



Artis zee

Floor-mounted system for cardiology
VC 14

Data sheet

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SIEMENS

Artis zee

Floor-mounted system for cardiology

The Artis **zee** floor-mounted system is specifically designed to meet the escalating demands of cardiac imaging today and in the future.

Artis **zee** can be equipped either with a 20 x 20 dynamic flat detector, or if more coverage is required, alternatively with the 30 x 40 variant.

Built on three pillars:

Imaging excellence

Enhanced workflow

Investment confidence

The Artis **zee** floor-mounted system enables clinicians to care with greater ease, precision and flexibility.

Artis zee floor-mounted system

Artis **zee** and its flexible configuration capabilities enable tailoring to:

- Interventional cardiology
- Electrophysiology
- Pediatrics
- Hybrid procedures
- General vascular applications

Positioning flexibility

Regardless of the detector size, the floor-mounted Artis **zee** allows convenient positioning of the C-arm around the table.

Its compact and slimline C-arm design needs only little space and requires minimal room preparation work.

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 left-side position, head-to-toe coverage of the patient is possible.

Additionally the system features Multispace.F* for further enhanced positioning of the C-arm relative to the table using stand rotation.

It provides access to the patient's left shoulder, for pacemaker implantations, for example.

The small footprint combined with the positioning flexibility makes the system an ideal solution for hybrid rooms where interventional cardiac and minimally invasive surgical procedures are performed.

Patient table

Catheterization table with free-floating removable tabletop and a maximum patient weight of up to 250 kg.

Optionally the table can be equipped with tilt/cradle capability and motorized stepping.

Detector size tailored to medical needs

With Artis **zee**, you have the choice between a compact 20 x 20 detector and 30 x 40 detector for larger coverage.

Both detectors can be rotated to any angle.

Especially for the larger landscape format detector, there is no need to compromise on patient access and coverage.



new ergonomic controls

Be it pre-examination, post-processing or quantification, the tableside control for the Artis **zee** provides the user with complete control.

- Modular system controls for freedom within the examination room
- Ergonomically redesigned graphical user interface
- Mouse-like joystick control for increased comfort
- Import and functions of integrated recording solution, AXIOM Sensis XP, accessible via tableside touchscreen



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Maximizing coverage and positioning flexibility

Multispace.F for the Artis **zee** floor-mounted system allows 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 whether the table is rotated to the right, left, or extended in the patient transfer position.

zee more, do more with the Artis **zee** Large Display*

Featuring a full-color 56-inch medical-grade screen that lets you view multiple inputs simultaneously, the Artis **zee** Large Display gives you the “whole picture” controlled directly at tableside.



Extend your viewing comfort*

The new extended DCS (Display Ceiling Suspension) with double pivot cantilevers allows for additional display positioning around the patient. Available in combination with any of the display configurations offered with the Artis **zee** systems.

Excellent image quality

The Artis **zee** imaging chain provides enhanced image quality and features key advances that significantly improve the clarity of both live fluoro and high-speed image acquisition at the lowest possible radiation levels.

Noise reduction

Artis **zee** provides sophisticated digital image processing, helping to reduce the apparent noise in the image without having to increase the X-ray dosage.

This makes the interventional procedures faster as the instruments can be seen better.

IC Stent*

IC Stent is a software option for Artis **zee** which provides for better visualization of the inserted stent.

The program uses the markers of the inserted balloon as a reference point in the subsequent images, for registration purposes. Using these images the signal-to-noise ratio can be increased and the visibility of the stent struts can be considerably improved.



Designed for high-end 3D applications

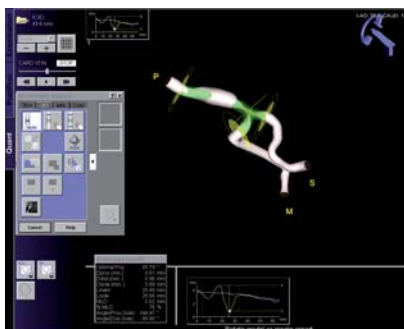
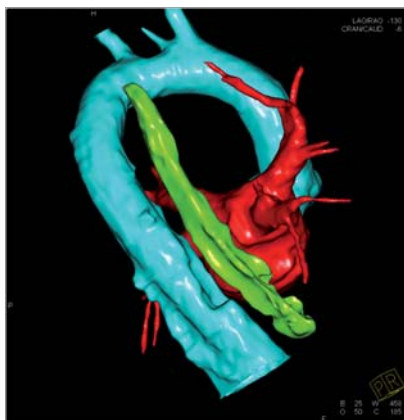
The Artis **zee** system is designed for the latest trendsetting imaging techniques and incorporates effective on-screen workflow guidance to combine a high standard of imaging with *syngo*'s great ease of use.

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.

We achieved excellent results in electrophysiology, pediatric cardiology and for aortic valve replacements.

- **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.

Not all features shown are necessarily standard and available in all countries.

* Option

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Floor-mounted system for cardiology

Stand

The floor-mounted single-plane C-arm system for digital imaging techniques is designed to meet the challenges of advanced diagnostic and interventional procedures in cardiology, electrophysiology, and universal angiography.

C-arm system

Highly flexible and quick positioning

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

Integrated, ICP computerized collision monitoring (ICP = Intelligent 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	185 cm (72.84")
Stand rotation	motorized programmable positioning from 0° to 35°
Double oblique projections	± 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 focus-detector distance	approx. 90 cm – 120 cm (35.4" - 47.24"), speed up to 9 cm/s (3.54")
Longitudinal C-arm movement	motorized up to 15 cm/s (5.09"/s)

MULTISPACE.F*

Additional stand rotation for free positioning of system and table relative to one another, for the following positions and additional 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

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Floor-mounted system for cardiology

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 (30.51" to 43.3")
Table length	281.5 cm (110.8")
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 (6.89")
Maximum unobstructed overhang	224 cm (88.19")
Maximum table load	390 kg [859.8 lbs.] (250 kg [551.2 lbs.] patient weight) ² (100 kg [220.5 lbs.] emergency resuscitation) (40 kg [88.2 lbs.] accessories)

Table with stepping (PERISTEPPING)⁺¹

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

Speed of table movement	180 mm in 1.3 s
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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) ² (100 kg [220.5 lbs.] emergency resuscitation) (40 kg [88.2 lbs.] accessories)

⁺ Modular choice (several variations to choose from)

¹ Only in combination with 30 x 40 flat detector; ² 160 kg patient weight for long tabletop

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Tabletops

Three 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")
Tabletop width	45.0 cm (17.72")
Max. patient weight	200 kg (441 lbs.) for table with tilt and OR table 250 kg for standard table and table with stepping
Al equivalent	≤ 1.4 mm (0.06") at 100 kV, HVL 3.7 mm (0.15") Al (according to CFR)
Mattress thin	< 0.6 mm (0.02") Al (= Standard)
Mattress thick	< 1.0 mm (0.04") Al (= Option)

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")
Tabletop width	52.5 cm (20.67")
Max. patient weight	200 kg (441 lbs.) for table with tilt and OR table 250 kg for standard table and table with stepping
Al equivalent	≤ 1.2 mm (0.047") at 100 kV, HVL 3.7 mm (0.15") Al (according to CFR)
Mattress thin	< 0.6 mm (0.02") Al (= Standard)
Mattress thick	< 1.0 mm (0.04") Al (= Option)

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.

Tabletop length	263.7 cm (103.8")
Tabletop 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 3.7 mm (0.15") Al (according to CFR)
Mattress thin	< 0.6 mm (0.02") Al (= Standard)
Mattress thick	< 1.0 mm (0.04") Al (= Option)

⁺ Modular choice (several variations to choose from)

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Floor-mounted system for cardiology

Imaging system

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

- Advanced noise reduction algorithm
- Optimized X-ray parameters
- Automated contrast and brightness adjustment
- Reliable details with digital acquisition zoom (DAZ)
- DDO (Dynamic Density Optimization) for real-time harmonization of fluoroscopy, native series and single images
- Real-time adaptive edge enhancement (zoom and gradient dependent), positive/negative image display, windowing, contrast/brightness, electronic shuttering, image shift (roaming), vertical and horizontal image reversal, zoom function

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)

Stores fluoroscopy images, incl. during fluoroscopy

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 post-processing data in the image

Image storage capacity

25,000 images in 1k/12-bit matrix

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

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

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Floor-mounted system for cardiology

Operating modes

Fluoroscopy

Digital pulsed fluoroscopy, with 10, 15, 30 p/s in 1k/12-bit matrix and digital real-time filtering for advanced noise reduction with motion detector

Additional fluoroscopy pulse rates from 0.5 to 7.5 p/s* (CAREVISION)

Roadmapping (requires DSA option) with automatic pixel shift

Storage of fluoroscopy images, incl. during fluoroscopy

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., 17 s at 30 p/s, 34 s at 15 p/s

Roadmap Plus*¹

Simultaneous display of subtracted, native fluoroscopy and reference images

Cardiac acquisition⁺

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

Cardiac acquisition includes IC Stent* software for enhanced stent visibility: operable at tableside, available in < 30 s

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

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 synchron image information

ECG-triggered fluoroscopy and acquisition*

ECG-triggered fluoroscopy/acquisition provides a still image of the catheter even with moving objects. This enables the use of low pulse frequencies resulting in a significantly lower dose compared to normal fluoroscopy/acquisition.

DR – 0.5 - 7.5 f/s⁺

Individual and serial images in original matrix size, full format and zoom 1 + 2 in 2k*, digital real-time filtering, individual image and series frame rates from 0.5 f/s to 7.5 f/s native, including time-controlled and manually variable frame rates

Acquisition, display and storage in original matrix size (up to 2k)*

DSA – 0.5 - 7.5 f/s⁺

Digital subtraction angiography in original matrix size, full format and zoom 1 + 2 in 2k*, digital real-time filtering, individual image and series frame rates from 0.5 f/s to 7.5 f/s, including time-controlled and manually variable frame rates

Acquisition, display and storage in original matrix size (up to 2k)*

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

¹ If DSA option is selected; ⁺ Modular choice (several variations to choose from)

* Option; ** Only up to 7.5 f/s for EP systems without cardiac acquisition

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Operating modes

DYNAVISON DR*

Native 2D-viewing with 3D impression based on digital rotational angiography with angle triggering

Rotation speed up to 45°/s

Acquisition rate up to 60 f/s* for 30 x 40 detector,
up to 60 f/s for 20 x 20 detector

3D Acquisition*

Allows native or subtracted 3D reconstruction based on digital rotational angiography with angle triggering

All parameters needed for the 3D reconstruction are included in the exam set

Automatic image data transfer to the workstation

Rotation speed up to 45°/s

Acquisition rate up to 60 f/s for 30 x 40 detector,
up to 60 f/s for 20 x 20 detector

Dynamic subtraction display with optimal alignment of mask and filling

Automatic pixel shift over the entire scene

3D Card acquisition*

Allows 3D reconstruction of the heart based on digital rotational angiography with ECG and angle triggering

All parameters needed for the 3D reconstruction are included in the exam set

Automatic image data transfer to the workstation

Rotation speed up to 45°/s

Acquisition rate up to 60 f/s for 30 x 40 detector
up to 60 f/s for 20 x 20 detector

PERISTEPPING* (only with 30 x 40 flat detector combo system)

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 30 x 40 flat detector combo system)

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

* Option

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syngo DynaCT Cardiac*

syngo X Workplace*

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 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 applications¹

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

Delivery volume

syngo X Workplace with 4 GB main memory

syngo InSpace 3D Flash includes syngo InSpace Viewer and 3D Volume Measurement

HW accelerator for fastest reconstruction

Optional

In-room controls and display

Further recommended syngo X Workplace applications:

syngo InSpace EP*

syngo DSA*

syngo iPilot*

syngo iGuide Toolbox*

syngo IZ3D*

syngo 3D/3D Fusion*

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

¹ Available with 30 x 40 detector

* Option

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Quantification

QVA – Vascular analysis for vessel diameters of 3 mm – 42 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*

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 (surface-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 1.5 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 cardiological vessel analysis with determination of stenosis level, distance measurement, and diameter calculation.

The IZ3D software application allows for interactive 3D reconstruction and visualization of coronary segments and is especially suited for supporting interventional cardiology, particularly in stenting procedures.

IZ3D is a software application that is completely integrated into the catheterization laboratory; no additional hardware is required.

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

* Option

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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

Archiving

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

DICOM viewer on CD or DVD

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*

View images from the syngo Multi-Modality Workplace (e.g., syngo InSpace 3D, CT, MR, Angio), Terason ultrasound on a separate display

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

* Option

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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; automatically guided selection depending on absorption

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***, 7.5 p/s

Pulse frequency can be adapted to the requirements of each application for significant reduction of 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 table 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 skin dose

Displayed on the data display and image system display

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

During fluoro: skin dose

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

* Option

** Mandatory in IEC countries

*** Only for 20 x 20 detector

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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 post-processing 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

Wireless footswitch*

Wireless connection¹

Without the footswitch cable, it reduces the danger of collisions on the floor and permits easy positioning of the footswitch

Voice Control*

Voice Control¹ allows functions to be called, providing ergonomic procedures

Hands-free operation allows better focus on the patient and promotes sterile operations

The voice commands are displayed on the multi-modality display (if available) or on the reference image display as a menu:

- Selected image processing commands
- Selection of the exposure zoom levels
- Selection of the stored system positions
- Roadmap control
- Resetting of the fluoro timer (5 min.)

In the control room

Siemens Healthcare universal *syngo* interface using keyboard and mouse for complete system functions such as post-processing, archiving, and configuring fluoro and acquisition 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*

* Option

¹ Not available in all countries

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Post-processing modes

Changing window values

Zooming/Panning

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)

** If DSA option is selected

Artis zee

Floor-mounted system for cardiology

Flat detector 20 x 20⁺

Solid-state 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 with removable grid

Input fields (diagonal) 25 cm, 20 cm, 16 cm and 10 cm (Overview, Zoom 1, 2, 3)
9.8", 7.9", 6.3" and 3.9" (Overview, Zoom 1, 2, 3)

Material aSi with CsI scintillator

Image cover < 1.5 mm carbon fiber

Pixel size 184 µm

Detector spatial resolution 2.7 LP/mm (Nyquist frequency)

Maximum acquisition speed up to 30 f/s (optionally up to 60 f/s)

Output digital video matrix 1024 x 1024, 14-bit

Detector quantum efficiency (DQE) 75%

Modulation depth at 1.0 LP/mm 60%

Modulation depth at the Nyquist frequency 20%

Weight < 10kg (22 lbs.9)

Flat detector 30 x 40⁺

Amorphous silicon flat detector with a 48 cm diagonal entrance plane

High-resolution 2k** matrix (1920 x 2480) with 154 µm pixel size and 14-bit digitization depth

High-speed fiber optic connection to the digital imaging system

Integrated temperature stabilizer

Integrated collision protection with removable grid

Detector rotation landscape/portrait selection with vertical display

Input fields 48, 42, 32, 22, 16, 11 cm (18.9", 16.5", 12.6", 8.7", 6.3", 4.3")

Material aSi with CsI scintillator

Image cover < 1.5 mm carbon fiber

Pixel size 154 µm

Maximum acquisition speed up to 60 f/s

Matrix up to 1920 x 2480

Digitization depth 14 bit

Spatial resolution of detector 3.25 LP/mm

Detector quantum efficiency (DQE) ≥ 73% (at 0 Lp/mm)

Modulation depth ≥ 60% (at 1.0 Lp/mm)

Modulation depth at the Nyquist frequency (3.25 LP/mm) 10%

Weight 20 kg (44lbs.)

** 2k matrix possible only with DR/DSA/PERIVISION or DYNAVISION mode up to 7.5 f/s

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Floor-mounted system for cardiology

Laser crosshairs*

Laser crosshairs for FD 30 x 40, integrated into the flat detector housing with tableside operation for simpler and quicker patient positioning

Class II laser, wavelength 600 – 700 nm (red), < 1 mW output power

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

Rotatable collimator for 30 x 40 detector

Angio collimator with rectangular blade, wedge-shaped finger 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

X-ray generator

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

100 kW at 100 kV (DIN 6822)

Nominal power Depends on X-ray tube and focus. See details in pertaining chapter.

SID tracking (automatic tube current adjustment to focus-detector distance)

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

Exposure time range 0.5 to 500 ms

Max. continuous power in fluoro mode 3000 W

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Floor-mounted system for cardiology

X-ray tube

MEGALIX Cat 125/35/80-121GW (for the 20 x 20 detector)

High-performance X-ray tube with metal center tube using liquid bearing technology with constant noiseless anode rotation

Max. exposure voltage (IEC 60613)	125 kV		
Focal spot (IEC 60613)	0.4	0.8	
Nominal power (IEC 60613) (thermal anode reference power = 300 W)	35 kW	80 kW	
Nominal power (thermal anode reference power = 0 W)	42 kW	112 kW	
Anode angle	8°		
Anode heat storage capacity	1,400,000 J (2,000,000 HU)		
Continuous heat dissipation of the tube assembly	max. 2900 W		
Anode rotation	150/180 Hz (3-phase current)		
Output	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)	< 0.35 m Gy/h (2000 W)		
Weight	36 kg (79.4 lbs.)		

MEGALIX Cat 125/15/40/80-122GW (for the 30 x 40 detector)

High-performance X-ray tube with metal center tube using liquid bearing technology with constant noiseless anode rotation

Max. exposure voltage (IEC 60613)	125kV		
Focal spot (IEC 60613)	0.3	0.6	1.0
Nominal power (IEC 60613) (thermal anode reference power = 300 W)	15 kW	40 kW	80 kW
Nominal power (thermal anode reference power = 0 W)	18 kW	52 kW	100 kW
Anode angle	12°		
Anode heat storage capacity	1,400,000 J (2,000,000 HU)		
Continuous heat dissipation of the tube assembly	max. 2900 W		
Anode rotation	150 Hz (3-phase current)		
Output	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)	< 0.35 mGy/h (2000 W)		
Weight	approx. 36 kg (79.4 lbs.)		

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Floor-mounted system for cardiology

X-ray tube

MEGALIX Cat Plus 125/40/90-122GW** (for the 20 x 20 detector)

High-performance X-ray tube with metal center tube using liquid bearing technology with constant noiseless anode rotation

Max. exposure voltage (IEC 60613)	125 kV	
Focal spot (IEC 60613)	0.4	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)	
Maximum heat content of the X-ray tube assembly	3,600,000 J (4,900,000 HU)	
Continuous heat dissipation of the tube assembly	max. 2900 W	
Anode rotation	150/180 Hz (3-phase current)	
Output	10 min	4000 W
	20 min	3000 W
	>30 min	2500 W
Maximum cooling capacity of the anode	400,000 J/min. (540,000 HU/min.)	
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	36 kg (79.4 lbs.)	

** Future availability

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Floor-mounted system for cardiology

X-ray tube

MEGALIX Cat Plus 125/20/40/80-122GW** (for the 30 x 40 detector)

High-performance X-ray tube with metal center tube using liquid bearing technology with constant noiseless anode rotation

Max. exposure voltage (IEC 60613)	125 kV		
Focal spot (IEC 60613)	0.3	0.6 x 0.6 ²	1.0
Nominal power (IEC 60613) (thermal anode reference power = 300 W)	17 kW	38 kW	80 kW
Nominal power (thermal anode reference power = 0 W)	19 kW	42 kW	93 kW
Anode angle	12°		
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)		
Continuous heat dissipation of the tube assembly	max. 2900 W		
Anode rotation	150 Hz (3-phase current)		
Output	10 min	4000 W	
	20 min	3000 W	
	> 30 min	2500 W	
Maximum cooling capacity of the anode	400,000 J/min. (540,000 HU/min.)		
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.)		

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Floor-mounted system for cardiology

Display Ceiling Suspension – DCS⁺

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

Length of longitudinal rails	425 cm (167.32")
Travel range of ceiling-mounted carriage	< 315 cm (124")
Vertical lift (height adjustment)	75 cm (29.5")
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°
2 nd 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 of the imaging system

DCS-extended*

Ceiling-mounted suspension system DCS-extended for 3 to 8 displays enables height adjustment, longitudinal travel, tilt and 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)	75 cm (29.5")
Length of double cantilever	60 cm and 120 cm (23.62" and 47.24")
Rotation range between cantilever extension and carriage	330°, settings every 30°
Rotation range between cantilever and cantilever extension	± 120°
Rotation range of displays	330°, settings every 30°

Display boom interface*¹

Universal interface for third-party display boom

* Option; ¹ Future availability

⁺ Modular choice (several variations to choose from)

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Floor-mounted system for cardiology

Displays

19" Monochrome Flat Displays

DSB 1906-DC⁺

DSB 1908-DC⁺

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/m²

Typical brightness 400 cd/m²

Contrast ratio 600 : 1

Horizontal viewing area 170°

Power consumption < 75 VA (W)

19" Color Display DSC 1904-DC⁺

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

Diagonal screen measurement 19" (48 cm)

Image display 1280 x 1024

Maximum brightness 280 cd/m²

Typical brightness 137 cd/m²

Contrast ratio 450 : 1

Horizontal viewing area 170°

Power consumption < 75 VA (W)

* Option

⁺ Modular choice (several variations to choose from)

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Floor-mounted system for cardiology

Artis zee Large Display*

DSC 5608-DC

56" viewing area enables a new dimension in medical imaging. Up to 21 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.

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
Luminance	450 cd/m ² (131 fL); min. 400 cd/m ² (117 fL)
LUT	11 bit
Antireflection coating	Anti-glare
Dimensions without stand (W x H x D)	1317 x 774 x 144 mm
Weight without stand	49 kg

Display Controller

Input performance

Total number of inputs	Digital: 21 Analog: 6
Number of simultaneous visible inputs	21
Digital input performance	DVI-D single link; max. 1920 x 1200, 60 Hz
High speed analog input performance (3 ports)	Max. 1600 x 1200, 60 Hz
Standard analog input performance (3 ports)	Max. 1280 x 1024, 75 Hz
Connectivity	21 inputs can be combined: Digital: up to 21 (DVI-D) Analog: up to 6 (DVI-I and VGA)

Ambient conditions

Operating temperature	0°C to + 40°C (– 32°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

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
Degree of protection	IP20
Dimensions (W x H x D)	482.6 x 177 x 470 mm
Weight	< 20 kg

* Option

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Floor-mounted system for cardiology

Injectors

MEDRAD Avanta*

Contrast medium syringe	150 ml
Contrast flow mode fixed	1 to 45 ml/s, increment 1 ml/s; variable 1-10 ml/s in 0.1 increments
Fixed rate flow for saline flushing	1.25 ml/s
Adjustable rise time	0.1 to 9.9 seconds, 0.1 s increments
Contrast syringe refill	user selectable 25 to 150 ml, increments of 25 ml, refill rate 2.75 ml/s
Automatic or manual refill	2.5 ml/s
Pressure range	20.5 to 82.7 bar
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	

MEDRAD MARK V ProVis*

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 – 55 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 82 bar, corresponds to 100 to 1200 psi
Cylinder	150 ml
Double head injector, 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	

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Floor-mounted system for cardiology

Injectors

ANGIOMAT Illumena*

Contrast medium syringe	150 ml
Flow rates	0.1 ml/s to 9.9 ml/s in 0.1 ml/s increments 10 ml/s to 40 ml/s in 1.0 ml/s increments 0.1 ml/min to 9.9 ml/min in 0.1 ml/min increments 10 ml/min to 999 ml/min in 1.0 ml/min increments
Pressure limit	5.1 to 82.7 bar (75 to 1200 PSI)
Adjustable volume	Volume: 0.1 to volume in syringe in 0.1 ml increments up to 9.9 ml, 1.0 ml increments thereafter
Fill rate	0.2 to 25 ml/s
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)

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	82 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*** (only for EU)

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	

* Option; ** Not for USA

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Floor-mounted system for cardiology

Standard accessories

Infusion bottle holder
Clips for ECG cables
Set of body straps
Arm rest
Head-end holder (for narrow tabletop)
Handgrips with support

Optional accessories

Please refer to separate catalog

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
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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.

Nominal power	15 kVA
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Line voltage	400 V for 440 V or 480 V; an adaptation to 440/480 V is required.
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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
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Line voltage	400 V for 440 V or 480 V; an adaptation to 440/480 V is required.
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Installation data

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

Generator

Nominal voltage ¹ (3 ph \pm 10%)	380, 400, 420, 440, 480 V at 50/60 Hz \pm 1 Hz
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Fuse	internal 50 A, external depending on fuse
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Power consumption	8 kVA for fluoro; 160 kVA for acquisition
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System control cabinet

Nominal voltage ¹ (3 ph + 10% – 15%)	380, 400 and 440 V at 50/60 Hz \pm 1 Hz; 480 V at 60 Hz \pm 1 Hz
---	--

Fuse	internal 35 A, external 50 A slow-blow fuse
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Power consumption	max. 8.5 kVA
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¹ Max. allowable nominal voltage between phases (L1, L2, L3) and PE 300 V

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Floor-mounted system for cardiology

Power unit for generator A100

	UN / 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
	480 V	≤ 0.12 Ohm	≤ 0.16 Ohm

* resistance values in Ohm at $U_N \pm 10\%$

Weight

Examination room	Stand	approx. 665 kg	(1466lbs.)
	Display ceiling suspension (DCS) (depending on configuration)	200 – 328 kg	(441 – 723 lbs.)
	Patient table (depending on table)	452 – 550 kg	(996 – 1213lbs.)
Control room	Imaging system and miscellaneous options	approx. 150 kg	(331 lbs.)
Electronics room	Generator	300 kg	(661 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.)

Ambient conditions (operation)

Examination and control room	Temperature range:	+ 15°C to + 30°C (recommended temp. 22°C [72°F])
	Relative humidity:	20 – 75% below dew point
Imaging system	Temperature range:	+ 10°C to + 35°C
	Relative humidity:	20 – 75% below dew point
	Air flow:	630 m ³ /h
	Noise level:	< 53 dB (A)
Generator	Temperature range:	+ 10°C to + 35°C
	Relative humidity:	20 – 75% below dew point
	Temperature gradient:	max. 5°C/h
	Air flow:	160 m ³ /h
	Noise level:	< 55 dB (A)
Cooling system (for MEGALIX tube)	Cooling air:	+ 5°C to + 30°C
	Air flow:	1100 m ³ /h
	Noise level:	55 dB (A) at 50 Hz; 59 dB (A) at 60 Hz
System control cabinet 1	Temperature range:	+ 15°C to + 30°C
	Relative humidity:	20 – 75% below dew point
	Temperature gradient:	max. 5°C/h
	Air flow:	500 m ³ /h
	Noise level:	48 dB (A)
System control cabinet 2 (only for OR table)	Temperature range:	+ 10°C to + 35°C
	Relative humidity:	20 – 75% below dew point
	Temperature gradient:	max. 5°C/h
	Air flow:	n/a
	Noise level:	n/a

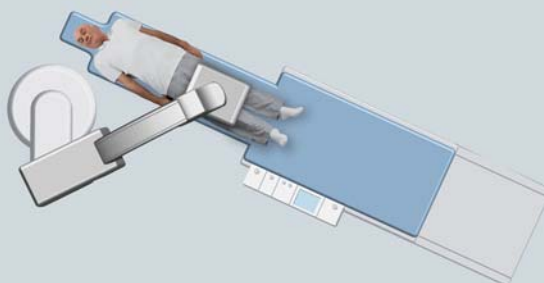
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Floor-mounted system for cardiology

System positions



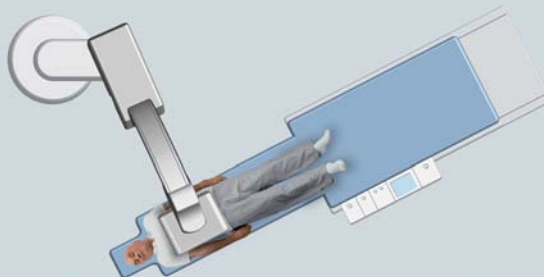
Head-end position



Right-side table rotated position*



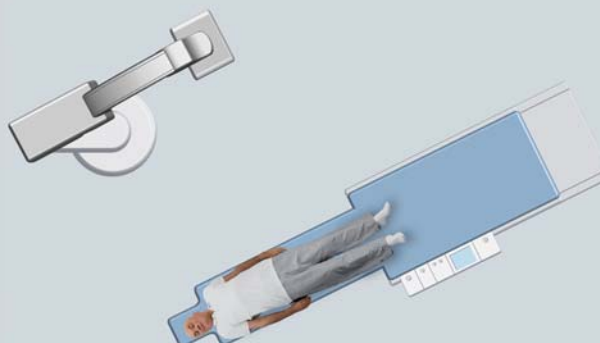
Left-side position



Left-side table rotated position*



Patient transfer position



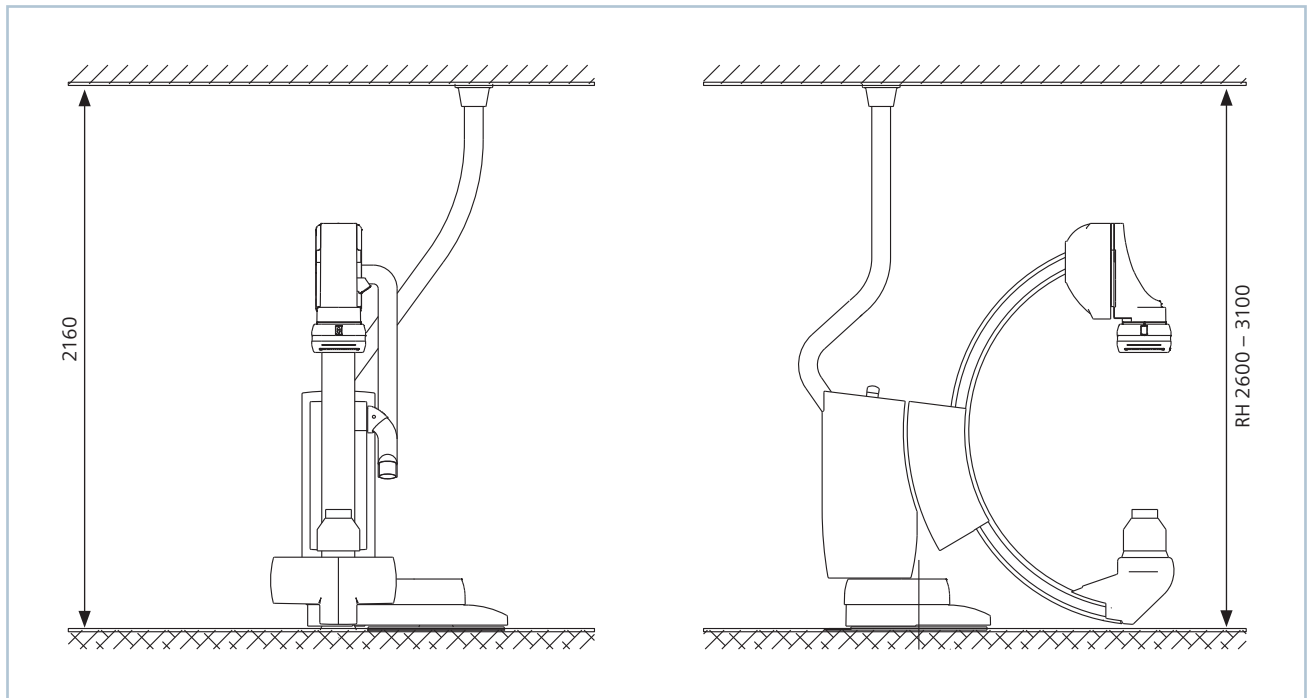
Park position*

* = MULTISPACE.F

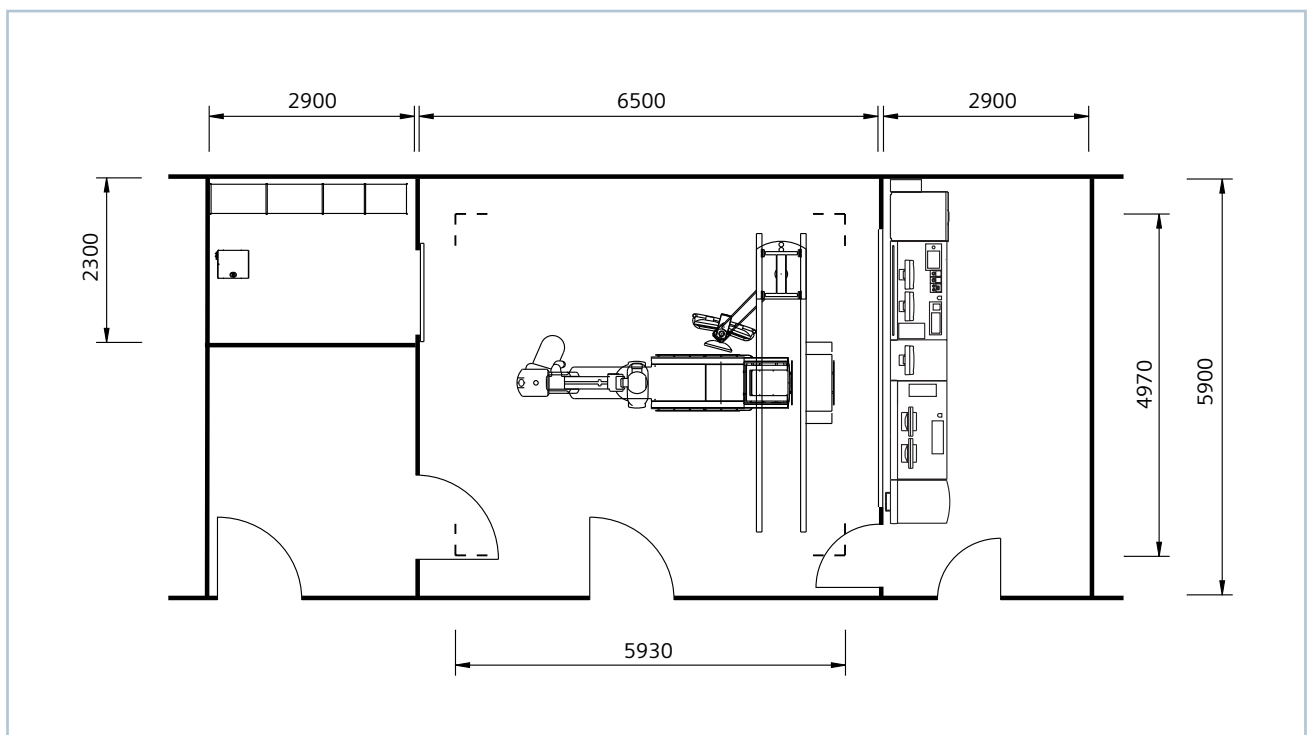
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Floor-mounted system for cardiology

System view (mm)



Room layout (mm)





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