

**PHILIPS**Image Guided Therapy  
Mobile C-arm System

1000

Zenition 10

# 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.



Zenition



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# 1 - System overview

- 1 **Reliable Flat Detector** technology delivers superb clarity and dose efficiency for performing a wide variety of procedures
- 2 **Increased utilization** through a versatile design that supports a broad mix of specialities
- 3 **Excellent C-arm geometry and compact Flat Detector** allows fast and convenient positioning for a broad range of patients
- 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



20 x 20 cm Flat Detector

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

Specifications	FD 20 x 20 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 $\mu$ m
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
Calibration	Calibration done during manufacturing in factory
Grid lines / cm	57
Grid material	Carbon fiber
Grid ratio	13:1

# 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"
Parallel movement	Dedicated parallel movement with rear-wheel steering, for easy positioning along operating table
C-arm stand length	2138 mm
Weight	<335 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 View 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 time of installation)



Mobile View Station – front view



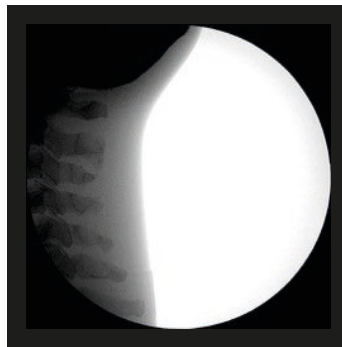
Mobile View Station – rear view

# 4 - Imaging

## Specifications

### SmartVision

- Flat Detector active matrix: FD 20 x 20 (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; reduce noise and artifacts on moving structures and objects; enhance images and sharpen edges.



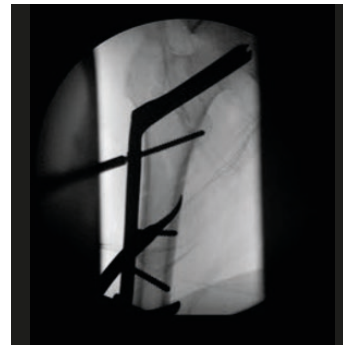
Off-center cervical spine  
without BodySmart



Off-center cervical spine  
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 to 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 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<sub>2</sub> (Carbon-di-oxide)
- 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)

<b>Mobile View Station monitors</b>	<b>Standard monitors</b>	<b>High-brightness monitors (optional)</b>
<b>Resolution</b>	1280 x 1024 pixels	1280 x 1024 pixels
<b>Maximum light output</b>	330 cd/m <sup>2</sup>	650 cd/m <sup>2</sup>
<b>Contrast ratio</b>	> 600:1	> 1000:1
<b>Viewing angle</b>	170° in horizontal and vertical direction	170° in horizontal and vertical direction
<b>Monitors</b>	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

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

## Specifications

### Operating values with pulsed fluoroscopy

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

### Operating values with exposure runs

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

### Operating values with single shot exposure (snapshot)

<b>kV range</b>	40-110 kV
<b>mA peak range</b>	3.175 to 19.1 mA
<b>Time range</b>	200 ms

## Specifications

<b>X-ray collimation</b>	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.
<b>Shutters</b>	Two coupled lead shutters with steel wedge
<b>Shutter material</b>	3 mm Pb
<b>Rotation of shutter</b>	Unlimited rotation (clockwise or anticlockwise)
<b>Wedge material</b>	0.2 to 2.5 mm stainless steel
<b>Adjustment of shutter and iris</b>	Stepless
<b>Iris material</b>	Lead with 5% antimony: Pb (Sb5%)
<b>Iris diameter (at detector)</b>	FD 11 Iris diameter: 200 mm (7.9") circular Minimum beam diameter at detector entrance for all formats: < 50 mm at detector
<b>Square fixed diaphragm (at detector)</b>	FD 11 SFD size 200 x 200 mm



Intuitive user interface

# 6 - Workflow

## Specifications

<b>Unify workflow</b>	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.
<b>Mobile View Station</b>	The compact Mobile View 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 View Station.
<b>Compact Flat Detector</b>	The compact Flat Detector frees up valuable workspace around the patient during challenging procedures. It gives you more room to see your patient, to see team members, and to coordinate tasks.
<b>Connectivity</b>	<ul style="list-style-type: none"> <li>• 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</li> <li>• Optional digital video output to display live and reference images on additional monitors (e.g. ceiling mounted) without a loss of resolution</li> <li>• Store-to-media provides a convenient way to store images for use in reports or presentations</li> </ul>
<b>DICOM</b>	<p>DICOM is integrated into the system for digital image to DICOM translation. A highly intuitive user interface simplifies use.</p> <ul style="list-style-type: none"> <li>• DICOM print</li> <li>• DICOM store</li> <li>• Modality Worklist Management (MWL) (optional)</li> <li>• Modality Performed Procedure Step (MPPS) (optional)</li> <li>• Storage Commit (optional)</li> <li>• DICOM storage to DVD or USB memory</li> <li>• DICOM query/retrieve (optional)</li> <li>• DICOM radiation dose structured reports</li> </ul> <p><b>DICOM image formats:</b></p> <ul style="list-style-type: none"> <li>• DICOM SC (Secondary Capture with/without text )</li> <li>• DICOM XA (X-ray Angiographic - multi frame)</li> <li>• Patient dose report</li> </ul>



Color coding



ClearGuide

## Specifications

<b>Integrated Healthcare Enterprise (IHE)</b>	Zenition 10 is compliant with the IHE Scheduled Workflow Integration Profile as an Acquisition Modality Actor.
<b>Digital video out (optional)</b>	2 DVI connectors live and reference monitor
<b>USB storage</b>	PNG, MP4, BMP
<b>IP addressing</b>	Static IP, DHCP
<b>Wireless standards supported</b>	IEEE 802.11 b/g/n (2.4 GHz and 5 GHz band)
<b>Number of antennas</b>	2 (embedded within the system, not visible)
<b>User-configurable SSID support</b>	Up to 16 SSIDs, each with a unique MAC address and configurable SSID Broadcast
<b>Authentication protocols</b>	PSK, IEEE 802.1x EAP-TLS and PEAP AES, TKIP and WEP encryption
<b>Security</b>	Secure boot and Whitelisting to prevent malware
<b>External room X-ray indication</b>	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)
Boot-up time	<= 90 seconds
Operating system	Windows® 10 LTSC 2019
• Processor speed	Intel Core™ i7-8700 6C
• RAM	8 GB: 2x4 GB DDR4 2666 MHz SO-DIMM
• Storage type	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

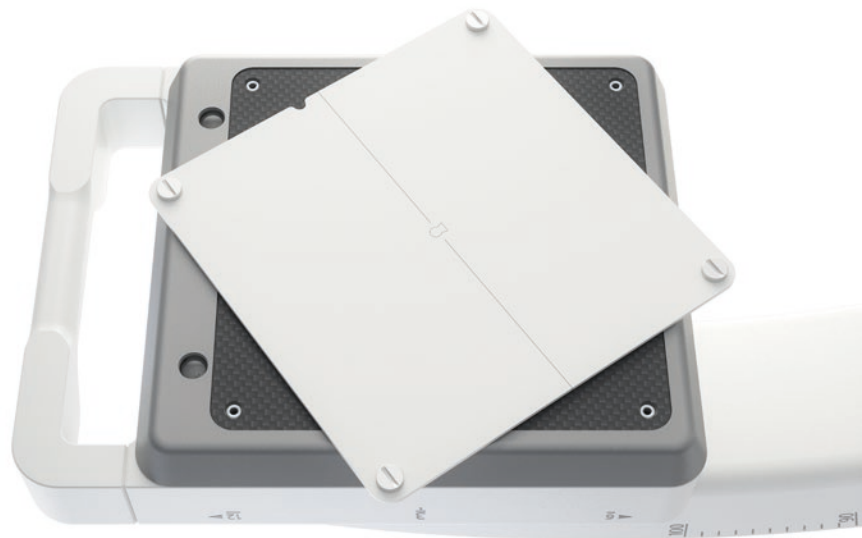


USB ports and DVD drive

# 7 - Clinical extensions

## Specifications

<b>Outlining*</b>	The outlining tool allows users to draw an outline digitally on an image of the live Mobile View Station screen using an externally connected mouse.
<b>Pain management extension*</b>	The pain management extension offers digital subtraction functionality to enable enhanced visualization of contrast medium injections.
<b>Vascular extension *</b>	<p>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 handheld remote or at the user interface on the Mobile View Station. An image memory of 140,000 images is available along with a footswitch.</p> <ul style="list-style-type: none"><li>• Subtracted fluoroscopy mode displays images in subtracted mode</li><li>• Trace mode shows the maximum opacification of the vessels (iodine and CO<sub>2</sub>) in real time</li><li>• Roadmap images support catheter guidance</li><li>• Remask lets you reselect the most suitable image in your run as a mask image for contrast runs</li><li>• SmartMask helps manage dose and contrast medium usage by re-using previously acquired images for roadmapping</li><li>• Landmarking provides a non-subtracted background image for anatomical reference</li><li>• Manual pixel-shift compensates for movement artifacts</li><li>• Subtraction on/off simplifies the orientation for subtracted images during roadmap procedures (controlled by remote control or user interface on the Mobile View Station)</li><li>• View trace creates a trace image in post-processing (Iodine + CO<sub>2</sub>)</li><li>• CO<sub>2</sub> mode is available for subtraction, trace white and roadmap with SmartMask and View Trace</li><li>• Bolus chase helps in tracking progress of contrast medium in angiography</li></ul>
<b>Pediatric extension *</b>	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 20 x 20 cm

### C-arm stand

Flat Detector assembly: height x weight x depth : 10.6 cm x 30.1 cm x 39.4 cm

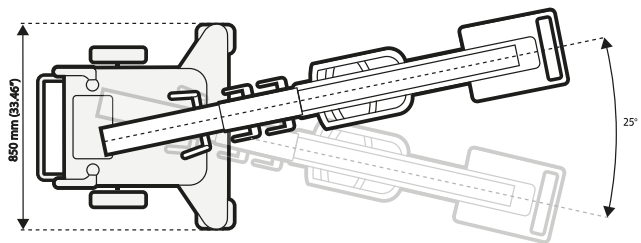
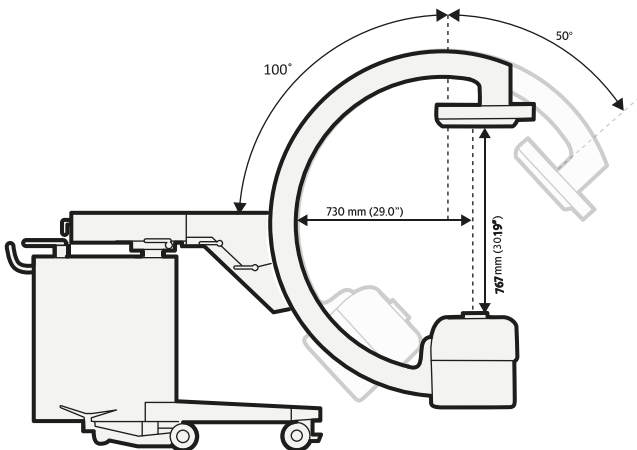
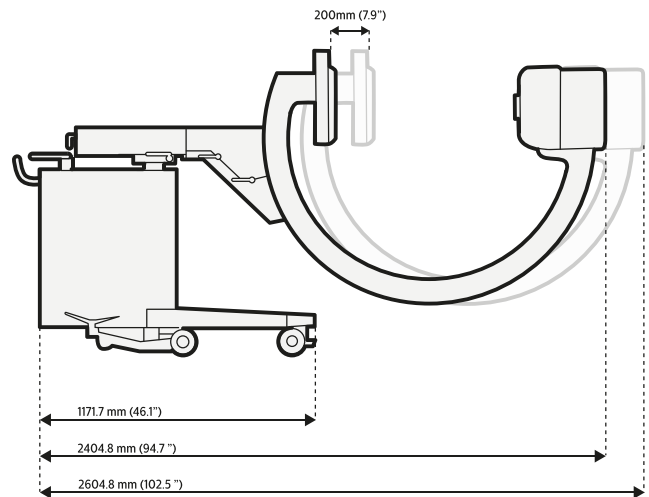
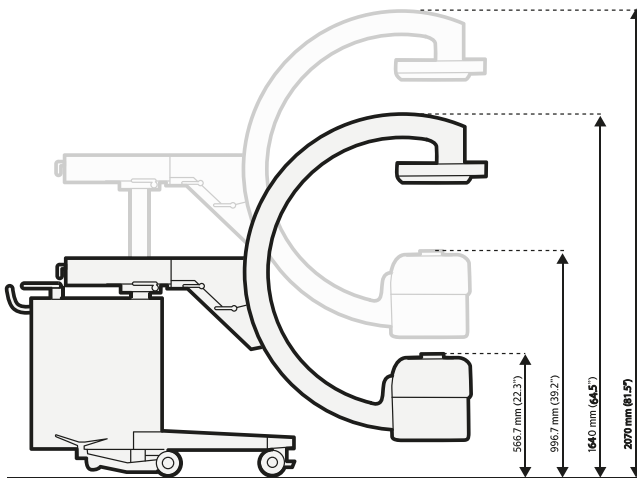
Tube tank assembly: height x weight x depth : 38 cm x 16.5 cm x 35.8 cm

Nominal Source Image Distance (SID): 100 cm

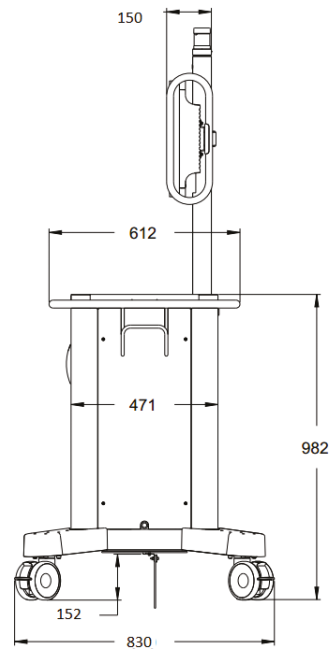
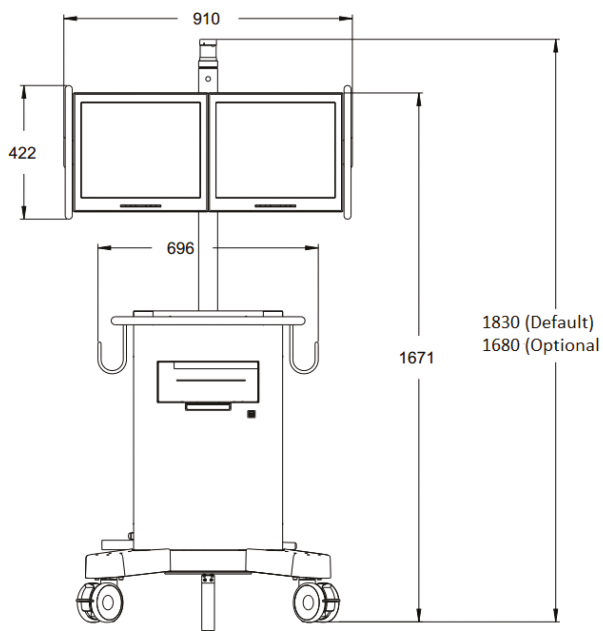
Source Skin Distance : 21.1 cm (IEC 20 cm spacer cover); 31.1 cm (HHS 30 cm spacer cover)

### Mobile View Station

Find drawings on next page



### Zenition 10 with 20 x 20 cm Flat Detector



Mobile View Station

# 9 - Options

## Specifications

<b>Integrated laser</b>	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)
<b>Video paper printer</b>	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.
<b>DICOM 3.0 and IHE</b>	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: <ul style="list-style-type: none"> <li>• Modality Worklist Management</li> <li>• Modality Performed Procedure Step</li> <li>• Storage Commit</li> <li>• Full compliance to the IHE Scheduled Workflow integration profile as an Acquisition Modality Actor</li> <li>• Query/retrieve (Image Viewer option)</li> </ul>
<b>Image viewer</b>	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
<b>Medical keyboard and mouse</b>	Cleanable keyboard and mouse is useful to maintain cleanability in OR.
<b>Handheld remote control</b>	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: <ul style="list-style-type: none"> <li>• Park image on reference monitor</li> <li>• Retrieve image from reference monitor</li> <li>• Protect image / release image</li> <li>• Retrieve previous image / run</li> <li>• Retrieve next image / run</li> <li>• Overview run / exam</li> <li>• Run cycle</li> <li>• Subtraction on / off</li> <li>• Detector zoom</li> <li>• Mode selection</li> </ul>
<b>Footswitch</b>	Wired footswitch cable length: 3.5 m
<b>Inbuilt UPS</b>	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.
<b>Sterilizable covers and springbow</b>	<ul style="list-style-type: none"> <li>• Sterilizable covers for flat detector, C-arc and the x-ray tank</li> <li>• A springbow for C-arc that holds the sterile cover of the C-arm in position, while allowing free movement of the C-arm</li> </ul>



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



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



The clinical images are from BV Vectra and do not represent the final image quality of the Zenition 10 mobile C-arm systems.

Zenition 10 mobile C-arm system is not for sale in USA and this material is not for use or distribution in USA.

Zenition 10 mobile C-arm system is not yet CE marked and not available for sale in the EER. CE certification pending.

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