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Item Description

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SOMATOM Definition Edge

The SOMATOM Definition Edge is based on the revolutionary Stellar Detector, the first fully-integrated detector. Designed to minimize electronic noise using Siemens' innovative TrueSignal Technology, it significantly improves the signal-to-noise-ratio (SNR). This enables the unique Edge Technology. It allows the generation of ultra-thin slices of 0.5 mm facilitating a spatial resolution of 0.30 mm. This new level of spatial resolution in clinical routine that can visualize previously unseen details without an increase in dose, for example to allow more accurate stenosis and stent analysis. Additionally, the Stellar Detector with TrueSignal Technology is the perfect match for Siemens' comprehensive ultra-low-dose imaging portfolio. With its improved SNR, the Stellar Detector can handle low signals much more efficiently, thus delivering more diagnostic quality with less patient radiation. With the Stellar Detector, the SOMATOM Definition Edge Dual Energy finally becomes truly suitable for Single Source CT. The novel design of the Stellar Detector with TrueSignal Technology provides HiDynamics, an extended dynamic range that improves the image detail level especially at low kV datasets. With this and the first dose-optimized Single Source Dual Energy scan mode, the SOMATOM Definition Edge allows adding tissue characterization to morphology. With these unrivaled features, the SOMATOM Definition Edge enters new frontiers in medical imaging, making it the Reference in Single Source CT.

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FAST CARE Platform

Siemens' unique FAST CARE platform is set to raise the standard of patient-centric productivity. Utilizing FAST - Fully Assisting Scanner Technologies - typically time-consuming and complex procedures during the scan process are extremely simplified and automated, not only improving workflow efficiency, but optimizing the clinical outcome by creating reproducible results, making diagnosis more reliable and reducing patient burden through streamlined examinations. Siemens' desire for as little radiation exposure as possible lies at the heart of the CARE - Combined Applications to Reduce Exposure - research and development philosophy offering a unique portfolio of dose saving features, many of them being introduced as industry's first.

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CARE Child

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

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FAST Planning #AWP

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

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DoseMAP

DoseMAP - Siemens CT Dose Management Program - creates transparency in dose values and makes it possible to assess the dose situation. It improves security by setting dose alerts.

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	DoseMAP has three components for complete and comprehensive dose management: Report, Analyze, and Protect.
1	WorkStream 4D #AWP WorkStream 4D further enhances the already superb workflow of the SOMATOM Definition AS CT system by offering direct generation of sagittal, coronal, oblique or double-oblique reconstructed images directly from CT raw data as part of the CT protocol.
1	X-CARE Partial scanning to reduce direct X-ray exposure for the most dose-sensitive body regions, e.g. the breasts, thyroid gland or eye lens
1	FAST IRS Reconstruction computer for the preprocessing and reconstruction of the CT raw data. The reconstruction computer contains of a cluster of high-performance GPU boards performing the preprocessing and reconstruction of the CT data. The peak reconstruction performance is up to 60 frames/sec.
1	ADMIRE #AWP ADMIRE (Advanced Modeled Iterative REconstruction) is the next generation of Iterative Reconstruction. ADMIRE offers on the fly powerful dose reduction, excellent image quality and everyday suitability. Other unique qualities of ADMIRE are: Superb details, delineation and sharpness of organ borders Positive impact on the image quality Thick slice reconstruction allows for PACS-ready workflow Reader-ready reconstructions deliver the desired image impression on the fly Due to the computer power of the new Image Reconstruction System (IRS), ADMIRE has a potential to lower radiation, improve organ delineation and to offer a routine-ready performance.
1	iMAR #AWP The iMAR metal artifact reduction algorithm combines three successful approaches (beam hardening correction, normalized sinogram inpainting and frequency split). This allows to reduce metal artifacts caused by metal implants such as coils, metal screws and plates, dental fillings or implants. iMAR is compatible with extended FoV, the extended CT scale as well as the newest dose reduction feature. Along with the new algorithm comes the simple user interface of iMAR enabling easy reconstruction of clinical images with reduced metal artifacts.
1	Extended Field of View Software program with special reconstruction algorithms that allow for visualization of objects using a FoV up to 78 cm (non-diagnostic image quality). License to use software on a single unit.
1	z-UHR incl. UHR z-UHR/UHR functionality provides maximum system spatial resolution.
1	CT Replacement Definition Edge Conversion to Siemens SOMATOM Definition Edge.
1	Rear cover incl. gantry panels Rear Cover including gantry control panels with control functionality from the backside.
1	Cooling System Air SOMATOM Definition Edge air cooling for the dissipation of heat generated in the gantry.
1	Patient Table Def. Edge 2000mm Patient table to support up to 200cm scan range. Motor-driven table height adjustment from

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min. 49 cm to max. 92 cm, longitudinal movement of the tabletop 200 cm in increments of 0.5 mm, positioning accuracy +/- 0.25 mm from any direction. Horizontal scan range 200 cm. Table height can be controlled alternatively by means of foot switch (2 each on both sides of the patient table). In the case of emergency stop or power failure, the tabletop can also be moved manually in horizontal direction. Max. table load: 227 kg/500 lbs, Table feed speed: 1-200 mm/s, Distance between gantry front and table base 40 cm.

Positioning aids: Mattress protector, head-arm support (inclusive cushion), and non-tiltable head holders with positioning cushion set, patient restraining system for head fixation, restraining-strap set with body fixation strap that can be directly connected to the patient table top, headrest, table extension, knee-leg support.

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Physiological Monitoring Module

The Physiological Measurement Module allows to connect a 3 Channel ECG cable for ECG controlled cardiac acquisition.

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ECG Cable IEC2 #D

ECG cable, IEC2 (AHA/US color coding).

1

Mattress w. improved table protect.

This mattress is ideal for trauma and acute care settings. The mattress has wide flaps and offers additional protection by preventing liquids spilling into the table by covering the gaps between table top and the table base.

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Table Side Rails

Side rails enable the quick and easy attachment of additional accessories such as an infusion bottle holder and i-control intervention module to the standard patient table.

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Tiltable Head Holder

Tiltable Head Holder for the fixation of the patient's head. Tilt range between +30 till - 15 degree.

1

Adapt. 3D Intervent. Suite Wireless

The complete solution for 2D and 3D non fluoroscopic and 2D fluoroscopic minimal invasive volume interventions.

The Adaptive 3D Intervention Suite contains Adaptive 3D Intervention for 3D volume intervention.

Intervention Pro for spiral and sequential non- fluoroscopic interventional procedures and complete organ coverage with maximal flexibility and with minimal single click effort

i-Fluoro CT for CT allows for 2 dimensional interventional fluoroscopic procedures

i-Control CT supports interventional procedures as independent remote unit

Foot switch for radiation release (x-ray).

1

Dual 19" Monitor #D

Siemens proprietary syngo software visualizes the examination workflow in individual process steps on so-called task cards, such as the patient registration, examination, viewing or 3D task card. The dual monitor feature enables the split of the syngo task cards on two monitors in two different ways. This option includes the syngo dual monitor software and a second high resolution, flicker-free, 19-inch (48 cm) color flat panel display for medical diagnostic applications. This display provides a resolution of 1280 x 1024 and has a wide viewing angle, features high contrast even under high ambient light conditions. Display light output stability is ensured by controlled backlight throughout the whole lifetime.

Possibility one: One monitor displays the viewing task card, for instance for the interactive review of image data. All other syngo task cards are displayed on the second monitor.

Possibility two: Both monitors display the 3D-Basic task card, enabling the viewing and manipulation of two different datasets on two monitors. It enables the comparison of two series from the same patient e.g. pre- and post-contrast or the comparison of two studies from the same patient e.g. pre- and post-surgery.

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1	Dual Monitor Ceiling Support The dual monitor solution enables access to images and scan data while interacting with the patient in the scan room. The high resolution, flicker free, 19-inch (48 cm) color flat panel displays are mounted at the ceiling support.
1	Ceiling Support Base Ceiling support for the accommodation and safe installation of one or two flat screen monitors in the examination room.
1	19in Flat Screen Monitor The 19" monitor option supports CT interventions and CT fluoroscopy with a display in the examination room.
1	Large Cover f.Ceiling Support Base In case monitor ceiling support requires very large openings in the ceiling, the larger ceiling support cover can be used in order to cover the wider base or if the ceiling support base will be mounted at the concrete ceiling without intermediate ceiling.
1	Additional User Manual Additional user manual for the above selected CT system.
1	CT Project Management A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemens equipment. The assigned PM will work with the customer's facilities management, architect or building contractor to assist you in ensuring that your site is ready for installation. Your PM will provide initial and final drawings and will coordinate the scheduling of the equipment, installation, and rigging, as well as the initiation of on-site clinical education.
1	CT Standard Rigging and Installation This quotation includes standard rigging and installation of your CT new system. Standard rigging into a room with reasonable access, as determined by Siemens Project Management, during standard working hours (Mon. - Fri./ 8 a.m. to 5 p.m.) It remains the responsibility of the Customer to prepare the room in accordance with the SIEMENS planning documents. Any special rigging requirements (Crane, stairs, etc.) and/or special site requirements (e.g. removal of existing systems, etc.) is an incremental cost and the responsibility of the Customer. All other "out of scope" charges (not covered by the standard rigging and installation) will be identified during the site assessment and remain the responsibility of the Customer.
1	Initial onsite training 32 hrs Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	Initial onsite training 32 hrs GovOffset
1	Additional onsite training 32 hours Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist if applicable. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

Qty	Item Description
1	<p>Additional onsite training 32 hours</p> <p>Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist if applicable. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
4	<p>Govt. Training Class (T&L not included)</p> <p>Tuition for (1) government attendee to attend a Classroom Course of choice at one of the Siemens training centers. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p>Stellant D Dual Ceiling w/Certegra WS</p> <p>New Stellant D Dual Ceiling mounted with Certegra Workstation NO Informatics. Short ceiling post - 580 mm.</p> <p>Other ceiling post lengths are available (different part numbers): 850 mm and 1000 mm.</p> <p>Includes Stellant D, Dual Head, ceiling mounted injector; Certegra workstation; installation and warranty through Medrad.</p>
1	Low Contrast CT Phantom & Holder
1	Surge Protective Device (SPD)
1	<p>s.via CT bundle B (Identifier)</p> <p>CT system bundled with syngo.via</p>
1	<p>syngo.via CT Workplace SW</p> <p>syngo.via CT Workplace is designed for use with the SOMATOM CT scanner.</p> <p>This 3D visualization software is the perfect solution for a wide range of cases - from the routine to the challenging.</p> <p>syngo.via CT Workplace is available as a one user workstation configuration.</p>
1	<p>Workplace HW</p> <p>syngo.via Server-based Workstation HW, tower floorstand configuration.</p>
1	<p>HP Care Pack. 5y WS HW Support</p> <p>Prime HW Support for 5 years (for Workstation/Workplace HW ? ML30 Gen9)</p>
1	<p>EIZO MX241W Display</p> <p>The EIZO MX 242W is a color widescreen LCD monitor for diagnostic use and clinical review with a resolution of 1920 x 1200 pixels.</p>
1	<p>syngo.via CTWP Impl. Package</p> <p>This Implementation Package includes installation and integration services for a syngo.via Modality Workplace.</p> <ul style="list-style-type: none"> - This package includes professional services, such as: - Installation of the syngo.via software on the syngo.via Modality Workplace - syngo.via client installation on a validated Siemens scanner acquisition workplace (AWP) (if applicable) - Connection to up to 3 DICOM nodes including the modality scanner, the PACS - Configuration of basic syngo.via workflows and rules - Basic installation service for the syngo.via Modality Workplace hardware at the customer's site - Integration into the Local Area Network of the customer and to Siemens Remote Service

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	over internet connection
1	syngo.via local Impl. (Identifier) Identifier for professional services completely provided by locally organized resources.
1	Via Workstation Server HW Installation Basic installation of the syngo.via Workstation hardware with the operating system at the customer's site by the hardware supplier. Integration into the Local Area Network of the customer and to Siemens Remote Service over internet connection. Please check that the following information is included in the customer quote: correct and complete delivery location, customer's contact person for implementation planning. See also the questions in the Sales Checklist, which supports you in evaluation of the customer's requirements.
1	VIA Govt Server HW Install Per agreement, credit for syngo.via hardware installation by 3rd party integrator 14412656
1	Virtual Initial Consultation, syngo.via This virtual initial consultation session, up to 4 hrs in duration, is designed to define the clinical customization of syngo.via specific to radiology workflow. Through direct communication with a clinical education specialist, this session will identify and configure site-specific workflow and imaging storage and retrieval parameters. This educational offering must be conducted no more than 4 weeks before the scheduled system turnover event. This consultation session will be scheduled during standard business hours, Monday through Friday. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	Initial onsite training 16 hrs syngo.via Up to (16) hours of on-site clinical applications training on syngo.via basic navigation and modality specific clinical workflows, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4)users. Training will focus on the use of syngo.via in clinical routine and customization of systems based on workflow needs. This educational offering must be completed (12) months from turnover date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	Dual Monitor Ceiling Support The dual monitor solution enables access to images and scan data while interacting with the patient in the scan room. The high resolution, flicker free, 19-inch (48 cm) color flat panel displays are mounted at the ceiling support. The space-saving ceiling installation along with the large movement range of the support allow maximum operating convenience when positioning the monitor. 19" flat screen monitor (2x) The 19" monitors support CT interventions and CT fluoroscopy with a display in the examination room. Dual Monitor Ceiling Support The Dual Monitor Ceiling support consists of: video transmitter, video receiver, power supply cable and a 30 m fiber-optic cable set for connecting the flat screen monitors. Displays suitable for medical diagnostic applications (room class 1 and 2 acc. To DIN 6868-157). Ceiling Support Base Ceiling support for the accommodation and safe installation of one or two flat screen monitors in the examination room.
1	CT with syngo.via (identifier) CT with syngo.via (identifier)

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CT Cardio-Vascular Engine @via#1

The CT Cardio-Vascular Engine provides advanced scanning options together with disease oriented workflows. Both together allow for speed in routine examinations while at the same time offering powerful functions and ease of use for complex cases.

The Engine delivers excellent diagnostic output from risk or vascular assessment to accurate morphological and functional analysis while automatically integrating multi-modality information into the workflow for differential diagnosis.

Shortest time-to-report for highest efficiency: many time-consuming manual preparation steps are automatically performed. All the data is ready for immediate review when opening the case.

Scan modes

- HeartView CT including:
- ECG-Gated Spiral scanning for high and irregular heart rates
- Adaptive Cardio Sequence for moderate heart rates
- MinDose
- syngo CaScoring for quick risk assessment and coronary age calculation (for single user at Acquisition Workplace)

Software Modules:

- syngo.CT CaScoring for quick risk assessment and coronary age calculation
- syngo.CT Coronary Analysis for quantification of coronary stenosis / arteries
- syngo.CT Cardiac Function for left ventricular functional assessment
- syngo.CT Vascular Analysis for assessment / quantification of general vascular pathologies, such as stenosis and AAA.

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CT Cardio-Vasc. Engine Pro @via #1

The CT Cardio-Vascular Engine Pro extends the clinical capabilities of the functional assessment with the fully automated right ventricular assessment e.g. for cardiac impairment affecting the right ventricle.

Advanced evaluation tools for myocardial perfusion add an incremental value for a safer evaluation of the hemodynamic relevance of coronary stenosis

Its Autotracer function extends the automated Coronary-tree segmentation, labeling and curved planar reformation (CPR) to the major systemic blood vessels for a faster and safer vascular reading process and diagnosis.

Additional Software Modules:

- syngo.CT Cardiac Function - Enhancement for evaluation of ischemia from early or late enhanced images; and from dynamic myocardial perfusion data
- syngo.CT Cardiac Function - Right Ventricle for right ventricular functional assessment
- syngo.CT Vascular Analysis - Autotracer for automatic identification and anatomical labeling of major blood vessels
- syngo.CT Rapid Stent Planning for automatic completion of manufacturer-specific graft order forms

One complimentary biomedical tuition is included with the purchase of this system.

OPTIONS

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1	syngo Security Package Security package for general regulatory security rules

Detailed Technical Specifications

Description

The SOMATOM Definition Edge is founded on Siemens' revolutionary Stellar Detector and the unique STRATON X-ray tube with Siemens' z-Sharp Technology. In combination with FAST (Siemens' Fully Assisting Scanner Technologies and Combined Applications to Reduce Exposure) and CARE (Combined Applications to Reduce Exposure) solutions as well as Siemens exclusive CT Clinical Engines options, the SOMATOM Definition Edge offers unprecedented image quality and detail at significantly reduced patient exposure, as well as substantially increased diagnostic speed and confidence.

The STRATON source provides direct oil cooling of the anode, eliminating the need for heat storage capacity (equivalent of 50 MHU). The resulting small and compact design enables an unprecedented cooling rate of 7.3 MHU/min as well as reliable performance even when operating at a very high rotation time of up to 0.28 sec (optional). In combination with the HeartView CT option temporal resolution of 142 ms (optional) of the SOMATOM Definition Edge allows to reliably scan even high heart rates, e.g. in acute chest pain evaluation, in coronary visualization, and in functional analysis of the heart.

The 0.5 mm slices from the innovative Edge Technology of the SOMATOM Definition Edge together with the unique z-Sharp Technology deliver a spatial resolution of up to 0.30 mm without an increase in dose allowing the visualization of previously unseen details in clinical routine, whether the to allow highly accurate analysis of stenosis and stents or crucial small fractures in acute care. In addition, the z-UHR functionality enables industry's highest isotropic and scan field position independent spatial resolution of up to 0.24 mm voxel size, visualizing the smallest anatomical structures with exceptional quality, for example complex inner-ear bones Neuro head image quality is significantly improved with Neuro BestContrast, by optimizing grey/white matter differentiation without increase in radiation dose.

The Ultra Fast Ceramics (UFC) of the Stellar Detector in the SOMATOM Definition Edge acquire 128 slices of measured image data per rotation. Using the Edge Technology, the SOMATOM Definition Edge can facilitate 256 slices with 0.5 mm thickness per rotation for high-resolution imaging or generate up to 384 slices, per rotation depending on the chosen examination mode.

In combination with its 78 cm large bore, up to 200 cm scan range, and the 80 kW (100 kW optional) generator power, it adapts to virtually any patient independent of size or condition, helping to save precious time from scan to diagnosis to treatment. When doing interventional CT for example, the easy patient access enables fast positioning of interventional instruments and thus provides a larger and more comfortable sterile environment. Or for emergency room examinations, the large bore of the SOMATOM Definition Edge virtually eliminates the necessity to reposition and adjust life support equipment. Additionally, positioning and scanning of bariatric patients is significantly simplified while improving patients comfort.

With all this, the SOMATOM Definition Edge offers the unique combination of industry's highest image detail and industry's highest sub-millimeter volume coverage of up to 23 cm/sec enabling whole body examinations within a few seconds - adapting to challenging patients such as poly-trauma and unconscious or uncooperative patients, leading to an improvement in image quality and patient comfort.

Siemens has developed many significant products and protocols that follow the "As Low as Reasonably Achievable" (ALARA) principle to reduce radiation dose to the lowest possible level. This desire for as little radiation exposure as possible lies at the heart of our CARE – Combined Applications to Reduce Exposure - research and development philosophy. The SOMATOM Definition Edge consequently offers a unique portfolio of dose saving features; many of them being industry's first like the Adaptive Dose Shield, CARE kV or 70kV scan modes. Using Siemens' CARE solutions radiation dose can be significantly reduced compared to conventional CT systems.

With the introduction of Siemens' unique FAST CARE Technology, the SOMATOM Definition Edge raises patient-centric productivity. Utilizing FAST – Fully Assisting Scanner Technologies -, typically time-consuming and complex procedures during the scan process are extremely simplified and automated, not only improving workflow efficiency, but optimizing the overall clinical outcome by creating reproducible results, making diagnosis more

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reliable and reducing patient burden through streamlined examinations.

With its unique Adaptive 4D Spiral scan mode (optional) the SOMATOM Edge overcomes the coverage limitations in dynamic CT imaging when using a static detector and allows for up to 48 cm coverage in dynamic CT imaging.

In addition the SOMATOM Definition Edge optionally offers the 3D minimal invasive suite, enabling 3D guided interventions with full control of the radiologist due to wireless in-room control. Already included with the standard configuration of the scanner is 2D Basic Intervention, which enables sequential scans (i-Sequence) e.g. for CT-guided biopsy. Also included is HandCARE™, which reduces on-line radiation exposure to the user and the patient by switching the radiation off in the upper segment of the 360° tube-rotation. It switches off the x-ray exposure for a 100° angle between three user selectable positions (10:00, 12:00 and 2:00 o'clock).

Furthermore, the system also enables the user to acquire Dual Energy data and benefit from Dual Energy post processing. Also the SOMATOM Definition Edge offers the widest range of clinical applications options, which allow performing everything from fast and confident diagnoses to comprehensive reporting in only a matter of minutes, reviewing results before the patient is off the table.

1. Gantry:

Aperture: 78 cm; power supplied via low-voltage slip ring. Scanning system: Stellar Detector with Siemens' proprietary Ultra Fast Ceramics (UFC) with 47,104 elements, 128 detector electronic channels (DAS) utilized for up to 128 slices/rotation acquisition, and 1,472 measuring channels per slice (The measuring system can contain replacement components).

In cases of very low signal at the detector (e.g. when scanning bariatric patients), the TrueSignal Technology minimizes electronic noise of detector thus increasing the signal-to-noise-ratio (SNR) and allowing to make much more efficient use of low signals.

Three laser light markers: Horizontal, sagittal, and vertical laser light that shows the isocenter position of the scan plane.

2. Tube Assembly:

Source: STRATON high performance X-ray source. Tube current range: Single source 20- up to 800 mA; Tube anode heat storage capacity equivalent of 50 MHU. Cooling rate 7.3 MHU/min (5,400 kJ/min). Focal spot size according to IEC 60336: 0.7 x 0.7 mm/7°, 0.9 x 1.1 mm/7°. Computer controlled monitoring of anode temperature, Multifan principle with flying focal spot.

3. High Power X-ray Generator:

Microprocessor-controlled, low-noise high-frequency generator with integrated, automatic self-testing system for continuous monitoring of operation. Settings: High-voltage range 70, 80, 100, 120 and 140 kV; power max. 80 kW (100 kW optional), adjustable in fine steps.

4. z-Sharp Technology:

The unique STRATON X-ray source utilizes an electron beam that is accurately and rapidly deflected, creating two precise focal spots alternating 4,608 times per second. This doubles the X-ray projections reaching each detector element. The two overlapping projections result 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. Siemens' proprietary UFC (Ultra Fast Ceramic) of the Stellar Detector and the corresponding 128-slice detector electronics enable a virtually simultaneous readout of two projections for each detector element – resulting in a full 128-slice acquisition. z-Sharp Technology, utilizing the STRATON X-ray sources together with the Edge Technology of the Stellar Detector provide scan speed independent visualization of up to 0.30 mm spatial resolution and a corresponding elimination of spiral artifacts in the daily clinical routine at any position within the scan field.

5. Control and Evaluation Unit:

Control box: CT control with patient intercom, user-recordable patient instruction system, 30 automatic patient instruction (API) text pairs are available in nine languages.

syngo Acquisition Workplace: The *syngo* Acquisition Workplace provides an intelligent and reliable workflow for data acquisition, image reconstruction and routine post-processing at the CT scanner. Built on the unique *syngo* platform, the *syngo* Acquisition Workplace is intuitive and user friendly. Computer system: High-performance computer with one Xeon Quad Core HT, 2.53GHz, NVIDIA Quadro 2000 DVI graphics card for fast 3D post-processing. High resolution, flicker free, 19-inch (48 cm) color flat panel display for medical diagnostic applications combining the demanding requirements of medical imaging with the advantages of liquid crystal displays. This display provides a resolution of 1,280 x 1024 and has a wide viewing angle, features high contrast even under high

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ambient light conditions. Display light output stability is enabled by controlled backlight throughout the whole lifetime. Keyboard and mouse, 8 GB RAM, 2 x 136 GB image storage for 520,000 uncompressed images, CD-R 700 MB for 1,100 images. DVD DICOM with 4.7 GB media for 8,400 images. External USB 2.0 devices for data storage are supported (recommended: Iomega 160 GB External Hard Drive Hi-Speed USB 2.0; Maxtor One Touch 160 GB External Hard Drive).

6. Cooling System:

SOMATOM Definition Edge can be equipped with either air or water cooling adapting to your room requirements. This optimizes system availability independently of the ambient conditions and reduces expensive reconstruction costs. System operating temperature: 18-28°C, 18 - 75 % rel. humidity (not condensing).

7. syngo User Software:

syngo features an intuitive and thus easy-to-learn user interface developed from prototypes in close cooperation with users. *syngo* visualizes the examination in individual process steps on so-called task cards, such as patient registration or examination card. A large number of functions and input parameters as well as the language used can be selected according to individual requirements. Frequently repeated processes can be automated and saved.

Patient registration:

The system can accept patient data in different ways. These include entering the data via keyboard or transfer of a worklist via network. DICOM Worklist: Software module for accepting lists of patient data and exam requirements from a Radiology Information Systems (RIS) via DICOM Get Worklist functionality. The program enables very efficient working and enables consistent patient data. In emergency cases, fast registration is possible. Here the system automatically assigns an emergency number which can later be replaced by the actual patient number. The input profile can be designed individually.

Examination card:

The SOMATOM Definition Edge is delivered with a large number of predefined examination protocols (e.g. for pediatric applications), making examination planning a very fast and efficient procedure. Example: A three-phase examination of the liver available as independent protocol only needs to be adapted to the patient's individual situation. Each examination is represented pictorially as a so-called "chronicle", which views the individual phases of the examination separately. This has the advantage that the individual phases of the examination can be accessed quickly and selectively and changes to the protocol can be made easily in graphical mode via drag-and-drop using the mouse. With a so-called routine window, it is possible to adapt individual examination parameters, representing a submenu of the essential parameters and giving information at a glance about the parameterization of the examination.

Viewing card:

On the viewing card it is possible to move interactively with the mouse through the image volume of the ongoing examination. The images of different examinations can be displayed simultaneously for comparison. A large number of functions are available for evaluation, documentation and archiving.

Filming card:

A virtual film sheet shows a 1:1 display of the film sheets to be printed out, thus enabling an effective preview of filming jobs and rewinding of the images, as well as providing a large number of evaluation functions. Layout changes are possible interactively with up to 64 images. The printout parameters for the autofilming process running in parallel to acquisition or reconstruction are also defined with the filming card. Freely selectable positioning of images onto film sheet, configurable image text.

3D card:

Secondary reconstruction calculation: Real-time MPR for real-time reformatting of secondary reconstructions. Slice orientation: coronal, sagittal, oblique and double-oblique. Secondary reconstructions can be determined from the topogram, other MPR views or from a 3D surface reconstruction. Reconstruction with selectable slice thickness.

CT Angio: Software 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: Minimum Intensity Projection and Thin MIP available. Interfering or irrelevant parts of the image can be eliminated with the integrated volume editor. The angular projections are reconstructed around a definable axis, whereby the maximum CT values in this direction are selected for each angular projection. The resulting images can be viewed with the CINE function as a series of images with a 3D image effect.

3D Display: Software for the three-dimensional display of surfaces of a body region from a series of continuous slices, for display and analysis of complex anatomies, e.g. the visceral cranium, pelvis, hips, for the purpose of planning surgical interventions. The 3D objects can be tilted and rotated interactively on the monitor and can also

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be displayed in relation to multiplanar reconstruction (MPR).

Volume card: Volume scans of tissues and organs, based on a "region-growing" algorithm and interactive ROI definition.

DynEva card: Software for dynamic evaluation of the contrast enhancement in organs and types of tissues, enabling the reconstruction of

- Time-density curves (up to 5 ROIs)
- Peak-enhancement images
- Time-to-peak images.

Video Capture and Editing Tool: Software contains 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 is supported, e.g. AVI, Flash (SWF), GIF, QuickTime (MOV), streaming video.

Additional task cards available as an option.

8. Examination and Evaluation Functions:

Topogram: Scanning perspectives: a.p., p.a., lat.; length of scan field: 128 – up to 1,970mm (depending on table configuration), width of scan field: 512 mm, 1.5 – 16 s (optional 20 s). The topogram can be switched off manually when the desired examination length is reached.

Tomogram: Scan field size: 50 cm. Standard scan times: 0.28 (optional), 0.33, 0.5 and 1 seconds. Slice thickness in sequence: 0.6, 0.75, 1, 1.2, 1.5, 2.0, 2.4, 3, 3.6, 4.0, 4.8, 5, 6, 7, 7.2, 8, 9, 10, 12, 14.4, 15, 20 mm
Slice thickness in spiral: 0.4**, 0.5, 0.6, 0.75, 1.0, 1.5, 2, 3, 4, 5, 6, 7, 8, 10 mm Real-time image display.
Immediate image reconstruction and display without time delay simultaneously to data acquisition in 512 x 512 matrix size.

Spiral: Scanning technique for continuous volume scans with continuous table feed in multirotation mode. Max. scan time of up to 100 seconds with full low-contrast resolution. Depending on table configuration volume length 1.970 mm with full low-contrast resolution (max. 200 cm scan range possible using multiple automatic ranges). Selection of the pitch factor between 0.3 and 1.7 depending on scan mode. Selection of up to 33 separately parameterizable examination ranges in a patient protocol. In addition individual anatomic sections can be successively combined and then scanned automatically. Storage of up to 10,000 examination protocols. Rotation times/cycle: 0.28 sec (optional), 0.33 sec, 0.5 sec and 1 sec.

Iterative reconstruction: SAFIRE* (standard) enables dose savings potential up to 60%.

*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.

Adaptive 4D Spiral (optional): Continuous multirotational data acquisition with continuous smooth bi-directional table movement. Quantitative evaluation and graphical display of time-density curves over entire organs.

Dual Energy: Dual Spiral Dual Energy Scan mode (standard) enables to acquire Dual Energy data and benefit from Dual Energy post processing with several applications.

The intelligent algorithm Neuro BestContrast improves native head image quality especially grey/white matter differentiation. Images are decomposed into high and medium/low spatial frequencies. While relevant tissue information is contained in medium and low frequencies noise is dominated by high frequencies. Separate processing of medium and low frequency information improves the tissue contrast without amplifying image noise resulting in a better signal to noise ratio.

Dynamic: Program for functional dynamic examinations. Serial scanning technique in one slice position with variable scans cycle times.

Description

Multiscan spiral examination without table feed: Continuous multirotational data acquisition in one slice position. Quantitative evaluation and graphical display of time-density curves.

WorkStream4D (optional) with Asynchronous Recon: 4D workflow with direct generation of axial, sagittal, coronal, or double-oblique images from standard scanning protocols. Elimination of manual reconstruction steps. Asynchronous Recon allows for multiple image reconstructions and reformats, parallel to scanning. With this feature, up to eight reconstructions job requests can be loaded into a scan protocol. Immediately upon completion of the scan acquisition, these reconstruction jobs are automatically executed in the background without delaying the start of next patient examination.

Image reconstruction and storage: Image reconstruction in full resolution (512 x 512 matrix) takes place during the examination with up to 60 fps (depending on image reconstruction system), with full cone beam reconstruction, z-Sharp Technology and full image quality. Reconstruction fields of 5 cm to 50 cm through raw data zoom with the possibility of freely selecting the image center either prospectively before each scan or retrospectively. Reconstructions of different slice thicknesses from a single raw data record, e.g. lung soft tissue and lung high-contrast with CombiScan, with simultaneous suppression of partial volume artifacts. Up to 8 reconstructions per scan range can be predefined with the examination protocol. Patient-related storage of the image and raw data.

Image display: 1024 x 1024 display matrix; screen splitting configurable up to 64 image segments; CT value scale from -1024 to +3071 HU. For very dense objects, the CT value scale can be extended from -10240 to +30710 HU (extended CT scale) e.g. for suppressing metal artifacts.

Image evaluation: Complete software-controlled image evaluation program for all diagnostic requirements.

CINE Display: Dynamic display technique for the visualization of time or volume series. A series of up to 1024 images can be displayed at a frame rate of at least 30 f/s. Automatic or interactive mouse-operated control.

Multitasking functions: Simultaneous processing during operation of the scanner.

Real-time Display: Image reconstruction in pace with the examination in full image quality (512 x 512 matrix) with up to 60 fps (with full cone beam reconstruction and z-Sharp Technology).

Metro Display: Simultaneous display, processing and evaluation of images from other patients while the current patient is being scanned.

Metro Documentation: Simultaneous documentation of images from any previously examined patient while the current patient is being scanned.

Metro Copy: Automatic transfer of image data to the *syngo* CT Workplace (optional) or a DICOM network node.

9. Network Module:

For the connection to a local Ethernet (10, 100 Mbit or 1-Gigabit) in order to communicate with networked printers, diagnostic and therapy workstations, RIS or HIS systems and teleradiology routers.

Scope of functions:

- Configurable network stations.
- Unlimited selection of stations.
- DICOM Standard (Digital Imaging and Communications in Medicine) for the transfer of information between DICOM-compatible units from different manufacturers. The scope of functions is described in detail in the DICOM Conformance Statement, and the standard version comprises the functions Send/Receive, Query/Retrieve and BasicPrint, Worklist, Storage Commitment, MPPS (Modality Performed Procedure Step).

10. Integrated CARE Solutions:

Stellar Detector: Due to TrueSignal Technology electronic noise can be minimized resulting in dose reduction in low signal imaging (e.g. bariatrics.).

UFC Detector: Dose reduction compared to conventional CT detectors. High efficiency for low mAs requirements enable best possible image quality with low patient dose.

Adaptive Dose Shield: world's first dynamic tube collimation that protects the patient from clinically irrelevant radiation in every spiral scan.

Description

CARE Filter: Specially designed X-ray exposure filter installed at the tube collimator. Dose reduction with increased image quality.

Pediatric Protocols: Special examination protocols with 70 and 80 kV and a large range of adjustable mAs values for optimum adaptation of the radiation exposure to the age and weight of the child to be examined.

CARE Topo: Real-time topogram, Manual interruption possible once desired anatomy has been imaged.

CARE Bolus: Operating mode for CM-enhancement triggered data acquisition. The objective is optimum utilization of the contrast medium bolus in its "plateau" phase in the target organ. This option has been especially adapted to the increased speed and timing requirements resulting from the multirow capability and faster rotation. The CM enhancement is observed via monitoring scans in a user-defined ROI with a trigger threshold. As soon as the enhancement reaches its predefined threshold, the spiral scan is triggered as quickly as possible. License for software use on one modality.

11. Siemens Remote Service:

Siemens Remote Service (SRS) offers a wide range of medical equipment-related remote services resulting in increased system availability and efficiency. SRS employs sophisticated authentication and authorization procedures, state-of-the-art encryption technologies and logging routines together with strictly enforced organizational measures that provide optimal patient data security and access protection. The following SRS services are included for all service agreement customers and during warranty period:

Remote Diagnosis & Repair: In case of an unforeseen system malfunction, Siemens competent experts may directly connect with the CT system in order to identify the problem quickly. Moreover the remote repair function enables Siemens to often correct software errors immediately. Should an engineer on site be required, Remote Diagnosis & Repair allows Siemens to identify defective parts efficiently and accelerate their delivery, thereby keeping repair times to a minimum.

Event Monitoring: Event Monitoring screens the performance of the system. If a parameter deviates from a predefined value, a status message is automatically sent to the Siemens UPTIME Service Center. Service Engineers may evaluate the status message at periodic intervals and may initiate appropriate action within the scope of the service agreement.

SOMATOM LifeNet: An information and service portal directly at the CT Scanner consoles, featuring up to date information on CT products, application guides, accessories and training schedules as well as download of the latest scan protocols and 90 day free trial licenses on available software applications.

Notes on software use: Use of the entire integrated software, including optional software programs, is restricted exclusively to the application with this system.

Note: This product is in compliance with IEC60601-1-2 and fulfills CISPR 11 Class A. Note: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Welcome Package

The Welcome Package contains a welcome letter, three current versions of the customer magazine SOMATOM Sessions, three Siemens Mouse Pads plus an e-Learning CD.

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.

Description

Siemens has always been at the forefront to deliver highest image quality and reduce radiation dose to the lowest possible level at the same time. But today, an additional barrier has to be mastered to maximize clinical outcome: overcome the growing restrictions and limitation of resources. With FAST CARE, Siemens opens a new chapter in CT, explicitly focusing on the optimization of patient-centric productivity in modern healthcare delivery. With FAST CARE, time-consuming and complex procedures such as scan or recon preparations are extremely simplified – ideally reduced to a single click. The scanning process gets more intuitive and the results become more reproducible.

The FAST CARE platform consists the following features:

FAST Scan Assistant: An intuitive user interface for solving conflicts by changing the scan time, resp. the pitch and/or the maximum tube current manually.

CARE kV: First automated, organ-sensitive voltage setting to improve image quality and contrast-to-noise-ratio while optimizing dose and potentially reducing it by up to 60%.

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

CARE Profile: Visualization of the dose distribution along the topogram prior to the scan

CARE Dashboard: Visualization of activated dose reduction features and technologies for each scan range of an examination to analyze and manage the dose to be applied in the scan

CARE Dose Configurator: Enhancement of Siemens' renowned real-time dose modulation CARE Dose4D, introducing new reference curves for each body region and for each body habitus allowing to adjust the configuration even more precisely to the patient's anatomy.

Dose Notification: As requested by the new release of the standard IEC 60601 3rd editions, the SOMATOM Definition Flash provides the ability to set dose reference values (CTDIvol, DLP) for each scan range. If these reference values are exceeded the Dose Notification window informs the user.

Dose Alert: As requested by the new release of the standard IEC 60601 3rd editions, the SOMATOM Definition Flash automatically adds up CTDIvol and DLP depending on z-position (scan axis). The Dose Alert window appears, if either of these cumulative values exceeds a user-defined threshold.

With Siemens' unique STRATON tubes, the tube voltage can now be reduced to 70kV which helps to reduce radiation exposure to patients. With prior tube technology, the minimum tube voltage setting was 80 kV. The new tube voltage setting of 70 kV helps to further reduce the radiation dose to small pediatric or neonate patients.

CARE Child consists of:

- dedicated 70 kV scan modes
- new CARE Dose4D curves for children
- respective Children Protocol utilizing these features

FAST Planning assists the scan and reconstruction planning, based on a topogram, to provide an easier, faster and standardized workflow in CT scanning. FAST Planning features the selection of the anatomical region of interest from a list prospectively defined scan and reconstruction ranges, automatic detection of the scan region(s) of interest and proposal of corresponding scan range(s) in the topogram (in a narrow or wide lateral FoV), optimized FoV and automatic iso-center adaptation for Head scans.

DoseMAP is exists of the three parts.

These three parts in combination with each other deliver a complete and comprehensive dose management.

Report Dose: Create transparency and document dose values.

- DICOM SR Dose Reports: DICOM structured file allows for the extraction of dose values (CTDIvol, DLP)

- DoseLogs: Whenever a limit exceeds of the set up reference dose levels (Dose Notification and Dose Alert) automatically a report is created on the system.

Description

The report can for example be used for audit purposes.

Analyze Dose: Assess the dose situation.

- CARE Analytics: makes it possible to set a query and retrieve DICOM SR Dose Reports. With CARE Analytics it is possible to assess DICOM SR Dose Reports from different DICOM nodes and document dose data to get an insight in radiation dose per case or examination type, cumulative dose per patient or to start in-house dose reporting.

Exported and structured dose information makes it possible to monitor the dose over time and gives an insight in the radiation values per examination type. Based on that outcome, measures can eventually be defined to reduce dose.

- CARE Dashboard: Pre-examination dose check-up by showing an overview of all the used dose reduction features per scan.

- CARE Profile: Pre-examination dose check-up by displaying the dose distribution prior to the scan at every z-position.

Protect Dose: Manage access to protocols and potentially protect patients from over-radiation

- Access protection: by setting a password it is only possible to change and access the scan protocols in the Scan Protocol Assistant by authorized staff members only.

- Dose Notification and Dose Alert: Both functionalities may help to protect from over-radiation and warn the operator in case set dose thresholds are exceeded.

Dose Notification checks the dose values per chronicle entry.

Dose Alerts checks the accumulated dose per z-position.

Unlike other automated MPR offerings, WorkStream 4D does not require thin slice data to be reconstructed prior to the production of reformatted images. This enhancement saves time when compared to alternative MPR techniques.

In Addition, WorkStream 4D allows the user to produce oblique and double oblique reformats as either MPR or MIP images which substantially improves workflow both for routine and CTA examination when compared with alternative techniques.

Further advantages are the elimination of manual reconstruction steps and the reduction of data volume up to a factor of 10, since virtually all diagnostic information is captured in 3D slices.

Dose reduction with CT has been limited by the currently used filtered back projection (FBP) reconstruction algorithm. When using this conventional reconstruction of acquired raw data into image data, a trade-off between spatial resolution and image noise has to be considered. Higher spatial resolution increases the ability to see the smallest detail; however, it is directly correlated with increased image noise in standard filtered back projection reconstructions as they are used in CT scanners today.

Iterative reconstruction approaches allow decoupling of spatial resolution and image noise.

With the next generation of iterative reconstruction, ADMIRE (Advanced Modeled Iterative REconstruction) correction loops are introduced into the image generation process next to a more precise modeling of geometry and hardware components.

Superb details, delineation and sharpness of organ borders and positive impact on image quality.

These iteration loops utilize raw-data information to significantly improve image quality.

A statistical weighting of all projections and measuring points in the raw data domain improve the quality

Additionally, intelligent model based noise cancellation iteration will take place in the image domain. This iteration distinguishes anatomical structures from noise and results in a natural image* impression and excellent IQ.

Thick slice reconstruction allows for PACS-ready workflow.

This new iterative reconstruction technique results in an excellent image quality with reduced noise and increased image sharpness that can be translated to dose savings for a wide range of clinical applications. ADMIRE shows a benefit in image quality in image thicker than 3mm in comparison to SAFIRE and therefore the impact of ADMIRE

Description

is visible on the PACS-station.

Reader-ready reconstructions deliver the desired image impression on the fly

The new IRS will support the reconstruction performance so that ADMIRE is suitable for the daily routine and it creates Reader-Ready Reconstructions with a reconstruction speed of up to 20 images/second. Different ADMIRE kernels and five reconstruction strengths can be chosen to tailor the results of ADMIRE to the personal requirements.

*in terms of the outliers in the pixel noise structure

In clinical practice, the use of ADMIRE 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 iMAR metal artifact reduction algorithm combines three successful approaches to reduce metal artifacts: beam hardening correction (in sinogram regions of less severe metal attenuation), normalized sinogram inpainting (in sinogram regions of high metal attenuation), and frequency split (to mix back noise texture and sharp details that are potentially lost during inpainting).

The correction process is then iteratively refined by repeating the normalized sinogram inpainting and the mixing steps thanks to the Adaptive Sinogram Mixing.

Along with the new algorithm comes the simple user interface of iMAR. Besides the typical reconstruction parameters it only requires to select the desired protocol from a drop down menu which contains the following type of implants: dental fillings, neuro coil, thoracic coil, hip implants, extremity implants, pacemakers, spine implants and shoulder implants.

In today's clinical environment, there are cases for which it is important to visualize areas outside of the normal 50 cm CT scan field. For this reason, special reconstruction algorithms have been created to allow for visualization of objects using a FoV up to 78 cm. This extra versatility was primarily created to assist with radiation treatment planning applications. 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 (non-diagnostic image quality). Image artifacts may be common in the area outside the normal 50 cm scan field, depending on the anatomy scanned.

Siemens proprietary z-UHR (z-Ultra High Resolution) option enables an isotropic resolution of 30 lp/cm (0.17mm) at 0% MTF (+/- 10%). In addition, z-UHR Catphan® measurements demonstrate the industry's highest visible high-contrast resolution of 0.24 mm x 0.24 mm x 0.24 mm. The combination of z-Sharp Technology and z-UHR offers, in daily clinical routine, an isotropic detail in the range of research CsI-aSi flat-panel and Micro CT technology. z-UHR is intended for ultra-high resolution bone-imaging, in particular for small structures such as inner ear, joints or fractures of the bone. The option includes the z-UHR software as well as a dedicated tantalum detector comb.

The Adaptive 3D Intervention Suite contains

Adaptive 3D Intervention as a built-In 3D minimal non invasive solution for spiral and sequential CT guided interventional procedures. It allows for 3D volume intervention - near to real-time interventional CT Imaging with coronal/sagittal/oblique images. It also allows for switching scan modes on the fly during intervention. Additionally an interventional 3D toolbar is available supporting syngo® 3D tools, Path Planning, to navigate the needle cautiously during the intervention including:

- Auto Needle Detection
- Switch between patient oriented view and needle oriented view
- i-NeedleSharp to avoid needle artifacts during an sequential intervention. i-needle sharp can be switched on and off.(available on tiltable gantries)

Intervention Pro supports spiral and sequential non- fluoroscopic interventional procedures and complete organ coverage with maximal flexibility and with minimal single click effort.

Intervention Pro supports spiral and sequential non- fluoroscopic interventional procedures and complete organ coverage with maximal flexibility and with minimal single click effort. It is designed for fast and intuitive non-fluoroscopic interventional procedures such as drainage, biopsies or pain therapy. It also allows for switching scan

Description

modes between sequential to spiral mode on the fly during CT intervention. It contains: 2D Basic interventions, i-Sequence mode, i-Spiral mode, customizable user layouts and interventional toolbars.

i-Fluoro CT

i-Fluoro CT allows for ultrafast 2-dimensional interventional fluoroscopic procedures. Fluoroscopic scans are acquired with low dose techniques and displayed in real time on, with up to 10 frames/s, an additional in-room monitor. It also allows for switching scan modes on the fly during intervention.

HandCARE™ for i-Fluoro reduces on-line radiation exposure to the user and the patient by switching the radiation off in the upper segment of the 360° tube-rotation. It switches off the x-ray exposure for a 100° angle between three user selectable positions (10:00, 12:00 and 2:00 o'clock). Thus providing a significant dose saving to the operator's hand and to the patient while keeping the image quality constant.

i-Control CT

The interventional control panel (i-Control) supports interventional procedures as independent remote unit. The i-Control can be attached to the side rails of the table*, or an i-Control trolley*. i-Control Wireless CT module supports interventional procedures as independent wireless remote unit.

Documentation: Images are stored in file system for easy filming and archiving.

Foot switch for radiation release (x-ray).

* Optional

Consisting of:

Two monitors, video transmitter, video receiver, power supply cable and a 30 m fiber-optic cable set for connecting the flat screen monitors. Displays suitable for medical diagnostic applications (room class 1 and 2 acc. To DIN 6868-157).

The space-saving ceiling installation along with the large movement range of the support allow maximum operating convenience when positioning the monitor.

Consisting of:

Ceiling support with installation kit, voltage supply.

Scope of delivery and functions:

- High-resolution, flicker-free monitor with 48 cm (19 in) flat screen, 1280 x 1024 resolution, 75 frames/s for parallel viewing and visual checking during the examination. The max. depth of the monitor is only 111 mm. Display suitable for medical diagnostic applications (room class 1 and 2 acc. To DIN 6868-157). In addition, a ceiling support or a monitor cart is required for installing the flat screen monitor (optional).

Eaton Surge Protective Device (SPD) Panel, 250kA per phase rating, 277/480VAC Wye, Three Phase (4W+G), Surge Counter, Dimensions 12.05"H x 7.47"W x 6.69" D, Weight: 13.5 lbs, 10 Year Limited Warranty

syngo.via CT Workplace provides one graphical user interface to prepare and read images from Computed Tomography Images.

General functions, including:

- Browser functionality for fast patient and data access
- Case navigator for easy and fast case navigation
- Automatic image Processing
- Loading and displaying images of images in user-specific layouts, multiple layouts for 2D, 3D diagnosis
- Ad Hoc workflow change for flexible application handling
- Scrolling through images (for example, movie mode, fast mouse scrolling, synchronized scrolling)
- Mirror, rotate, invert, windowing, pan/zoom, annotations, distance and angle measurement, pixel lens, and ROI/VOI evaluation

Description

- Findings navigator - create, collect , navigate and present findings quickly
- Correlated cursor
- Series synchronization for pan/zoom, windowing, LUT, scrolling
- User-defined context menu
- Snapshot images as secondary capture
- Movie export

Integrated 3D tools, such as:

- All reformats immediately available: VRT, MIP, MIP thin, MinIP, MPR thin / thick, interactive slice thickness change
- VRT Punch, VRT Gallery
- Clip plane and clip box
- Table removal
- Bone removal for fast segmentation and removal of bony structures
- MPR/MPR Fusion and registration
- Parallel, curved & radial ranges
- 2D & 3D reference lines, 3D reference point
- Region growing and quantification for interactive segmentation of anatomical structures

Anatomic intelligence:

- Automatic spine labeling
- Automatic rib labeling for CT thorax scans
- Automatic landmark registration for accurate anatomical alignment of multiple time point cases

Applications for dedicated clinical areas

Beside standard 2D/3D capabilities, the following advanced functionalities for dedicated clinical areas are part of *syngo.via*.

These applications are medical products in their own right and necessary country-specific approvals might not yet be available (e.g. 510k, CE Mark).

syngo CT Coronary

Review Marker, Heart Isolation, Movie (Beating Heart), Plaque Visualization, Manual Coronary Tracking (> 2 click centerline), Cardiac Planes, Curved & Cross-Section MPR, context-specific reporting

CT Vascular

Review Marker, Manual Vessel Tracking (> 2 click centerline), Curved & Cross Sectional MPR, Integrated Reporting Plaque Visualization, context-specific reporting

syngo.CT Dual Energy

syngo.CT Dual Energy offers a viewer that displays a fused image for initial diagnosis. It includes Optimum Contrast to calculate automatically contrast-optimized images, the possibility to calculate monoenergetic images for a range of 40 - 190 keV as well as *syngo*.CT DE Rho/Z to display electron density and effective atomic number maps. The additional, optional Dual Energy applications utilize *syngo* Dual Energy's two data sets even further: the material-specific difference in attenuation enables an easy classification of the elementary chemical composition of the scanned tissue.

The Rapid Results Technology offers the ability to select the required Dual Energy results in the scan-protocol. After auto-transfer of the image data to the connected *syngo.via* system, all predefined results are calculated automatically. On top of that, an immediate distribution of the results to the connected reading environment can be triggered.

syngo.CT Dual Energy works with Dual Energy images from SOMATOM Definition, Definition Flash, SOMATOM Drive & SOMATOM Force and with single source Dual Energy images from SOMATOM Definition Edge, SOMATOM Definition AS family, SOMATOM Perspective and SOMATOM Scope (Power configuration).

Workflow automation:

Disease-specific workflow mapping is performed based on image information (modality and/or study description)

Description

Context -specific reporting:

- Context-specific reports can be derived from different clinical applications (structured reporting)
- Findings collected in the Findings Navigator can be transferred to context-specific reporting applications and can then be stored as DICOM Structured Reports
- The reports created with *syngo.via* are stored as encapsulated PDF DICOM objects. The report can also be saved in the file system as a PDF file and viewed and printed by the clinical user.

More functionality, including:

- Query/retrieve from DICOM nodes
- Exporting images and creating patient media
- Filming (DICOM print) or postscript printing functionality

Prerequisites for all service-related issues:

- Availability of a customer administrator that performs dedicated administration and support tasks (like 1st-line support, data security, backup)
- Minimum permanent broadband Internet connection bandwidth for uncompromised service support of 2,000 kBit/s downstream and 512 kBit/s upstream.
Otherwise, certain support services may not be provided and the agreed remote response time cannot be guaranteed.

Specification of minimum broadband Internet connection in detail:

- Downstream: 2000 kBit/s for Software update, IT- and Application support (Siemens Remote Service - SRS)
- Upstream: 512 kBit/s for Application support (SRS)
- Upstream: 256 kBit/s for Software update and IT support (SRS)

Scope of delivery:

- DVDs with *syngo.via* software - VB10
(software license for one *syngo.via* client user)

Brief description

Type: Hewlett Packard server-based workstation
Processor: 1x CPU
RAM: 32GB or more
System Disk with Data Disk: RAID Level 5
Gross Image Storage: approximately 900GB
Optical drive: CD/DVD-RW
Graphical Processing Unit: NVIDIA GPU

Operating System: Windows Server 2012 R2 Standard
Included accessory: USB Standard international keyboard

Recommended Environment Requirements

A 100 Mbit/s (minimum) / 1 Gbit/s (recommended) network environment is needed for optimal performance.
For remote access a 6 Mbit/s (minimum) / 10 Mbit/s (recommended) broad-band connection is required.

Technical details are subject to change without notice!

Brief description

Prime HW Support with a service window depending on your IT Care Plan and on the SIEMENS Customer Care Center (CCC) office hours.
The delivery of the on-site Break&Fix support is performed by HP.

- Content of the Prime HW Support: **Remote problem diagnosis and support** – Siemens Service remotely

Description

uses HP support tools to isolate your problem and facilitate resolution in close cooperation with the next HP service hub in your area.

- **Break & fix service with on-site support.** – For issues that cannot be resolved remotely, an authorized HP Services representative will be sent on-site and returns your system to operational condition, repairing or replacing components or entire units. If required, HP services restore at the same time system and network functionality to allow Siemens Service to seamlessly continue with any further required remote service activity.
- **Defective Media Retention Service** – This option lets you protect sensitive data by keeping your defective disk, without the need to return defective media.
- **Integrated service management:** - Seamless cooperation and processes between SIEMENS and HP to ensure optimized end-to-end issue handling.
- **Enhanced HW support** – Provision of necessary BIOS-, Firmware and Driver update packages to keep the HW system up to date. Required patches and updates are provided remotely to be installed conveniently during the next application maintenance or service window by the responsible IT system administrator.

Brief description

Size: 24.1"

Brightness: 350 cd/m²

Contrast ratio: 1000:1

DICOM calibration: with bundled RadiCS LE quality control

After-sales service: 3 years swap service

Due to country-specific regulations, the monitor will be shipped without a power cable. The power cable will need to be sourced locally.

The Implementation Package includes the following tasks for *syngo.via* Modality Workplace (called *syngo.via* Modality Workplace):

- Basic hardware installation and network integration, including up to one *syngo.via* client (does not apply for *syngo.via* MI Workplace for SPECT)
- Activation of Siemens Remote Services connections
- Import of all *syngo.via* server license files
- Basic clinical configuration and integration of up to 3 DICOM nodes in *syngo.via* Modality Workplace (modality scanner and one PACS and one DICOM printer). All nodes need to be validated for connection with *syngo.via*.
- Configuration of basic workflow rules
- Acceptance Test in cooperation with the customer
- *syngo.via* client installation on a validated Siemens scanner acquisition workplace (AWP) (if applicable)

Context of the implementation tasks:

- The DICOM conformance of the DICOM nodes is a prerequisite for connection to *syngo.via*.
- The DICOM nodes to be connected to *syngo.via* Modality Workplace must be configured and tested by the customer. If necessary, the customer orders these services from the DICOM node's vendor.
- The configuration of the customer's Local Area Network is performed by the customer.
- Provision of a minimum broadband Internet connection bandwidth with 2000 kBit/s downstream and 256 kBit/s upstream for Siemens Remote Services (SRS) by the customer. If the customer does not provide SRS connectivity, then additional professional services for implementation without SRS support are offered. For service support after implementation the following minimum specification has to be provided: Downstream 2000 kBit/s (for Software update, IT- and Application support); Upstream 512 kBit/s (for Application support); Upstream 256 kBit/s (for Software update and IT support).

Description

- The customer provides information, such as: IP addresses of the *syngo.via* Modality Workplace for its network integration and the DICOM nodes identifiers.
- The customer provides the required power supply and the installation location for the server hardware, as well as the required LAN capacity. For the LAN capacity between *syngo.via* Modality Workplace and the PACS/modality systems a min. of 1 Gbit/sec is required. Between *syngo.via* clients and server a min of 100 Mbit/sec is required.
- Presence and support of the customer's administrators (clinical and IT administrator) are required during implementation. In preparation for implementation support, the customer's administrators have completed the *syngo.via* web-based trainings, which are part of the scope of delivery.
- A list of applications and systems with validated connectivity to *syngo.via* Modality Workplace can be requested from your Siemens Sales Representative.
- If a DICOM node or another system has not been validated yet for connection to *syngo.via* by Siemens, then the customer will give his acceptance though there could be a narrowed functionality of the connection.
- For an installation of the client on a validated Siemens scanner AWP a scheduled downtime of one hour of the scanner is required.

Project coordination is performed by Siemens. Please see the *syngo.via* Data Sheet for system requirements and detailed description of implementation tasks.

The hardware installation service includes the following tasks:

- Unwrapping, consolidation of all packaging material and notification to the customer that the materials are ready for removal.
- Mechanical and electrical connections at site of operation
- Connection to the power supply, to Uninterruptable Power Supply (if applicable)
- Startup of operating system; check status of patches, drivers, service packs and hot fixes, etc.
- Connection and network configuration of the server and the remote service board to the LAN
- Configuration of remote service board (network settings, users configuration) if supported by the server
- Test monitor setup (if applicable) and handover of the readily installed system to the customer.

For the HW installation the customer provides:

- Access to the location and space for server operation
- Electrical power
- LAN access and LAN configuration
- Configuration of the broadband internet access for Siemens Remote Services
- IT Administrator's coordination and support for the mechanical and IT installation.
- Server and monitor(s) are at the site of operation. The customer's monitors are accompanied by appropriate cables.
- The connection of one or two monitors to a *syngo.via* Modality Workplace with a Workplace HW Extended (if available) does not include monitor calibration.
- For a *syngo.via* Modality Workplace with a Workplace HW Extended (if available) depending on local legal regulations, the monitor installation described here may allow viewing only

This hardware installation service includes the following tasks:

- Unwrapping of server and monitors (if applicable). Consolidation of all packaging material and notification to the Customer that the materials are ready for removal
- Mechanical and electrical connections at site of operation
- Mechanical connections to console and to diagnostic monitors (if applicable)
- Connection to the power supply, to Uninterruptable Power Supply (if applicable)
- Startup of operating system, check status of patches, drivers, service packs and hot fixes etc.
- Connection of the server and the remote service board (e.g. the HP dash board) to LAN; network configuration of the server and the remote service board
- Configuration of the operating system for two monitors (if delivered by Siemens)
- Test monitors setup (if applicable)

Description

- Handover of the readily installed system to the customer.

Context of the implementation tasks:

The customer provides, as described in the *syngo*.via Data Sheet:

- Access to the location and space for server operation as well as for the monitors (if applicable)
- Server and monitor(s) are on-site of operation. The customer's monitors are accompanied by appropriate cables.
- Electrical power
- LAN access and LAN configuration
- Configuration of the broadband internet access for Siemens Remote Services
- IT Administrator's coordination and support for the mechanical and IT installation.
- The connection of one or two monitors to a workstation-based server does not include monitor calibration.
- Depending on local legal regulations, the monitor installation described here may allow viewing only.

19" Monitors, Scope of delivery and functions: High-resolution, flicker-free monitor with 48 cm (19 in) flat screen, 1280 x 1024 resolution,. The max. depth of the monitor is only 111 mm. Display suitable for medical diagnostic applications

The dual monitor ceiling support consists of: a Ceiling support with installation kit and voltage supply.

Available for room heights (unfinished concrete floor) from 2600mm to 3700mm.

Note: If the room height is not included in the recommended range, an ergonomic monitor viewing height might not be possible, in this case the use of a monitor cart is recommended.
Please refer to the Planning Guide regarding further details.

The **CT Cardio-Vascular Engine** permits access for one user for the following scan modes and software modules:

Scanner Modes:

- **z-Sharp** Technology ensures you the high spatial resolution required for exceptional visualization of the complex coronary and vascular anatomy.
- Fast **rotation time of 0.28 s** per rotation delivers high temporal resolution and fast volume coverage. A constant high temporal resolution of 142 ms (resp. 71 ms in bi-segment mode) allows to freeze motion and to minimize the occurrence of motion artifacts (e.g. cardiac motion).
- **HeartView** provides Siemens' proprietary Cardio ECG-gated spiral (helical) acquisition and reconstruction techniques for optimal image quality.
- Fully integrated ECG device facilitates ECG gating and **Adaptive ECG pulsing** for maximum dose reduction.
- **Adaptive Cardio Sequence** is an intelligently triggered sequence, fast enough to freeze the heart and robustly visualize the coronary arteries even at high and arrhythmic heart rates (Arrhythmia Compensation). The integrated automatic **Arrhythmia Compensation** provides higher safety and image quality in cases of extra systoles. **FlexPadding** allows widening the acquisition window for even more robustness.
- **Adaptive Dose Shield** for spiral acquisition to eliminate pre- and post-spiral over-radiation.
- Intuitive **ECG editing** tool allows adapting for extra beats in arrhythmic situations ensuring optimal retrospective image reconstruction.
- **syngo BestPhase**, a software dedicated to automatically detect the optimal phase for motionless coronary visualization. The phase is defined in either end-systole, end-diastole or both time points and

Description

automatically reconstructed

- The 4% **MinDose** algorithm lets the user save even more dose for coronary CT angiography. A special algorithm decreases tube current during ECG-Pulsing down to 4% of the tube output, thus decreasing dose compared to conventional ECG scanning. Only in combination with **syngo.CT Cardiac Function**, this data can be additionally used for full functional assessment over all cardiac phases.
- **DirectViewing** is a tool for real time navigation through full volumes of up to 24 heart phases by using an integrated, fast 3D volume viewer. DirectViewing completes the workflow of Cardio BestPhase by giving you the flexibility to individually visualize phases for all coronary arteries.
- **CARE Dose4D** delivers the highest possible image quality at the lowest possible dose for patients - maximum detail, minimum dose.
- Fast and accurate visualization of complex neurological disorders of head, neck, and spine using dedicated X-ray filters, e.g. Posterior Fossa Optimization (PFO), image reconstruction, and beam hardening correction algorithms for artifact elimination.

Software Modules

- **syngo.CT CaScoring** is a workflow step that quantifies coronary calcifications (mass, volume, Agatston equivalent) and calculates the patients coronary age. During the evaluation, the patient's score is compared to the scores of a healthy reference group. Implemented large reference databases are:

- MESA, McClelland, Circulation, 2006 (USA, 6,110 patients); Data support for different ethnic groups: Caucasian, Asian, Hispanic, etc.
- Hoff, Am J Cardiol, 2001 (USA, 35,246 patients)
- Rumberger, Mayo Clinic, Proc, 1999 (USA, 1,898 patients)
- HNR, Schmermund, Atheroscl., 2006 (Germany, 4,275 patients)
- Raggi, Circulation, 2000 (USA 9,730 patients)

- **syngo.CT Coronary Analysis** provides a cardiac-specific set of automatic pre-processing steps and display functions for quick and reliable evaluation and quantification of angiography images of the coronary arteries. With these features, the case is ready for review when first opened, thus saving many manual workflow steps and bringing more efficiency into daily practice. The rule-out of coronary artery disease is possible in less than a minute.

- Automatic segmentation and labeling of the main coronary arteries (RCA, LAD, CX), major coronary branches and **saphenous vein grafts (SVG)**
- The **Single-Click Stenosis** function provides all relevant information for stenosis quantification and coronary stent planning: Stenosis diameter and area, curved length, minimum lumen identification, effective diameter etc.
- The **VesselSURF** tool guarantees ultra-fast, 3D vessel assessment in axial slices even without the existence of centerlines or in occluded vessels. As the vessel is being surfed the cross section and best longitudinal view are displayed in real time
- **The Image Sharpening** tool allows for a more thorough evaluation of calcified lesions or stents without the need for an additional reconstruction at the scanner thus saving up to 3 minutes
- **Robust segmentation** of the coronary vessels despite high-grade stenoses
- Comprehensive 3D visualization of the **coronary tree**, including layered display of cardiac and coronary anatomy with individual VRT-presets
- Anatomy Visualizer for 3D layered visualization of multiple anatomical structures
 - Automated centerline definition with less editing for **challenging evaluations** in long and/or partially occluded vessels
- Extend centerlines in CPR view
- Multi-click centerline definition for **challenging evaluations** on long or partially occluded vessels
- **Straightened MPR** view for complete vessel overview, easy stenosis identification, and quick measurements

- **syngo.CT Vascular Analysis** allows to automatically evaluate and quantify angiography images of the general vessels. It provides a vascular-specific set of auto-preprocessing steps and display functions. These functions make it possible that the case is immediately ready for review when opened, thus saving many manual workflow steps to bring more efficiency into daily practice.

Description

- The **VesselSURF** tool guarantees ultra-fast 3D vessel assessment in axial slices even without center lines or in totally occluded vessels, while displaying longitudinal/perpendicular cross sections of the vessel in addition to the 2D images in real time
- Auto pre-processing steps, like auto bone and table removal, provide an **immediate vascular-only view**
- The 2-click center line creation allows for a **quick and robust vessel segmentation** and CPR display
- **Vessel analysis tools** provide all relevant information, e.g. stenosis diameter and area, curved length, profile curve, minimum lumen identification, etc.
- Measurement and reporting tools for therapy support, such as stent planning in case of AAA
- Bone & Vessel Isolation mode for selective highlighting of high-contrast structures, for example to bring out the bone in trauma cases involving fractures of the femur or hip, or for **single-click plaster cast removal**
- Anatomy Visualizer for 3D layered visualization of multiple anatomical structures
- Automated centerline definition with less editing for **challenging evaluations** in long and/or partially occluded vessels
- Extend centerlines in CPR view
- **Straightened MPR** view for complete vessel overview, easy stenosis identification, and quick measurements

- **syngo.CT Cardiac Function** is a workflow step that allows reading and diagnosing CT angiography images of the heart for the evaluation of left ventricular function. Automatic pre-processing of the data includes left ventricular volumetry and myocardial wall segmentation of the left ventricle in all cardiac phases without any interaction. Full Cardiac assessment is now possible in less than four minutes.

- The local cardiac function is automatically displayed in AHA-conform 17 segment **2D polar maps**
- The display of the **aortic valve plane** with a single click facilitates the quantitative assessment of the aortic annulus for pre-procedural TAVI planning. Automatic calculation of the C-arm angulation (LAO/RAO, CRAN/CAUD) helps to save contrast agent in the interventional procedure.
- The workflow **CT TAVI Planning** allows to combine the assessment of the aortic annulus with the evaluation of the peripheral vessels (CT Vascular) providing streamlined TAVI planning, including evaluation of the aortic root and the left-ventricular outlet tract.
- Straightforward drawing of contours, e.g. in the case of congenital heart disease or severe cardiomyopathy
- Polar map visualizations include flexible scaling
- Comprehensive **movie functionality**
- Quick creation of short-axis movies at multiple locations for PACS viewing
- **Cardiac movie playback** including adjustment of movie speed to heart rate

The latter three applications feature the **Rapid Results Technology**: You can automatically generate reproducible and standardized visualizations of the coronary and general vessels in various types and orientations. Be creative and design your own personal Protocols that suit your daily work best. Define your workflow once and let Rapid Results Technology produce the decision basis for coronary evaluations, stent and TAVI planning, as well as examinations of unclear ischemia. syngo.via's client-server technology lets you share your Protocols with other colleagues. Save time for reading other cases by automatically creating just the right amount of information – standardized and reproducible.

- **Customize** your every-day procedures by defining and saving individual Protocols in the Protocol Configurator
- Re-use your **own configured protocols** for an automated generation of snapshots, radial and parallel ranges for MPR, MIP, and VRT images (incl. VRT presets) in every case
- Save time by **standardizing image creation**, including PACS series and filming
- Pause the Protocol execution at any time and adjust settings interactively
- Configure result names and properties including snapshot and range series
- Send your findings to report and printing
- Provide hints, tips, and recommendations both to bring standardization to clinical routine and in order to **educate fellow colleagues**
- Integration of **measurement tools** into a protocol, such as length and diameter measurements
- enabling a direct communication between scanner and PACS, utilizing your syngo.via workstation

The **CT Cardio-Vascular Engine Pro** permits access for one user for the following additional software modules:

Additional Software Modules

- **syngo.CT Cardiac Function - Enhancement** is an extension of the CT Cardiac Function workflow step that allows visualizing hypodense and/or hyperdense myocardial areas within CT datasets acquired with Single or Dual

Description

Energy* CT.

- Dedicated button for **First Pass Enhancement**: Single-click identification of hypodense areas within the myocardium by color-coding
- Dedicated button for **Late Enhancement**: Color-overlay helps to visualize hyperdense areas with a single click
- Color overlay can be turned on/off at any time
- Offering the **full spectrum of myocardial perfusion analysis**: First pass enhancement (Single and Dual Energy*), dynamic quantitative perfusion**, late enhancement (Single and Dual Energy*)
- Overlay of myocardial perfusion information on MPRs
- AHA-conform **17 segment polar maps** for all types of perfusion data
- Straightforward localization of myocardial enhancement defects
- Visualization of all types of perfusion data with the **Hybrid View** facilitating the analysis of the correlation of a defect with the coronary arteries - for a quick assessment of the hemodynamic relevance of a stenosis

* Requires at least one user license of *syngo*.CT DE Heart PBV

** Requires *syngo* VPCT Body - Myocardium

- ***syngo*.CT Cardiac Function - Right Ventricle** is an option for the CT Cardiac Function workflow step that allows reading and diagnosing CT angiography images of the heart for the evaluation of right ventricular function, allowing full cardiac assessment in less than one minute.

- ***syngo*.CT Vascular Analysis - Autotracer** is an option for the CT Vascular Analysis workflow step that allows automatic vessel centerline extraction and anatomical labeling of the main vessels, even before the case is opened for review. When the case is opened, all major vessels are already segmented and anatomically labeled. The first vessel is prepared in CPR view and the cross-sectional cuts are displayed for immediate evaluation. It is prerequisite for fast and efficient rule-out of atherosclerosis or severe stenosis in less than a minute while making possible a full vascular assessment in less than four minutes.

- ***syngo*.CT Rapid Stent Planning** introduces the automatic completion of manufacturer-specific stent order forms. As of delivery, *syngo*.CT Rapid Stent Planning provides the three order forms Gore Excluder, Zenith Flex, and Medtronic Endurant in pdf-Format. On top of that, new site-specific order form templates may be generated to match the requirements of other vendors (requires Adobe Acrobat Professional).

Software license enabling system to support Enhanced User and System management, including:

- User authentication to prohibit unauthorized access
- Privileges to define user/role based functionality
- Permissions to control data access
- Audit trails to log system and data access.