in biplane probe.)
- Panoramic View\*<sup>1</sup>
- TDI\*<sup>1</sup> (Tissue Doppler Imaging)
- RT-3D (4D) mode \*<sup>1</sup>\*<sup>2</sup>
- DFI\*<sup>1</sup>\*<sup>3</sup> (Detective Flow Imaging)
- Request function: In multi-mode display, it is possible to select one mode for full screen display.
- Real-time Tissue Elastography \*<sup>1</sup>\*<sup>4</sup>
- BiPlane mode(Color) \*<sup>5</sup>
- 3D Zoom mode(Color) \*<sup>5</sup>
- Active 3D mode(Color) \*<sup>5</sup>
- Wide Angle 3D mode(Color) \*<sup>5</sup>

\*<sup>1</sup> Probe dependent.

\*<sup>2</sup> Option: EU-9184 and SOP-ARIETTA850-4

\*<sup>3</sup> Option: SOP-ARIETTA850-105

\*<sup>4</sup> Option: SOP-ARIETTA850-43

\*<sup>5</sup> Option: SOP-ARIETTA850-129, EU-9183 and PEU-LISENDO880

## Beam former

### Transmission

CPWG (Compound Pulse Wave Generator)

Programmable waveform transmission

### Reception

Multi processing high-speed digital beam former

12-bit A/D converter (4096 gray levels)

A/D Sampling Frequency: 40[MHz]

Parallel processing: Up to 20 directions

### Transmission/Reception method of Harmonics

Reception frequency: 3.2-22.0 MHz\*<sup>1</sup>

\*<sup>1</sup> 22MHz can be achieved under below conditions.

•Probe: SML44

- Frequency "High"
- Frequency Information "Receive"

#### Tissue Adaptive Technology

Sound speed adjustment: 26 steps  
Automated sound speed adjustment

#### Focusing

Transmission: Multi-stage transmission focus of up to 4 stages out of 16 stages (probe dependent)  
Reception: PixelFocus  
eFocusing

### **System Dynamic Range**

320dB

### **System Processing Channels**

7,072,000 Channels

### **Frame rate**

Max. More than 882 frames/s\*

\* Depends on probes and various settings

### **Volume rate (Mechanical 3D scanning)**

Max. up to 41 volumes/s\*

\* Depends on probes and various settings

### **B-mode**

- Display Gray Scale: 256 levels
- Scanning area: Continuously variable
- Line Density: 8 steps
- HI Frame Rate (Multi Parallel Processing)
- Zoom  
HI zoom (real-time image):  
Max. Up to 0.5 cm display image (probe dependent)  
PAN zoom (real time and frozen image):  
Max. Up to 0.5 cm display image (probe dependent)
- Depth range selections:  
0.75/1.0/1.5/2.0/2.5/3.0/3.5/4.0/4.5/5.0, 1 cm intervals from 5.0 to 24 cm, and 2cm intervals from 24cm to 40cm (probe dependent)
- Longitudinal and lateral inversion
- Rotation by 90 degrees (probe dependent)
- Gain\*: 80 dB range
- Echo enhancement: 8steps
- Texture: 2 steps(Smooth/Sharp), not available in M-mode
- Enhance / Smoothing: 8 steps for each other

- Persistence: 8steps, including Off  
(Available to change type for adaptive frame rate)
- TGC (time gain control):  
Gain versus depth curve control: 8 slide controls TGC curve memory function
- LGC (lateral gain control):  
Gain versus angle curve control: 8 sectors (Sector probes only)
- Dynamic range: 40-90 dB
- Gray map: 10 types, changeable after frozen
- AGC: 8 steps
- Gamma curve: 4types
- Spatial Compound Imaging  
(by selected linear and convex sector probes)
- Trapezoidal scan (possible by selected linear probes)
- B steer function: This function enables you to use oblique function not only Color Flow/ Power Doppler mode but B mode.
- Adaptive Imaging: HI REZ function 8 steps /HI REZ Plus  
Adaptive imaging is the technique to generate optimum image with changing filter characteristic depending on input signal.  
This technique which installed this ultrasound diagnostic scanner reduces speckle noise on B-mode images and provides uniformly and high contrast images.  
\* Gain and Dynamic range can be changed after freezing
- Border Clear Filter  
This technique is expanded gray scale so it is reduced noise and emphasized border.
- Acoustic Noise Reduction: 8 steps for 2 types.  
This technique is reduced acoustic noise (Based on signal level)
- Low Echo Reduction  
This technique is compressed low gradient echo level.
- Near-field Noise Reduction(NNR): 5 Types(A-E)  
This technique reduces artifacts and noises in the heart chamber or blood vessel.  
Carving Imaging: 10 steps(Off and combination of NNR Type(C, D, E) and level(Low, Mid, High))
- Grayscale Enhance  
This technique is enhanced image which is displayed as grayscale.
- Auto-optimizer (Optimization of gain, sound velocity adjustment)
- Needle Emphasis (probe dependent)
- Wide Scanning (probe dependent)
- Panoramic View  
It is possible to display an image of an extensive range of the body by moving the probe. An area wider than

the scanning width of the probe can be displayed.

### **M-mode:**

- Sweep method: Moving bar  
Sweep speed:  
300.0, 200.0, 133.3, 100.0, 66.7, 50, 40.0 mm/s
- Gain: B-gain  $\pm 30$  dB
- Dynamic Range: 40 dB-90 dB
- AGC: 8 steps
- Acoustic Noise Reduction
- Low Echo Reduction
- Grayscale Enhancement
- FAM (Free Angular M-mode)

### **Spectral Doppler:**

- Display: Power spectrum
- Real-time Doppler Auto Trace
- Doppler methods:
  - PW (Pulsed Wave) Doppler
  - HPRF (High Pulse Repetition Frequency) PW Doppler
  - Dual Gate Doppler
  - CW (Continuous Wave) Doppler \*
- Reference frequencies (probe dependent):  
Maximum 3 frequencies  
PW: 1.5, 1.9, 2.0, 2.1, 2.5, 3.0, 3.3, 3.5, 3.8, 4.0, 4.4, 5.2, 6.0, 6.3 MHz  
CW: 1.7, 1.8, 2.0, 2.1, 2.5, 3.0, 3.3, 3.8, 5.0 MHz
- Analysis rate:  
PW: 0.05 to 40 kHz  
CW: 1.1 to 40 kHz
- Max. velocity range:  
PW/HPRF:  $\pm 1.26$  cm/s to  $\pm 802.08$  cm/s  
CW:  $\pm 25.07$  cm/s to  $\pm 1600$  cm/s
- Base line shift: Adjustable in real-time and frozen
- Steerable CW Doppler: probe dependent
- Steered linear scanning: Max.  $\pm 30$  degrees  
changeable at 5 degrees interval
- Auto angle Correction
- Spectrum inversion
- Angle correction: Available up to 80 degrees  
(Pre-settable, changeable after freezing)  
Auto angle correction, Warning function available
- Sample volume for PW Doppler:  
Size: 0.5 – 20 mm, changeable in 0.5mm, 1.0 mm step  
Display depth of the sample volume: possible
- Wall filter: 12steps, 1/16 of PRF is Max.
- Doppler gain: 60dB variable, adjustable in real-time and frozen.

- Echo Enhancement(CW): 3 steps
- Low Echo Reduction(PW)
- Grayscale Enhancement
- Doppler Gamma: 40-90dB  
(Adjustable in real-time and frozen)
- Auto-Optimizer  
(Optimization of gain, velocity range, baseline shift and sample gate position / size / angle correction )
- Audio output: 2 channels

\*Option: EU-9184

### **Color Doppler Mode**

- Color area size: Continuously variable
- Steered linear scanning:  
Max.  $\pm 30$  degrees \*, changeable at 5 degrees interval  
\* Probe dependent
- Line density: Up to 8 steps  
(Changeable setting independently with B mode)
- Gain: 128 range, changeable after frozen
- Texture: 2 steps(Smooth/Sharp)
- Glossy Level: Off + 4 steps
- HI Frame Rate(Color)(Multi Parallel Processing)
- Auto-Optimizer (Optimization of gain and ROI position)

### **Color Flow Mode**

- Display patterns:  
Velocity (derived from mean Doppler frequency shift), Velocity + variance, Variance, Velocity + intensity, Velocity + variance + intensity)
- Max. velocity range:  $\pm 0.63$ cm/s to  $\pm 458.33$ cm/s
- Reference frequency: (Probe dependent)  
1.9, 2.0, 2.1, 2.5, 3.2, 3.3, 3.5, 4.0, 4.4, 5.2, 6.0, 6.3 MHz
- Pulse repetition frequency:  
0.03 to 19.8 kHz
- Gradation:  
 $\pm 127$  levels for velocity (red and blue)  
64 levels for variance (green)
- Color Inversion: Normal, Invert
- Smoothing: 5 steps, adjustable in real-time and frozen
- Wall filter: 6 steps
- Persistence (Color): 8 steps
- Wall Motion Reduction: Off + 3 steps, 2 methods
- Packet Size: 3 levels
- Base line shift(Color):  
Up to double velocity ( $\pm 127$  steps)
- Color coding: 15 kinds
- TGC Enhancement: 2 kinds

#### • Power Doppler Mode

- Display patterns: Power Doppler, Directional Power Doppler
- Gradation: 256 levels
- Color coding 15 kinds
- Non-display of B/W image: Possible in ROI
- Smoothing: 5 levels

#### • High Resolution Power Doppler(eFLOW) Mode

One of the Color Flow imaging functions that can display blood flow information in a high spatial and temporal resolution.

- Display patterns:  
eFLOW, Directional eFLOW
- Pulse repetition frequency:  
0.03 to 19.8 kHz
- Gradation: 256 levels ( $\pm 127$  levels for directional)
- Color coding: 15 kinds
- Non-display of B/W image: Possible in ROI
- Advanced wall motion reduction
- Smoothing: 5 levels

#### **TDI (Tissue Doppler Imaging)**

- Function Available

#### **DFI (Detective Flow Imaging) \***

- DFI is a function to detect bloodstream information at high sensitivity and high frame rate with eigen space method.

\* Option: SOP-ARIETTA850-105 (Probe dependent)

#### **Manual**

It is applicable to browse instruction manual on this system.

- On-board operation manual

#### **Protocol Assistant**

This function provides the capability to guide study by displaying protocol list (view name, mode, measure).

It is useful to improve everyday study.

- Available to registered protocol: 128 kinds
- Suspend protocol function
- Available to edit protocol on the system
- Available to register and edit reference image
- Available to import or export like preset

#### **Cine Memory**

Cine search and loop display (in B mode): ECG time phase display is possible

- Capacity  
B mode: Max. 63,500 frames.  
M and D modes: Max. Approx. 900 seconds.

#### **Data Management**

##### 1. Image data

###### 1-1. Format

Multiple-frame (moving) image

DICOM (Raw, MJPEG)

PC Format (WMV, MJPEG, MP4)

Single-frame (still) image

DICOM (Non-compressed, RLE, RGB (Plane/Pixel), JPEG)

PC Format (Tiff, Bmp, JPEG)

###### 1-2. Image acquisition mode

- Real-time multi-frame image acquisition (Raw, Image)

Aquiring both RAW and Image at the same time

Post ECG: Max. 10 cardiac cycles (R-R)

Pre ECG: Max. 10 cardiac cycles (R-R)

Post Time: Max. 90 seconds

Pre Time: Max. 16 seconds

Manual:

Raw data: Max. 150 seconds

Image data: Max. 180 seconds

- Cine loop high-speed data transfer (Raw, Image)

It is possible to selectively store data of arbitrary section in the Cine Memory.

- Simultaneous output to multiple media

It is possible to output still image data to multiple of storage media include network and printers at the touch of a button.

###### 1-3 Image data management tool

Image viewer

- Compatible with DICOM and PC-format images
- Simultaneous display of stored and real-time images is possible (Compare mode)
- Thumbnail display of stored images (1-36 images)
- Check mark is put on a transferred image
- Image zoom, rotation, inversion
- 1:1 replay (main unit HDD or DICOM storage data)
- DVD-RAM
- CD-R
- USB memory
- USB HDD
- Re-storing to media, transfer
- Adjustment is possible on the reconstructed Raw-data image (gain, dynamic range, gamma curve type, and color coding in Color flow mapping mode)

## 2. Measurement data

It is possible to store measurement data in the main unit hard disk

## 3. Patient data

Displayed information\*

### Patient information

ID (up to 64 characters), Name (up to 64 characters, including middle name), Birthday, Sex, Age, Height, Weight, Occupation

### Study information

Procedure ID, Accession, Study ID, Study Description Referring physician, Reporting Phys, Sonographer

\* Conforms to DICOM 3.0 standard

## 4. Data storage

- Main unit hard disk  
Capacity: Approx. 1TB
- USB memory
- USB HDD
- CD-R
- DVD-RAM
- DVD-R
- Network interface(DICOM format): 10 BASE/T or 100 BASE/TX, (automatically switched)

## 5. DICOM network communication

- Conformity to DICOM service class:
  - Ultrasound image storage SCU
  - Ultrasound multi-image storage SCU
  - Storage media FSC/FSR
  - Print management SCU
  - Modality worklist management SCU(For details, please refer to the DICOM Conformance Statement issued by Hitachi, Ltd.)
  - Modality performed procedure step (MPPS) SCU
- Storage: Possible to store patient information directly to DICOM file server
- Print: Possible to printout images with DICOM compatible printer directly
- Work list management: Retrieval of patient and reservation information from hospital information system (HIS)  
NOTE: The HIS needs to be compatible with DICOM standard supplement 10. The HIS network and the DICOM network need to be linked.
- Router setting: possible
- Compatible with SR (Structured Report) for OB, cardiology, vascular and abdominal measurements\*<sup>1</sup>
- Query/Retrieve\*<sup>2</sup>
- Compatible with ED(Evidence Documents)

- Profile
- IHE (Integrated Healthcare Enterprise) SWF (Scheduled Work Flow)

\*<sup>1</sup> Option: SOP-ARIETTA850-21

\*<sup>2</sup> Option: SOP-ARIETTA850-59

## 6. Security measures

User authentication function is available.

3 Types of user authority can be set.

It is possible to set whether password is required or not at the start of operation.

### Audit logs

Accesses related to user management and patient data are recorded as audit log data.

Handling of these logs is limited to users with Level 1 access.

## 7. Teaching file can be made.

## Measurements and Analysis:

### Basic measurements

#### On B-mode image

Distance, Dist-trace, Area/Circum, Volume, Hip J  
Angle, Histogram, Angle, B.Index

#### On M-mode image

Length, Time, Heart Rate, M.VEL, M.Index

#### On spectral Doppler

D.VEL, ACCEL, RI, Time, P1/2T, Heart Rate, D.Caliper,  
D.Index (Caliper), D.Index (Trace), Mean.VEL., PI,  
D.Trace, Steno Flow, Regurg Flow, Real-time Doppler  
auto trace

#### On B/D mode

Blood Flow

#### On B(Flow) mode

Flow Profile\*

\* Option: SOP-ARIETTA850-7

### Application measurements

#### • Obstetrical measurements & calculations

Gestational age, Fetal weight  
Fetal Doppler measurements  
Fetal cardiac function measurements  
AFI (Amniotic fluid index)  
Cervical length  
Supports multiple gestations  
Growth analysis function (display of past measurement  
data)  
Automated NT Measurement\*<sup>1</sup>  
Automated FHR Measurement\*<sup>2</sup>  
Automated FS Measurement\*<sup>3</sup>  
\*<sup>1</sup> Option: SOP-ARIETTA850-42  
\*<sup>2</sup> Option: SOP-ARIETTA850-72.  
\*<sup>3</sup> Option: SOP-ARIETTA850-71

#### • Gynecological measurements & calculations

Uterus measurements  
Endometrial thickness measurements  
Cervical measurements  
Ovary measurements  
Follicular measurements (Volume measurements by 3-  
axis measurements are possible.)  
Urinary bladder measurements  
Uterine artery, Ovarian artery measurements

#### • Cardiac analysis

##### B mode

LV Volume measurements  
Area-length, BP-ellipse, Simpson (Disc), Modified

Simpson\*, Bullet, Pombo\*\*, Teichholz\*\*, Gibson\*\*

\*: Automatic heart cavity trace is possible.

(3-point or full automated method\*\*)

\*\* : Automatic measurement is possible. (Option:  
SOP-ARIETTA 850-74, PEU-LISENDO880)

Valve area measurements (AVA, MVA)

LA/AO

Ratio

Right ventricle measurements

LV myocardial mass

LA / RA Volume measurements

Area-length, Simpson\*

\*: Automatic heart cavity trace is possible.

(3-point or full automated method) (Option: SOP-  
ARIETTA 850-74, PEU-LISENDO880)

FAC measurements\*

\*: Automatic heart cavity trace is possible. (3-  
point) (Option: SOP-ARIETTA 850-74, PEU-  
LISENDO880)

IVC (inferior vena cava) measurements

##### M mode

Pombo (wall), Teichholz (wall), Gibson (wall)

Mitral valve measurements

LA/AO measurements\*

\*Automatic measurement is possible. (Option: SOP-  
ARIETTA 850-74, PEU-LISENDO880)

Tricuspid valve measurements

Pulmonary valve measurements

IVC (inferior vena cava) measurements

TAPSE measurements

##### Doppler mode

LVOT (left ventricle outflow tract) flow

RVOT (right ventricle outflow tract) flow

Trans-mitral flow (Full Automated or Automated  
setting period method)

Regurgitant flow (AR, PR, MR, TR)

Volumetric flow(MR)

Stenotic flow (AS, PS, MS, TS)

Pulmonary vein flow

Coronary flow

TDI PW(Full Automated or Automated setting period  
method)

##### B(Flow)/D mode

PISA measurements

##### B TDI mode

Asynchrony analysis for CRT

#### • Vascular analysis

Carotid artery:

CCA (common carotid artery)



ICA (internal carotid artery)  
 ECA (external carotid artery)  
 BIFUR (Bifurcation of carotid artery)  
 VERT (Vertebral artery)  
 % Stenosis area  
 % Stenosis diameter  
 IMT (Intima-media thickness) Measurements  
 Automated IMT measurements  
 IMT-C10 measurements  
 Measurements of arteries in extremities:  
 Lower extremity artery flow  
 Upper extremity artery flow  
 Stenotic rate:  
 % Stenosis area  
 % Stenosis diameter  
 Transit time of Vessel Flow measurements(TVF)\*  
 \* Option: SOP-LISENDO880-47, PEU-LISENDO880  
 Measurements of veins in extremities:  
 Lower extremity venous flow  
 Upper extremity venous flow  
 Trans-cranial blood flow measurements

#### • Report Functions

- Obstetrical report
- Gynecological report
- Cardiac function report
- Vascular report
- Urological report
- Abdominal measurement report
- Small parts report

It is possible to recall past measurement reports.

Examination data history can be plotted on the report.

Direct printout of each report is possible with an optional PC printer.

Output of measurement values in CSV file is possible.

- Hot Key function: It is possible to assign measuring functions to the alphabet keys on the keyboard
- Measurements on VCR playback image: Possible (manual calibration)
- User's calculation  
 30 equations can be set for each application  
 User-assignable terms: 60 words possible
- Font size of measurement result: Possible to change in 3 kinds

### Physiological Signal Display

- Displayed information: ECG, PCG\*<sup>1</sup>, Pulse \*<sup>2</sup>wave, breathing waveform
- ECG synchronized display: Available for one phase

- Detect regular pulse from arrhythmia (RRp/RRpp)
- Automated jumping to most optimized R-R Phase
- Reducing Filter for Tachy or Bradycardia
- Display value for each R-R interval time
- Display position: Continuously variable (both in B and M modes)
- Bar graph display for breathing waveform
- 3 type electrocardiogram (I, II, III)
- Automated detection end diastole and end systole phase.
- Automated split as end diastole(left) and end systole(right)

\*1 Option: MA-300 (Not available in EU)

\*2 Option: TY-307A (Not available in EU)

### Dual Gate Doppler (Probe dependent)

This is a function which displays Doppler Spectrums of two different sample points simultaneously.

Supported combinations are PW/PW, TDI/TDI, and PW/TDI.\*

This function is beneficial for functional evaluations of heart failures and phase analysis. For example, E/e' measurements can be performed in a single scan.

\*Automated sample gate setting for each gate.

- iDGD : It is performed below function automatically when it is frozen.
  - Select optimized time phase
  - Measure E/e'

### Automated IMT Measurement

It is possible to automatically extract max IMT, min IMT and mean IMT by simply setting ROI (region of interest) on a long-axis view of the vessel. In addition, the thicknesses at 3 points, i.e., the point at max IMT, and the points at 1cm on the right and left of the max IMT, can be automatically detected and averaged.

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## Optional Functions

### PC printer

It is possible to printout OB/GYN, cardiology, PV, small parts and urology report screens including ultrasound images directly with an external PC printer.

### Cardiac 3D (4D)\*

Cardiac 3D(4D) function provides the capability to display Cardiology 3D image and to display dual image(reference image and biplane image) simultaneously by using matrix probe(TTE)

- Scanning rate: Up to 999 volumes/s
- Biplane Mode(Color)
- 3D Zoom Mode(Color)
- Active 3D Mode(Color)
- Wide Angle 3D Mode(Color)
- Live 1,2,3,4,5,6 beat 3D volume imaging
- Live 1,2,3,4,5,6,7 beat 3D color volume imaging
- It is possible to display 3 arbitrary sections simultaneously
- MPR (Multi-planar Reconstruction)
- Surgeon's View Display
- 2 click cropping operation
- Display Layout(Single , Dual , Quad , MSI)
- Function to change 3D Imaging Parameter
- Change MPR View to operate by drag
- Density (Both Lateral and Elevation)
- Performance mode(Function to control of rising temperature for 3D TTE surface part)
- Function to rotate(Tilt) plane operation (same as probe operation)

\* Option: SOP-ARIETTA850-129, EU-9183 and PEU-LISENDO880 (Probe dependent)

### iEF\*

iEF calculates Biplane EF with full automated ED/ES frame detecting and full automated A2C and A4C contour tracing

of biplane images acquired from a transthoracic 2D matrix probe.

\* Option: SOP-ARIETTA850-120 (Probe dependent), EU-9183 and PEU-LISENDO880

### 4D LV-Analysis\*

#### • Additional features to 4D LV-Function:

- Polar plot with parametric display for all parameters
- Dynamic (amplitude) and static (time to peak)

parametric display for all parameters

- Global LV twist and LV torsion calculation
- Displacement and strain analysis
  - Longitudinal, circumferential and radial component analysis
  - Principal tangential strain and 3D displacement analysis
  - Segmental peak, time to peak and global average values in result table
  - Segmental parameter over time chart display
- Rotation and twist analysis
  - Basal and apical rotation as well as twist values in result table
  - Segmental parameter over time chart display
- Configurable export of all measurements (single results as well as parameter-time curves) to spreadsheet format

\* Option: PM-AR850-S003(Probe dependent)

\*This option is manufactured by TomTec Imaging System GmbH

### 4D RV-Function\*

#### • Semi-Automated quantification of the Right Ventricle

- Fast and easy Workflow
- Automatic contour proposal - no laborious contour drawing
- RV surface model

#### • 4D Review and Analysis

- Real-time interactive 4D model (Beutel) display of ventricle
- Display of 2D ultrasound slices (SAX and LAX) with Beutel contours as overlay
- Graph displays for global volumes over time
- Display of result window with derived parameters

#### • Measurements

- Global volumes over time
- Calculation of EDV, ESV, EF, SV
- Right ventricular longitudinal strain (RVLS) of
  - free wall
  - septum
- Additional 2D measurements:
  - TAPSE
  - FAC
  - RVDd base (RVD1)

- RVDd mid (RVD2)
- RVLd (RVD3)

\* Option: PM-AR850-S004(Probe dependent)

\*This option is manufactured by TomTec Imaging System GmbH

## 4D MV-Assessment\*

### • Semi-Automated Annulus and Leaflet Detection

- Fast and Easy Workflow (20 secs for static model)
- Semi automatic annulus detection
- Automatic and dynamic MV model generation via object segmentation
- Automatic measurements for annulus, leaflets and coaptation
- Morphological and functional analysis views
- Analysis screen for 4D presentation of tissue and annular structures
- Transparency rendering to display all objects within tissue
- Definition and display of surgical and ventricular view orientations
- Display of b/w tissue and Doppler color information in all views
- Adjustable cut plane (D'Art)
- Color texture on leaflet models that represents their topology

### • 4D Reconstruction Mode

- Real-time rendering
- Interactive 4D cube for data presentation and manipulation
- 4D rendering of b/w tissue and color Doppler data
- 3D visualization of automatic measurements
- Hybrid 4D display of measurements and grayscale data
- Interactive display settings for optimum display
- Separate settings for threshold and transparency
- Generic manual measurements

### • Further general features

- On-screen help
- Planimetry layout for individual MPR adjustment
- Carpentier segmentation labels on leaflet surface

### • Measurements

- Manual measurements such as distance, angle, curve and area
- Static and dynamic annular measurements
- Static and dynamic leaflet measurements

- Static and dynamic coaptation measurements

\* Option: PM-AR850-S005(Probe dependent)

\*This option is manufactured by TomTec Imaging System GmbH

## RT-3D (4D) \*1

- It is possible to display 3 arbitrary sections simultaneously
- MPR (Multi-planar Reconstruction)
- 360 degrees omni-directional rotation
- 4 kinds of rendering selectable
- Combination of 2 kinds of rendering type (Rendering Mode Mix)
- Detail scan of the ROI (Region of interest) is possible
- Inversion Mode (black-and-white)
- B-mode measurements on an arbitrary plane possible
- Auto Clipper : Automated placenta rejection function
- Spatio-temporal Image Correlation (STIC)\*2
- Flow 3D
- Multi Slice Imaging (MSI)
- HI REZ
- Threshold Low
- Free Axis of MPR (FMPR)
- 4Dshading
- Curved MPR: Displays cross sections on an arbitrary curve or straight line from the volume data. It is possible to display up to 3 cross sections.

\*1 Option: EU-9184 and SOP-ARIETTA850-4 (Probe dependent)

\*2 Option: SOP-ARIETTA850-41 (Probe dependent)

## Real-time Tissue Elastography\*1

This function is used to visualize the stiffness of a tissue in real-time. The strain generated in a tissue on applying pressure is represented by colors

(it is available to change Elastography Color Map)

- Elasto mode: Overlapping display of Elastography on B-mode image
- Dual Elasto mode: Dual image display of Elasto mode, possible to select different color map on each side.
- Real-time biplane: Elasto mode Overlapping display of Elastography on B-mode image of either cross-section, in the function to display B-mode image with the one of different cross-section simultaneously.
- Strain Ratio measurement: Calculation of ratio of strain between arbitrary 2 regions
- Assist Strain Ratio: Clicking center of the tumor automatically sets the measurement ROI to the tumor and the fatty layer (the mammary gland region and

- lesion are targeted).
- **Strain Graph:**  
The time variation of distorted average value is displayed on a graph in real time.
- **Auto Select Frame:**  
The frame under stable pressure is chosen automatically.
- **Strain Histogram\*<sup>2</sup>**
- **Compatible to RAW data**
- **Guide to displacement direction**  
Display the direction of displacement of the liver caused by the heart beat in real-time

\*<sup>1</sup> Option: SOP-ARIETTA850-43 (Probe dependent)

\*<sup>2</sup> Option: SOP-ARIETTA850-60.

### **Shear Wave Measurement\*<sup>1</sup>**

Shear Wave Measurement is a function for measuring the propagation velocity of shear waves and the stiffness. The propagation velocity of shear waves varies with tissue hardness.

- **Shear Wave Measurement mode**  
Measures the propagation velocity of shear waves in the target region.
- **ROI setting function**  
A trackball can be used to change the position of the ROI you select to measure.
- **Automatic recording of still images**  
The instrument can be set up to automatically send results after measurements.
- **Integration with measurement functions**  
Measurement data is saved for each selected measurement. You can modify a measurement during an examination.
- **Data saved to CSV files**  
Measurement data is saved in a CSV file.
- **Attenuation measurement\*<sup>2</sup>**  
At the same time Vs measurement, measure near ROI center Ultrasound attenuation (ATT).
- **Combi-Elasto is possible.**

\*<sup>1</sup> Option: SOP-ARIETTA850-73

\*<sup>2</sup> It is only available with C251 and C252 probe.

### **Shear Wave Elastography\***

Shear Wave Elastography(SWE) is a function for measuring the propagation velocity of shear waves and the stiffness, and creating images of the 2D distribution of propagation velocity. The propagation velocity of shear waves varies according to tissue hardness.

- **Shear Wave Elastography(SWE)**

You can superimpose shear wave propagation velocities in color on B mode images. The color SWE image appears inside the SWE ROI.

- **ROI setting function**  
This function lets you use the trackball to adjust the position of the measurement ROI.
- **SWE measurement**  
You can measure the propagation velocity of shear waves within a single or multiple arbitrary regions. Measurement starts when the image is frozen.

\* Option: SOP-ARIETTA850-73

### **Combi-Elasto\***

The Shear Wave Measurement screen and the Real-time Tissue Elastography screen are displayed at the same time in the dual-screen view. While viewing an elasticity image, you can perform shear wave measurement to measure the velocity, hardness, and attenuation value of shear waves.

\* Option: SOP-ARIETTA850-43, SOP-ARIETTA850-60, and SOP-ARIETTA850-73.

### **Automated NT Measurement\***

It is possible to automatically extract the nuchal translucency thickness (NT) by simply setting ROI (region of interest) . In addition, thicknesses at max NT, Mean NT can be automatically calculated.

\* Option: SOP-ARIETTA850-42

### **Automated FHR Measurement\***

Set measurement ROI on fetal heart plane in B mode image and measures heart rate automatically.

\* Option: SOP-ARIETTA850-72.

### **Automated FS Measurement\***

It is Possible to automatically extract the fetus left ventricle inside diameter shortening rate (FS).

\* Option: SOP-ARIETTA850-71

### **Real-time Virtual Sonography \*<sup>1</sup>**

The Real-time Virtual Sonography function is able to synchronize the volume data which was previously acquired by CT, MRI, PET, or US and in real-time US image.

The magnetic position sensor is installed on the probe to determine the position and angle of the probe.

As a result, the display of cross sections that match ultrasound images is enabled, allowing you to use the cross sections as a reference for your ultrasound

diagnosis.

The same section of ultrasound image and CT/MR/PET image or US volume data is displayed as real time by acquiring the position information on the probe from a magnetic sensor and reconstructing MPR (Multi Planer Reconstruction) image from CT/MR/PET image and US volume data.

In various diagnosis areas (liver, breast and prostate) examination is possible as it supports convex type, linear type, intracavitary probe.

Moreover, it can use together with Real-time Tissue Elastography.

•Monitor Display

- Dual : Virtual / US
- Quad : Virtual / US / Virtual / Virtual
- Overlay: Virtual + US

•Magnetic field quality display: Possible

•3D body mark display : ON/OFF

•3D body mark size : 3 kinds

•Marking function : Possible

•Multi-volume function : Max. 4 CT/MR/PET/US images for retrieving, saving and the display switching

• US-US RVS function : US volume data generated beforehand can be displayed as Virtual image in the same to US real-time image section.

•Last registration : It is possible to return just before the condition of registration.

•Reset function : It is possible to return initial condition of registration.

•Built-in magnetic sensor: possible (probe dependent)

•Displaying fused virtual images\*<sup>2</sup>

By fusing a parts image or color image of the SYNAPSE VINCENT analysis image to the CT or MRI base image, you can use the fused image as a virtual image in an RVS examination.

•3D Sim-Navigator\*<sup>3</sup>

3D Sim-Navigator is an auxiliary function provided by the Real-time Virtual Sonography (RVS) software.

3D Sim-Navigator has the following features.

- Displays the puncture guide line on virtual images
- Navigator view (3-screen)
- Displays C-plane image
- Registration of needle marks
- Displays distance between multiple needle marks

• E-field Simulator \*<sup>4</sup>

A color map superimposed on the CT image simulates the distribution of electric current from the given location of the multiple electrodes.

• Needle Tracking\*<sup>5</sup>

Tracks and displays the needle tip location in real time during RFA procedures.

• Body Motion Tracking\*<sup>6</sup>

The omniTRAX Active Patient Tracker (manufactured by CIVCO) provides automatic image registration of fused images using real time ultrasound with previously acquired CT; with the synchronized status adjusted when small patient movements occur.

\*1 Option: EU-9185B, EZU-RVF1B, PM-ARIETTA850-H004, SOP-ARIETTA850-62

\*2 Option: SOP-ARIETTA850-97.

\*3 Option: SOP-ARIETTA850-75.

\*4 Option: SOP-ARIETTA850-96.

\*5 Option: SOP-ARIETTA850-84, EU-9197

\*6 Option: SOP-ARIETTA850-85, EU-9197

## 2D Tissue Tracking (2DTT) \*

2DTT enables the evaluations of regional wall motion abnormalities within your region of interest, such as the myocardium and valves automatically by speckle tracking method on a B-mode image. With only minimal angle dependency, analysis from various cross sections have become possible. Multiple analyses, including wall thickness, various strains and rotation angle can be performed.

•Analysis

- Free use

Distance and angular change between 2 points of your choice can be analyzed.

- SAX: Parasternal short-axis view

•Circumferential Strain and Strain Rate

•Radial Strain and Strain Rate Global

Circumferential Strain, Strain Rate

•Angle and Angle Rate

•Twist (With Overlay function)

-APEX: Apical long-axis view

•Apex-S (Strain)

• Longitudinal Strain and Strain Rate

• i2DTT

(Automated Processing for Bull's eye)

• Transverse Strain and Strain Rate

• Global Longitudinal Strain and Strain Rate

• Volume

• %EF(Modified Simpson Method)

• Apex-V (Volume)

• i2DTT

(Automated Processing for Bull's eye)

•Volume for cavity

- Single and Biplane EF  
(With Overlay Function)
- dv/dt(volume variation velocity)
- Center of gravity coordinate, display tracking

•View

-SAX

- SAX
- Basal SAX
- Mid SAX
- Apical SAX

-APEX-S, -V

- 2ch, 3ch, 4ch (Inversion view included)

•Graph Type

- Line Graph
- Color Graph
- Line & Color Graph
- Bull's eye (with Overlay function)

•Measurements

- Point to Point
- Time to Peak
- 3 point: One-third point of diastole duration
- Distance

\*Option :SOP-ARIETTA850-49

### Stress Echo analysis\*

Image display modes in which image acquisition is possible: B, Each Flow modes

- Image acquisition methods:  
ECG synchronized acquisition
- Compatible frame rate: Up to 75 Hz
- Recalled screen  
Playback speed: Selectable  
Image allocation: Possible  
Scoring: Possible  
Auto View Recognizing: On/Off
- Protocol: Skip view function is available.  
Exercise stress protocols:
  - Exercise Stress Echo
  - Treadmill Exercise
  - Bicycle Exercise

Pharmacological stress protocols:

- DSE
- High-Dose DSE
- Low-Dose DSE
- Arbutamine
- Dipyridamole

User's protocol:

The user can make a protocol within 8 views X 12

stages in 1 exam.

Full disclosure (Multi acquisition): 270 seconds

- Scoring screen  
Playback speed: Selectable  
Comparison between different stages in the same view is possible  
Image playback mode is selectable  
Bull's eye display (16 or 17 segmentation selectable)
- Report screen  
Display format  
Chart/Stage overview/View overview

\*Option: SOP-ARIETTA850-15, PEU-LISENDO880

### TDI analysis\*

Tissue Doppler Imaging (TDI) analysis is an echocardiographic technique employing the Doppler principle to measure the velocity of myocardial segments and other cardiac structures.

Strain information analysis is also available.

B-mode

Temporal Velocity Profile

Velocity, time, acceleration, ratio

Regional Velocity Profile

Velocity, distance

TDI-Myocardial Thickness (Wall thickness)

Distance, time, velocity

Strain rate

Time, strain rate

Strain

Time, strain

CSV output of analyzed data is possible. CSV is a file format that can be converted into Excel file directly.

\*Option: SOP-ARIETTA850-13

### CHI (Contrast Harmonic Imaging)\*

Contrast agent generates abundant second harmonics when disrupted, which eases detection by Harmonic Echo. Setting for low-pressure type contrast agent is also incorporated.

- Wide-band Contrast Harmonic Imaging (WbC)

The wideband pulse inversion method enables retrieval of echoes from the ultrasound contrast agent across a broad spectrum and display them in CHI mode at a high level of sensitivity.

- Tissue Reduction Contrast Harmonic Imaging (TrC)

The Amplitude Modulation method makes it possible to reduce signals from tissue to get clearer CHI mode images.

#### •CHI-eFlow

Signals from ultrasound contrast agent are imaged in Power Doppler of CHI mode.

By destroying the contrast agent with high acoustic pressure, the contrasted area can be displayed clearer with CHI-eFlow.

#### •Monitor mode

In the Monitor mode, images are available with a low sound pressure during the intermission of high sound pressure transmission.

#### • Motion-compensated Accumulation Imaging

It is possible to display running of fine blood vessels by accumulating contrast echo information.

#### •Flash

This mode sends high acoustic pressure transmissions at set intervals to destroy the ultrasound contrast agent.

#### •Frame Rate Limit

Function of limiting Frame Rate not to break bubbles.

\* Option: SOP-ARIETTA850-44 (Probe dependent)

### Contrast Echo analysis\*

#### • Image Subtraction

Fixed Reference: Subtraction of reference frame from all frames

Any 2 Frame: Subtraction between 2 selected frames

Display modes: All images, arbitrary images

#### • Time-Intensity Curve display

- Intensity level graphing of average, median, max and mode in the ROI.
- Standard deviation (SD) graphing of intensity in the ROI.
- Accumulation imaging: Possible

#### • Inflow Time Mapping

The inflow time of contrast medium can be indicated by color map on the multi images recorded by contrast echo inspection.

##### -Measurement

- Point to point
  - SD
  - Raising time
  - Fitting curve\*
  - Distance
  - Inflow Time Mapping Measurement
- \*: Parameters A, B and Beta can be calculated.

Series: Graphic display in frame sequence or time sequence

By Group: Graphic display with the time of one

sequence of intermittent acquisition as the horizontal scale (Graphs of multiple sequences are overlapped.)

Display mode: Image, Graph

ROI type: Square, Draw, Arc, and Circle

CSV output of analyzed data is possible.

\* Option: SOP-ARIETTA850-44 (Probe dependent)

### EyeballeEF\*

The EyeballeEF function provides the capability to examine the cardiac volume and ejection

fraction, GLS (Global Longitudinal Strain) in a short period of time. By using the EyeballeEF function, you can check the reference values such as an EF value in real time and check the measurement results immediately after Freeze.

\* Option: SOP-ARIETTA850-58 (Probe dependent), PEU-LISENDO880

### eTRACKING (Echo Tracking) \*

It is possible to precisely measure displacement of blood vessel to obtain indices of stiffness of the vessels such as pressure-strain elastic modulus ( $E_p$ ), stiffness parameter ( $\beta$ ), arterial compliance (AC), one-point pulse wave velocity (PWV $\beta$ ), and augmentation index (AI).

Blood-pressure gauge is necessary for this examination.

\* Option: SOP-ARIETTA850-11, PEU-LISENDO880

### FMD (Flow Mediated Dilatation) analysis\*

It is possible to continually record and plot the vessel diameter of the whole processes from baseline through occlusion and vasodilatation to recovery.

\* Option: SOP-ARIETTA850-16 (includes eTRACKING software), PEU-LISENDO880

### WI (Wave Intensity) \*

The heart and the arterial system are acting, constantly interfering with each other through forward traveling waves and reflected waves. WI is calculated based on changes in blood pressure and blood flow speed obtained at an arbitrary point in a circulatory system. WI is a new indicator of blood flow dynamics, which is expected to help pave the way for analysis of the interference between the heart and the arterial system. The analysis comprises of contraction and dilatation characteristics, influence of reflected waves from peripherals, and an index related to time. Blood-pressure gauge is necessary for this examination.

\* Option: SOP-ARIETTA850-34 (includes eTRACKING software.), PEU-LISENDO880

## General Specifications

### Acoustic Power

- 0 to 100%

### Preset Function

- 100 kinds (Max. 10 kinds per each probe)
- Preset contents storable in USB memory
- Q.S.S.(Quick Scanning Selector)  
Image modifying parameters (e.g. Gain, frequency, depth) of your choice can be registered. (Up to 4 sets per preset)  
These parameters can immediately be registered and selected by touch panel during examinations.
- Preset is booted up in conjunction with ID information(BodyParts or etc,)

### Characters and graphic displays

Character input area:

- ID\*, name, age, sex, retained text  
\*: Can be corrected after exam
- Input is possible with virtual keyboard on LCD panel
- Automatic Annotation Labeling:  
800 words (User registration is possible.)
- Body mark:  
38 kinds are available per each region.  
8 regions+1 user is able to register.  
Body mark editor to create user's body mark:  
Available  
Probe mark: 4 kinds  
Display position: changeable  
Fetal body mark: rotatable
- Assist line display (Probe dependent)

### Menu control

- 10.4-inch color TFT LCD touch panel

### Active Probe Ports

- For electronic scanning probes: 6 (4 active, 2 parking)
- For independent probes\*: 1

\*Option: EU-9187B

### Input/Output Signals

- Data Input/Output
  - USB2.0: 5 channels  
(Main unit 2+ Operation Panel 3)
  - USB3.0: 1 channel
- Digital Video Input/Output
  - DVI-D digital: 2 channels (Output 1, Input1)  
Resolution: Full HD(1600x900)
- Analog Video Input/Output

#### Output

- Color composite (BNC): 1 channel
- Y/C: 1 channels

#### Input

- Y/C: 1 channel
- Network
  - LAN (Wired, Wireless)
- Others  
Audio (L/R): 2 channels (Output 1, Input 1)

### Viewing Monitor

- 22 inch OLED display  
Resolution: WXGA++ (1600 x 900)
- Tilt and swivel are possible.
- Height adjustment and swivel together with operation panel

### Safety Regulation

- IEC 60601-1 Ed.3.0: 2005, IEC 60601-1 Ed.3.1: 2012  
Class I, Type BF

### Environmental Requirements

#### In Operation

- Temperature: +10 to +40 degrees C
- Relative Humidity: 30 to 75%  
(non condensing)
- Atmospheric pressure: 700 to 1060 hPa
- Altitude: Up to 3000m

#### In Storage/transportation

- Temperature: -10 to +50 degrees C  
(0 to +50 degrees C for mechanical probes)
- Relative Humidity: 10 to 90%  
(non condensing)
- Atmospheric pressure: 700 to 1060 hPa

### Power Requirement

- 100 to 120/ 200 to 240V ±10%, 50 or 60 Hz,  
Max. 1300 VA (with optional recorders connected)  
Max. 900 VA (main unit only)
- Shut down tool  
Hibernation\*  
\*If you unplug power, the condition is saved.

### Dimensions

- 55 cm (W) × 90 cm (D) ×122– 169.5cm (H)

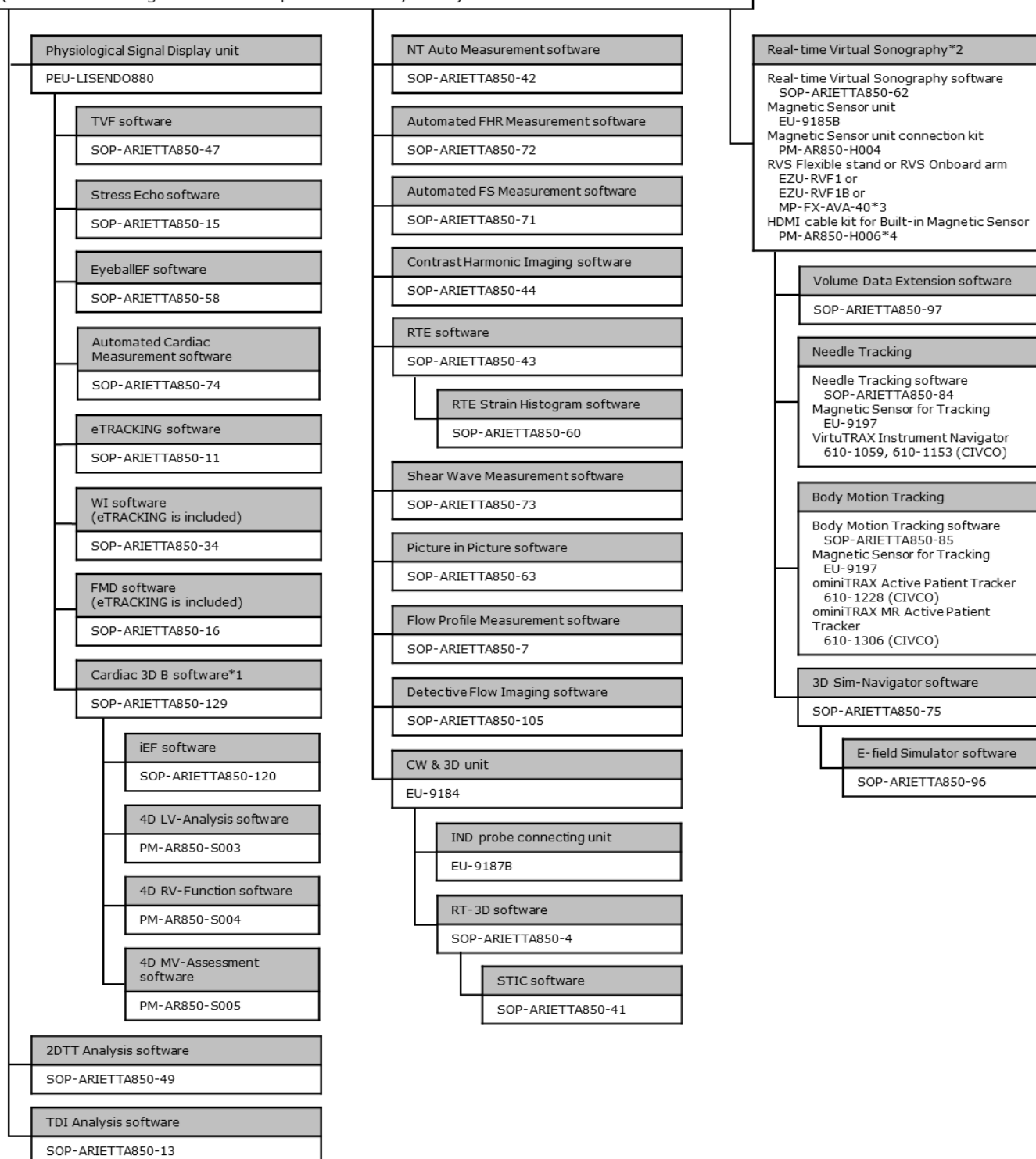
### Weight

- 150 kg (main unit only)



## System Configuration

ARIETTA 850/850 Endoscopic main unit  
(includes a viewing monitor and Alphanumeric keyboard)



**Continue to the next page**

**ARIETTA 850/850 Endoscopic main unit**  
(includes a viewing monitor and Alphanumeric keyboard)

McAfee Embedded Control 3 software	Foot Switch
SOP-ARIETTA850-128	MP-2345B (1-point) MP-2819 (3-point)
DICOM SR software	Jelly Warmer
SOP-ARIETTA850-21	JW-3000U Jelly Warmer Mounting kit MP-FX-AVA-2B-R (right side) or MP-FX-AVA-2B-L (left side)
DICOM QR software	Endo-cavity Probe holder
SOP-ARIETTA850-59	MP-PH-AVA-11B
Monochrome Printer	Flexible hook
UP-X898MD (Sony) P95DW (Mitsubishi) B/W printer connection kit PM-LI880-H001	MP-HA-AVA-2
Color Printer	Flexible hanger
UP-D25MD (Sony) CP30DW (Mitsubishi) Color printer connection kit PM-LI880-H002 Mounting Rack of Color Printer MP-FX-AVA-30 (for Sony) or MP-FX-AVA-31 (for Mitsubishi)	MP-HA-AVA-3
HD Video Recorder	Adapter for Large Probe holder
HVO-500MD/FHD (Without DVD drive) HVO-550MD/FHD (With DVD drive) Digital Video Recorder connection kit PM-LI880-H003B Mounting kit of Digital Video Recorder MP-FX-AVA-32B (Without Color Printer) or MP-FX-AVA-33B (With Color Printer)	MP-PH-ADAPTER-5BU
	Adapter for Large Probe holder (for thin and long probes)
	MP-PHAD-AR70-1U
	Olympus Ultrasonic Endoscope connection kit
	See page 22 for details
	Junction Box for ProSound LN/CV Probes
	JB-294D
	DC IN Cable
	L-CABLE-705
	CD-R/DVD Disk Drive unit

\*1 EU-9183 is necessary.

\*2 Most of attachment/adaptor is optional. See "Optional Probes" description.

\*3 Can not be used simultaneously with the color printer.

\*4 Necessary when performing RVS with a built-in magnetic sensor probe.

## OPTIONAL PROBES

### Electronic convex sector probes

Application (description)	Model	Frequency range (MHz)	Scanning angle (degrees)	Optional accessories
Abdominal	C35	8.0-2.0	70	Needle Guide - Ultra-Pro 644-082 (CIVCO) * <sup>1</sup> RVS Attachment RV-004 * <sup>2</sup>
Abdominal	C251	5.0-1.0	70	Needle Guide - Ultra-Pro 644-082 (CIVCO) * <sup>1</sup> RVS Attachment RV-004 * <sup>2</sup>
Abdominal	C252	6.0-1.0	70	Needle Guide - Ultra-Pro 644-082 (CIVCO) * <sup>1</sup> RVS Attachment RV-004 * <sup>2</sup>
Abdominal	C22P * <sup>3</sup>	6.0-1.0	74	Puncture Adapter EZU-PA7C2 * <sup>1</sup> MP-2824 RVS Attachment RV-012 * <sup>2</sup>
Abdominal	C22K	6.0-1.0	82	Puncture Adapter MP-2781 MP-2781-5 MP-2781-25 Needle Guide - Ultra-Pro 614-109 (CIVCO) * <sup>1</sup>
Abdominal	C23	6.0-1.0	110*	Puncture Adapter 644-096 (CIVCO) * <sup>1</sup> RVS Attachment RV-017 * <sup>2</sup> Waterproof case WP-001
Abdominal	C23RV	6.0-1.0	110*	Puncture Adapter 644-096 (CIVCO) * <sup>1</sup> RVS Attachment RV-017 * <sup>7</sup> Waterproof case WP-001
Abdominal	C25P * <sup>4</sup>	5.0-1.0	70	Puncture Adapter EZU-PA7B1-1 EZU-PA7B1-2 EZU-PA7B1-3 EZU-PA7B1-4 EZU-PA7B1-C RVS Attachment RV-005 * <sup>2</sup>
Transvaginal	C41V1	10.0-2.0	200	Puncture Adapter EZU-PA7V RVS Attachment RV-002 * <sup>2</sup>
Transvaginal• Transrectal	C41B	10.0-2.0	200	Puncture adaptor MP-2445 RVS attachment RV-013 * <sup>2</sup> Probe cover RB-945BP-NS Waterproof case WP-001

Transrectal	C41RP *5	9.0-2.0	180	Puncture Adapter MP-2452 Waterproof case WP-001
Abdominal	C42	8.0-4.0	80	Puncture Adapter EZU-PA532 Needle Guide - Ultra-Pro 644-077 (CIVCO) *1 RVS Attachment RV-006(Normal use) *2 RV-007(When Puncture Adapter is used) *2
Intraoperative	C42K	10.0-4.0	65	Puncture Adapter MP-2783, MP-2458 Needle Guide - Ultra-Pro 614-100 (CIVCO) *1
Intraoperative	C42T	10.0-3.0	65	RVS Attachment RV-003 *2 Waterproof case WP-001

\*When Wide Scanning is ON.

## Electronic linear probes

Application (description)	Model	Frequency range (MHz)	Scanning width (mm)	Optional accessories
Small Organ	L34	7.0-3.0	38	Puncture Adapter EZU-PA3C1H Needle Guide - Ultra-Pro 644-079 (CIVCO) *1 Other Attachment EZU-PA3C1 EZU-PA3C2
Peripheral Vessel	L441	12.0-2.0	38	Needle Guide - Ultra-Pro 644-075 (CIVCO) *1
Small Organ	L55	13.0-5.0	50	Puncture Adapter EZU-PA7L2 *1 RVS Attachment RV-008 *2
Small Organ	L64	18.0-5.0	38	Puncture Adapter EZU-PA7L3 *1 RVS Attachment RV-009 *2 Acoustic Coupler EZU-TECPL1(Acoustic Coupler for Elastography) SF-001(Acoustic Coupler for Superficial) EZU-TEATC2(Attachment)
Intraoperative	L43K	12.0-2.0	26	Waterproof case WP-001
Intraoperative	L44K	14.0-2.0	42	Waterproof case WP-001
Intraoperative	L53K	15.0-3.0	25	Waterproof case WP-001
Intraoperative	L44LA	13.0-2.0	36	-
Intraoperative	L44LA1	13.0-2.0	38	Waterproof case WP-001
Intraoperative	L51K	15.0-3.0	13	Waterproof case WP-001
Intraoperative	L46K1	14.0-2.0	63	Waterproof case WP-001

## Electronic phased array sector probes

Application (description)	Model	Frequency range (MHz)	Scanning angle* (degrees)	Optional accessories
Cardiac Adult	S121	5.0-1.0	120	-
Cardiac Pediatric	S31	9.0-2.0	100	-
Neonatal Cardiology	S42	14.0-3.0	100	-
Cardiac, TEE	S3ESEL * <sup>6</sup>	8.0-2.0	100	-
Cardiac Adult, TEE	S3ESL1	9.0-2.0	100	-

\*When Wide Scanning is ON.

## CMUT Probes (linear probes)

Application	Model	Frequency range (MHz)	Scanning width (mm)	Optional accessories
Small Organ	SML44	22.0-2.0	38	RVS Attachment RV-014 * <sup>2</sup>

## RT-3D (4D) Probes\*

\* **SOP-ARIETTA850-4** and **EU-9184** are necessary.

Application	Model	Frequency range (MHz)	Scanning angle (degrees)	Optional accessories
Fetal	VC34	7.0-2.0	70	-
Fetal	VC35	8.0-2.0	72	-
Transvaginal	VC41V	8.0-2.0	145	

## Bi-plane probe

Application (description)	Model	Frequency range (MHz)	Scanning angle (degrees)	Optional accessories
Transrectal	CC41R	8.0-4.0	100/120	Puncture Adapter EZU-PA5V Puncture EZU-PA3U RVS Attachment RV-010 * <sup>2</sup> Waterproof case WP-001
Transrectal	CC41R1	10.0-2.0	180/180	Puncture Adapter EZU-PA5V RVS Attachment RV-015* <sup>2</sup> Probe Cover RB-945BP-NS Waterproof case WP-001
Transrectal	CL4416R	Convex	10.0-2.0	Puncture Adapter BA-001 RVS Attachment RV-011* <sup>2</sup> Probe Cover RB-945BP-NS Waterproof case WP-001
		Linear	14.0-2.0	
Transrectal	C41L47RP	Convex	8.0-4.0	Puncture Adapter EZU-PA3U RVS Attachment RV-011* <sup>2</sup>
		Linear	10.0-5.0	

## Matrix 3D(4D) Probes\*

\***SOP-ARIETTA850-129, EU-9183 and PEU-LISENDO880** are necessary

Application (description)	Model	Frequency range (MHz)	Scanning angle (degrees)	Optional accessories
Cardiac Adult, TTE	MXS1	5.0-1.0	90	-

## Independent CW Doppler Probes\*

\* Independent probe connection unit **EU-9184 and EU-9187B** are necessary.

Application	Model	Frequency range (MHz)	Optional accessories
Cardiac Adult	UST-2265-2	2.0	-
Cardiac Adult	UST-2266-5	5.0	-

## Electrical Radial Probes

Application	Model	Frequency range (MHz)	Scanning angle (degrees)	Optional accessories
Transrectal	R41R	10.0-5.0	360	Waterproof case WP-001
Transrectal	R41RL	10.0-5.0	360	Waterproof case WP-001

## Olympus Ultrasonic Endoscope Probes

\* Optional software **SOP-ARIETTA850-17-1, SOP-ARIETTA850-18-1, SOP-ARIETTA850-39-1, SOP-ARIETTA850-40-1, SOP-ARIETTA850-36-1** or **SOP-ARIETTA850-80-1** is necessary.

The model number that can be connected depends on destination.

ARIETTA 850 becomes "ARIETTA 850Endoscopic" by affixing the Endoscopic label included in options for EUS probe connection.

Model number (Olympus)	Frequency (MHz)		Scanning angle	Remarks
	B/W B and M mode	Doppler/Flow		
GF-UC140P-AL5 GF-UC240P-AL5 GF-UCT140-AL5 GF-UCT240-AL5	5.0,6.0,7.5,10.0	4.4, 6.0, 7.5	180 deg.	SOP-ARIETTA850-17-1 is necessary. Junction Box JB-294D or later is necessary. "OLY-R5C1" is displayed on the screen.
GF-UE160-AL5 GF-UE260-AL5	5.0,6.0,7.5,10.0 THI 3.8, 5.0, 6.0, 7.5	4.4, 6.0, 7.5	360 deg.	SOP-ARIETTA850-18-1 is necessary. Junction Box JB-294D or later is necessary. "OLY-R5R1" is displayed on the screen.
GF TYPE UCT180 GF TYPE UCT260	5.0,6.0,7.5,10.0 THI 3.8, 5.0, 6.0, 7.5	4.4, 6.0, 7.5	180 deg.	SOP-ARIETTA850-39-1 is necessary. Junction Box JB-294D or later is necessary. "OLY-R5C4" is displayed on the screen.
TGF-UC180J TGF-UC260J	5.0,6.0 7.5,10.0 THI 3.8, 5.0, 6.0, 7.5	4.4, 6.0, 7.5	115 deg.	SOP-ARIETTA850-40-1 is necessary. Junction Box JB-294D or later is necessary. "OLY-R5C5" is displayed on the screen.
BF TYPE UC180F BF TYPE UC260FW	5.0,7.5,10.0,12.0 THI 3.8,5.0,6.0,7.5	4.4, 6.0, 7.5	65 deg	SOP-ARIETTA850-36-1 is necessary. Junction Box JB-294D or later is necessary. "OLY-R8C2" is displayed on the screen.
BF-UC190F BF-UC290F	5.0,7.5,10.0,12.0 THI 3.8,5.0,6.0,7.5	4.4, 6.0, 7.5	65 deg	SOP-ARIETTA850-80-1 is necessary. Junction Box JB-294D or later is necessary. "OLY-R6C1" is displayed on the screen.

\*1 An optimal Needle Guide Replacement Kit (CIVCO) is necessary.

\*2 Necessary to perform RVS.

\*3 One piece of RV-012 is attached.

\*4 One of puncture adapter is necessary to use needle.

\*5 Two pieces of MP-2452-G18 are attached. Probe cover RB-665P-NS is necessary.

\*6 Probe cover (CIVCO transducer cover 610-933) is necessary to use S3ESEL.

\*7 Necessary to perform RVS with an external magnetic sensor.

## Probes and available functions

Function Probe	eFocusing	Hiframerate(BW)	Hiframerate (Col)	Fmt	WbT	HdTHI	CHI (Low)	CHI (Mid)	CHI (High)	TDI	Panoramic View	RVS	Needle Emphasis	Needle tracking on guide	Elastography	Shear Wave		eFLOW	DFI	Compound	CW
																Elastography Measurement	Elastography				
C35	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	-	✓	-	-	✓	✓	✓	
C251	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	
C252	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
C22P	✓	-	-	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	-	✓	-	✓	-	✓	
C22K	✓	-	-	-	✓	✓	✓	✓	-	-	-	-	✓	-	-	-	-	✓	-	✓	
C23	✓	-	-	-	-	✓	✓	✓	✓	-	-	✓	✓	✓	✓	-	-	✓	✓	✓	
C23RV	✓	-	-	-	-	✓	✓	✓	✓	-	-	✓	✓	✓	✓	-	-	✓	✓	✓	
C25P	✓	-	-	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	-	-	-	✓	-	✓	
C41V1	✓	-	-	-	✓	✓	✓	✓	-	-	-	✓	✓	-	✓	-	-	✓	-	✓	
C41B	✓	-	-	-	✓	✓	✓	✓	-	-	-	✓	✓	-	✓	-	-	✓	-	✓	
C41RP	-	-	-	-	-	✓	-	-	-	-	-	-	✓	-	-	-	-	✓	-	✓	
C42	✓	-	-	✓	✓	✓	-	-	-	-	-	✓	✓	-	✓	-	-	✓	-	✓	
C42K	✓	-	-	-	-	✓	-	-	-	-	-	-	✓	-	✓	-	-	✓	-	✓	
C42T	✓	-	-	-	-	✓	✓	✓	-	-	-	✓	-	-	✓	-	-	✓	-	✓	

Convex sector

Linear

Function Probe	eFocusing	Hiframerate(BW)	Hiframerate (Col)	Fmt	WbT	HdTHI	CHI (Low)	CHI (Mid)	CHI (High)	TDI	Panoramic View	RVS	Needle Emphasis	Elastography	Shear Wave Measurement	ET /FMD/ WI	DFI	eFLOW	CW	Compound	Trapezoid
L34	✓	-	-	-	✓	✓	✓	✓	-	-	✓	-	✓	✓	-	✓	-	✓	✓	✓	✓
L441	✓	-	✓	-	✓	✓	✓	✓	-	-	✓	-	✓	✓	-	✓	✓	✓	✓	✓	✓
L55	✓	-	-	-	-	✓	✓	✓	-	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓
L64	✓	-	-	-	✓	✓	-	-	-	-	✓	✓	✓	✓	*	✓	✓	✓	✓	✓	✓
L43K	✓	-	-	-	-	✓	✓	✓	-	-	-	-	-	✓	-	-	-	✓	✓	✓	✓
L44K	✓	-	-	-	-	✓	✓	✓	-	-	-	-	-	✓	-	-	-	✓	✓	✓	✓
L53K	✓	-	-	-	✓	✓	-	-	-	-	-	-	-	✓	-	-	-	✓	✓	✓	✓
L44LA	✓	-	-	-	-	✓	✓	✓	-	-	-	-	-	✓	-	-	-	✓	✓	✓	✓
L44LA1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	-
L51K	✓	-	-	-	-	✓	✓	✓	-	-	-	-	-	✓	-	-	-	✓	✓	✓	✓
L46K1	✓	-	-	-	-	✓	✓	✓	-	-	-	-	-	✓	-	-	-	✓	✓	✓	✓

\* Attenuation measurement is not available.

Phased array sector

Function Probe	Compound	CW	eFLOW	Elastography	Panoramic View	TDI	CHI (High)	CHI (Mid)	CHI (Low)	HdTHI	WbT	FmT	HiFrameRate (Col)	HiFrameRate(BW)	eFocusing
S121	-	✓	✓	-	-	✓	-	-	✓	-	✓	✓	✓	✓	✓
S31	-	✓	✓	-	-	✓	-	-	-	-	-	✓	✓	-	-
S42	-	✓	✓	-	-	✓	-	-	-	-	-	✓	✓	-	-
S3ESEL	-	✓	✓	-	-	✓	-	-	-	-	-	-	✓	-	-
S3ESL1	-	✓	✓	-	-	✓	-	-	-	-	-	-	✓	-	-



### CMUT Probe (Linear)

Function \ Probe	Probe
Trapezoid	✓
Compound	✓
CW	-
ET /FMD/ WI	✓
DFI	✓
eFLOW	✓
Elastography	✓
RVS	✓
Panoramic View	✓
TDI	-
CHI (High)	-
CHI (Mid)	-
CHI (Low)	-
HdTHI	✓
WbT	✓
FmT	-
eFocusing	✓

### RT-3D (4D)

Function \ Probe	Probe	VC34	VC35	VC41V
Trapezoid	-	-	-	-
Compound	✓	✓	✓	✓
CW	-	-	-	-
eFLOW	✓	✓	✓	✓
Elastography	-	-	-	✓
Panoramic View	-	-	-	-
TDI	✓	✓	✓	-
CHI (High)	-	-	-	-
CHI (Mid)	-	-	-	-
CHI (Low)	-	-	-	-
HdTHI	✓	✓	✓	-
WbT	✓	✓	✓	✓
FmT	✓	✓	✓	✓
Hiframerate (Col)	✓	✓	✓	-
Hiframerate(BW)	✓	✓	✓	✓
eFocusing	✓	✓	✓	-

### Matrix 3D (4D)/ Independent

Function \ Probe	Probe	MXS1	UST-2265-2	UST-2266-5
IEF	✓	✓	-	-
4D MV-Assessment	✓	-	-	-
4D RV-Function	✓	-	-	-
4D LV-Analysis	✓	-	-	-
Cardiac 3D B	✓	-	-	-
BiPlane	✓	-	-	-
Dual Gate Doppler	✓	-	-	-
CW	✓	✓	✓	✓
eFLOW	✓	-	-	-
TDI	✓	-	-	-
CHI (High)	-	-	-	-
CHI (Mid)	-	-	-	-
CHI (Low)	-	-	-	-
HdTHI	-	-	-	-
WbT	-	-	-	-
FmT	✓	-	-	-
HI Framerate(CF)	✓	-	-	-
HI Framerate(B)	✓	-	-	-
eFocusing	✓	-	-	-

### Bi-plane

Function \ Probe	Probe	CC41R	CC41R1	CL4416R (Convex)	CL4416R
Trapezoid	-	-	-	-	✓
Compound	-	-	-	✓	✓
eFLOW	✓	✓	✓	✓	✓
Elastography	✓	✓	✓	✓	✓
RVS	✓	✓	✓	✓	✓
Panoramic View	-	-	-	-	✓
TDI	-	-	-	-	-
CHI (High)	-	-	-	-	-
CHI (Mid)	✓	-	-	-	-
CHI (Low)	✓	-	-	-	-
HdTHI	-	✓	✓	✓	✓
WbT	✓	✓	✓	✓	✓
FmT	-	-	-	-	-

(Linear)														
C41L47RP (Convex)	-	✓	-	-	-	-	-	-	✓	✓	✓	-	-	
C41L47RP (Linear)	-	✓	-	-	-	-	-	✓	✓	✓	✓	-	✓	

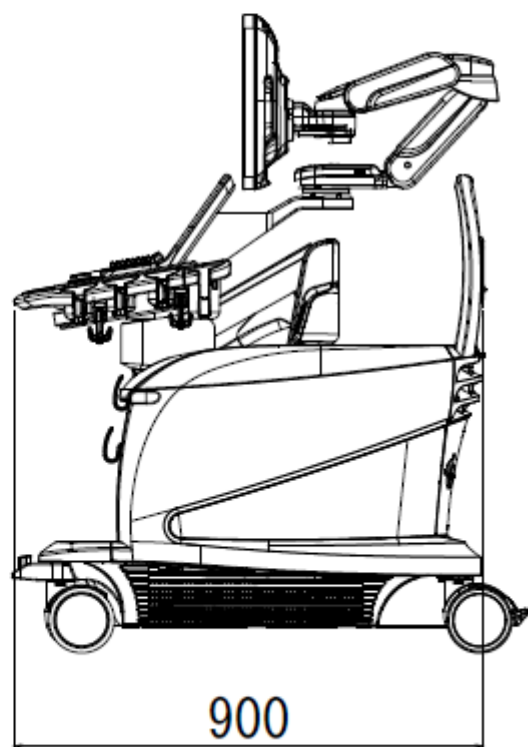
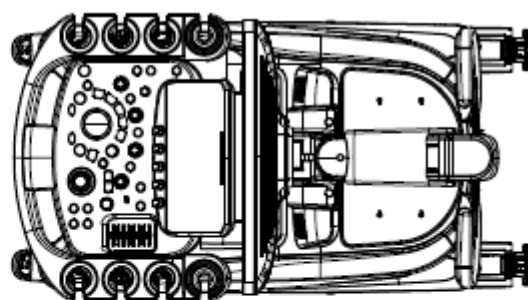
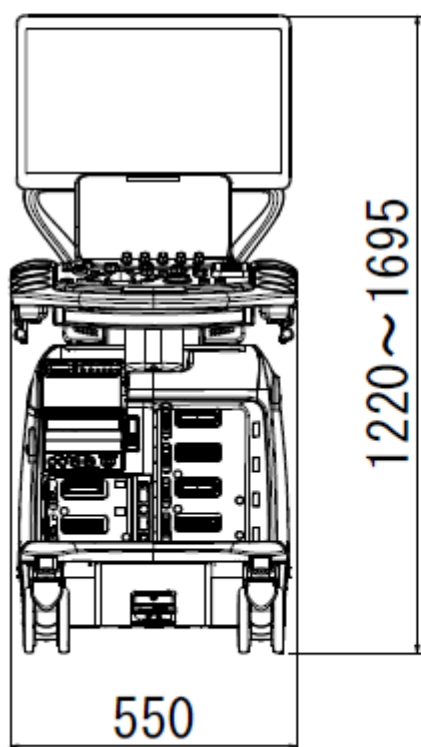
#### Electrical radial

Function Probe	Compound	eFLOW	Elastography	RVS	Panoramic View	TDI	CHI (High)	CHI (Mid)	CHI (Low)	HdTHI	WbT	FmT
R41R	-	✓	✓	-	-	-	-	-	-	-	✓	-
R41RL	-	✓	✓	-	-	-	-	-	-	-	✓	-

#### Olympus Ultrasound Endoscope

Function Probe	eFocusing	FmT	WbT	HdTHI	CHI (Low)	CHI (Mid)	CHI (High)	TDI	Panoramic View	RVS	Needle Emphasis	Elastography	Shear Wave Measurement	eFLOW	DFI	Compound	Dual Gate Doppler
GF-UC140P-AL5 GF-UC240P-AL5 GF-UCT140-AL5 GF-UCT240-AL5	-	-	-	-	-	-	-	-	-	-	-	✓	-	✓	-	-	-
GF-UE160-AL5 GF-UE260-AL5	✓	-	-	-	✓	✓	-	-	-	-	-	✓	-	✓	-	-	-
GF TYPE UCT180 GF TYPE UCT260	✓	-	-	-	✓	✓	-	-	-	-	✓	✓	✓*	✓	✓	-	-
TGF-UC180J TGF-UC260J	-	-	-	-	✓	✓	-	-	-	-	-	✓	-	✓	-	-	-
BF TYPE UC180F BF TYPE UC260FW	-	-	-	✓	-	-	-	-	-	-	-	✓	-	✓	-	-	-
BF-UC190F BF-UC290F	-	-	-	✓	-	-	-	-	-	-	-	✓	-	✓	-	-	-

\* Attenuation measurement is not available.



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