The Most Popular CT in the World*

SOMATOM Emotion

Datasheet for 6-slice configuration
syngo CT 2009E

Answers for life.

SIEMENS

* Based on the number of systems sold worldwide.

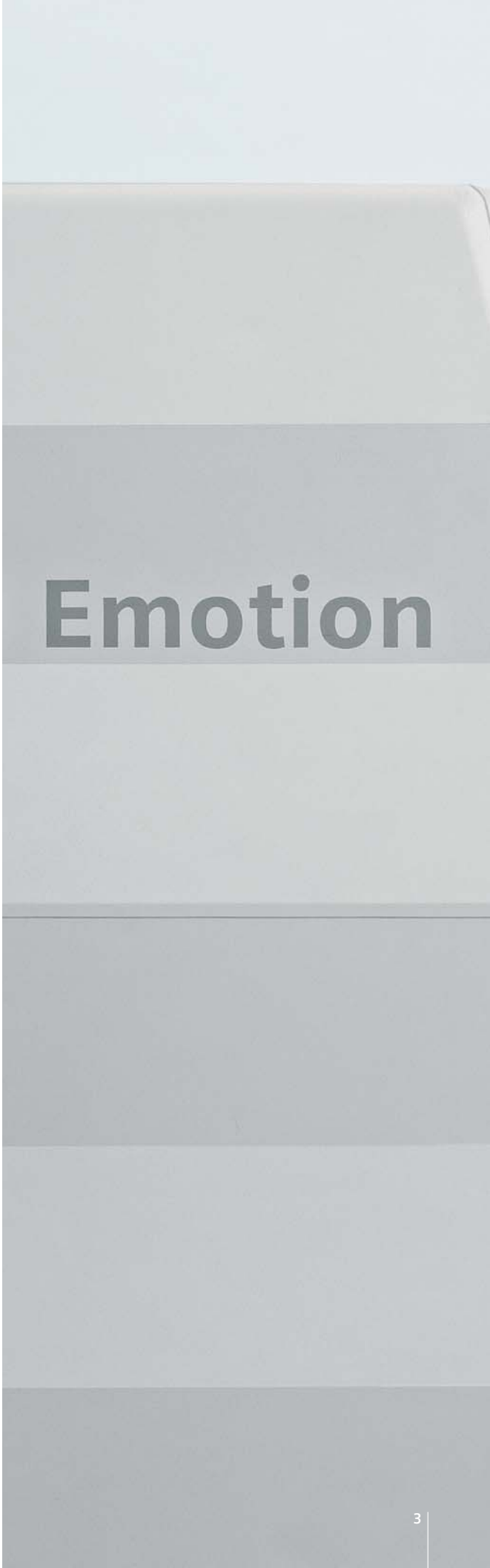
SOMATOM

SOMATOM Emotion

Over 6,500 Emotion systems sold worldwide: The most Popular CT in the World

Sales for the SOMATOM® Emotion CT system have now exceeded 6,500 worldwide making it the world's most popular CT system*. The SOMATOM Emotion has achieved this outstanding success through a combination of an extremely efficient system, leading-edge clinical applications, and Siemens' continued focus on system uptime. This combination offers our customers enhanced clinical capabilities that translate into better clinical outcomes and greater financial success. The success of this philosophy is easily recognized with over 6,500 satisfied and knowledgeable customers worldwide.

We are now continuing this unparalleled success story in an increasingly competitive and rapidly changing healthcare market. While patients continue to expect higher diagnostic accuracy, healthcare institutions and physicians are being forced to reduce time to diagnosis and unnecessary hospitalization. To meet these and tomorrow's demands for higher quality and cost-efficient healthcare, we have developed the new SOMATOM Emotion. With the Emotion 6-slice configuration, CT scanning has never seen a system reaching this level of efficiency. You can expect, and will receive, high-end imaging performance from an unbelievably compact and efficient scanner that can continuously protect your investment and maximize your returns. If you are a radiologist, technologist, or financial administrator, you will enjoy knowing that you own the world's most popular CT scanner*.



* Based on the number of systems sold worldwide

SOMATOM Emotion – Standard Configuration

System Hardware	
0.8 s rotation time	•
Multislice UFC™ (Ultra Fast Ceramic) Detector	•
5.0 MHU liquid bearing X-ray tube	•
40 kW generator	•
CT patient table (200 kg/440 lbs table load)	•

Workplaces	
syngo® Acquisition Workplace	•
19" (48 cm) flat screen monitor	•
DVD Storage	•
CD Storage	•

CARE Applications	
CARE Filter	•
CARE Topo	•
CARE Dose4D™	•

System Software	
syngo Examination	•
syngo Viewing	•
syngo Filming	•
syngo Archiving & Network	•
syngo Service Solutions	•
Image Filter	•
SureView™	•
SOMATOM LifeNet	•
Video Capture and Editing Tool	•
Scan Protocol Assistant	•

Applications	
Real-time MPR	•
syngo 3D SSD (Surface Shaded Display)	•
syngo Volume Calculation	•
syngo VRT (Volume Rendering Technique)	•
CT-Angiography	•
syngo Dynamic Evaluation	•
Automated bone removal	•

• Standard feature

SOMATOM Emotion – Options

System Hardware	
0.6 s rotation time	◦
50 kW power generator	◦
Additional 19″ (48 cm) flat screen monitor	◦
Dual 19″ (48 cm) flat screen monitor	◦
Radiation Treatment Planning Enhancement	◦

Workplaces	
syngo CT Workplace	◦
syngo MultiModality Workplace	◦
syngo WebSpace	◦
Additional 19″ (48 cm) flat screen monitor	◦
Dual 19″ (48 cm) flat screen monitor	◦
2 GB Enhanced Graphics Card	◦
4 GB Enhanced Graphics Card	◦

CARE Applications	
CARE Contrast CT	◦
CARE Bolus CT	◦
CARE Vision CT with HandCARE™	◦
ECG-pulsing (included in *syngo* HeartView CT)	◦

System software and applications on *syngo* Acquisition Workplace	
Extended FOV (Field of View)	◦
syngo Security Package	◦
Siemens Virus Protection	◦
e-Logbook	◦
syngo HeartView CT (including ECG-pulsing)	◦
syngo Calcium Scoring CT	◦
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 CT	◦
Respiratory Gating and Triggering CT	◦
Advanced Interventions	◦
WorkStream4D™ (3D-Recon)	◦
syngo Expert-i	◦
Virtual Simulation	◦

syngo applications for *syngo* MultiModality Workplace and *syngo* CT Workplace	
syngo VRT	◦
syngo InSpace4D™	◦
syngo InSpace4D AVA (Advanced Vessel Analysis)	◦
syngo InSpace4D EP	◦
syngo InSpace Parenchyma Analysis	◦
syngo Fly Through	◦
syngo Dental CT	◦
syngo Osteo CT	◦
syngo Pulmo CT	◦
syngo Circulation	◦
syngo Circulation Plaque Analysis	◦
syngo Circulation PE Detection Basic*	◦
syngo Circulation PE Detection**	◦
syngo Calcium Scoring CT	◦
syngo Volume Perfusion CT Neuro	◦
syngo Neuro DSA CT (Digital Subtraction Angiography)	◦
syngo Neuro PWM CT (Perfusion Weighted Map)	◦
syngo Volume Perfusion CT Body	◦
syngo Colonography CT	◦
syngo Colonography CT PEV (Polyp Enhanced Viewing)	◦
syngo LungCARE CT	◦
syngo LungCAD (Computer Assisted Detection)	◦
WorkStream4D (3D-Recon and Recon card CT Workplace) for *syngo* CT Workplace	◦
syngo Image Fusion CT	◦
syngo Expert-i	◦
syngo CT Oncology	◦
syngo Security Package	◦
e-Logbook for CTWP	◦

◦ Optional feature
* Only available in the USA
** Not commercially available in the USA

System Hardware

Gantry	
Aperture	70 cm
Gantry depth	68.4 cm (27“)
Distance scan plane to gantry cover	26.4 cm (10.4“)
Scan field	50 cm (70 cm reconstructed FOV available*)
Tilt	± 30°
Rotation time	0.6**, 0.8, 1.0, 1.5 s
Temporal resolution	down to 150 ms (*syngo* HeartView CT*)
Continuously rotating tube-detector unit with optimized geometry for high-resolution data acquisition across the entire scan field	
CT storage box in gantry allows easy access to standard CT accessories	

Data acquisition system	
Max. number of slices/rotation	6
Number of physical detector rows	16
Number of physical detector channels/slice	736
Number of detector elements	11,776
Total channels per slice	1,472
Number of projections	up to 1,875 (1/360°)
Sequence acquisition modes	6 x 1 mm, 6 x 2 mm, 6 x 3 mm, 2 x 5 mm
Spiral acquisition modes	6 x 0.5 mm, 1 x 1 mm, 6 x 1 mm, 6 x 2 mm, 6 x 3 mm
Speed and efficiency based on UFC (Ultra Fast Ceramic) Detector with ultra short afterglow	
Designed to effectively suppress scattered radiation	

* Optional

** Requires HeartView CT option or Emotion Power pack option

System Hardware

Tube assembly	
Tube	DURA 422MV High performance CT X-ray tube
Tube current range	20–240 mA, 20–345 mA with Power Package*
Tube voltage	80, 110, 130 kV
Tube anode heat storage capacity	5.0 MHU
Focal Spot size according to IEC 60 336	0.8 x 0.5 mm/7° 0.8 x 0.7 mm/7°
Computer controlled monitoring of anode temperature	
Multifan principle with Flying Focal Spot	

Three laser light markers
Coronal, sagittal, and axial laser light, that show the isocentric position of the scan plane. With RTP (Radiation Treatment Planning) Enhancement, the laser lights can be easily adjusted.**

CARE Filter	
Al equivalent	tube: 5.5 mm Al
Beam limiting device	collimator: 0.5 mm Al

Generator	
Max. power	40 kW, 50 kW with Power Package*

Patient table	
Max. table load	200 kg/440 lbs
Table feed speed	1–100 mm/s
Vertical table travel range	45–83 cm (at table top) (17.7–32.7")
Vertical travel speed	≤ 22.4 mm/s
Scannable range	153 cm (60")
Distance between gantry front and table base	37 cm (14.5")

Patient breath-hold time indicator
Patient-friendly display at the back of the gantry for indication of the remaining breath-hold time

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

* Optional
** Optional for RTP

syngo Workplaces

syngo Acquisition Workplace

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.

High-performance computer

XEON QC6700 2.66GHz

Graphics accelerator

Core2 Quad Core Q9400 for fast 3D postprocessing

Standard monitor

19" (48 cm) flat screen monitor
1,280 x 1,024 resolution
1,024 x 1,024 image display matrix
0.29 mm pixel size

Additional monitor*

19" (48 cm) flat screen monitor
Replication of primary monitor at remote location
Distance from host up to 30 m

Dual monitor*

19" (48 cm) flat screen monitor
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

RAM storage

4 GB

Image storage

146 GB; 260,000 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 devices for image data.

DICOM viewer

Included on each CD/DVD; automatically started on the viewer's PC

* Optional

syngo Workplaces

syngo CT Workplace*

The *syngo* CT Workplace is a dedicated CT processing workplace that provides instant access to image and scan data via a shared database with the *syngo* Acquisition Workplace. With access to our comprehensive portfolio of CT clinical applications, the *syngo* CT Workplace can be customized to further enhance clinical performance.

High-performance computer

2 x Xeon 3.0 GHz processor

Graphics accelerator

NVIDIA Quadro FX 3500 for fast 3D postprocessing

Enhanced graphics card* additionally accelerates applications

Standard monitor

19" (48 cm) flat screen monitor

1,280 x 1,024 resolution

1,024 x 1,024 image display matrix

0.29 mm pixel size

Dual monitor*

19" (48 cm) flat screen monitor

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

RAM storage

8 GB

Image storage

Shared database with *syngo* Acquisition Workplace

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 devices for image data.

DICOM viewer

Included on each CD/DVD; automatically started on the viewer's PC

* Optional

syngo Workplaces

syngo MultiModality Workplace*

syngo MultiModality Workplace provides the unique advantage of an efficient multi-modality diagnostic workflow at a single workplace. Based on the unique *syngo* platform, it manages the clinical diagnostic workflow anywhere within the clinical environment. With the *syngo* MultiModality Workplace radiologists and clinicians benefit from access to our comprehensive *syngo* applications for Computed Tomography, Magnetic Resonance, PET and SPECT imaging, Angiography, and Radiation Therapy Planning.

High-performance computer

2 x Dual Core Intel Xeon 2.83 GHz processor

Graphics accelerator

NVIDIA Quadro FX 5600 for fast 3D postprocessing

Enhanced graphics card* additionally accelerates applications

Optional 2 GB and 4 GB enhanced graphics card

Standard monitor

19" (48 cm) flat screen monitor

1,280 x 1,024 resolution

1,024 x 1,024 image display matrix

0.29 mm pixel size

Dual monitor*

19" (48 cm) flat screen monitor

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

RAM storage

6 GB – 8 GB

Disc expansion

For increased capacity and performance*
(add. 300 GB for image data)

Image storage

147 GB; 260,000 uncompressed images

Additional storage

CD-R	700 MB 1,100 images
DVD DICOM drive	4.7 GB DVD media 8,0 00 images Write-RW/+RW/-DL/Read

DICOM viewer

Included on each CD; automatically started on the viewer's PC

* Optional

syngo CT.3D

***syngo* CT.3D (on *syngo* CT Workplace)**	◦
syngo CT Workplace	
19″ (48 cm) flat screen monitor	
2 GB Enhanced Graphics Card	◦
syngo 3D Basic	
syngo VRT	◦
syngo Fly Through	
syngo InSpace4D	◦
syngo Volume Calculation	
syngo Dynamic Evaluation	
syngo Expert-i	◦
WorkStream4D (3D-Recon and Recon Card CT Workplace)	

***syngo* CT.3D (on *syngo* MultiModality Workplace)**	◦
syngo MultiModality Workplace	
19″ (48 cm) flat screen monitor	
2 GB Enhanced Graphics Card	◦
syngo 3D Basic	
syngo VRT	◦
syngo Fly Through	
syngo InSpace4D	◦
syngo Volume Calculation	
syngo Dynamic Evaluation	
syngo Expert-i	◦

CT Engines

CT Neuro Engine Routine*	◦
syngo Volume Perfusion CT Neuro	
Auto-preprocessing DSA CT	
syngo Neuro PWM	

CT Neuro Engine Pro*	◦
syngo Volume Perfusion CT Neuro	

CT Oncology Engine Routine*	◦
syngo CT Oncology (excl. *syngo* LungCAD)	
syngo Colonography CT	
Virtual Dissection	
syngo CT Prefetching	

CT Oncology Engine Pro*	◦
syngo Colonography CT PEV	
syngo LungCAD for *syngo* CT Oncology	
syngo Image Fusion CT	

◦ Optional feature
* *syngo* software feature of CT Clinical Engines available within *syngo* MultiModality Workplace

syngo WebSpace and e-Tune

syngo WebSpace*

syngo WebSpace is a state-of-the-art thin-client-server solution. It is the gateway to real-time access to thin-slice CT data, and cutting-edge 3D and 4D tools based on *syngo* InSpace4D software solution – enterprise-wide and beyond. The proprietary Fast Data Link between the SOMATOM Emotion and *syngo* WebSpace provides virtually instantaneous availability of the reconstructed thin slices. Above that, *syngo* WebSpace can easily be integrated in your PACS environment. With a single mouse click the current case immediately opens in 3D on your PACS workstation**. All 3D rendering takes place on the central *syngo* WebSpace server, so that even the largest CTA and cardiac studies can be reviewed from any client computer** in the network with astonishing speed.

Server hardware

syngo WebSpace runs on standard, commercially available server hardware and is released for the hardware configuration which is available from Siemens

Client software

To be downloaded from *syngo* WebSpace server and installed on the client computer. Client software requires approximately 100 MB of free disk space for installation.

Minimum requirements for client computer

PC or Laptop computer, Windows™ 2000; XP
1 GHz processor and up to 16 GB RAM
Graphics card according to the standard Open GL 1.2 or higher

Network requirements

Local area network:	100 MBit/s (minimum), 1 GBit/s (recommended)
Remote access:	2 MBit/s (minimum), 6 MBit/s (recommended)

Configuration

	Trend	Expert	Department	Clinic
Concurrent sessions	3	5	10	20
Slices per user (max.)	5,000	5,000	5,000	5,000
Slices total (max.)	5,000	5,000	10,000	20,000
RAM	12 GB	12 GB	12 GB	16 GB
Volume rendering devices	1 x VolPro 4 GB	1 x VolPro 4 GB	2 x VolPro 4 GB	4 x VolPro 4 GB

e-Tune*

For maximum investment protection, Siemens offers e-Tune as an option for the *syngo* WebSpace service contract. e-Tune is a dedicated program for *syngo* WebSpace, which contains maintenance, updates, and upgrades to the latest available software version. This range of services makes *syngo* WebSpace a complete and future-proof solution – just as you would expect from a partner like Siemens.

* Optional
** Client computer must meet minimum specifications

CARE Applications

UFC Detector

Up to 30 % dose reduction compared to conventional CT detectors

High efficiency for low mAs requirements enable best possible image quality with low patient dose

Ultra short afterglow. Specially developed for sub-second and multislice applications.

SureView – Multislice Spiral Image Reconstruction

Brilliant image quality and dose savings up to 20 % in spiral mode

CARE Filter

Specially designed X-ray exposure filter installed at the tube collimator. Up to 25 % dose reduction with increased image quality.

Pediatric protocols

Special clinical protocols with 80 or 110 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 Topo

Real-time topogram

Manual interruption possible once desired anatomy has been imaged

CARE Dose4D – minimizing dose, maximizing quality – patient by patient

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 with up to 68 % dose reduction

ECG-pulsing****

Dose modulated cardiac spiral for dose reduction during the systolic heart phase (part of the *syngo* HeartView CT* package with retrospective ECG-gating). Up to 50 % dose savings for the patient.

CARE Bolus CT*

Scan mode for contrast bolus triggered data acquisition

Significant improvement of the planning procedure and diagnosis 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 a ROI (Region of Interest)

* Optional

** Requires *syngo* HeartView CT option

CARE Applications

CARE Vision CT* with HandCARE
Perform interventions with real-time image guidance, including CT fluoroscopic mode. Single slice or simultaneous display of 3 slices for optimal navigation with two alternate display methods: A) 256 x 256, 1024 x 1024, 256 x 256 B) 512 x 512, 512 x 512, 512 x 512
Head and feet label for easy orientation adaptable to physician's position
Auto-move table to displayed image position
User configurable dose and windowing display
Switch between continuous and incremental table movement with user configurable increment
Automatic table positioning via buttons or joystick with auto-stop function
Includes Real-time image guidance: Image rate up to 10 frames/s Image matrix 512 x 512 Configurable saving of images
Foot switch. Radiation release directly at the gantry.
Additional monitor. For parallel image display in the examination room.
Flat screen 19" (48 cm) monitor
Distance from host max. 30 m
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. HandCARE yields dose savings of up to 70 % for the physician and up to 30 % for the patient.

Basic Intervention*
For non-fluoroscopic CT intervention
Biopsy mode with user configurable dose and windowing display
Switch between continuous and incremental table movement with user configurable increment
Automatic table positioning via buttons or joystick with auto-stop function
3 image display
Zoom and pan functionality
Head and feet label for easy orientation adaptable to physician's position
Auto-move table to displayed image position

Advanced Intervention*
For fluoroscopic CT intervention
Basic intervention with CARE Vision and HandCARE

* Optional

System Software

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)

Patient information from HIS/RIS via DICOM Get Worklist

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

Protocols

Up to 10,000 protocols can be edited, modified, and stored

Scan Protocol Assistant for fast and easy protocol adjustment

Patient communication

Integrated patient intercom

Automatic Patient Instruction (API)
- Freely recordable
- 30 API text pairs
- Presets in twelve languages available

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 control panels

For convenient patient positioning (e.g. in case of trauma or interventional exams)

Gantry tilt control from the operator's console

Synchronized scanning and contrast injection*

CARE Contrast facilitates enhanced CT examinations through the hardware and software integration of CT scanner and injector

Topogram

Length	128–1,500 mm (5–59″)
Scan times	1.5–15.8 s
Views	a.p., p.a., lateral
Real-time topogram	
Manual interruption possible once desired anatomy has been imaged	

Sequence Acquisition

Reconstructed slice widths	1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 9.0, 10.0, 12.0, 18.0 mm
Scan times full scan (360°)	0.6*, 0.8, 1.0, 1.5 s (± 5 %)
Partial scan times (240°)	0.4*, 0.53 s (± 5 %)
No. of uninterrupted scans per range	99
No. of ranges in autorange	8
Standard scan cycle time	2.1 s (± 10 %) at 0.6 s scan time* 2.4 s (± 10 %) at 0.8 s scan time
Acquisition with or without table feed	
Automatic clustering of scans	

Dynamic Multiscan

Multiple (continuous) sequence scanning without table movement for fast dynamic contrast studies

Dynamic scan cycle time	0.9 s (± 10 %) at 0.6 s scan time* 1.2 s (± 10 %) at 0.8 s scan time

* Optional

** Requires *syngo* HeartView CT option

System Software

Multislice Spiral Acquisition	
Reconstructed slice widths	0.63, 0.75, 1.0, 1.25, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0 mm
Scan times full scan (360°)	0.6*, 0.8, 1.0, 1.5 s
Reconstruction increment	0.1–10 mm
Pitch factor	0.4–1.8
Spiral scan time max.	100 s
Scan length	max. 150 cm (59")

Extended Field of View*

Special image reconstruction algorithms that provide visualization of objects using a FOV up to 70 cm**

Scan protocol assistant

Easy and intuitive way to change and manage scan protocols

Auto Field of View Adaptation

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

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.

* Optional

** 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

System Software

Image reconstruction	
Real-time display	Real-time image display (512 x 512) during spiral acquisition
Slice thickness	0.63–18.0 mm
Scan field	50 cm (70 cm*)
Recon field	5–50 cm, 5–70 cm with extended FOV**
Standard recon time	up to 8 images/s
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 selection and/or retrospective reconstruction for spiral scans	
Real-time image display in 512 x 512 matrix parallel to spiral acquisition (e.g. for trauma)	

CINE display	
Display of image sequences	
Automatic or interactive with mouse control	
Max. image rate	30 frames/s

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

Filming
Digital film documentation; connection to 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

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

Raw data	
Drive size	365 GB
Capacity	5,300 scan-seconds
External USB 2.0 disks for quick and easy raw data storage are supported	

* Optional

** Optional, reconstruction area outside the standard 50 cm FOV is for visualization purposes only and is not of diagnostic image quality

System Software

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

syngo Dynamic Evaluation

Evaluation of contrast enhancement in organs and tissues

Calculation of
- Time-density curves (up to 5 ROI's)
- Peak-enhancement images
- Time-to-peak images

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.

2D postprocessing

Image zoom and pan

Image manipulations
- Averaging, subtraction
- Reversal of gray-scale values
- Mirroring

Advanced image algorithms
- Low Contrast Enhancement for improving low contrast detectability
- High Contrast Enhancement for increased sharpness of high contrast structures
- Advanced Smoothing Algorithm edge preserving and smoothing filter, dedicated to cardiac exams

WorkStream4D*

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

Elimination of manual reconstruction steps

Reduction of data volume up to a factor of 10, since virtually all diagnostic information is captured in 3D slices

syngo Security Package*

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

Siemens Virus Protection*

Offers top-level defense in safeguarding CT systems against viruses

syngo Expert-i*

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

* Optional

Image Quality

Low-contrast resolution	
Low-contrast resolution is the ability to see • a small object (mm) • with a certain contrast difference (HU) • on a particular phantom (Ø) • at a certain mAs value (mAs) • with a particular patient dose (mGy)	
Phantom	**CATPHAN (16 cm)**
Object size	3 mm
Contrast difference	3 HU
Dose at the surface	19.2 mGy* at 100 mAs
Technique	1.0 s, 0.8 s, 10 mm, 130 kV
Phantom	**CATPHAN (20 cm)**
Object size	5 mm
Contrast difference	3 HU
Dose at the surface	14.2 mGy* at 90 mAs
Technique	1.0 s, 0.8 s, 10 mm, 130 kV

High-contrast resolution	
0 % MTF (± 10 %)	17.5 lp/cm, 0.29 mm
2 % MTF (± 10 %)	15.1 lp/cm, 0.32 mm
10 % MTF (± 10 %)	13.6 lp/cm, 0.37 mm
50 % MTF (± 10 %)	10.0 lp/cm, 0.50 mm
Technique	Tungsten wire in air 160 mAs, 130 kV, 0.8 s, 1.0 mm

Homogeneity	
Cross-field uniformity in a 20 cm water phantom	max. ± 4 HU typ. ± 2 HU
Phantom positioned near center of rotation	

Dose, $CTDI_{100}$ values mGy/100 mAs			
Phantom Ø		110 kV	130 kV
16 cm	A	13.3	20.1
	B	13.6	20.3
32 cm	A	3.9	6.2
	B	7.6	11.6
A: at center	B: 1 cm below surface		
Technique	PMMA-Phantom Absorbed dose for reference material air Max. deviation ± 30 % Expected deviation 20 % Slice 1 x 10		

* Air KERMA, measured on the surface of the phantom with max. deviation ± 30 %

Applications

Real-time MPR*

Real-time multiplanar reformatting of secondary views

Variable slice thickness (MPR thick, MPR thin) and distance with configurable default values

Viewing perspectives
- Sagittal
- Coronal
- Oblique
- Double oblique
- Freehand (curvilinear)

syngo 3D SSD (Surface Shaded Display)

Three-dimensional display of surfaces with different density values
- Soft tissue
- Bone
- Contrast-enhanced vessels

syngo Volume Calculation

Measurements of various tissues and organs with HU-based region growth algorithms and interactive ROI definition

syngo VRT (Volume Rendering Technique)

Advanced 3D application package for the optimal display and differentiation of different organs through independent control of color, opacity, and shading in up to 4 tissue classes

CT-Angiography

MIP: Maximum Intensity Projection

MinIP: Minimum Intensity Projection

Thin MIP function for projection within a small slab to focus on particular vascular structure

Evaluation of spiral images and display of vessels, vascular anomalies, aneurysms, plaques, and stenoses

Automated Bone Removal

Simplified workflow

Fast accurate presentation of subtracted CTA data sets

syngo CT Oncology*

Fast-track routine diagnostic oncology, staging, and follow-up. It provides a range of fully automated tools specifically designed to support physicians in the detection, segmentation, and evaluation of suspicious lesions including dedicated tools for lung, liver, and lymph node assessment. It also offers a fully automated follow-up protocol and features LungCAD (Computer Assisted Detection). *syngo* CT Oncology also facilitates functional imaging offering fusion of PET with CT data.

syngo InSpace4D* – real-time interactive evaluation, in space and time

One-click bone removal

One-click table removal

Automated segmentation and removal of bony structures for vascular analysis

4D evaluation of the beating heart with full resolution

Real-time navigation through moving anatomy in user selectable arbitrary planes

High performance volume reading for physician's diagnosis and pre-surgical planning in daily clinical routine

syngo Fly Through*

Virtual Endoscopy software enabling visualization of vessels, airways, and the intestines

syngo Dental CT*

Reformatting of panoramic slices and paraxial sections through the lower and upper jaw for analysis in connection with implantation surgery

syngo Osteo CT*

Non-invasive measurement of the bone mineral density of the lumbar spine to help early diagnosis of osteopenia and osteoporosis, and to assess the effectiveness of treatment

Osteo CT measurements are standardized to the ESP Phantom (ESP: European Spine Phantom)

Includes table mat and reference Phantom for Osteo CT studies

* Optional

Applications

syngo Pulmo CT*

Quantitatively evaluates lung density and structure to help early diagnosis and treatment of lung disease and surgical intervention planning

syngo HeartView CT*

ECG-synchronized volume acquisition using prospective ECG triggered or retrospective ECG-gating mode

Basis for 3D cardiac reconstructions, e.g. CT-Angiography of the coronary vessels and Calcium Scoring

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

The ECG signal used for scanning and image reconstruction is acquired by an integrated ECG device. The ECG signal is displayed on the gantry front cover.

ECG-gated, multi-phase 4D reconstruction in up to 24-phases enabling dynamic evaluation of the heart and thoracic anatomy

syngo Circulation*

Fully automated cardiac evaluation

Automatic quantification of stenoses

One-click heart isolation

One-click coronary segmentation

Full evaluation of left-ventricular function

syngo Plaque Analysis*

Manual definition of HU values for three components (calcified, intermediate, low)

Automatic plaque volume definition

Color coding of plaque components

Automatic histogram

Fully integrated in *syngo* Circulation

syngo Circulation PE Detection**

Automated off-line detection of pulmonary emboli

syngo Circulation integrated reporting of occlusion grade, location, and PE relevant cardiac measurements

syngo Circulation PE Detection Basic***

Intuitive pulmonary artery evaluation tool with integrated reporting functionality

syngo InSpace4D AVA (Advanced Vessel Analysis)*

Optional plug-in for *syngo* InSpace4D

Dedicated *syngo*-based application for analysis of vessel lesions

Automatic vessel segmentation plus accurate quantification of vascular lesions. Compatible with CT and MR datasets.

syngo InSpace4D EP*

Enables “one-click” segmentation and endoscopic view of the left atrium based on CT and MR scans – planning of Afib procedures in 3D

syngo Calcium Scoring CT*

Displays the quantity and distribution of coronary calcification for the diagnosis and treatment of cardiac disease

Calibration for mass score calculation depending on patient size

syngo Volume Perfusion CT Neuro*

Evaluates dynamic CT data of the brain. Used for the early differential diagnosis of acute ischemic stroke. Additionally, it allows imaging of blood brain barrier disruptions in brain tumors.

syngo Neuro DSA CT (Digital Subtraction Angiography)*

The fully automated bone removal, facilitates optimal visualization and evaluation of complex intracranial vascular structures and helps to delineate aneurysms and other vascular diseases

syngo Neuro PWM (Perfusion Weighted Map)*

3D calculation of colored perfusion weighted maps from standard CTA images of the brain. Enhances 3D visualization of severely ischemic areas in acute stroke.

* Optional
** Not commercially available in the USA
*** Only available for the USA

Applications

syngo Colonography CT*

For non-invasive visualization and quantitative evaluation of colon polyps

Enables real-time virtual 3D endoluminal viewing

syngo Colonography CT PEV (Polyp Enhanced Viewing)*

Computer-assisted identification of polyps with virtual second reader support

syngo LungCARE CT*

Software for fast 3D-based visualization and quantitative evaluation of lung nodules, with lowest possible radiation dose. Includes fully automated follow-up.

syngo LungCAD (Computer Assisted Detection)*

Provides computer supported identification of lung nodules. Functions as a second reader opinion.

syngo Volume Perfusion CT Body*

For functional analysis of organs and tumors. Useful for interventional procedures and radiation therapy monitoring and planning.

syngo Image Fusion CT*

Registration and composite display of CT, MR, NM, and PET images. Provides for optimal physician's diagnosis by fusion of morphological data with functional information.

RTP Enhancement*

Hardware and software components to optimize the RTP process

Respiratory Gating and Triggering CT*

Hardware and software components that allow for the capture and storage of a patient's respiratory signal data during a spiral (for gated reconstruction) or triggered sequence acquisition

Respiratory data is synchronized with the CT acquisition data

The user can select the image reconstruction points (based on respiratory cycle amplitude)

Preselection of up to 8 phases for respiratorily gated reconstruction

Organ motion artifacts caused by respiration are minimized or eliminated and better accuracy is obtained regarding organ position, size, and volume

Selection of image reconstruction points based on respiratory cycle amplitude and respiratory phase respectively

e-Logbook for AWP and CTWP*

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

- View
- Archive
- Print
- Export

syngo Expert-i*

Enables the physician to interact with the _syngo_ CT Workplace or _syngo_ MultiModality Workplace from virtually anywhere in your hospital

* Optional

Installation

Dimensions	Height (mm/inch)	Width (mm/inch)	Length (mm/inch)	Weight (kg/lbs)
Components				
Gantry	≤ 1,820 / 71.7	≤ 690 / 27.2	≤ 2,300 / 90.6	≤ 1,200 / 2,640
Patient table	≤ 940 / 37.0	≤ 680 / 26.7	≤ 2,230 / 87.8	≤ 400 / 880
Operator's console*	≤ 730 / 28.7	≤ 800 / 31.5	≤ 1,200 / 47.2	≤ 60 / 132
UPS	≤ 440 / 17.3	≤ 135 / 5.3	≤ 490 / 19.3	≤ 40 / 88
Line Connection Box (LCB)	≤ 820 / 32.3	≤ 350 / 13.7	≤ 750 / 29.5	≤ 110 / 242
Image reconstruction system	≤ 450 / 17.7	≤ 220 / 8.7	≤ 620 / 24.4	≤ 30 / 66
***syngo* Workplaces**				
syngo Acquisition Workplace	≤ 500 / 19.7	≤ 250 / 9.8	≤ 650 / 25.6	≤ 30 / 66
syngo CT Workplace*	≤ 500 / 19.7	≤ 250 / 9.8	≤ 650 / 25.6	≤ 30 / 66
syngo MultiModality Workplace*	≤ 500 / 19.7	≤ 250 / 9.8	≤ 650 / 25.6	≤ 30 / 66
syngo* WebSpace				
syngo WebSpace Server	≤ 508 / 20.0	≤ 282 / 11.1	≤ 732 / 28.8	≤ 70 / 154

Power supply	
Nominal voltage ± 10 %	380–480 V
Nominal line frequency ± 10 %	50; 60 Hz
Max. power consumption	≤ 70 kVA
Power consumption	≤ 3.7 kW standby
Mean power consumption	≤ 7.0 kW scanning

Protection against input power instability	
X-ray	10 ms
Controllers	300 ms
syngo Acquisition Workplace and *syngo* CT Workplace	3 min
Frequency stability	± 5 % 50; 60 Hz

Electromagnetic compatibility
This product is in compliance with IEC 60601-1-2 and fulfills CISPR 11 Class A

Examination room environment	
Temperature range	18–30 °C
Relative air humidity without condensation	20–85 %
Heat dissipation (Gantry)	≤ 6.8 kW scanning ≤ 2.5 kW standby
Heat dissipation (Computer)	≤ 1.3 kW

Surface area for installation	
Minimum installation space for the complete system**	18 m^2 / 194 ft^2

* Optional

** Full performance in terms of gantry tilt and scannable range, depending on the adjustable scan range and safety distances according to country-specific requirements

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