물 품 규 격 서

☐ 입찰공고번호 : (학)일송학원 관리국 제2025-206호
☐ 입찰건명 : 심장혈관흉부외과(외래) Ultrasound Scanner, Cardiac 구매
☐ 수요기관 : 한림대학교성심병원
☐ 납품장소 : 수요기관 희망장소 입고도
☐ 물품내역 등

연번	품명(영문, 국문)	규격 및 사양	총 구매 예정수량 (Q'TY)	1회 최대 발주수량	Warranty 기간	단위 (Unit)
1	Ultrasound Scanner, Cardiac (심장초음파 영상진단기)	하단 참조	1	1	검수(합격)일로부터 3년 종료월 말일까지	SET

☐ 공통사항

1. 장비의 설치와 작동 및 교육은 무상으로 제공한다.
2. 수요기관 담당자 입회하에 계약상대자는 제품의 설치 테스트 및 시험작동을 실시하여야 한다.
3. **무상 하자담보 책임기간은 물품 검수(합격)일로부터 *3년 종료월 말일 까지*를 기본 원칙으로 하며 계약상대자의 추가 제안에 따라 3년을 초과하여 설정할 수 있다.**
4. 무상 하자담보 책임기간 중 수요기관의 사정으로 인하여 부서 및 장비의 위치가 불가피하게 이동을 필요로 할 경우 설명 및 설치가 무상으로 이루어진다.
5. 무상 하자담보 책임기간 중 중 공급된 장비의 부속품이 단종된 경우 수요기관이 인정하는 동등 이상의 장비로 무상 교체가 이루어져야 한다.
6. 계약상대자는 어떠한 상황에서나 애프터서비스를 위하여 전문서비스 인력을 제공하여야 하며 애프터서비스를 위하여 교체 부품을 보관하여야 한다.
7. 계약상대자는 장비 납품 시 납품일을 기준하여 제품 제조년월이 6개월 이내인 장비를 납품하고 납품장비에 해당 제조년월이 명시되어야 한다.
8. 기존 노후 의료장비 철거 및 회수(또는 보상판매) 조건으로 제안할 수 있다.

<규격 · 사양-A>

A. Features

This System combines the proven breadth, quality and performance of the Model product line with a new and innovative software image processing platform: cSound™. This Model is the maker's cardiovascular ultrasound's high-end scanner.

The cSound architecture benefits all this model's probes and applications. This model supports the following clinical applications: Adult cardiac(2D and 4D transesophageal) including coronary, pediatric cardiac, intracardiac, intraoperative, intraluminal, pediatric including neonatal, fetal heart, obstetrics, gynecology, abdominal, small parts, thyroid, adult and neonatal cephalic, peripheral vascular, musculoskeletal conventional and superficial including nerves and urology.

B. Specifications

1. Basic system architecture
   1) 22" wide-screen, High-Definition (HD), flicker-free LCD display
   2) 12" ultra-high resolution, wide screen format, color, multi-touch LCD screen
   3) Touch key board
   4) Five active probe ports
   5) ECG port
   6) Integrated 1TB HDD
   7) Multiple USB ports (front/back)

2. True Confocal Imaging (TCI)
   1) Ultra narrow focused two-way beam profile throughout the field of view, maintaining frame rate, no zone stitching, no multi-line acquisition artifacts and enhanced dynamic contrast resolution throughout field of view compared to conventional focal imaging

3. Auto Optimization (ATO, ASO)
   1) Automatic tissue optimization (ATO) : Single keystroke optimizes immediately automatically and dynamically different grayscale settings with the goal of signal independent uniform gain and contrast distribution
   2) Automatic Spectrum Optimization (ASO) : It provides a single push, automatic, real-time optimization dis-play of PW or CW spectrum scale and baseline

4. UD Clarity and UD Speckle Reduce Imaging (UD-SRI)
   1) An advanced image processing technique to remove speckle in real-time examining the relative difference between neighboring pixel values and determining whether the grayscale variations have a sharp difference, follow a trend, or are random in nature

5. Anatomical M-mode (AMM)
   1) M-mode cursor can be adjusted at any plane
   2) Free(curved) drawing of M-mode generated from the cursor independent from the axial plane
   3) Anatomical M-mode and Curved Ana-tomical M-mode displays SI and SRI

6. Curved Anatomical M-mode (CAMM)

1) Free(curved) drawing of M-mode generated from the cursor independent from the axial plane
2) It displays allowing an M-mode along an arbitrary curve in a 2D image
3) Anatomical M-mode and Curved Ana-tomical M-mode displays SI and SRI

7. HD imaging

1) Real-time simultaneous acquisition at dual frequencies compounded to help reduce speckle and noise while enhancing resolution and contrast

8. Virtual Apex

1) Virtual apex provides a wider field ofview with phased array probes, effective at certain imaging views where a wide near field is preferred

9. LVO contrast

1) Enables contrast applications intended for imaging of the left ventricle
2) LV contrast (M5Sc-D, 6VT-D) enhances delineation of the LV border in combination with ultrasound contrast agents

10. Tissue Velocity Imaging (TVI)

1) Myocardial Doppler imaging with color overlay on tissue image
2) Tissue Doppler data can be acquired in background during regular 2D imaging
3) The velocity of myocardial segments after entire heart cycle can be displayed in one single image

11. Tissue Tracking (TT)

1) Real time display of the time integral of TVI for quantitative display of myocardial systolic displacement
2) Myocardial displacement is calculated and displayed as a color coded overlay on the grayscale and M-mode image - different colors represent different displacement ranges

12. Q-Analysis

1) Traces for velocity or derived parameters inside defined regions of interest as function of time
2) Contrast analysis with traces

13. QuickApps

1) Factory and user programmable sub-preset feature that keeps 2D and geometry settings while adapting color flow or contrast parameters

14. Pre-Post Compare

1) Labelling of measurements and images acquired in different stages of an exam or procedure, allowing to compare measurements pre and post proce-dure.

15. Z-Score

1) Support for five sets of user-selectable Z score publications covering the most common pediatric dimension measurements

16. Cardiac Auto Doppler
1) Cardiac Auto Doppler automatically provides Doppler measurement results for the most common parameters, with minimal user guidance

17. Spline Tool Measurement
1) A generic spline (polynomial interpolation) tracing tool for cardiac structures.
The tool's tracing is based on user-defined points in the image, added by trackball/trackpad clicks.

18. Multiple-angle compound imaging
1) Multiple co-planar images from different angles combined into a single image in real-time to help enhance border definition and contrast resolution, as well as reduce angular dependence of border or edge as compared to no-compound imaging

19. LOGIQView - Extended Field of View
1) Provides the ability to construct and view a static 2D image with wider field-of-view of a given transducer. This allows viewing and measurements of anatomy that is larger than what would fit in a single image

20. Virtual Convex Imaging
1) Virtual convex allows a wider FOV and aims to enhance image quality on linear probes in particular

21. Blood Flow Imaging
1) Combines color Doppler with grayscale speckle imaging
2) Helps improve delineation of blood flow without bleeding into tissue or vessel wall

22. IMT
1) Automatic measurements of carotid artery Intima-Media Thickness (IMT) on any acquired frame

23. Scan Assist Pro
1) Customizable automations that assist the user through each step of the scan
2) Helps enhance consistency and reduce keystrokes

24. FlexiViews
1) Provides instant access to predefined (factory or user created) 4D views during live mode
May provide more consistent data while reducing scanning time

25. 4D Views (4D TEE with 6VT-D)
1) Auto alignment to define standard orientation of acquired 4D data

2) "Standard views, such as 4CH, 2CH, LAX, mitral valve and aortic valve, are defined from the standard orientation"
3) Automatic display of volume renderings and 2D cut planes from standard views

26. Biplane / Triplane imaging
1) Bi-plane and/or tri-plane acquisition

27. TEE interface
1) This option enables acquisition of images with TEE probes

28. Privacy Security and data protection
1) Windows 10 with whitelisting, disk Encryption and LDAP

29. Dicom Connectivity Package
1) Enables support for DICOM functionality via network connection

30. AI Auto Measure 2D
1) The AI based Auto Measure 2D feature enables automated quantification of the most common distance measurements performed on parasternal LAX 2D images

31. AI Auto Measure Spectrum Recognition
1) The AI based Spectrum Recognition feature enables automated recognition of the most common Doppler spectra and automatically starts the Auto Doppler measurement

32. 4D
This option enables the basic 4D features on this model and is a prerequisite for other 4D related options as well. It also included 4D Auto LVQ.

33. 11L-D Linear Array Probe
1) Probe presets: Vascular (incl. carotid, LEA, LEV, UEA, UEV), breast, small parts, msk, thyroid, scrotal

34. L8-18i-D Linear Array Probe
1) Probe presets: Cardiac, vascular, musculoskeletal, small parts

35. 6VT-D Active Matrix 4D Volume TEE Probe
1) Probe presets: Cardiac, LVO contrast, coronary

36. ECG Cable set

37. B/W printer

38. O/S Manual

C. Consist of(per 1 Set)

1. Basic system architecture
2. True Confocal Imaging (TCI)
3. Auto optimization (ATO, ASO)
4. UD Clarity and UD Speckle Reduce Imaging (UD-SRI)
5. Anatomical M-mode (AMM)
6. Curved Anatomical M-mode (CAMM)
7. HD imaging
8. Virtual Apex
9. LVO contrast
10. Tissue Velocity Imaging (TVI)
11. Tissue Tracking (TT)
12. Q-Analysis
13. QuickApps
14. Pre-Post Compare
15. Z-Score
16. Cardiac Auto Doppler
17. Spline Tool Measurement
18. Multiple-angle compound imaging
19. LOGIQView - Extended Field of View
20. Virtual Convex imaging
21. Blood Flow Imaging
22. IMT
23. Scan Assist Pro
24. FlexiViews
25. 4D Views
26. Biplane / Triplane imaging
27. TEE interface
28. Privacy Security and data protection
29. Dicom Connectivity Package
30. AI Auto Measure 2D
31. AI Auto Measure Spectrum Recognition
32. 4D
33. 11L-D Linear Array Probe
34. L8-18i-D Linear Array Probe
35. 6VT-D Active Matrix 4D Volume TEE Probe
36. ECG Cable set
37. B/W Printer
38. O/S Manual

D. Remarks

-. Warranty : 검수(합격)일로부터 3년 종료월 말일

<규격 · 사양-B>

A. Features

1. Next generation ultra-low noise, wide dynamic range digital broadband acoustic beamforming with proprietary architecture.
2. Offers up to 4,718,592 total digital channels
3. Optimized for high definition 21.5 inch LCD display
4. Supports both 3D TTE and 3D TEE

B. Specifications

1. Ultrasound Imaging System

(1) Basic architecture

- Next generation ultra-low noise, wide dynamic range digital broadband acoustic beamforming with proprietary architecture
- Includes 512 GB hard drive
- Optimized for high definition 21.5 inch LCD display
- 12 inch wide touch screen
- Next generation SonoCT real-time compound imaging
- Next generation XRES adaptive image processing
- Advanced dynamic motion suppression algorithms that reduce flash artifacts
- Transport mode: from sleep mode to on

(2) Imaging Modes

- 2D grayscale imaging with advanced pulse coding, pulse shaping, and frequency compounding technologies
- M-mode
- Tissue Harmonic Imaging (THI) with pulse inversion technology
- Coded beamforming
- SonoCT beam-steered real-time compound imaging
- Harmonic SonoCT imaging
- Up to five levels of XRES adaptive image processing technology
- iSCAN intelligent scanning for one-button TGC and gain optimization
- Color Doppler
- Color Power Angio imaging (CPA) and directional CPA
- High-PRF pulsed wave (PW) Doppler

(3) M-Mode

- Selectable sweeping rate
- Time markers : 0.1 and 0.2 seconds
- Acqusition zoom capability
- Selectable display format prospective or retrospective (1/3-2/3, 1/2-1/2, 2/3-1/3, side by side, full screen)
- Chroma colorization with multiple color maps
- Cineloop review for retrospective analysis of M-mode data

(4) Color Doppler
- Color compare dual display
- Wall filter
- Flow optimization
- Ability to continuosly stter between ±3 steer angle on linear array transducers
- Cineloop review with full playback control
- Velocity and variance display

(5) Spectral Doppler
- Display annotations including Doppler mode, scale(cm/sec)
  Nyquist limit, wall filter setting, gain, acoustic output status
- Ultra-high resolution 1 millisecond spectral FFT rate
- Angle correction with automatic velocity scale adjustments
- Selectable sweep speeds
- Selectable low-frequency signal filtering with adjustable wall filter setting
- Selectable display format prospective or retrospective:
  1/3-2/3, 1/2-1/2, 2/3-1/3, side by side, full screen
- Doppler Review for retrospective analysis or Doppler data
- Post-processing in PW frozen mode including map, baseline, invert and chroma

(6) Pulsed Wave (PW) Doppler
- Simultaneous 2D, colr Doppler, pulsed Doppler
- HPRF capability in all modes including Duplex, Simultaneous Duplex
- iSCAN optimization automatically adjusts scale and baseline

(7) Steerable Continous Wave (CW) Doppler
- Steerable through 90° sector
- Maximum velocity range : 19 m/sec (transducer dependent)

(8) Color Power Angio Imaging
- Automatically adapts transmit and receive bandwidth processing based
  on the color box position providing optomal sensitivity and color resolution
- Highly sensitive mode for all vessel visualization
- Cineloop review with full playback control
- Individual controls for gain, filters, sensitivity, echo write prority
- Dynamic Motion Differentiation

(9) Tissue Doppler Imaging (TDI)
- Available on all cardiac imaging transducers
- TDI gain, TGC and LGC compatible
- TDI Opt: Optimized transmit and receive frequencies
- Eight maps

2. Integrated Echo Data Management
- 512 GB Hard Drive + 240GB SSD
- USB ports
- Storage capacity of approximately 350 patient exams
  (assuming 40 images, 6 seconds of clips and reports per exam)

3. Auto SCAN intelligent optimization
   - Continuous, real-time adjustment of system gain and TGC to achieve balanced brightness of tissues
   - Available from 2D touch screen controls

4. iSCAN Intelligent Optimization
   - One touch image optimization
   - In 2D mode one button automatic adjustment of system gain and TGC to achieve balanced brightness of tissues
   - Available in contrast imaging for selected transducers / applications
   - In Doppler mode one button automatic adjustment
     · Doppler PRF based on detected velocity
     · Doppler baseline based on detected flow direction
   - Adaptive gain compensation (AGC) dynamically adjusts low level 2D echoes to reduce gain artifacts and improve image uniformity with 2D and 3D imaging

5. SonoCT Real-time Compound Imaging
   - Virtually all clutter and artifacts eliminated
   - Automatic selection of the number of steering angles based on the user-selected resolution/frame rate (Res/Speed) condition
   - Up to nine lines of sight automatically adjusted via DRS control

6. XRES adaptive real-time image processing
   - Available on all imaging transducers
   - Virtually eliminates speckle noise artifact and dynamically enhances tissue margin
   - Available in all imaging modes including color flow and Doppler
   - Available in contrast modes
   - Operates in conjunction with SonoCT real-time compound imaging
   - Provides high speed processing that allows over 2800 frames-per-second displays

7. Automated Cardiac 2D QuantificationA.I. (a2DQA.I.) and a2DQA.I.LA
   Left ventricle and left atria global volume analysis from 2D and biplane images
   - Quantification of native and non-native images
   - Quantification of non-ECG images
   - Automated border detection for cardiac chambers and vessel cavities
   - Computation of area, LV volumes, and advanced parameters for LV systolic and diastolic function including fractional area change (FAC), ejection fraction (EF), peak ejection rate (PER), peak rapid filling rate (PRFR), and atrial filling fraction (AFF)
   - Computation of LA area, volumes, and advanced parameters including fractional area change (FAC) and ejection fraction (EF)

8. AutoStrain LV
   - Provides automated 2D longitudinal strain quantification

- Objective assessment of left ventricle global function and regional wall motion deformation and timing using TOMTEC 2D speckle tracking technology
- One-button-push global longitudinal strain

9. Live 3D Package
   - Volume display with surface redering (transparency, brightness and lighting controls)
   - Multiplanr reconstruction (MPR) view display
   - Specialized algorithms and maps maximize three-dimensional display
   - Cropping tools on both volume and multiplanar reconstruction views
   - Supported by SonoCT and XRES modes to reduce noise artifacts

10. Live xPlane Package
   - Simultaneous display of two live imaging planes
   - Color and grayscale modes
   - Lateral, rotational and elevation steering

11. Auto Measure
   - Powered by artificial intelligence, the fully automated Doppler and 2D distance measurements improve exam.
   - Efficiencies by more than 50% of time saving on cardiac measurements for everyday echo.

12. MultiVue (Live 3D cropping and MPR alignment tool)
   - A new 3D visualization tool for ultrasound procedure guidance available in all 3D modalities (including 3D color), live/frozen images, and in Review.
   - Faster measurements for 3D for device sizing (compare to QLAB or XHair).
   - One-click alignment of catheter within cardiac anatomy, previously not possible using manuals.
   - A quick way to align the MPRs on a structure/device within a 3D volume

13. 3D Auto MV
   - TOMTEC 3D Auto MV application is designed to take a Live 3D volume of the mitral valve and turn it into an easy-to-interpret dynamic model in just few simple steps, providing access to a comprehensive list of MV measurements and calculations.

C. Consist of(per 1 Set)

1.	Ultrasound Imaging System	1set
2.	Integrated Echo Data Management	1set
3.	Auto SCAN intelligent optimization	1set
4.	iSCAN Intelligent Optimization	1set
5.	SonoCT Real-time Compound Imaging	1set
6.	XRES adaptive real-time image processing	1set
7.	Automated Cardiac 2D QuantificationA.I. (a2DQA.I.) and a2DQA.I.LA	1set
8.	AutoStrain LV	1set

9.	Live 3D Package	1set
10.	Live xPlane Package	1set
11.	Auto Measure	1set
12.	MultiVue (Live 3D cropping and MPR alignment tool)	1set
13.	3D Auto MV	1set
14.	X8-2t Adult Cardiac xMATRIX 3D TEE Sector Transducer	1set
15.	L15-7io HockeyStick Linear Transducer	1set
16.	L12-3 Ergo Vascular 2D Linear Transducer	1set
17.	B/W Printer	1set
18.	ECG Cable set	1set
19.	DICOM 3.0 Package	1set
20.	Operation / Service Manual	1set

D. Remarks

-. Warranty : 검수(합격)일로부터 3년 종료월 말일