



OEC[®] 9900 Elite

Premium Digital Mobile C-arm Technical Data

- 1k² high resolution imaging technology on a mobile system.
- Featuring precision imaging Dynamic Range Management (DRM) for uncompromised image quality.
- Flat panel monitors on an articulating arm allow viewing of images from anywhere in the room.
- Simple user interface reduces procedure time to improve efficiency.
- Preset imaging profiles optimize I.Q. by enhancing features of interest.
- Dose optimization enabled with pulsed fluoro, low mA dose mode, Preview collimation, and dose rate display.
- Remote service connectivity.



X-ray System

Generator

- 60kHz high frequency
- 15kW power
- Up to 120kVp
- Up to 75mA for radiographic film exposure
- Continuous high level fluoro (HLF) up to 20mA
- Digital spot up to 75mA
- Digital cine pulse
 - 15 or 30 pulses per second, 60 Hz
 - 12 or 25 pulses per second, 50 Hz
 - Up to 150mA
 - 10ms pulse width
- Full power from standard wall outlet
- Patented battery buffered design

X-ray Tube

- Rotating anode X-ray tube
- 0.3 and 0.6 nominal focal spots
- Anode heat capacity: 300,000 HU
- Anode cooling rate: 85,000 HU/min.
- Housing heat capacity: 1,600,000 HU
- 9" (23cm) Standard C-arm housing cooling rate 15,000 HU/min.
- 9" (23cm) Super C-arm and 12" (31cm) standard C-arm housing cooling rate 22,500 HU/min.
- 9" (23cm) Cardiac Super C-arm and motorized (MD) C-arm housing cooling rate 31,000 HU/min.

Digital Image Rotation

- Digitally adjusts image display
- Automatic image update
 - Image rotation
 - Image reversal (side-to-side)
 - Image invert (top-to-bottom)
- Image positioning without additional exposure

PreView Collimator

- On-screen collimator position indication
- PreView iris collimator
- PreView Tungsten rotatable double leaf collimator
- Adjusts collimators without X-ray exposure

Fluoro Mode

- kVp range: 40 - 120
- mA range: 0.2 - 10 normal mode
1.0 - 20 HLF (high level fluoro)
- Auto and manual fluoro modes
- AutoTrak ABS varies mA, kVp, camera gain

Pulsed Fluoro Mode

- kVp range: 40 - 120
- mA range: 0.2 - 10
- Pulse rate: 1, 2, 4, 8
- Pulse width: 25 or 50ms
- AutoTrak ABS, mA, kVp, camera gain
- Reduces X-ray dose to patient and operator

High Level Pulsed Fluoro

- kVp range: 40 - 120
- mA range: 1 - 40
- Pulse rate: 1, 2, 4, 8
- Pulse width: 25 or 50ms
- AutoTrak ABS, mA, kVp, and camera gain

Digital Cine Pulse Mode

- kVp range: 40 - 120
- mA range: up to 150
- Pulse rate: 15 or 30pps 60 Hz, 12 or 25pps 50 Hz (cardiac and endovascular systems)
- Pulse width: 10ms
- AutoTrak ABS, mA, kVp, camera gain

Digital Spot Mode

- kVp range: 40 - 120
- mA range: Up to 75
- Automatic exposure termination and automatic image save

Radiographic Mode

- mA range: up to 75
- mAs range: up to 300
- Computer controlled exposure time
- Film cassette holder (Optional)
 - 10" x 12" (24cm x 30cm) for 9" I.I.
 - 14" x 14" (35cm x 35cm) for 12" I.I.

Video Imaging System

9" Image Intensifier

- Tri-mode 9"/6"/4.5" (23cm/15cm/11cm) image intensifier
- Minimum central resolution (at monitor):
 - 9" (23cm): 2.2 lp/mm
 - 6" (15cm): 3.0 lp/mm
 - 4.5" (11cm): 3.5 lp/mm
- DQE: 65% (typical)

12" Image Intensifier

- Tri-mode 12"/9"/6" (31cm/23cm/15cm) image intensifier
- Minimum central resolution (at monitor):
 - 12" (31cm): 1.6 lp/mm
 - 9" (23cm): 2.2 lp/mm
 - 6" (15cm): 2.6 lp/mm
- DQE: 65% (typical)

Precision imaging with Dynamic Range Management (DRM) enhances features of interest while attenuating background noise.

- Preset Imaging Profiles
 - 9800
 - General
 - Orthopedic
 - Spine
 - Cardiac
 - Vascular
 - Bolus Chase
 - Peripheral Vascular (PVAS)

AutoTrak

Automatic Brightness Stabilization (ABS)

- Automatically seeks the subject anatomy anywhere within the imaging field and selects the optimum imaging technique
- Automatically adjusts to anatomical size and location
- Provides uniform image quality throughout entire image
- Simplifies operation

Configurations

Image I.Q.

- Smart Window
 - Dynamically senses the collimator position and automatically adjusts brightness and contrast to produce high image quality
- Smart Metal
 - Allows user to adjust automatic brightness and contrast sensitivity levels to metal
 - Provides optimum image quality even when metal is introduced to the field
- Tungsten Collimator
 - Denser collimator limits X-ray exposure area
 - Reduces scatter radiation
 - Improves image detail

Video Camera

- High resolution 1k x 1k CCD camera
- Full frame capture
- Motorized rotation
- On-screen orientation indicator (real-time feedback without fluoro)
- Left-right image reversal
- Top-bottom image invert

Video Display

- Dual 19" (48cm) display anti-glare, LCD flat panel monitors mounted on an articulating arm
 - 22" horizontal travel
 - 7° up/10° down
 - Monitors viewable from all four sides of workstation
 - Horizontal and vertical viewing angle 170°
- 1200 CD/M² maximum brightness
- Touch screen system control
- 1280 x 1024 high resolution monitors
- Integrated color monitor for display of VGA, DVI, DVI-D, S-VHS, and SDI-SD formats

Video Display – TechView

- 10.4" (26.4cm) display, LCD flat panel monitor mounted on mainframe
 - 270° side/side rotation
 - 30° up/5° down tilt
 - Horizontal viewing angle 80°, Vertical viewing angle 70°
- 800 x 600 resolution monitor

GSP Platform

- 1k x 1k x 16 bit image processing
- Preset Imaging Profiles
 - 9800
 - General
 - Orthopedic
 - Spine
- Noise filter with on-screen indicator
- Minimal difference spatiotemporal noise filter (MDST)
- Real-time dynamic range management (DRM)
- Automatic digital brightness and contrast control
- Manual digital brightness and contrast control
- Negate mode
- Save and auto-save feature
- Swap and auto-swap feature
- Patient information
 - Examination list
 - Customized patient information
- Customize functions
 - Workstation set-up
 - Mainframe set-up
 - Patient information set-up
 - Date/time set-up
 - DICOM interface set-up
- Last image hold
- 63 image storage
- CD/DVD burner with DICOM viewer for displaying images on PC platforms
 - 512 x 512 or 1k x 1k
- Integrated DICOM interface (store, print, worklist, and query/retrieve)
- HIPAA SecureView
 - Password protection
 - Blank screen function
 - Delete all

ESP Platform

Includes all the GSP features and:

- 1000 image storage
- Zoom and roam function
- Image annotation
- Measurement software

PMCare Platform

Includes all the ESP features and:

- Real-time digital subtraction (DSA)
- Peak opacification
- 8fps Dynamic digital disk
 - Recording/playback rate: 1, 2, 4, 8fps
 - Recording time: 5 minutes @ 8fps
 - Automatic image playback
 - Frame-by-frame review

Basic Vascular Platform

Includes all the ESP features and:

- Peripheral Vascular preset imaging profile (PVAS)
- Vascular preset imaging profile
- Real-time digital subtraction angiography (DSA)
- Roadmapping
- Re-registration
- Variable landmarking
- Mask save/recall
- Peak opacification
- 8fps Dynamic digital disk
 - Recording/playback rate: 1, 2, 4, 8fps
 - Recording time: 5 minutes @ 8fps
 - Automatic image playback
 - Frame-by-frame review

Vascular 15 Platform

Includes all the Basic Vascular features plus:

- Digital cine pulse mode
 - 15 pulses/sec 60 Hz (12 pulses/sec 50 Hz)
 - Up to 150mA
 - 10ms pulse width
- 15fps Dynamic digital disk (60 Hz) 12fps (50 Hz)
 - Recording/playback rate: 1, 2, 4, 8, 15fps (60 Hz) 12fps (50 Hz)
 - Automatic image playback capability
 - Frame-by-frame review
 - Recording time: 10 minutes @ 15fps (60 Hz) 12 fps (50 Hz)

Vascular MTS Platform

Includes all the Vascular 15 features plus Motion Tolerant Subtraction (MTS) and:

- Bolus chase preset imaging profile
- Digital cine pulse mode
 - 30 pulses/sec 60 Hz (25 pulses/sec 50 Hz)
 - Up to 150mA
 - 10ms pulse width
- 30fps Dynamic digital disk 60 Hz (25fps, 50 Hz)
 - Recording/playback rate: 1, 2, 4, 8, 15, 30fps 60 Hz (1, 2, 4, 8, 12, 25, 50 Hz)
 - Recording time: 10 minutes @ 30fps 60 Hz (time depends on record frame rate) (25 fps, 50 Hz)

Cardiac Platform with Interventional Vascular Capability

Includes all the Vascular MTS features and:

- Cardiac preset imaging profile
- Single leaf curved collimator
- Three pedal footswitch

Additional Features

Motorized (Option) - 9" or 12" I.I.

- 9°/sec. Orbital motorized rotation
- 9°/sec. Lateral motorized rotation
- RUI (remote user interface)
 - Table side control panel
 - All 9900 mainframe controls
 - Image review functions
 - C-arm motion joystick control
 - Motorized vertical lift
- Contact/collision detection
- C-arm angle display - real-time and saved images
- Active X-ray tube cooling

Hardcopy Options

- Integrated film/paper printer
 - No film developing required
 - 8" x 10" (20.3cm x 25.5cm) laser quality film/paper
 - Multi-format, 1, 2, 4 on 1
 - Multi-copy capability
- Thermal printers
- Integrated DICOM interface (storage class/print class/query work-list)

User Interface

- Entire system is computer controlled and software upgradeable
- Touchscreen control simplifies operation
- Automated system operation requires minimum operator interface
- Multi-functional controls
 - Footswitch
 - IR remote (optional)
 - Hand-held control
- Simplified keyboard with integrated touchpad
- Multi-purpose image directory
 - Retrieve and review images
 - Compose hardcopy films
 - Copy images
- X-ray dose summary

Connectivity

- USB export with DICOM viewer for displaying images on PC platforms (Optional)
 - Web viewable, easy image portability to EMR or presentations
 - JPEG (compressed), BMP (high res) and AVI (Cine) formats
 - DICOM compatible
 - OEC compatible
 - Remove patient information setting
- Wireless DICOM connectivity (Optional)
 - IEEE 802.11 a/b/g/n
 - Support static IP and DHCP processing
 - Dual Band (2.4GHz and 5GHz)
 - Security methods: WEP-64, WEP-128, WPA-PSK(TKIP), WPA2-PSK (AES-CCMP), PEAP:EAP-MS-CHAPv2
 - Internal firewall
- Printers: Integrated film/paper/thermal (optional)

Uninterruptible Power

- Orderly shutdown

Regulatory Compliance

- U.S. 21 CFR Subchapter J
- NFPA 99
- UL 60601-1 (CSA/NRTL)
- IEC60601-1 (plus relevant Collateral and Particular Standards)

OEC 9900 Elite C-arm Options

The OEC 9900 Elite is available in a number of configurations, allowing you to select the product features that best meet your clinical needs:



Standard C 9" (23cm) I.I.



Standard C 12" (31cm) I.I.



Super C 9" (23cm) I.I.

Orthopedics, General Surgery and Pain Management

9900 GSP

9900 ESP

- For orthopedics, general surgery, GI, pain management and other general applications.

Endovascular and Pain Management

9900 Basic Vascular 8fps

9900 PMCare 8fps

9900 Vascular 15fps (12fps @ 50 Hz)

9900 Vascular MTS 30fps (25fps @ 50 Hz)

- For vascular surgery and interventional vascular applications.
- 12/9/6" (31/23/15cm) tri-mode image intensifier: A larger field of view than our standard 9/6/4.5" (23/15/10cm) image intensifier, for many vascular applications or wherever a larger field of view is required.

Cardiac Surgery and Mobile Cardiac Cath/EP Lab

9900 Cardiac 30fps (25fps @ 50 Hz)

- For complex coronary, peripheral or abdominal angiography.
- C design: Larger than our standard C, the design provides greater clearance and greater range of overscan for the oblique angulations required in both cardiac and spine work 9" (23 cm) I.I. only.

9900 MD C-arm

- 9°/sec. Lateral motorized rotation
- 9" (23cm) I.I., 12" (31cm) I.I.
- RUI (remote user interface)
 - Table side control panel
 - All 9900 mainframe controls
 - Image review functions
 - C-arm motion joystick control
 - Motorized vertical lift
- Contact/collision detection
- C-arm angle display - realtime and saved images.
- Enhanced X-ray tube housing cooling system.



Motorized C-arm 9" (23cm) I.I.



Motorized C-arm 12" (31cm) I.I.

System configuration options

Description	GSP	ESP	PMCare 8fps	Basic 8fps Vascular	Vascular 15fps	Vascular (MITS) 30fps	Cardiac 30fps
Standard C-arm Assembly with 9"/6"/4.5" (23/15/11cm) I.I.	■	■	■	■	■		
Standard C-arm Assembly with 12"/9"/6" (31/23/15cm) I.I.	■	■	■	■	■	■	
Super C-arm Assembly with 9"/6"/4.5" (23/15/11cm) I.I.	■	■	■	■	■		■
Motorized C-arm Assembly with 9"/6"/4.5" (23/15/11cm) I.I.							■
Motorized C-arm Assembly with 12"/9"/6" (31/23/15cm) I.I.						■	
Rotating Anode X-ray Tube	●	●	●	●	●	●	●
Tungsten Dual-Leaf Collimator	●	●	●	●	●	●	●
Iris Collimator	●	●	●	●	●	●	●
Single-Leaf Curved Collimator							●
Pulsed Fluoro (up to 8pps)	●	●	●	●	●	●	●
Digital Subtraction Angiography (DSA)			●	●	●	●	●
Roadmapping				●	●	●	●
Peak Opacification			●	●	●	●	●
Re-Registration (Pixel Shift)				●	●	●	●
Variable Landmark				●	●	●	●
Digital Cine Pulse (15pps, Up to 150mA 60 Hz) (12pps, Up to 150mA 50 Hz)					●	●	●
Digital Cine Pulse (30pps, Up to 150mA 60 Hz) (25pps, Up to 150mA 50 Hz)						●	●
Digital Spot	●	●	●	●	●	●	●
High Level Pulsed Fluoro (Up to 40mA)	●	●	●	●	●	●	●
Radiographic Film Mode	●	●	●	●	●	●	●
9800 Preset Imaging Profile	●	●	●	●	●	●	●
General Preset Imaging Profile	●	●	●	●	●	●	●
Orthopedic Preset Imaging Profile	●	●	●	●	●	●	●
Spine Preset Imaging Profile	●	●	●	●	●	●	●
Vascular Preset Imaging Profile				●	●	●	●
Bolus Chase Preset Imaging Profile						●	●
Cardiac Preset Imaging Profile							●
Peripheral Vascular Preset Imaging Profile (PVAS)				●	●	●	●
1k x 1k x 16 Bit Image Processing	●	●	●	●	●	●	●
Image I.Q. (Smart Window/Smart Metal)	●	●	●	●	●	●	●
Measurement Software		●	●	●	●	●	●
Digital Image Rotation	●	●	●	●	●	●	●
Noise Filtering (Averaging)	●	●	●	●	●	●	●
Minimal Difference Spatiotemporal Noise Filter	●	●	●	●	●	●	●
Digital Zoom & Roam		●	●	●	●	●	●
Real-Time Dynamic Range Management (DRM)	●	●	●	●	●	●	●
Image Annotation Function		●	●	●	●	●	●
Multi-Purpose Image Directory	●	●	●	●	●	●	●
X-ray Summary	●	●	●	●	●	●	●
Static Image Storage	63	1000	1000	1000	1000	1000	1000
8fps Dynamic Disk			●	●			
15fps Dynamic Disk (60 Hz) 12fps Dynamic Disk (50 Hz)					●	●	●
30fps Dynamic Disk (60 Hz) 25fps Dynamic Disk (50 Hz)						●	●
TechView (US) (not available on MD systems)	●	●	●	●	●	●	●
TechView (International) (not available on MD systems)	■	■	■	■	■	■	■
Integrated Ultrasound (not available outside the United States)	■	■	■	■	■	■	
9" I.I. (23cm) Laser Aimer/Image Localizer (not available with Motorized C-arm)	■	■	■	■	■	■	■
12" I.I. (31cm) Laser Aimer/Image Localizer (not available with Motorized C-arm)	■	■	■	■	■	■	
IR Remote Control		■	■	■	■	■	■
Integrated CD/DVD burner with DICOM Viewer	●	●	●	●	●	●	●
Integrated DICOM Interface (store, print, worklist query)**	●	●	●	●	●	●	●
Wireless DICOM/USB Connectivity	■	■	■	■	■	■	■
Two Pedal Footswitch	●	●	●	●	●	●	●
Three Pedal Footswitch							●
Hand Control	●	●	●	●	●	●	●
MedRad/Nemoto Injector Interface Capability*			■	■	■	■	■
Room-In-Use Indicator Interface	●	●	●	●	●	●	●
HIPAA SecureView	●	●	●	●	●	●	●
Sony Thermal Hardcopy Printers*	■	■	■	■	■	■	■

*Contact your sales representative for specific model options.

**DICOM options vary outside the United States.

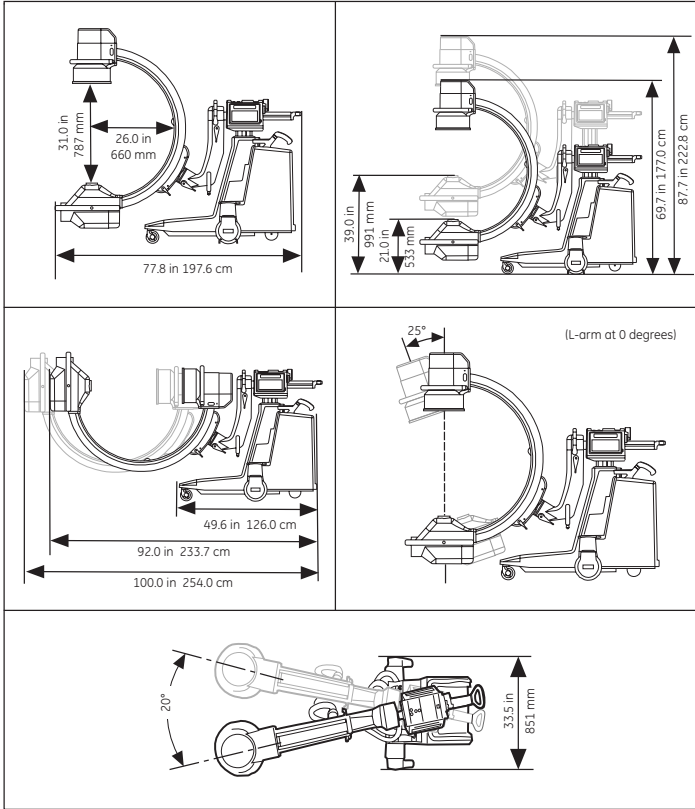
● = Standard feature ■ = Optional feature Blank = Feature not available

Physical Specifications

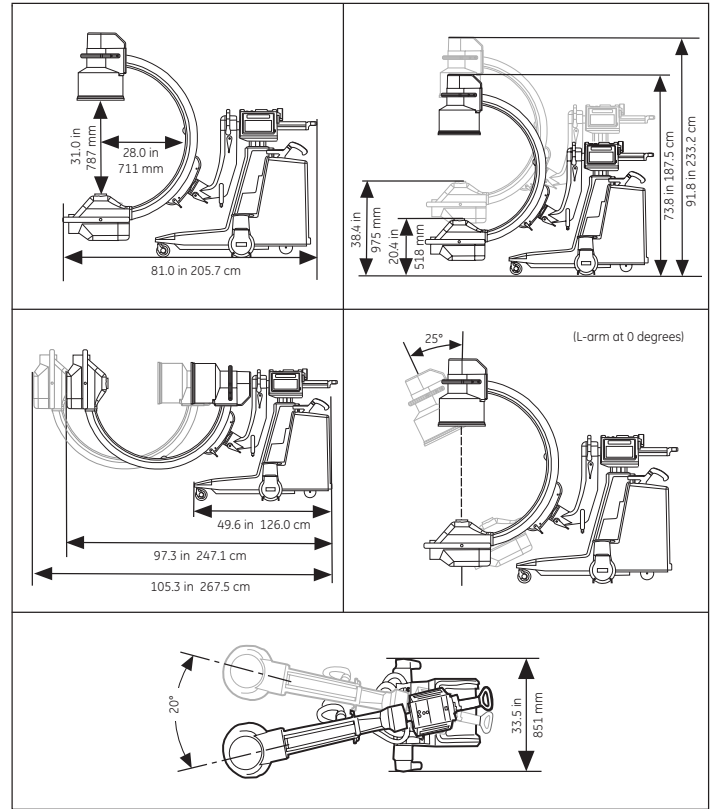
	9" I.I. (23cm)	12" I.I. (31cm)	Super C 9" I.I. (23cm)	Motorized C-arm 9" I.I. (23cm)	Motorized C-arm 12" I.I. (31cm)
Mainframe ⁽¹⁾					
System length	77.8 in (197.6 cm)	81.0 in (205.7 cm)	80.1 in (203.5 cm)	80.1 in (203.5 cm)	83.0 in (210.8 cm)
System height	69.7 in (177.0 cm)	73.8 in (187.5 cm)	71.7 in (182.1 cm)	71.3 in (181 cm)	73.4 in (186.4 cm)
System width	33.5 in (851 mm)	33.5 in (851 mm)	33.5 in (851 mm)	33.5 in (851 mm)	33.5 in (851 mm)
Weight	610 lbs (277 kg)	660 lbs (299 kg)	630 lbs (286 kg)	661 lbs (300 kg)	702 lbs (318 kg)
C-arm					
SID	39.4 in (100.1 cm)	39.4 in (100.1 cm)	39.0 in (991 mm)	39.0 in (991 mm)	39.0 in (991 mm)
Free space in arc	31.0 in (787 mm)	31.0 in (787 mm)	31.0 in (787 mm)	31.0 in (787 mm)	31.0 in (787 mm)
Depth in arc	26.0 in (660 mm)	28.0 in (711 mm)	33.0 in (838 mm)	33.0 in (838 mm)	33.0 in (838 mm)
Orbital rotation	115° (90°/25°)	120° (90°/30°)	145° (90°/55°)	141° (89°/52°)	122° (87°/35°)
Lateral rotation	270° (180°/90°)	270° (180°/90°)	360° (270°/90°)	360° (90°/270°)	360° (90°/270°)
Flip/flop	180°/90°	180°/90°	N/A	N/A	N/A
Wig/wag	20°	20°	20°	N/A	N/A
Horizontal travel	8.0 in (203 mm)	8.0 in (203 mm)	8.0 in (203 mm)	8.0 in (203 mm)	4.0 in (102 mm)
Vertical travel	18.0 in (457 mm)	18.0 in (457 mm)	18.0 in (457 mm)	15.0 in (381 mm)	15.0 in (381 mm)
Workstation ⁽¹⁾					
Height	69.0 in (175.3 cm)	69.0 in (175.3 cm)	69.0 in (175.3 cm)	69.0 in (175.3 cm)	69.0 in (175.3 cm)
Width	38.0 in (96.5 cm)	38.0 in (96.5 cm)	38.0 in (96.5 cm)	38.0 in (96.5 cm)	38.0 in (96.5 cm)
Depth	27.3 in (693 mm)	27.3 in (693 mm)	27.3 in (693 mm)	27.3 in (693 mm)	27.3 in (693 mm)
Weight	530 lbs (240 kg)	530 lbs (240 kg)	530 lbs (240 kg)	530 lbs (240 kg)	530 lbs (240 kg)
Operating Range					
Temperature	10° to 35°C	10° to 35°C	10° to 35°C	10° to 35°C	10° to 35°C
Humidity	20% - 80%	20% - 80%	20% - 80%	20% - 80%	20% - 80%
Electrical Service					
100V	20 A	20 A	20 A ⁽²⁾	N/A	N/A
120V	12 A	12 A	12/ 16 A ⁽³⁾	16 A	16 A
200V	N/A	N/A	10 A	10 A	10 A
220V, 230V, 240V	10 A	10 A	10 A	10 A	10 A

⁽¹⁾ System in transport position. ⁽²⁾ Without active cooling. ⁽³⁾ 16 A Service required for active cooling.

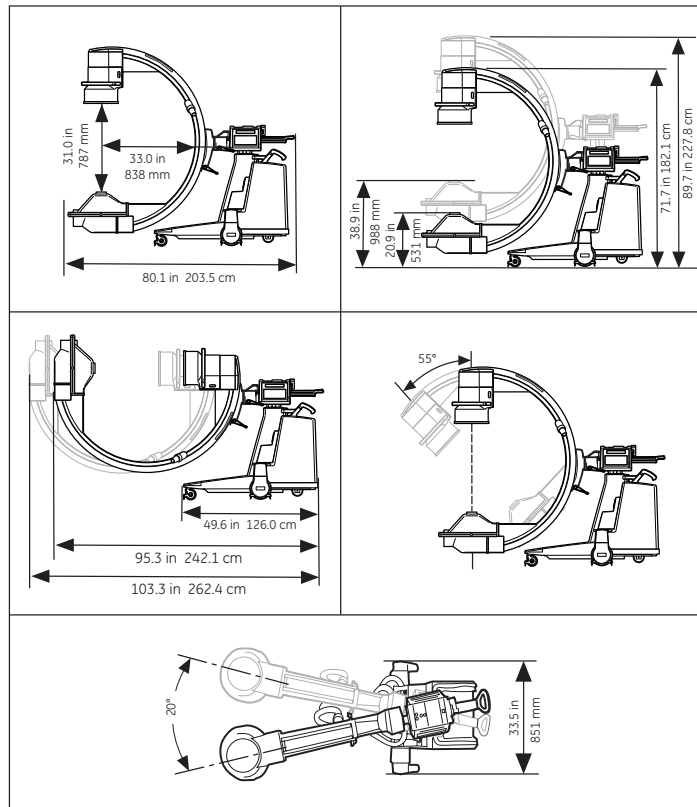
Mobile C-arm (9", 23cm I.I.)



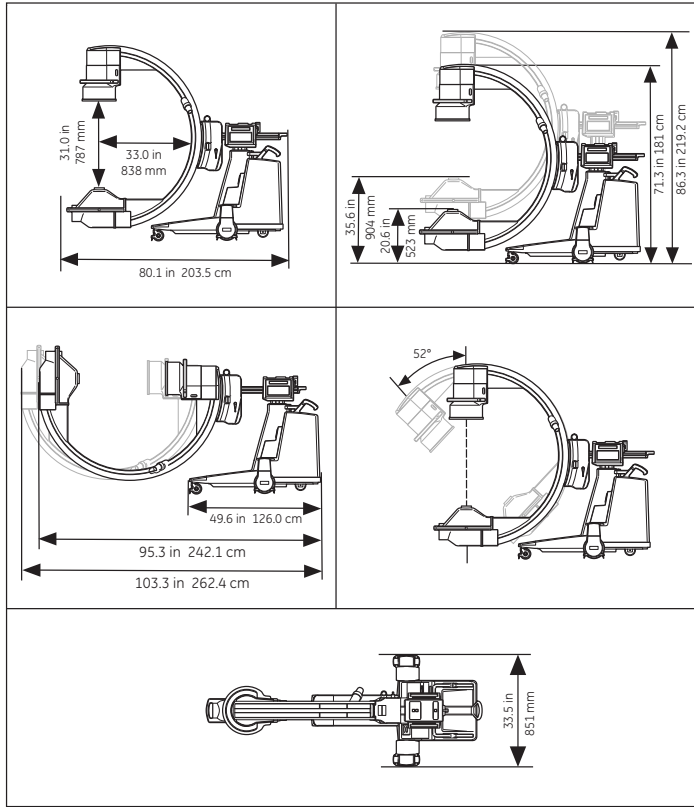
Mobile C-arm (12", 31cm I.I.)



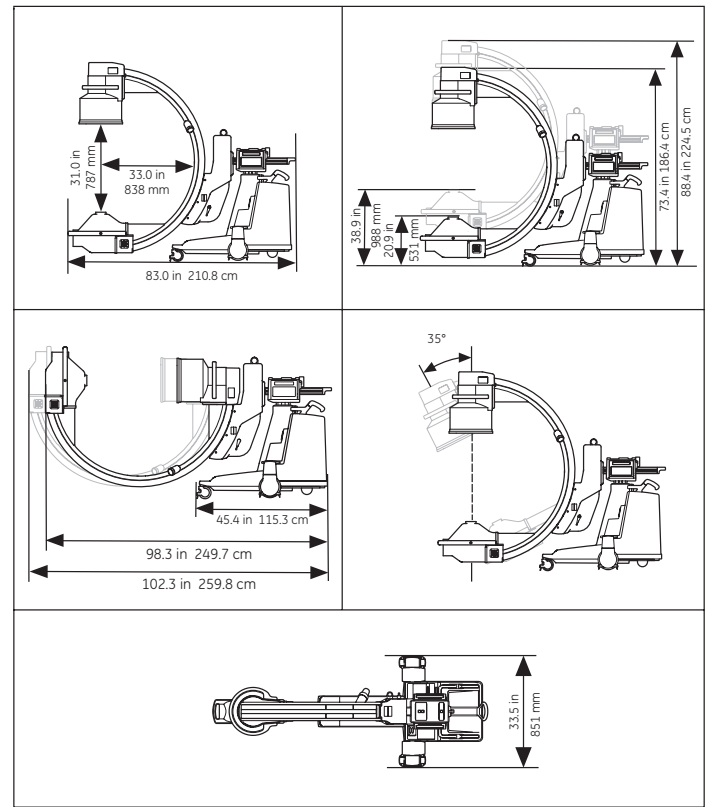
Super C-arm (9", 23cm I.I.)



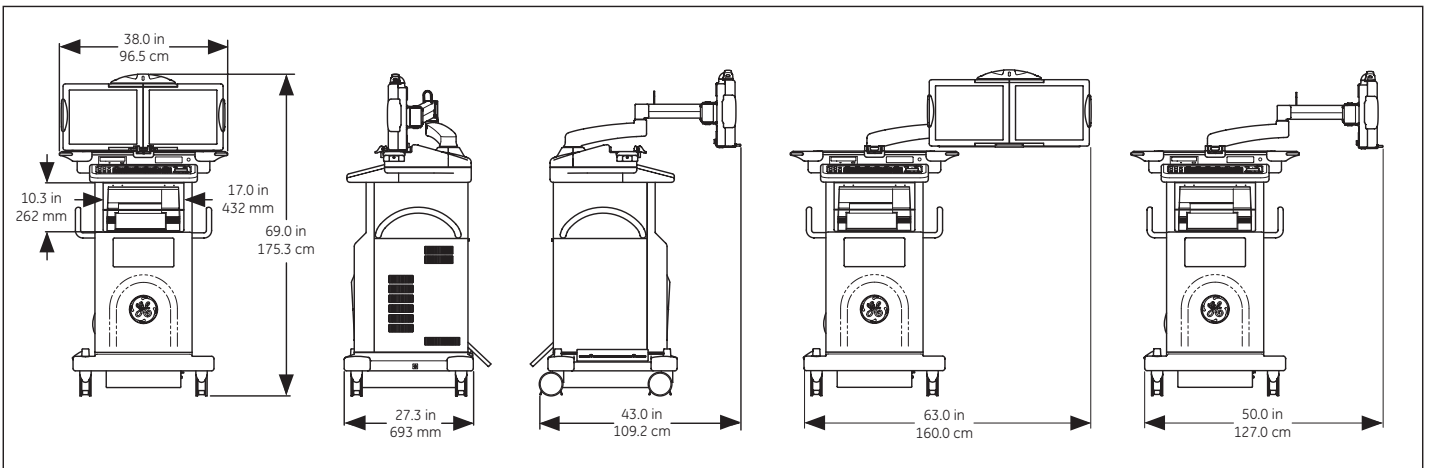
Motorized C-arm (9", 23cm I.I.)



Motorized C-arm (12", 31cm I.I.)



Workstation



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