DRTECH **Technical Specification**

Mobile C-arm X-ray System

EXTRON 7

INTRODUCTION

EXTRON 7 is a premium C-arm system designed to provide superb image quality at low-dose and make surgical imaging easier for physicians and technicians. This fully digitalized system offers fast and effortless patient positioning with its large C-arc and offers features that increase the workflow with optimized user interface to provide value to any operating room settings.



FEATURES

- **Ultimate Low-Dose Digital C-arm System**
  Low-dose, high-performance surgical imaging system with proven detector and industry leading low dose technology reducing unnecessary radiation exposure for physicians, operators and patients.

- **RNR, Real-time Noise Reduction Imaging Technology**
  Real-time motion and non-motion region analysis enables optimal image processing, delivering high-quality low noise images with up to 30% higher SNR.

- **User Friendly Design**
  EXTRON's user-friendly and usability focused design for convenient and effective surgical setting

- **Improved Workflow, Enhanced Productivity**
  Equipped with practical functions that help reduce surgery time and maximize user convenience.

- **Reinforced Safety**
  Ensures safety in a OR against unexpected system error with RAID 1st [OPTION] class storage, Emergency Radiography and Mirroring System.

SYSTEM CONFIGURATION

Standard Configuration

Unit	Model Name	Remarks
C-arm System	**EXTRON 7**	◆ C-arm Unit ◆ Monitor cart ◆ Digital Imaging System ◆ 30x30 Dynamic Flat Panel Detector ◆ 43” 4K Monitor (700cd/m^2) ◆ Green Laser guide in horizontal and vertical directions ◆ Wireless 4-button Foot Switch ◆ Hand Switch ◆ Air Kerma ◆ Virtual Collimator ◆ Emergency Radioscopy (IEC 60601-2-43 (A2:2019)) ◆ Manuals (Service, Installation, User) ◆ XConsole Imaging SW

Option

Unit
◆ 31.5” 4K Medical Monitor (800cd/m^2) ◆ Wired 4-button Foot Switch (Additional Purchase Only) ◆ RAID 1st class storage ◆ Thermal Printer (UP-D897MD) ◆ D.S.A (Digital Subtraction Angiography) ◆ D.A.P (Dose Area Product)

System Power Requirements

Line Voltage/Input Power	120-127 VAC 50/60Hz, 20A(Momentary),5A(Stand-by) 220-230 VAC 50/60Hz, 16A(Momentary), 3A(Stand-by)
Line Phase	Single Phase
Line Cord	7M

Grounding Requirements

Grounding must be provided in compliance with all applicable legal requirements for medically used electrical equipment.

Ambient Conditions

Operation:

Ambient Temperature	10℃~35℃ (for main equipment only)
Relative Humidity	35~75%
Atmospheric pressure	800~1060hPa

Transportation & Storage:

Ambient Temperature	-10℃~50℃ (for main equipment only)
Relative Humidity	10~85%
Atmospheric pressure	700~1060hPa

COMPLIANCE:

- IEC 60601-1
- IEC 60601-1-3
- IEC 60601-1-6
- IEC 60601-2-28 :
- IEC 60601-2-43
- IEC 60601-2-54
- IEC 60601-1-2

PRODUCT SPECIFICATION:

X-ray Generator:

Type		High frequency
Power output (kW)		15kW @ 220VAC
Input line voltage		220 – 230 VAC single phase
Input line frequency		50/60 Hz
Inverting frequency		40kHz
Fluoroscopy Mode		
Continuous	**kV Range**	40 – 120kV
	mA Range	0.2 – 10mA, 20mA, 30mA
	Frame Rate	Continuous – Max. 30 frames
Snapshot	**kV Range**	40 -120kV
	mA Range	6mA (fixed)
Pulsed Mode		
Pulse	**kV Range**	40 – 120kV
	mA Range	0.5 – 10mA
	Pulse Rate	Rate: 1, 2, 4, 8, 15, 30 pulses/sec.
Boost	**kV Range**	40 – 120kV
	mA Range	Boost – 20: 20mA (fixed)
		Boost – 40: 40mA (fixed)
		Boost – 60: 60mA (fixed)
	Pulse Rate	Rate: 15 pulses/sec

Radiography Mode	
kV Range	40 – 120kV
mA Range	40mA, 100mA, 150mA
mAs Range	0.28 – 160mA
Exposure time	0.006 – 4.0 sec
ABC (Auto Brightness Control)	
kV Range	40 – 120kV
mA Range	0.2 – 6.0mA (20, 40, 60mA @ Boost)

X-ray Monoblock:

X-ray tube	Rotating anode
Target angle	10
X-ray tube voltage	40 – 120kV
Focal spot	0.3 / 0.6mm (IEC60336 Ed.4)
Anode speed	50Hz: 3,000 rpm 60Hz: 3,600 rpm
Radiation protection	Leakage Technique Factor : 120kV, 3mA
Cooling method	Natural or forced air
Anode heat contents	225kJ (300kHU)
Anode heat dissipation rate	75,600 HU/min
Available thermal capacity (RX)	600kJ
Total thermal capacity	910kJ
Weight	21.5kg
Minimum inherent filtration	1.4mm Al @ 75kV
Additional Filtration	4.0mm Al + 0.1mm Cu
Total Filtration	5.4mm Al + 0.1mm Cu

ESU (Energy Storage Unit):

Type	Capacitor bank
Max load output power	20kW (200mA @ 100kV 0,1 S)
Input power supply	Single Phase 230Vac 50/60Hz
Rated input max power	6,900VA (max. 30A @ 230V)
Max. current protection breakers	Un = 230VAC F1:16A 400VAC aM 20kA
Output power supply	365VDC max 30A
Weight	15.7kg

Detector:

Standard	
Panel	IGZO TFT
Scintillator	CsI (Cesium Iodide)
Effective Active Area	303.1 x 303.1mm
Resolution	2,048 x 2,048 pixels
Pixel Pitch	148um
A/D Conversion	16 bit

Energy Range	40-160kVp
DQE	0 lp/mm – 78% 0.5 lp/mm – 73%
MTF	0 lp/mm – 100% 1.0 lp/mm – 61%
Max Frame Rate	90
Power Consumption	15W

Grid:

Standard	
Size	324 x 324mm
Grid Line	200 L/inch
Ratio	8:1
Focus Distance	100cm
Option	
Size	246 x 246mm
Grid Line	200 L/inch
Ratio	8:1
Focus Distance	100cm

Monitor:

Standard	
Size	43”
Panel Technology	IPS
Native Resolution	3,840 x 2,160
Brightness (Typ,. Nit)	700cd/ m^2 (Typ.)
Contrast Ratio	1,200:1
Viewing Angle (H x V)	178° Typ.
Response Time	8 ms (G to G)
Power Consumption	105W max
Weight	11.2 kg
Fixed monitor arm	Straight type
Medical Monitor (Option)	
Size	31.5”
Panel Technology	IPS
Native Resolution	3,840 x 2,160
Brightness (Typ,. Nit)	800cd/ m^2 (Typ.)
Contrast Ratio	1,700:1
Viewing Angle (H x V)	178° Typ.
Response Time	9.5 ms (G to G)
Power Consumption	160W max
Weight	13 kg
Dual hinge monitor arm	2-way

X Console PC Requirements:

CPU	Intel i7-12700K
RAM	16GB
HDD	SSD 250
Operating System	Window 10 IoT
Power Supply	FSP HYPER K 700W

X Console OP:

CPU	Intel Apollo Laske N4200 Quad core, Up to 2.50GHz
RAM	SO-DIMM DDR3 4G X 2EA
HDD	M.2 2242 128GB 3D TLC
LAN Card	Windows 10 IoT Enterprise Entry LTSC 2019
Display Panel	a-Si Touchscreen TFT – LCD, LCM
Display Size	15.6 inch
Resolution	1,920 (H) x 1,080 (V)
Brightness (Typ., nit)	400cd/ m^2 (Typ.)
Contrast Ratio	800:1
Power Supply	12V DC

Footswitch:

Wired(Option)	
Type	Micro switch
Button	2 pedal, 2 button
Wireless	N/A
Degree of Protection	IPX8 to IEC/EN 60529
Applied Standards	IEC 60601-1: ANSI/AAMI ES60601-1: IEC 60529
Pedal	Shock-proof thermoplastic, UL 94, V-0/V-2
Housing	Shock-proof thermoplastic UL 94, V-0, RAL 7035
Wireless	
Type	Micro switch
Button	2 pedal, 2 button
Degree of Protection	IPX8 to IEC/EN 60529
Applied Standards	IEC 60601-1: ANSI/AAMI ES60601-1: IEC 60529
Pedal	Shock-proof thermoplastic, UL 94, V-0/V-2
Housing	Shock-proof thermoplastic UL 94, V-0, RAL 7035
Voltage Supply	3 commercially available batteries, Type C (LR 14)
Antenna	Internal Antenna
Frequency	2.4 – 2.4835 GHa
Channel Bandwidth	2MHz
Modulation Principle	GFSK, adaptive frequency, hopping of 40 channels
HF data rate	1Mbps
Interface data rate	115.2 kBd (UART)

Memory Position:

Horizontal Movement	200mm (Display in 1cm increments)
Vertical Movement	500mm (Display in 1cm increments)
Pivot Rotation	470˚ (±235˚) (Display in 1degree increments)
Orbital Rotation	165 ˚ (±120˚~-45˚) (Display in 1 degree increments)
Pre-Set Memory	3 Positions
Save State	Yes

Thermal Print (Option):

Print	SONY UP-D898MD
Power Requirements	100 to 240V AC, 50/60Hz
Input Current	1.3A to 0.6A
Pixels (Maximum)	4,096 x 1,280 dots
Image size (Maximum)	320 x 100mm
Dimensions (W/H/D)	154 x 88 x 240mm
Weight	2.5kg

Image Processing:

Image Processing	RNR (Motion Detection)
	ABC (Auto Brightness Control) [Object Detection]
	ABM (Auto Brightness Memory)
	Auto Pixel Stretch
	LUT
	Metal Detection
	Needle Enhancement
	Noise Reduction Filter
	Edge Enhancement Filter
	Profile
Digital Imaging System (DIS)	DIS Program
	PACS (DICOM 3.0)
	CD/DVD Burn
	Patient Management
	Image W/L
	LIH, Image Rotate

Digital Subtraction Angiography (DSA) [option]:

Angiography Package	Digital Subtraction Angiography (DSA)
	Roadmap (RSA)
	Re-mask
	Manual Pixel Shift
	Max. Peak Opacification (MSA)
	Landmark
Frame Rate	Max. 30 frames/ sec
Total DSA Time	Unlimited
Total Frame	Unlimited

Cine Extract	Yes
Output	DICOM (Cine) MP4 (Cine)

Dose Area Product (DAP Option):

Product	VacuDAP-C
Standard Calibration Response	960pC/ uGy m^2
Leakage Current	≤ 0.1pA
Quality Equivalent Filtration	0.3 mm Al(@70KV)
Active Area	1 Ø (8 ... 70) mm
Chamber voltage	300 V
Dose Area Product	0.01 uGy/m^2
Dose Area Product Rate	0.01 uGy/m^2
Irradiation time	0.001s
Ionization Chamber Weight	55g
Electronics Weight	135g

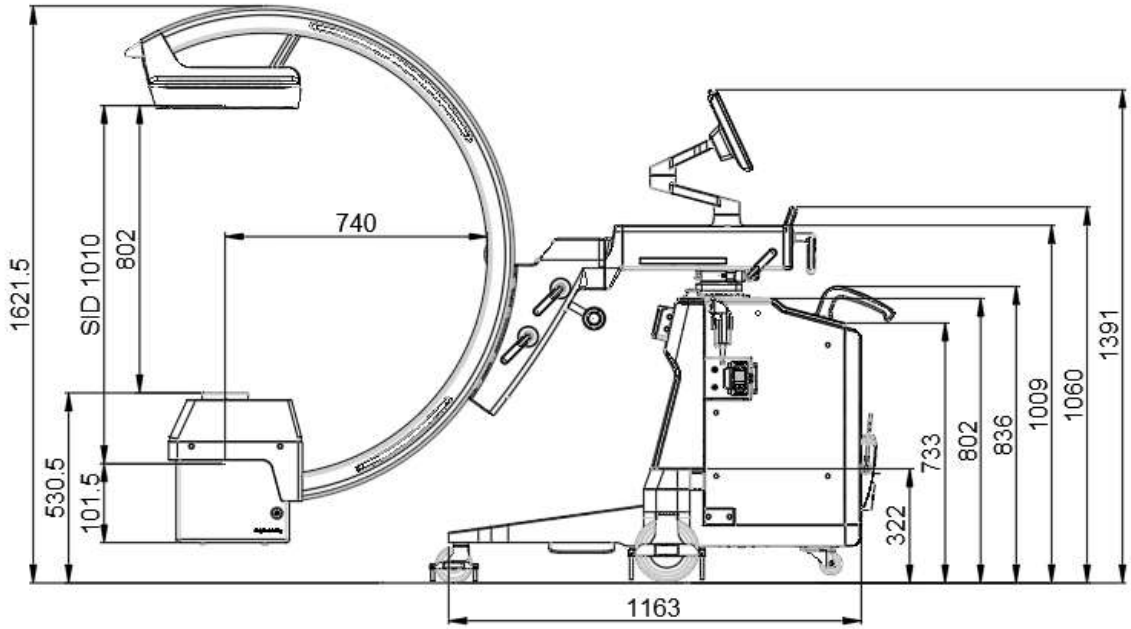
Radiation Safety:

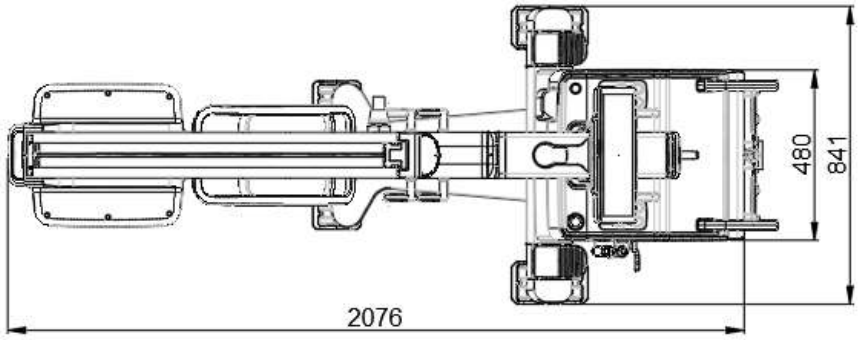
Collimator	Iris Collimator
	4 Leaf Collimator
	Leaf Rotation
	Virtual Collimator
Laser Guide	Green Laser (Class 2)
	At Tube (Tube to detector side)
	At Detector (Detector to Tube side)
Dose Report	Air-Kerma
	DAP

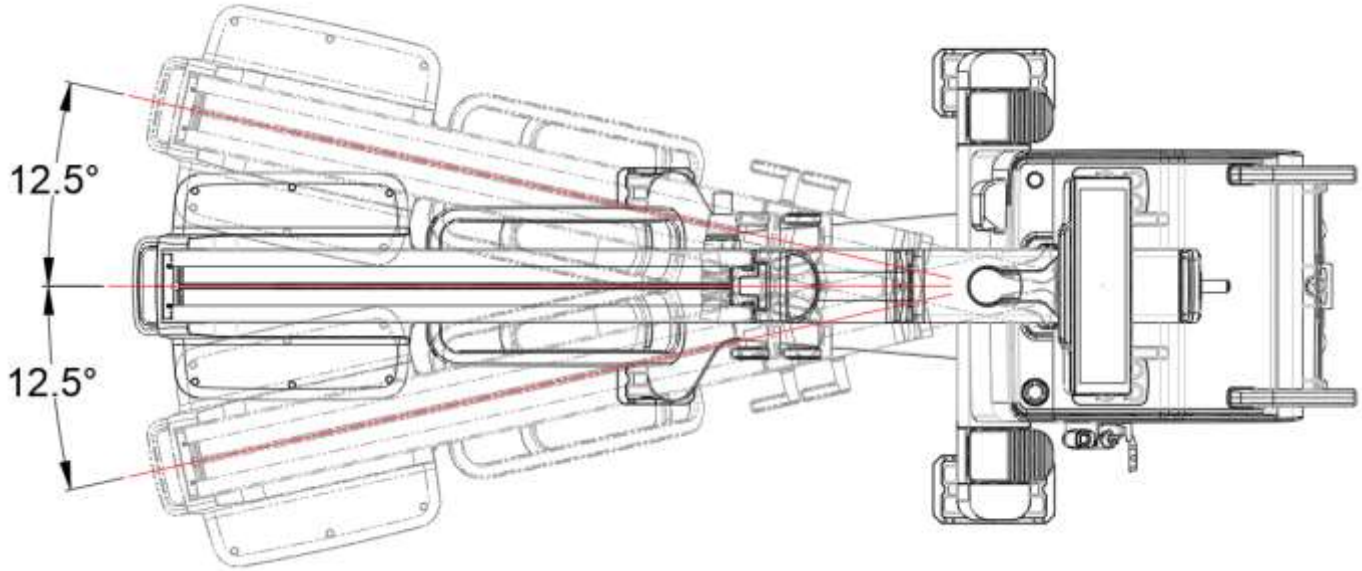
C-arm:

SID	1,010mm
Orbital Rotation	165 ˚ (+120 ˚/-45 ˚)
Free Space	802mm
Arc depth	740mm
Horizontal Movement	200mm
Vertical Movement	500mm
Vertical Movement Speed	25mm/sec
Panning Movement	± 12.5˚
Panning distance	± 268.8 mm (@ Center of the detector)
Pivot Rotation (C-arm rotation)	± 235˚
Reverse Position	Yes

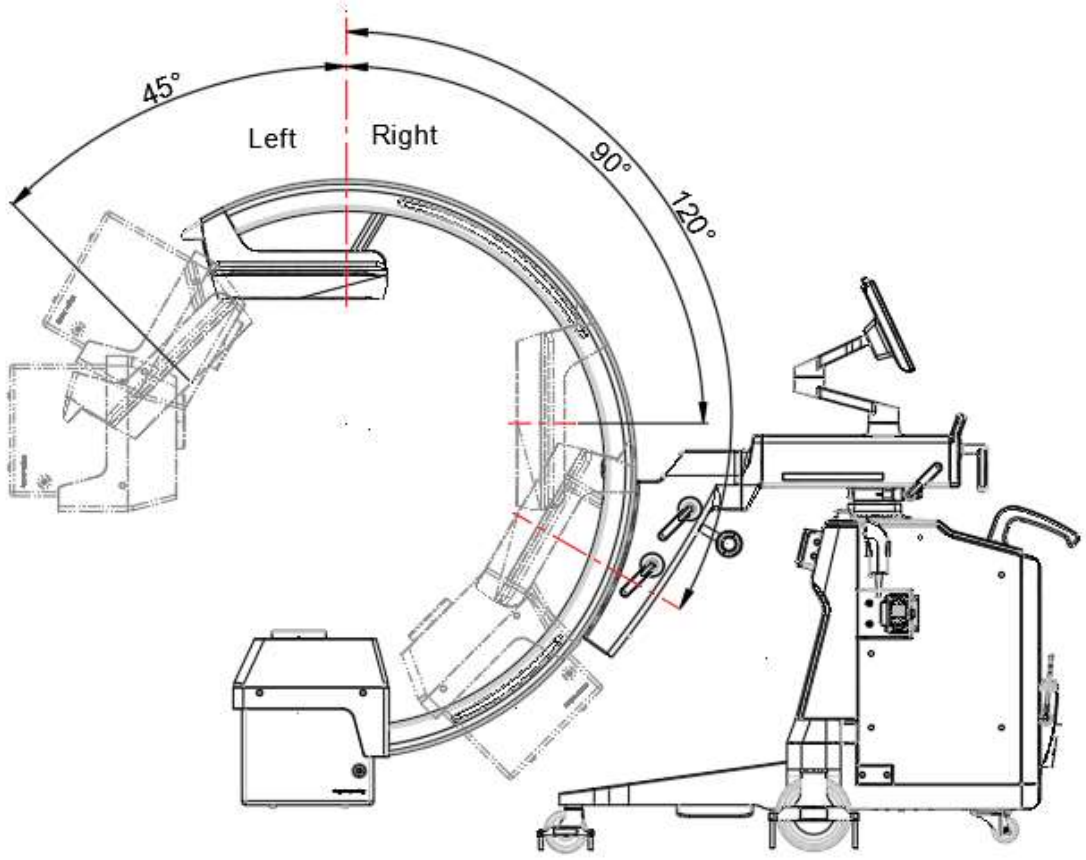
Outline Drawings



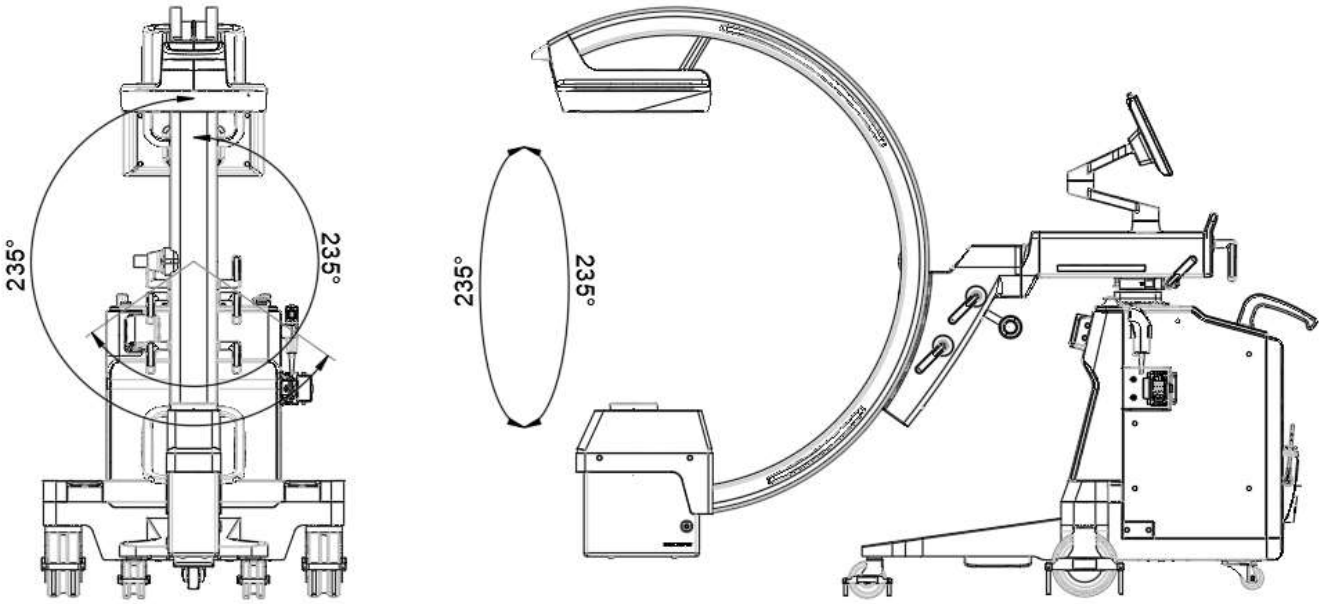




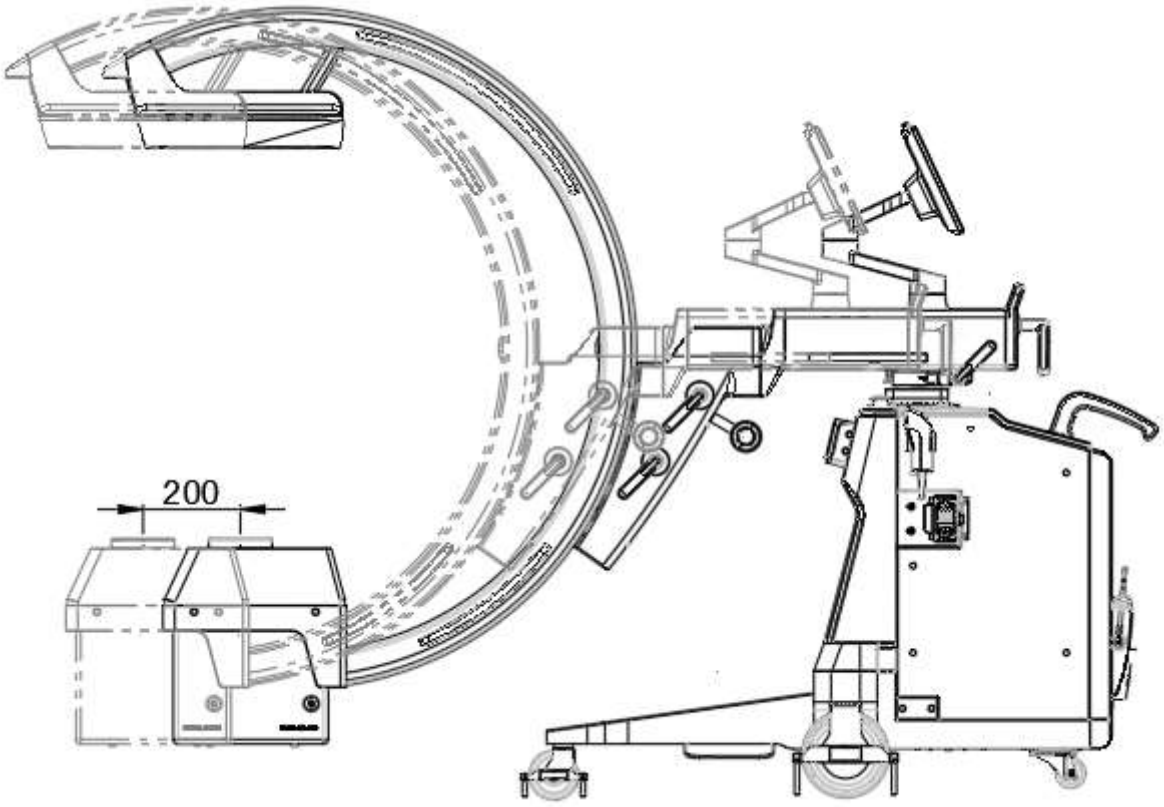
Panning motion (±12.5˚)



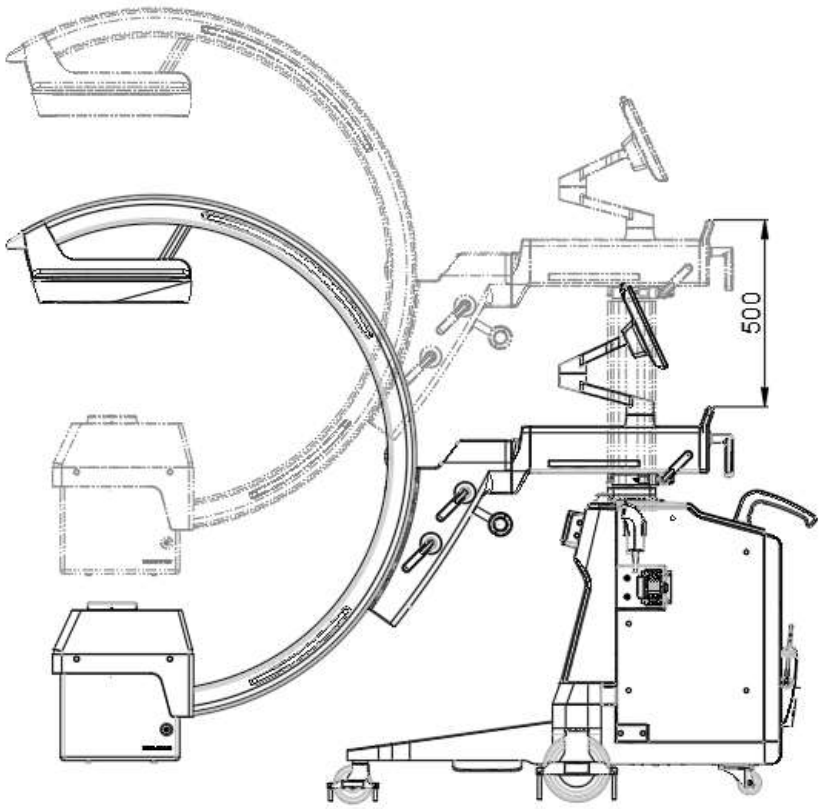
Orbital Rotation 165˚ (+120˚~-45˚)



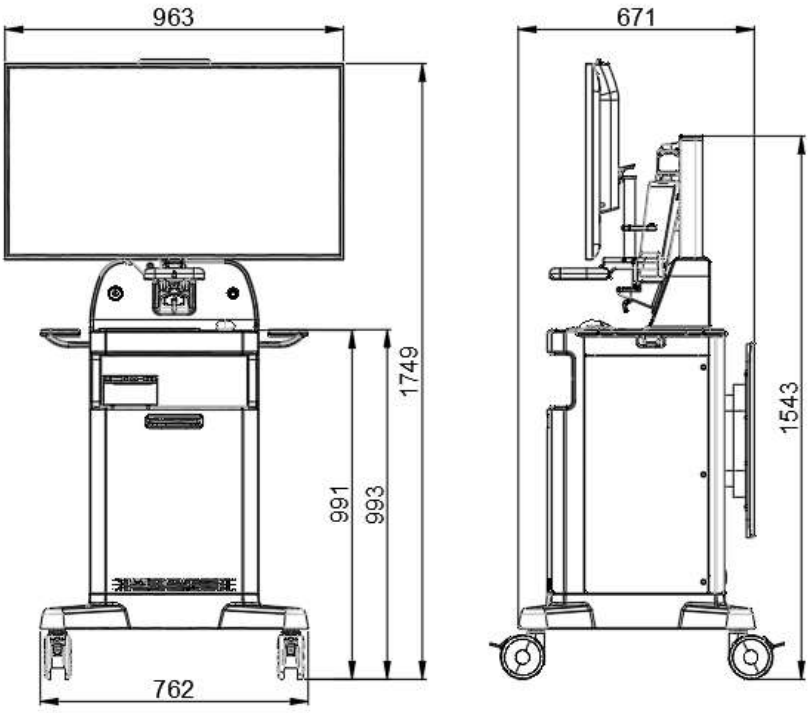
Pivot Rotating (±235˚)



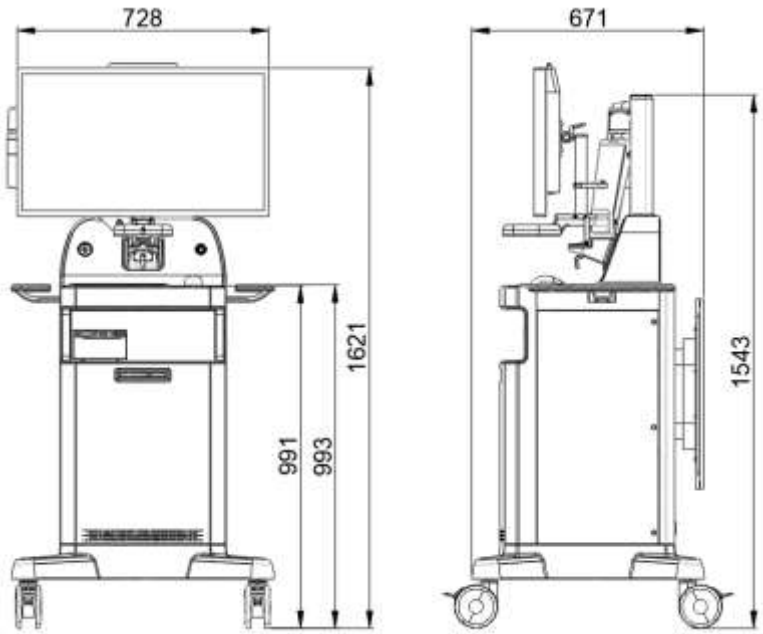
Horizontal movement (200mm)



Vertical movement (500mm)



43 inch Monitor



31.5 inch Monitor

DRTECH Corp.

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