

SHIMADZU

PRODUCT DATA

Radiographic
Mobile X-ray
System

MobileArt Evolution (MX7 Version)



GENERAL

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

FEATURES

- (1) Smooth and Quiet Movement
Power-assist technology allows moving the unit easily and quietly.
- (2) Compact Design
Excellent forward visibility allows freely moving through even tight spaces.
- (3) Easy Positioning
The system can be freely and quickly maneuvered into position using Inch-Mover buttons to move the main body and swiveling the column to move the X-ray tube.
- (4) Standard Anatomical Programs
Anatomical programs (APR) are installed as standard, to allow setting radiography parameters easily.
- (5) Cordless System
The built-in battery enables obtaining X-ray images without plugging in the unit.
- (6) Status Indicator Light
The status indicator light illuminates or blinks in response to X-ray exposure or system abnormalities. This allows a visual confirmation of system status.
- (7) New energy saving collimator with a bright irradiation field
LEDs have been adopted as the light source to indicate the irradiation field. This reduces power consumption while improving brightness levels and durability.
- (8) Dose Management
Prior to exposure, dose area product (DAP) is estimated based on the exposure parameter setting and estimated value is displayed on the console. After exposure, DAP value is recalculated based on actual exposure parameter and displayed.

CONFIGURATION

- (1) Inverter type high voltage generator
- (2) X-ray tube unit
- (3) Collimator
- (4) Cart

OPTION

- (1) Remote controlled exposure switch
- (2) Protective screen (folding)
- (3) Dose area product (DAP) meter mount kit (*1)
- (4) Distance indicator (*2)
- (5) Grid unit
- (6) Keyless entry
- (7) Luminous hand switch
- (8) Additional hand switch
- (9) Large cassette box
- (10) Grip height adjustment kit (*3)
- (11) Decoration label

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

(*2) Distance indicator is not applicable when DAP meter is mounted.

(*3) Available at installation.

SPECIFICATIONS

High-Voltage Generator (32kW type)

Item	Specification
Max. Electric Power	32 kW (100 kV, 320 mA, 20 ms / 80 kV, 400 mA, 20 ms)
Ratings	Maximum tube voltage: 133 kV Maximum tube current: 400 mA Maximum power: 32 kW (20 msec)
Nominal minimum exposure time	1.0 msec.
Maximum Current-Time Product Settings at each mode	
General Radiography *1	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
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	72

High-Voltage Generator (12.5kW type)

Item	Specification
Max. Electric Power	12.5kW (100 kV, 125 mA, 0.1 sec)
Ratings	Maximum tube voltage: 125kV Maximum tube current: 160mA Maximum power: 12.5 kW (0.1 sec)
Nominal minimum exposure time	3.2 msec.
Maximum Current-Time Product Settings at each mode	
General Radiography *1	40 - 90 kV: 320 mAs 91 - 100 kV: 280 mAs 101 - 110 kV: 250 mAs 111 - 120 kV: 220 mAs 121 - 125 kV: 200 mAs
Tube Voltage Setting Range and Display	Setting Range: 40 kV to 125 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	72

*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)

X-ray Tube Unit

Item		Specification	
		32kW type	12.5kW type
Model		0.7/1.3U163C-36	0.7U163CS-36
Nominal Focal Spot Size		0.7/1.3 mm	0.7 mm
Target Angle		16 degrees	
Nominal Max. Tube Voltage	Radiography	133 kV	125 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 (300HU/s)	
Nominal anode input power (20 msec, 0.1msec)		Focus size 1.3 mm: 36.4 kW, 30.5 kW Focus size 0.7 mm: 19.9 kW, 16.8 kW	
Maximum Filament Voltage		15 V	
Maximum Filament Current (*1)		5.6 A	
Target Material		Rhenium-tungsten faced on molybdenum	
Anode rotation (*2)		RPM is 70 Hz: 3800 rpm (min-1) or more	RPM is 60 Hz: 3200 rpm (min-1) or more.
X-ray protection (*3)		Less than 0.87 mGy (2.58×10^{-5} C/kg) in an hour at distance of 1 m from focus	
Surface Temperature on Touchable Surface of X-ray Tube Unit		Maximum 60 °C (Compliant to IEC60601-2-28)	
Mass		12.8 kg	13 kg

*1: This is maximum value which can be used at the time of adjustment of tube current.

*2: Direction of anode rotation is counter-clockwise as viewed from cathode side

*3: 32 kW type:

Conditions of detection for the leakage radiation are

(1) Maximum used tube input 125 kV, 120 W continuously.

(2) Repeated radiographic loading to keep the average load to be 100 W (141 HU/s) at the maximum voltage.

12.5 kW type:

Conditions of detection for the leakage radiation are

(1) Maximum used tube input 125 kV, 160 W continuously.

(2) Repeated radiographic loading to keep the average load to be 71 W (100 HU/s) at the maximum voltage

Collimator

Item		Specification
Model		R-20C
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 of entire system		2.5 mm Al equivalent @70 kV or higher for both X-ray tube unit and collimator

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)	Tall column type : Approx.1930 mm(76.0 inch)
	Short column type* : Approx.1780 mm(70.0 inch)
Focal point height (from floor)	Tall column type : Approx.600 to 2010 mm(23.6 to 79.1 inch)
	Short column type* : Approx.600 to 1860 mm(23.6 to 73.2 inch)
	High focal point* : Approx.750 to 2010 mm(29.5 to 79.1 inch)
Tube support arm	Telescopic arm
Arm length	635 to 1200 mm
Column rotation range	+/- 270 degree
Tube rotation around support arm	+/- 180 degree
Tube rotation around tube axis	Forward 90 degree, Backward 20 degree
Rotation of collimator	+/- 110 degree
System width x length	580 mm x 1145 mm
Total weight	32kW type: Approx. 435 kg
	12.5kW type: Approx. 400 kg

* Short column type or High focal point may be available upon inquiry. Please contact Shimadzu sales representative.

Power Supply

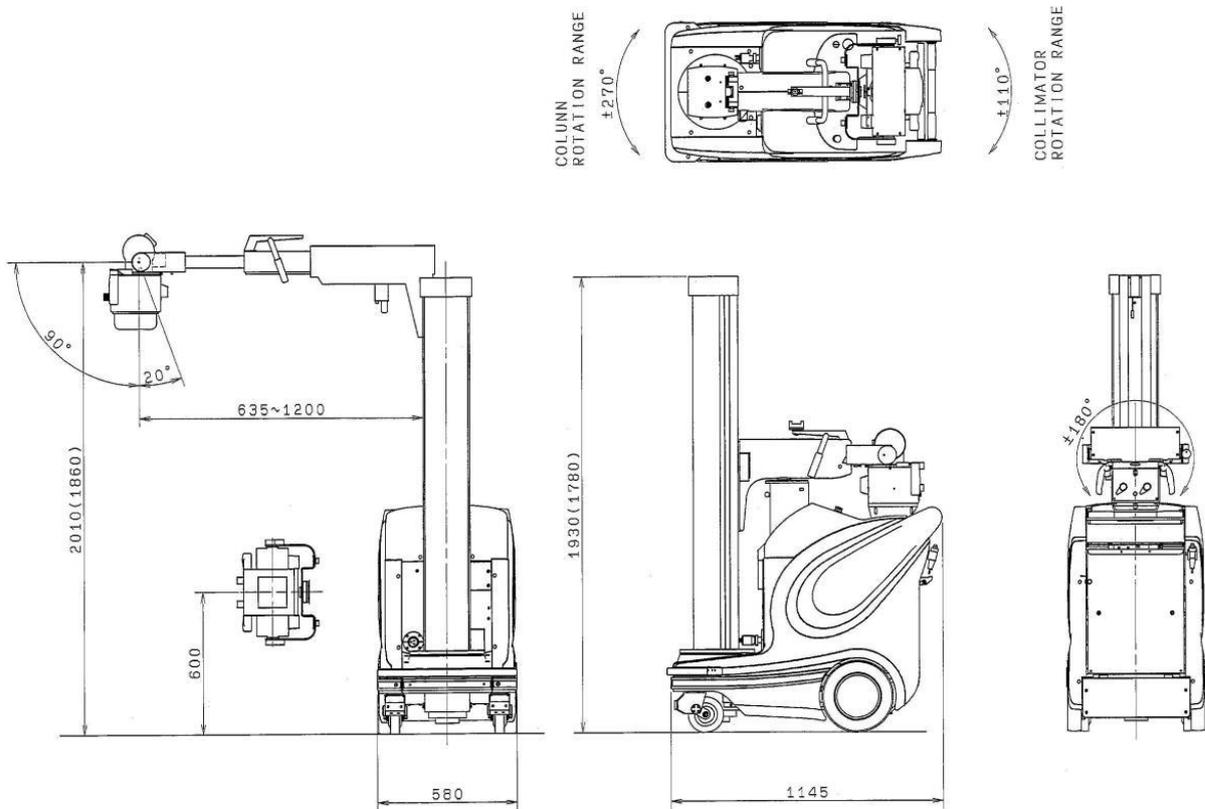
Item	Specification
When Powered by Battery	Power Supply
	Battery Type
When Charging Battery	Internal battery
	Sealed lead storage battery (12 V x 20cells)
	Supply Voltage
	Supply Frequency
	Power Supply Rating
	Supply Impedance
Ground Resistance	Single-phase 100, 110, 120, 200, 220, 230, 240 V AC
	50/60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

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



Values shown in () are for Type S

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Shimadzu Corporation Medical Systems Division has been certified by TÜV Rheinland as a manufacturer of medical systems in compliance with ISO9001:2008 Quality Management Systems and ISO13485:2003 Medical Devices Quality Management Systems.

Remarks:

- Every value in this catalogue is a standard value, and it may vary a little from the actual at each site,
- The appearances and specifications are subject to change for reasons of improvement without notice
- Certain configurations may not be available pending regulatory clearance. Contact your Shimadzu representative for information on specific configurations.
- Before operating this system, you should first thoroughly review the Instruction Manual.