

SIEMENS



siemens.com/somatom-definition-as

Maximize Outcome. Minimize Dose.

SOMATOM Definition AS

Datasheet for 64-slice configuration | syngo CT VA48A



Maximize Outcome.

With the SOMATOM Definition AS, Siemens has established a scanner that for the first time is capable of adapting to virtually every patient and every clinical question. With its great flexibility, the system has proven to be the right choice when it comes to high-end CT imaging – no matter whether it is set to be used for routine diagnostic imaging, high-end cardiac settings, or to add functional and material information to morphology with Dual Energy or dynamic datasets. Furthermore, the system can be tailored to fit specialized clinical settings like high-end surgery, a two room acute care solution with a Sliding Gantry, a dedicated radio therapy planning scenario with a large bore, or a highly efficient interventional setting with outstanding 3D capabilities. All this comes along with Siemens' unique FAST CARE Technology.

It's simply made to maximize clinical outcome – meaning to have outstanding clinical results with more time for patients – and patient-centric productivity.

Minimize Dose.

In addition, the system is designed to minimize dose. From the very beginning, one of the most important topics for Siemens CT has been patient safety. And in Computed Tomography, patient safety translates primarily into dose reduction. Over the years, Siemens has been highly successful in integrating many innovations into the Siemens scanners that significantly reduce radiation dose in comparison to other systems available on the CT market – for example the Adaptive Dose Shield or SAFIRE* with the capability to reduce dose by up to 60%. Along with the CARE features like CARE kV – the industry's first automated exam-specific kV setting – the system gives our customers every means to minimize dose and consequently take best care of their patients' well-being.

* In clinical practice, the use of SAFIRE may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task. The following test method was used to determine a 54 to 60% dose reduction when using the SAFIRE reconstruction software. Noise, CT numbers, homogeneity, low-contrast resolution and high contrast resolution were assessed in a Gammex 438 phantom. Low dose data reconstructed with SAFIRE showed the same image quality compared to full dose data based on this test. Data on file.



System Configuration

Standard System Hardware	Optional System Software
0.33 s rotation time	Adaptive 4D Spiral
0 MHU STRATON® X-ray tube	iMAR – iterative Metal Artifact Reduction
z-Sharp™ Technology	syngo HeartView CT (including Adaptive ECG-Pulsing and Adaptive Cardio Sequence)
Adaptive Dose Shield	syngo Security Package
Multislice UFC™ (Ultra Fast Ceramic) Detector	syngo Expert-i
80 kW generator	Extended FoV (Field of View)
CT patient table	HD FoV (Field of View)
(160 cm scan range, 212 kg / 467 lbs table load)	HD FoV (Field of View) Pro
Up to 40 fps image reconstruction	Standard Applications for CT Intervention
Optional System Hardware	2D Basic Intervention
0.3 s rotation time	HandCARE
100 kW generator*	Needle Path Planning
UHR (Ultra high resolution) /	Optional Applications for CT Intervention
z-UHR (z-Ultra high resolution)	Adaptive 3D Intervention Suite
CT patient table	Adaptive 3D Intervention
(200 cm scan range, 227 kg / 500 lbs table load)	Intervention Pro
Multi-purpose patient table	i-Fluoro
(200 cm scan range, 307 kg / 676 lbs table load)	i-Control
Up to 60 fps image reconstruction	Standard FAST CARE Technology
Additional 19" (48 cm) flat screen monitor	FAST Adjust
Dual 19" (48 cm) flat screen monitor with dual display functionality	FAST Scan Assistant
Advanced radiotranslucent ECG extensions for the uncompromised, metal artifact-free use in Cardiac CT imaging	FAST Planning
Standard Workplace	FAST DE Results
syngo® Acquisition Workplace	FAST Window
19" (48 cm) flat screen monitor	CARE kV
CD/DVD storage	CARE Child
Optional Workplace	CARE Profile
syngo.via	CARE Dose4D™
Additional 19" (48 cm) flat screen monitor	CARE Filter
Dual 19" (48 cm) flat screen monitor with dual display functionality	CARE Topo
Standard System Software	CARE Dashboard
syngo Examination	CARE Bolus CT
syngo Viewing	
syngo Filming	
syngo Archiving & Network	

For more information on syngo.via applications please refer to the CT Applications and Engines overview brochure.

* Only ex factory, not available as an upgrade option

System Configuration

Optional FAST CARE Technology

FAST Acute Upgrade
FAST Cardio Upgrade
FAST Hardware Package
FAST Spine
FAST 3D Align
FAST Cardio Wizard
CARE Contrast III
Sinogram Affirmed Iterative Reconstruction (SAFIRE)
X-CARE

DoseMAP

DICOM Structured Dose Report
CARE Analytics
Scan Protocol Lock
Dose Notification
Dose Alert

Dual Energy Technology

Dual Spiral Dual Energy scan mode

Standard Applications for *syngo* Acquisition Workplace

syngo 3D Real Time MPR
syngo 3D SSD (Surface Shaded Display)
syngo Volume Calculation
syngo Dynamic Evaluation
syngo VRT (Volume Rendering Technique)
CT-Angiography
Neuro BestContrast
Adaptive Signal Boost
syngo 3D Real Time MIP

Optional Applications for *syngo* Acquisition Workplace

syngo Cardio BestPhase Plus
syngo Calcium Scoring
syngo Fly Through
syngo Dental CT
syngo Osteo CT
syngo Pulmo CT
syngo Volume Perfusion CT Neuro
syngo Volume Perfusion CT Body
syngo Image Fusion
Respiratory Gating and Triggering CT

syngo Neuro DSA CT
syngo 3D Bone Removal
WorkStream4D™

syngo.via

Wide Range of individual applications
CT Cardio-Vascular Engine
CT Acute Care Engine
CT Oncology Engine
CT Neuro Engine

System Hardware

Gantry	
Aperture	78 cm
Scan field	50 cm 65 cm with HD FoV* 78 cm with extended FoV* 78 cm with HD FoV Pro*
Tilt	± 30°
Rotation time	0.30*, 0.33, 0.5, 1 s
Three laser light markers	Horizontal, sagittal, and vertical laser light showing the isocenter position of the scan plane
Integrated display panel	Gantry front display showing current scan parameters such as kV, mA, scan time, table position, gantry tilt, and ECG trace**
Gantry front and rear* control panels	For convenient patient positioning (e.g. in case of trauma or interventional exams) Gantry tilt control from the operator's console
Continuously rotating tube-detector unit with optimized geometry for high-resolution data acquisition across the entire scan field	
Tube Assembly System	
Tube	STRATON MX P High-performance CT X-ray tube
Tube current range	20–666 mA, up to 800 mA (with 100 kW generator)***
Tube voltage	70, 80, 100, 120, 140 kV
Tube anode heat storage capacity	0 MHU (0.6 MHU capacity combined with 7.3 MHU/min (5,400 kJ/min) cooling rate is comparable to the performance of a conventional tube with approximately 50 MHU (37,000 kJ) anode heat storage capacity)
Cooling rate	7.3 MHU/min
Focal spot size according to IEC 60336	0.7 x 0.7 mm/7°* 0.9 x 1.1 mm/7°
z-Sharp Technology	The unique STRATON X-ray tube utilizes an electron beam that creates two precise focal spots alternating 4,608 times per second. This doubles the X-ray projections at each detector element. The corresponding detector electronics enable a virtually simultaneous readout of two projections for each detector element, resulting in a full two-slice acquisition per detector row. The two projections are overlapping, what results in an oversampling in z-direction. The resulting measurements interleave half a detector slice width, doubling the scan information without a corresponding increase in dose. This provides scan speed independent visualization of 0.33 mm isotropic voxels and a corresponding minimization of spiral artifacts at any position within the scan field.
Generator	
Max. power	80 kW, 100 kW***
Adaptive Dose Shield	
The first dynamic tube collimation that protects the patient from clinically irrelevant radiation in Spiral CT	
Computer-controlled monitoring of anode temperature	

* Optional

** Optional for *syngo* HeartView CT

*** Optional (only ex factory, not available as an upgrade option)

System Hardware

Data Acquisition System	
UFC Detector	Ultra short afterglow. Optimal for sub-second and multislice acquisition.
Max. number of slices/rotation	64 (acquired slices); 192 (reconstructed slices)
Number of detector rows	32
Number of detector electronic channels	64
Number of detector elements	23,552
Total channels per slice	1,472
Number of projections	up to 4,608/360°
Sequence acquisition modes	64 x 0.6 mm, 32 x 0.6 mm, 20 x 0.6 mm, 8 x 0.6 mm (UHR), 2 x 1 mm, 30 x 0.6 mm, 6 x 1.2 mm, 16 x 1.2 mm, 12 x 1.2 mm, 1 x 5 mm, 1 x 10 mm
Spiral acquisition modes	16 x 0.3 mm (z-UHR), 64 x 0.6 mm, 32 x 0.6 mm, 8 x 0.6 mm (UHR), 16 x 1.2 mm, 10 x 0.6 mm, 20 x 0.6 mm
Adaptive Signal Boost	The Adaptive Signal Boost amplifies low signal areas of the CT data and further reduces streaks and noise in the image especially for larger patients
Adaptive 4D Spiral mode*	Spiral scan mode for a larger perfusion range than the detector width
z-UHR (Ultra High Resolution)**	Siemens' proprietary z-UHR enables previously unachievable image detail with an isotropic resolution of 30 lp/cm (0.17 mm) at 0% MTF ($\pm 10\%$). The combination of z-Sharp Technology and z-UHR offers an isotropic detail in the range of flat panel or Micro CT technology.
Standard Patient Table	
Max. table load	212 kg / 467 lbs
Table feed speed	1–200 mm/s
Minimal patient load position	505 mm
Vertical travel speed	20–30 mm/s
Scannable range	1,600 mm
Distance between gantry front and table base	40 cm
Optional Patient Table 2,000 mm	
Max. table load	227 kg / 500 lbs
Table feed speed	1–200 mm/s
Minimal patient load position	490 mm
Vertical travel speed	20–50 mm/s
Scannable range	2,000 mm
Distance between gantry front and table base	40 cm
Optional Multi-purpose Patient Table	
Max. table load	307 kg*** / 76 lbs***
Table feed speed	1–200 mm/s
Minimal patient load position	550 mm
Vertical travel speed	20–50 mm/s
Scannable range	2,000 mm
Distance between gantry front and table base	40 cm/60 cm**
Additional exchangeable table tops*	High-capacity patient and trauma table top; RTP table top
Optional Foot Pedals****	
4 pairs of foot pedals are provided on the bottom edge of the patient table allowing table lifting and lowering from various positions	

* Optional; 2,000 mm or multi-purpose patient table required

** Optional

*** Optional with high-capacity table top

**** Only for multi-purpose patient table

Workplaces

syngo Acquisition Workplace (AWP)

The *syngo* Acquisition Workplace provides an intelligent and reliable workflow for data acquisition, image reconstruction, and routine postprocessing at the CT scanner. Built on the unique *syngo* platform, the *syngo* Acquisition Workplace is intuitive and user friendly.

Via Client@AWP allows to install a *syngo.via* client directly at the CT Acquisition Workplace providing all clinical applications especially in trauma situations where they are needed at the Scanner

syngo.via*

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

syngo.via is intended to be used for viewing, manipulating, communicating, and storing medical images. It can be used as a stand-alone device or together with a variety of cleared*** and unmodified *syngo.via* based software options.

Image Reconstruction

Real-time display	Real-time image display (512 x 512) during spiral acquisition
Slice thickness	0.6–15 mm
Recon field	50 cm 65 cm with HD FoV*/**** 78 cm with extend FoV*/**** 5–78 cm with HD FoV pro*/****
Recon time (FBP)****	Up to 40 fps Up to 60 fps (with FAST IRS)*
Recon time (IR)*****	Up to 16 fps Up to 20 fps (with FAST IRS)*
Recon matrix	512 x 512
HU scale	–1,024 to +3,071
Extended HU scale	–10,240 to +30,710

Wide range of selectable slice thickness for prospective and/or retrospective reconstruction

Raw Data

Capacity	900 GB 2.0 TB (with FAST IRS)*
----------	-----------------------------------

External USB 2.0 disks for quick and easy raw data storage are supported

* Optional

** Prerequisites include: Internet connection to clinical network, DICOM compliance, meeting of minimum hardware requirements, and adherence to local data security regulations

*** The software options are medical devices on their own rights, partially not available for US

**** The image quality for the area outside the standard 50 cm scan field does not meet the image quality specifications shown in the technical data sheet and image artifacts may appear, depending on the anatomy scanned

***** Filtered Back Projection

***** Iterative Reconstruction with SAFIRE

Workplaces

Workplace	AWP
High-performance Computer	1 x Xeon Quad Core 2.53 GHz*
Graphics Accelerator	NVIDIA Quadro 2000* for fast 3D postprocessing –
Standard Monitor	19" (48 cm) flat screen 1,280 x 1,024 resolution 1,024 x 1,024 image display matrix 0.29 mm pixel size
Additional Monitor**	Yes. Additional monitor for replication of primary monitor at remote location. Distance from host up to 30 m.
Dual Monitor***	Yes
RAM Storage	8 GB
RAID	Software RAID 0 for enhanced read/write performance
Image Storage	2 x 136 GB; 520,000 uncompressed images
Additional Storage	DVD DICOM drive: 4.7 GB DVD media 8,000 images Write-RW / +RW / -DL / Read CD-R: 700 MB 1,100 images External USB 2.0 disks for quick and easy raw data storage are supported. External USB memory stick for image data.
DICOM Viewer	Included on each CD; automatically started on the viewer's PC

* Or equivalent

** Optional

*** Optional. Dual monitor enables the simultaneous display of two scans on two monitors within the 3D task card, ideally used for comparison of follow-up studies or native and contrast-enhanced scans.

Standard System Software: *syngo* Examinations

Scan Protocol Assistant

Up to 10,000 protocols can be edited, modified, and stored
Easy and intuitive way to change and manage scan protocols

Automatic Patient Positioning

Two user-configurable buttons on the gantry panel
One touch, quick patient positioning for preselected clinical protocols – e.g. head, thorax

Topogram

Length	128–1,559/1,970* mm
Scan times	1.5–16/20* s
Views	a.p., p.a., lateral

Real-time topogram

Manual interruption possible once desired anatomy has been imaged

Patient Communication

Integrated patient intercom

Automatic Patient Instruction (API)	Freely recordable; 30 API text pairs; presets in nine languages available
Views	a.p., p.a., lateral

Sequence Acquisition

Reconstructed slice widths	0.6, 0.75, 1, 1.2, 1.5, 2, 2.4, 3, 3.6*, 4, 4.8, 5, 6, 7, 7.2, 8, 9, 10, 12, 14.4, 15, 20 mm
Temporal resolution	150 ms*, 166 ms, 250 ms, 500 ms, down to 75 ms (with 0.3 s rotation time* and <i>syngo</i> HeartView CT*)
Partial scan times (260°)	0.22*, 0.24, 0.36, 0.72 s
No. of uninterrupted scans per range	100
No. of ranges per protocol	33
Scan cycle time (min. scan cycle time depending on rotation time)	0.5 s*/0.75 s–60 s (± 10%)
Scan range	Max. 1,600 mm/62.99"; 2,000 mm/78.74"*

Acquisition with or without table feed

Automatic clustering of scans

Dynamic Multiscan: Multiple (continuous) sequence scanning without table movement for fast dynamic contrast studies with maximum slice thickness of 20 mm

Multislice Spiral Acquisition

Reconstructed slice widths	0.4**, 0.5*, 0.6, 0.75, 1, 1.5, 2, 3, 4, 5, 6, 7, 8, 10 mm
Scan times full scan (360°)	0.3 s*, 0.33, 0.5, 1 s
Slice increment	0.1–10 mm
Pitch factor	0.35–1.5, down to 0.15 (<i>syngo</i> HeartView CT)*, down to 0.09 (Respiratory Gating and Triggering CT)*
Spiral scan time	100 s, max. 200 s*
Scan length	Max. 1,540 mm/60.62"; 1,940 mm/76.38"*
No. of ranges per protocol	33

Automatic clustering of scans

Optimized special reconstruction algorithm (PFO: Posterior Fossa Optimization) for reduction of beam hardening artifacts in head images

* Optional

** Optional, with z-UHR option

Standard System Software: *syngo* Examinations

Patient Registration

Direct input of patient information on *syngo* Acquisition Workplace immediately prior to scan

Pre-registration of patients at any time prior to scan

Special emergency patient registration (allows examination without entering patient data before scanning)

Transfer of patient information from HIS/RIS via DICOM Get Worklist

Transfer of examination information from scanner into HIS/RIS via MPPS (Modality Performed Procedure Step)

SureView: Siemens' Patented Solution for Multislice CT Reconstruction

Excellent for clinical workflow: Forget about compromises in your clinical workflow. Just specify the slice thickness in your protocols according to your clinical needs. SureView automatically takes care of providing excellent volume image quality – with exceptional performance.

Multiply your clinical performance with SureView: High-quality imaging at any scanning speed. SureView allows the CT scanner to automatically select the necessary pitch value to achieve the coverage and scan time defined by you, while keeping selected slice thickness and image quality.

Includes advanced cone beam reconstruction algorithms for elimination of cone beam artifacts

Auto Field of View Adaption

When positioning the scan range, the width of the range is automatically adapted to cover the whole body of the patient

CINE Display

Display of image sequences

Automatic or interactive with mouse control

Max. image rate 30 frames/s

Image Filter

Advanced image algorithms LCE: Low Contrast Enhancement for improving low contrast detectability
HCE: High Contrast Enhancement for increased sharpness of high contrast structures
ASA: Advanced Smoothing Algorithm edge preserving smoothing filter, dedicated to Cardiac exams

Neuro BestContrast

Achieve a significant increase in contrast without an increase in noise or dose

e-Logbook

Tool to collect patient information for statistics, documentation, and research

- view
- archive
- print
- export

syngo Dynamic Evaluation

Evaluation of contrast enhancement in organs and tissues

Calculation of

- time-density curves (up to 5 ROIs)
- peak-enhancement images
- time-to-peak images

syngo 3D Real Time MIP

For the reconstruction of angular projections from the images of a spiral data record for the display and diagnosis e.g. of aneurysms, plaques, stenoses, vascular anomalies or vascular origins. MIP: Maximum Intensity Projection, MinIP: Maximum Intensity Projection and Thin MIP available.

Standard System Software: *syngo* Viewing

Windowing

Window width and center freely selectable

Single window

Double window (e.g. bone/soft tissue)

Multiple window settings for multi-image display

Organ-specific window settings, e.g. for soft tissue and bones

2D Postprocessing

Image zoom and pan

Image manipulations

- averaging, subtraction
- reversal of gray-scale values
- mirroring

Evaluation Tools

Parallel evaluation of more than 10 Regions of Interest

- circle
- irregular
- polygonal

Statistical evaluation

- area/volume
- standard deviation
- mean value
- min./max. values
- histogram

Profile cuts

- horizontal
- vertical
- oblique

Distance measurement

Angle measurement

Online measurement of a 5 x 5 pixel size ROI

Freely selectable positioning of coordinate system

Crosshair

Image annotation and labeling

Standard System Software: *syngo* Filming and *syngo* Archiving & Networking

Filming

Digital film documentation, connection to a suitable digital camera

Connection via DICOM Basic print

Automatic filming

Interactive virtual film sheet

Customizable film formats with up to 64 images

Filming parallel to other activities

Independent scanning and documentation

Freely selectable positioning of images onto film sheet

Configurable image text

Printing

Documentation on postscript printer supported

Video Capture and Editing Tool

Integrated solution for imaging and visualization of 4D information, allowing the generation and editing of video files for improved diagnoses, recording, and teaching. A wide range of multimedia formats are supported, e.g. AVI, Flash (SWF), GIF, QuickTime (MOV), streaming video.

Image Transfer/Networking

Interface for transfer of medical images and information using the DICOM standard. Facilitates communication with devices from different manufacturers.

DICOM Storage (Send/Receive)

DICOM Query/Retrieve

DICOM Basic print

DICOM Get Worklist (HIS/RIS)

DICOM MPPS

DICOM Storage Commitment

DICOM Viewer on CD

Optional System Software

Adaptive 4D Spiral*

Facilitates volume perfusion studies in head and body applications for a perfusion range of up to 9 cm (with 0.3 s rotation speed – optional)

Continuously repeated bi-directional table movement during spiral acquisition enables an extended range for 4D information

syngo HeartView CT

syngo HeartView CT with ECG-synchronized true isotropic volume acquisition using prospective ECG-triggered or retrospective ECG-gating mode

Basis for 3D cardiac scanning and reconstruction, e.g. CT-Angiography of the coronary and thoracic vessels or Calcium Scoring

The ECG signal used for gating the CT images is acquired by an integrated ECG device. The ECG signal is displayed on the gantry front cover and the scan interface.

Temporal resolution of down to 75 ms temporal resolution

Adaptive ECG-synchronized dose modulation (pulsing) allowing additional dose savings

Adaptive ECG-synchronized Cardio Sequence scan allowing additional dose savings

Quality control tools enable retrospective ECG viewing and interaction as well as computer-assisted heart phase definition

Automatic detection of irregular heartbeats with intuitive ECG-editing functionality

syngo Security Package

Provides functionality for user management and flexible access control for patient data

syngo Expert-i

Enables the physician to interact with the syngo CT Workplace from virtually anywhere in your hospital

WorkStream4D

4D workflow with direct generation of axial, sagittal, coronal, or double-oblique images from standard scanning protocols

Extended FoV (Field of View)

Special image reconstruction algorithms that provide visualization of objects using an FoV up to 78 cm**

HD FoV (Field of View)

Special image reconstruction using an FoV up to 65 cm algorithms that provide visualization of objects with an accuracy sufficient for RTP and bariatric scanning**

HD FoV (Field of View) Pro

Special reconstruction algorithms that allow for visualization of objects using a FOV up to 78 cm**

* Requires 2,000 mm or Multi-purpose Patient Table

** The image quality for the area outside the standard 50 cm scan field does not meet the image quality specifications shown in the technical data sheet and image artifacts may appear, depending on the anatomy scanned

Optional Applications for CT Intervention

Adaptive 3D Intervention Suite

Complete solution for non-fluoroscopic and fluoroscopic minimally invasive 3D volume interventions. Includes Adaptive 3D Intervention, Intervention Pro, i-Fluoro, i-Control (wireless or cable), foot switch.

Adaptive 3D Intervention

Near to real-time coronal, sagittal, and oblique image guidance

Layout Editor 3D: user-configurable screen layouts in 3D

Display of coronal, axial, and sagittal MPRs and VRT

Interventional toolbar with path planning tools such as Auto Needle Detection

i-NeedleSharp: avoids needle artifacts during a sequential intervention

Intervention Pro

Spiral and sequential non-fluoroscopic interventional procedures

i-Sequence biopsy mode with user-configurable dose and windowing display

i-Spiral mode for complete organ coverage

Switching scan modes on the fly during intervention with one single click

Up to 8 image display for better navigation in the volume

Layout Editor with user-configurable screen layouts

Interventional toolbar with measurement tools and automatic table positioning via buttons or joystick with auto-stop function

Switch between continuous and incremental table movement with user-configurable increment

i-Precision view: increases or decreases the predefined mAs value

HandCARE for i-Sequence: Real-time dose modulation during the CT-guided intervention avoids direct X-ray irradiation of the radiologist's hand

i-Fluoro

Real-time fluoroscopic image guidance with up to 10 frames/s

Image matrix 512 x 512

Fluoroscopy mode with X-ray up to 100 s (dependent on hardware configuration)

Dose & Time Watch for continuous observation of dose and scan time

Up to 8 image display for better navigation in the volume

Intelligent inheritance and adaptation of interventional scan parameters

Interventional toolbar with measurement tools and automatic table positioning via buttons or joystick with auto-stop function

Switching scan modes on the fly during intervention with one single click

Switch between continuous and incremental table movement with user-configurable increment or "move table top only" mode

Additional flat screen monitor 19" (48 cm) for parallel image display in the examination room

HandCARE: Real-time dose modulation during the CT-guided intervention. The tube current is automatically switched off to avoid direct X-ray exposure to the physician's hands.

Foot Switch

Radiation release directly at the gantry

i-Control

In-room intervention module for full remote control of gantry, table, and user interface

FAST CARE Technology Standard CARE Applications

CARE Bolus CT

Scan mode for contrast bolus triggered data acquisition

Significant improvement of the planning procedure by enabling an optimum spiral scan start after contrast injection

The procedure is based on repetitive low dose monitoring scans at one slice level and analysis of the time density curve in an ROI (Region of Interest)

CARE Child

Dedicated pediatric CT imaging, including 70 kV scan modes and specific CARE Dose4D™ curves and protocols

Special clinical protocols with 70 or 80 kV selection and a wide range of mAs settings. The X-ray exposure is adapted to the child's (and small adult's) weight and age, substantially reducing the effective patient dose.

CARE Dashboard

Visualization of activated dose reduction features and technologies for each scan range of an examination

CARE Dose4D™

Automated real-time tube current adjustment for best diagnostic image quality at lowest possible dose, independent of patient size and anatomy

Fully automated dose management for adults and children

Manual interruption possible once desired anatomy has been imaged

CARE Filter

Specially designed X-ray exposure filter installed at the tube and the collimator for protocol individual optimization of patient dose and image quality

CARE kV

First automated, organ-sensitive voltage setting to optimize contrast-to-noise ratio and reduce dose in relation to the size of the patient

CARE Profile

Visualization of the dose distribution along the topogram prior to the scan

CARE Topo

Real-time topogram

Manual interruption possible once desired anatomy has been imaged

FAST CARE Technology Optional CARE Applications

X-CARE

Angular tube current modulation reducing X-ray exposure (organ dose) of peripheral dose-sensitive body regions, e.g. the breasts, thyroid gland or eye lens

Sinogram Affirmed Iterative Reconstruction (SAFIRE)

Siemens' iterative reconstruction with excellent raw-data based image quality improvement or significant dose reduction*

CARE Contrast III

Synchronized scanning and contrast injection through integration of CT scanner and injector facilitates enhanced CT examinations and improved workflow

* In clinical practice, the use of SAFIRE may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task. The following test method was used to determine a 54 to 60% dose reduction when using the SAFIRE reconstruction software. Noise, CT numbers, homogeneity, low-contrast resolution and high contrast resolution were assessed in a Gammex 438 phantom. Low dose data reconstructed with SAFIRE showed the same image quality compared to full dose data based on this test. Data on file.

FAST CARE Technology Standard FAST Applications

FAST Adjust

Direct scan parameter adjustment at the push of a button

FAST Scan Assistant

Easy and intuitive scan parameter setting

FAST Planning

Direct, organ-based setting of scan and recon ranges for a faster and more standardized workflow

FAST DE Results

Automatically generates Dual Energy datasets at the AWP and the results will be sent directly to the reading environment for a straight forward Dual Energy workflow

Enables Dual Energy applications like *syngo* Monoenergetic for metal artifact reduction

FAST Window

Automatic optimization of the window setting when CARE KV is used

FAST CARE Technology Optional FAST Applications

FAST Acute Upgrade

0.3 s rot. speed

100 kW

200 cm table

FAST Cardio Wizard

FAST Spine

WorkStream4D

FAST Cardio Upgrade

0.3 s rot. speed

100 kW

FAST Cardio Wizard

FAST Hardware Package

0.3 s rot. speed

100 kW

200 cm table

FAST IRS

FAST 3D Align

FAST 3D Align enables automated alignment of FOV, adjustments and reconstructions of standard views

FAST Spine

Accurate and automatically aligned preparation of spine recons with just a single click

FAST Cardio Wizard

On-screen step by step guide to cardiac scanning for higher reliability and reproducibility in cardiac CT

Dual Energy Technology

Dual Spiral Dual Energy

Acquisition of two different kV and mA levels using two successive spiral scans

Fully automated procedure to register the two datasets for further reading

Metal Artifact Reduction

Monoenergetic with FAST DE Results

Dual Spiral Dual Energy scan in combination with monoenergetic enables basic metal artifact reduction

iMAR – iterative Metal Artifact Reduction*

Reduces metal artifacts in various body regions

Advanced metal artifact reduction with a combination of beam hardening correction, normalized sinogram inpainting, and frequency split

Adaptive Sinogram Mixing with iteratively refined process for normalized sinogram inpainting and mixing steps

Compatible with extended FoV, extended CT scale and dose reduction features

Simple user interface

DoseMAP

DICOM Structured Dose Report

Comprehensive overview of applied radiation

Automatically created after every examination in addition to the patient protocol

CARE Analytics

Retrieve and query dose data, monitor data, and document data

Scan Protocol Lock

Manage access to scan protocols

Increased security by managing user administration rights

No unauthorized access or changes to scan protocols

Dose Notification

Helps to protect patients from over-radiation

Dose Alert

Warns the operator in case set dose thresholds are exceeded

* Optional

teampay

teampay

teampay is a cloud-based network that brings together healthcare professionals in order to advance medicine and human health

SOMATOM Definition AS configuration is compatible and ready for teampay.

For more information and experiences please visit:
www.siemens.com/teampay

syngo.via

syngo.via*

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

syngo.via is intended to be used for viewing, manipulating, communicating, and storing medical images. It can be used as a stand-alone device or together with a variety of cleared*** and unmodified syngo.via based software options

License Model

The number of installed clients can be unlimited. Thereby 10 concurrent clients can be opened, 5 with advanced and 5 with standard applications

syngo.via Server

The HW configuration depends on the server that has been chosen

Workstation-based Server
Server HW Config. L
Server HW Config. XL

Please see the syngo.via datasheet for more details

syngo.via Clients****

Minimum requirements:

- Processor: Pentium IV, 2.4 GHz or higher
- RAM: 1.5 GB
- Hard drive (free space): 500 MB
- Graphic card: OpenGL 1.1 (min. 1024 x 768)
- Pixel depth graphic cards: 16–32 bits

Network Requirements

Network hardware:

- Minimum (100 MBit/s)
- Recommended (1 GBit/s)

Client remote connection: The minimum bandwidth specification (sporadic use for viewing data remotely):

- Download: 6 Mbit/s
- Upload: 1 Mbit/s
- Ping time (latency): 20 ms to 25 ms

Recommended (routine use in clinical routine):

- Download 16 Mbit/s
- Upload 2 Mbit/s
- Ping time (latency): 10 ms

For more information on applications please refer to the CT Applications and Engines overview brochure.

* syngo.via can be used as a standalone device or together with a variety of syngo.via based software options, which are medical devices in their own rights

** Prerequisites include: Internet connection to clinical network, DICOM compliance, meeting of minimum hardware requirements, and adherence to local data security regulations

*** The software options are medical devices on their own rights, partially not available for US

**** Optional

Installation

Dimensions	Height (mm/inch)	Width (mm/inch)	Length (mm/inch)	Weight (kg/lbs)
Components				
Gantry	≤ 1,980/78.0	≤ 2,380/93.7	≤ 935/36.8	≤ 2,250/4,960
Patient table	≤ 1,000/39.4	≤ 750/29.5	≤ 2,445/96.3	≤ 500/1,102
Multi-purpose table*	≤ 1000/39.4	≤ 690/27.2	≤ 2445/96.3	≤ 600/1,323
Operator's console	≤ 720/28.3	≤ 800/31.5	≤ 1,200/47.2	≤ 35/77
Power cabinet	≤ 1,960/77.2	≤ 900/35.4	≤ 700/27.6	≤ 600/1,322
Water/air cooling system**				
Indoor unit	≤ 1,960/77.2	≤ 1,005/39.6	≤ 700/27.6	≤ 413/911
Outdoor unit	≤ 1,050/41.3	≤ 1,150/45.3	≤ 2,500/98.4	≤ 185/408
Image Recon. System	≤ 505/18.9	≤ 255/10.0	≤ 765/30.1	≤ 100/220
syngo Workplaces				
syngo Acquisition Workplace	≤ 500/19.7	≤ 250/9.8	≤ 650/25.6	≤ 30/66
syngo.via*				
syngo.via*	≤ 508/20.0	≤ 282/11.1	≤ 732/28.8	≤ 70/154

* Optional

** Optional split cooling available

Installation

Power Supply	
Nominal voltage 3/N~	380–480 V in 20 V steps
Nominal line frequency	50; 60 Hz
Line impedance at 80 kW	90–140 mOhm dependent on line voltage
Line impedance at 100 kW*	80–125 mOhm dependent on line voltage
Line fuse protection	3 x 125 A (NH)
Power Consumption	
Computer on	2.5 kVA
System on standby	4.0 kVA
Scanning operation	125 kVA (at 80 kW)
Protection Against Input Power Fluctuation/Interruptions	
Gantry with X-ray	≤ 5 ms
Gantry without X-ray	≤ 10 ms
Image Reconstruction	≤ 300 s
System, <i>syngo</i> Acquisition Workplace, <i>syngo</i> CT Workplace	with UPS
Fluctuation	
Nominal voltage	+10/ -16%
Nominal frequency	2 Hz
Electromagnetic Compatibility	
This product is in compliance with IEC 60601-1-2 and fulfils CISPR 11 Class A	
Cooling	
Heat dissipation to cooling environment (air-cooled) including gantry, table, power supply and computer periphery	Min. 6.5 kW Max. 12 kW
Heat dissipation to water cooling environment (water-cooled) including gantry, table, power supply and computer periphery	Min. 6.5 kW Max. 12 kW
Heat dissipation computing periphery only	Max. 2.5 kW
Room Environment	
Temperature range	18–28 °C
Temperature gradient	Max. 6 K/h
Relative air humidity without condensation	20–75%
Surface Area for Installation	
System (incl. workplace)	18 m ²

* Optional

Image Quality

Low-contrast Resolution

Low-contrast resolution is the ability to see

- a small object
- with a certain contrast difference
- on a particular phantom
- with a particular dose (CTDIvol)

Spiral

Phantom	CATPHAN (20 cm)
Object size	5 mm
Contrast difference	3 HU
CTDIvol (Ø 32 cm)	12 mGy
Technique	10 mm, 120 kV

Sequence

Phantom	CATPHAN (20 cm)
Object size	5 mm
Contrast difference	3 HU
CTDIvol (Ø 32 cm)	11 mGy
Technique	10 mm, 120 kV

High-contrast Resolution

x-y-plane*	2% MTF ($\pm 10\%$) 24 lp/cm 10% MTF ($\pm 10\%$) 13.4 lp/cm 50% MTF ($\pm 10\%$) 11.5 lp/cm
Technique	160 mA, 120 kV, 0.5 s, 2.4 mm
z-axis**	2% MTF ($\pm 10\%$) 22 lp/cm 10% MTF ($\pm 10\%$) 17.5 lp/cm 50% MTF ($\pm 10\%$) 7.5 lp/cm
Technique	160 mA, 120 kV, 1 s, 0.4 mm

Homogeneity

Cross-field uniformity (typical mode) in a 20 cm water phantom	max. ± 4 HU typ. ± 2 HU
--	------------------------------------

Dose, CTDI₁₀₀ Values

Phantom		kV				
		70	80	100	120	140
16 cm	A	2.9	4.6	9.3	15.2	22.3
	B	3.1	4.9	9.6	15.7	22.9
32 cm	A	0.7	1.2	2.7	4.7	7.2
	B	1.5	2.5	5.1	8.6	12.8

A: at center B: 1 cm below surface

Technique	Collimation 16 x 1.2 mm 100 mAs 360° rotation PMMA-Phantom Absorbed dose for reference material air Max. deviation $\pm 40\%$ for 70 kV Typically less than 15% Values according to IEC 60601-2-44
-----------	---

Phantom Validation of z-Sharp Technology

CATPHAN measurement demonstrates clearly industry's highest routine isotropic resolution of 0.33 mm (not for cardiac mode)

- in daily clinical routine
- at any scan speed (any pitch)
- at all positions of the scan field

Pitch	0.55	1.0	1.5
z-axis			
0.33 mm			
0.36 mm			
0.38 mm			
0.42 mm			

Pitch	1.0 Center	1.0 100 mm Off-center
z-axis		
0.33 mm		
0.36 mm		
0.38 mm		
0.42 mm		

Phantom Validation of z-UHR***

CATPHAN measurement results in industry's highest isotropic resolution of 0.24 mm in all three planes (x, y, and z)

- 0.24 mm x 0.24 mm x 0.24 mm
- for ultra-high resolution bone-imaging
- isotropic detail in the range of flat panel or Micro CT technology
- 0.3 mm collimation

* Optional. Standard high-contrast resolution
17.4 lp/cm at 0% MTF and 16.4 lp/cm at 2% MTF

** Optional with z-Sharp / z-UHR

*** Optional

Selected Scientific Publications

SAFIRE:

Baumüller S, Winklehner A, Karlo C, Goetti R, Flohr T, Russi EW, Frauenfelder T, Alkadhi H.
Low-dose CT of the lung: potential value of iterative reconstructions.
Eur Radiol. 2012 Dec;22(12):2597-606.

CARE kV:

Winklehner A, Goetti R, Baumüller S, Karlo C, Schmidt B, Raupach R, Flohr T, Frauenfelder T, Alkadhi H.
Automated attenuation-based tube potential selection for thoracoabdominal computed tomography angiography: improved dose effectiveness.
Invest Radiol. 2011 Dec;46(12):767-73.

Eller A, May MS, Scharf M, Schmid A, Kuefner M, Uder M, Lell MM.
Attenuation-based automatic kilovolt selection in abdominal computed tomography: effects on radiation exposure and image quality.
Invest Radiol. 2012 Oct;47(10):559-65.

Siegel MJ, Hildebolt C, Bradley D.
Effects of Automated Kilovoltage Selection Technology on Contrast-enhanced Pediatric CT and CT Angiography.
Radiology. 2013 Apr 5. [Epub ahead of print]

Siegel MJ, Ramirez-Giraldo JC, Hildebolt C, Bradley D, Schmidt B.
Automated Low-Kilovoltage Selection in Pediatric Computed Tomography Angiography: Phantom Study Evaluating Effects on Radiation Dose and Image Quality.
Invest Radiol. 2013 Apr 4. [Epub ahead of print]

Adaptive 4D Spiral, dynamic CT Angiography:

Sommer WH, Becker CR, Haack M, Rubin GD, Weidenhagen R, Schwarz F, Nikolaou K, Reiser MF, Johnson TR, Clevert DA.
Time-resolved CT angiography for the detection and classification of endoleaks.
Radiology. 2012 Jun;263(3):917-26.

Adaptive Dose Shield:

Deak PD, Langner O, Lell M, Kalender WA.
Effects of adaptive section collimation on patient radiation dose in multisection spiral CT.
Radiology. 2009 Jul;252(1):140-7.

Christner JA, Zavaletta VA, Eusemann CD, Walz-Flannigan AI, McCollough CH.
Dose reduction in helical CT: dynamically adjustable z-axis X-ray beam collimation.
AJR Am J Roentgenol. 2010 Jan;194(1):W49-55.

Adaptive Cardio Sequence:

Arnoldi E, Johnson TR, Rist C, Wintersperger BJ, Sommer WH, Becker A, Becker CR, Reiser MF, Nikolaou K.
Adequate image quality with reduced radiation dose in prospectively triggered coronary CTA compared with retrospective techniques.
Eur Radiol. 2009 Sep;19(9):2147-55.

Duarte R, Fernandez G, Castellon D, Costa JC.
Prospective Coronary CT Angiography 128-MDCT Versus Retrospective 64-MDCT: Improved Image Quality and Reduced Radiation Dose.
Heart Lung Circ. 2011 Feb;20(2):119-25.

CT Angiography, other than cCTA:

Hinkmann FM, Voit HL, Anders K, Baum U, Seidensticker P, Bautz WA, Lell MM.
Ultra-fast carotid CT-angiography: low versus standard volume contrast material protocol for a 128-slice CT-system.
Invest Radiol. 2009 May;44(5):257-64.

Adaptive 4D Spiral, perfusion imaging:

Goetti R, Leschka S, Desbiolles L, Klotz E, Samaras P, von Boehmer L, Stenner F, Reiner C, Stolzmann P, Scheffel H, Knuth A, Marincek B, Alkadhi H.
Quantitative computed tomography liver perfusion imaging using dynamic spiral scanning with variable pitch: feasibility and initial results in patients with cancer metastases.
Invest Radiol. 2010 Jul;45(7):419-26.

Morhard D, Wirth CD, Fesl G, Schmidt C, Reiser MF, Becker CR, Ertl-Wagner B.
Advantages of extended brain perfusion computed tomography: 9.6 cm coverage with time resolved computed tomography-angiography in comparison to standard stroke-computed tomography.
Invest Radiol. 2010 Jul;45(7):363-9.

Helck A, Sommer WH, Klotz E, Wessely M, Sourbron SP, Nikolaou K, Clevert DA, Notohamiprodjo M, Illner WD, Reiser M, Becker HC.
Determination of glomerular filtration rate using dynamic CT-angiography: simultaneous acquisition of morphological and functional information.
Invest Radiol. 2010 Jul;45(7):387-92.

Xyda A, Haberland U, Klotz E, Jung K, Bock HC, Schramm R, Knauth M, Schramm P.
Diagnostic performance of whole brain volume perfusion CT in intra-axial brain tumors: preoperative classification accuracy and histopathologic correlation.
Eur J Radiol. 2012 Dec;81(12):4105-11.

On account of certain regional limitations of sales rights and service availability, we cannot guarantee that all products included in this brochure are available through the Siemens sales organization worldwide. Availability and packaging may vary by country and is subject to change without prior notice. Some/All of the features and products described herein may not be available in the United States.

The information in this document contains general technical descriptions of specifications and options as well as standard and optional features which do not always have to be present in individual cases.

Siemens reserves the right to modify the design, packaging, specifications and options described herein without prior notice. Please contact your local Siemens sales representative for the most current information.

Note: Any technical data contained in this document may vary within defined tolerances. Original images always lose a certain amount of detail when reproduced.

The statements contained herein are based on the actual experience of Siemens customers. Siemens maintains data on file to support these claims. However, these statements do not suggest or constitute a warranty that all product experience will yield similar results. Results may vary, based on the particular circumstances of individual sites and users.

Not for distribution in the U.S.

Siemens Healthcare Headquarters

Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen
Germany
Phone: +49 9131 84 0
siemens.com/healthcare

Legal Manufacturer

Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen
Germany