



Artis zee

Floor-mounted cardiology system for Magnetic Navigation
Biplane cardiology system for Magnetic Navigation
VC 21

Data sheet

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SIEMENS

Artis zee

Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

The Artis **zee** Magnetic Navigation is specially designed for integration with the NIOBE® magnetic navigation system by Stereotaxis, Inc.

It includes all system modifications required for compatibility with the magnetic field of the NIOBE® system.

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

The CARE package helps to reduce radiation for the operator and patient with high diagnostic and interventional outcomes.

The CLEAR package offers a comprehensive range of applications to enhance image quality without increasing the dose.

Artis **zee** Magnetic Navigation:

- Compatibility with the NIOBE® magnetic navigation system and its $\pm 15^\circ$ tiltable magnets
- Floor-mounted C-arm stands for fast, programmable movements
- Additional biplane-mounted stand for Artis **zee** biplane MN

Positioning flexibility

The floor-mounted Artis **zee** supports convenient positioning of the C-arm around the table.

The C-arm features a floor rotation point that enables motorized swivel from the head-end position to a left-side position relative to the patient table.

With the C-arm in the left-side position, head to-toe coverage of the patient is possible.

Patient table

Catheterization table with free-floating easily exchangeable tabletop and a maximum patient weight of up to 250 kg. Optionally the table can be equipped with tilt/cradle capability and motorized stepping.





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Tablesideside control

The slimline tableside touch screen control features easy-to-read *syngo* icons to operate connected systems convenient and fast.

Configurable layouts can be customized on site.

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



CARE Package

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

CAREvision: reduced pulse rates in fluoroscopy

CAREprofile: radiation free collimation

CAREposition: radiation free patient repositioning

CAREfilter: automated CU prefiltration of X-ray beam

CAREwatch: display of dose in the examination room

CAREguard: effective skin dose control

CAREreport: dose information embedded in DICOM structured report

CAREmonitor: peak skin entrance dose monitoring

Artis zee Large Display*



With the new Artis **zee** Large Display 9, 18 or 24 systems can be connected to the screen. The screen layout can be changed with the tableside control module. With its new built-in backup concept, additional back-up monitors are no longer necessary. A special algorithm provides sharp display of waveforms in zoomed format.

New generation: Artis zee Cockpit*



The Artis **zee** Cockpit allows you to control up to nine systems from one workplace. This will clean up the control room. The Artis **zee** Cockpit can be configured with one or two high resolution 4 megapixel 30" medical-grade monitors. It is even possible to set up the system even for two operators with one keyboard and mouse for each monitor.

CLEAR Package

The CLEAR applications provide outstanding image quality to increase certainty during interventions.

CLEARcontrol: harmonization of the image especially in areas with large density differences

CLEARview: dose adaptive noise reduction for sharp images

CLEARvessel: crisp visualization of vessel edges

CLEARmotion: detection of fine structures and effective compensation of motion artifacts

CLEARchoice: allows customizing the image quality to the customer's preference

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

X-ray tube

The new MEGALIX Cat Plus tube features the new flat emitter technology.

This enables a higher current during fluoroscopy resulting in better image quality especially for obese patients.



* Option

Designed for high-end 3D applications

The Artis **zee** system is designed for the latest trendsetting imaging techniques and incorporates effective on-screen workflow guidance to combine a high standard of imaging with *syngo*'s great ease of use.

The 3D data sets are acquired quickly and easily with the help of on-screen workflow guidance.

Artis **zee**: A confident investment

A new interventional imaging system represents a substantial investment for any healthcare enterprise.

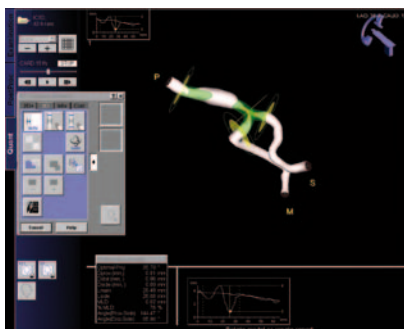
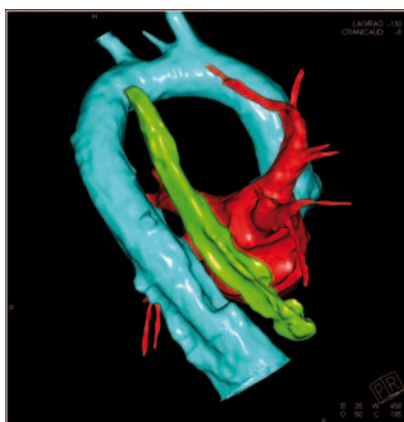
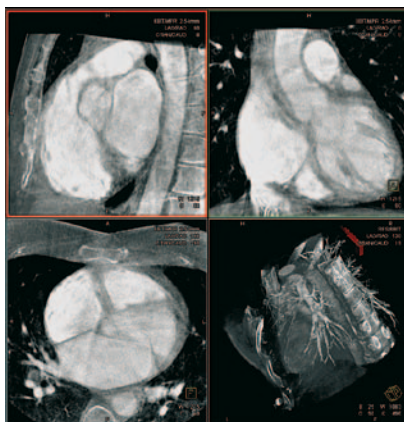
Artis **zee** was specifically designed to provide value for your investment today and in the years ahead.

• *syngo* DynaCT Cardiac*

Based on rotational angiography with a frame rate of 60 frames/second, *syngo* DynaCT Cardiac creates CT-like images directly in the cath lab.

It can be operated in the fast acquisition mode with one 5-second rotation or in the advanced ECG-gated mode.

syngo DynaCT Cardiac is the ideal choice for intraprocedural 3D imaging for a wide range of clinical applications in cardiology.



• *syngo* InSpace EP*

To segment anatomical structures like the left atrium out of a 3D data set, *syngo* InSpace EP offers outstanding performance with its unique one-click segmentation.

Additional structures like the esophagus or the aorta can be visualized in the same image and even an endoscopic view is supported.

• *syngo* iPilot*

The overlay of 3D structures on the live fluoroscopy image with *syngo* iPilot sets new standards for interventional procedures.

Best results are achieved by using a *syngo* DynaCT Cardiac data set.

• 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 2 or more 2D X-ray projections.

• *syngo* Aortic ValveGuide*

syngo Aortic ValveGuide offers fast and precise automatic segmentation of the aortic root directly from *syngo* DynaCT Card 3D images, thus providing excellent support for planning the valve implantation.

Color-coded anatomical landmarks together with the overlay of the 3D structures and the live fluoroscopy created with *syngo* iPilot allow for efficient valve positioning.

¹ A *syngo* X Workplace is required to produce 3D results. For details regarding the X Workplace, please refer to the specific data sheet.

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Stand

The C-arm system (single or biplane) with digital imaging techniques is designed for the challenges of modern cardiac and electrophysiological diagnostics, interventional procedures and hybrid procedures.

C-arm system

Highly flexible use and quick positioning

One single joystick (per plane) for all patient-angle oriented C-arm and detector movements

Integrated, computerized collision monitoring (ICP, Intelligent Collision Protection)

Programmed positioning	Up to 5 system positions for the Artis zee floor MN, up to 7 system positions for the Artis zee biplane MN; additional 50 user positions (magnets in park position), and 3 direct positions
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Isocenter-to-floor distance	106 cm (41.73")
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Focus-to-isocenter distance	75 cm (29.53")
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Patient coverage	185 cm (72.84")
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Floor stand

C-arm standard positioning	Motorized from 0° at the head end and 35° on the left side relative to the longitudinal axis of the table
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Double oblique projections (magnet in park position)	± 130° LAO/RAO and + 53°/- 45° CRAN/CAUD at 0° to head end ± 45° LAO/RAO and + 15°/- 45° CRAN/CAUD with 35° left-sided C-arm position
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Double oblique projections (magnet in navigation position 0°)	± 29° LAO/RAO and + 53°/- 45° CRAN/CAUD
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Magnet in navigation position at ± 15° tilt	44° LAO / 14° RAO 44° RAO / 14° LAO and + 53° / - 45° CRAN/CAUD
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Angulation speed	Variable up to 25°/s with LAO/RAO and 18°/s with CRAN/CAUD
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Variable focal spot-to-detector distance	Approx. 90 – 120 cm (35.43" – 47.24"); speed up to 9 cm/s (3.54"/s)
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C-arm depth	92.5 cm (36.4")
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Ceiling-mounted stand (Artis zee biplane MN)

Ceiling-mounted, compact C-arm for hemiaxial oblique projections, also during simultaneous biplane operation

Longitudinal C-arm movement	Motorized up to 15 cm/s (5.09"/s)
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Double oblique projections	From 0° to 120° LAO/RAO and ± 55° cran/caud
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Angulation speeds	Variable rotation up to 10°/s
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Variable focal spot-to-detector distance	Approx. 90 – 124 cm (35.43" – 48.82"); speed up to 9 cm/s (3.54"/s)
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Automap*

Automatic stand positioning depending on the reference image selected

Automatic reference image selection depending on the current stand positioning (only possible if the NIOBE® magnets are in park position)

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Patient tables

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	± 120° 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) ¹ (100 kg [220.5 lbs.] emergency resuscitation) (40 kg [88.2 lbs.] accessories)

Table with tilt⁺

Similar to the standard table, but with head-down/head-up tilt options including motorized stepping for PERISTEPPING* and servo operation

Tilt angle head down/head up	±15°
Tilt speed head down/head up	4.0°/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) ² (100 kg [220.5 lbs.] emergency resuscitation) (40 kg [88.2 lbs.] accessories)

OR version table⁺

Similar to table with tilt, with head-down/head-up and lateral tilt options, including PERISTEPPING*

Tilt angle head down/head up	± 15°; lateral ± 15°
Tilt speed head down	2.5°/s
Maximum table load	340 kg (749.6 lbs.) (200 kg [440.9 lbs.] patient weight) ¹ (100 kg [220.5 lbs.] emergency resuscitation) (40 kg [88.2 lbs.] accessories)

⁺ Modular choice (several variations to choose from); ¹ 160 kg patient weight for long tabletop

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Tabletops

Three changeable 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	≤ 1.4 mm (0.06") at 100 kV, HVL 3.6 mm (0.15") Al
Mattress thin	< 0.6 mm (0.02") at 100 kV, HVL 3.6 mm (0.15") Al (= Standard)
Mattress thick	< 1.0 mm (0.04") at 100 kV, HVL 3.6 mm (0.15") Al (= Option)
Heatable mattress*	(see Artis zee 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	≤ 1.5 mm (0.06") at 100 kV, HVL 3.6 mm (0.15") Al
Mattress thin	< 0.6 mm (0.02") at 100 kV, HVL 3.6 mm (0.15") Al (= Standard)
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 provides the possibility 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 (440.9 lbs.) for table with tilt and OR table 250 kg (551.2 lbs.) for standard table
Al equivalent	≤ 1.4 mm (0.06") at 100 kV, HVL 3.6 mm (0.15") Al
Mattress thin	< 0.6 mm (0.02") at 100 kV, HVL 3.6 mm (0.15") Al (= Standard)
Mattress thick	< 1.0 mm (0.04") at 100 kV, HVL 3.6 mm (0.15") Al (= Option)

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Imaging system

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

CLEARpackage

The CLEARpackage enables optimized image quality through real-time processing of the image data.

CLEARcontrol: The new 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.

- Precondition to run LowDose Acquisition Protocols

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 users 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.

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)

Quantification:

Angle/length measurement with automatic calibration

Text functions:

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

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

DICOM network connection and *syngo* user interface

Ready Processed Images

Configurable mode to store and archive overlays and postprocessing data in the image

Image storage capacity

25,000 images in 1k/12-bit matrix (standard for Artis **zee** floor MN)

50,000** images in 1k/12-bit matrix

100,000* images in 1k/12-bit matrix

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Post-processing modes

Changing window values

Zooming/Panning

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

Anatomical background**

Anatomical surroundings visible by fading in the native image

Electronic shutter

To collimate an image electronically

Annotation

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

Distance and angle measurement

Setting new mask**

A new mask can be set with "Move Mask" or "Replace Mask"

Pixel shift**

Manual pixel shift, automatic pixel shift, flexible pixel shift (rubber masking)

** With DSA option only

Operating modes

Fluoroscopy

Digital pulsed fluoroscopy, with 7.5, 10, 15, 30 p/s in 1k/12-bit matrix (4096 gray scales)

Additional fluoroscopy pulse rates from 0.5 to 6 p/s (CAREVISION)

Roadmapping (requires DSA option) with automatic pixel shift

Store Monitor: Any image can be stored at the disk.

Store Reference: Any image can be stored as reference image, even during online-fluoroscopy is performed.

Store Fluoro: 1024 images

Overlay fade, online superimposing of active fluoro and reference image

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

Overlay of DSA reference image with automatic adjustment of system geometry

Cardiac acquisition*

Acquisition at 7.5, 10, 15 and 30 f/s, acquisition, display and storage in 1k matrix, 12-bit (4096 gray scales)

Cardiac acquisition includes CLEARstent*

Software for enhanced stent visibility: operable at tableside, available in < 30 s

Pediatrics option* with 60 f/s (only for 20 x 20 detector)

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Operating modes

Low Dose Cardiac Subtraction*

Low dose digital subtraction angiography with frame rates of 7.5, 10, 15 and 30 f/s, acquisition, display and storage in 1k matrix, 12-bit. Preferably used for applications requiring low dose at higher frame rates, e.g. in pediatrics.

ECG recording* and storage

Recording, storage and display of an ECG waveform

ECG waveform displayed on the display with synchronous image information

DYNAVISON 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
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Acquisition rate	up to 60 f/s
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DYNAVISON**

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
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Acquisition rate	up to 60 f/s
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3D Acquisition*

Allows native or subtracted 3D reconstruction based on digital rotational angiography with angle triggering for acquisition of *syngo* InSpace 3D high-contrast images* and/or *syngo* DynaCT low-contrast images*.

Automatic image data transfer to the *syngo* X Workplace while all parameters needed for the 3D reconstruction are already included in the exam set. This allows fast 3D-reconstruction and optimized image quality.

Rotation Speed	up to 45°/s
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Acquisition rate	up to 60 f/s
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3D CARD Acquisition*

Allows native 3D reconstruction based on digital rotational angiography with angle triggering and ECG-gating for acquisition of *syngo* DynaCT Cardiac images*.

Automatic image data transfer to the *syngo* X Workplace while all parameters needed for the 3D reconstruction are already included in the exam set. This allows fast 3D-reconstruction and optimized image quality.

Rotation Speed	up to 45°/s
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Acquisition rate	up to 60 f/s
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syngo DynaCT Cardiac*

For reconstruction of two-dimensional images acquired via Artis angiography systems into three-dimensional images or models

Protocols on acquisition system support standard imaging, the C-arm travels around the patient in an arc

syngo DynaCT Cardiac*

Fast acquisition cardiac mode:

Creates cross-sectional images of structures with limited movement like the left atrium, the pulmonary vessels and the aortic arch with just one 5 s run of the C-arm.

ECG-gated acquisition mode:

Creates cross-sectional 3D images of the beating heart. By using multiple, e.g. 2 – 4, C-arm runs with ECG-gated acquisition and 3D reconstruction to take account of the cardiac phases, the temporal resolution of the 3D volume is optimized. This results in high-resolution visualization of moving cardiac structures.

Soft tissue imaging for interventional radiology applications

Two-dimensional images acquired via native rotational angiography are used to obtain CT-like slices or CT-like images

Standard CT post-processing techniques are applied

High frame rates enable scans to be performed within approx. 5 – 20 seconds

syngo X Workplace*

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

Optional

In-room controls and display

Further recommended syngo X Workplace optional applications:

- syngo DSA
- syngo IZ3D
- syngo InSpace 3D/3D Fusion
- syngo InSpace EP
- syngo iPilot
- syngo iGuide Toolbox
- syngo Aortic Valve Guide

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

syngo.via*

syngo.via is the new imaging software creating an exciting experience in efficiency and ease of use – anywhere.

Optional applications:

- syngo.Interventional Viewer
- syngo.Interventional QVA
- syngo.Interventional QCA
- syngo.Interventional IZ3D
- syngo.Interventional LVA

For more information about syngo.via applications, please refer to separate data sheet

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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 objective, 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*

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

LVA – Left ventricular analysis, biplane* (for Artis zee biplane MN)

A left ventricular analysis comprising the measurement results of both planes that increases the accuracy of the volume results via information from the second projection of the left ventricle

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

IZ3D*

IZ3D is reconstruction software for calculating 3D coronary models from at least two 2D projection images for coronary vessel analysis with determination of stenosis level, distance measurement, and diameter calculation.

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).

Networking

Ethernet interface, full-duplex, gigabit transfer rate

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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

Data export

DVD drive for automatic digital image storage (incl. DICOM viewer) on a DVD or CD-R for offline data exchange in DICOM format, such as JPEG, Bitmap or AVI

DVD recorder for archiving fluoroscopies and acquisitions on a DVD

USB interface to copy images on a memory stick or on an external hard disk

Security Package

syngo Security Package*

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

Integration of the Siemens Recording System

AXIOM Sensis XP Interface*

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

Viewing in the examination room

Multi-Modality Viewing (4 x 1)*

View images e.g. from the syngo Workplace (e.g., syngo InSpace 3D, CT, MR, US, Angio)

Conversion to PAL/NTSC*

Live images (DVI format) can be converted to a low-res PAL/NTSC video norm (PAL/NTSC format)

Dual monitor configuration*

Connection of an additional image monitor for parallel display of two different reference images

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CARE

CAREmatic

Automatic X-ray control system for fully automatic calculation and optimization of exposure data based on fluoroscopic values

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

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

CAREprofile

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

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 system is moved, the current positions of the central beam and image edges are superimposed on the LIH image as orientation points

CAREwatch

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

Displayed on the data display and 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)

Motion: 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.

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.

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CARE

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.

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.

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.

Operation

In the examination room

Complete system operation via modular control elements at the patient table for controlling C-arm movement, patient table, and collimators

Touchscreen control with multi-functional joystick for operating the imaging system including postprocessing and quantification as well as selecting organ programs

Ergonomically designed footswitch for releasing fluoroscopy, radiography, and table brakes, as well as an additional configurable function

In the control room

Siemens Healthcare universal syngo operation via keyboard and mouse for complete imaging system functions such as image postprocessing, archiving and configuring fluoro and acquisition programs

4 x 4 or 8 x 8 crossbar video switch*

Standalone DVI-D (digital) video crossbar distributor with 4/8 selectable video inputs and 4/8 selectable video outputs (suited only for installation in the control room)

Installation of imaging system in electronics room instead of control room*

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*

Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

Flat detector 20 x 20

Amorphous silicon flat detector with a 25 cm diagonal entrance plane

High-resolution 1k matrix with 184 µm pixel size and 14-bit digitization depth

High-speed fiber-optic connection to the digital imaging system

Integrated temperature stabilizer

Integrated collision protection

Removable grid

Detector housing (W x L x H)	246 mm x 246 mm x 99 mm
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Active imaging size	177 mm x 177 mm
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Size incl. housing and collision protection	286 mm x 286 mm
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Input fields (diagonal)	25 cm, 20 cm, 16 cm and 10 cm (9.8", 7.9", 6.3" and 3.9")
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Material	a-Si with CsI scintillator
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Image cover	< 1.5 mm carbon fiber
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Pixel size	184 µm
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Output digital video matrix	1024 x 1024, 14-bit
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Detector spatial resolution	2.7 LP/mm (Nyquist frequency)
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Detector quantum efficiency (DQE)	75% (0.05 LP/mm, 3.2 µGy)
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Modulation depth	65% (at 1 LP/mm)
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Modulation depth at the Nyquist frequency	22% (at 2.7 LP/mm)
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Weight	< 10 kg (22 lbs.)
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Rotatable collimator for 20 x 20 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

Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

X-ray generator

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	0.5 to 1000 mA in 0.01 mA steps
Pulse frequency	0.5 to 100 p/s or continuous mode
Max. mA in pulsed fluoro mode	250 mA (small focus) 68 mA (micro focus)
Pulse time	0.5 to 800 ms
Max. continuous power in fluoro mode	3000 W
Tube voltage for fluoroscopy	40 to 125 kV in 0.1 kV steps 0.1 to 24 mA
Acquisition	40 to 125 kV in 0.1 kV steps
CAREMATIC automatic X-ray control system for fully automatic calculation and optimization of exposure data based on fluoroscopic values	
Patient transparency monitoring	
Monitoring of tube load with data display	
kV and mA post-display on image display	
Generator control is fully integrated in the system control	
Sequence time	600 s
Rise time	≤ 1 ms at ≤ 125 kV
Max. high voltage cable length	30 m

Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

X-ray tube

MEGALIX Cat Plus NIOBE® 125/40/90-121GW for plane B, 125/40/90-123GW for plane A**

- New high-performance X-ray tube
- Up to 40 % greater fluoro power with new 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)	0.4 ¹	0.8
Nominal power (IEC 60613) (thermal anode reference power = 300 W)	35 kW	90 kW
Nominal power (thermal anode reference power = 0 W)	42 kW	112 kW
Anode angle	8°	
Maximum anode heat content	2,500,000 J (3,375,000 HU)	
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	150/180 Hz (3-phase current)	
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) (at 125 kV in 1 m distance)	< 0.44 m Gy/h (2500 W)	
Weight	approx. 47 kg (103.6 lbs.)	

¹ With flat emitter technology

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Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

Artis zee Cockpit*

One or two displays enable a new dimension in medical imaging in the control room. Up to nine different image sources can be shown on the same display, allowing high flexibility in arranging images in 4 different screen layouts.

Operating modes	1 keyboard/mouse	1 display
	1 keyboard/mouse	2 displays
	2 keyboards/mice	2 displays

Display 30"

Resolution	2560 x 1600
Contrast ratio	max. 1000 : 1
Typical brightness	180 cd/m ²
Display area (W x H)	641 x 401 mm
Dimensions without stand (W x H x D)	689 x 450 x 90 mm
Weight without stand	11.2 kg (24.7 lbs.); 15.7 kg (34.6 lbs.) incl. stand

Display Controller

Video inputs

Video input connector	7 x DVI-D 1920 x 1200, 60 Hz (Artis zee, AXIOM Sensis, syngo Workplace, syngo Dynamics, syngo Imaging (XS), syngo Workflow); 1 x VGA 1920 x 1200, 60 Hz; 1 x DVI-I analog 1280 x 1024, 60 Hz
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Display Ceiling Suspension – DCS / DCS PRO*

Ceiling-mounted suspension system for 2 to 8 displays (not including data display) 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°
Configuration	DCS 2 / 3 DCS-PRO 4 / 6 / 8

2nd DCS* with 2 to 3 displays*

Integrated Data Display

All examination-relevant data of the system and table geometric data, system messages, and dose data with the CAREWATCH option are displayed on the reference display on the imaging system

Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

DCS-extended* / DCS Large Display extended*

Ceiling-mounted suspension system DCS-extended for 3 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") or 545 cm** (214.6")
Travel range of ceiling-mounted carriage	< 315 cm (124") or 320 cm** (126")
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

Displays

19" Monochrome Flat Displays⁺

19" TFT high-contrast black-and-white display for flicker-free, distortion-free live image and reference image display for 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
Maximum brightness	1000 cd/m ²
Typical brightness	400 cd/m ²
Contrast ratio	600 : 1
Horizontal viewing area	170°
Power consumption	< 75 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
Maximum luminance	280 cd/m ²
Stabilized luminance	137 cd/m ²
Contrast ratio	600 : 1
Viewing angle (min.)	170° H and V
Power consumption	< 75 VA (W)

⁺ Modular choice (several variations to choose from)

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Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

Artis zee Large Display*

56" viewing area enables a new dimension in medical imaging. Up to 24 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. Two 56" displays plus one HD display are possible.

Resolution	3840 x 2160
Display area (W x H)	1244 x 700 mm
Panel technology	Color, TFT, MVA
Viewing angle	176 ° H and V
Contrast ratio	1200 : 1; min. 900 : 1
Maximum brightness	450 cd/m ² (131 fL)
Typical brightness	400 cd/m ² (117 fL)
LUT	11 bit
Anti-glare shield*	
Dimensions without stand (W x H x D)	1317 x 774 x 144 mm
Weight without stand	49 kg (108 lbs.)
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 videosignal is displayed in a shrunked format below the original video resolution of the source system. Optimized waveform display with channels 5, 6, 9, 14, 15, 18, 23, 24, 27.
Number of controllers	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; 24 physical: simultaneously usable, 15 digital + 6** shared (analog/digital) ** 6 shared inputs with 3 DVI-I and 3 HDMI or 3 VGA inputs are available
Number of video plugs	9, 18, 24
Digital input performance	DVI-D single link; max. 1920 x 1200, 60 Hz
High speed analog input performance (3 ports)	Max. 1920 x 1200, 60 Hz
Standard analog input performance (3 ports)	Max. 1280 x 1024, 75 Hz
Ambient conditions	
Operating temperature	5 °C to + 40 °C (– 41 °F to + 104 °F)
Storage temperature	– 20 °C to + 55 °C (– 4 °F to + 131 °F)
Operating humidity	10 % to 80 %, relative, not condensing
Storage humidity	10 % to 95 %, relative
Barometric pressure	700 hPa to 1060 hPa or up to 3050 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; 450 mm (24)
Weight	< 20 kg (44.1 lbs.)

* Option

Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

Injectors	
MEDRAD MARK V ProVis rack mount*	
Contrast medium syringe	150 ml
Flow rates for 150 ml syringes	0.3 – 10.0 ml/s in 0.1 ml/s increments 10 – 50 ml/s in 1 ml/s increments 0.3 – 10.0 ml/min/hr in 0.1 ml/min/hr increments 10 – 59 ml/min/hr in 1 ml/min/hr increments
Release delay for injection or radiation	0 to 99.9 s in 0.1 s increments
Pressure limit	6 to 83 bar, corresponds to 100 to 1200 psi
Cylinder	150 ml
Feedback on actual injection parameters	
Mechanical construction	movable stand, removable injector head
Rack mount version	
Ceiling-mounted injector head, swivel only or swivel/movable mount	
MEDRAD Avidia Pedestal* (not for USA, and not in conjunction with surgery table)	
Contrast medium syringe	150 ml
Contrast flow mode fixed	0.1 to 50 ml/s
Variable syringe filling speed	1.0 to 20 ml/s
Pressure range	83 bar (1200 PSI)
Syringe	150 ml
Feedback on actual injection parameters	
Mechanical construction	movable stand, removable injector head
Rack mount version	
Injector head on overhead tube support, swivel only or swivel/movable mount	
MEDTRON Accutron HP-D*/**	
Contrast medium syringe	2 x 200 ml
Flow rates	0.1 – 30 ml/s in 0.1 increments
Adjustable rise time	0.1 to 10 seconds, 0.1 s increments
Pressure limit	83 bar, programmable in 5-83 bar in 1 bar increments
Cylinder	200 ml
Double head injector, feedback on actual injection parameters	
Mechanical construction	movable stand, removable injector head
Rack mount version	
Injector head on overhead tube support, swivel only or swivel/movable mount	

Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

Injectors

ACIST CVI* (Order through SPH price book)

Contrast medium syringe	100 ml
Flow rates	0.6 to 40 ml/s in 0.1 increments
Release delay for injection or radiation	0 to 99.9 s
Pressure limit	14 to 83 bar (200 to 1200 PSI)

MEDRAD MARK 7 Arterion*

Flow rates	0.1-45 ml/s in 0.1 increments 0.1-59.9 ml/s in 0.1 increments
Volume	1-150 ml in 1 ml increments
Pressure limit (150 ml syringe)	100-1200 psi in 1 psi increments 689-8273 kPa in 0.1 increments
Rise time	0.0-9.9 s in 0.1 increments
Delay time	0.0-99.9 s in 0.1 increments
Fill speed	1-20 ml/s operator configurable
Fill volume	1-150 ml
Syringe size	150 ml
Syringe heat maintainer	35°C (95°F) ± 5°C (9°F)
Protocol memory	40 protocols
Injection memory history	50 injections

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Floor-mounted cardiology system for Magnetic Navigation
Biplane cardiology system for Magnetic Navigation

Standard and optional accessories

Please refer to separate catalog

Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

Remote Service*

Preparation for Siemens Remote Service (SRS):

Allowed hardware and software remote diagnosis

Allowed remote system configuration, e.g., adding a DICOM node

Early warning system to help ensure system operation (Guardian)

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

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. 65 seconds after switching on and restarting the generator, 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.

Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

Installation data

Line voltage connection, 3-phase-current λ / Δ

Generator

Nominal voltage ¹ (3 ph $\pm 10\%$)	380, 400, 420, 440, 460 V at 50/60 Hz ± 1 Hz; 480 V at 60 Hz ± 1 Hz
Fuse	Internal 50 A, external depending on fuse
Power consumption	8 kVA for fluoro per plane; 160 kVA for acquisition per plane

System control cabinet

Nominal voltage ¹ (3 ph $\pm 10\%$)	380, 400, 440 V, 460 V at 50/60 Hz ± 1 Hz; 480 V at 60 Hz ± 1 Hz
Fuse	Internal 35 A, external 50 A slow-blow fuse
Power consumption	Max. 11 kVA

¹ Max. allowable nominal voltage between phases (L1, L2, L3) and PE 300 V

Internal line resistance for generator A10 Plus²⁾

U_N / P	100 kW	80 kW
380 V**	≤ 0.08 Ohm	≤ 0.10 Ohm
400 V**	≤ 0.09 Ohm	≤ 0.11 Ohm
420 V	≤ 0.09 Ohm	≤ 0.12 Ohm
440 V	≤ 0.10 Ohm	≤ 0.14 Ohm
460 V	≤ 0.11 Ohm	≤ 0.15 Ohm
480 V	≤ 0.12 Ohm	≤ 0.16 Ohm

* Option; ** Resistance values in Ohm at $U_N \pm 10\%$

²⁾ To achieve the full generator power, the measured internal line resistance may not exceed the following values

Artis zee

Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

Weight			
Examination room	Floor stand (incl. mounting plate)	approx. 665 kg	(1466 lbs.)
	Ceiling stand (incl. longitudinal rail) for Artis zee biplane MN	approx. 566 kg	(1248 lbs.)
	Display ceiling suspension (DCS) (depending on configuration)	200 – 328 kg	(441 – 723 lbs.)
	Patient table (depending on table)	452 – 550 kg	(996 – 1213 lbs.)
Control room	Imaging system and miscellaneous options (for Artis zee floor MN)	approx. 150 kg	(331 lbs.)
	(for Artis zee biplane MN)	200 kg	(441 lbs.)
Electronics room	Generator (x 2 for Artis zee biplane MN)	300 kg	(661 lbs.)
	Cooling system		
	(X-ray tube, x 2 for Artis zee biplane MN)	42 kg	(93 lbs.)
	System control cabinet 1 (x 2 for Artis zee biplane MN)	270 kg	(595 lbs.)
	System control cabinet (only for OR table)	125 kg	(276 lbs.)
	Cable cabinet	120 kg	(265 lbs.)

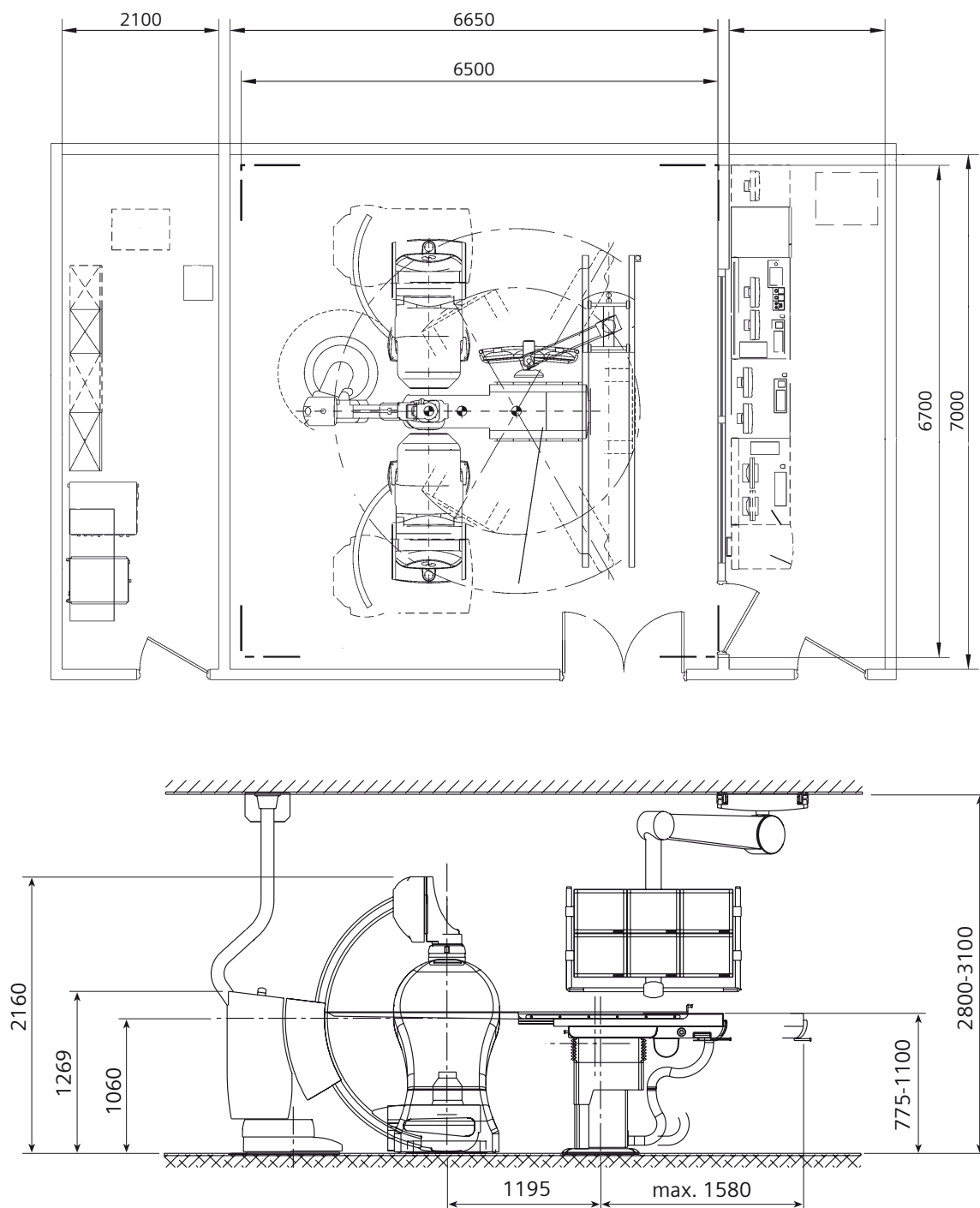
Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

Ambient conditions (operation)		
Examination and control room	Temperature range: Relative humidity:	+ 15°C to + 30°C (recommended temp. 22°C [72°F]) 20 – 75% below dew point
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	Temperature range: Relative humidity: Temperature gradient: Air flow: Noise level: Air pressure:	+ 10°C to + 40°C 20 – 75% (not condensing) max. 5°C/h 160 m³/h < 55 dB (A) 700 hPa to 1060 hPa
Cooling system (for MEGALIX Cat Plus tube)	Cooling air: Air flow: Noise level:	+ 5°C to + 30°C (frost-free room) 950 m³/h 55 dB (A) at 50 Hz; 59 dB (A) at 60 Hz
System control cabinet 1	Temperature range: Relative humidity: Temperature gradient: Air flow: Noise level:	+ 15°C to + 30°C 20 – 75% (not condensing) max. 5°C/h 500 m³/h 48 dB (A)
System control cabinet 2 (only for OR table)	Temperature range: Relative humidity: Temperature gradient: Air flow: Noise level:	+ 10°C to + 35°C 20 – 75% (not condensing) max. 5°C/h n/a n/a
System control cabinet 3 (only with dBC MN)	Temperature range: Relative humidity: Temperature gradient: Air flow: Noise level:	+ 15°C to + 30°C 20 – 75% (not condensing) max. 5°C/h 500 m³/h 48 dB (A)
Operation altitude	Less than or equal to 3000 meters	
Overvoltage category	II	
Pollution degree	2	
Oxygen enriched environment	n/a	

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Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

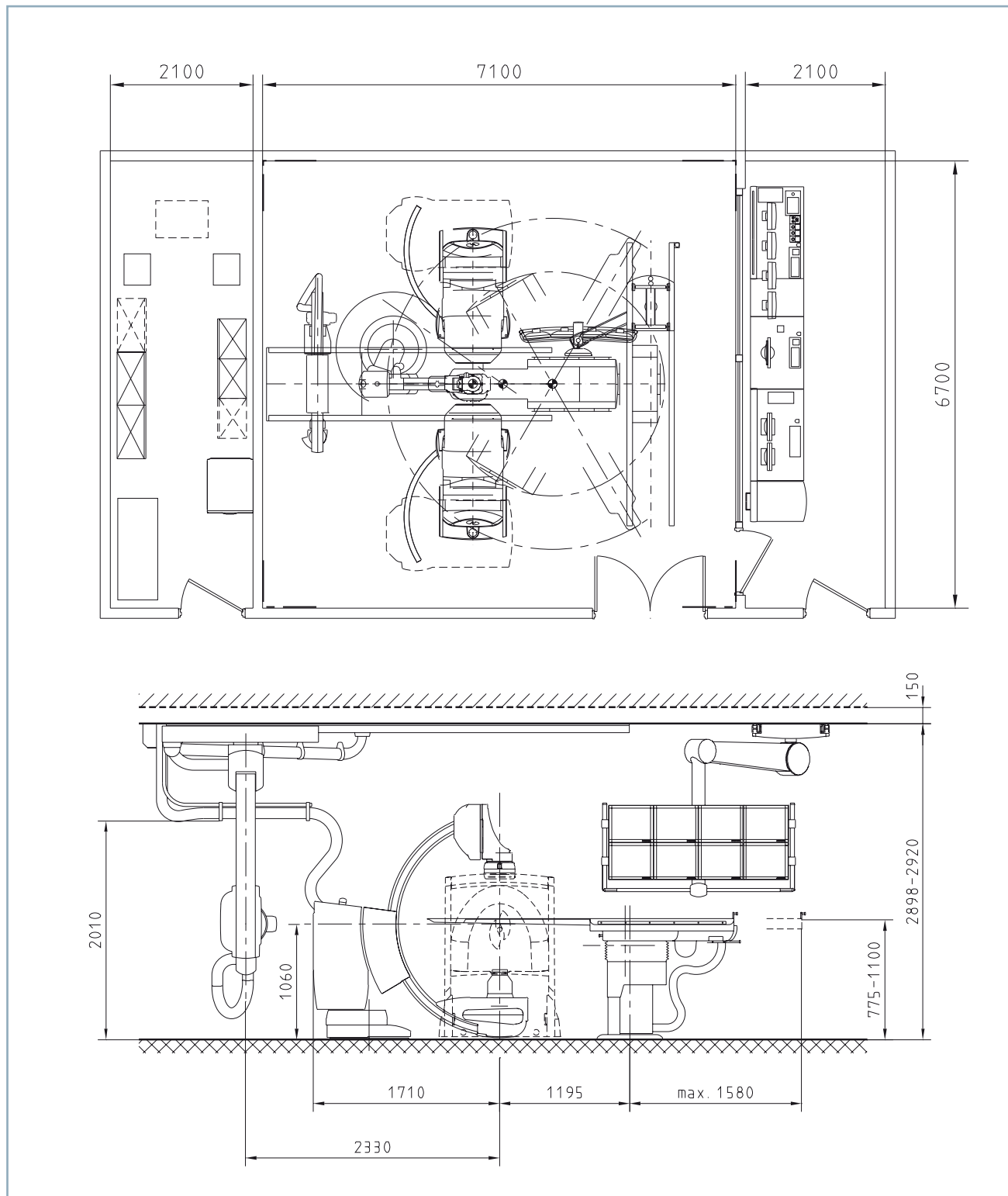
Room layout and system view (mm) Artis zee floor MN



Artis zee

Floor-mounted cardiology system for Magnetic Navigation Biplane cardiology system for Magnetic Navigation

Room layout and system view (mm) Artis zee biplane MN



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For floor-mounted systems 10094142, 10502506; for biplane systems 10094143, 10502507

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