Philips Image Guided Therapy Mobile C-arm System 1000 – Zenition 10

Specifications

Power the future of routine surgeries with the Philips Image Guided Therapy Mobile C-arm System 1000 – Zenition 10. With this system, you gain high-quality imaging, high uptime and efficient workflow in a powerfully compact design. Zenition 10 supports fast transport, fast set-up and fast imaging for your daily mix of orthopedic, trauma and other procedures – all supported by the Philips global service network.

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2   **Increased utilization** through a versatile design that supports a broad mix of specialties

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4   **Personalized IQ enhances imaging consistency** with application-specific protocols and customizable presets

5   **Unify workflow** brings intuitive control and handling to the Zenition Flat Detector system to reduce training and enhance teamwork – with a workflow consisting of ClearGuide and Color Coding

6   **Proven uptime** with Philips support

2 – Flat Detector

20x20 cm Flat Detector

The Zenition 10 comes with a 20x20 cm Flat Detector that delivers distortion-free images with superb resolution and dose efficiency for performing a wide variety of surgical procedures.

Specifications	FD 20x20 cm
Flat Detector type	Trixell amorphous silicon detector
Scintillator	Cesium iodide
Matrix	1024 x 1024 pixels
Field of view	20 cm x 20 cm (7.9" x 7.9") Zoom: 20 cm / 14.4 cm / 10.4 cm (7.9" / 5.7" / 4.1")
Pixel pitch	200 µm
Dynamic range	81 dB
A/D conversion	16 bit
DQE (@ 0 lp/mm)	0.75
MTF (@ 1 lp/mm)	0.53
Spatial resolution measured on grid surface, no filters in beam	Fluoro OV: >2.2 lp/mm Z1: >2.5 lp/mm Z2: >2.8 lp/mm
Nyquist frequency	2.5 lp/mm
Grid lines / cm	57
Grid material	Carbon fiber
Grid ratio	13:1
Anti-scatter grid	Removable

3 - Geometry

Excellent C-arm geometry and compact Flat Detector allow fast and convenient positioning for a broad range of patients.

3.1 C-arm stand specifications

Angulation	150° rotation (+100° / -50°)
Motorized height movement	430 mm / 16.9" Speed: > 1.0 cm/s, <2.5 cm/s
Longitudinal movement	200 mm / 7.9"
Panning movement (swivel)	± 12.5°
Rotation	± 180°
Lowest lateral position	1060 mm
Source to Image Distance (SID)	1000 mm / 39.4"
Free space in C-arm	767 mm / 30.19"
C-arm depth	730 mm / 29" (when measured with 20 cm spacer)
Parallel movement	Dedicated parallel movement with rear-wheel steering, for easy positioning along operating table
C-arm stand length	2138 mm
Weight	Max. 330 kg
C-arm stand width	850 mm
C-arm stand height	1640 mm
Brakes on all movements	Yes, manual
Steering	Rear wheels
Cable deflectors	Yes

3.2. Mobile Viewing Station specifications

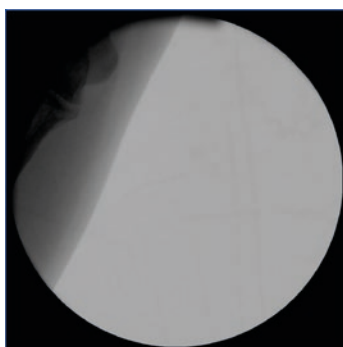|	
Depth	830 mm
Width	830 mm
Height	1830 mm
Weight (including options)	160 kg/352 lbs
Monitor height movement	Up to 150 mm (possible at the time of installation)

Mobile Viewing Station – front view
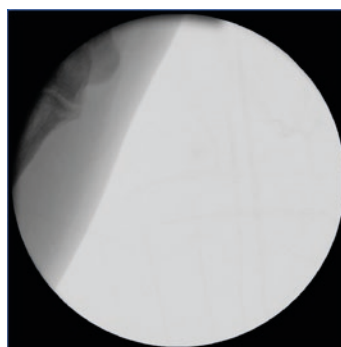
Mobile Viewing Station – rear view

4 ‑ **Imaging**

Specifications

SmartVision	• Flat Detector active matrix: FD 20x20 cm (1024 x 1024) pixels. • 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 or manually in real time. • Our fully automated 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 technology enables automatic image adjustments in the event of patient or table movement, in real time on live images; reduces noise and artifacts on moving structures and objects; enhances image and sharpens edges.

Without BodySmart   **With BodySmart**

Without MetalSmart   **With MetalSmart**

Specifications

DoseWise	• Imaging modes:
	  - Fluoro mode options of different X-ray dose levels, enabling dose savings when desired or enhanced image quality when necessary
	  - Three different pulse rates for fluoro modes; the lower pulse rate can help manage X-ray dose
	• Collimation:
	  - Graphical shutter, iris and image orientation on Last Image Hold image on C-arm stand without applying radiation
	  - Real lead symmetrical shutters
	• Automatic Electronic Blanking (AEB) following the lead shutters and iris to enhance image quality
	• The integrated laser allows staff to 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 program 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 the anatomy of interest): • Low-dose fluoroscopy • Normal-dose fluoroscopy • FluoTap • Exposure run to produce high-quality images • Single shot exposure, for extra-sharp, single snapshot images • Auto Contrast Brightness (ACB) on/off settings • Subtraction (Digital Subtraction Angiography) • Trace • CO_2 (carbon dioxide) • Roadmap Blur reduction and noise reduction buttons to further adjust the level of temporal noise reduction to the amount of movement in the region of interest

Real-time processing functions

Feature	• Feed-forward gain control • White compression • Adaptive temporal recursive noise reduction • Adaptive multi-resolution brightness/ contrast/ edge enhancement/ spatial noise reduction • Automatic Electronic Blanking (AEB) • Video invert • Digital image rotation • Mirroring • Flipping • Manual/ auto contrast/ brightness

Post-processing functions

Feature	• 360° digital rotation, mirror left/right and up/down without radiation • Contrast and brightness/ edge enhancement • 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) • Pixel-shift, landmarking and view trace • Measurement (to precisely quantify lengths and angles in images) • Manual Electronic Blanking (MEB)

Mobile Viewing Station monitors	Standard monitors	High-brightness monitors (optional)
Resolution	1280 x 1024 pixels	1280 x 1024 pixels
Maximum light output	330 cd/m²	650 cd/m²
Contrast ratio	> 600:1	> 1000:1
Viewing angle	170° in horizontal and vertical direction	170° in horizontal and vertical direction
Monitors	Two 19" standard color LCD monitors for diagnostic image quality display. Monitor LUT: • DICOM GSDF compliant	Two 19" high-brightness color LCD monitors for diagnostic image quality display. Monitor LUT: • DICOM GSDF compliant

5 – X-ray generation

Specifications

X-ray generator	Zenition 10 uses a monoblock architecture with the generator 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 (40 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 10 systems have a fixed anode and high-power generator with excellent heat management to perform routine surgical and interventional procedures.
Tube type	Fixed anode X-ray tube
Nominal X-ray tube assembly voltage	110 kV
Nominal focal spot values	0.6 and 1.2
Maximum anode heat content	57 kJ = 79.8 kHU
Max. uninterrupted fluoro time	10 minutes legal block for fluoroscopy
Maximum anode cooling rate	600 W = 36 kJ/min = 50.4 kHU/min
Anode target angle	9°
Anode material	Tungsten
Available thermal capacity (RX)	1056 kJ = 1478 kHU
Maximum continuous housing heat dissipation	90W = 5.4 kJ/min = 7.56 kHU/min
Cooling method	Active oil-circulation cooling
Inherent filtration of X-ray tube	1.8 mm Al equivalent
Integrated beam filter	3.8 mm Al equivalent + 0.1 mm Cu
Total beam filtration	>=6mm Al eq @ 75 kV
Max. generator output	2.1 kW

Specifications

Operating values with pulsed fluoroscopy

kV range	40-110 kV
mA peak range	0.900 to 5.4 mA
Pulse width	16.049 ms to 222.22 ms
Pulse rate	1 - 2 - 4 - 7.5 – 15

Operating values with exposure runs

kV range	40-110 kV
mA peak range	0.900 to 7.2 mA
Pulse width	66.667 ms to 222.22 ms
Pulse rate	2 - 4 - 7.5 - 15

Operating values with single shot exposure (snapshot)

kV range	40-110 kV
mA peak range	3.175 to 19.1 mA
Time range	200 ms

Specifications

X-ray collimation	Zenition 10 makes collimation easy. Its lead shutters can be moved inward or outward, and can be rotated for excellent image quality at the touch of a button. You can position shutters or adjust the iris on the last X-ray image, enabling the shutters or iris to be positioned without the need for live fluoroscopy.
Shutters	Two coupled lead shutters with steel wedge
Shutter material	3 mm Pb
Rotation of shutter	Unlimited rotation (clockwise or anticlockwise)
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)	FD 11 Iris diameter: 200 mm (7.9") circular Minimum beam diameter at detector entrance for all formats: < 50 mm at detector
Square fixed diaphragm (at detector)	FD 11 SFD size 200 x 200 mm

Intuitive user interface

6 - **Workflow**

Specifications

Unify workflow	Unify workflow brings intuitive control and handling to your system to increase efficiency of training and enhance teamwork.
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 numbers always match up, even if the image is rotated, flipped, or mirrored.
Mobile Viewing Station	The compact Mobile Viewing Station fits perfectly within the surgical workflow. Its intelligent design provides the user with easy system set-up, enhanced viewing capabilities and easy transportation. The design is easy to clean. All system controls are at your fingertips on the live monitor of the Mobile Viewing Station.
Compact Flat Detector	The compact Flat Detector frees up valuable workspace around the patient during challenging procedures. It gives you more room to see your patient, see team members, and coordinate tasks.
Connectivity	• Wireless data transfer 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 output to display live and reference images on additional monitors (e.g. ceiling mounted) without a loss of resolution • Store-to-media provides a convenient way to store images for use in reports or presentations
DICOM	DICOM is integrated into the system for digital image to DICOM translation. A highly intuitive user interface simplifies use. • DICOM print • DICOM store • Modality Worklist Management (MWL) (optional) • Modality Performed Procedure Step (MPPS) (optional) • Storage Commit (optional) • DICOM storage to DVD or USB memory • DICOM query/retrieve (optional) • DICOM radiation dose structured reports **DICOM image formats:** • DICOM SC (Secondary Capture with/without text) • DICOM XA (X-ray Angiographic - multi frame) • Patient dose report

Color Coding

ClearGuide

Specifications

Integrated Healthcare Enterprise (IHE)	Zenition 10 is compliant with the IHE Scheduled Workflow Integration Profile as an Acquisition Modality Actor.
Digital video out (optional)	2 DVI connectors live and reference monitor
USB storage	PNG, MP4, BMP
IP addressing	Static IP, DHCP
Wireless standards supported	IEEE 802.11 b/g/n (2.4 GHz and 5 GHz band)
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 AES, TKIP and WEP encryption
Security	Secure boot and Whitelisting to prevent malware
External room X-ray indication	Yes (optional)

PC hardware details

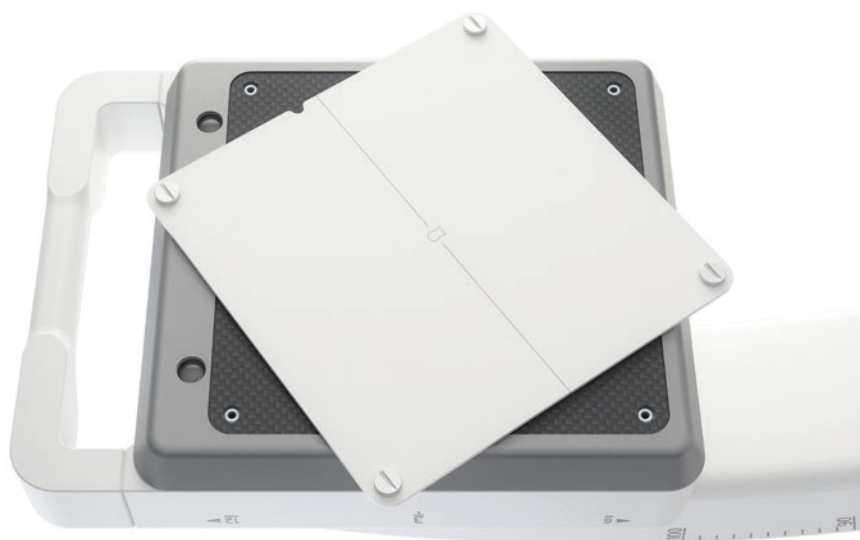|	
# of USB ports	1 USB 2.0 and 1 high-speed USB 3.0 port
Storage	Up to 140,000 images
DICOM Store (DVD/USB) and Retrieve (USB/DVD/PACS)	Yes
Embedded Multi-Modality Viewer	Image Viewer (optional)
Service tools (PSC, Remote, LOTS)	On-system service tool (Philips Support Connect) Remote service/remote assistance (Look Over The Shoulder)
Operating system • **Processor speed** • **RAM** • **Storage type**	Windows® 10 LTSC 2019 Intel Core™ i7-8700 6C 8 GB: 2x4 GB DDR4 2666 MHz SO-DIMM 500 GB 7200 rpm SATA 2.5" x 2 HDD
Image processing bits	System image processing: 14 bits
Storage capacity in GB	2 x 500 GB HDD of which ~300 GB or 140,000 images for image storage
Image matrix	1 k x 1 k
Storage image bits	14-bit image data + 1-bit measuring field

USB ports and DVD drive

7 - Clinical extensions

Specifications

Outlining*	The outlining tool allows users to draw an outline digitally on an image of the live Mobile Viewing Station screen using an externally connected mouse.
Pain management extension*	The pain management extension offers digital subtraction functionality to enable enhanced visualization of contrast medium injections.
Vascular extension *	The vascular extension offers you comprehensive support for vascular cases, providing an extensive range of vascular imaging tools. Most vascular functions can be controlled by a handheld remote or at the user interface on the Mobile Viewing Station. • Subtracted fluoroscopy mode displays images in subtracted mode • Trace mode shows the maximum opacification of the vessels (iodine and CO_2) in real time • Roadmap images support catheter guidance • Remask lets you reselect the most suitable image in your run as a mask image for contrast runs • SmartMask helps manage dose and contrast medium usage by re-using previously acquired images for roadmapping • Landmarking provides a non-subtracted background image for anatomical reference • Manual 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 Viewing Station) • View trace creates a trace image in post-processing (Iodine + CO_2) • CO_2 mode is available for subtraction, trace white and roadmap with SmartMask and View Trace • Bolus chase helps in tracking progress of contrast medium in angiography
Pediatric extension *	Dedicated pediatric mode allows exam settings to enable low-dose modes for pediatrics. Further dose can be managed by removing the X-ray grid.

Removable grid

8 – Dimensions

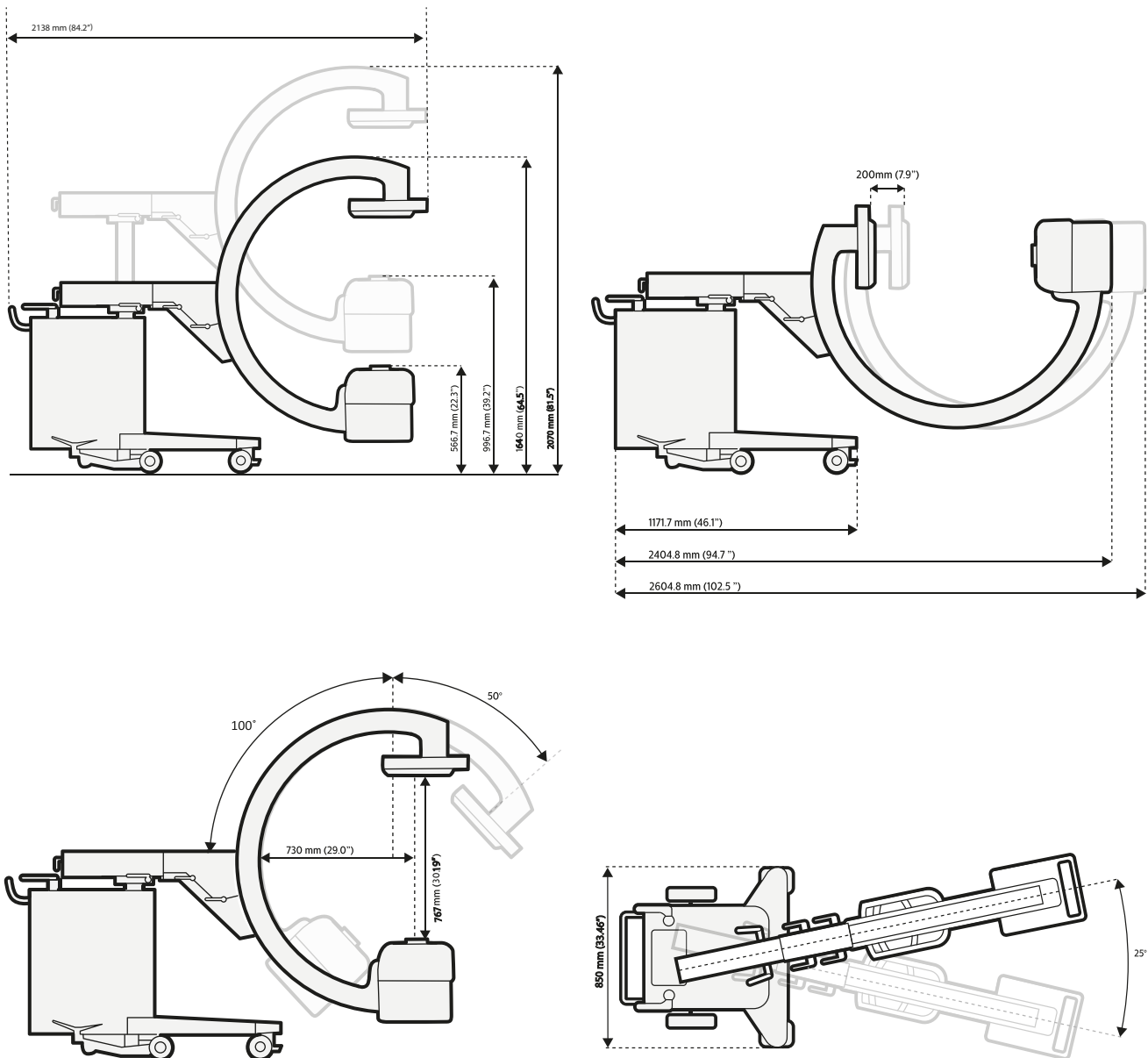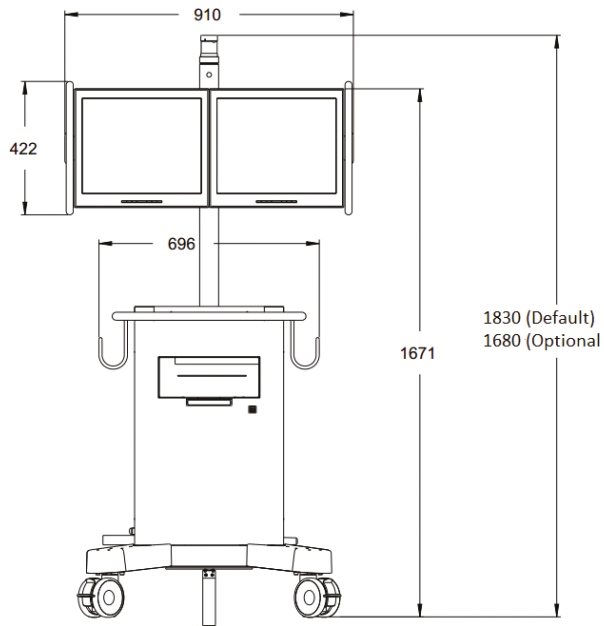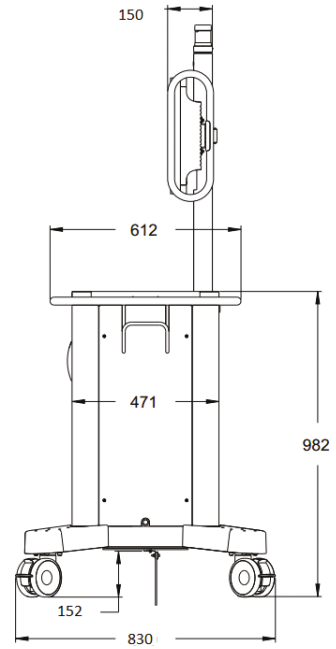| Specifications	FD 20x20 cm
C-arm stand	Flat Detector assembly: height x width x depth: 10.6 cm x 30.1 cm x 39.4 cm Tube tank assembly: height x width x depth: 38 cm x 16.5 cm x 35.8 cm Nominal Source Image Distance (SID): 100 cm Source Skin Distance: 21.1 cm (IEC 20 cm spacer cover); 31.1 cm (HHS 30 cm spacer cover)
Mobile Viewing Station	Find drawings on the next page

Zenition 10 with 20x20 cm Flat Detector

Mobile Viewing Station

910

422

696

1830 (Default)
1680 (Optional

1671

150

612

471

982

152

830

9 – Options

Specifications

Integrated laser	Integrated laser in the Flat Detector housing, can be activated and deactivated, at the touch of a button that enables positioning of the C-arm without radiation. 635 nm maximum output < 10 m W Laser class 1 (IEC)
Video paper printer	Thermal printer to print video images from the live (left) monitor onto paper during or after examinations. Print 1, 2, 4, or 6 images on one page in landscape or portrait format.
DICOM 3.0 and IHE	Zenition 10 can be equipped with the Philips Integrated DICOM solution, which transfers images from the Zenition 10 onto the hospital network in a Secondary 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 with the IHE Scheduled Workflow integration profile as an Acquisition Modality Actor • Query/retrieve (Image Viewer option)
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 GB hard disk. MIP / MPR - maximum intensity projection singles out high-intensity areas for 2D projection of a 3D volume
Medical keyboard and mouse	Cleanable keyboard and mouse is useful to maintain cleanability in 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: • Park image on the reference monitor • Retrieve the image from the reference monitor • Protect image/release image • Retrieve the previous image/run • Retrieve the next image/run • Overview run/exam • Run cycle • Subtraction on/off • Detector zoom • Mode selection
Footswitch	Wired footswitch cable length: 3.5 m
Inbuilt UPS	The system is provided with an optional built-in Uninterruptible Power Supply (UPS) that provides backup power in case of a mains failure, allowing the user to save data and shut down the system properly.
Sterilizable covers and springbow	• Sterilizable covers for flat detector, C-arm and the X-ray tank • A springbow that holds the sterile cover of the C-arm in position, while allowing free movement of the C-arm

Handheld remote control   **Wired footswitch**

10 - Services

A comprehensive portfolio of services

The success of your organization depends on people. Philips Services are designed with that in mind, helping to create healing environments, develop your staff, improve your organization's performance, and increase patient satisfaction.

The resources, training, and support we offer enable you to focus on what's most important – your patients. Philips provides a complete portfolio of services designed around your patients, your people, and your organization.

Remote expert connect
An efficient workflow

Philips technical experts can log in to your computer screen and guide you through a service issue to save time. Remote diagnostics help reduce on-site visits and speed up issue resolution. Remote service scheduling allows you to give access to your system for remote work, at a convenient time. Configuration, customization, log file analysis and other services that previously required on-site visits are now available by connecting to our remote experts.

Education and training
Meaningful learning for enhanced patient care

To help departments unlock the full potential of equipment and staff, Philips provides a flexible, hands-on and personalized education program, tailored to the learning needs of clinicians and other staff. By improving clinical workflows and standardizing on best practices, Philips supports healthcare professionals to use technologies with greater confidence and accuracy, while keeping their knowledge and competencies up to date.

Philips Healthcare Operational Services*

Future-forward, tailor-made service agreements that keep your equipment up and running

Our service agreement portfolio contains 8 types of contracts tailored to your needs and goals.

Choose from a diverse range of direct-support options, where you effectively rely on Philips, or tiered support, where your own in-house capabilities are complemented by Philips support and expertise.

Philips Healthcare Operational Service agreements include access to clinical and technical expertise via our customer care solutions centers.

8 types of flexible service agreements, tailored to your needs

Direct Support Contracts						In-house Support Contracts	
						Cooperation	Remote only
Premium Plus	**Premium**	**Balanced Plus**	**Balanced**	**Essential Plus**	**Essential**	**In-house Support**	**In-house Remote**
When system availability and continuity of care are business-critical	Provides peace of mind from strong system coverage	Maintenance support to keep your operations running smoothly	Perfect balance between system availability and budget	Practical maintenance solution to meet your organizational priorities	For those who prioritize their planned maintenance activities	Partnering up to augment your in-house team with OEM expertise	Remote on-demand support for your in-house biomed team
Comprehensive coverage		Medium coverage		Low coverage		Medium to Comprehensive coverage	Low coverage

*Healthcare Operational Services availability is subject to market release.
 Please check with your regional sales representative for suitable service contracts.

11 – Sustainability

When you choose Philips, you choose a partner committed to meeting sustainability and circular economy ambitions. As a leading health technology company, our purpose is to improve people's health and well-being through meaningful innovation, positively impacting 2.5 billion lives per year by 2030.

The Zenition 10 is the result of our EcoDesign process and offers significant environmental improvements:

Product life improved by **25%**[1]

Power efficiency improved by **13%**[1]

Parts recovery during servicing, with recycling passport available to ensure high-quality disassembly and recycling

Zenition 10 is **manufactured at a site certified** for Environmental Management (ISO14001), Occupational Health and Safety (ISO45001)

[1] As compared to predecessor products.

How to reach us
Please visit www.philips.com
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