

SHIMADZU

PRODUCT DATA

Mobile X-ray System MobileDaRt Evolution MX8 Version



GENERAL

The MobileDaRt Evolution is a general-purpose mobile digital X-ray system, which can be freely moved throughout a hospital to directly obtain X-ray images of various areas of the body.

This product data may contain references to products these are not available in your country. Please contact us to check the availability of these products in your country.

The TM and ® symbols are omitted in this manual.

Availability of the FPD detector or the option depends on the regional radio wave regulation.

Please contact sales representative in the region regarding the availability.

FEATURES

- (1) Great Forward Visibility
During travel the collapsible column and compact X-ray tube design does not obstruct visibility.
- (2) Intuitive Maneuverability
The system provides natural, responsive light touch driving capabilities.
- (3) Large & Flat design Display
The built-in 19inch large LCD monitor enhances visibility and touch panel operability, and it can be cleaned up easily thanks to fully embedded design.
- (4) Easy Positioning (All free function)
"All Free" buttons enable one-step positioning by releasing electromagnetic locks of arm and column at the same time.
- (5) Wide Exposure Coverage
The system is useful for imaging in confined and limited spaces of numerous equipment with broad exposure range.
- (6) Inch-Mover
The main unit can be moved forward or backward by simply operating from the collimator without technologist's moving around the patient bed.
- (7) Status Indicator
The color-coded indicator lamps illuminate or blink in response to X-ray exposures or system abnormalities.
- (8) High Frequency Inverter
Using a high-frequency inverter, with a maximum frequency of 60kHz, the system can obtain high and efficient X-ray generation with low-ripple.
- (9) Bright irradiation field
LEDs have been adopted as the light source to indicate the irradiation field, helping imaging in a bright room or in the daytime.
- (10) Vibration resistant DR unit
SSD is mounted to offer quick access to clinical sites. The mobile cart can be driven even in PC start up time.
- (11) Quick Response (*2)
A reference image is displayed 2 seconds after exposure, allowing on-site image verification.
- (12) High Throughput
The system assists workflow improvements by sending image data to an imager or PACS through hospital's internal network.
- (13) Wireless Features
In addition to FPD and hand switch option, Bar code reader can provide wireless solution(option).
- (14) Dose Management
Area dose is calculated before exposure to display estimated dose value on the console. After exposure, it shows recalculated value based on actual conditions of exposure area and parameter.

- (15) Value-added FPD
The wireless FPD is light weight and can be handled easily. The fine pixel size and high DQE (except AeroDR2 1417S) enables excellent image quality with low dose.
- (16) High durability & Water Proof FPD
The FPD withstands a load of 300kg or 400kg. AeroDR3 and AeroDR2 series have IPX6 water proof function.

CONFIGURATION

- (1) Inverter type high voltage generator
- (2) X-ray tube unit
- (3) Collimator
- (4) Cart
- (5) DR unit
- (6) Flat Panel Detector (FPD)

17 x 17inch	AeroDR 1717HQ
	AeroDR3 1717HD
14 x 17inch	AeroDR2 1417HQ (XE)*
	AeroDR2 1417S (LT)*
	AeroDR3 1417HD
10 x 12inch	AeroDR 1012HQ
	AeroDR3 1012HQ

*: Name of FPD may vary depending on countries.

- (7) Battery Charger

OPTION

- (1) Wireless exposure switch
- (2) Protective screen (folding)
- (3) Dose area product (DAP) meter mount kit (*1)
- (4) Grid Unit
- (5) Keyless entry
- (6) Wireless LAN
- (7) Luminous hand switch
- (8) Additional hand switch
- (9) Barcode reader (Wireless or wired)
- (10) External monitor interface
- (11) DICOM PRINT / MPPS
- (12) Intelligent Grid
- (13) Motion / Lung
- (14) Simple Check QA/QC
- (15) LDAP Cyber Security
- (16) Adjustable handle kit
- (17) LCD screen Protector
- (18) Decoration Label : Sweet Animals

(*1) Physical DAP meter can substitute calculated dose function, when needed.

(*2) Depends on FPD type and binning mode.

SPECIFICATIONS
High-Voltage Generator

Item		Specification	
Max. Electric Power		32kW (100kV, 320mA, 20ms / 80kV, 400mA, 20ms)	
Ratings		Tube voltage: 40 - 133 kV Tube current: 50 - 400 mA Maximum power: 32kW (20msec)	
Nominal minimum exposure time		1 msec.	
Maximum Current-Time Product Settings at each mode			
Cassette Radiography *1 Common with Normal mode and Low battery mode		Common with large focus and small focus 40 - 90 kV: 320 mAs 91 - 100 kV: 280 mAs 101 - 110 kV: 250 mAs 111 - 120 kV: 220 mAs 121 - 133 kV: 200 mAs	
Digital Radiography *1 *2	Long-term Radiography	Large focus 40 - 65 kV: 320 mAs 66 - 80 kV: 280 mAs 81 - 85 kV: 250 mAs 86 - 100 kV: 220 mAs 101 - 105 kV: 200 mAs 106 - 125 kV: 180 mAs 126 - 133 kV: 140 mAs	Small focus 40 - 65 kV: 320 mAs 66 - 80 kV: 280 mAs 81 - 100 kV: 220 mAs 101 - 125 kV: 180 mAs 126 - 133 kV: 140 mAs
	Short-term Radiography	Large focus 40 - 50 kV: 200 mAs 51 - 60 kV: 160 mAs 61 - 80 kV: 125 mAs 81 - 100 kV: 100 mAs 101 - 125 kV: 80 mAs 126 - 130 kV: 63 mAs 131 - 133 kV: 50 mAs	Small focus 40 - 60 kV: 160 mAs 61 - 80 kV: 125 mAs 81 - 100 kV: 100 mAs 101 - 125 kV: 80 mAs 126 - 130 kV: 63 mAs 131 - 133 kV: 50 mAs
Digital Radiography *1 *2 (@Low battery mode)	Long-term Radiography	Common with large focus and small focus 40 - 65 kV: 320 mAs 66 - 80 kV: 280 mAs 81 - 100 kV: 220 mAs 101 - 120 kV: 180 mAs 121 - 133 kV: 140 mAs	
	Short-term Radiography	Large focus 40 - 50 kV: 200 mAs 51 - 55 kV: 160 mAs 56 - 65 kV: 125 mAs 66 - 80 kV: 100 mAs 81 - 100 kV: 80 mAs 101 - 120 kV: 63 mAs 121 - 133 kV: 50 mAs	Small focus 40 - 55 kV: 160 mAs 56 - 65 kV: 125 mAs 66 - 80 kV: 100 mAs 81 - 100 kV: 80 mAs 101 - 120 kV: 63 mAs 121 - 133 kV: 50 mAs
Tube Voltage Setting Range and Display		Setting Range: 40 kV to 133 kV, in 1 kV increments Display: Digital	
Current-Time Product Setting Range and Display		Setting Range: 0.32 – 320 mAs at 12.5% step 0.32, 0.36, 0.40, 0.45, 0.50, 0.56, 0.63, 0.71, 0.80, 0.90, 1.0, 1.1, 1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.5, 2.8, 3.2, 3.6, 4.0, 4.5, 5.0, 5.6, 6.3, 7.1, 8.0, 9.0, 10, 11, 12, 14, 16, 18, 20, 22, 25, 28, 32, 36, 40, 45, 50, 56, 63, 71, 80, 90, 100, 110, 125, 140, 160, 180, 200, 220, 250, 280, 320 mAs Display: Digital	
Anatomical Programs		441 432 for FPD radiography 9 for general radiography	
Battery Life for wireless hand switch		Approx. 27,000 exposures) (150 exposures per day X 180 days)	

*1: The various conditions are as follows (conform to IEC-standards):

Tube voltage (within +/-10 %), Tube current (within +/- 20 %)

mAs within +/- (10 % + 0.2 mAs), Time within +/- (10 % + 1 ms)

*2: The maximum radiography time of the DR long-time radiography mode is 2,800 msec.

X-ray Tube Unit

Item		Specification
Model		0.7/1.3U163C-36
Nominal Focal Spot Size		0.7/1.3mm
Target Angle		16 degrees
Nominal Max. Tube Voltage	Radiography	133kV
X-ray Tube Unit (tube and housing)	Max. Heat Content	750kJ (1060kHU)
	Max. Continuous Heat Dissipation Rate	120W (170HU/s)
X-ray Tube (tube only)	Max. Anode Heat Content	210kJ (300kHU)
	Max. Anode Heat Dissipation Rate	800W (1130HU/s)
	Max. Continuous Heat Dissipation Rate	210W (300HU/s)
Minimum inherent filtration *1		2.0mm Al equivalent @75kV
Mass		12.8kg (28.2lbs)

Collimator

Item		Specification
Model		R-20C
Field	Shape	Rectangular
	Max. Field	430mm x 430mm at SID 1m
	Min. Field	0mm x 0mm (leaves closed)
Illumination Field	Average Illumination	160lx or more
	Illuminance Ratio	3 or more
	Precision	2% of SID
	Center Indicator	Cross hairs
	Type of Lamp	LED
	Illumination Period	30 seconds max., with automatic off timer
Minimum inherent filtration *1		1.0mm Al equivalent @75kV

*1) 2.5mm Al equivalent or higher @75kV for both X-ray tube unit and collimator.

X-ray Tube Support and Cart

Item	Specification
Driving method	Motorized
Maximum Driving speed	Approx. 5km/h (depends on floor condition)
Height during transportation (from floor)	1270mm (50inch)
Focal point height (from floor)	680 to 2025mm (26.8 to 79.8inch)
Tube support arm	Collapsible arm
Arm length	638 to 1203mm (25.1 to 47.4inch)
Driving handle height	102cm (40.2 inch) : floor to top of handle 95cm (37.4 inch) and 102cm (40.2 inch) : w/ Adjustable Handle option
Column rotation range	+/- 270degree
Tube rotation around support arm	+/- 180degree
Tube rotation around tube axis	Forward 90degree, Backward 30degree
Rotation of collimator	+/- 90degree
System width x length	560mm x 1285mm (22.0 to 50.6inch)
Total weight	Approx. 440kg(970lbs) (with DR unit)

DR system (MX8k)

Item		Specification
Flat Panel Detector (FPD)	Application	General X-ray radiography
	Size of imaging unit	AeroDR3 1417HD : W384 x D460 x H15mm AeroDR2 1417HQ/1417S : W383.7 x D460.2 x H15.9mm AeroDR3 1717HD : W460 x D460 x H15mm AeroDR 1717HQ : W459.8 x D460.2 x H15.9mm AeroDR3 1012HQ : W282 x D333 x H15mm AeroDR 1012HQ : W281.8 x D333.0 x H15.9mm
	Scintillator	CsI
	Pixel Size	AeroDR3 series : 100/200micron AeroDR / AeroDR2 series : 175 micron
	Effective number of pixels	AeroDR3 1417HD : 3,488 x 4,256 / 1,744 x 2,128 AeroDR2 1417HQ/1417S : 1,994 x 2,430 AeroDR3 1717HD : 4,248 x 4,248 / 2,124 x 2,124 AeroDR 1717HQ : 2,428 x 2,428 AeroDR3 1012HQ : 2,456 x 2,968 / 1,228 x 1,484 AeroDR 1012HQ : 1,404 x 1,696
	Effective field of view	AeroDR3 1417HD : 348.8 x 425.6mm AeroDR2 1417HQ/1417S : 348.95 x 425.25mm AeroDR3 1717HD : 424.8 x 424.8mm AeroDR 1717HQ : 424.9 x 424.9mm AeroDR3 1012HQ : 245.6 x 296.8mm AeroDR 1012HQ : 245.7 x 296.8mm
	Dynamic Range	Approx. 4-digit
	Gradation	16bit (65,536 gradations)
	Weight (Including battery)	AeroDR3 1417HD, AeroDR2 1417HQ : 2.6kg (5.7lbs) AeroDR2 1417S : 2.5kg (5.5lbs) AeroDR3 1717HD : 3.2kg (7.1lbs) AeroDR 1717HQ : 3.6kg (7.9lbs) AeroDR3 1012HQ : 1.5kg (3.5lbs) AeroDR 1012HQ : 1.7kg (3.7lbs)
	Max. Exposure Time	3,000 msec
	Mechanical Strength	AeroDR3 series : Partial load: 180kg(397lbs), given 40mm(1.6in.) diameter Uniform load: 400kg(882lbs) over all surface AeroDR, AeroDR2 series : Partial load: 150kg(330lbs), given 40mm(1.6in.) diameter Uniform load: 300kg(661lbs) over all surface
	Water Proof	AeroDR3, AeroDR2 series : IPX6 AeroDR series : N/A
	Battery Life	AeroDR3 1417HD : [100micron] 251 frame/6.9H [200micron] 309 frame/8.6 H AeroDR2 1417HQ: 300frame/8.2H AeroDR2 1417S : 150frame/4.1H AeroDR3 1717HD : [100micron] 217 frame/6.0H [200micron] 276 frame/7.6H AeroDR 1717HQ : 189 frame/5.2H AeroDR3 1012HQ : [100micron] 145 frame/3.9H [200micron] 165 frame/4.5 H AeroDR 1012HQ : 146 frame/4.0H (3 shot per study, R-R time 20sec., study interval 5min.)
	Battery Charge Time	AeroDR3 1417HD/1717HD : Approx. 30min. AeroDR3 1012HQ : Approx. 20min. AeroDR2 1417HQ : Approx. 30min. AeroDR2 1417S : Approx. 13min. AeroDR 1717/1012HQ via. cradle : Approx. 30min. AeroDR 1717/1012HQ via. multi size cradle or wiring connection: Approx. 60min.

Item			Specification	
	Wireless Communications	Standard	IEEE 802.11a	(AeroDR series)
			IEEE 802.11a/n	(AeroDR3 series, AeroDR2 series)
		Frequency band	5GHz	(AeroDR series)
			2.4GHz / 5GHz	(AeroDR3 series, AeroDR2 series)
		Security	WPA2-PSK(AES)	
Display Unit	Size		48.3cm (19inch): diagonal	
	Brightness		300cd/mm ² (Typ.)	
	Contrast Ratio		1 : 1,500 (Typ.)	
	LCD drive method		VA	
	View angle		170 degrees for all directions	
	Touch panel type		Projected Capacitive Touch Panel	
	Resolution		1,280 x 1,024	
Digital Radiography System	Hard disk		Solid-state drive (SSD) 128GB or equivalent	
	Memory		8GB RAM or equivalent	
	CPU		Intel Core i5	
	OS		Windows 10 64bit	
	LAN		10/100/100 Base T x1 IEEE 802. 11a/b/g/n (option)	
	Image Preview		Less than 2seconds	
	Image Processing		Auto-gradation process Frequency processing (F process) Equalization processing (E process) Hybrid processing (HF process - HE process) Hybrid smoothing process (HS process) Grid removal process Automatic exposure field recognition process Tube Gauze Enhance / REALISM Intelligent Grid (option)	
	Image Storage		3,000 images	
	DICOM		Storage, MWM, Print (option), MPPS (option), RDSR	

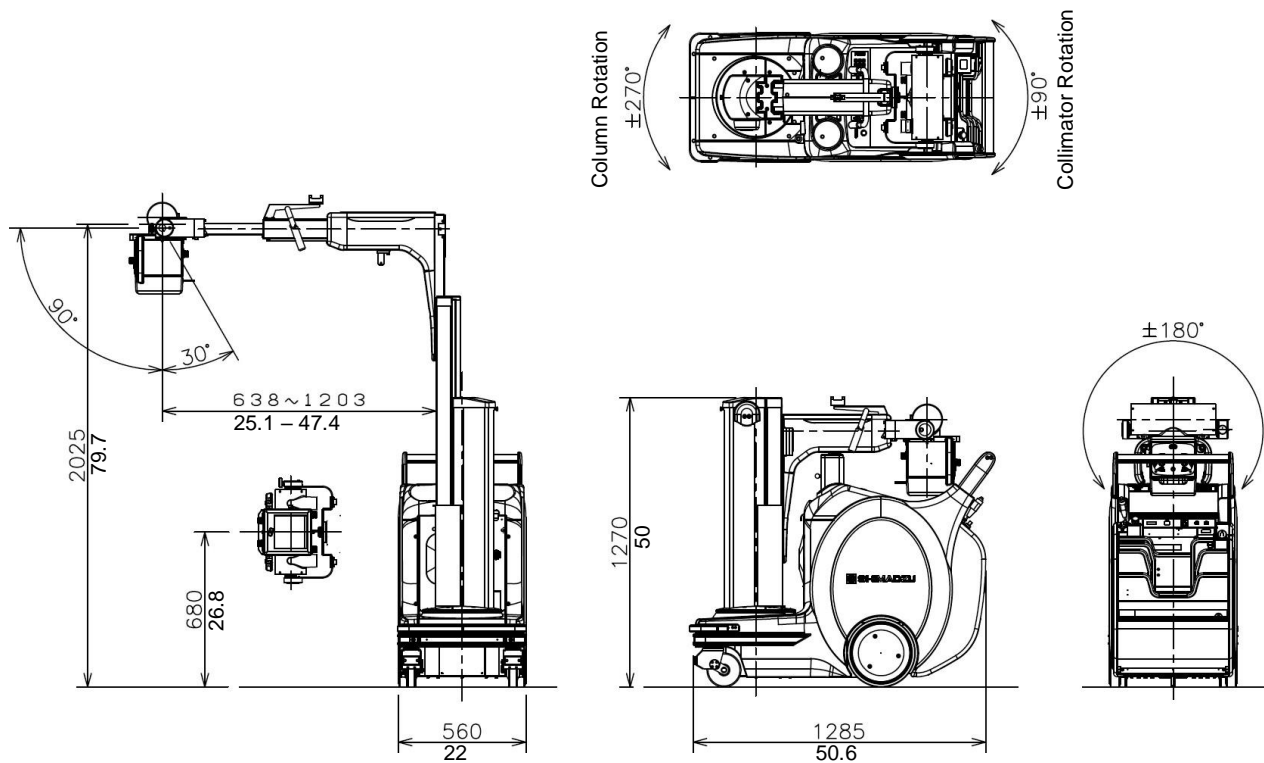
Power Supply

Item		Specification
When Powered by Battery	Power Supply	Internal battery
	Battery Type	Sealed lead storage battery (12V x 20cells)
When Charging Battery	Supply Voltage	Single-phase 100, 110, 120, 200, 220, 230, 240VAC
	Supply Frequency	50/60Hz
	Power Supply Rating	1 kVA
	Supply Impedance	Single phase 100, 110, 120 VAC: 1.0Ωmax.
		Single phase 200, 220, 230, 240 VAC: 4.0Ω max.
	Ground Resistance	Ground terminal: 100Ω max.
		Additional ground terminal: 100Ω max.
Power Cable Length		4m (13ft)

Operating Environment

Item	Specification
Atmosphere	No explosive or corrosive gases
Ambient Temperature	10 to 30 degrees C
Relative Humidity	35 to 80% (with no condensation)
Atmospheric Pressure	800 to 1060hPa
Environment Luminosity	150 to 500lx

DIMENSIONS unit: mm
 inch



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Shimadzu Corporation

Headquarters

1, Nishinokyo-Kuwabara-cho, Nakagyo-ku, Kyoto 604-8511, Japan
<https://www.shimadzu.com/med/>



Shimadzu Corporation Medical Systems Division has been certified by TÜV Rheinland as a manufacturer of medical systems in compliance with ISO9001:2015 Quality Management Systems and ISO13485:2016 Medical Devices Quality Management Systems.

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- ★ Before operating this system, you should first thoroughly review the Instruction Manual.