

A composite image featuring a Siemens Artis Q.zen medical device on the left and a female medical professional on the right. The device is white with a red horizontal stripe and has the 'Artis Q.zen' logo on its upper section. The medical professional is wearing blue scrubs and a blue surgical cap that also features the 'Artis Q.zen' logo. She is looking towards the camera with a slight smile. The background is a plain, light grey.

**SIEMENS**

Artis Q.zen

Artis Q.zen

# Artis Q.zen

Visionary intervention – ultra-low-dose

[www.siemens.com/artis-q-zen](http://www.siemens.com/artis-q-zen)

Answers for life.



Experience the future  
of interventional imaging

# Artis Q.zen

Visionary in performance.  
Visionary in precision.  
Visionary in sensitivity.

The Artis Q.zen product line for interventional imaging is a visionary breakthrough in X-ray detection with unique **sensitivity** that enables ultra-low-dose imaging. It takes **performance** in X-ray generation and **precision** to the next level.

Artis Q.zen inaugurates a groundbreaking new detector technology based on crystalline silicon that reduces electronic noise and allows imaging at ultra-low-dose levels.

The system's new powerful GIGALIX X-ray tube offers unparalleled **performance** for a high contrast resolution at any angle and any patient size. In the fight against the most threatening diseases such as coronary artery disease, stroke, and tumors, Artis Q.zen delivers innovative applications offering **precision** for enhanced guidance during interventional procedures in cardiology, radiology, and surgery.

**Experience the future of interventional imaging.**

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



Artis Q.zen





# Visionary in ... sensitivity

Continuously reducing radiation exposure for both patients and staff is fundamental in interventional imaging, especially during long-lasting procedures with fluoroscopy guidance or when treating children. For enhanced dose sensitivity, Artis Q.zen introduces crystalline silicon detector technology to angiography, which allows device guidance using ultra-low-dose imaging.

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# Crystalline silicon detector

## High sensitivity for ultra-low-dose imaging

The active matrix of the Artis Q.zen detector allows the signal to be amplified directly where it is generated at each pixel of the matrix. This on-pixel amplification enhances the signal to electronic noise ratio compared to amorphous silicon detectors significantly and for the first time enables imaging with very low radiation, down to only 6 nGy per pulse.

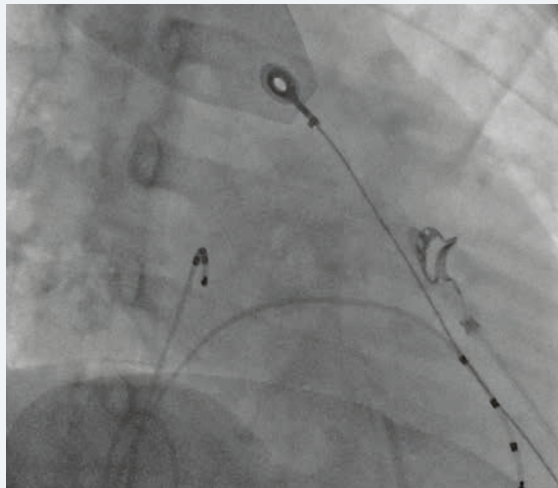
We call this new acquisition mode "ultra-low-dose imaging".

The image guidance of EP catheters can now be done with ultra-low-dose imaging. This reduces radiation to the patient and personnel in the room, which is especially important for complex, long-lasting procedures such as pulmonary vein isolations. The detector delivers clear image quality even when using other systems in the room, such as mapping systems, without additional shielding.

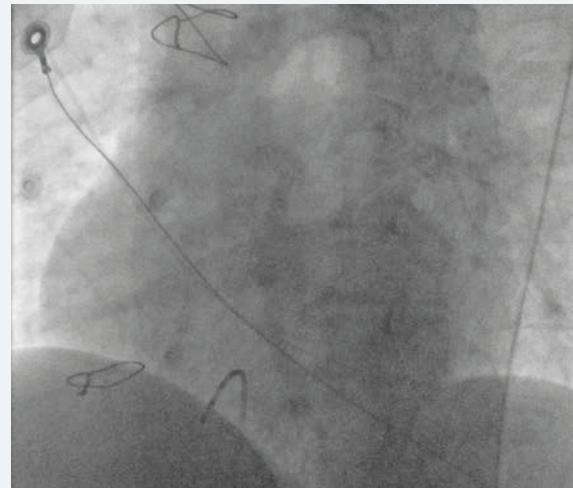
When treating babies and children, reducing radiation is of particular

importance. Especially for complex interventional procedures in pediatric cardiology and radiology, ultra-low-dose imaging might help to reduce the radiation significantly.

The ultra-fast readout technology of the new crystalline silicon detector allows for higher frame rates in 3D imaging, up to 99 f/s. In addition, the crystalline silicon detector provides more coverage compared to small cardiology detectors, allowing views of the entire heart.



Amorphous silicon: 39 nGy / pulse

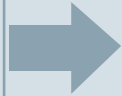
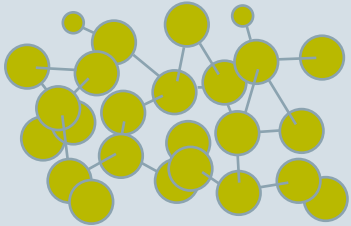


Crystalline silicon: 10 nGy / pulse

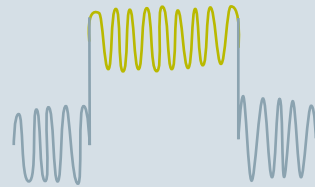
University Hospital Basel, Switzerland; comparison of fluoroscopy images of a pulmonary vein isolation procedure;

- Active matrix with on-pixel amplification increases the signal-to-electronic-noise ratio and enables ultra-low-dose imaging
- Ultra-low-dose imaging reduces radiation for both patients and staff, especially in long-lasting procedures with fluoroscopy guidance
- More coverage compared to small cardiology detectors

Amorphous silicon  
with passive matrix

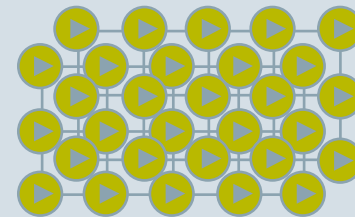


Electronic noise

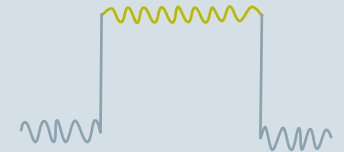


13.4 dB SENR  
(Signal-to-electronic-noise-ratio at 5 nGy)

Crystalline silicon with active  
matrix and on-pixel amplification



Electronic noise



23 dB SENR  
(Signal-to-electronic-noise-ratio at 5 nGy)



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# Visionary in ... performance

To see any device and anatomical structure in any patient and at any angulation is one of the main challenges in interventional imaging. For better performance and image quality, Artis Q.zen provides enhanced visualization to see small devices. It offers high contrast resolution even at steep angulations. And it enables sharp images of moving objects such as coronary arteries while the optimized X-ray pulse helps to reduce radiation by up to 60%.







# GIGALIX

## Focused power

The GIGALIX X-ray tube has been designed around a unique flat emitter technology that generates powerful short pulses. Compared to filament technology, the higher maximum current of the flat emitter enables CLEARpulse and enhances image quality in challenging situations such as with obese patients or in steep angulations. The small square focal spots of the GIGALIX result in higher spatial resolution for all clinical applications and help to better visualize small devices and vessels.

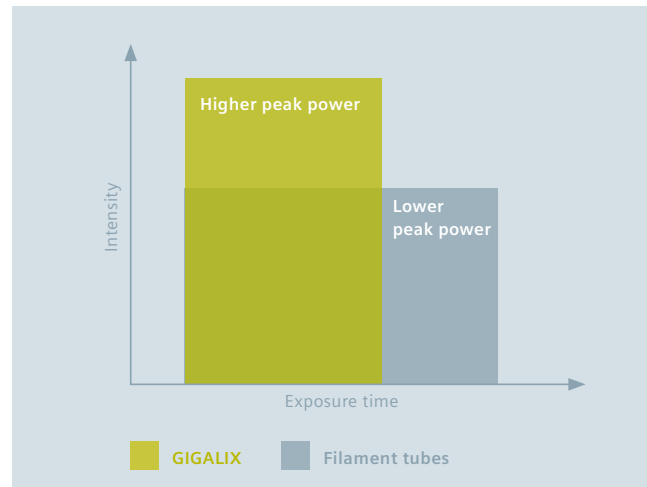
Together with the higher contrast resolution, this results in up to 70% better visibility of small devices\*.

With CLEARpulse, the pulse length can be shortened. This allows visualizing moving objects such as coronary vessels more sharply.

CLEARpulse also optimizes the X-ray spectrum by lowering the required tube voltage and allowing for additional filtration.

Together with small focal spots, this generates equal image quality with up to 60% less dose\*.

The GIGALIX X-ray tube in the Artis Q.zen product line scores a double win: enhanced image quality at a significantly lower dose for both patients and staff.

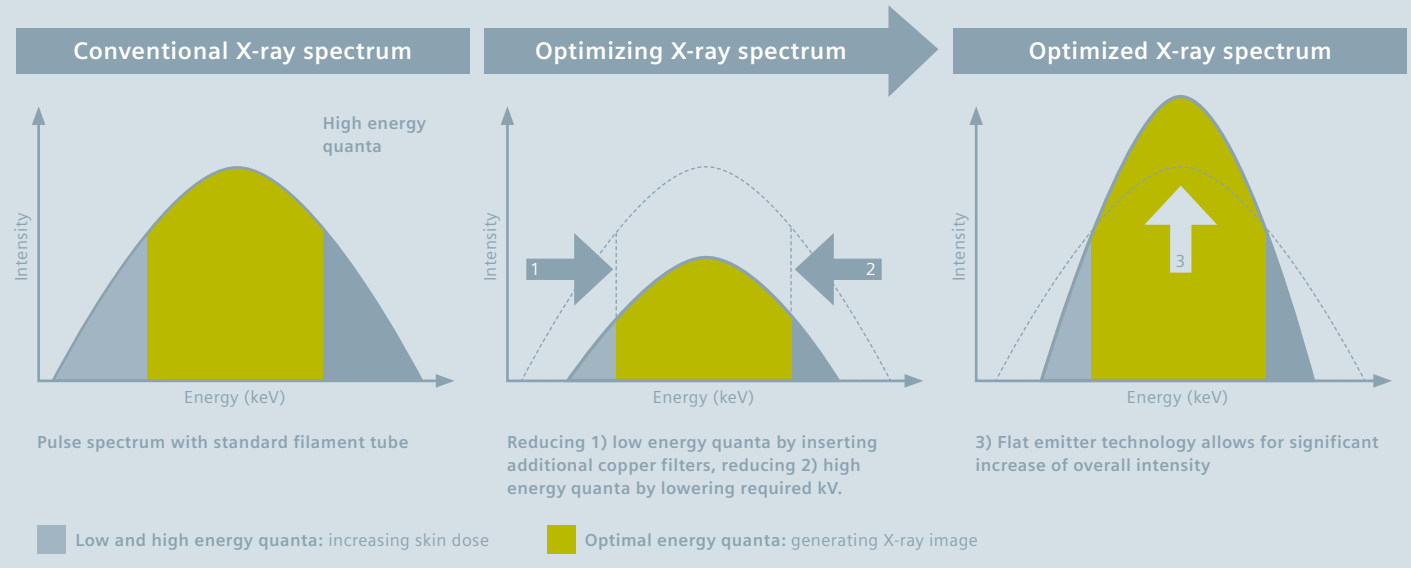


- Flat emitter technology for high contrast resolution even at steep angulations
- Small square focal spots for excellent spatial resolution to see more details
- CLEARpulse for sharp images and low dose

CLEARpulse – Sharp images and low dose



## How to optimize X-rays with the GIGALIX tube



Up to **70%** better visibility  
of small vessels\*

Up to **43%** shorter pulses  
for better images and optimized dose\*

\* Compared to previous X-ray tube technology. Data on file.





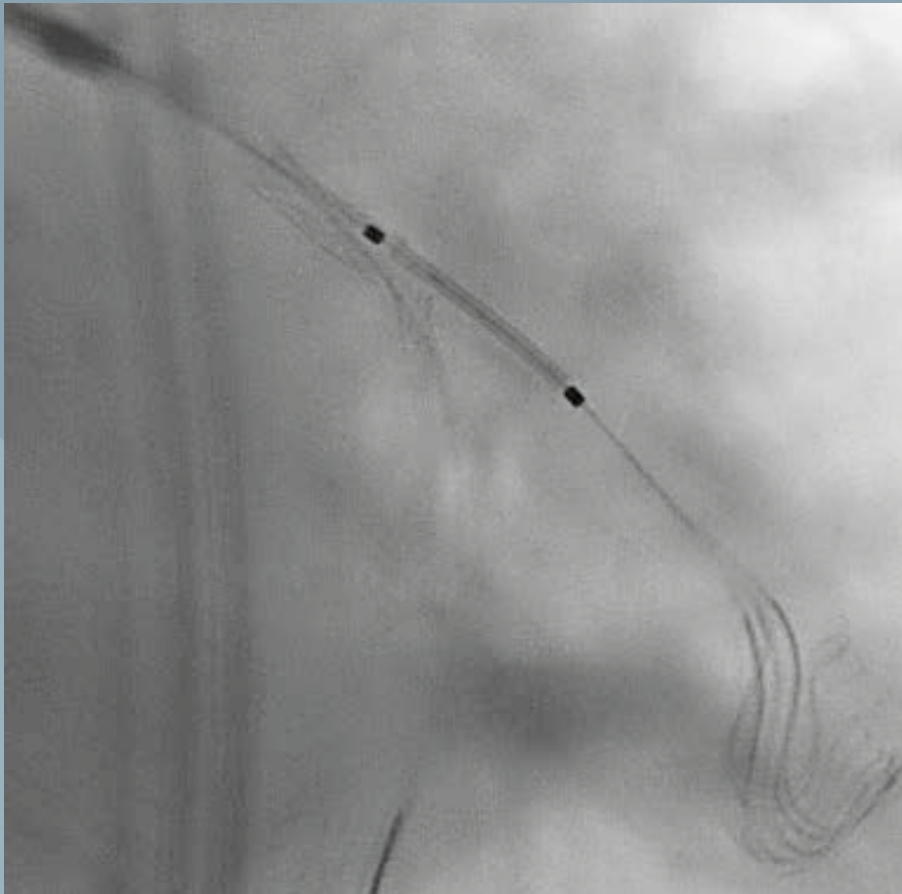




# Visionary in ... precision

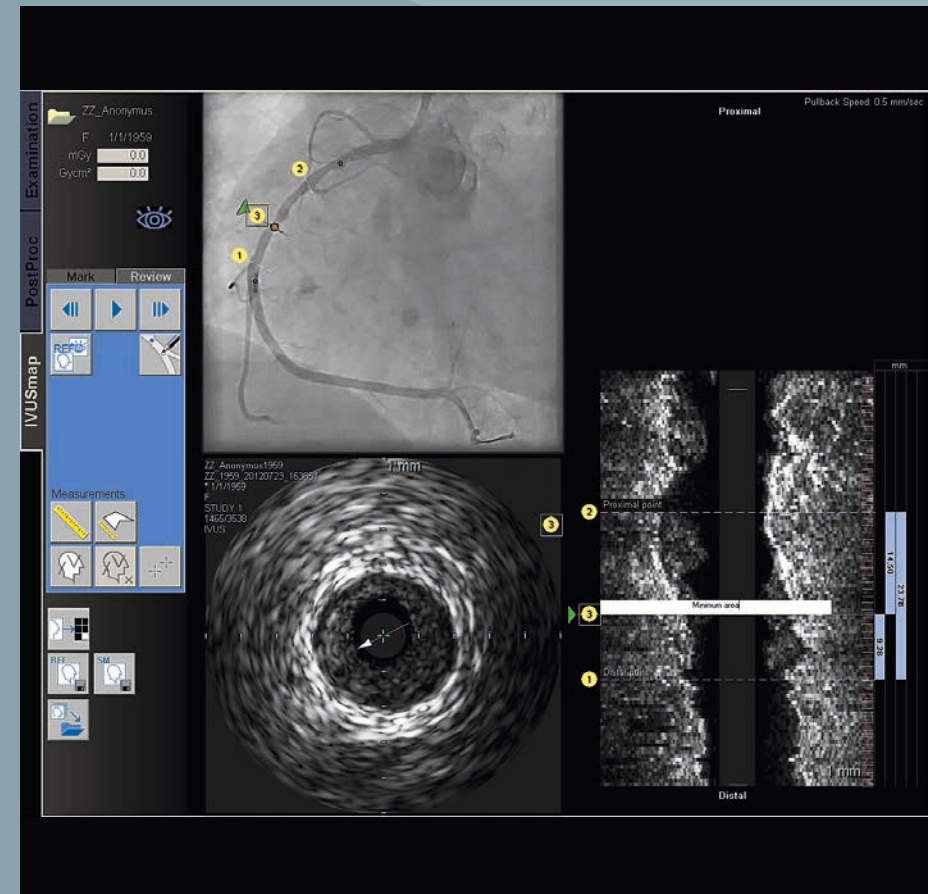
Precise guidance is needed to help improve clinical outcomes during interventions. Artis Q.zen offers applications for cardiology, interventional radiology and image-guided surgery.

# Applications for advanced interventional imaging



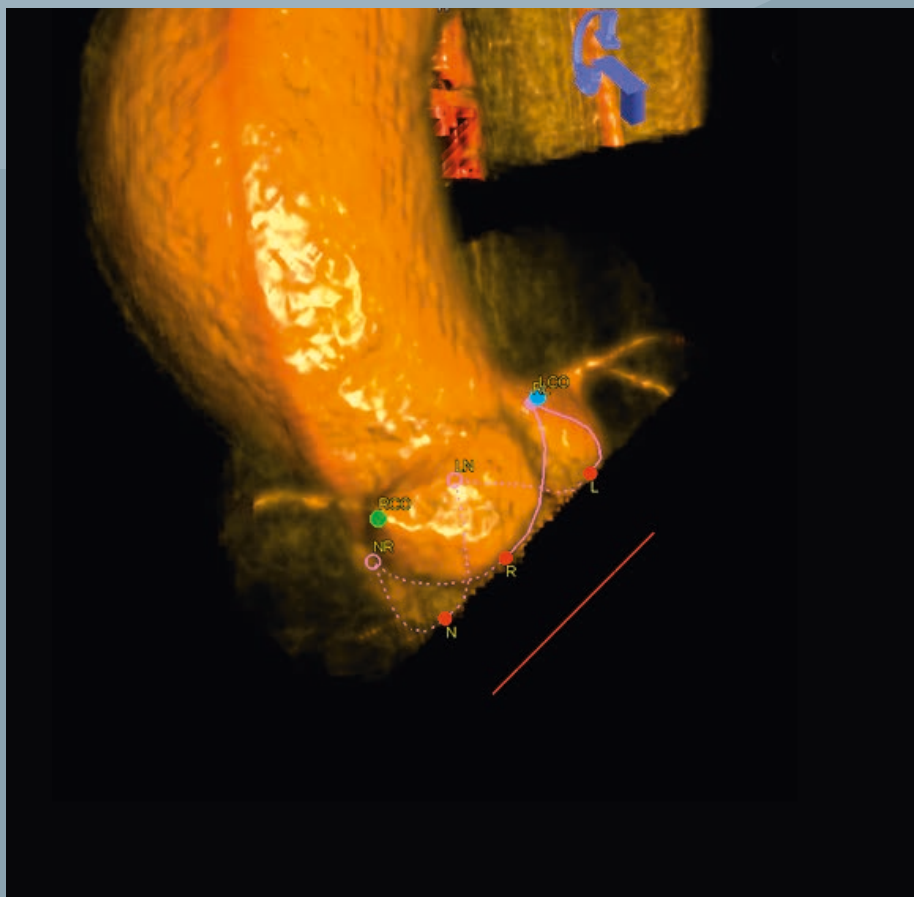
## CLEARStent Live – Real-time stent enhancement software

- Support of complex procedures
- Real-time verification of stent positioning while moving the device
- Potential to speed up procedures and to save contrast agent



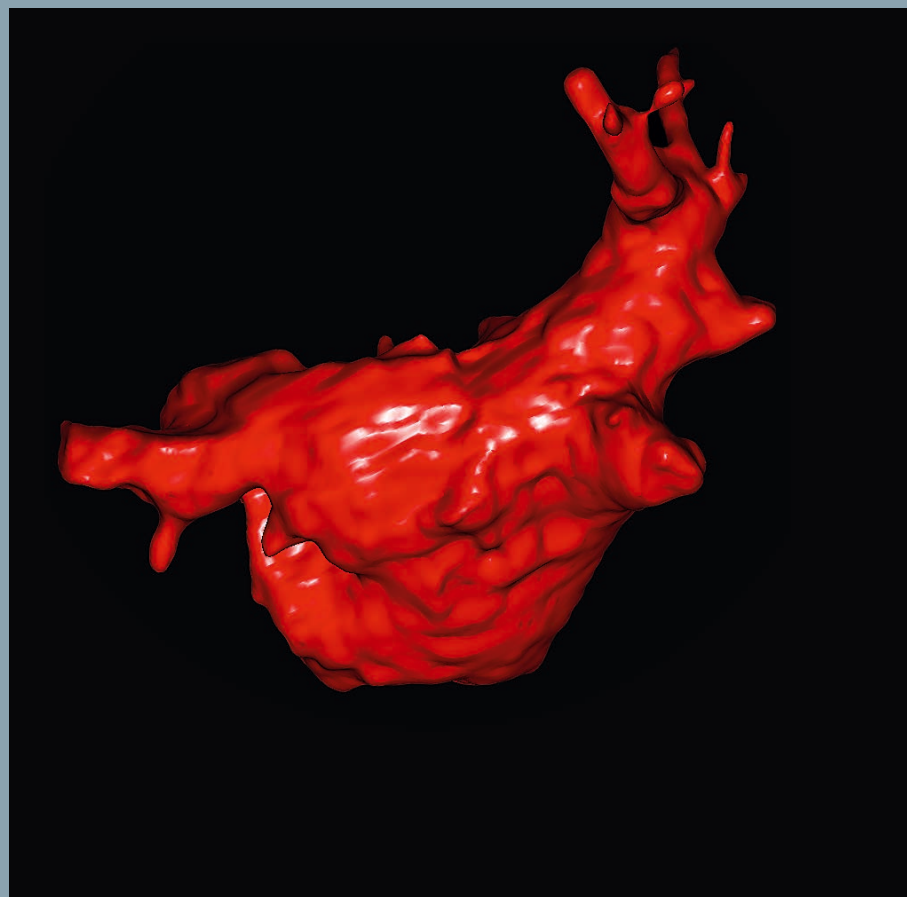
## IVUSmap – Integrated co-registration of IVUS images with angiography

- Combined information of angiography and IVUS imaging
- Bookmarks guide stent positioning and deployment
- Automated workflow integrated into procedure



**syngo Aortic ValveGuide –**  
**A new level of valve positioning convenience**

- Automated aortic root segmentation and visualization of anatomical landmarks in seconds
- Automated C-arm positioning to orthogonal view without fluoroscopy allowing for dose and contrast medium savings
- Improved guidance through overlay of aortic contour and landmarks onto live 2D image

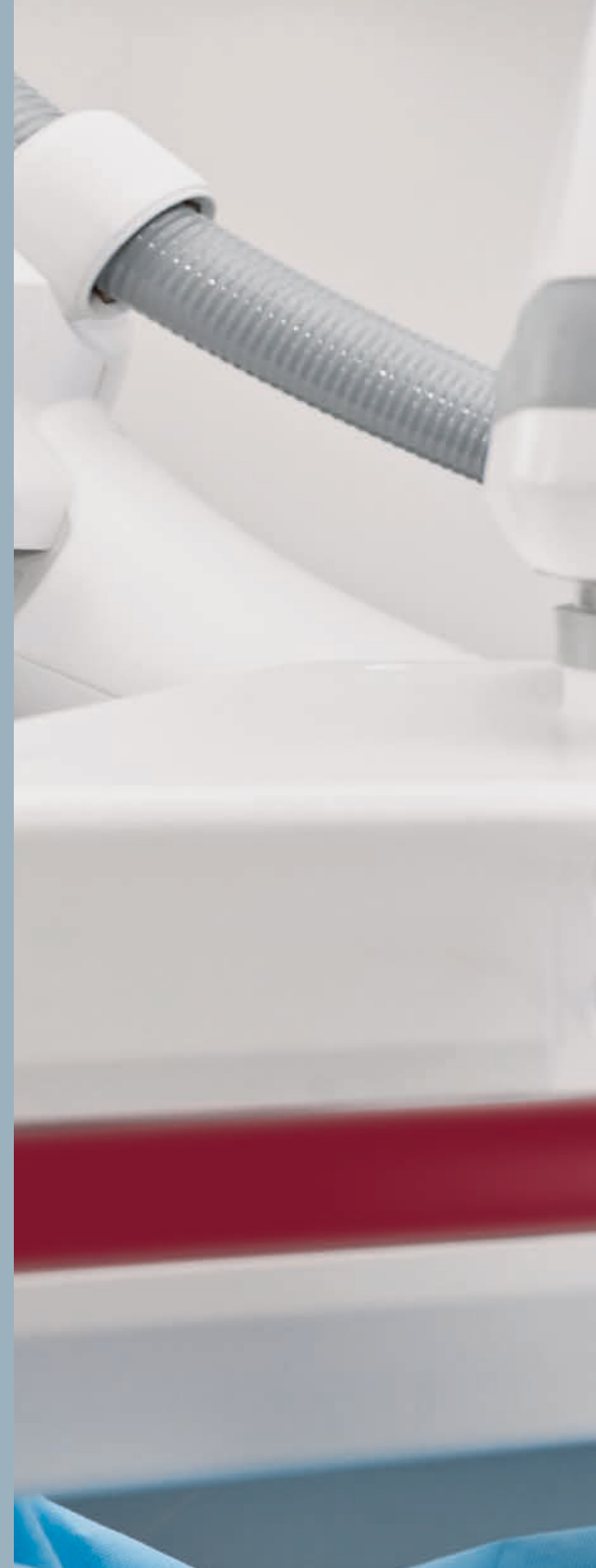


**syngo DynaCT Cardiac –**  
**Ungated and ECG-gated CT-like imaging of the heart**

- High-quality 3D volumes for cardiac anatomy assessment, measurements, and procedure planning
- Dedicated acquisition programs for 3D and 4D
- Additional tools for procedure planning, overlaying 3D onto 2D, and fusing 3D volumes from other modalities

# When **vision** becomes **reality** ...

Experience the future of interventional imaging and learn more about Artis Q.zen system configurations and options.







Artis Q.zen

# Artis Q.zen

## Floor-mounted system

The Artis Q.zen floor-mounted system offers high positioning flexibility on a very small footprint.

The C-arm features a floor rotation point with motorized swivel – from the head-end position to a left-side position. This ensures optimum access to the patient's head as well as extensive coverage from head to toe.

Flexible positioning of the C-arm relative to the table is possible, e.g. allowing access to the patient's left side for pacemaker implantations.

A special orthogonal position with rotated table enables easy access to the patient's head and sides for hybrid procedures.

Artis StraightView maintains upright images for all C-arm and table positions.

The compact and slimline C-arm design has a small footprint requiring an examination room size of only 25 m<sup>2</sup>.



- High positioning flexibility on a very small footprint
- Excellent access to the patient's head for complex procedures under anesthesia
- Extensive coverage from head to toe





# Artis Q.zen

## Ceiling-mounted system

The Artis Q.zen ceiling-mounted system offers high positioning flexibility for the C-arm at any angle.

The C-arm can be conveniently positioned around the patient's left, right or head side, and any angle in between. This enables optimum patient access. The longitudinal ceiling travel offers maximum coverage from head to toe as well as easy parking away from the table.

during table tilting, and StraightView upright images for all positions of the C-arm and table.

In addition, the system provides the uncompromised image quality of syngo DynaCT in the lateral position.

For increased imaging accuracy, InFocus maintains the projection angle during stand rotation, IsoTilt the projection angle

- High positioning flexibility of the C-arm at any angle
- Easy parking away from the table
- Maximum patient coverage from head to toe
- High 3D image quality also in lateral acquisition





# Artis Q.zen Biplane system

The Artis Q.zen biplane system offers high positioning flexibility and excellent patient access for biplane imaging.

The Artis Q.zen biplane system combines high performance and positioning flexibility. It supports two isocentric imaging positions enabled by the floor rotation point with motorized swivel from head end to left side. This allows optimum access to the patient's head as well as extensive coverage from head to toe in biplane imaging mode.

In single plane mode, the table and stand rotation allows access even to the patient's left side. A special orthogonal position with rotated table enables easy access to the patient's head for complex procedures under anesthesia. For increased imaging accuracy, IsoTilt maintains the projection angle during table tilting and Artis StraightView upright images for all C-arm and table positions.

- Two isocentric imaging positions enabling access to the patient's head for anesthesia in biplane mode
- Synchronized movements of both planes
- Extensive coverage from head to toe







# Artis Large Display

It's time to see the whole picture on one monitor.

With the Artis Large Display, 9, 18, or 24 video signals can be connected to the screen. The screen layout can be changed from the tableside.

With its built-in backup concept, additional back-up monitors are no

longer necessary. Also, a special algorithm ensures sharp display of ECG signals in zoomed formats, which is especially important to precisely visualize intracardiac ECG signals.



- Scalable from 9 to 24 inputs
- Tableside control
- Special ECG signal optimization algorithm



- Control up to 9 systems from one workplace and clean up your control room
- Configure the Cockpit to your needs with one or two keyboards and monitors

# Artis Cockpit

It's time to clean up the control room.

Stop running from one system to the next – let the Artis Cockpit consolidate all your information in one workplace. The 30-inch medical-grade monitor offers 4 megapixel resolution and high brightness for excellent image display. Up to nine inputs can be simultaneously displayed and controlled, with a choice of four different layouts. The position of the system inputs on the screen

can be easily rearranged using the unique drag & drop functionality.

Artis Cockpit offers one single workplace that can be equipped with one or two keyboards and monitors. With so much more efficiency in the control room, you can focus on your procedure and your patient.



# CARE+CLEAR

Artis Q.zen includes the CARE+CLEAR packages to complement the imaging chain for optimized post-processing and dose reduction. The CARE package helps reduce radiation for the operator and patient. The CLEAR package offers a comprehensive range of applications to enhance image quality. CARE+CLEAR are standard with all Artis Q.zen systems.

We think beyond technical hardware improvements. Introduced in 1994, our ever growing CARE portfolio (Combined Applications to Reduce Radiation Exposure) continues to reduce radiation dose for patients and clinical staff while maintaining high image quality for diagnostic confidence.

## Dose saving

- **CAREvision** provides variable fluoroscopy frame rates, pulse frequencies can be adapted to clinical needs
- **CAREfilter** is a specially designed copper prefiltration system that automatically adjusts the filter to the patient's anatomy
- **CAREprofile** allows radiation-free collimator and semitransparent filter

adjustment using the last image hold (LIH) position as reference

- **CAREposition** enables radiation-free object positioning, i.e. allows the table or C-arm position to pan without using fluoroscopy
- **Low-Dose Acquisition**, a dedicated acquisition protocol, helps to achieve dose reductions
- **Low-Dose syngo DynaCT** provides 3D images at the lowest possible dose levels

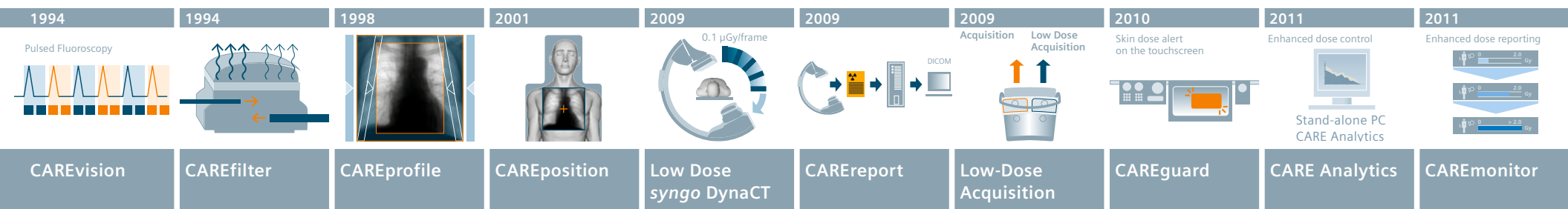
## Dose monitoring

- **CAREguard** allows three threshold values to be defined for the accumulated skin dose and signals when a skin dose level is exceeded

- **CAREwatch** displays the dose area product and dose rate at the interventional reference point on the live display in the examination and control rooms
- **CAREmonitor** shows in real-time the accumulated peak skin dose according to the current projection in the form of a fill indicator on the live monitor

## Dose reporting

- **CAREreport** is a DICOM-structured radiation report containing all patient demographic, procedure, and dose information
- **CARE Analytics** is a stand-alone tool for installation on any PC in the hospital network, allowing evaluation of DICOM dose structured reports







Almost 20 years of Siemens innovations to reduce, monitor, and report dose in angiography

CLEAR offers a comprehensive range of applications with real-time processing to enhance image quality – without increasing the dose.

- **CLEARpulse** shortens the pulse length and optimizes the X-ray spectrum, which leads to overall image quality improvements
- **CLEARcontrol** enhances the image creation process with a unique histogram analysis and optimizes image brightness and contrast
- **CLEARview** enhances overall image quality, especially when using low-dose imaging protocols with dose-adaptive noise reduction
- **CLEARmotion** helps detect small structures and efficiently compensates for motion artifacts
- **CLEARchoice** enables preferred image quality selection during application



Artis Q.zen



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