영 문 사 양 서

H.S. NO.	품목번호	Description	Q'ty	UNIT
9018.12 0000		Diagnostic Ultrasound System	1	set

A. Feature :

- I -

- This system delivers our top-of-the-line performance and intuitive workflow in a system designed to meet the rigors and pace of point-of-care (POC) environments.
- From someone new to ultrasound to the most experienced ultrasound user, everyone needs fast, accurate information at the point of care.

- II -

- This system adopts advanced technologies and integrates them into an accessible, patient-centered solution.
- This new and innovative solution helps clinicians reimagine their clinical practice in the demanding environments like critical care and emergency medicine.
- With its patient-centered information solution, extreme image clarity, clinical-oriented workflow, smart tools and thoughtful design, the system helps you to provide a higher quality of service at any point of care.
- Incorporating a full suite of Smart Tools, such as AutoEF Plus for systolic function evaluation, Auto DFR for diastolic function evaluation, Smart Echovue for cardiac view recognition and guidance, Smart VTI/IVC/B-line for fluid management, the system offers an efficient and reliable way to face the challenges in point of care settings.

B. Specification

- I -

1. **System Architecture**
   - Next generation ultra-low noise, wide dynamic range digital broadband acoustic beamforming with proprietary architecture
   - Optimized for high definition featuring a 21.5 inch 1080 x 1920 LCD panel
   - Compatible with PureWave and xMatrix transducer technology
   - One-touch 2D optimization with broadband frequency compounding
   - WideSCAN capability to expand field of view during SonoCT imaging
   - Variable xRes is an extension of exclusive xRes speckle noise reduction feature
   - Continuously variable steering in 2D, color Doppler, and Doppler modes
   - Advanced dynamic motion suppression algorithms that reduce flash artifacts

2. **Imaging Modes**
   - 2D grayscale imaging with advanced pulse coding, pulse shaping and frequency compounding technologies
   - M-mode
   - Anatomical M-mode
   - Color Doppler
   - Color Power Angio (CPA) imaging
   - Duplex and simultaneous 2D/PW Doppler
   - Duplex continuous wave (CW) Doppler

- High-definition zoom (write zoom)
- Reconstructed zoom with pan (read zoom)
- User-definable presets

3. **2D Imaging**
- Available on all imaging transducers
- Dual mode imaging with cine loop and 2D image
- WideSCAN imaging

4. **M-mode**
- Avaliable on cardiac imaging transducers
- Selectable sweeping rates
- Time markers : 0.2 and 1.0 seconds
- Acquisition zoom capability
- Chroma colorization with multiple color maps
- Cineloop review for retrospective analysis

5. **Anatomical M-mode**
- Available on all imaging transducers
- Uses 2D image as basis for M-mode analysis at a defined line, independent of transducer orientation
- Provides data on direction, position and timing of any single echo received from any point of the tissue for M-mode analysis

6. **Tissue Doppler Imaging**
- Available on all sector transducers
- Frame rate control: high frame rate acquisition of tissue motion
- TDI gain, TGC compatible
- Eight maps
- Duplex mode of operation in conjunction with 2D available, dependent on transducer and clinical application

7. **Tissue Harmonic Imaging (THI)**
- Provides second harmonic processing to reduce artifacts and provides high quality images
- Extends high performance imaging capabilities to all patient body types
- Support of SonoCT (Harmonic SonoCT) and XRES modes

8. **Color Doppler**
- Adaptive mode adjusts Doppler frequency and sensitivity based on color ROI placement within image available on all imaging transducers
- Cineloop review with full playback control
- 256 color bins
- Trackball-controlled color region of interest: size and position
- Maps, filters, color sensitivity, line density, smoothing, echo write priority, color persistence, gain and baseline optimized automatically by preset or is user selectable
- Velocity and variance displays
- Color inver in Live and Frozen imaging
- Color/2D line density control
- User selectable smoothing control
- User selectable persistence control

9. **Color Power Angio(CPA)**
   - Automatically adapts transmit and receive bandwidth processing based on the color box position providing excellent sensitivity and color resolution
   - Highly sensitive mode for small vessel visualization
   - Available on all imaging transducer
   - Multiple color maps
   - Adjustable CPA region of interest : size and position
   - Post-processing includes hide CPA, write priority, gain, CPA map, smoothing

10. **Spectral Doppler**
   - Display annotations including Doppler mode, scale (cm/sec), Nyquist limit, wall filter setting, gain, acoustic output status, sample volume size, normal/inverted, angle correction, grayscale curve
   - Adjustable velocity display ranges

11. **Continuous wave (CW) Doppler**
   - Available on sector transducers
   - iSCAN optimization that automatically adjusts scale and baseline

12. **Pulse wave (PW) Doppler**
   - Available on all imaging transducers
   - Duplex modes display tissue movement and blood flow in 2D and PW Doppler simultaneously
   - iSCAN optimization that automatically adjusts scale and baseline

13. **SonoCT real-time compound imaging**
   - Available on all transducers except sector
   - Virtually all clutter and artifacts eliminated

14. **XRES adaptive image processing**
   - Available on all transducers
   - Operation in conjunction with SonoCT imaging

15. **iSCAN one-touch intelligent image optimization**
   - One - touch image optimization 2D and Doppler
   - Available on all imaging transducers
   - Operation in conjunction with SonoCT and XRES imaging
   - Adaptive Gain Compensation (AGC)

16. **AutoSCAN intelligent optimization**
   - Continuous, real-time adjustment of system gain and TGC to achieve balanced brightness of tissue

17. **Needle visualization**
   - Enhances the visibility of needles in the region of needle enhancement
   - Provides options for needle approach and various degrees of needle paths and angles

18. **Cineloop review**
   - Acquisition, storage and display in real time and duplex modes of up to 20 seconds for quick review of 2D and color images

19. **NetLink connectivity option(DICOM)**

- Supported DICOM services
- Image and structured report export to network storage servers
  Send images after each Print/Acquire or End of Exam

20. AutoStrain EF application

- Provides longitudinal strain values for A4C, A3C, A2C, Endo peak global longitudinal strain for LV
- Automatically detects LV contour and assigns view labels
- Supports 3 points ROI for LV contour workflow
- Strain rate calculation
- Support for analyzing non-ECG images
- Automated view recognition and labeling with manual correction
- Fast speckle tracking on three apical images at once
- Peak longitudinal strain for each apical view and global average

21. Clinical option analysis packages

- Cardiac analysis
- Vascular analysis
- Cerebrovascular
- Fetal biometry
- Fetal heart M-mode, doppler
- Gynecology, Early gestation, Uterus, Urology
- Small parts which include thyroid, testicle and prostate

22. C5-1 curved array with PureWave crystal technology

- 5 to 1 MHz extended operating frequency range
- General purpose abdominal, obstetrical, gynecological and interventional applications

23. eL18-4 broadband linear array with PureWave crystal technology

- 18 to 4 MHz extended operating frequency range
- Broad bandwidth for great detail and clinical versatility
  : Breast, MSK, Small Parts, Vascular, OB, Pediatrics, Abdominal

24. S5-1 sector array with PureWave crystal technology

- 5 to 1 MHz extended operating frequency range
- Adult echo, pediatric echo and TCD applications

25. X8-2t TEE array with PureWave and xMatrix technologies

- 8 to 2 MHz extended operating frequency range
- Transesophageal application (cardiac), adult cardiac

26. Operation Manual

- II -

1 Main System- General Information

- 23.8 inch high-resolution color LCD monitor.
- Image resolution : 1920 x 1080
- Landscape Display and Portrait Display
- 256GB Solid State Hard Disk & iStation™ Patient Information Management
- Discrete GPU (Graphics Processing Unit)
- Revolutionary ZST^{+} platform
- B/M/Color/Power/Directional Power/PW Doppler (incl. High Pulsed Repitition Frequency)

- iBeam™ (Spatial Compounding Imaging), iClear™ (Speckle Suppression Imaging)
- iTouch™ (Auto Image Optimization)
- Smart Track (Real Time Color Flow Tracking and Optimization)
- PSH™ (Phase Shift Harmonic Imaging)
- iZoom™ (Full Screen View)
- iScanHelper (Tutorial function)
- Network port, HDMI Output and 4 USB 3.0 Ports (3 Type-A, 1 Type-C)

2 **DICOM Basic**
PACS transfer system.

3 **DICOM/HL7 Worklist**
DICOM software solution to interface tool to share data between hospital or radiology information syste and the NMIS program.

4 **Shared service package**
Application package includes Abdomen/General, Obstectrics, Gynecology, Cardiac, Small Parts, Urology, Vascular, Pediatric, Nerve, Emergency & Critical packages)

5 **iWorks**
Standardized Workflow Protocol to enhance diagnostic efficiency.

6 **iNeedle™**
Enhance needle vi
Uniquely, unique technology applies to both linear and convex transducer.

7 **CW Doppler**
CV Package : Continuous Wave Doppler.

8 **Physio Module - ECG (AHA)**
ECG module set.

9 **Free Xros M**
Anatomical M-Mode

10 **AutoEF Plus (Advanced and automatic Ejection Fraction Measurment)**
Automatic systolic function. Automatic recognition of the diastole and systole from 2D echo clips and output EDV/ESV/EF etc., results using the Simpson method. Especialy AutoEF Plus deosn't need ECG connection. It recognizes and traces endocardium, using different color to show confidence level.

11 **TDI (Tissue Doppler Imaging)**
Tissue Doppler imaging (TDI) is a technology that employs the Doppler effect to assess muscle wall characteristics throughout the cardiac cycle including velocity, displacement, and deformation.

12 **Smart Fluid Management technology : Smart B-Line™**
Automatically count B-lines according to the BLUE protocol, guiding the fluid infusion and preventing pulmonary edema.

13 **Smart Fluid Management technology : Smart IVC™ (Inferior Vena Cava)**
Automatically trace the IVC (Inferior Vena Cava) diameter change, and calculate the CI (Collapsibility Index), DI (Distensibility Index) and IVC Variation on real-time images or clips.

14 Smart Fluid Management technology : Smart VTI™ (Velocity Time Integral)
Automatic measurement of the VTI(Velocity Time Integral) and CO (Cardiac Output), for rapid assessment of volume responsiveness. Automatically, it locates the Color box, PW sample line and sample volume onreal-time B mode images and trace the PW spectrum of LVOT, and obtain VTI, SV, CO, SVV (Stroke Volume Variation) automatically.

15 C5-1s / 5-1 MHz Curved Array Transducer
- Adjustable multi-freq. (1.3 - 5.7 MHz)

16 L12-3RCs / 12-3 MHz Linear Array Transducer
- Adjustable multi-freq. (3.0 - 11.0 MHz)

17 SP5-1s / 5-1 MHz Phased Array Transducer
- Adjustable multi-freq. (1.0 - 5.0 MHz)

18 P8-2T / 8-1 MHz Phased TEE Array Transducer
- Adjustable multi-freq. (1.0 - 8.0 MHz)

19 Operation manual

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21.	Service manual (file)	1
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D. Remark :

1. The equipment should be installed by the contract company and set-up and operation test shall be performed by the maker-trained service engineer at free of charge.
2. Three years charge-free warranty(All parts including batteries) is guaranteed after the installation. Service key(e.g. service mode password)and service program have to be provided for PNUH BME immediately until the medical equipment falls into disuse when PNUH BME needs it.
3. Service, operation and quick manual should be provided. (All necessary information including block diagram and circuit diagram for understanding function of biomedical equipment should be included in service manual. All manuals should be provided in the computer file format.)
4. A biomedical equipment company can not require written consent which is the authority to keep confidentiality about the service manual from start to finish (SPEC review, a bid and disuse).
   The authority of provided service manual immediately will belong to Pusan National University Hospital after conclusion of a contract. PNUH will be committed to keep confidentiality of service manual.
5. The product should be replaced with a new upgraded model when the service include part supply be discontinued in 5 years from the point of acceptance of the product by the hospital.
6. All software upgrade should be supplied at the end-user's site, free of charge for 5 years.
7. Your company should confer with the data processing department in order to link medical equipment up to PNUH's network such as EMR and PACS after a bid and bear the expenses of the installation (software, program).

8. From contract until disuse (by standard of durable years of Public Procurement Service), a biomedical equipment seller company has to take responsibility to supply service and repair parts if the repair parts if the biomedical equipment model be discontinued or the manufacture company go out of business. Also it must accept promptly for PNUH to demand service and parts.