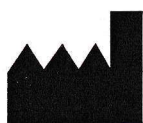
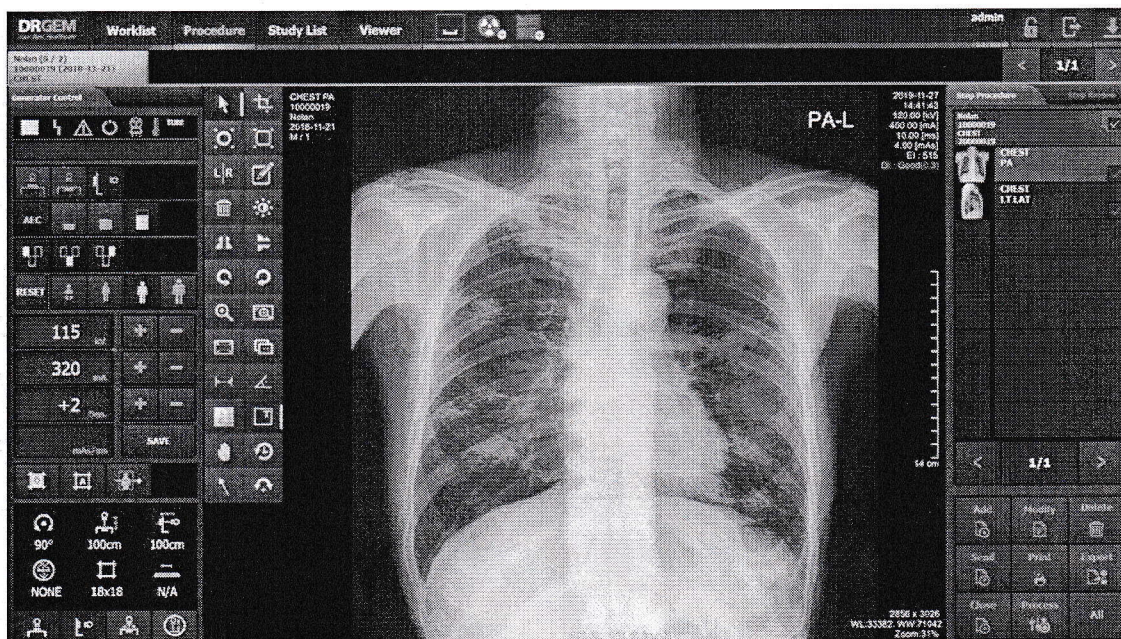


GXR-SD/CSD/USD

PREMIUM Series

Digital Radiography System

Operation Manual



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D/N: RMD1402-002, Rev.12



- Digital flat panel detector (iRay)

Model		Mano4343T	Mano4343X	Mano4343W	Mano4336W
Active Pixel Area / Matrix		17 x 17 inch (3,072 x 3,072)			17 x 14 inch (2,800 x 2,304)
Pixel Pitch		139um			150um
Limiting Resolution		3.6 lp/mm			3.3 lp/mm
Screen		Csl			
Energy Range		40 – 150kVp			
A/D Conversion		16-bits			
MTF	@ 1 lp/mm	70%	75%	71%	75%
	@ 2 lp/mm	45%	50%	44%	49%
	@ 3 lp/mm	26%	30%	26%	29%
DQE	@ 0 lp/mm	65%	56%	65%	63%
	@ 1 lp/mm	47%	40%	47%	48%
	@ 2 lp/mm	35%	30%	35%	37%
Interface		Gigabit Ethernet		Gigabit Ethernet / WiFi(802.11ac)	
Weight		Approx. 4kg(Without Cable)		4.6kg	3.6kg

- Digital flat panel detector (Fujifilm)

Model		DR-ID1271SE	DR-ID1273SE	DR-ID1272SE	DR-ID1274SE
Active Pixel Area / Matrix		17 x 14 inch (2,836 x 2,336)		17 x 17 inch (2,836 x 2,832)	
Pixel Pitch		150um			
Limiting Resolution		3.3 lp/mm			
Screen		GOS	CsI	GOS	CsI
Energy Range		40 – 150kVp			
A/D Conversion		16-bits			
MTF	@ 1 lp/mm	75%	80%	75%	80%
	@ 2 lp/mm	42%	54%	42%	54%
DQE	@ 0 lp/mm	45%	72%	45%	72%
	@ 1 lp/mm	31%	54%	31%	54%
Interface		Gigabit Ethernet		Gigabit Ethernet	
Weight		2.9 kg (6.3 lbs.)		3.7 kg (8.1 lbs.)	

- **Imaging Workstation**

CPU	Intel Core i5-8500 3.2GHz(up to 3.6GHz) 6M or higher
Memory	4GB (1x4GB) DDR4 2400Mhz or Higher
Display	Intel® HD Graphics 630 or Higher
Storage	256GB SSD, 1TB 7200RPM SATA HDD
Monitor	23 inch Color LED, Display resolution: 1920 x 1080 pixels (16:9)
Maker	HP
Weight	Desktop: 9.86 kg (21.73 lbs.), Monitor: 5.8 kg (12.78 lbs.)

- **Imaging Software**

- 1) General Features

- Windows based graphic user interface
- Multi-image display (1x1 ~ 4x4)
- Multi-image selection
- Auto display layout changing function
- X-ray generator control panel
- Unlimited procedure step
- Quick step add feature and image maintenance feature by popup menu
- ROI changing and creation feature
- Maker feature (support the creation of unlimited number of maker by user)
- Multi-language support
- EXCEL sheet for language support (only possible on Microsoft Office automation environment)
- DAP meter (optional)
- Unlimited PACS code (CPT code)
- Default anatomic program more than 700
- Support DICOM Worklist SCU, DICOM Storage SCU and transfer function
- Support DICOM Multi-transfer function
- High-performance post-processing feature
- Copy & Move Images
- Dose monitoring function
- Built-in memory function
- Grid line suppression function
- Reject analysis function
- 9 preset function
- Cobb's angle function
- Tube & line enhancement function

- Detector built-in charger function
- APR positioning guide function

2) Post processing parameters

- MODULE 1
 - ◆ Edge Enhancement: 0 ~ 50
 - ◆ Contrast Factor : 1 ~ 200
 - ◆ Image Frequency : 0 ~ 20
 - ◆ Image Latitude : -10 ~ 10
 - ◆ Sharpness : 0 ~ 100
- MODULE 2
 - ◆ Histogram Optimization : -1.00 ~ 1.00
 - ◆ Skin line Weight : -1.00 ~ 1.00
 - ◆ Latitude Compression : -1.00 ~ 1.00
 - ◆ Contrast Enhancement : -1.00 ~ 1.00
 - ◆ Edge Enhancement : -1.00 ~ 1.00
 - ◆ Noise Suppression : -1.00 ~ 1.00
- MODULE 3
 - ◆ Global Brightness : -10.00 ~ 10.00
 - ◆ Global Contrast : -10.00 ~ 10.00
 - ◆ Latitude Compression : -10.00 ~ 10.00
 - ◆ S-Structure Enhancement : -10.00 ~ 10.00
 - ◆ Noise Suppression : -10.00 ~ 10.00

3) Image Maintenance (All functions are supported by the pop-up menu)

- ROI : Default 8 ROI support / Unlimited support for anatomic projection
- MARK : Unlimited support (User preset support)
- Horizontal Flip
- Vertical Flip
- Rotate CW
- Rotate CCW
- Inverse (Black or White)
- Text Annotation
- Ruler : Distance tool
- Angle : Angle measurement tool

- Zoom : Image zoom in/out
- Magnify : Image magnify glass window
- Pan : Image panning
- Fit Image : Auto fitting to window size
- Image Cut : Image crop/cut function
- Image Copy : Copy of image in the region of interest(ROI)
- Image Recovery : Recover the original image
- Image Bright/Contrast control : Supported by rightclick mouse

4) CD Burning

- DICOMDIR based CDR data generation
- Support CD/DVD Recording
- Include internal DICOM Viewer
- Support multi-study data

5) DICOM Features : DICOM PRINT

- DICOM 3.0 compatible
- Support Print Preview
- Support Film Orientation : Portrait / Landscape
- Support Film Size : 8X10 / 10X12 / 10X14 / 11X14 / 14X14 / 14X17 / 24X24 / 24X30 / 25X30
- Support Film Layout : 1:1 / 1:2 / 2:1 / 2:2 / 3:1 / 1:3 / 3:3 / 4:4
- Support Real size printing
- Support image swap in layout

6) DICOM Feature : DICOM STORAGE

- DICOM 3.0 compatible
- Support DX/CR modality (can be extended for DR and other)
- Support RDSR(Radiation Dose Structured Report)
- Support the modification of Transfer Syntax

7) DICOM Feature : MPPS

- Support Modality Performed Procedure Step feature
- Provides only three state : FAILED / IN PROGRESS / COMPLETED

8) DICOM Feature : WORKLIST

- Support DICOM Modality Worklist Standard
- Support DICOM Query/Retrieve

- Support Search Filter (ID / Name / Access Number)
- Support Import Filter

9) DICOM Feature : STORAGE COMMITMENT

10) DICOM Feature : QUERY/RETRIEVE

11) DICOM Feature : VERIFICATION

12) Overlay Display on image

- Projection description
- Patient Name / Sex / Age
- kV / mA / Time / mAs
- Feed-back mAs / Feed-back Time for AEC
- EI(Exposure Index) / DI(Deviation Index)
- Window Width/Level
- Overlay can be set by user

13) Full-spine Imaging

- Stitches whole spine/long bone images to single image
- Support 2 or 3 images stitching
- Support zoom in/out of all images simultaneously
- Moves single image or all images simultaneously
- Support automatic stitching using 2 point
- Support image clipping
- Automatically remove non-exposure area
- Adjust windows of single or all images simultaneously
- Provide full-spine imaging apparatus

● X-ray Generators

System Model	GXR-32SD	GXR-40SD	GXR-52SD	GXR-68SD	GXR-82SD
Generator Model	GXR-32	GXR-40	GXR-52	GXR-68	GXR-82
Output Rating	32kW	40kW	52kW	68kW	82kW
Line Nominal, Phase	220~230VAC, 1Φ 380/400/480VAC, 3Φ		380/400/480VAC, 3Φ		
Line Frequency	±10% (50/60Hz)				
kV Range/Frequency	40~125kV, 1kV step/30kHz		40~150kV, 1kV step/100kHz		
mA Range	10 to 400mA	10 to 500mA	10 to 640mA	10 to 800mA	10 to 1,000mA
Timer Range	0.001 to 10 sec, 38 steps				
mAs Range	0.1 to 500mAs (Optional up to 1,000mAs)				
Max. Power Output	400mA@80kV 320mA@100kV 250mA@125kV 200mA@150kV(3 Φ)	500mA@80kV 400mA@100kV 320mA@125kV 250mA@150kV(3 Φ)	640mA@81kV 500mA@104kV 400mA@130kV 320mA@150kV	800mA@85kV 640mA@106kV 500mA@136kV 400mA@150kV	1,000mA@82kV 800mA@102kV 640mA@128kV 500mA@150kV
Power Requirement	Minimum 125% of output rating				
Minimum Breaker Rating	75A(220-230Vac,1Φ) 50A(380Vac,3Φ) 50A(400Vac,3Φ) 40A(480Vac,3Φ)	100A(220-230Vac,1Φ) 65A(380Vac,3Φ) 65A(400Vac,3Φ) 50A(480Vac,3Φ)	75A(380Vac,3Φ) 75A(400Vac,3Φ) 65A(480Vac,3Φ)	75A(380Vac,3Φ) 90A(400Vac,3Φ) 75A(480Vac,3Φ)	100A(380Vac,3Φ) 100A(400Vac,3Φ) 90A(480Vac,3Φ)
Rotor Supply	Low Speed Dual Speed (Option for 3Φ)		Dual Speed (Option for GXR-52)		
Reproducibility	Coefficient of Variation: kV < 0.005, Time < 0.005, mAs < 0.01				
Accuracy	kV < ±(1%+1kV), mA < ±(3%+1mA), Time < ±(1%+0.5ms), mAs < ±(3%+0.1mAs)				
Linearity	Coefficient of Linearity < 0.01 : CL = (X1-X2)/(X1+X2), where X is mR/mAs				
Anatomical Programs	User programmable max. 1,280 programs with APR utility software				
Technique Selection	4 point display(kV, mA, Time, mAs)				
Image Receptors	2 Bucky + 1 Non-Bucky				
Auxiliary Power Supply	External System Power		230VAC, 1A, 230W (PBT-4) 230VAC, 2A, 460W (PBT-6)		
			110VAC, 1A, 110W		
	Magnetic Lock(Brake) Power		28VDC, 6.3A, 176W		
	Collimator Lamp Power		24VAC, 6.3A, 150W		
Leakage Radiation	Less than 2mR/hr				
Dimension / Weight	Control Console		336(W) x 47(H) x 232(D) mm / 1.7kg(3.8lbs)		

● Patient Table

1) 4-way Floating tabletop table

Model		PBT-4	
Movement	Tabletop	Longitudinal	1,000(±500)mm
		Transverse(Lateral)	250(±125)mm
	Bucky	Longitudinal	Max.350mm with standard tray 300mm with rotating tray
Tabletop		Inherent Filtration	Laminate : 1.2mmAl at 100kV Carbon : 0.5mmAL at 100kV
		Max. Patient Weight	300kg (660lbs)
		Size	2,200(W) x 818(D) x 45(H) mm 2,000(W) x 818(D) x 45(H) mm 1,800(W) x 818(D) x 45(H) mm
Bucky Type		Oscillating	Fixed
Grid		FD 34~44inch, 103 or 180 lpi, ratio 8~12:1	FD 100cm, 200lpi, ratio 8~12:1 Optional removable grid
Lock(Brake)		EM Lock, beam sensor on/off	
Center indication		Buzzer sound and LED	
Electrical Rating		100~240Vac, 200VA, 50/60Hz	
Dimension / Weight		Laminate	2,200(W) x 818(D) x 660(H) mm / 145.7kg(321.2lbs) 2,000(W) x 818(D) x 660(H) mm / 142.7kg(314.6lbs) 1,800(W) x 818(D) x 660(H) mm / 139.7kg(308lbs)
		Carbon	2,200(W) x 818(D) x 660(H) mm / 140.3kg(309.3lbs) 2,000(W) x 818(D) x 660(H) mm / 137.9kg(304lbs) 1,800(W) x 818(D) x 660(H) mm / 134.6kg(296.7lbs)

* APPLIED PART, Optional Rotating tray

2) Elevating table

Model		PBT-6	
Movement	Tabletop	Longitudinal	1,000(±500)mm Option 1100(±550)mm
		Transverse(Lateral)	250(±125)mm
	Vertical	Travel	285(575~860)mm,, Option 360(500~860)mm,
		Speed	17mm/sec
		Operating	Motorized movement by Foot Switch DC-motor (Linear Actuator)
	Bucky	Longitudinal	Standard application - 550mm with standard tray - 295mm with rotating tray - 290mm with Table Bucky Tracking(Optional) Option 1100mm longitudinal application - 740mm with standard tray - 690mm with rotating tray - 680mm with Table Bucky Tracking(Optional)
Tabletop		Inherent Filtration	Laminate : 1.2mmAl at 100kV Carbon : 0.5mmAL at 100kV
		Max. Patient Weight	300kg(660lbs)

	Size	Standard application 2,200(W) x 878(D) x 45(H) mm 2,000(W) x 878(D) x 45(H) mm 1,800(W) x 878(D) x 45(H) mm Option 1100mm longitudinal application 2,660(W) x 878(D) x 45(H) mm 2,400(W) x 878(D) x 45(H) mm 2,200(W) x 878(D) x 45(H) mm
Bucky Type	Oscillating	Fixed
Grid	FD 34~44inch, 103 or 180 lpi, ratio 8~12:1	FD 100cm, 200lpi, ratio 8~12:1 Optional removable grid
Lock(Brake)	EM Lock, Foot Switch on/off	
Center indication	Transverse center, height center	
Side Cover	2-story telescopic Cover	
Electrical Rating	100~240VAC, 400VA, 50/60Hz	
Dimension / Weight	Laminate	Standard application 2200(W) x 878(D) x 860(H) mm / 255.2kg(562.6lbs) 2000(W) x 878(D) x 860(H) mm / 252.2kg(556lbs) 1800(W) x 878(D) x 860(H) mm / 248.2kg(547.2lbs) Option 1100mm longitudinal application 2660(W) x 878(D) x 860(H) mm / 310kg(683.4lbs) 2400(W) x 878(D) x 860(H) mm / 306kg(674.6lbs) 2200(W) x 878(D) x 860(H) mm / 303kg(668lbs)
	Carbon	Standard application 2200(W) x 878(D) x 860(H) mm / 249.1kg(549.2lbs) 2000(W) x 878(D) x 860(H) mm / 246.9kg(544.3lbs) 1800(W) x 878(D) x 860(H) mm / 243.6kg(537lbs) Option 1100mm longitudinal application 2660(W) x 878(D) x 860(H) mm / 302.2kg(666.2lbs) 2400(W) x 878(D) x 860(H) mm / 299.2kg(659.6lbs) 2200(W) x 878(D) x 860(H) mm / 296.9kg(654.6lbs)

* APPLIED PART, Optional Rotating tray

3) Mobile Patient Table

Model	PDT-1
Max. Patient Weight	Max. 200kg (441lbs)
Dimension / Weight	2004(W) x 650(D) X 712(H)mm / 62kg (137lb)

● Wall Bucky stand

Model	WBS(Motorized)	
Cassette stroke	970mm(300mm~1,270mm from floor to focus) 1,120mm(300mm~1,420mm from floor to focus) 1,290mm(300mm~1,590mm from floor to focus) 1,540mm(300mm~1,860mm from floor to focus)	
Bucky Type	Oscillating	Fixed
Grid	FD 40~72inch, 103 or 180lpi, ratio 8~12:1	FD 150cm, 200lpi, ratio 8~12:1 Optional removable grid

Model	WBS-TA
Cassette stroke	Vertical 1,526mm (326~1,852mm from floor to Bucky center)
Vertical movement	Manual and Motorized movement
Bucky Type	Oscillating type
Grid	Focal distance 40~72inch, 103 lpi, ratio 10:1
Tilting range	-30° ~ 90°
Tilting Movement	Motorized Movement
Lock(Brake)	EM Lock, Switch on/off
Balance	Counter Weight
Electrical Rating	100~240VAC, 200VA, 50/60Hz
Dimension / Weight	Max. 2,179(H) x 743(W) x 949(D) mm / 195kg(430lbs)
Option	Remote controller, Overhead handgrip

* APPLIED PART, Optional Rotating tray

Model	WBS-TM(Motorized)	
Stroke	Vertical	1,492mm (286~1,778mm from floor to Bucky center)
	Tilted 90°	1,517mm (645~2,162mm from floor to Bucky surface)
Bucky Type	Spring oscillating	
Grid	FD 150cm, 103 lpi, ratio 10:1	
Tilting Angle	-30 ~ 90°	
Withstanding load (at tilting angle 90°)	20kgf at the point 150mm from the side.	
Inherent Filtration	0.5mmAl at 100kV	
Lock(Brake)	EM Lock, Switch on/off by foot switch(Vertical movement, Tilting)	
Vertical Balance	Counter Weight	
Vertical Movement	Manual (Option: Motorized)	
Tilting Balance	Spring	
Electrical Rating	100-240VAC, 160VA, 50/60Hz	
Dimension/Weight	Max. 2,184(H) x 669(W) x 1140(D) mm / 218kg(480lbs)	

* APPLIED PART, Optional Rotating tray

2) Floor Mounted

Model	TS-FM6(Motorized)	
Tube Rotation Angle	Horizontal axis	$\pm 135^\circ$
	Vertical axis	$\pm 180^\circ$ (mechanical detents at every 90°)
Tube stroke	Longitudinal	2,100mm (Optional 2,900mm and 3,600mm)
	Lateral	250mm
	Vertical	1,706mm (240~1,946mm from floor to focus)
Vertical Movement	Manual or Motorized(Optional) Motorized option supports vertical sync with table and wall stand	
Tube Rotation	Manual or Motorized(Optional) Motorized option supports the source tilting type image stitching operation	
Lock(Brake)	EM Lock, Switch on/off	
Balance	Counter Weight	
Column Rotation	$\pm 180^\circ$, EM lock, Switch on/off	
Tube OP	7 inch Touch screen	
Electrical Rating	100–240VAC, 160VA, 50/60Hz	
Dimension / Weight	2,327(H) x 3,006(D) mm / 266kg(586lbs) Option(Tube Head Motorized Rotation): 2,330(H) x 3,006(D) mm /272kg(599lbs)	

Tube Model	E7884X	DXT-12M	E7252X
Manufacturer	CANON	DRGEM	CANON
Focal Spot Size	0.6/1.2mm	0.6/1.2mm	0.6/1.2mm
Rating(0.1s)	22/54kW@60Hz	22/54kW@60Hz	27/75kW
Max. Anode HU	300kHU(210kJ)	300kHU(210kJ)	300kHU(210kJ)
Target Angle	12°	12°	12°
Max. kV	150kV	150kV	150kV
Weight	16kg(35.3lbs)	16kg(35.3lbs)	18kg(39.7lbs)
Inherent Filtration	0.9mmAl/75kV	1.0mmAl/75kV	0.9mmAl/75kV
Half Value Layer	More than 2.9mmAl eq. at 80kVp		
Leakage Radiation	Less than 100mR/hr		

Tube Model	DXT-14U	RAD-14	DXT-15U *
Manufacturer	DRGEM	VAREX	DRGEM
Focal Spot Size	0.6/1.2mm	0.6/1.2mm	0.6/1.2mm
Rating(0.1s)	27/75kW	32/77kW	32/77kW
Max. Anode HU	300kHU(210kJ)	300kHU(210kJ)	300kHU(210kJ)
Target Angle	12°	12°	12°
Max. kV	150kV	150kV	150kV
Weight	18kg(39.7lbs)	16.4kg(36.2lbs)	16.4kg(36.2lbs)
Inherent Filtration	1.0mmAl/75kV	0.6mmAl/75kV	0.7mmAl/75kV
Additional Filtration		0.5mmAl	0.5mmAl
Half Value Layer	More than 2.9mmAl eq. at 80kVp		
Leakage Radiation	Less than 100mR/hr		

* Adopting VAREX RAD-14 Insert.

● Collimator

Model	MCR	DXC-RML, DXC-RMH
Manufacturer	DRGEM	
Control	Manual with 30sec. lamp timer	
Field Shape	Rectangular	
Max. Field Size	More than 43x43cm(17x17inch) at 100cm SID	
Leakage Radiation	Less than 100mR/hr	Less than 40 mR/h
Max. kVp shield	150kV	150kV
Inherent Filtration	1.2mmAl eq.	2mmAl eq.
Luminosity	Over 160LUX at 100cm SID (Typ. 200LUX)	Over 160LUX at 1cm SID
Light source	HLX64642 150W 24V / OSRAM	LED and Halogen
Standard	Rotating flange with fixing knob	
Option	Tape measure	Line laser+shutter, Measure tape Near port moving shutters, Mounting flange mechanical detent Accessory guides spring, Additional filter, DAP rail
Electrical Rating	24Vac, 6.3A, 50/60Hz	Halogen type - 24 V DC/AC - 50~60Hz 160VA LED type - 12~45V DC 35VA / 20~30VAC 35VA - 50~60Hz
Dimension / Weight	185(W) x 213(D) x 180(H) mm / 6.3kg(13.9lb)	196(W) x 250(D) x 171(H) mm 7.1kg(15.6lb)

Model	R108	R302A, R302MLP/A, R302MFMLP/A
Manufacturer	RALCO	
Control	Manual with 30sec. lamp timer	
Field Shape	Rectangular	
Max. Field Size	More than 43x43cm(17x17inch) at 100cm SID	
Leakage Radiation	Less than 100mR/hr	
Max. kVp shield	150kV	150kV
Inherent Filtration	2.0mmAl eq.	2.0mmAl eq.
Luminosity	Over 160LUX at 100cm SID (Typ. 250LUX)	Over 160LUX at 100cm SID (Typ. 200LUX)
Light source	Single LED	HLX64638 100W 24V / OSRAM
Standard	Tape measure, rotating flange	Auto collimation for R302 MLP/A and R 302 MFMLP/A Auto filter selection for R 302 MFMLP/A
Option	Line laser, near port shutters	Tape measure, line laser, rotating flange
Electrical Rating	20–30Vac, 30VA, 50/60Hz	24Vac, 6.3A, 50/60Hz
Dimension / Weight	223(W) x 246(D) x 140(H) mm / 6.6kg(14.6lb)	195.5(W) x 237(D) x 206.5(H) mm / 9.4kg(20.7lb)

● AEC Ion Chamber (Option)

Model	ICX1162(ICX1192B)	Amplimat 5-Field
Manufacturer	AID	Philips
Field	3 Fields	5 Fields
X-ray Energy Range	40~150kV	40~150kV
Exposure time Range	1ms to 10s	1ms to 6s
Inherent Filtration	0.4 mm Al eq.	0.8 mm Al eq.
Weight	2kg (4.4lb)	1.8kg (4lb)

- DAP meter (Option)

DAP Resolution	0.01 μGym^2
Interface	RS485
Active area	115 x 115mm / 146 x 146mm
Display	Optional integrated or separate display (single or dual line)
Dimension	158 x 134.5 x 17mm / 180 x 156 x 17mm

- Other Options

- Pedestal console stand
- Patient holder
- Patient hand grips (Tabletop, Wall stand– Overhead, Lateral)
- Cassette holders (Lateral, External Wall Bucky)
- DAP meter with display
- Full-spine imaging software with apparatus
- DC power supply for line powered x-ray generator in case of insufficient line power
- DC brake for low speed starter of x-ray generator
- Radiation protection
 - Wearing(apron, neck guide, glove), movable xray protection wall

- AP (Access Point) for Wireless

Model	RT-AC68U (AC 1900)
Product Picture	
Manufacturer	ASUS
Standards	IEEE 802.11n, IEEE 802.11ac
Frequency	5GHz / 2.4GHz
Wireless LAN (max.)	1.3Gbps(5GHz)/600Mbps (2.4GHz)
Weight Antennas Type	3 external antennas
AC Power Adapter	19V / 1.75A
Regulatory Compliance	CE, FCC, RoHS, KCC