

REQUESTING SERVICE: DIAGNOSTIC RADIOLOGY SVC(114A)  
SHIP TO: MATHER VA B56020  
V.A. Medical Center  
WAREHOUSE - BLDG. 652  
10535 HOSPITAL WAY  
MATHER, CA 95655

P.O.# 612-B56020

Qty	Item Description
1	<b>SOMATOM Definition Edge</b> 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.
1	<b>CT Replacement Definition Edge</b> Conversion to Siemens SOMATOM Definition Edge.
1	<b>TwinBeam Dual Energy</b>
1	<b>Adaptive 3D Intervention Suite</b> 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	<b>High-speed 0.28 s rotation</b> Fast rotation time of 0.28 seconds for unprecedented image quality and highest scan speed. Fast gantry rotation times are the prerequisite for highest temporal resolution and are therefore essential for brilliant, motion free cardiovascular imaging.

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1	<p><b>100 kW Power</b></p> <p>The 100 kW power allows the X-ray generator the use of maximum power of 100kW in fine adjustable steps.</p>
1	<p><b>FAST IRS</b></p> <p>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 80 frames/sec.</p>
1	<p><b>UHR</b></p> <p>UHR mode delivers Ultra High resolution in plane of up to 24lp/cm for high defined imaging of small structures such as inner ear, joints or fractures of the bone</p>
1	<p><b>Rear cover incl. gantry panels</b></p> <p>Rear Cover including gantry control panels with control functionality from the backside.</p>
1	<p><b>Patient Table Def. Edge 2000mm</b></p> <p>Patient table to support up to 200cm scan range. Motor-driven table height adjustment from 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.</p> <p>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.</p>
1	<p><b>Mat for Patient Table</b></p> <p>For the comfortable positioning of the patient on the CT table.</p>
1	<p><b>Physiological Measurement Module</b></p> <p>The Physiological Measurement Module allows connection of a 3 Channel ECG cable for ECG controlled cardiac acquisition.</p> <p>Item includes ECG cable</p>
1	<p><b>Cooling System Air</b></p> <p>SOMATOM Definition Edge air cooling for the dissipation of heat generated in the gantry.</p>
1	<p><b>i-Control Trolley</b></p> <p>Trolley for the i-control CT module</p>
1	<p><b>Dual 19" Monitor #D</b></p> <p>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.</p> <p>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.</p>

**Qty****Item Description**

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.

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

**Earthquake Kit**

The SOMATOM CT Scanner earthquake kit enables a special floor mounting necessary in earthquake-prone countries or areas.

1

**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. DoseMAP has three components for complete and comprehensive dose management: Report, Analyze, and Protect.

1

**CARE kV**

CARE kV automatically proposes the best tube voltage based on the patient's size, the system capabilities, and the type of examination. Once the kV setting has been chosen, CARE kV also automatically adjusts other scan parameters, including the tube current. This reduces dose, maintains a constant image quality, and simplifies processes for technicians.

1

**CARE Child**

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

1

**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.

1

**CARE Profile**

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

1

**FAST Planning #AWP**

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

1

**FAST Adjust**

FAST Adjust: assists the user to handle system settings in a fast and easy way by automatically solving of conflicts within user defined limits by one single click on the FAST

Qty	Item Description
1	<p>Protocol Assistant. FAST Adjust offers an undo functionality to return to previously set values.</p> <p><b>HeartView CT</b></p> <p>Scanning technique and program for ECG controlled data acquisition and image reconstruction with SOMATOM Definition Edge.</p> <p>The package comprises:</p> <p>HeartView CT option on the syngo Acquisition Workplace console for the ECG-controlled acquisition and reconstruction of artifactfree images of the heart.</p> <p>The ECG signal is supplied by an ECG device integrated in the gantry.</p> <p>The use of the software of this option is restricted to a single system unit.</p>
1	<p><b>Adaptive 4D Spiral</b></p> <p>The unique Adaptive 4D Spiral moves beyond fixed detector limitations to provide full coverage of any organ in 4D. It introduces up to 48 cm range for dynamic CTA imaging and 4D Noise Reduction to significantly improve image quality with no increase in dose or, alternately, reduce dose without compromising image quality (4D Noise Reduction requires Volume Perfusion CT Neuro or Body).</p>
1	<p><b>ADMIRE #AWP</b></p> <p>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:</p> <ul style="list-style-type: none"> <li>• Superb details, delineation and sharpness of organ borders</li> <li>• Positive impact on the image quality</li> <li>• Thick slice reconstruction allows for PACS-ready workflow</li> <li>• Reader-ready reconstructions deliver the desired image impression on the fly</li> </ul> <p>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.</p>
1	<p><b>iMAR #AWP</b></p> <p>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.</p> <p>iMAR is compatible with extended FoV, the extended CT scale as well as the newest dose reduction feature.</p> <p>Along with the new algorithm comes the simple user interface of iMAR enabling easy reconstruction of clinical images with reduced metal artifacts.</p>
1	<p><b>Extended Field of View</b></p> <p>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.</p>
1	<p><b>WorkStream 4D #AWP</b></p> <p>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.</p>
1	<p><b>FAST Spine #AWP</b></p> <p>Accurate and anatomically aligned preparation of spine recons with just a single click.</p>

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1	<b>FAST 3D Align #AWP</b> FAST 3D Align enables automated alignment of FOV, adjustments and reconstructions of standard views.
1	<b>Cardio BestPhase Plus #AWP</b> Cardio BestPhase, a software dedicated to automatically detect the optimal phase for motion-less coronary visualization. The phase is defined in either end-systole, end-diastole or both timepoints and automatically reconstructed. Includes DirectViewingTM, a tool for real time navigation through full volumes of up to 24 heart phases by using an integrated fast 3D volume viewer, available both on the Examination and Recon subtask card. Furthermore it provides easy VRT visualization of the coronaries with removal of all parts of the chest in up to 20 phases within 15 seconds. DirectViewingTM completes the workflow of Cardio BestPhaseTM by giving you the flexibility to individually visualize phases for all coronary arteries.
1	<b>syngo Volume Perfusion CT Neuro#AWP</b> Fully automated 3 dimensional syngo Volume Perfusion CT - Neuro facilitates quantitative 3D volume evaluation for differential diagnosis of ischemic stroke and supports simultaneous multislice processing as well as the stringent time and workflow requirements in an emergency setting where time is of the essence.
1	<b>syngo Neuro DSA CT #AWP</b> syngo(r) Neuro DSA CT is a dedicated postprocessing application which allows removing bone structures from CT-Angiography (CTA) datasets for improved visualization of the cerebral vasculature. It uses an additional nonenhanced CT (NECT) scan with the aim to automatically and quickly remove bone from cerebral CTA data. The algorithm works completely automated and makes this application easy to use. This improves visualization of vascular structures in the area of the skull base and helps to delineate aneurysms and other vascular diseases.
1	<b>syngo Volume Perfusion CT Body#AWP</b> syngo Volume Perfusion CT - Body allows the quantitative 3D evaluation of dynamic CT data of organs and tumors. By providing images of blood flow, blood volume and permeability from one set of dynamic CT images. syngo Volume Perfusion CT Body allows the assessment of perfusion disturbances and perfusion changes during therapy. It might be particularly helpful in the differential diagnosis and monitoring of tumors.
1	<b>syngo 3D BoneRemoval #AWP</b> Simple, automated bone removal functionality for the syngo 3D application. Preconfigured algorithms for angiography and hip/pelvis fracture scenarios are included to facilitate fast removal of bone structure for three dimensional presentation and analysis of CT data.
1	<b>Tiltable Head Holder</b> Tiltable Head Holder for the fixation of the patient's head. Tilt range between +30 till - 15 degree.
1	<b>Computer Cabinet</b> New cabinet to accommodate the computer system and UPS. Matched to the design of the control console table. Width: 800 mm, Depth: 800 mm, Height: 720 mm
1	<b>Computer Desk, height adjust 110V</b> The height adjustable table (710 mm to 1100 mm) supports optimal ergonomic working positions at the CT consoles. It allows users to switch between the dynamism of a standing desk and the comfort of a traditional desk.
1	<b>Additional User Manual</b> Additional user manual for the above selected CT system.

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1	<p><b>CT Project Management</b></p> <p>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.</p>
1	<p><b>CT Standard Rigging and Installation</b></p> <p>This quotation includes standard rigging and installation of your CT new system.</p> <p>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.)</p> <p>It remains the responsibility of the Customer to prepare the room in accordance with the SIEMENS planning documents.</p> <p>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.</p> <p>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.</p>
1	<p><b>Initial onsite training 32 hrs</b></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. 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.</p>
1	<p><b>Initial onsite training 32 hrs GovOffset</b></p>
1	<p><b>Additional onsite training 32 hours</b></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>
1	<p><b>Additional onsite training 24 hours</b></p> <p>Up to (24) 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>
1	<p><b>Additional onsite training 32 hours</b></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>
1	<p><b>teamplay Welcome &amp; Registration Package</b></p> <p>teamplay is a cloud-based network that brings together your imaging modality users, the systems' dose and utilization data, and the users' expertise to help you improve the delivery of care to your patients. Basic features are provided free of charge. Premium features (benchmarking, non-Siemens devices) are provided on a trial basis for three months at no</p>

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	charge, and may be used thereafter on a subscription fee basis. To register: <a href="http://teamplay.siemens.com/#/institutionRegistration/1">http://teamplay.siemens.com/#/institutionRegistration/1</a>
1	<b>Surge Protective Device (SPD)</b>
1	<b>IEC Main Disconnect Panel - CT/175A</b> Integrated Electrical Cabinet/Main Disconnect Panel for Definition AS and Definition Edge products.  Components supplied: IEC Main Disconnect Panel The Installation, Operations and Service Manual 4 sets of Emergency Power Off push buttons  DOES NOT INCLUDE installation. Customer is responsible for the installation of the cabinet. Includes one year warranty. Service provided by Siemens.
1	<b>CT Slicker</b> Thermoseal seams and flaps deflect fluids, reducing contaminant penetration into the cushion and table. Contaminants are retained on the tabletop or shunted to the floor. Cleanup is faster, more thorough, and contaminant build-up is reduced. Built using heavy, clear, micro matte vinyl, and top grade hook and loop fastening strips (Velcro) to better fit the specified table. Custom vinyl resists tears and minimizes radiologic interference. Latex free. Set includes CT Skirts. Shipped with main cover, a catheter bag holder, and 3 restraining belts unless otherwise noted. Includes warranty from RADSCAN Medical.
1	<b>Low Contrast CT Phantom &amp; Holder</b>
1	<b>NEMA_XR-29 Standard</b> This system is in compliance with NEMA XR-29 Standard Attributes on CT Equipment Related to Dose Optimization and Management, also known as Smart Dose.
1	<b>Dose Alert</b> Dose Alert: Dose Alert automatically adds CTDIvol and DLP values depending on z-position (scan axis). The Dose Alert window appears, if either of these cumulative values exceeds a user-defined threshold.
1	<b>Dose Notification</b> Dose Notification: Dose Notification 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.
1	<b>Access Protection</b> Scan Protocols are password protected allowing only authorized staff members to access and permanently change protocols
1	<b>Adaptive Dose Shield</b> Adaptive Dose Shield for spiral acquisition to eliminate pre- and post-spiral over-radiation.
1	<b>CARE Dose4D</b> CARE Dose4D delivers the highest possible image quality at the lowest possible dose for patients - maximum detail, minimum dose. Adaptive dose modulation for up to 60% dose reduction
1	<b>CARE Dose Configurator</b> 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

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1	<p><b>DoseLogs</b></p> <p>Whenever a dose limit exceeds the established reference dose levels (Dose Notification and Dose Alert) a report is automatically created on the system, enhancing your ability to track radiation dose.</p>
1	<p><b>Lung Imaging</b></p> <p>For well over a decade, CT has been recognized and used as the standard of care for lung nodule detection and sizing. This is due to CT's spatial resolution, geometric accuracy, and ability to create various reconstructions and 3D views. The high contrast environment in the chest between the lungs and the nodules makes for a relatively easy detection task for clinicians using CT images. Recent advances in CT technology have allowed these scans to be effectively performed at lower doses, higher resolutions, and faster scan times.</p> <p>The SOMATOM Definition Edge CT is indicated for use in low dose lung cancer screening for high risk populations*. The Edge is delivered with two specific scan protocols to provide low dose lung cancer screening exams at approximately 1.3 mGy CTDI for a standard size adult. These default protocols utilize Siemens proprietary dose reducing features such as CARE Dose4D(tm), automatic exposure control technology that modulates and adapts dose for every patient, for high image quality at low dose.</p> <p>*As defined by professional medical societies.</p>
1	<p><b>FAST Scan Assistant</b></p> <p>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.</p>
1	<p><b>SureView</b></p> <p>Provides exceptional image quality at any pitch setting, enabling you to scan faster because you can scan at any pitch without degrading image quality</p>
1	<p><b>CARE Bolus</b></p> <p>Operating mode for CM-enhancement-triggered data acquisition.</p>
1	<p><b>UFC Detector</b></p> <p>Ultra Fast Ceramics (UFC) technology is a unique type of scintillation technology material that quickly and efficiently transforms radiation from the X-ray tube into light signals. Its superb overall quantum efficiency and unique short afterglow enable time-critical X-ray detection at low doses and extremely fast data collection.</p>
1	<p><b>Neuro BestContrast</b></p> <p>The Neuro BestContrast algorithm can provide enhanced tissue contrast, resulting in improved contrast between gray and white matter without increasing image noise. This post processing step is rapid and can be easily incorporated into clinical workflow where it can be used with other dose reduction approaches such as iterative reconstruction.</p>
1	<p><b>Gantry tilt incl. tilted spiral</b></p> <p>Allows for sequential scanning with a tilted gantry between +/- 30°, depending on the vertical position of the table. Using the gantry tilt sensitive organs (like eye lenses) can be moved out of the scan range or it eases access during interventional procedures. The tilted spiral allows to utilize the gantry tilt for spiral scan modes.</p>
1	<p><b>syngo VRT</b></p> <p>Advanced 3D functionality as an extension to the basic 3D viewer, containing volume rendering technique (VRT) and advanced editing functions.</p>
1	<p><b>Standard UPS for Definition Edge</b></p> <p>The standard partial system uninterruptible power system (UPS) is built directly into the power distribution cabinet (PDC) and supports the critical circuits for table and gantry electronics, console computer, image reconstruction system, and the internal Ethernet switch (to ensure connectivity). This enables safe removal of patient if outage occurs during scanning.</p>



**Qty**

**Item Description**

The UPS allows for a safe shutdown of the CT scanner in the event of power interruption. The UPS provides 5-7 minutes of power, during which the user is prompted and guided through the process to perform a safe shutdown of the system. This safe shutdown ensures that no data is lost.

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**Definition System Complimentary Biomed Training**

#### **Offset Definition System Complimentary Biomed Training**

This educational offering must be completed by the later of (12) months from purchase of training or if applicable, completion of installation. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

**Offset Part 14428168 Additional User Manual**

**Offset Part CT\_ADD\_32 One Additional Onsite Training 32 hours**

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## OPTIONS

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1	<p><b>Stellant D Dual Ceiling w/Certegra WS</b></p> <p>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	<p><b>Bayer Informatics Starter Pkg.</b></p> <p>Contrast Dose Management Software package Point-of-Care Data Entry Automates Direct Documentation Auto-populate the accession number, study description, and more, directly from RIS. Capture vital injection details, including contrast brand and concentration, saline, catheter gauge, injection site, lot number, expiration date, and technologist IDs</p> <p>Includes the following: CT Point of Care Software Contrast Dose Management with VM Installation &amp; Implementation Services through Bayer</p>
1	<p><b>Bayer HL7 Outbound Interface</b></p> <p>HL7 Outbound Interface, RIS Systems Interface - Workflow Connections for Quality and Analytics. The platform makes contrast-dose connections through the Medrad Stellant CT Injection system with Certegra Workstation, Contrast-injection records are collected and shared across interfaced IT systems.</p> <p>Requires Informatics Starter Package. Installation included when purchased with Stellant Certegra Workstation configuration.</p>

## Detailed Technical Specifications

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### 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 reliable and reducing patient burden through streamlined examinations.

## Description

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

## Description

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

## Description

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

TwinBeam Dual Energy is routinely applicable without compromising on image quality or radiation dose. To create two X-ray spectra (high and low) simultaneously from one tube, the Straton® tube assembly generates a prefiltered X-ray beam before it reaches the patient. Due to additional filtration, this technique requires high tube power reserves that are available on Siemens CT scanners with the Straton tube.

TwinBeam Dual Energy is an innovative, high-end approach that allows simultaneous acquisition of high and low kV datasets in a single spiral scan mode. Image acquisition is possible for all rotation times. High and low energy image series are reconstructed separately. Composed reconstruction delivers a single energy image dataset using the full information by directly combining the low and high energy data from the detector. With the full number of projections available for both spectra, there is no compromise on image quality.

### Routine-ready workflow

TwinBeam Dual Energy in combination with FAST DE Results paves the way for Dual Energy in clinical routine. As part of an advanced workflow, FAST DE Results generates Dual Energy datasets at the acquisition workplace with results sent directly to the reading environment for a straightforward workflow that delivers advanced diagnostic information.

Available applications for FAST DE Results are:

- DE Monoenergetic (40 keV, 50 keV, 70 keV, 100 keV, 120 keV, 140 keV, 190 keV)
- DE Mixed images
- DE Iodine overlay image
- DE VNC image
- DE Iodine + VNC

FAST DE Results is as easy as selecting a recon job and will enhance your daily workflow significantly.

## 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 fluoroscopic interventional procedures such as drainage, biopsies or pain therapy. It also allows for switching scan modes between sequential to spiral mode on the fly during CT intervention. It contains: 2D Basic interventions, i-Sequence mode with HandCARE, 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

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<p>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.</p> <p>i-Control CT</p> <p>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*</p> <p>Documentation: Images are stored in file system for easy filming and archiving.</p> <p>Foot switch for radiation release (x-ray).</p> <p>* Optional</p>
<p>Mobile trolley for accommodation and safe installation of the i-control CT module</p>
<p>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</p> <p>The dual monitor ceiling support consists of: a Ceiling support with installation kit and voltage supply.</p> <p>Available for room heights (unfinished concrete floor) from 2600mm to 3700mm.</p> <p>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.</p>
<p>DoseMAP is exists of the three parts. These three parts in combination with each other deliver a complete and comprehensive dose management.</p> <p><b>Report Dose:</b> Create transparency and document dose values.</p> <ul style="list-style-type: none"> <li>- <u>DICOM SR Dose Reports:</u> DICOM structured file allows for the extraction of dose values (CDTIvol, DLP)</li> <li>- <u>DoseLogs:</u> Whenever a limit exceeds of the set up reference dose levels (Dose Notification and Dose Alert) automatically a report is created on the system. The report can for example be used for audit purposes.</li> </ul> <p><b>Analyze Dose:</b> Assess the dose situation.</p> <ul style="list-style-type: none"> <li>- <u>CARE Analytics:</u> makes it possible to set a query and retrieve DICOM SR Dose Reports. With CARE Analytics it is possible 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.</li> <li>- <u>CARE Dashboard:</u> Pre-examination dose check-up by showing an overview of all the used dose reduction features per scan.</li> <li>- <u>CARE Profile:</u> Pre-examination dose check-up by displaying the dose distribution prior to the scan at every z-position.</li> </ul> <p><b>Protect Dose:</b> Manage access to protocols and potentially protect patients from over-radiation</p>

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<p>- <u>Access protection</u>: 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.</p> <p>- <u>Dose Notification and Dose Alert</u>: 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.</p>
<p>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.</p> <p>CARE Child consists of:</p> <ul style="list-style-type: none"> <li>- dedicated 70 kV scan modes</li> <li>- new CARE Dose4D curves for children</li> <li>- respective Children Protocol utilizing these features</li> </ul>
<p>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.</p>
<p>The option supports adaptive prospective ECG-triggered sequence scanning and adaptive retrospective ECG-gated spiral scanning to obtain CT images of the heart in defined phased of the cardiac cycle at a minimum rotation time of 0.28 s (optional). With prospective ECG-triggered sequence scanning, quick scans are triggered by ECG signals. A temporal resolution of up to 142 ms can be achieved. Retrospective gating is based on a continuous spiral scan with simultaneous ECG recording. The cardio spiral reconstruction allows volume imaging in selectable phases of the cardiac cycle.</p> <p>With retrospective ECG-gated spiral scans the ECG signal can be edited for improved image quality in the case of severe arrhythmia. A dedicated "Preview" tool enables the planning of the volume reconstruction during an optimal cardiac phase on the basis of axial single slices. With ECG-pulsed control of the tube current a dose reduction of approx. 50% can be achieved with retrospective ECG-gated spiral scans. The special scan protocols "Cardio-Care" and "Cardio-Sharp" offer a special filter technique for cardiac examinations for improved sharpness and a lower dose.</p> <p>ECG-controlled imaging techniques are the basis for both the quantification of calcified plaques in the coronary arteries (calcium scoring) and 3D reconstructions of the heart and coronary arteries in contrast media studies (CT angiography of the heart). Retrospective ECG gating also allows functional imaging of the heart. Moreover, these techniques suppress pulsation or motion artifacts in the lung and in vessels close to the heart (e.g. ascending aorta). The ECG signal is supplied by an ECG device integrated in the gantry.</p>
<p>Adaptive 4D Spiral applies a continuously repeated bi-directional table movement, moving the patient smoothly in and out of the gantry over the desired scan range. In stroke assessment, it provides the information not just for a limited section of the disease, but for the whole brain. It assures a reliable assessment of the type and extent of cerebral perfusion disturbances. In addition, it allows to perform perfusion studies over the entire organ in both head and body. Enabling to assess the entire extent of the disease and visualize the function of potential metastasis. Finally it enables the visualization and evaluation of complex intracranial vascular structures in separate phases. Arterial and venous phase are captured in a single scan, but can then also be evaluated separately. So you're able to not only delineate aneurysms and other vascular diseases, but also to exclude occlusions of the aortic vessels and assess venous thrombosis.</p>
<p>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.</p> <p>Iterative reconstruction approaches allow decoupling of spatial resolution and image noise.</p> <p>With the next generation of iterative reconstruction, ADMIRE (Advanced Modeled Iterative REconstruction)</p>

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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 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.

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.

FAST Spine provides various modes that automatically create anatomically orientated spine reconstructions based on a 3D volume. It provides an easier, faster and standardized workflow in CT scanning. FAST Spine features

<p><b>Description</b></p> <p>automatic segmentation of the spinal canal, automatic labeling of the vertebrae, anatomically oriented slices – (orthogonal to the spinal canal), coronal and sagittal reconstructions which refer to the curvature of the spinal column and more. All modes offer the possibility to adapt the results manually.</p> <p>FAST Spine requires Workstream 4D.</p>
<p>FAST 3D Align automatically corrects misalignment of anatomic structures, organs of the patient. It aligns those to fit it to the selected reconstruction plane for a highly automated reconstruction workflow. Additionally it minimizes the black area in the image through automatically adjusts recon field of view selection.</p> <p>FAST 3D Align requires Workstream 4D.</p>
<ul style="list-style-type: none"> <li>- Reliable assessment of the type and extent of cerebral perfusion disturbances.</li> <li>- Simple and easy workflow with automatic reference vessel and automatic midline identification.</li> <li>- New: Auto-Stroke Functionality for automated display of all perfusion parameters within seconds</li> <li>- 3D analysis of all perfusion data</li> <li>- New automated guided workflow with automatic quantification of Cerebral Blood Flow (CBF), Cerebral Blood Volume (CBV), Time To Peak (TTP) and Mean Transit Time (MTT) parameters.</li> <li>- Integrated automated 3 dimensional assessment of infarcted tissue and tissue at risk.</li> <li>- Overview of all perfusion parameters in one window set (CBF, CBV, MTT, TTP)</li> <li>- Integrated automated motion correction enhance the ability of data evaluation in uncooperative patients</li> </ul> <p><b>Brain Tumor Evaluation</b></p> <p>Fully automated <i>syngo</i> Volume Perfusion CT facilitates quantitative 3D evaluation of brain tumors.</p> <ul style="list-style-type: none"> <li>- Visualization and evaluation of vascular leakage in 3 D</li> <li>- Dedicated 3D blood-brain-barrier imaging</li> <li>- Enhance the ability to grade tumors</li> <li>- Plan biopsies and monitor therapy</li> </ul> <p>The application computes a bone subtracted volume dataset maintaining all information about vascular and soft tissue structures for further processing. The result of the application is a new CTA volume without bones but maintaining all other information for further processing in the Neuro DSA (Digital Subtraction Angiography) CT application or any other suitable application.</p> <p><b>Workflow</b></p> <ul style="list-style-type: none"> <li>- The completely automated algorithm makes this application easy to use</li> <li>- The NECT dataset can either be reconstructed from a standard spiral CT scan acquired for diagnostic purposes or from an additional low dose NECT scan</li> <li>- CTA dataset will be loaded first, followed by either a volume dataset without contrast media (NECT) or a calculated dataset (Neuro DSA dataset)</li> <li>- Calculation subtracts both scans</li> <li>- During evaluation, toggling between CTA dataset and Neuro DSA dataset is possible</li> </ul> <p><b>Image display</b></p> <ul style="list-style-type: none"> <li>- Display settings in VRT and MPR modes (thick and thin MPR, MIP, thin MIP) are supported</li> </ul> <p><b>Documentation</b></p> <ul style="list-style-type: none"> <li>- <i>syngo</i> filming and saving can be used to save result images in the database.</li> <li>-</li> </ul> <p><i>syngo</i> Volume Perfusion CT Body offers:</p> <ul style="list-style-type: none"> <li>- Fast simultaneous 3 dimensional calculation of: <ul style="list-style-type: none"> <li>- Blood Flow image</li> </ul> </li> </ul>

## Description

- Blood Volume image
- Permeability image for organs and lesions
- Various optional parameter images.
- Automated motion correction for improved accurate anatomical object alignment.
- Predefined evaluation settings for different organs.
- Specific evaluation protocols for liver perfusion.
- Organ specific guided workflow.
- Optimized 3 dimensional color display of perfusion parameter images including image type dependent multislice windowing
- Composite images allowing a merged display of an anatomical image with a color parameter display in the target ROI
- ROI measurement with calculation tools of mean value and standard deviation for detailed analysis of perfusion changes

### Documentation

- Storage of all result images in the database
- Direct copy to filming

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

Integrated Electrical Cabinet/Main Disconnect Panel for Definition AS and Definition Edge products.

Components supplied:

- IEC Main Disconnect Panel
- The Installation, Operations and Service Manual
- 4 sets of Emergency Power Off push buttons

DOES NOT INCLUDE installation. Customer is responsible for the installation of the cabinet. Includes one year warranty. Service provided by Siemens.

This panel incorporates several features desirable for system installations to minimize down time, protect the CT and Chiller electronics, and to reduce operational delays after a power outage. The panel has a main circuit breaker, Q1 with individual branch breakers for the CT and various cooling options. Additionally, the IEC provides protection for a Flow Heater circuit and Heat Exchanger, as well as a connection for a System Surge suppressor. When the main circuit breaker is turned off, all power circuits within the panel will be de-energized.

The CT power is protected by an electronic circuit breaker, Q2, and is controlled by a contactor, K2. Q2 also provides the disconnect means to lock-out and tag-out (LOTO) the CT power circuit for maintenance purposes. The contactor will open with any loss of power or by pressing any Emergency Power Off (EPO) pushbutton. The K2 contactor control circuit is factory configured to automatically reenergize the CT upon restoration of facilities power. The control circuit may be re-configured to require the operator to manually restart the CT once the incoming power has been restored. This protects the sensitive electronic circuits of the CT from sags and surges that immediately follow power loss from blackouts, storms, utility reclosure operations, and out of phase automatic transfer switch operations.

The Chiller Loads are protected by an electronic circuit breaker, Q3. Q3 also provides the disconnect and lock-out and tag-out (LOTO) means for the Chiller power circuit for maintenance purposes.

The optional Flow Heater is connected directly to circuit breaker Q4, the optional Surge Suppressor is connected to Q5 and the optional Heat Exchanger is connected to Q6. Unless Q1 is turned off, these loads will always be on, and may only be de-energized from inside the IEC panel.

The control circuits are low voltage 24 VDC and are fully powered from within the panel. The restart functionality and EPO circuitry is controlled with a safety relay, K10. See page 13 for detail.

The white SAFETIES OK indicator light on the front of the panel is illuminated when none of the EPOs are

## Description

pressed. When the white light is active, pressing the green START pushbutton will cause the CT system to be energized. The green START button will illuminate, and the white SAFETIES OK light will go off. Pressing the STOP button will de-energize the CT system. Any EPO pressed while the CT system is energized will result in the immediate de-energizing of the CT system.

If an EPO is pressed at any time, the EPO must be reset which will cause the SAFETIES OK light to activate. Then the START button will activate the CT system.

### IMPORTANT:

If building power is removed from the panel while the CT system is energized, the CT system will reenergize when building power is restored without any human interaction.

Panel Dimensions: 36 in x 30 in x 9.1 in (H x W x D)

Weight: 157 pounds

This product is certified for OSHPD sites.

## Lung Imaging

This SOMATOM Definition scanner offers two specific scan protocols to provide Lung Imaging at 1.3 mGy CTDI or greater and for use with post-processing applications

**LungLowDose** Uses CARE Dose 4D in conjunction with CARE kV and adaptive dose shield to provide imaging of the lung with a default scanner protocol set at 1.3 mGy CTDI. This protocol provides images from .6 mm and are acquired using .6 mm collimation and a z-sharp mm of 128X0.6 mm off. Default settings of a reference kVp of 120 and quality Reference mAs of 20 with rotation speed of .50 are used to achieve this dose. This protocol is set using a Kernel of B70f, B31F and B70F for axial viewing.

**LungCARE** Uses CARE Dose 4D in conjunction with CARE kV and adaptive dose shield to provide imaging of the lung with a default scanner protocol set at 1.3 mGy CTDI. This protocol provides images from .6 mm and are acquired using .6 mm collimation and a z-sharp mm of 128X0.6 mm off. Default settings of a reference kVp of 120 and quality Reference mAs of 20 with rotation speed of .50 are used to achieve this dose. This protocol is set using a Kernel of B80f, B31F and B60f to be automatically transferred and post-processed on a Siemens workstation.