PHILIPS

Image guided therapy

Zenition 50 Series

Mobile C-arms

Philips Zenition 50 Series

Specifications

Point and shoot simplicity and reliable uptime make the Zenition 50 Series, the ideal image-intensifier-based systems for intensive use in interventions and surgeries. The Zenition harmonized range of systems opens new opportunities for you to reduce operational costs, simplify use and streamline fleet management. All systems offer the same intuitive control and handling for every user. Every Zenition system shares a standard Windows® platform and is ready to embrace new clinical applications and service and support technologies as they evolve. The Technology Maximizer program helps you manage upgrade costs for years to come.

Contents

1 Image Intensifier

Zenition 50 Series with 9" image intensifier

Zenition 50 Series with 12" image intensifier

Specifications	9" image intensifier	12" image intensifier
Image intensifier	The Zenition 50 Series comes with a 9" image intensifier and can go wherever you need it - surgery, intensive care and the emergency room.	The Zenition 50 Series comes with a 12" image intensifier and can go wherever you need it - surgery, intensive care and the emergency room.
Image intensifier type	Triple-mode HRC	Triple-mode
Nominal II formats	23, 17, and 13 cm (9", 7", and 5")	31, 23, and 17 cm (12", 9", and 7")
Grid type	Focused Grid, Circular, Carbon fibre cover; 60 lines/cm Ratio = 1:10 SID = 100 cm	Focused Grid, Circular, Carbon fibre cover; 60 lines/cm Ratio = 1:10 SID = 100 cm
TV camera type	CCD; high-resolution 1 k2	CCD; high-resolution 1 k2
Image rotation	Digital, live and on LIH	Digital, live and on LIH
Image reversal	Yes	Yes
Mirror up/down	Digital, live and on LIH	Digital, live and on LIH
Mirror left/right	Digital, live and on LIH	Digital, live and on LIH
Automatic anatomical measuring field	Yes with 'BodySmart' and 'MetalSmart'	Yes with 'BodySmart' and 'MetalSmart'
Add central resolution in all magnifications	Typical central visual resolution (lp/mm) 23 cm: 4.2 17 cm: 5.0 13 cm: 5.7	Typical central visual resolution (lp/mm) 31 cm: 4.0 23 cm: 4.8 13 cm: 6.0

2 Geometry

2.1 C-arm stand	
Angulation	115° rotation (+90°/-25°)
Extended Angulation (option)	135° rotation (+90°/-45°) for increased projection flexibility
Motorized height movement Speed	490 mm/19.3" typical: up ~1.8 cm/s, down ~2.4 cm/s
Longitudinal movement	200 mm/7.9"
Panning movement (swivel)	± 10°
Rotation	± 180°, with safety stop at ± 135°
Lowest lateral position	1034 mm (C-arc under the table) 740 mm (C-arc over the table)
Source to image distance (SID)	98.3 cm
Free space in C-arm	76.6 cm
C-arm depth	610 mm
Parallel movement	Dedicated parallel movement with rear-wheel steering, for easy positioning along operating table
C-arm stand length	2060 mm (81.1")
Weight	310 kg for 9" / 312 kg for 12"
C-arm stand width	815 mm
C-arm stand height	1680 mm for 9" / 1770 mm for 12"
Brakes on all movements	Yes, manual
Steering	Rear wheels
Cable deflectors	Yes
2.2 Mobile View Station specifications	
Depth	701 mm
Width	702 mm (monitors folded) 943 mm (monitors unfolded)
Height	1850 mm
Weight (including options)	140 kg
Monitor rotation	180°
Monitor height movement	230 mm

3 Imaging

Specifications	
SmartVision	• Unique BodySmart software allows free positioning of the anatomy, even at the edge of the image detector. It automatically detects anatomy and adjusts parameters to produce high quality images • Contrast and brightness can be adjusted automatically in real time or manually • Our fully automatic MetalSmart feature excludes metal artifacts caused by metal implants to provide higher image quality and efficient dose control for orthopedic and other procedures, compared to systems without metal exclusion • Philips premium imaging technologies correct for patient or accidental table motion, automatically and in real-time on live images; reduce noise and artifacts, also on moving structures and objects; and enhance images and sharpen edges

Specifications	
DoseWise	• Imaging modes: – Fluoro modes ranging from Low X-ray dose to High Level, enabling dose savings when desired or enhanced image quality when necessary – Three different pulse rates for fluoro modes; the lower pulse rate can help to manage X-ray dose • Collimation: – Graphical shutter and iris and image orientation on Last Image Hold image on C-arm stand tablet-like UI without applying radiation – Real lead asymmetrical shutters – Independent shutter positioning – Automatic Electronic Blanking following the lead shutters and iris to enhance image quality • Automatic Shutter Positioning (ASP) sets shutters to the anatomy of interest for excellent image quality at the touch of a button • The II side laser (optional) and the tube side laser (optional) lets staff position the C-arm without using radiation • Several features contribute to increased dose awareness, including dose reporting, dose display, and an alert when exceeding a pre-defined procedure dose level
Acquisition settings	Preset acquisition settings apply dedicated fluoroscopy settings to obtain superb image quality for the anatomy of interest without applying more X-ray dose than necessary. Within each program there are different X-ray modes available (depending on anatomy of interest): • Low Dose Fluoroscopy • Normal Dose Fluoroscopy • Medium Dose Fluoroscopy • High Dose Fluoroscopy • Exposure run to produce high quality images • Single shot exposure, for extra-sharp, single snapshot images • Hiding choices on the UI • Auto Contrast Brightness (ACB) on/off settings • Subtraction • Trace Blur reduction and noise reduction buttons to further adjust the level of temporal noise reduction level to the amount of movement in the region of interest

Removable grid

Specifications	
Real time processing functions	
Feature	• Feed-forward gain control • White compression • Adaptive temporal recursive noise reduction • Spatial noise reduction • Adaptive multiresolution brightness / contrast / edge enhancement • Blanking • Video invert • Digital image rotation • Mirroring • Flipping • View trace • Subtract • Trace • Manual/auto contrast/brightness
Post processing functions	
Feature	• 360° digital rotation mirror left/right and up/down without radiation • Contrast and Brightness and edging • Annotation (for a single image or all images in an examination) • Video invert (negative) • Zoom and roam (factor 2x real-time magnification, freely movable to any section of an image) • Measurement (to precisely quantify lengths and angles in images) • Electronic shutters (to block out over exposed areas outside the region of interest) • View Trace • Landmarking (mixing anatomy with vessel tree)
Mobile view station monitors	
Resolution	1280 x 1024 pixels
Maximum light output	650 cd/m² (High Brightness, optional)
Maximum light output	330 cd/m² (Standard Brightness)
Contrast ratio	>500:1 (standard brightness)
Viewing angle	170° in horizontal and vertical direction
Tablet-like UI	Offers easy access to post-processing of acquired images, patient demographics as well as patient administration and data export (live monitor) (optional)
Monitors	Two 19" Standard Brightness (high brightness optional) Color LCD monitors for diagnostic image quality display. Monitor LUT: • DICOM GSDF compliant

4 X-ray generation

Specifications	
X-ray generator	The Zenition 50 Series uses a monoblock architecture with the high tension transformer in the X-ray tank. With the monoblock there is no need to transmit pulses over high voltage cables, which can result in a ramping up and ramping down effect, due to the electrical impedance of the cables. Because the monoblock generator operates at high frequencies (78.125 kHz and 15.625 kHz), it produces sharp pulses, which results in fewer motion artifacts in the image. This also allows less soft radiation to be used and produces less heat.
X-ray tube	Zenition 50 series have a rotating anode and high power generator with excellent heat management to perform the most demanding interventional procedures.
Tube type	Rotating anode X-ray tube
Nominal x-ray tube voltage	120 kV
Nominal focal spot values	0.3 and 0.6 mm
Maximum anode heat content	315 kHU = 225kJ
Maximum anode heat dissipation	54 kJ/min = 75.6 kHU/min = 900 W
Max. uninterrupted fluoro time	10 minutes legal block
Maximium continuous anode heat dissipation	550 W
Anode rotating speed	3000 rpm
Anode target angle	10°
Anode material	RT-TZM (Rhenium-Tungsten-Titanium-Zirconium-Molybdenum)
Maximum housing heat content	1350 kJ = 1890 kHU
Maximum housing heat dissipation	192 W = 11.5kJ/min = 16.1kHU/min
Maximium continuous housing heat dissipation	120 W = 7.2kJ/min = 10.1 kHU/min
Cooling method	Active oil-circulation cooling
Inherent filter	0.75 mm Al eq at 75 kV
Integrated beam filter	1.0 mm Al. + 0.1 mm Cu
Total beam filtration	4.73 mm Al eq.
Maximum Generator Output	15 kW

Specifications	
Operating values with Exposure Runs	
kV range	40 - 120 kV
mA peak range	2.5 - 60 mA
Pulse width	7.407 - 31.11 ms
Pulse rate	4, 7.5, 15 pps (optional 30 pps)
Operating values with Continuous Fluoroscopy	
kV range	40-120 kV
mA range	0.10 - 20 mA
Operating values with Pulsed Fluoroscopy	
kV range	40-120 kV
mA peak range	0.5 - 60 mA
Pulse width	8 - 22.22 ms
Pulse rate	6.5, 12.5 pps
Operating values with Single shot exposure (snapshot)	
kV range	40-120 kV
mA peak range	2.5 - 100 mA (normal) 5.2 - 125 mA (high power)
Time range	100, 167, 300 ms (normal) 100 ms (high power) (Optional)
X-ray collimation	The Zenition 50 Series makes collimation easy. Its full lead (assymetric) shutters can be rotated and moved independently, and the unique Philips Automatic Shutter Positioning (ASP) feature automatically positions shutters for high image quality at the touch of a button. You can position shutters or adjust the iris on the last X-ray image (Last Image Hold on Stand UI), eliminating additional X-ray dose during collimation.

Specifications	
Shutters	Two independent lead shutters with steel wedge: shutters can be coupled for rotation and translation, or moved individually for asymmetric collimation
Automatic shutter positioning	Automatic shutter placement based on image content
Shutter material	3 mm Pb
Rotation of shutter	360°
Wedge material	0.2 to 2.5 mm stainless steel
Adjustment of shutter and iris	Stepless
Iris material	Lead with 5% antimony: Pb (Sb5%)
Iris diameter (at detector)	12" <50 mm - 295 mm 9" <50 mm - 240 mm
Position indication	On screen and also on last image hold without radiation on Stand UI

Zenition 50 Series with 12 inch Image Intensifier

5 Workflow

Specifications	
Unify workflow*	Unify workflow brings intuitive control and handling to your system to reduce training and enhance teamwork.
• Tablet-like UI	Physicians and operators experience a whole new level of simplicity with our tablet-like user interface on the C-arm and intelligent workflow. Now you can just touch the screen with a finger to drag the shutters and iris into position on Last Image Hold. At each step you only see the features you need, making it easy to find the right selections.
• ClearGuide and color coding	Our unique ClearGuide in combination with color coding on the C-arm speeds up positioning. ClearGuide provides a uniform reference for the operator and physician to use during positioning. A set of numbers (3, 6, 9, 12) on the Detector corresponds to the same numbers displayed on the clinical image. The physician can say 'Rotate orange towards 3' and the operator knows exactly what to do. The numbers always match up, even if the image is rotated, flipped, or mirrored.
Mobile View Station	The compact Mobile View Station fits perfectly in the surgical workflow. Its intelligent design provides the user with easy system setup, enhanced viewing capabilities and easy transportation. Its unique design also makes it easy to clean. All system controls are at your fingertips on the live monitor of the Mobile Vie w Station. With this tablet-like UI, you can intuitively set up an exam, post-process images, or export a case to PACS. The operator can easily see the clinical image on this 15" stand UI screen without obstructing the view of the physician. Because we use advanced infra-red technology, the touchscreen monitor delivers the same image quality as non-touchscreen monitors.
Connectivity	• The Wireless Data Transfer option allows users to connect to the RIS/HIS to send and retrieve images or other relevant data wirelessly and reduce the amount of cable clutter in the OR • Optional Digital Video out to display live and reference images on additional monitors (e.g. ceiling mounted) without a loss of resolution • Optional Video in allows you to conveniently display external video signals like endoscopy or ultrasound on the right C-arm monitor, so all the information needed is in one view • Optional USB storage provides a convenient way to store and images for use in reports or presentations

*Position memory not available for Zenition 50 Sereis

ClearGuide

Specifications	
DICOM	DICOM is seamlessly integrated into the system for digital image to DICOM translation. A highly intuitive user interface simplifies use. • DICOM print (optional) • DICOM store (optional) • Modality Worklist Management (MWL) (optional) • Modality Performed Procedure Step (MPPS) (optional) • Storage Commit (optional) • DICOM Storage to DVD or USB memory (optional) • DICOM query/retrieve (optional) • DICOM Radiation Dose Structured Reports DICOM image formats: • Secondary Capture (SC) with/without text • Angiography (XA - multi frame) • Patient dose report
Integrated Healthcare Enterprise (IHE)	The Zenition 50 Series is compliant with the IHE Scheduled Workflow Integration Profile as an Acquisition Modality Actor. For an optimal viewing angle, the LCD monitors can be rotated 180° and adjusted in height (230 mm/9")
Digital video out (optional)	2 DVI connectors live and reference monitor
Video in (optional)	S-Video, DVI (digital and analog), SDI
USB storage (optional)	PNG, MP4, BMP
IP addressing (optional)	Static IP, DHCP
Wireless standards supported	IEEE 802.11a / b / g / n / ac (2.4 GHz and 5 GHz band) FIPS 140-2:compliant
Number of antennas	2 (embedded within the system, not visible)
User configurable SSID support	Up to 16 SSIDs, each with a unique MAC address and configurable SSID Broadcast
Authentication protocols	PSK, IEEE 802.1x EAP-TLS and PEAP
Security	AES, TKIP and WEP encryption FIPS 140-2 compliant whitelisting to prevent malware
External room X-ray indication	Yes (optional)

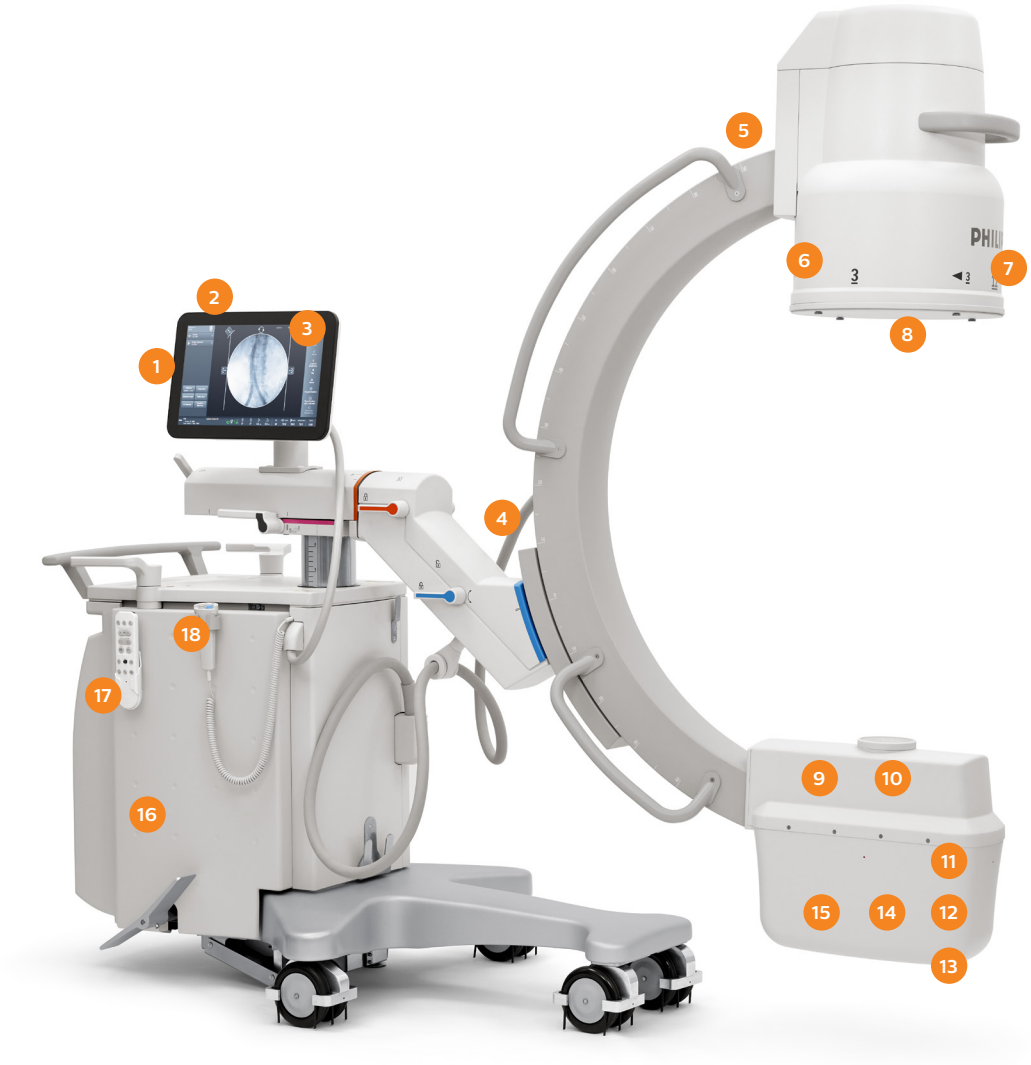
Color coding

PC Hardware details	
# of USB ports	2 USB 2.0 and 1 High speed USB 3.0 port
Storage	up to 140,000 images
DICOM STORE (DVD/USB/ PACS) and Retrieve (USB/DVD/PACS) both are optional	Yes
Embedded MMV	Image Viewer (optional)
Service Tools (PSC, Remote, LOTS)	On system service tool (Philips Support Connect) Remote Service Remote Assistance (Look Over The Shoulder, LOTS)
Boot up time	< 77 seconds
Operating System **• Processor speed** **• RAM** **• Storage type**	Windows® 7 Embedded Intel Core™ i7-4790S (4 GHz) 8 GB: 2x DDR3 1600 MHz 4 GB SO-DIMM 2x 1TB HDD
Image processing bits	II subsystem: 12 bits, system image processing: 14 bits
Storage capacity in GB	2x 1TB HDD, of which ± 800 GB or 140,000 images for image storage
Storage image matrix	1 k x 1 k
Storage image bits	14 bit image data + 1 bit measuring field

6 Clinical extensions

Specifications	
Outlining	The outlining tool allows users to draw an outline (in 5 different colors, 1 color at a time) digitally on an image on the touchscreen monitor using a stylus pen, for example, to mark a bifurcation or side branches on live fluoroscopy images. Drawings can be switched/ toggled on and off. The undo button corrects mistakes and the delete function gets rid of the drawing with the touch of a button.
Pain management extension	The Pain management extension offers digital subtraction functionality to enable enhanced visualization of contrast medium injections. Pain interventionalists can work with confidence to avoid potentially dangerous intravascular injections when using digital subtraction to enhance visualization of contrast distribution.
Cardiac extension	This combination of dedicated cardiac exam types, high pulse rates and image memory of 140,000 images is the ideal package for cardiac interventions. The cardiac extension includes dedicated anatomical programmed fluoroscopy parameters for electrophysiology procedures, pacemaker placements, and cardiac surgery. With motion-stopping pulses of up to 30 pulses per second and 60 mA, the Zenition 50 Series captures sharp images of fast moving anatomy in the region of interest. Standard memory (140,000 images) provides capacity to record long cases at high frame rates.
Vascular extension	The vascular extension offers you the full support for vascular cases, providing an extensive range of vascular imaging tools. Most vascular functions can be controlled by handheld remote or at the user interface on the Mobile View Station. Image memory of 140,000 images available.
Vascular Processing	• Subtracted fluoroscopy mode displays images in subtracted mode • Trace mode shows in real time the maximum opacification of the vessels (Iodine + CO_2) • Roadmap images support catheter guidance • Remask lets you reselect the most suitable image in your run as a mask image for contrast runs • Smart Mask manages dose and contrast medium usage by re-using previously acquired images for roadmapping • Landmarking provides a non-subtracted background image for anatomical reference • Real time pixel shift compensates for movement artifacts • Subtraction on/off simplifies the orientation for subtracted images during roadmap procedures (controlled by remote control or User Interface on the Mobile View Station) • View Trace creates a trace image in post-processing (Iodine + CO_2) • CO_2 mode for subtraction, trace white and roadmap with Smart Mask and view trace
Cardiovascular extension	The cardiovascular extension provides high quality fluoroscopy, subtraction runs, and roadmap guidance to support challenging cardiac and vascular procedures. Vascular processing features include subtracted fluoroscopy mode, trace mode to show the maximum opacification of vessels in real time, and real-time pixel shift to compensate for movement artifacts. Extra support for cardiac examinations is provided with dedicated anatomically programmed fluoroscopy parameters for electrophysiology procedures, pacemaker placements, and cardiac surgery. With motion-stopping pulses of up to 30 pulses per second and 60 mA, the Zenition 50 Series captures high quality images of fast moving anatomy in the region of interest.

7 System overview

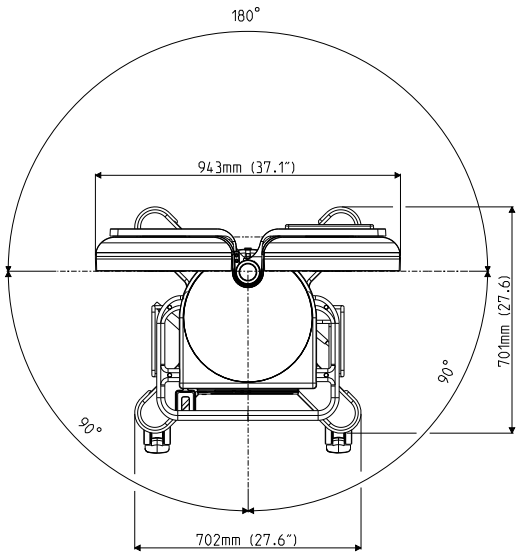


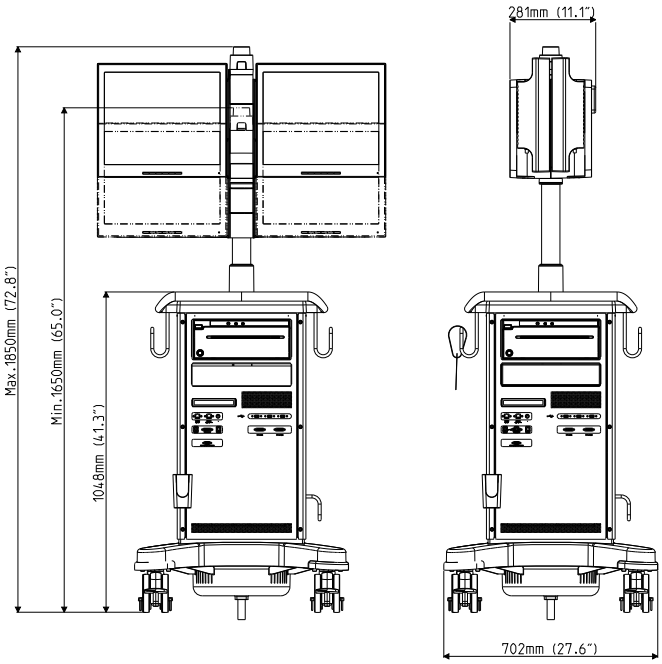
1. Tablet-like UI (Unify Workflow)
2. Application specific protocols and customizable presets
3. Adjust shutter and image orientation while on LIH
4. Color coding (Unify Workflow)
5. Fully Counterbalenced C-arc
6. 2 image intensifier sizes (9" and 12")
7. ClearGuide (Unify Workflow)
8. Removable X-ray grid
9. Unique asymmetric shutters
10. A smart new way of filtering
11. BodySmart
12. MetalSmart
13. 15kW system
14. Compact X-ray tank
15. Monoblock design
16. Technology Maximizer
17. Remote control
18. Point and Shoot design

19 Outlining
20 High Speed wireless data transfer / Wireless data handling
21 Image Viewer/MMV
22 Lightweight MVS
23 Advanced Image Processing algorithms/radiation management features
24 80 seconds boot-up
25 Remote Support + Philips Support Connect tool
26 Windows® Platform
27 Advances Connectivity and interoperability tool
28 External Video-In

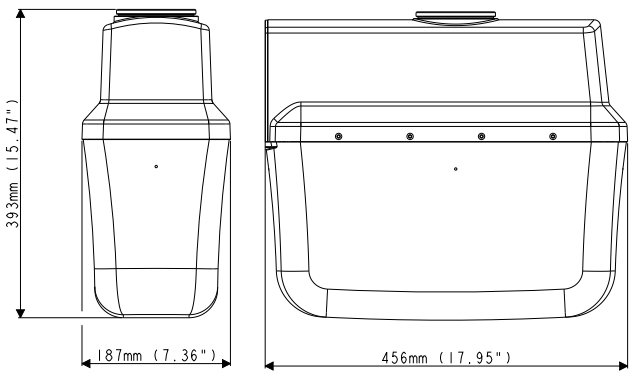
8 Dimensions

Specifications	
C-arm stand	- 9" IITV: height x width x depth: 45.7 cm x 28.8 cm x 36.3 cm - 12" IITV: height x width x depth: 54.7 cm x 38.5 cm x 41.2 cm - Tube Tank: height x width x depth: 39.4 cm x 18.7 cm x 46.7 cm - SID (focus to II surface distance): 9"IITV: 982 mm, 12"IITV: 983 mm - Focus to end of collimator assembly distance: 15.3 cm (source to diaphragm distance); 20.3 cm (source to IEC 20 cm spacer cover); 30.3 cm (source to HHS 30 cm spacer cover)
Mobile View Station	- Monitors: Height x width x depth: 37.3 cm x 42.4 cm x 10 cm - Find drawings on next page

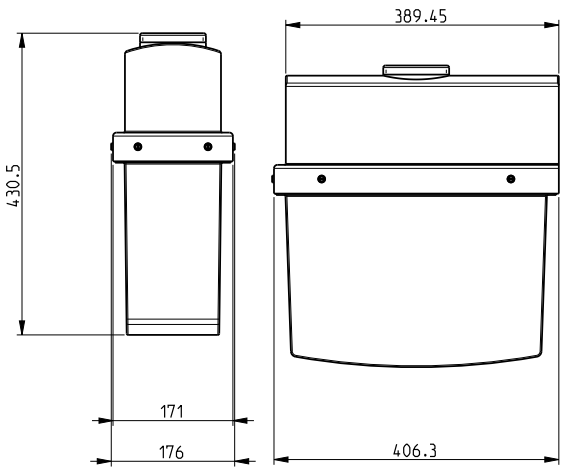




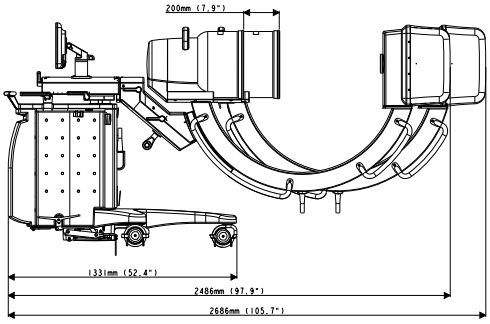
Mobile View Station

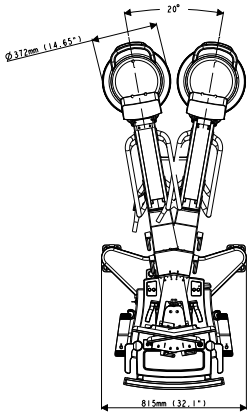


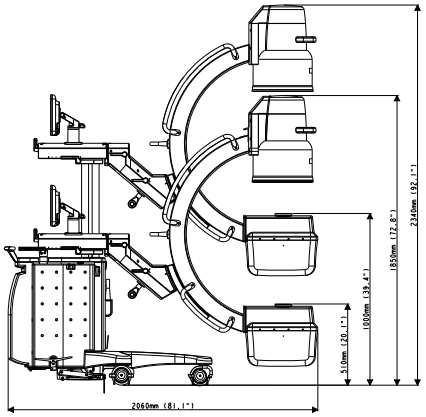
Tube tank, new

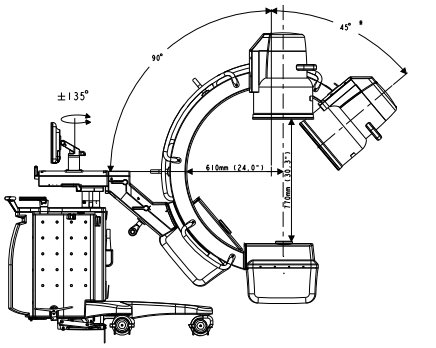


Tube tank, old



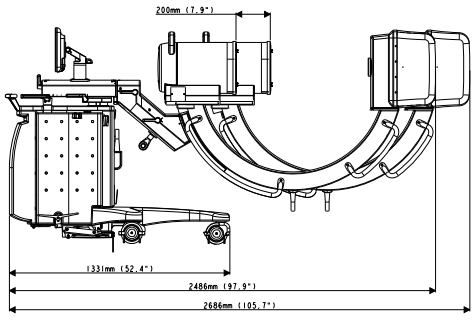


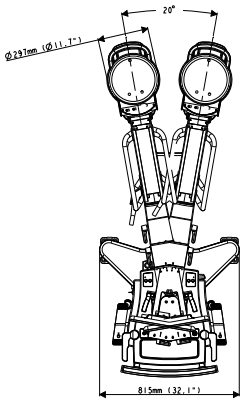


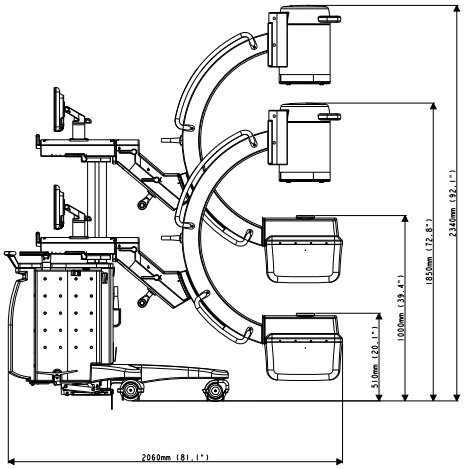


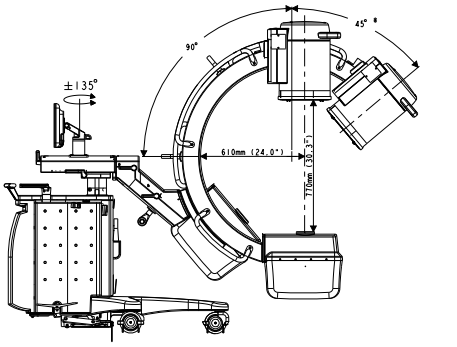
* FOR EXTENDED ROTATION : 45°
* FOR STANDARD ROTATION : 25°

Zenition 50 Series with 12" Image Intensifier









* FOR EXTENDED ROTATION : 45°
* FOR STANDARD ROTATION : 25°

Zenition 50 Series with 9 inch Image Intensifier

9 Options

Specifications	
Tank laser aiming device	Optional laser projects a crosshair from the X-ray tank towards the Image Intensifier, indicating the center of the X-ray beam and enabling alignment of the C-arm without X-ray.
II laser aiming device	Positioning device for use at the image intensifier side
Video paper printer	Thermal printer to print video images from the live (left) monitor on to paper during or after examinations. Print 1, 2, 4, or 6 images on one page in landscape or portrait format. Sony UP-97xAD printer.
Video paper/transparency printer	Thermal printer to print video images from the live (left) monitor on to paper or transparencies during or after examinations. Print 1, 2, 4, or 6 images on one page in landscape or portrait format. Sony UP-99xAD printer.
DICOM and IHE	Zenition 50 can be equipped with the Philips Integrated DICOM solution, which transfers images from the Zenition 50 onto the hospital network in a Seconary Capture DICOM SC or a DICOM XA format. The Basic DICOM package supports DICOM Print and DICOM Store. The advanced DICOM/IHE package (optional) supports: • Modality Worklist Management • Modality Performed Procedure Step • Storage Commit • Full compliance to the IHE Scheduled Workflow integration profile as an Acquisition Modality Actor • Supports DICOM Structured Dose Reports (standard feature) • Query/Retrieve (Image Viewer option)

Handheld remote control

Wireless footswitch

Specifications	
Image Viewer	Offers an intuitive multi-purpose platform for retrieving and handling DICOM images from different modalities. It lets you compare pre-operative images side-by-side with the live fluoroscopy images. 500 Gbyte hard disk. • MIP/MPR - maximum intensity projection singles out high intensity areas for optimized 2D projection of a 3D volume
Wireless data transfer	The Wireless Data Transfer option allows users to connect to the RIS/HIS to send and retrieve images or other relevant data wirelessly and reduce the amount of cable clutter in the OR.
Handheld remote control	The remote control unit is a handheld infrared keypad used to control the main image handling functions. For sterile operation, it can be used in a transparent sterile plastic cover. The functions include: • Run loop • Overview run/exam • Retrieve previous image/run • Retrieve next image/run • Park image on Reference monitor • Retrieve image from Reference monitor (Smart mask) • Protect image/release image • Mode selection • Detector-format selection • Subtraction on/off • Image grab
Footswitch	wired footswitch cable length: 3.5 m and Wireless

Wired footswitch

10 Service

Specifications	
RightFit Customer Service Agreement	Different RightFit Customer Service Agreements are available that allows you to leverage the capabilities of your in-house service teams to maintain and service your Zenition 50 series to reduce delays and improve uptime.
Technology Maximizer	A program that runs in tandem with your RightFit Customer Service Agreement.[3] When you opt into the program, you receive the latest available software and hardware technology releases for a predictable fee.
Planning	• System installation project management • Room design services
Start-up	• Clinical application education • In-house service training • Online learning center
Peak usage	• Comprehensive, partner and flexible service agreements • Remote services • Service information portal
Renewal	• Installed base programs • System relocation services • Refurbished systems
Remote proactive support	One valuable feature in our Service Agreements is remote support. It helps you get the most from your imaging system and maintain its peak performance every day. Philips Remote Services is an advanced, secure network that links your Zenition 50 Series to our global remote services customer care centers. Configuration, customization, log file analysis and other services that formerly required on-site visits are now available by connecting to our remote experts. Remote system log analysis allows our experts to detect anomalies and plan an on-site visit to increase efficiency. Remote service helps to maintain equipment performance – protecting you against lengthy downtime and unexpected costs. If a deteriorating situation is detected by our remote service, corrective action can be carried out quickly and decisively, often with no interruption to your busy schedule. Our application specialist can also use the remote viewing feature to resolve application-related issues more quickly, without an on-site visit. A global platform for system communication certifies that all service data is handled via best-in-class encrypted transmission technology.

[3] Eligible RightFit Service Agreements are available with Technology Maximizer.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