

물 품 규 격 서

- ☐ 입찰공고번호 : (학)일송학원 관리국 제2025-085호
- ☐ 입찰건명 : 영상의학과(일반검사실) Digital Radiography X-Ray Unit 외 1종 구매
- ☐ 수요기관 : 한림대학교 동탄성심병원
- ☐ 납품장소 : 수요기관 희망장소 입고도
- ☐ 물품내역 등

품명(영문, 국문)	규격 및 사양	총 구매예정수량 (Q'TY)	1회 최대 발주수량	WARRANTY 기간
Digital Radiography X-Ray Unit 외 1종	A or B	2 Set	2 Set	검수(합격)일로부터 3년 종료월 말일 까지

☐ 공통사항

1. 장비의 설치와 작동 및 교육은 무상으로 제공한다.
2. 수요기관 담당자 입회 하에 계약상대자는 제품의 설치 테스트 및 시험작동을 실시하여야 한다.
3. 무상 하자담보 책임기간은 물품 검수(합격)완료일로부터 3년 종료월 말일 까지를 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 설치 시 협의 하에 무상 또는 부득이한 경우 실비 기준으로 이루어진다.
5. 무상 하자담보 책임기간 중 중 공급된 장비의 부속품이 단종된 경우 수요기관이 인정하는 동등이상의 장비로 무상교체가 이루어져야한다.
6. 계약상대자는 어떠한 상황에서도 애프터서비스를 위하여 전문서비스 인력을 제공하여야 하며 애프터서비스를 위하여 교체 부품을 보관하여야 한다.
7. 계약상대자는 장비 납품 시 납품일을 기준하여 제품 제조년월이 6개월 이내인 장비를 납품 하고 납품장비에 해당 제조년월이 명시되어야 한다.
8. 기존 사용 중인 의료장비 철거 및 회수 또는 보상판매 조건으로 제안할 수 있다.

<규격서 A>

A. Features

가. DR X-Ray Unit

- This inverter system is high frequency and the tube voltage characteristic of low ripple very close to constant voltage type is realized, so that the X-ray output is increased substantially. Rising and falling time of X-ray tube voltage have been shortened, realizing a highly accurate, ultra short time control, thus presenting good contrast radiographys.
- The system produces large 18" x 18" images, while maintaining the extremely high resolution of 140 micron. The wide view 17 inch FPD is large enough to capture sizeable areas on maximum size film. It provide distortion free.
- The overhead x-ray tube crane can be synchronized with the bucky stand.
- The long vertical ceiling support travel range provides sufficient SID for images in the supine position as well as for low position images in the standing position.

나. Mobile X-Ray Unit

- This system is attributable to a purpose-developed Power Assist Optimized system. Controls and sets the optimum traveling speed by the amount of pressure applied to the steering bar. Real time relay system produces the smooth as silk drive.
- The frontal section of the main unit has been purposefully designed to allow a wide forward field of view during traveling. This characteristic minimizes risks of collision and hence injury to hospital staff, patients and visitors.
driving motors if the bumper feels pressure from anything in front of the unit.
- The collimator does more than just controlling the radiation field. The unit positioning buttons are incorporated on the collimator. They provide the radiographer with absolute, one stop control of the main unit for precise positioning even when the operator is on the other side of the bed.
- The generator has a variable range of frequency. In practical terms, this capability translates to a very high quality radiation intensity and hence production of excellent image quality vis-a-vis other types of generator.

B. Specifications

가. DR X-Ray Unit

1. Flat Panel Detector

- 1) TFT type : Amorphous Silicon TFT
- 2) Scintillator : CSI
- 3) Detector size : 18"x18" (47 x 47cm)
- 4) Number of pixels : 3,328 x 3,328 pixels
- 5) Pixel pitch : 140μm
- 6) Spatial Resolution : 3.5 lp/mm
- 7) Output gradation : 16 bits
- 8) AED (Auto Exposure Detection)

2. Wireless Portable Flat Panel Detector

- 1) TFT type : a-Si Flexible TFT
- 2) Scintillator : CSI
- 3) Detector size : 14"x17" (36 x 43cm)
- 4) Number of pixels : 3,548 X 4,316 pixels
- 5) Pixel pitch : 99µm
- 6) Spatial Resolution : 5.0 lp/mm
- 7) Weight : 2.4kg
- 8) Output gradation : 16 bits
- 9) Water Proof : IP67
- 10) AED (Auto Exposure Detection)

3. Inverter type high frequency X-ray generator

- 1) Power : 80KW
- 2) Max. frequency : 100KHz(MAX 400Khz)
- 3) Short time rating : 150kV / 320mA
79kV / 630mA
- 4) Setting range radiography
 - Tube Voltage : 40 ~ 150KV
 - Tube Current : 10 ~ 1000mA
 - mAs : 0.1 ~ 1000mAs
 - Timer : 0.001 ~ 10sec

4. Heavy duty X-ray Tube Unit

- 1) Focal spot size : 0.6/1.2mm
- 2) Target angle : 12°
- 3) Anode heat storage capacity : 600KHU

5. Ceiling suspended X-ray Tube Support

- 1) Range of movement
 - Vertical travel : 1600mm
 - Fixed rail : 3000/3300/3600/4000/4500/5000 mm
 - Moving rail : 2400/2700/3000/3300/3600/4000 mm
 - Operation : Manual, electromagnetic lock, auto positioning
- 2) Rotation : ±180° (Manual) / ±135° (Auto)
- 3) Synchronize with Wall Bucky stand

6. X-ray Beam Collimator

- 1) Type : Rectangular
- 2) Max. field at SID 100cm : 48cm x 48cm
- 3) Min. field at SID 100cm : 5cm x 5cm

7. Wall bucky stand

- 1) Vertical stroke : 1,450mm
- 2) Rotation : -20 ~ +90°
- 3) Pivot rotating : 45° (1-way)
- 4) Display : 10.1" LCD Display

8. Six way floating Table

- 1) Moving Way : 6-way floating
- 2) Table Top Dimension : 2330 x 817 mm
- 3) Up/Down Movement : 350 mm
- 4) Right/Left Movement : ± 125 mm
- 5) Back/Forth Movement : ± 300 mm
- 6) Patient Weight : Less than 320kg

9. Acquisition workstation

- 1) CPU : INTEL I5 12400 2.5GHz
- 2) RAM : DDR4 8G PC5-38400
- 3) HDD : 1TB 7200RPM
- 4) SSD : NVME 250G
- 5) Display Monitor : 22 Inch LCD monitor
- 6) Data transfer system : Wire & Wireless system
- 7) Image display time : Within 3sec

10. DICOM 3.0 Package

11. Software Function

- 1) EI Display & AWC
- 2) Examinations from the HIS/RIS
- 3) Image Rotation
- 4) Multi-frequency processing
- 5) Exposure data recognizer
- 6) Noise control processing
- 7) Grayscale adjustment

12. High tension cable

13. Five AEC(Auto Exposure Control) -디텍터 일체형

14. Dose Area Product Meter(DAP)

15. Whole spine package

16. Autopositioning Function

17. AI Solution

18. Pure Grid

19. Accessories

- 1) Service & operation manual
- 2) Apron 외 : 5 Set(Apron 걸이 포함)
- 3) 환자 무릎 촬영 보조기구
- 4) Hip검사용 디텍터 거치대
- 5) 환자 촬영용 발판
- 6) Spine Board (Easy mover)

나. Mobile X-Ray Unit

1. Wireless Unbreakable glass-free Portable FlatPanel Detector (17x17)
 - 1) Detctor type : a-Si Flexible TFT
 - 2) Scintillator : CSI
 - 3) Detector size : 43cm x 43cm
 - 4) Numberofpixels : 4,316 x 4,316 pixels
 - 5) Pixel pitch : 99 μ m
 - 6) Spatial Resolution : 5.0lp/mm
 - 7) Weight : 2.9kg
 - 8) Output gradation : 16 bit
 - 9) Dust and Water Resistant : IP67
 - 10) AEDWireless Unbreakable glass-free Portable FlatPanel Detector (14x17)
2. Inverter type high frequency X-ray generator
 - 1) Max. Power : 32kW
 - 2) Max. Frequency : 60KHz
 - 3) Max. Tube Voltgage : 133kV
 - 4) Max. Tube Current : 400mA
 - 5) Tube Voltage range : 40-133kV
 - 6) mAs range : 0.32 - 320mAs at 12.5% step
3. Heavy duty X-ray tube unit
 - 1) Focal spot size : 0.7mm / 1.3mm
 - 2) Anode heat storage capacity : 300kHU
4. X-ray Beam Collimator
 - 1) Inch-mover buttons : Subtly back & forward drive of the main unit
 - 2) Field knob : Open and close the collimator leaf
 - 3) Light beam switch : Light the collimator lamp
 - 3) All free buttons : Adjustment of SID, rotation, extension and contraction of the cross-arm
5. X-ray tube support
 - 1) Arm Type : Collapsible type
 - 2) Max. X ray tube reach : 63.8 to 120.3cm
 - 3) Max. focal height : 202.5cm
 - 4) collum hight form floor : 127cm
 - 5) focal hight from floor : 68 to 202.5 cm
6. Main body with cart
 - 1) Powersupply : Internal battery
 - 2) Motor Drive Speed : Approx. 5km/h
 - 3) Climbingpower : Max.7degrees
 - 4) Batterycapacity : 20,000mAs
 - 5) Dimension (W×L×H) : 560x1,285x1,270mm
7. Acquisition Workstation

- 1) CPU : 2.2GHz
- 2) RAM : 14GB
- 3) HDD : 1TB
- 4) SSD : 128GB
- 5) Display Monitor : 19 Inch LCD monitor
- 6) Datatransfersystem : Wire & Wireless system
- 7) Image display time : Within 3sec
- 8. DICOM 3.0 Package
- 9. Software Function
 - 1) EI Display & AWC
 - 2) Examinations from the HIS/RIS
 - 3) ImageRotation
 - 4) Multi-frequency processing
 - 5) Exposure data recognizer
 - 6) Noise control processing
 - 7) Grayscale adjustment
- 10. Pure Grid
- 11. Accessories
 - 1) Service & operation manual
 - 2) Detector Battery Charger(배터리충전기)
 - 3) Rechargeable Battery (디텍터 충전배터리)
 - 4) Wireless Handswitch (무선 익스포저 스위치)
 - 5) Detector Charge Kit (메인바디 디텍터 충전 킷)
 - 6) Apron

C. Consist of(per 1Set)

가. DR X-Ray Unit - 1Set

- 1. Wired Flat Panel Detector 2ea
- 2. Wireless Flat Panel Detector 1ea
- 3. Inverter type high frequency X-ray generator 1ea
- 4. Heavy duty X-ray tube unit 1ea
- 5. Ceiling suspended X-ray tube support 1ea
- 6. X-ray beam collimator 1ea
- 7. Wall bucky stand 1ea
- 8. Six way floating Table 1ea
- 9. Acquisition workstation 1ea
- 10. DICOM 3.0 Package 1ea
- 11. Software Function 1ea
- 12. High tension cable 1ea
- 13. Five AEC(Auto Exposure Control) -디텍터 일체형 2ea
- 14. Dose Area Product Meter(DAP) 1ea
- 15. Whole spine package 1ea
- 16. Autopositioning Function 1ea

17. AI Solution	1ea
18. Pure Grid	1ea
19. Accessories	1Set
1) Service & operation manual	
2) Apron 외 : 5 Set(Apron 걸이 포함)	
3) 환자 무릎 촬영 보조기구	
4) Hip검사용 디텍터 거치대	
5) 환자 촬영용 발판	
6) Spine Board (Easy mover)	

나. Mobile X-Ray Unit - 1Set

1. Wireless Unbreakable glass-free Portable Detector	2ea
2. Inverter type high frequency X-ray generator	1ea
3. Heavy duty X-ray tube unit	1ea
4. X-ray beam collimator	1ea
5. X-ray tube support	1ea
6. Main body with cart	1ea
7. Acquisition Workstation	1ea
8. DICOM 3.0 Package	1ea
9. Software Function	1ea
10. Pure Grid	1ea
11. Accessories	
1) Service & operation manual	1ea
2) Detector Battery Charger(배터리충전기)	1ea
3) Rechargeable Battery (디텍터 충전배터리)	1ea
4) Wireless Handswitch (무선 익스포저 스위치)	1ea
5) Detector Charge Kit (메인바디 디텍터 충전 킷)	1ea
6) Apron	2ea

D. Remarks

1. 장비의 운송, 설치, 교육은 공급자가 책임진다.
2. 제품 하자에 관하여 검수합격일로부터 3년 종료월 말일까지 보증(Warranty)기간으로 한다.
3. 기존장비 철거 및 회수조건

<규격서 B>

A. Features

가. DR X-Ray Unit

1. It has TFT(Thin Flat Transistor) detectors.
2. The receptor type is amorphous silicon with a Cesium Iodide scintillator.
3. The ceiling X-ray tube has THU(Tube Head Unit) with a 12" LCD touch screen.
The unit can be connected to workstation for accessing various information, and it also gives an access to acquired images from a control room.
4. The detectors are synchronized with X-ray tube for easy operation.
5. The collimator is a 160LUX LED type, which allows 4 dimensional fields of view.
6. Auto tracking : automatically aligning x-ray tube with a focal point of detector.
7. Worklist provides Korean language for patient's name, and it can be compatible with DICOM 3.0 for easy access to HIS/RIS.
8. All of the acquired images are low dose and high resolution.
Furthermore, it's processed to get noise reduction and edge enhance images.
9. Remote control gives the freedom to control x-ray tube and detector from console and x-ray room.

나. Mobile X-Ray Unit

1. Detectors are lightweight for agile use and move quickly to serve a number of patients
2. Users' daily routines are simplified with fast and productive workflow in a wireless system
3. Image Processing features support vital diagnostic clarity with outstanding imaging.

B. Specifications

가. DR X-Ray Unit

1. Digital Detector
 - Type : Amorphous Silicon TFT
 - Size : 17 X 17inch(43 X 43cm)
 - Active Pixel : 3,036 X 3,040 pixels
 - Conversion Screen : Cesium Iodide
 - Acquisition Depth : 16 Bits
 - Spatial resolution : 3.57lp/mm
 - Pixel pitch : 140μm
 - Dust/Water resistance: IP54
2. Glass Free Digital Detector
 - Type : Amorphous Silicon TFT
 - Size : 14 X 17inch(35 X 43cm)
 - Active Pixel : 2,466 X 3,040 pixels
 - Conversion Screen : Cesium Iodide
 - Acquisition Depth : 16 Bits
 - Spatial resolution : 3.57lp/mm
 - Pixel pitch : 140μm
 - Dust/Water resistance: IP54

3. Automatic Collimator with Each Blade Control

- Blade control : 4-axis Motorized Control
- Copper prefilter : 0.1mm;0.2mm;0.3mm
- Collimation control : Manual or Automatic
- Lamp : LED lamp > 160lux

4. Patient Table

- 6-Way Movement
- Table Top dimensions : 2410 X 812 mm
- Elevating Up/ Down Range : 545 ~ 900 mm
- Longitudinal (L/R) movement range : ± 480 mm
- Transverse (F/R) movement range : ± 140 mm
- Wireless Foot Switch

5. Wall Stand

- Up Down Range : 280 ~ 1850 mm
- Detector Tilting : -20° ~ $+90^{\circ}$
- Detector Rotating : 0° ~ $+90^{\circ}$
- Auto Tracking
- LED Indicator

6. Imaging Workstation

- Full HD 24" LCD Monitor
- Hard Disk storage : SSD 256GB + HDD 1TB
- RAM : 8GB
- OS : Window 10
- DICOM 3.0 Compatible
- DICOM Modality worklist : HIS / RIS

7. X-Ray High Voltage Generator

- 80kW, 1000mA ,150kVp
- mA range : 10 ~ 1000 mA
- 380 VAC, 3-Phase, 50/60Hz

8. X-Ray Tube

- Anode heat storage capacity : 600KHU
- Tube Voltage : 40 ~ 150kVp
- Focal spot: 0.6 / 1.2 mm

9. Ceiling-mounted Tube Head Unit

- Fully automated
- Translation: X, Y axis Depends on a room size Z axis 1,800mm
- 12 inch wide touch screen
- Soft Handling
- Auto Positioning

10. AEC(Auto Exposuer Control)
11. DAP (Dose Area Product)
12. Whole spine Package (Stand, Table)
 - Include Auto Stitching stand
13. Unique solution S/W
 - SimGrid S/W
 - Value-up Package S/W (Voice Guide 외)
 - Vision assist S/W (Live camera지원)
 - Vision Auto S/W
 - Vision Stitching S/W
14. Manufacture Accessories
 - Remote controller
 - Foot Switch
 - P-bar (Stand)
 - Patient Handgrips (Table)
 - Detector Lateral Holder
 - Operation/Service manual
15. Local Accessory
 - 환자 무릎 촬영용 보조기구
 - Hip 검사용 디텍터 거치대
 - 환자 촬영용 발판
 - Apron 5set (Apron걸이 포함)
 - Spine Board (Easy mover)

나. Mobile X-Ray Unit

1. Glass Free Digital Detector
 - Type : Amorphous Silicon TFT
 - Size : 14" X 17" (35 X 43cm)
 - Active Pixel : 2,466 X 3,040 pixels
 - Conversion Screen : Cesium Iodide
 - Acquisition Depth : 16 Bits
 - Pixel pitch : 140μm
2. Glass Free Digital Detector
 - Type : Amorphous Silicon TFT
 - Size : 17" X 17" (43 X 43cm)
 - Active Pixel : 3,040 X 3,036 pixels
 - Conversion Screen : Cesium Iodide
 - Acquisition Depth : 16 Bits
 - Pixel pitch : 140μm
 - Dust/Water resistance: IP57

3. Image Workstation in main body
 - 21.5 inch wide touch screen
 - Storage : 500GB
 - RAM : 16GB
 - S-View imaging Engine
4. Mechanic
 - Type : Collapsible
 - Tube Reach : 793 ~ 1,355 mm
 - Focal spot Range : 550 ~ 2030 mm
 - Colum Rotation(deg) : $\pm 315^\circ$
 - Tube Rot arm axis(deg) : $-180 \sim 180^\circ$
 - Tube Rot tube axis(deg) : $-30 \sim 90^\circ$
 - Weight : 339 kg
 - Detector charges automatically in the cabinet
 - Battery type : Li-on
5. High Voltage Generator
 - Maximum Power kW : 40 KW
 - kVp Range : 40 ~ 150 kVp
 - mA Range: 10 ~ 500 mA
 - mAs Range : 0.1 ~ 500 mAs
6. X-ray Tube
 - Heat Capacity(HU) : 300KHU
 - Nominal Tube Voltage : 150kVp
 - Anode angle : 16°
 - Focal spot : 0.6/1.2 mm
7. Collimator
 - Type : 2-axis manual blade
 - Lamp : LED
8. Dose Area Product (DAP)
9. SimGrid S/W
10. Accessories
 - Wireless Hand Switch
 - Detector battery
 - Detector battery charger
 - Apron & Thyroid protector (2 Set)
 - Service & Operation Manual

C. Consist of(per 1set)

가. DR X-Ray Unit - 1Set

1. Main Unit	1ea
2. Digital Detector	2ea
3. Glass Free Digital Detector	1ea
4. Automatic Collimator with Each Blade Control	1ea
5. Patient Table	1ea
6. Wall Stand	1ea
7. Imaging Workstation	1ea
8. X-Ray High Voltage Generator	1ea
9. X-Ray Tube	1ea
10. Ceiling-mounted Tube Head Unit	1ea
11. AEC	1ea
12. DAP	1ea
13. Whole Spine Package	1ea
14. Unitque Solution S/W	1ea
15. Manufacture Accesories	1Set
16. Local Accesories	1Set

나. Mobile X-Ray Unit - 1Set

1. Main Unit	1ea
2. Glass Free Digital Detector(14*17)	1ea
3. Glass Free Digital Detector(17*17)	1ea
4. Image Workstation In Main Body	1ea
5. Mechanic	1ea
6. High Volgtage Generator	1ea
7. X-Ray Tube	1ea
8. Collimator	1ea
9. DAP	1ea
10. Sim Grid S/W	1ea
11. Accessories	1Set

D. Remarks

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2. 제품 하자에 관하여 검수합격일로부터 3년 종료월 말일까지 보증(Warranty)기간으로 한다.
3. 기존장비 철거 및 회수조건