

SIEMENS



Data Sheet

Artis zee

Floor-mounted system for interventional imaging

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Artis zee

Floor-mounted system for interventional imaging

The Artis zee with PURE® floor-mounted system features a wide range of configurations and 3D applications to fulfill interventional imaging need.

The ergonomically designed controls translate into an enhanced workflow that increases your efficiency. And with the development of new software applications for Artis zee, you also enjoy investment confidence – and will stay on state-of-the-art technology for years to come.

Artis zee can be equipped either with an as20 flat detector, or if more coverage is required, with the large as40HDR flat detector.

High image quality with low dose is provided by the CARE+CLEAR packages.

Artis zee and its flexible configuration capabilities enable tailoring to:

- Interventional radiology
- Hybrid procedures
- General vascular applications
- Interventional cardiology
- Electrophysiology
- Pediatric cardiology
- Minimally invasive surgical angiography

Small footprint

The Artis zee with PURE® floor-mounted system fits rooms as small as 25¹⁾ square meters (< 269.1 sq ft.), due to a very small footprint.

Besides the small footprint, the Artis zee floor offers high positioning flexibility and allows the steepest angulations.

Small rotatable detector

The Artis zee system with the small detector offers easy patient access and allows the steepest angulations.

Large rotatable detector

The Artis zee system with a large detector offers excellent performance for an improved clinical workflow with a larger field of view.

Flexible full-body coverage

The rotating flat detector and collimator of Artis zee allow an optimum level of patient access and provides superb anatomical coverage. Controlled at both the tableside and the detector housing itself, the rotation allows operation in landscape or portrait mode as well as any angle in between while maintaining a heads-up display on the monitor.

Patient table

Patient table with easily exchangeable, free-floating tabletop. Optionally the table can be equipped with tilt/cradle capability and motorized stepping.

Flexible with MULTISPACE.F*

Maximizing coverage and positioning flexibility, MULTISPACE F stands for additional examination positions. The stand rotation enables free positioning of the C-arm and table relative to one another, providing the flexibility and comfort in positioning that allow users to work from both sides of the table in challenging studies (ICD, pacemaker, etc.).

Tableside control

The slimline tableside touchscreen control features easy-to-read *syngo* icons to operate connected systems conveniently and fast. Configurable layouts can be customized on site.

The mouse-like control joystick allows easy operation and can be mounted on the right- or left-hand side.



New HDR Detector technology

Artis zee is available with a new optimized large detector with high dynamic range



The as40HDR detector is designed to deliver excellent image quality with syngo DynaCT*.

The 16-bit analog/digital converter and true 16-bit imaging chain enables a high dynamic range leading to a four times greater greyscale resolution for enhanced soft tissue contrast in 3D imaging with syngo DynaCT*. An up to 10 % increased DQE helps to improve image quality and dose efficiency.

Artis zee with PURE®

Adding smooth to smart

In angiography, many physicians don't get to experience the full capabilities of their modern interventional systems as both procedures and system interaction get increasingly complex.

With PURE®, increase your process efficiency in the angio suite, enable all your staff members to get the full potential of the system, and expand your clinical capabilities – with an angio system that combines better ease of use, integrated expert therapy guidance, and tools providing better diagnostic information.



Artis with
PURE®

Smooth interaction

Save time during procedures. Fewer steps. More efficiency.

Smart performance

Expand your capabilities. More confidence. Better outcomes.

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CARE+CLEAR

Reducing dose in interventional procedures is increasingly important for both patients and clinical staff. In many cases, however, image quality is the key to successful procedures.

Everything in life should be well balanced. We can support you in attaining a balance for your patients, you and your staff – with a perfect interplay of the excellent image quality and the lowest reasonable dose.

The advantages are clear:

- Reduced radiation dose for your patients, you and your staff
- Optimized image contrast and sharpness without increasing dose
- Efficient and transparent dose monitoring, reporting, and documentation
- CARE+CLEAR portfolio comes standard with every Artis system



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Imaging System

X-ray tube

MEGALIX Cat Plus 125/40/90 (for the as20 detector)

High-performance X-ray tube

Up to 40% greater fluoro power with flat emitter technology

Increased contrast during fluoroscopy, especially for examinations on obese patients

Oil/water cooled

Max. exposure voltage (IEC 60613)	125 kV
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Focal spot (IEC 60336)	0.4 ¹⁾	0.8
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Nominal power (thermal anode reference power = 300 W)	35 kW	90 kW (IEC 60613:1989)
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Nominal power (thermal anode reference power = 0 W)	42 kW	112 kW (IEC 60613:1989)
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Nominal radiographic anode input power	38 kW	99 kW (IEC 60613:2010)
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Anode angle	8°
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Maximum anode heat content	2,500,000 J (3,375,000 HU)
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Maximum heat content of the X-ray tube assembly	3,600,000 J (4,900,000 HU)
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Maximum cooling capacity of the anode	400,000 J/min. (540,000 HU/min.) / 6667 W
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Continuous heat dissipation of the tube assembly	max. 2900 W
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Anode rotation	160 Hz (3-phase current)
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Max anode current in pulsed fluoro mode	250 mA small focus
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Maximum anode current in acquisition	800 mA large focus
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Anode input power	10 min 4000 W
	20 min 3000 W
	> 30 min 2500 W

Total filtration (IEC 60601-1-3)	≥ 2.5 mm Al
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Leakage radiation (IEC 60601-1-3)	< 0.44 mGy/h (at 125 kV in 1 m distance: 2500 W)
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Weight	approx. 37 kg (79.4 lbs.)
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Cooling unit

Cooling medium	water (not distilled) with coolant additive
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Cooling medium temperature	max. 55 °C
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Max. pressure	3.1 bar
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Flow rate	3.5 l/min
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Weight (cooling system)	< 28 kg (61.73 lbs.) + 6.5 kg (14.33 lbs.) cooling liquid
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¹⁾ With flat emitter technology

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X-ray tube			
MEGALIX Cat Plus 125/20/40/80 (for the as40HDR detector)			
High-performance X-ray tube			
Up to 40% greater fluoro power with flat emitter technology			
Increased contrast during fluoroscopy, especially for examinations on obese patients			
Oil/water cooled			
Max. exposure voltage (IEC 60613)	125 kV		
Focal spot (IEC 60336)	0.3	0.6 x 0.6 ¹⁾	1.0
Nominal power (thermal anode reference power = 300 W)	17 kW	38 kW	80 kW (IEC 60613:1989)
Nominal power (thermal anode reference power = 0 W)	19 kW	42 kW	93 kW (IEC 60613:1989)
Nominal radiographic anode input power	19 kW	39 kW	85 kW (IEC 60613:2010)
Anode angle	12.5°		
Maximum anode heat content	2,500,000 J (3,375,000 HU)		
Maximum heat content of the X-ray tube assembly	3,600,000 J (4,900,000 HU)		
Maximum cooling capacity of the anode	400,000 J/min. (540,000 HU/min.) / 6667 W		
Continuous heat dissipation of the tube assembly	max. 2900 W		
Anode rotation	160 Hz (3-phase current)		
Max anode current in pulsed fluoro mode	250 mA small focus 66 mA micro focus		
Maximum anode current in acquisition	800 mA large focus		
Anode input power	10 min 4000 W 20 min 3000 W > 30 min 2500 W		
Total filtration (IEC 60601-1-3)	≥ 2.5 mm Al		
Leakage radiation (IEC 60601-1-3)	< 0.44 mGy/h (at 125 kV in 1 m distance: 2500 W)		
Weight	approx. 36 kg (79.4 lbs.)		
Cooling unit			
Cooling medium	water (not distilled) with coolant additive		
Cooling medium temperature	max. 55 °C		
Max. pressure	3 bar		
Flow rate	3.5 l/min		
Weight (cooling system)	< 28 kg (61.73 lbs.) + 6.5 kg (14.33 lbs.) cooling liquid		

¹⁾ With flat emitter technology

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Floor-mounted system for interventional imaging

X-ray generator A100 Plus

Microprocessor-controlled high-frequency X-ray generator with automatic dose rate control for fluoroscopy and acquisition

Multi-pulse converter frequency	100 kHz
Max. generator power (IEC 60601-2-7 and IEC 60601-2-54)	1000 mA at 100 kV \triangleq 100 kW 800 mA at 125 kV \triangleq 100 kW
Tube current (continuous fluoroscopy)	0.5 mA to 250 mA in 0.01 mA steps
Tube current (acquisition mode)	15 mA to 1000 mA in 0.01 mA steps
Tube current (pulsed fluoroscopy)	15 mA to 250 mA in 0.01 mA steps (small focus)
Pulse frequency	0.5 p/s to 66 p/s or continuous mode
Pulse time	0.5 ms to 800 ms
Max. continuous power in fluoro mode	3000 W
Tube voltage	40 kV to 125 kV in 0.1 kV steps

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Floor-mounted system for interventional imaging

Detector as20⁺

Amorphous silicon flat detector with 25 cm diagonal entrance plane

High-resolution a-Si matrix with 184 µm pixel size and 14-bit digitization depth

High-speed fiber optic connection to the digital imaging system

Integrated temperature stabilizer yes

Integrated collision sensor yes

Removable grid yes

Detector rotation yes

Active detector cooling yes, liquid cooling

Active imaging size 177 mm x 177 mm

Detector housing (W x L x H) 246 mm x 246 mm x 99 mm

Detector housing and collision protection 286 mm x 286 mm

Input fields (diagonal) 25, 20, 16, 10 cm (9.84", 7.87", 6.3", 3.94")

Material a-Si with CsI scintillator

Image cover < 1.5 carbon fiber

Digitization depth 14-bit (16384 gray scale levels)

Pixel pitch 184 µm

Image display matrix 1024 x 1024 pixels

Nyquist frequency 2.7 lp/mm

DQE (detective quantum efficiency) 0 lp/mm: 75 % typical at 3.2 µGy (RQA5)

MTF (modulation transfer function) 1 lp/mm: 65 % typical (according to IEC 62220)

Signal to electronic noise ratio (SENR) ≥ 9.4 dB at 5 nGy (RQA5, 1x1 binning, high gain)¹⁾

Weight < 10 kg (22.05 lbs.)

Cooling unit

Cooling medium ethylene glycol : distilled water = 40 : 60 (volume)

Cooling medium temperature max 40 °C

Max pressure approx. 0.18 MPa

Flow rate 0.6 l/min

Weight (cooling system) 14.2 kg (33.3 lbs.)

⁺ Modular choice

¹⁾ SENR = 20 x log (Signal-to-electronic noise ratio) = 20 x log (sensitivity x dose / electronic noise)

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Detector as40HDR	
Amorphous silicon flat detector with 48 cm diagonal entrance plane	
High-resolution a-Si matrix with 154 µm pixel size and 16-bit digitization depth	
Integrated collision sensor	yes
Removable grid	yes
Detector rotation	yes
Active detector cooling	yes, liquid cooling
Active imaging size	382 mm x 293 mm
Image display matrix	1024 x 1024 pixels (for images up to 2480 x 1920 pixels)
Size incl. housing and collision protection	512 mm x 405 mm
Input fields	48 cm, 42 cm, 32 cm, 22 cm, 16 cm, 11 cm (18.9", 16.54", 12.6", 8.66", 6.3", 4.33")
X-ray conversion technology	a-Si with CsI scintillator
Digitization depth	16-bit (65536 gray scale levels)
Pixel pitch	154 µm
Nyquist frequency	3.25 lp/mm
DQE (detective quantum efficiency)	0 lp/mm: 77 % typical at 2µGy (RQA5)
MTF (modulation transfer function)	1 lp/mm: 59 % typical (according to IEC62220)
Signal to electronic noise ratio (SENR)	11 dB typical at 5 nGy (RQA5, 1x1 binning, high gain)
Cooling unit	
Cooling medium	ethylene glycol : distilled water = 40 : 60 (volume)
Cooling medium temperature	max. 40 °C
Max pressure	approx. 0.18 MPa
Flow rate	0.6 l/min

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Floor-mounted system for interventional imaging

Laser crosshairs*

Laser crosshairs for as40HDR, integrated into the flat detector housing with tableside operation for simplified patient positioning and facilitated puncture planning in combination with syngo Needle Guidance.

Class 1M (IEC 60825-1) laser, wavelength 600 – 700 nm (red), < 1 mW output power

Rotatable collimator for as20 detector

Compact collimator for cardioangiography with rectangular blade and wedge-shaped finger filter

Automatic synchronous rotation of the detector and collimator unit to compensate for image rotation at different examination positions of the support stand; rotation also possible via remote control enabling upright images of objects or body parts not aligned with the table, e.g. arms.

Rotatable collimator for as40HDR detector

Angio collimator with rectangular blade, wedge-shaped filters for DSA and cardiological applications and graduated finger filter

Independent rotation and shift of filter blades

Automatic synchronous rotation of the detector and collimator unit to compensate for image rotation at different examination positions of the support stand; rotation also possible via remote control enabling upright images of objects or body parts not aligned with the table, e.g. arms.

Floor-mounted system for interventional imaging

Operating modes

Fluoroscopy

Digital pulsed fluoroscopy, with 7.5, 10, 15, 30 p/s

Additional fluoroscopy pulse rates from 0.5, 1, 2, 3, 4, 6** p/s (CAREVISION)

Roadmapping (requires DSA option) with automatic pixel shift

Overlay fade, online superimposing of active fluoro and reference image

Store Monitor: Any image can be stored on the disk

Store Reference: Any image can be stored as a reference image, even during online fluoroscopy

Store Fluoro*: Last 1024 image of last performed fluoro

Last Image Hold (LIH)

Fluoro Loop*

Storage and display of dynamic fluoro sequences

The maximum fluoro time that can be saved depends on the pulse frequency selected, e.g., 34 s at 30 p/s, 68 s at 15 p/s

Roadmap*¹⁾

Individual windowing of vessel map and tool image

Previous Roadmap Mask function with automatic adjustment of system geometry

Show progress function for embolization procedures

CLEARmap*

Fast and easy access to enhanced image quality in Roadmap. CLEARmap enables enhanced image quality and functionality with fewer system interactions. CLEARmap simplifies the workflow, while saving dose and contrast e.g. by allowing zooming and panning during Roadmap and using pre-acquired DSA images for Roadmap.

Cardiac acquisition*

Acquisition at 7.5, 10, 15 and 30 f/s, acquisition, display and storage in original matrix, 12-bit

Pediatric option with 60 f/s

DR – 0.5 - 7.5 f/s

Digital radiography with digital real-time filtering, applicable for single images and series with frame rates from 0.5 f/s to 7.5 f/s (to 30 f/s³⁾).

Acquisition, display and storage are performed in original matrix size at a resolution of up to 4.76 megapixels with as40HDR²⁾

Time-controlled and manually variable frame rates are included

DSA – 0.5 - 7.5 f/s*

Digital subtraction angiography with digital real-time filtering, applicable for single images and series with frame rates from 0.5 f/s to 7.5 f/s (to 30 f/s³⁾)

Acquisition, display and storage are performed in original matrix size at a resolution of up to 4.76 megapixels²⁾

Remask, peak opacification for iodine contrast (MaxOpac) and CO₂ contrast (MinOpac), display of anatomical background (Landmark) from 0 to 100 %

Time-controlled and manually variable frame rates are included

2k option*

Enables full pixel resolution for acquisition and storage of single images and series (up to 7.5 f/s) with a resolution of up to 4.76 megapixel (2480 pixel x 1920 pixel)

It requires an as40HDR detector and is applicable for digital radiography, digital subtraction angiography, 3D-acquisition and Perivision in overview format, zoom 1 and zoom 2

Floor-mounted system for interventional imaging

Operating modes	
High-speed acquisition for DR and DSA*	
Acquisition at 10/15/30 f/s	
Subtracted display possible only with DSA	
Anatomical background¹⁾	
Anatomical surroundings visible by fading in the native image	
Setting new mask¹⁾	
A new mask can be set with "Move Mask" or "Replace Mask"	
Pixel shift¹⁾	
Manual pixel shift, automatic pixel shift, flexible pixel shift (rubber masking)	
CLEARmatch	
Automatic pixel shift processing during Roadmap and DSA based on real time movement detection for most accurate subtracted image display.	
Six degrees of freedom: two translative, rotational, zoom and two shearing movement.	
CLEARstent*	
Software for enhanced stent visualization, can be activated from tableside	
CLEARstent Live*	
Real-time stent enhancement for facilitation of cardiac procedures	
DYNAVISION DR*	
Native 2D viewing with 3D impression based on digital rotational angiography with angle triggering.	
Angle triggering enables a reduction in dose while simultaneously improving image quality.	
Rotation speed	up to 45°/s
Acquisition rate	up to 30 f/s (as20 detector); up to 75 f/s (as40HDR detector)
DYNAVISION^{*/1)}	
Subtracted 2D viewing with 3D impression based on digital rotational angiography with angle triggering.	
Angle triggering enables a reduction in dose while simultaneously improving image quality.	
Dynamic subtraction display with optimal alignment of mask and filling and automatic pixel shift over the entire scene.	
Rotation speed	up to 45°/s
Acquisition rate	up to 30 f/s (as20 detector); up to 75 f/s (as40HDR detector)
3D Acquisition* for syngo DynaCT	
Allows native or subtracted 3D reconstruction based on digital rotational angiography with angle triggering for acquisition of syngo Dyna3D high-contrast images* and/or syngo DynaCT low-contrast images*.	
Automatic image data transfer to the optional syngo X Workplace while all parameters needed for the 3D reconstruction are already included in the exam set. This allows for 3D reconstruction and optimized image quality.	
Rotation speed	up to 45°/s
Acquisition rate	up to 60 f/s (as20 detector); up to 75 f/s (as40HDR detector)
3D CARD Acquisition* for syngo DynaCT Cardiac	
Allows native 3D reconstruction based on digital rotational angiography with angle triggering or ECG gating for acquisition of syngo DynaCT Cardiac images*.	
Automatic image data transfer to the optional syngo X Workplace while all parameters needed for the 3D reconstruction are already included in the exam set. This allows for 3D reconstruction and optimized image quality.	
Rotation speed	up to 45°/s
Acquisition rate	up to 60 f/s (as20 detector); up to 75 f/s (as40HDR detector)

* Option; ¹⁾ With DSA option only

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Operating modes

PERISTEPPING* (only with as40HDR detector)

Peripheral digital angiography stepping of the table with a single contrast-medium injection performed while observing the contrast medium bolus

Position-dependent variable frame rates

Fully automatic exposure control

The collimator setting is automatically saved for each stepping increment

PERIVISION* (only with as40HDR detector)

Peripheral digital angiography with stepping of the table and online subtraction display in one examination procedure with a single contrast-medium injection while observing the contrast medium bolus

One automatically acquired mask image for each individual position

Position-dependent variable frame rates

Fully automatic exposure control

The collimator setting is automatically saved for each stepping increment

ECG-triggered fluoroscopy and acquisition*

ECG-triggered fluoroscopy/acquisition provides a still image of the catheter while compensating for cardiac movement. This enables the use of low pulse frequencies, resulting in a significantly lower dose compared to normal fluoroscopy/acquisition

Multiple acquisition program

Up to 128 acquisition programs per each mode for flexible adjustment of the X-ray and image processing parameters to the different procedures (selectable in the examination room and in the control room)

Additional functions

ECG recording and storage*

Recording, storage and display of an ECG waveform

ECG waveform is displayed with synchronous image information

Artis zee

Floor-mounted system for interventional imaging

Imaging system

High-resolution digital imaging system with outstanding image quality due to real-time image processing

Fast, direct access to all series, single images and reference images, store monitor images, in both the examination room and the control room

Possible display of CT/MR images (512² or 1 k matrix) as static reference image

Windows 7 operating system

Image storage capacity

100,000 images in 1k/12-bit matrix with a size of 2 MB	25,000 images in 1k/12-bit matrix
200,000 images* in 1k/12-bit matrix with a size of 2 MB	50,000 images in 1k/12-bit matrix*
400,000 images* in 1k/12-bit matrix with a size of 2 MB	100,000 images in 1k/12-bit matrix*

CLEAR

CLEAR optimizes image quality through real-time processing of the image data.

CLEARcontrol: The histogram analysis provides a more homogeneous image impression by harmonizing over- and underexposed areas of the image. This is done fully automatically, thus eliminating any further manual user corrections through windowing.

CLEARview: Dose-dependent filtering of the image data efficiently suppresses image noise, enabling clear, sharp images, even for low-dose acquisitions.

CLEARvessel: Every pixel is analyzed in real time, and vessel edges are shown in high contrast without adding noise to the image.

CLEARmotion: Detection of fine structures and effective compensation of motion artifacts.

Fine moving structures, such as small vessels and guidewires, are detected in the image and motion artifacts are suppressed efficiently. The visibility of small moving vessels and guidewires is improved significantly during fluoroscopy.

CLEARchoice: Allows to customize the image quality to their preferences.

CLEARstent*: Uses a fully automatic process to improve the visibility of the deployed stent for cardiac interventions.

CLEARstent Live*

Real-time stent enhancement for facilitation of cardiac procedures.

General functions

Changing window values

Zooming/Panning

Modification on the fly during postprocessing and pre-configurable for each individual acquisition program

Annotation

For inserting predefined or free text and drawing lines, arrows and circles

Distance and angle measurement

Text functions

Preconfigured image labeling using text modules or free annotation, comment line for image, patient positioning annotation

EP Option

Dedicated measure to improve signal noise in the EP lab. The kit is mounted to the tube and will minimize electromagnetic interference to the other EP recording and EP mapping systems in direct proximity to the system.

* Option

Floor-mounted system for interventional imaging

CARE

Combined applications to reduce exposure (CARE) help to reduce radiation dose for the operator and the patient

CAREfilter

Five-level adaptive Cu prefiltration (CAREfilter) for reduction of skin dose; automatic selection control based on the absorption of the object

Filter levels 0.1, 0.2, 0.3, 0.6, 0.9 mm Cu

The increase of prefiltering from 0.2 to 0.9 mm at 70 kV results in a dose saving up to 50 % ¹⁾

CAREvision

Pulsed fluoroscopy with additional reduced pulse frequencies of 0.5, 1.0, 2.0, 3.0, 4.0, 6.0** p/s

Pulse frequency can be adjusted to the requirements of each application to significantly reduce radiation exposure, particularly during interventions

The reduction from 30 fps to 7.5 fps at 70 kV results in a dose saving up to 75 % ¹⁾

CAREprofile

Radiation-free positioning of primary and semi-transparent collimators via graphic display in the LIH image on the image display

CAREprofile provides radiation-free collimator and image filter adjustment ²⁾

CAREposition

With CAREposition it is possible to perform visually controlled object positioning without radiation

Radiation-free object positioning via graphic display of the central beam and image edges in the LIH image on the image display

When the table is moved, the current positions of the central beam and image edges are superimposed on the LIH image by a graphic overlay

CAREwatch

A measurement chamber is integrated into the collimator housing for acquisition of dose area product and reference air kerma / reference air kerma rate

Displayed on the image system display

Different displays can be configured for fluoroscopy and for fluoro pause:

During fluoro: reference air kerma rate

During fluoro pause: accumulated reference air kerma or dose area product or percentage of a configurable dose limit value (total of fluoroscopy and acquisition)

* Option

** 6.0 p/s with as20 detector only

¹⁾ Dose saving dependent on patients weight and size

²⁾ According to Article Nickoloff, Cardiovasc. Intervent. Radiol. (2007) 30:168-176 virtual collimation can reduce the total fluoroscopy time by 0.5–3 min in many examinations.

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CARE

CAREmonitor

CAREmonitor shows the accumulated peak skin entrance dose according to the current projection in the form of a fill indicator on the live monitor. Any change to the C-arm, table, SID, zoom, or collimator prompts the system to automatically update the calculation.

CAREguard

CAREguard provides an effective way to control skin dose. Three reference air kerma threshold values can be defined. If the accumulated reference air kerma exceeds a configured threshold, a warning sound is given and a pop-up displays on the system.

CAREreport

CAREreport is a DICOM structured dose report; it contains all patient demographics, procedure, and dose information. Using commercially available programs or in-house software, this information can be filtered for further processing, such as dose analysis.

Low-dose syngo DynaCT* (included in syngo DynaCT option)

The low-dose syngo DynaCT provides 3D information during the treatment of very radiosensitive patients such as children. 3D imaging results can be achieved at only 0.3 mSv (neuro) based on Alderson phantom.

The reduction from 360 nGy/f to 100 nGy/f at 70 kV results in a dose saving up to 72 %¹⁾

Low-dose acquisition

Low-dose acquisition provides excellent image quality with a dose reduction of up to 67 % in comparison to normal acquisition protocols. One acquisition pedal of the footswitch can be configured as a low-dose acquisition pedal.

The reduction from 240 nGy/f to 80 nGy/f at 70 kV results in a dose saving up to 67 %¹⁾

Low-dose fluoroscopy

The reduction from "Fluoro" to "Fluoro –" results in a dose saving up to 50 %¹⁾

Automatic exposure control

Automatic X-ray control operating five fully independent, self-adjusting, and angulation-driven parameters for optimal dose calculation based on fluoroscopic values

Publications

Nickoloff et al., Cardiovasc Intervent Radiol (2007) 30:168-176

White Paper, Low-dose imaging is becoming a clinical reality

* Option

¹⁾ Dose saving dependent on patients weight and size

Floor-mounted system for interventional imaging

Quantification

Quantification

QVA – Vascular analysis for vessel diameters of 0.5 mm – 50 mm* (not for coronary analysis)

Measurement program integrated into the imaging system for exact and reproducible vascular analysis

Automatic contour recognition

Stenosis quantification

Automatic and manual determination of reference diameter

Automatic and manual calibration methods

Diameter measurement

LVA – Left ventricular analysis*²⁾

Scientific measurement program integrated in the imaging system for evaluating the functional efficiency of the left ventricle

Automatic and manual contour recognition

Calculation of the ejection fraction, volumes and indices (area-length and Simpson methods)

Wall motion (centerline, radial and regional methods)

Automatic and manual calibration

Diameter measurement

QCA – Scientific coronary analysis for vessel diameters of 0.5 mm – 7 mm*

Scientific cardiological vascular analysis with stenosis quantification:

Scientific measurement program integrated into the imaging system for clinically validated, objective, exact and reproducible evaluation of coronary arteries

Automatic contour recognition

Stenosis measurement with geometrical and densitometric calculations

Automatic and manual determination of reference diameter

Automatic and manual calibration methods

Diameter measurement

QCA bifurcation*

Adds the option of quantifying bifurcations to scientific coronary analysis

Angle/length measurement with automatic calibration

DICOM network connection and syngo user interface

Remark: Quantitative Coronary Analysis (QCA) is based on the gold standard in coronary analysis:

CAAS II (Cardiovascular Angiography Analysis System Mark II) by Pie Medical, Netherlands. The CAAS II algorithms were developed at Erasmus University in Rotterdam. They have been clinically validated and are internationally recognized for scientific purposes (multi-center studies).

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Advanced applications

IVUSmap*

Integrated cardiac workflow simultaneously records of IVUS and X-ray images and subsequent co-registration

Synchronized navigation in angiography or IVUS images along the coronary artery, allowing for measurement of areas and distances and insertion of bookmarks

Automated workflow guided by touch screen display

Works exclusively with Volcano® IVUS systems²⁾

CLEARstent*

Uses an image-quality optimized algorithm to improve the visibility of the deployed stent during cardiac interventions

Optionally, contrast can be given. CLEARstent then calculates a scene alternating between the contrast-filled lumen and the stent-enhanced image.

Resulting images and scenes can be archived in PACS and reviewed on any DICOM viewer

CLEARstent Live*

CLEARstent Live improves visibility of stents and balloons or other devices in real time, in relation to cardiac anatomy or previously deployed, for cardiac interventions.

CLEARstent Live supports frame rates up to 15 fps

Works even when the balloon is moved within the coronary vessel or contrast agent is injected, allowing precise stent positioning relative to previously implanted stents and/or vessel anatomy, therefore facilitating complex procedures

Processed images are displayed side by side with original scene on assist monitor (when present, otherwise on reference monitor)

CLEARstent Live scenes are automatically saved to scene directory allowing for review of resulting DICOM images on any DICOM viewer

IZ3D*

IZ3D offers automated detection and 3D analysis of single and bifurcated coronary arteries from 2D angiographic images.

Out-of-plane magnification and foreshortening errors are minimized by calculating true geometric shape in 3D space from two 2D X-ray projections.

In stent planning mode, a virtual stent can be specified. This virtual stent is then displayed in the 3D image and corresponding markers are overlaid onto live fluoro and acquisition.

IZ3D Store

IZ3D Store* allows to export the 3D data set generated via IZ3D. The result is stored in STL-format and can be used for scientific 3rd party applications.

Artis zee

Floor-mounted system for interventional imaging

System specifications

Stand

The Artis zee floor angio system is specifically designed to meet the escalating demands of high-end imaging for interventional radiology, interventional cardiology, minimally invasive and hybrid procedures.

C-arm system

Highly flexible and quick positioning

Single joystick for patient-angle oriented C-arm and detector movements

Integrated computerized collision protection

Programmable positioning	up to 5 system positions, additional 50 user-definable user positions and 3 direct positions
Isocenter-to-floor distance	106 cm (41.73")
Focus-to-isocenter distance	75 cm (29.53")
Patient coverage (free floating tabletop, minimum without repositioning)	180 cm (70.87") or 188 cm (74") (dependent on FD size)
C-arm depth	92.5 cm (36.4")
Stand rotation	motorized programmable positioning from 0° to 35°
C-arm oblique projections ¹⁾	± 130° LAO/RAO and + 55°/- 45° CRAN/CAUD at 0° head-end C-arm position; ± 45° LAO/RAO and + 15°/- 45° CRAN/CAUD at 35° left-side C-arm position
Angulation speed	variable rotation up to 25°/s with LAO/RAO and 18°/s with CRAN/CAUD; variable rotation, automated runs up to 45°/s
Variable focal spot-to-detector distance	approx. 90 cm – 120 cm (35.4" - 47.24"), speed up to 9 cm/s (3.54")

MULTISPACE.F* – Maximum positioning flexibility

Additional stand rotation for free positioning of system and table relative to one another, for the following positions, in addition to others:

Patient access from the left side	
Right-side C-arm positioning	30° relative to the longitudinal axis of the patient and double oblique projections of 58°/65° LAO/RAO and + 45°/- 45° CRAN/CAUD
OR position (Stand left, table rotated)	orthogonal to the longitudinal axis of the patient and double oblique projections of 50°/45° LAO/RAO and + 43°/- 45° CRAN/CAUD
Stand rotation	manual from + 60° to – 220°
Orthogonal system control oriented to the longitudinal axis of the patient	

Automap*

Automatic stand positioning depending on the reference image selected

Automatic reference image selection depending on the current stand positioning

Artis zee

Floor-mounted system for interventional imaging

Patient tables (for free-floating tabletops)

Depending on the diagnostic and therapeutic focus, the various patient table configurations enable user-specific application

Standard table⁺

Floor-mounted patient table for all angiographic examinations and interventions

Large unobstructed cantilevered tabletop and wide range of rotation enables access to patient from all sides and easy transfer and positioning

Telescoping column with motorized height adjustment

Table control module for operation of all table functions

Table height 77.5 cm to 110 cm (30.5" to 43.3")

Table length 281.5 cm (110.8") (with narrow and wide tabletop)

Lift speed 4 cm/s (1.58"/s)

Table rotation $\pm 120^\circ$ with 5° increments

Manual longitudinal travel 125 cm (49.2")

Manual transverse travel ± 17.5 cm (6.9")

Maximum unobstructed overhang 224 cm (88.19") (with narrow and wide tabletop)

Maximum table load 390 kg [859.8 lbs.] (250 kg [551.2 lbs.] patient weight with narrow, wide and neuro tabletop)
(100 kg [220.5 lbs.] emergency resuscitation)
(40 kg [88.2 lbs.] accessories)

Table with stepping (PERISTEPPING)⁺

Similar to the standard table, but with additional motorized longitudinal travel and PERISTEPPING.

Speed of table movement 270 mm/s

Table with tilt⁺

Similar to standard table, with head-down/head-up tilt options and servo operation, prepared PERISTEPPING

Tilt angle head down/head up $\pm 15^\circ$

Tilt speed head down/head up $4.0^\circ/\text{s}$

Servo-supported table control module for operation of all table functions including motorized longitudinal table movement in tilt position with power-dependent control

Maximum table load 340 kg [749.6 lbs.] (200 kg [440.9 lbs.] patient weight)
(100 kg [220.5 lbs.] emergency CPR)
(40 kg [88.2 lbs.] accessories)

OR table (with tilt and cradle)⁺

Similar to table with tilt, with head-down/head-up, lateral tilt options and servo operation, prepared PERISTEPPING

Tilt angle lateral $\pm 15^\circ$

Tilt speed lateral $2.5^\circ/\text{s}$

Maximum table load 340 kg [749.6 lbs.] (200 kg [440.9 lbs.] patient weight)
(100 kg [220.5 lbs.] emergency CPR)
(40 kg [88.2 lbs.] accessories)

⁺ Modular choice

Floor-mounted system for interventional imaging

Free-floating tabletops

Four carbon-fiber tabletops with special, contoured foam mattresses are available:

Narrow tabletop/mattress⁺

Narrow form with recess at head end, e.g., for cardiological applications. The tabletop is tapered in the thorax region for the greatest possible freedom of C-arm angulation.

Tabletop	Length: 228.6 cm (90"); width: 45.0 cm (17.72")
Max. patient weight	200 kg (441 lbs.) for table with tilt and OR table 250 kg (551.2 lbs.) for standard table and table with stepping
Al equivalent of tabletop	≤ 1.4 mm (0.06") at 100 kV, HVL 3.6 mm (0.15") Al
Al equivalent of mattress thin	< 0.6 mm (0.02") at 100 kV, HVL 3.6 mm (0.15") Al (= Standard)
Al equivalent of mattress thick	< 1.0 mm (0.04") at 100 kV, HVL 3.6 mm (0.15") Al (= Option)
Heatable mattress*	(see Artis Accessory catalog)

Wide tabletop/mattress⁺

Wide, straight shape for universal applications. The tabletop is straight up to the head area and offers maximum positioning comfort, even for obese patients

Tabletop	Length: 228.6 cm (90"); width: 52.5 cm (20.67")
Max. patient weight	200 kg (441 lbs.) for table with tilt and OR table 250 kg (551.2 lbs.) for standard table and table with stepping
Al equivalent of tabletop	≤ 1.4 mm (0.06") at 100 kV, HVL 3.6 mm (0.15") Al
Al equivalent of mattress thin	< 0.6 mm (0.02") at 100 kV, HVL 3.6 mm (0.15") Al (= Standard)
Al equivalent of mattress thick	< 1.0 mm (0.04") at 100 kV, HVL 3.6 mm (0.15") Al (= Option)
Heatable mattress*	(see Artis Accessory catalog)

Long tabletop/mattress⁺

Longer design with a wide, straight form for special angiographic applications, e.g., angio OR. The tabletop is straight and lengthened to increase accessibility with maximum positioning comfort.

Table length	316.6 cm (124.65")
Max. unobstructed overhang	259.1 cm (102.01")
Tabletop	Length: 263.7 cm (103.8"); width: 52.5 cm (20.67")
Max. patient weight	160 kg (352.7 lbs.)
Al equivalent of tabletop	≤ 1.5 mm (0.06") at 100 kV, HVL 3.6 mm (0.15") Al
Al equivalent of mattress thin	< 0.6 mm (0.02") at 100 kV, HVL 3.6 mm (0.15") Al (= Standard)
Al equivalent of mattress thick	< 1.0 mm (0.04") at 100 kV, HVL 3.6 mm (0.15") Al (= Option)

Neuro tabletop/mattress⁺

Narrow form with a dovetail interface at the table head end. The interface allows for attaching head clamps, e.g. for neurosurgical applications. The tabletop is tapered in the thorax region for the greatest possible freedom of C-arm angulation.

Table length	253.9 cm (99.96")
Max. unobstructed overhang	196.4 cm (77.32")
Tabletop	Length: 201.0 cm (79.13"); width: 45 cm (17.72")
Maximum patient weight	200 kg (441 lbs.) for table with tilt and OR table 250 kg (551.2 lbs.) for standard table
Al equivalent of tabletop	≤ 1.4 mm (0.06") at 100 kV, HVL 3.6 mm (0.15") Al
Al equivalent of mattress thin	< 0.6 mm (0.02") at 100 kV, HVL 3.6 mm (0.15") Al (= Standard)
Al equivalent of mattress thick	< 1.0 mm (0.04") at 100 kV, HVL 3.6 mm (0.15") Al (= Option)

⁺ Modular choice; * Option

Artis zee

Floor-mounted system for interventional imaging

Artis Large Display*	
55" viewing area enables a new dimension in medical imaging. Up to 26 different image sources can be shown on the same display, allowing high flexibility in arranging different screen layouts. Important images can be scaled to the desired size, less important information can be moved out of the focus.	
Display	55" †
Resolution	3840 x 2160
Pixel size	0.315 x 0.315
Display area (W x H)	1209.6 x 680.4 mm
Panel technology	Color, TFT (IPS)**
Viewing angle	178° H and V
Calibrated contrast	1000 : 1
Max. luminance	700 cd/m ²
Calibrated luminance	400 cd/m ²
Dimensions without stand (W x H x D)	1265.3 x 735.7 x 134.5 mm
Weight without stand	541 kg ± 2 kg (90.4 lbs. ± 4.4)
Power consumption	400 W
Multi-Display Controller	Three different controllers are available
Optimized waveform display	A special algorithm enables optimal visualization of especially ECG and EEG waveforms when the video signal is displayed in a shrunken format below the original video resolution of the source system. Optimized waveform display with channels 5, 6, 9, 14, 15, 18, 24, 27.
Number of inputs	9 physical, simultaneously usable: 7 digital + 1 high-speed analog, 1 standard analog; 18 physical, simultaneously usable: 14 digital + 2 high-speed analog, 2 standard analog; 26 physical, simultaneously usable: 20 digital + 6 analog
Digital input specifications	DVI-D single link; max. 1920 x 1200, 60 Hz
High-speed analog input specifications (3 ports)	Max. 1920 x 1200, 60 Hz
Standard analog input specifications (3 ports)	Max. 1280 x 1024, 75 Hz
Ambient conditions	
Operating temperature	5°C to + 40°C (– 41°F to + 104°F)
Operating humidity	10% to 80%, relative, not condensing
Storage temperature	– 20°C to + 55°C (– 4°F to + 131°F)
Storage humidity	10% to 95%, relative
Barometric pressure	700 hPa to 1060 hPa or up to 3000 m (10,000 ft)
Power requirements	
Input voltage	100 to 240 V AC, 50 to 60 Hz
Input current	5.0 to 2.5 A
Redundancy	2 independent power supplies, hot-swap capable
Mechanical specifications	
Mechanical adaption	19" rack design, 4 U high
Dimensions (W x H x D)	482.6 x 178 x 350 mm (482.6 x 178 x 450 mm with 24 video plugs)
Weight	< 20 kg (44.1 lbs.)

* Option

† Depends on logistic regulations

** IPS (In-plane-switching) is an innovative screen technology which provides higher luminance, a higher dynamic range and consistent contrast from all viewing angles (only available with 55" display).

Floor-mounted system for interventional imaging

Displays

19" Color Display⁺

19" TFT color and gray scale live and reference images display. High-speed presentation of motion studies and dynamic images in X-ray diagnostics as well as interventional therapeutic procedures

Light weight, high luminance and contrast values

Ambient light sensor for optimum adaption to the room brightness

Diagonal screen measurement	19" (48 cm)
-----------------------------	-------------

Image display	1280 x 1024
---------------	-------------

Pixel size	0.294 x 0.294 mm
------------	------------------

Calibrated luminance	400 cd/m ²
----------------------	-----------------------

Max. contrast ratio	1000 : 1
---------------------	----------

Viewing angles (H, V)	176°
-----------------------	------

Power consumption	< 75 VA (W)
-------------------	-------------

Power save mode	< 10 VA (W)
-----------------	-------------

19" Color Display⁺

Suitable for color display in the control room; not to be used as live display in the examination room

Diagonal screen measurement	19" (48 cm)
-----------------------------	-------------

Image display	1280 x 1024
---------------	-------------

Pixel size	0.294 x 0.294 mm
------------	------------------

Calibrated luminance	180 cd/m ²
----------------------	-----------------------

Max. contrast ratio	800 : 1
---------------------	---------

Viewing angle (min.)	178° H and V
----------------------	--------------

Power consumption	< 75 VA (W)
-------------------	-------------

Power save mode	< 10 VA (W)
-----------------	-------------

21" Color Display⁺

21" TFT color and gray scale images display

Light weight, high luminance and contrast values

Ambient light sensor for optimum adaption to the room brightness

Diagonal screen measurement	21" (54 cm)
-----------------------------	-------------

Image display	1600 x 1200
---------------	-------------

Pixel size	0.270 x 0.270 mm
------------	------------------

Calibrated luminance	270 cd/m ²
----------------------	-----------------------

Max. contrast ratio	1500 : 1
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Viewing angles (H, V)	178°
-----------------------	------

Power consumption	< 48 VA (W)
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Power save mode	< 0.5 VA (W)
-----------------	--------------

Artis zee

Floor-mounted system for interventional imaging

Display Ceiling Suspension

DCS Large Display plus two

For one Large Display and two additional 19"/21" displays enables height adjustment, longitudinal travel, swivel capabilities with enhanced working load (+ 25 kg [55.1 lbs.] in comparison with standard DCS-LD protected).

Length of longitudinal rails	425 cm (214.6")
Travel range of ceiling-mounted carriage	< 315 cm (124")
Vertical lift (height adjustment)	85 cm (33.46")
Length of cantilever	120 cm (47.24")
Rotation range of the ceiling-mounted support to the rail axis	300°, settings every 30°
Rotation range of displays	330°, settings every 30°

DCS* / DCS PRO*

Ceiling-mounted suspension system for 2 to 8 displays enables height adjustment, longitudinal travel, swivel capabilities.

Length of longitudinal rails	425 cm (167.32")
Travel range of ceiling-mounted carriage	< 315 cm (124")
Vertical lift (height adjustment)	85 cm (33.46")
Length of cantilever	120 cm (47.24")
Rotation range of the ceiling-mounted support to the rail axis	300°, settings every 30°
Rotation range of displays	330°, settings every 30°

2nd DCS* with 2 to 3 displays*

DCS-extended* / DCS Large Display extended*

Ceiling-mounted suspension system DCS-extended for 4 to 8 displays or one Large Display enables height adjustment, longitudinal travel, swivel capabilities. Enhanced positioning range and flexibility by double pivot cantilever.

Length of longitudinal rails	425 cm (167.32")
Travel range of ceiling-mounted carriage	< 315 cm (124")
Vertical lift (height adjustment)	88.5 cm (34.84")
Length of double cantilever	60 cm and 120 cm (23.62" and 47.24")
Rotation range between cantilever extension and carriage	300°, settings every 30°
Rotation range of displays	330°, settings every 30°

** System and DCS are in one rail system

Display boom interface*

Universal interface for third-party display boom

Artis zee

Floor-mounted system for interventional imaging

Artis Cockpit*

One or two displays support up to nine different image sources, in 4 different screen layouts, on the same displays.

Configurations	1 keyboard/mouse	1 display
	1 keyboard/mouse	2 displays
	2 keyboards/mice	2 displays

High brightness display 30"

Panel	Color TFT 30"
Resolution	2560 x 1600
Pixel size	0.256 mm x 0.256 mm
Contrast ratio	1500 : 1
Viewing angles (H, V)	178°
Power consumption	57 W / max. 116 W
Power save mode	1 W
Max. luminance	750 cd/m ²
Typical luminance	400 cd/m ²
Display area (W x H)	655.36 mm x 409.6 mm
Dimensions without stand (W x H x D)	731 mm x 485 mm x 84 mm
Weight without stand	14.3 kg (31.5 lbs.)
Weight incl. stand	20.7 kg (45.6 lbs.)

Display Controller

Video inputs

Video input connector	up to 9 input signals 7 x DVI-D 1920 x 1200, 60 Hz; 1 x VGA 1920 x 1200, 60 Hz; 1 x DVI-I analog 1280 x 1024, 60 Hz
-----------------------	------------------------------------------------------------------------------------------------------------------------------

Artis zee

Floor-mounted system for interventional imaging

Operation

An ideal workflow requires full user operation capabilities for the system including imaging system and generator under sterile conditions in the examination room. That way the user is able to operate the system independently without the need to leave the examination room. The intuitive *syngo* operating elements allow for managing the whole process from preparation of the patient to image post-processing in a safe, reliable, and time-efficient way.

Operation in the examination room

Complete system operation through modular control elements directly at the patient table for controlling C-arm movements, patient table and multileaf collimator. Touchscreen with multi-functional joystick for operation of the imaging system, including post-processing and quantification as well as selection of the organ programs. It is based on *syngo* operation. The touchscreen is specifically configurable to individual clinical requirements.

Data regarding system and table geometry, dose data with CAREwatch, as well as system messages, are shown on the live display.

Ergonomically designed footswitch for releasing fluoroscopy, acquisition, and table brake, as well as an additional configurable function.

Wireless footswitch*¹⁾

Permits easy positioning of the footswitch

Operation in the control room

Standard Siemens *syngo* control via keyboard and mouse for all imaging system functions such as image post-processing, archiving and configuring of organ programs.

Additional operating options in the control room

The entire system can also be operated from the control room using the same functions as in the examination room:

- Touchscreen control* with multi-functional joystick
- Control modules* for C-arm, table and collimator
- Multi-functional hand switch* for acquisition control, switching acquisition frame rates and/or step movements (option for PERISTEPPING and/or PERIVISION)
- Footswitch*

Artis zee

Floor-mounted system for interventional imaging

Connectivity

DICOM Functions

DICOM Send

Sends images and series to DICOM networks or workstations

DICOM StC (Storage Commitment)

Receives archiving confirmation from the image archive

DICOM Print*

Prints image material using virtual film sheets via DICOM print laser camera or network laser printer

DICOM Query/Retrieve

Searches for images and series in DICOM networks (Query)

Imports images and series from DICOM networks (Retrieve)

DICOM Get Worklist*

Imports patient and procedure data from a DICOM patient management system

DICOM MPPS* (Modality Performed Procedure Step)

Sends dose data as well as patient examination status to a patient data management system

Exam protocol can be sent as DICOM image

DICOM SR

Stores quantification results and relevant dose data as DICOM Structured Report and sends it to DICOM network

Ready Processed Images

Configurable transfer mode to store and archive overlays and post-processing results in the image pixels

Networking

Ethernet interface, full-duplex, gigabit transfer rate

Artis zee

Floor-mounted system for interventional imaging

Data export*

USB interface, supports manual storage of clinical images/scenes in DICOM, jpeg, Bitmap or AVI format

Integration of the Siemens Recording System

Sensis Interface*

Interface to Sensis hemodynamic and electrophysiological recording system for automatic acquisition or transfer of patient demographic data and system parameters (dose report)

For more information about the Sensis recording system, please refer to separate data sheet

Connection with ACUSON Freestyle Elite ultrasound system

Artis Freestyle Access*

Preparation for the connection of ACUSON Freestyle Elite with Artis Access ultrasound system to the Artis. It allows for viewing of ultrasound images on the Large Display, transfer of demographic patient information, and mounting of the ultrasound unit on the Large Display ceiling suspension.

syngo X Workplace*

syngo X Workplace high-end post-processing workstation with syngo-based user software and network modules, for real-time 3D reconstruction and 3D viewing

For more information about the syngo X Workplace applications, please refer to separate data sheet

Artis zee

Floor-mounted system for interventional imaging

Injectors

For more information and additional injectors, please refer to the accessories catalog

Standard and optional accessories

Please refer to separate catalog

Remote Service*

- Preparation for Siemens Remote Service (SRS):
- Allows remote hardware and software diagnosis
- Allows remote system configuration, e.g., adding a DICOM node
- Early warning system to help ensure system operation (Guardian)
- Virus protection

Security Package

syngo Security Package*
SW option for Artis with expanded security features such as user management and audit trail function

Artis zee

Floor-mounted system for interventional imaging

Room preparation

Emergency power supply*

Emergency power supply* for the imaging system

Bridging of the imaging system power supply (50/60 Hz) until line voltage is back. In case of power failures of more than 90 seconds the imaging system will be shut down automatically.

Nominal power	2 kVA
---------------	-------

Emergency power supply* for all system, table movements and imaging system

Emergency power supply for uninterrupted power supply for all system and table movements, as well as imaging system and monitors for a period of at least 10 min. during a primary power failure.

On-site emergency power supply system is a legal requirement in accordance with IEC 60601-2-43 (for tilt and Artis OR tables)

Nominal power	15 kVA
---------------	--------

Line voltage	400 V / 440 V or 480 V; an adaptation to 440/480 V is required.
--------------	-----------------------------------------------------------------

Emergency power supply* for the entire system incl. emergency fluoro

Emergency power supply for the entire system incl. emergency fluoro for a period of at least 10 minutes during a primary power failure. Uninterrupted power supply for all system and table movements, as well as imaging system and monitors.

Approx. 30 seconds after power failure the generator has finished restart and you will be able to work with continuous fluoroscopy in emergency operation mode.

Nominal power	40 kVA
---------------	--------

Line voltage	400 V / 440 V or 480 V; an adaptation to 440/480 V is required.
--------------	-----------------------------------------------------------------

Internal line resistance for generator A100 Plus¹⁾

U_N/P	80 kW	100 kW
380 V	$\leq 135 \text{ mOhm}$	$\leq 110 \text{ mOhm}$
400 V – 460 V	$\leq 135 \text{ mOhm}$	$\leq 135 \text{ mOhm}$
480 V	$\leq 135 \text{ mOhm}$	$\leq 125 \text{ mOhm}$

¹⁾ To achieve the full generator power, the measured internal line resistance should not exceed the following values.
Resistance values in Ohm at $U_N \pm 10\%$

Artis zee

Floor-mounted system for interventional imaging

Installation data

Line voltage connection, 3-phase current, TN-S

Generator

Nominal voltage ³⁾ (3 phase)	380 V, 400 V, 420 V, 440 V, 460 V \pm 10 %, 50/60 Hz \pm 1 Hz, 480 V, 60 Hz
Fuse	internal 50 A, external 63 A slow-blow fuse
Power consumption	1.8 kVA system off 2.25 kVA system in standby 8 kVA for fluoroscopy 160 kVA for acquisition

System control cabinet

Nominal voltage ³⁾ (3 phase)	380 V, 400 V, 420 V, 440 V, 460 V \pm 10 %, 50/60 Hz \pm 1 Hz, 480 V, 60 Hz
Fuse	internal 26 A, external 50 A slow-blow fuse
Power consumption	max. 8.5 kVA (long-time loading > 5 min)

³⁾ Max. allowable nominal voltage between phases (L1, L2, L3) and PE 277 V; * Option

Weight¹⁾

Examination room	Stand	approx. 665 kg	(1466 lbs.)
	Installation plate	45 kg	(99 lbs.)
	Display ceiling suspension (DCS) (depending on configuration)	235 – 355 kg	(518 – 782.6 lbs.)
	Patient table (depending on table)	452 – 550 kg	(996 – 1213 lbs.)
	Injector wall connection	5 kg	(11 lbs.)
Control room	Imaging system	approx. 150 kg	(331 lbs.)
	UPS for imaging system (option)	51 kg	(112 lbs.)
	Control room distributor	29 kg	(64 lbs.)
	Miscellaneous	50 kg	(110 lbs.)
	Large display container	115 kg	(253.53 lbs.)
	Large display	approx. 60 kg	(132.27 lbs.)
	Control console	40 kg	(88 lbs.)
	Video container	60.5 kg	(133 lbs.)
	XWP	52.0 kg	(114.64 lbs.)
Equipment room	Artis Cockpit	31.0 kg	(68.34 lbs.)
	Generator	300 kg	(661.4 lbs.)
	Cooling system (X-ray tube)	42 kg	(93 lbs.)
	System control cabinet	270 kg	(595 lbs.)
	System control cabinet (only with OR table)	125 kg	(276 lbs.)
	Cable cabinet	120 kg	(265 lbs.)

¹⁾ All weight specifications are for reference only. Depending on the system configuration, the resulting ceiling and floor loads will be different.

Artis zee

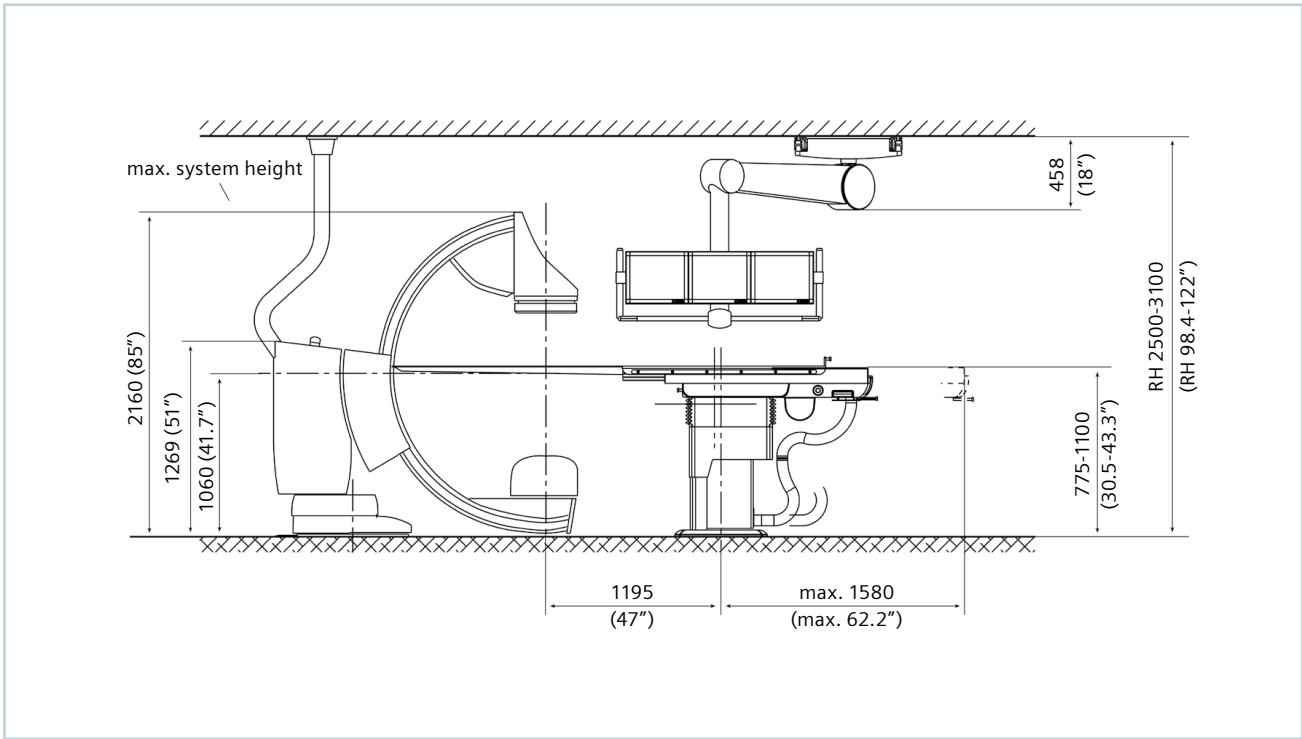
Floor-mounted system for interventional imaging

Ambient conditions (operation)		
Examination, control- and equipmentroom	Temperature range: Relative humidity: Temperature gradient: Barometric pressure:	+ 15 °C to + 30 °C (recommended 22 °C) 20 – 75 % below dew point max. 5 °C/h 70 kPa – 106 kPa
Imaging system	Temperature range: Relative humidity: Temperature gradient: Air flow: Noise level:	+ 10 °C to + 35 °C 20 – 75 % (not condensing) max. 10 °C/h 630 m³/h < 53 dB (A)
Generator	Air flow: Noise level:	160 m³/h < 55 dB (A)
Cooling system (for MEGALIX tube)	Cooling air: Air flow: Noise level:	+ 15 °C to + 30 °C (frost-free room) 950 m³/h 55 dB – 59 dB at 50/60 Hz
System control cabinet 1	Air flow: Noise level:	650 m³/h 48 dB (A)
System control cabinet 2 (only for OR table)	Please see room conditions	
Stand	Mechanical impact: Vibrations: Noise level:	max. 10 g/16 ms max. 0.1 g/10-200 Hz < 55 dB (A)
Operation altitude	Less than or equal to 3000 meters (10,000 ft)	
Overvoltage category	II	
Pollution degree	2	
Oxygen enriched environment	n/a	

Artis zee

Floor-mounted system for interventional imaging

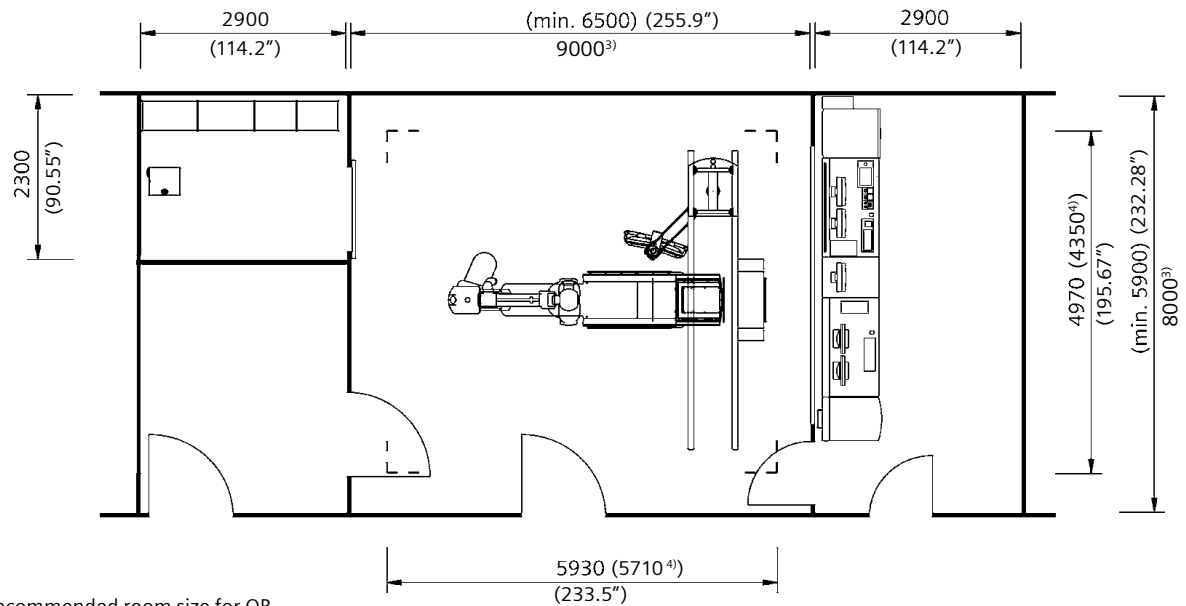
System view (mm)



Artis zee

Floor-mounted system for interventional imaging

Room layout (mm)



³⁾ Recommended room size for OR

⁴⁾ 25 square meters (< 269.1 sq ft.) with limitations for PERI, Tilting, OR tables and MULTISPACE.F

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VD11D/E

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Caution: Federal law restricts this device to sale by or on the order of a physician.

For floor-mounted systems 10094135, 10502501

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