

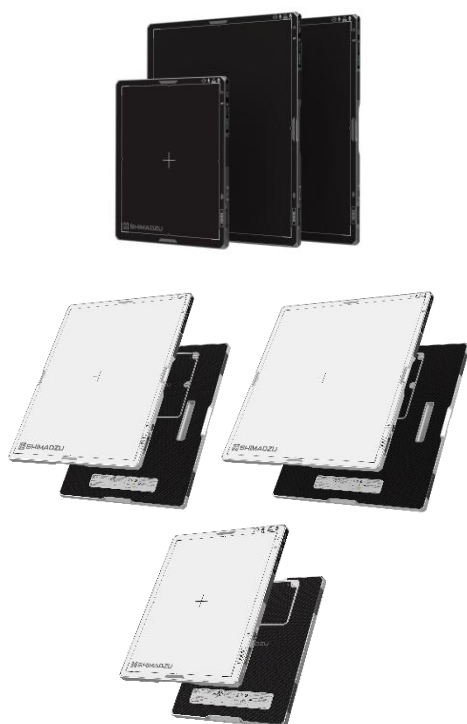


PRODUCT DATA

Mobile X-ray System

MobileDaRt Evolution

MX9 Premium Version v type



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 don't 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
A reference image is displayed 5 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) Second Monitor
A monitor is built into the tube head, displaying exposure conditions and more during positioning. These conditions can be adjusted via the touchscreen.
- (16) Value-added FPD
The wireless FPD is light weight and can be handled easily. The fine pixel size and high DQE enables excellent image quality with low dose. (FXRD-4343FAW/3643FAW/2530FAW, FXRD-4343VAW/3643VAW/2530VAW PLUS)
- (17) High durability & Waterproof FPD
The FPD withstands a load of 400 kg and has the waterproof function.
(Waterproof level depends on FPD model)
- (18) Retained Object Confirmation Support Image
Processing Smart DSI aids the detection of objects retained in the body by enhancing regions of the image that potentially show surgical needles, gauze with radiopaque threads, and other foreign objects.
- (19) Storage Bin with FPD charger
The mobile's large storage bin stores FPDs as well as accessories like pens and markers. The front bins can provide space for wipes and other accessories. FPD can be charged in the large storage bin. (FPD Wired connection kit is required.)
- (20) Laser Navigation
Projecting vertical and horizontal laser markers makes the irradiation field's center clearer. These markers illuminate when the tube head and the FPD reach the appropriate angle, making accurate positioning easier.
- (21) 3D Camera application
A depth-sensing camera equipped on the tube head estimates the SID, and the relative angle between the tube head and the FPD. The Entrance Surface Dose (ESD) is automatically calculated. The camera also provides a live view for precise positioning.

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	FXRD-4343FAW
	FXRD-4343VAW
	FXRD-4343VAW PLUS
14 x 17inch	FXRD-3643FAW
	FXRD-3643VAW
	FXRD-3643VAW PLUS
10 x 12inch	FXRD-2530FAW
	FXRD-2530VAW
	FXRD-2530VAW PLUS

- (7) Cradle

OPTION

- (1) Wireless exposure switch
- (2) Protective screen (folding)
- (3) Dose area product (DAP) meter mount kit (*1)
- (4) Keyless entry
- (5) Wireless LAN
- (6) Luminous hand switch
- (7) Additional hand switch
- (8) FPD Wired connection kit
- (9) Scatter Correction
- (10) Adjustable handle kit
- (11) LCD screen Protector
- (12) Decoration Label : Sweet Animals
- (13) IR Remote Controller
- (15) Retained Object Confirmation Support Image Processing (Smart DSI)
- (14) Cross Laser Marker
- (15) 3D Camera application

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

SPECIFICATIONS
High-Voltage Generator

Item		Specification	
Max. Electric Power		32 kW (100 kV, 320 mA, 20 ms / 80 kV, 400 mA, 20 ms)	
Ratings		Tube voltage: 40 – 133 kV Tube current: 50 – 400 mA Maximum power: 32 kW (20 msec)	
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	
Wireless hand switch (option)	Battery Life	Approx. 27,000 exposures (150 exposures per day X 180 days)	
	Operable Range	Approx. 10 m from the system (depends on surrounding conditions)	

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

Collimator

Item		Specification
Model		R-20CU
Field	Shape	Rectangular
	Max. Field	430 mm x 430 mm at SID 1 m
	Min. Field	0 mm x 0 mm (leaves closed)
Illumination Field	Average Illumination	160 lx 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		1.0 mm Al equivalent @75 kV

*1) Total Al equivalent $\geq$ 2.5 mm@75 kV (X-ray tube and collimator combined).

X-ray Tube Support and Cart

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

DR system (MX9v)

Item		Specification
	Application	General X-ray radiography
	Size of imaging unit	FXRD-4343FAW, FXRD-4343VAW, FXRD-4343VAW PLUS: W460 x D460 x H15.0 mm FXRD-3643FAW, FXRD-3643VAW, FXRD-3643VAW PLUS: W384 x D460 x 15.0 mm FXRD-2530FAW: W282.5 x D333.3 x H15.0 mm FXRD-2530VAW, FXRD-2530VAW PLUS: W284 x D350 x H15.0 mm
	Scintillator	Csl
	Pixel Size	FXRD-4343FAW, FXR-3643FAW, FXR-2530FAW: 99 microns FXRD-4343VAW, FXRD-4343VAW PLUS, FXRD-3643VAW, FXRD-3643VAW PLUS: 140 microns FXRD-2530VAW, FXRD-2530VAW PLUS: 124 microns
	Effective number of pixels	FXRD-4343FAW: 4,276 x 4,276 FXRD-3643FAW: 3,508 x 4,276 FXRD-2530FAW: 2,484 x 2,996 FXRD-4343VAW, FXRD-4343VAW PLUS: 3,048 x 3,048 FXRD-3643VAW, FXRD-3643VAW PLUS: 2,536 x 3,048 FXRD-2530VAW, FXRD-2530VAW PLUS: 2,048 x 2,536
	Effective field of view	FXRD-4343FAW: 423.324 x 423.324 mm FXRD-3643FAW: 347.292 x 423.324 mm FXRD-2530FAW: 245.916 x 296.604 mm FXRD-4343VAW, FXRD-4343VAW PLUS: 426.72 x 426.72 mm FXRD-3643VAW, FXRD-3643VAW PLUS: 355.04 x 426.72 mm FXRD-2530VAW, FXRD-2530VAW PLUS: 250.976 x 314.464 mm
	Dynamic Range	FXRD-4343FAW, FXR-3643FAW, FXR-2530FAW: 303 min. FXRD-4343VAW, FXRD-3643VAW, FXRD-2530VAW: 900 min. FXRD-4343VAW PLUS, FXRD-3643VAW PLUS, FXRD-2530VAW PLUS: 1028 min.
	Gradation	16 bit (65,536 gradations)
	Weight (Including battery)	FXRD-4343FAW One battery pack: 2.95 kg (6.5 lbs) Two battery pack: 3.15 kg (6.9 lbs) FXRD-4343VAW One battery pack: 3.45 kg (7.6 lbs) Two battery pack: 3.65 kg (8.0 lbs) FXRD-4343VAW PLUS One battery pack: 3.7 kg (8.2 lbs) Two battery pack: 3.9 kg (8.6 lbs) FXRD-3643FAW One battery pack: 2.4 kg (5.3 lbs) Two battery pack: 2.6 kg (5.7 lbs) FXRD-3643VAW One battery pack: 2.95 kg (6.5 lbs) Two battery pack: 3.15 kg (6.9 lbs) FXRD-3643VAW PLUS One battery pack: 3.1 kg (6.8 lbs) Two battery pack: 3.3 kg (7.3 lbs) FXRD-2530FAW: 1.7 kg (3.7 lbs) FXRD-2530VAW: 1.95 kg (4.3 lbs) FXRD-2530VAW PLUS: 2.15 kg (4.7 lbs)
	Max. Exposure Time	2,800msec
	Mechanical Strength	Partial load: 200 kg (440 lbs), given 40 mm (1.6 in) diameter Uniform load: 400 kg (881 lbs) over all surface
	Dustproof / Waterproof	FXRD-4343FAW, FXRD-3643FAW, FXRD-2530FAW, FXRD-4343VAW, FXRD-4343VAW PLUS, FXRD-3643VAW, FXRD-3643VAW PLUS, FXRD-2530VAW, FXRD-2530VAW PLUS: IP67
	Battery Life	FXRD-4343FAW, FXRD-3643FAW, FXRD-4343VAW, FXRD-4343VAW PLUS, FXRD-3643VAW, FXRD-3643VAW PLUS: One battery pack: 270 frames (100 sec interval) Two battery pack: 540 frames (100 sec interval) FXRD-2530FAW: 270 frames (100 sec interval) FXRD-2530VAW, FXRD-2530VAW PLUS: 252 frames (100 sec interval)

Item			Specification
	Battery Charge Time		FXRD-4343FAW, FXRD-3643FAW, FXRD-2530FAW, FXRD-4343VAW, FXRD-4343VAW PLUS, FXRD-3643VAW, FXRD-3643VAW PLUS, FXRD-2530VAW, FXRD-2530VAW PLUS: Approx. 2 H by Cradle Approx. 2 H by first charging with wiring Unit
	Wireless Communications	Standard	IEEE 802.11n/ac
		Frequency band	2.4 GHz / 5 GHz
		Security	WPA2-PSK(AES)
Display Unit	Size		48.3 cm (19 inch): diagonal
	Brightness		470 cd/m 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
Second Monitor	Size		17.8 cm (7 inch): diagonal
	LCD drive method		IPS
	View angle		89 degrees for all directions
	Touch panel type		Projected Capacitive Touch Panel
	Resolution		800 x 480
3D Camera	Usable range		0.6m ~ 6m
	Resolution		HD (1280 x 720)
Digital Radiography System	Storage		Solid-state drive (SSD) 240 GB or equivalent
	Memory		16 GB RAM or equivalent
	CPU		Intel Xeon® W-11155MRE or equivalent
	OS		Windows 10 64 bit
	LAN		10/100/1000 Base T x1 IEEE 802. 11a/b/g/n (option)
	Image Preview		Less than 5 seconds
	Image Processing		Contrast Processing Noise Reduction Grid Pattern Remove Process Auto Exposure Field Recognition Free Rotation Scatter Correction(option)
	Image Storage		FXRD-4343VAW, FXRD-4343VAW PLUS, FXRD-3643VAW, FXRD-3643VAW PLUS, FXRD-2530VAW, FXRD-2530VAW PLUS: 5,000 images FXRD-4343FAW, FXRD-3643FAW, FXRD-2530FAW: 2,500 images
	DICOM		Print, Storage, MWM, MPPS, STORAGE COMMITMENT, RDSR

Power Supply

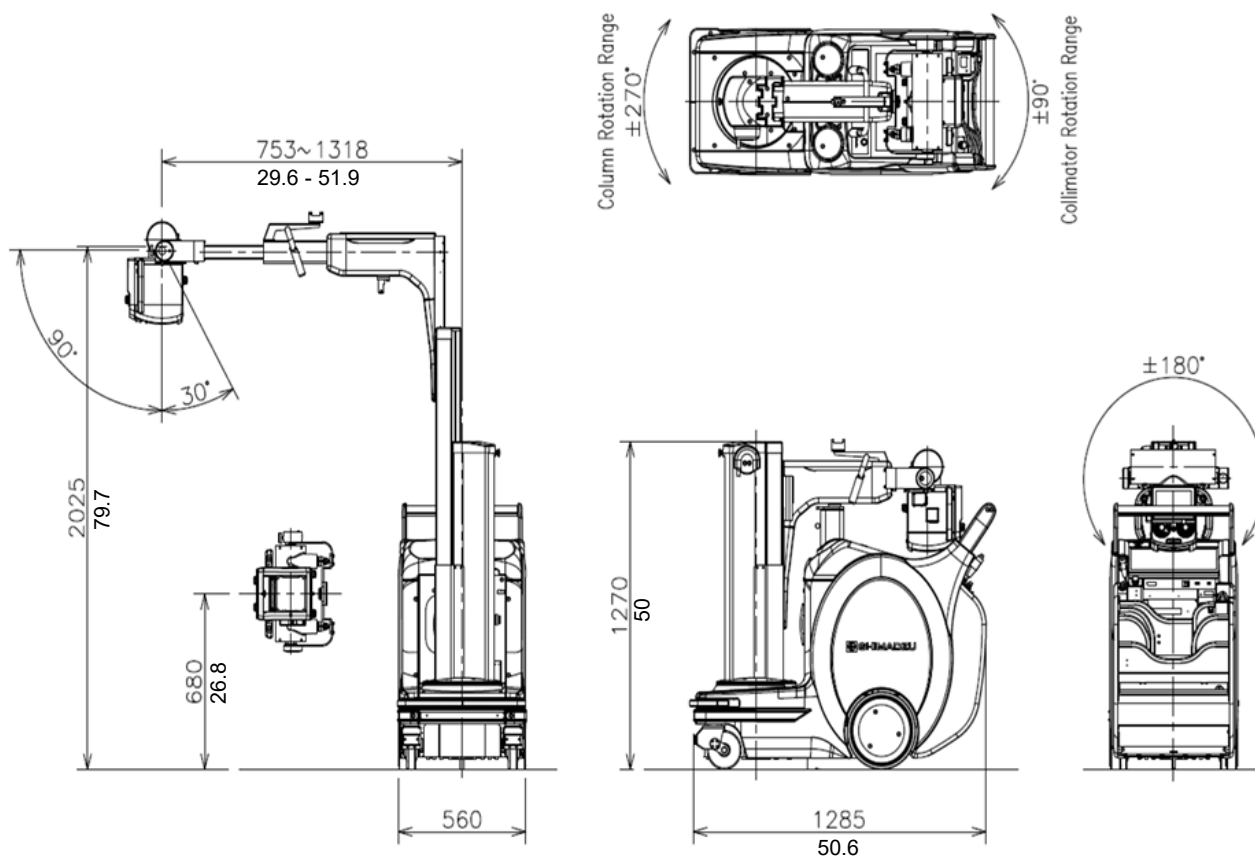
Item		Specification
When Powered by Battery	Power Supply	Internal battery
	Battery Type	Sealed lead storage battery (12 V x 20 cells)
	Battery capacity	7.2 Ah (20-hour rate), DC240 V
When Charging Battery	Supply Voltage	Single-phase 100, 110, 120, 200, 220, 230, 240 VAC
	Supply Frequency	50/60 Hz
	Power Supply Rating	1 kVA
	Supply Impedance	Single phase 100, 110, 120 VAC: 1.0 Ω max.
		Single phase 200, 220, 230, 240 VAC: 4.0 Ω max.
	Ground Resistance	Ground terminal: 100 Ω max.
		Additional ground terminal: 100 Ω max.
Power Cable Length		3 m (10 ft)

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 1060 hPa
Environment Luminosity	150 to 500 lx

DIMENSIONS

unit: mm
 ← inch →



Label Description: Mobile X-ray System MobileDaRt Evolution

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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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