

SHIP TO: WAREHOUSE (MONTG)  
V.A. Medical Center  
215 PERRY HILL RD  
MONTGOMERY, AL 36109-3798

REQUISITION: 619-B92002

**Qty**

**Item Description**

1

**SOMATOM Drive**

The SOMATOM Drive contains two new Straton MX Sigma tubes and Sigma generators to boost the power and enable an industry standard of low kV imaging with a significant step towards personalization with 10kV steps. Both tubes can be used with Tin Filters, for further dose reduction in non-contrast imaging and lung cancer screening.

This is in conjunction with two StellarInfinity Detectors & Integrated IR (Iterative Reconstruction), including key technologies TrueSignal and Edge Technology, the SOMATOM Drive routinely generates ultra-thin 0.5 mm slices e.g. for most accurate stenosis, plaque and stent analysis.

Available with 75 ms temporal resolution, faster than any conventional CT on the market, providing whole organ dynamic imaging and routine true Dual Energy scans.

All this power and precision is backed by three key technology areas-

DistinCT Imaging: focused on providing the most specific parameters for best quality and lowest dose for each individual patient regardless of circumstances that they are in.

DistinCT Reading: focused on providing the quickest access to all diagnostic images regardless of the time of day, number of patients or the advanced nature of a study.

DistinCT Function: focused on providing access to more quantitative data to enhance patient diagnosis and treatment outcomes.

SOMATOM Drive - provides the capabilities to "Drive Precision for all" patients.

1

**Cooling System Water/Air #split**

Water-to-air heat exchanger for the dissipation (to the air outside) of heat, generated in the gantry.

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**Trafo for cooling system water/air**

For adequate power consumption the chiller system may need an additional transformer: If the electrical connection to be used can not provide either 400V at 50Hz or 460V at 60Hz this transformer is needed.

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**Service Switch**

Service switch to shut off the outdoor cooling unit for maintenance or in case of emergency

Qty	Item Description
1	<p><b>Multi-purpose table</b></p> <p>The Multi-Purpose table is especially designed for multi-disciplinary use, while still enabling ultra-fast spiral scanning up to 458 mm/s. Its flexible design allows exchange of table tops for routine radiology, Trauma or bariatric use. Table load capacity up to 307 kg / 676 lbs. with bariatric table top (High Capacity Patient &amp; Trauma Table Top). Physiological Measurement Module included.</p>
1	<p><b>Mat for MPT Standard Table Top</b></p> <p>Replacement for the positioning mattress for Standard Multi Purpose Table Top</p>
1	<p><b>High Cap. Patient &amp; Trauma Tab.Top</b></p> <p>The high capacity and trauma table top offers the capability to support up to 307 kg/676 lbs of patient weight. It allows easy positioning and transfer from and to the table, due to its flat surface. Special accessories and an extended table top width of 530 mm ensure a safe and comfortable positioning for obese patients.</p>
1	<p><b>High Cap. Patient &amp; Trauma Acc Kit</b></p> <p>The High capacity and Trauma accessory kit contains additional Patient restraint set with a width of 400mm and additional table extensions for feet and head.</p>
1	<p><b>Mattress for Bariatric Table Top</b></p> <p>This mat is used for scanning non-bariatric patients on the flat, bariatric table top. Placing this mat on the bariatric table top eliminates the need to exchange the table top when non-bariatric patients are scanned. This mat has a curved profile and enables comfortable positioning of non-bariatric patients.</p>
1	<p><b>Advanced radiotranslucent ECG ext.</b></p> <p>A dedicated advanced radio translucent ECG (Electrocardiogram) extension to be used for state-of-the-art ECG cardiac scanning without compromises. These carbon fiber extensions are designed for metal artifact-free cardiac imaging especially for small children and babies.</p>
1	<p><b>CT Replacement Drive</b></p> <p>Conversion to Siemens SOMATOM Drive.</p>
1	<p><b>FAST IRS</b></p> <p>FAST reconstruction computer for the preprocessing and reconstruction of the CT raw data. The reconstruction computer contains a cluster of high-performance GPU boards performing the preprocessing and reconstruction of the CT data.</p>
1	<p><b>DistinCT Imaging</b></p> <p>We combine our market leading applications to make this the most Distinct scanner for our customers. Including SureView, Flash Spiral, Dual Adaptive Dose Shields, CARE Dose 4D, CARE kV, CARE Child, CARE Profile, CARE Dashboard, CARE Bolus, Dose MAP, FAST Adjust, XXL Mode 2cm and ADMIRE.</p>
1	<p><b>DistinCT Imaging - Advanced</b></p> <p>We combine the unique features of the SOMATOM Drive, to push the most distinct CT scanner to its maximum potential, including the full power of the Straton MX Sigma tube - DistinCT - Sigma High Power including, High Power 70 and High Power 80, Dual Power 4cm, 10kV Steps, X-CARE and CARE Contrast III. Additionally Tin Filter scanning allows reaching new levels in low dose non-contrast scans.</p>
1	<p><b>DistinCT Reading</b></p> <p>We combine our market leading applications to make reporting consistent, fast and simple for our customers. Includes VRT, Workstream 4D and Extended FoV.</p>
1	<p><b>DistinCT Reading - Advanced</b></p> <p>We combine our advanced applications to make reporting of complex and atypical anatomical structures faster and simpler.</p> <p>Includes iMAR for anatomically driven metal artifact reduction, combines three successful approaches (beam hardening correction, normalized sinogram inpainting and frequency split).</p>

Qty	Item Description
1	<p>This allows to reduce metal artifacts caused by metal implants.</p> <p>FAST Spine, providing anatomically aligned preparation of spine recons with just a single click.</p> <p>HD FoV Pro, special reconstruction algorithms allow for visualization of objects using a FoV up to the bore size with an image quality suited for radiation therapy planning.zUHR for functionality improved spatial resolution.</p>
1	<p><b>DistinCT Function - Cardiac</b></p> <p>Cardiac scanning options to enable the simple to use, routine cardiac CTA and calcium scoring workflows, including beta blocker independent scanning, one heart beat scanning and flex scanning to enable functional imaging at low doses. Includes: Heart View, Cardio Best Phase Plus and syngo Calcium Scoring CT.</p>
1	<p><b>Rear cover incl. Touch Panels</b></p> <p>Standard CT rear gantry cover, including two Touch Panels, for additional access to the positioning of the patient from both sides of the gantry.</p>
1	<p><b>Advanced Applications</b></p> <p>We combine our market leading applications to make positioning simple for our customers.</p> <p>FAST Topo - enables faster scan speeds in topograms, which minimizes breath-hold artifacts. It also has the potential to decrease the topogram dose.</p> <p>FAST Planning - assists 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>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 by automatically adjusting the recon field of view.</p> <p>FAST 3D Align works in combination with Workstream 4D.</p>
1	<p><b>Ring Light</b></p> <p>SOMATOM Drive offers a gantry ring mood light (LED) in different, preset, adjustable colors. Designed not only for aesthetics, they can be used to help create a relaxing atmosphere for your patients.</p>
1	<p><b>Head Holder</b></p> <p>Head holder for the fixation of the patient's head in combination with the cushion set.</p>
1	<p><b>Head-Arm Rest</b></p> <p>This head-arm rest allows placing the head and the arm of trauma patients and even unconscious patients reliably for CT scanning. It is very useful in emergency rooms, e.g. for whole body scans, as it extends the scan range by about 30 cm. It can be placed in the standard Multipurpose Table accessory holder.</p>
1	<p><b>Patient Restraint 400 mm</b></p> <p>400 mm wide restraint strap for the safe positioning of even obese patients on the patient table.</p>
1	<p><b>Computer Desk, height adjust 110V</b></p> <p>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.</p>

Qty	Item Description
1	<p data-bbox="397 394 633 426"><b>Computer Cabinet</b></p> <p data-bbox="397 426 1294 478">New cabinet to accommodate the computer system and UPS. Matched to the design of the control console table.</p> <p data-bbox="397 478 552 510">Width: 800 mm,</p> <p data-bbox="397 510 552 541">Depth: 800 mm,</p> <p data-bbox="397 541 552 562">Height: 720 mm</p>
1	<p data-bbox="397 583 698 615"><b>Additional User Manual</b></p> <p data-bbox="397 615 1294 667">Commonly utilized where one manual is used for training purposes and the other is kept as a record.</p>
1	<p data-bbox="397 688 706 720"><b>CT Project Management</b></p> <p data-bbox="397 720 1294 867">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 data-bbox="397 888 868 919"><b>CT Standard Rigging and Installation</b></p> <p data-bbox="397 919 1153 951">This quotation includes standard rigging and installation of your CT new system.</p> <p data-bbox="397 972 1294 1024">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 data-bbox="397 1024 1294 1077">It remains the responsibility of the Customer to prepare the room in accordance with the SIEMENS planning documents.</p> <p data-bbox="397 1077 1294 1150">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 data-bbox="397 1150 1294 1213">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 data-bbox="397 1234 747 1266"><b>Initial onsite training 32 hrs</b></p> <p data-bbox="397 1266 1294 1434">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 data-bbox="397 1455 885 1486"><b>Initial onsite training 32 hrs GovOffset</b></p>
1	<p data-bbox="397 1507 836 1539"><b>Additional onsite training 32 hours</b></p> <p data-bbox="397 1539 1294 1686">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 data-bbox="397 1707 950 1738"><b>teampay Welcome &amp; Registration Package</b></p> <p data-bbox="397 1738 1294 1864">teampay 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 charge, and may be used thereafter on a subscription fee basis.</p> <p data-bbox="397 1864 1031 1896">To register: <a href="http://teampay.siemens.com/#/institutionRegistration/1">http://teampay.siemens.com/#/institutionRegistration/1</a></p>
1	<p data-bbox="397 1917 787 1948"><b>Surge Protective Device (SPD)</b></p>

Qty	Item Description
1	<b>Riedel Chiller Start-up by SBT</b>
2	<p data-bbox="397 443 532 464"><b>CT Slicker</b></p> <p data-bbox="397 474 1294 548">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.</p> <p data-bbox="397 558 1294 621">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.</p> <p data-bbox="397 663 808 684">Includes warranty from RADSCAN Medical.</p>
1	<b>Low Contrast CT Phantom &amp; Holder</b>
1	<p data-bbox="397 758 841 779"><b>Standard UPS for SOMATOM Drive</b></p> <p data-bbox="397 789 1294 884">The standard partial system uninterruptible power supply (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>
1	<p data-bbox="397 909 574 930"><b>Lung Imaging</b></p> <p data-bbox="397 940 1294 1087">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 data-bbox="397 1119 1294 1266">The SOMATOM Drive CT is indicated for use in low dose lung cancer screening for high risk populations*. The Drive is delivered with two specific scan protocols to provide low dose lung cancer screening exams at approximately 0.33 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 data-bbox="397 1297 829 1325">*As defined by professional medical societies.</p>
1	<p data-bbox="397 1350 634 1371"><b>Access Protection</b></p> <p data-bbox="397 1381 1294 1430">Scan Protocols are password protected allowing only authorized staff members to access and permanently change protocols</p>
1	<p data-bbox="397 1455 675 1476"><b>Adaptive Dose Shield</b></p> <p data-bbox="397 1497 1243 1518">Adaptive Dose Shield for spiral acquisition to eliminate pre- and post-spiral over-radiation.</p>
1	<p data-bbox="397 1543 602 1564"><b>CARE Analytics</b></p> <p data-bbox="397 1575 1294 1623">Stand-alone tool, for installation in any PC in the hospital network, allowing evaluation of DICOM dose Structured Reports (DICOM SR)</p>
1	<p data-bbox="397 1648 623 1669"><b>CARE Dashboard</b></p> <p data-bbox="397 1680 1294 1728">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</p>
1	<p data-bbox="397 1753 581 1774"><b>CARE Dose4D</b></p> <p data-bbox="397 1785 1294 1854">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</p>
1	<p data-bbox="397 1879 716 1900"><b>CARE Dose Configurator</b></p> <p data-bbox="397 1911 1294 1959">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</p>

Qty	Item Description
1	<p>habitus allowing to adjust the configuration even more precisely to the patient's anatomy.</p> <p><b>CARE kV</b></p> <p>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%.</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>CARE Profile</b></p> <p>CARE Profile: Visualization of the dose distribution along the topogram prior to the scan</p>
1	<p><b>DICOM SR Dose Reports</b></p> <p>DICOM structured file allows for the extraction of dose values (CTDIvol, DLP)</p>
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>Dose Alert</b></p> <p>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.</p>
1	<p><b>Dose Notification</b></p> <p>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.</p>
1	<p><b>FAST Adjust</b></p> <p>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 Adjust button. The limits for scan time and tube current per scan are defined via the Scan Protocol Assistant. FAST Adjust offers an undo functionality to return to previously set values.</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>NEMA_XR-29 Standard</b></p> <p>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.</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>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>

**Qty**

**Item Description**

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**SOMATOM Drive System Complimentary Biomed Training**

This educational offering includes system training tuition for 1 clinical engineering professional on the SOMATOM Drive and the syngo multimodality workstation as applicable. The training curriculum depends on and is limited to the system purchased and may include multiple courses including classroom training in USA or an international site, and/or virtual and web-based training. Additional modality basics training may be required as a prerequisite to these courses and must be purchased separately. This system training includes a 15% discount. Travel and lodging are not included. This educational offering must be completed by the later of (12) months from purchase or install end date; if training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund. This forfeiture does not apply to Federal government agencies.

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

Project # 2016-1953 Toshiba Aquillion 64, expiration date/deinstall date 2/2020 (

Offset SOMATOM Drive System Complimentary Biomed Training (

Offset Part 1447340 Additional User Manual (

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**OPTIONS**

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Qty	Item Description
1	<b>CT Hands-On Wrkshp at Customer Facility</b> This (4) hour customized workshop will take place onsite at the customer's facility and will be facilitated by Siemens Clinical Education Specialists. Through the use of didactic and/or hands-on training attendees will be able to increase their knowledge and skills to help improve their clinical practice. Workshop must be scheduled consecutively (Monday - Friday) during standard business hours. This educational offering must be completed (12) months from date of purchase order. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	<b>AddL 4 HR Hands-On Wkshp at Cust Facil</b> This additional (4) hour customized workshop for customers, to be delivered consecutively with the initial workshop purchase, will take place onsite at the customer's facility or designated facility and will be facilitated by Siemens Clinical Education Specialists. Through the use of didactic and/or hands-on training attendees will be able to increase their knowledge and skills to help improve their clinical practice. Workshop must be scheduled consecutively (Monday - Friday) during standard business hours. This educational offering must be completed by the later of (12) months from purchase or install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	<b>Stellant D Dual Ceiling w/Certegra WS</b> Stellant D Dual Ceiling mounted with Certegra Workstation NO Informatics. Short ceiling post - 580 mm.  Other ceiling post lengths are available (different part numbers): 850 mm and 1000 mm.  Includes Stellant D, Dual Head, ceiling mounted injector; Certegra workstation; installation and warranty through Medrad.

# Detailed Technical Specifications

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## Description

The SOMATOM Drive contains two Straton MX Sigma tubes, both capable of being equipped with Tin Filters. The tube, with its unique copper backed anode (0MHU heat dissipation) and advanced Electrostatic focusing, has the unique High Power 70 and High Power 80, which boosts the power available in industry standard low kV imaging. The MX Sigma is in a tight ecosystem with the Sigma Generator, enabling the significant step towards 10kV steps, further improving the dose precision of the system.

This is in conjunction with two Stellar<sup>Infinity</sup> Detectors & Integrated IR (Iterative Reconstruction), and including key technologies, TrueSignal and Edge Technology, both of which enable CT imaging to go where it has never gone before, by routinely generating ultra-thin 0.5 mm slices. e.g. for most accurate stenosis, plaque and stent analysis.

All this power and accuracy is placed in combination with the Siemens unique DistinCT Imaging technologies, including CARE Dose 4D and CARE kV, to enable the SOMATOM Drive to achieve significantly low dose for all scans and patient types at a widely sought after image impression and quality.

DistinCT Imaging technology concentrates on those CT parameters and requirements that are directly affected by the patient and clinical question. This leads to a distinct set of parameters for each patient enabling them to receive the best dose and image quality required.

DistinCT Reading concentrates on the individual requirements of the reading physician and simplifies time-consuming/complex post processing procedures for more user independent reproducibility, leading to fast and consistent results.

DistinCT Function provides access to the key building blocks of advanced medical imaging, with quantification a key to diagnostics and treatment outcomes. Dual Energy is supported by many years of research and is routinely available for daily imaging. It not only automatically provides a second contrast without any extra dose, but it is able to improve quantification of change in oncology and other key clinical fields.

Cardiac Imaging benefits directly from a 75ms true in-plane temporal resolution, enabled by Siemens unique Dual Source capabilities. Advanced dynamic imaging studies, including but not exclusive to perfusion is advanced by the 48cm dynamic range of the SOMATOM Drive, which can be performed at low kV due to the power of the system.

SOMATOM Drive - provides the capabilities to "Drive Precision for all" patients with:

- Routine thorax and cardiac scanning below at sub mSv, without the need to apply heart rate control.
- Single range, superfast Thorax/Heart/Abdomen (triple rule out) without need for breath hold instructions
- Pediatric patients without the need for sedation
- Patients with metal implants, removing artifacts with iMAR, which is also boosted in combination with Dual Energy Monoenergetic
- 75 ms temporal resolution for all heart rates (even in atrial fibrillation)
- whole organ coverage using Adaptive 4D Spiral at low kVs
- routine capable True Dual Energy scans - quantitative dynamic myocardial stress perfusion and Dual Energy single phase perfusion.
- obese patients up to 307 kg/676lbs (opt.) with 78 cm bore and 2 x 100kW
- Integrated Iterative Recon at a clinically proven fast recon speed

With the new SOMATOM Drive, healthcare innovation leader, Siemens, drives precision in core routine medical imaging, for all patients, situations and our future as partners.

The SOMATOM Drive is founded on Siemens own, second series of Dual Source architecture, with Flash-Spiral scanning up to 458 mm/s, high precision z-Sharp Technology, Dual Energy with Tin Filters and a range of proven dose CARE solutions from X-CARE to the Adaptive Dose Shield.

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## Description

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Using Siemens' z-Sharp technology the SOMATOM Drive can provide the fastest sub-millimeter volume coverage at industry's highest spatial resolution. The rotation time of 0.28 seconds delivers excellent temporal resolution up to 75 ms independent from the heart rate and which is inherent in all Flash-Spiral protocols.

The SOMATOM Drive, we Drive Precision for all patients without compromising on patient dose or comfort, with the speed to cover the entire thorax in less than a second - providing motion free images even without a breath hold.

Typical (6ft, 183cm) whole-body scanning requires less than 4 seconds from head to toe.

Pediatric scans become sub-second procedures.

Perfusion or dynamic vascular imaging long-range scans become applicable in routine

The SOMATOM Drive is also the solution for precisely scanning the unexpected, unplanned and uncontrollable patients i.e. obese and trauma patients, restless patients, unconscious or uncooperative patients, patients who cannot hold their breath or patients that are deaf, or patients with an uncontrollable heart. Maintaining image quality in these situations is paramount, and performing these without additional lengthy preparations, reduces time-consuming interruptions to your daily practice.

### The SOMATOM Drive - System Overview

#### Drive Gantry with Touch Panels (our advanced User- Machine Interface)

The SOMATOM Drive gantry introduces the clinically routine, software-integrated Touch Panel system. These Touch Panels allow user operation of the machine on the level of the patient, including ECG trace detection on all four sides of the scanner (rear panel optional). The unique software integration allows for expansion of functionality of the system, initiating a solid growth potential with the user-machine functionality.

The 78 cm large bore, the 200 cm scan range - with patient weight up to 307 kg (676 lbs) (opt.) - and the 200 kW generator power, it can provide high quality scanning of patients of all sizes or conditions. Its ultrafast rotation time of 0.28 sec leads to true acquired 75 ms temporal resolution to freeze any cardiac motion even in high and irregular heart rates. The SOMATOM Drive continues to support the superfast Flash-Spiral mode acquisitions of 2 x 128 x 0.6 mm, which allows for scan speeds up to 458 mm/s

#### Straton MX Sigma tubes with z-Sharp Technology

The two Straton MX Sigmas provide direct oil cooling of the copper backed anode, eliminating the need for heat storage capacity (0 MHU). The resulting small and compact design (120 mm diameter) enables an unprecedented cooling rate of 7.3 MHU/min as well as the reliable performance when operating two x-ray sources at an ultrafast rotation time of 0.28 sec. With its unique XDC (X-Ray Deflection Control) the Straton MX Sigma in combination with the Sigma Generator, introduces High Power 70 & High Power 80, providing the much needed power at low kV.

Utilizing the Flash-Spiral scanning technology in combination with Siemens' own z-Sharp Technology it routinely enables the industry's highest isotropic, scan field position and pitch independent (SUREView) spatial resolution. This allows a highly beneficial combination of exceptional image detail and unmatched sub-millimeter volume coverage of 458 mm/sec enabling whole body examinations within sub-seconds and seconds, without the need for breath hold.

SOMATOM Drive is a powerful yet highly balanced system, with super-fast speed and yet the power to achieve low kVs, both at the same time.

#### Stellar<sup>infinity</sup> Detector with Integrated IR

The Stellar<sup>infinity</sup> Detector in the SOMATOM Drive utilizes the most advanced manufacturing processes. Combining Siemens fully-integrated detector modules, it is designed to minimize electronic noise in conjunction with Siemens' innovative TrueSignal Technology, which minimizes electronic noise, cross-talk and helps to significantly improve the signal-to-noise-ratio (SNR). In combination with Siemens' proprietary UFC (Ultra-Fast Ceramics) scintillator the SOMATOM Drive acquires 2 x 128 slices per rotation at outstanding dose efficiency.

By further applying Edge Technology the spatial resolution can now be increased to an unprecedented 0.30 mm in daily clinical routine.

With the latest Infinity module we have integrated our IR (iterative Reconstruction) software processing, to multiply the potential of both hardware and software developments.

In combination with z-UHR (optional), it delivers a spatial resolution of 0.24 mm voxel size, allowing you to visualize extremely small anatomical structures with exceptional quality, for example the complex inner-ear bones,

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## Description

outstanding fine details of the coronary tree or intracranial, pulmonary, mesenteric, renal and peripheral vessels. It also helps to perform accurate stenosis measurements or stent planning with outstanding precision.

### Sigma Power Generator

Utilizing the unmatched precision of the Analog to Digital High Voltage Control the Sigma Generator power of up to 2 x 100 kW delivers highly precise, maximized resources for every clinical challenge. The tight ecosystem with the Straton MX Sigma tube enables the precision required for 10kV steps and High Power 70 & 80, and thus helps to acquire exceptional image quality for all.

### Clinical Applications

The SOMATOM Drive builds on the architecture of the second generation of Siemens Dual Source imaging, proven by more than 1000 installations worldwide and a wide range of clinical publications. With the Tin Filters and a large field of view (500 mm FOV visual, 330 mm full Dual Energy FOV), it offers very wide spectral energy separation and 80/Sn140 kV as well as 100/Sn140 kV modes to enable routine Dual Energy for all patients.

### Adaptive 4D Spiral

The unique Adaptive 4D Spiral scan mode (optional) enhances the SOMATOM Drive by providing a significant dynamic coverage, up to 48 cm or 18.89", for advanced dynamic and perfusion imaging which is incomparable to using a static detector. 3D Interventional Suite

In addition the SOMATOM Drive optionally offers a built in 3D minimal invasive suite, enabling 3D guided interventions with full control of the radiologist due to the new wireless and wired in-room controls.

### Neuro BestContrast

Neuro head image quality is optimized with Neuro BestContrast, by providing an optimization of grey/white matter differentiation without increase in radiation dose.

### HeartView

HeartView allows reliable scanning at all heart rates - even highest and irregular heart rates (atrial fibrillation), e.g. in acute chest pain evaluation, in coronary visualization, dynamic myocardial stress perfusion imaging and in functional analysis of the heart.

### Heart Perfusion (dynamic, stress, quantitative)

Heart Perfusion mode, for quantitative, dynamic myocardial stress perfusion imaging, is a sequence shuttle mode to dynamically cover up to approximately twice the detector width for myocardial perfusion studies with sufficient temporal resolution of 75 ms even for high heart rates. For a heart rate of 63 beats per minute or less every single heartbeat and for a heart rate of greater than 63 beats per minute every second heartbeat, images were acquired. This it provides sufficient temporal resolution even for high heart rates.

### SOMATOM Drive

System specification in detail

#### 1. System Gantry and Detector:

Aperture: 78 cm; power supplied via low-voltage slip ring.

Patient Table: Standard table (200 cm) or Multi-purpose table (opt.) are available. The standard table consists of:

- Motor-driven table height adjustment from min. 48 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
- Control elements on both sides on the front and rear panel of the gantry
- Table height can be controlled alternatively by means of foot switch (2 each on both sides of the patient table)
- Max. table load: 227 kg/500 lbs (optional 307kg/676lbs)
- Table feed speed: 2-458 mm/s

## Description

- Distance between gantry front and table base 40 cm, e.g. for convenient positioning of a mobile C-arm between gantry and table or for convenient access during CT-intervention.
- Positioning aids: Positioning mattress, mattress protector, head-arm support (inclusive cushion), 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 with positioning mattress, knee-leg support
- Optional Foot Pedals, available for high capacity table, conveniently allow table lifting and lowering from various positions
- Optional Multi-purpose table: Additional exchangeable table tops for High- capacity patient and trauma table top; RTP table top
- In the case of emergency stop or power failure, the tabletop can also be moved manually in horizontal direction

Scanning system: Adaptive Array Detector (AAD) systems based on UFC (ultra-fast ceramics) with 47,104 elements for measurement system A and 30,720 for system B. 2 x 128 detector electronic channels (DAS) utilized for up to 2 x 128 slices/rotation acquisition, and 1,472 for measurement system A and 960 for system B, 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 Adaptive Signal Boost improves image quality by amplifying individual pixels based on an analysis of the surrounding image data. It reduces streaks and noise and maintains the correct HU values for large patients.

Spiral acquisition modes:

128 x 0.6 mm, 64 x 0.6 mm, 40 x 0.6 mm, 32 x 0.6 mm, 20 x 0.6 mm, 10 x 0.6 mm, 32 x 1.2 mm, 16 x 0.3 mm\*, 8 x 0.3 mm\*, 16 x 0.6 mm\*, 8 x 0.6 mm\*.

Sequence acquisition modes:

64 x 0.6 mm, 32 x 0.6 mm, 32 x 1.2 mm, 12 x 1.2 mm, 1 x 5 mm, 1 x 10 mm, 8 x 0.3 mm\*, 8 x 0.6 mm\* (\* optional).

The scan field diameter is 50 cm.

Three laser light markers:

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

### 2. Tube Assembly:

The two Straton MX Sigma X-Ray sources provide direct oil cooling of the copper backed anode, eliminating the need for heat storage capacity (0 MHU). The resulting small and compact design (120 mm diameter) enables an unprecedented cooling rate of 7.3 MHU/min as well as the reliable performance when operating two x-ray sources at an ultrafast rotation time of 0.28 sec.

- 2 x Straton MX Sigma X-ray source
- Tube current range: Single source 20-800 mA
- Dual Source 40-1600 mA
- Tube anode heat storage capacity 0 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
- 2 x Adaptive Dose Shields

### 3. z-Sharp Technology:

The unique Straton MX Sigma X-ray source with z-Sharp Technology 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' Stellar<sup>infinity</sup> Detector hardware and the highly integrated 2 x 128-slice detector electronics enable a virtually simultaneous readout of two projections for each detector element - 2 x 2 x 64 slices for every viewing angle - resulting in a full 2 x 128-slice acquisition. z-Sharp Technology, utilizing the MX Sigma X-ray sources and the Stellar<sup>infinity</sup> Detector hardware, provides visualization of 0.33 mm isotropic voxels and a corresponding elimination of spiral artifacts in the daily clinical routine.

- 2 x 128-slice acquisition with z-Sharp technology

Industry's highest isotropic spatial resolution of 0.33 mm voxel size

Visualization of the smallest anatomical structures with exceptional image quality in complex inner-ear bones or small sized vessels such as the intracranial, mesenteric and coronary system. Based on that, accurate stenosis

## Description

measurements or stent planning with outstanding precision are enabled.

### 4. Sigma (High Power X-ray) Generator:

2 microprocessor-controlled, low-noise high-frequency generators with integrated, automatic self-testing system for continuous monitoring of operations. Settings: High-voltage range 70, 80, 90, 100, 110, 120, 130 and 140 kV; power max. 2 x 100 kW (depends on clinical network) - for no compromises in obese imaging - adjustable in fine steps. The kV steps are automatically selected through CARE kV based on patient body habitus and examination type for lowest possible dose at constant signal to noise ratio (image quality).

### 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 1x Xeon QC6700, 2.66GHz, NVIDIA Quadro FX1700 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 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. Keyboard and mouse, 8 Gbyte RAM, 2 x 136 Gbyte 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 Gbyte External Hard Drive Hi-Speed USB 2.0; Maxtor One Touch 160 Gbyte External Hard Drive).

### 6. CT Image Computer System:

Reconstruction computer for the preprocessing and reconstruction of the CT raw data. The reconstruction computer contains of a cluster of 2,2 GHz dual kernel high-performance processors performing the preprocessing and reconstruction of the CT data with up to 50 images per second.

Recon time (512 x 512 matrix) up to 60 fps with weighted filtered 3D back projection (WFBP) and z-Sharp technology at full image quality.

Up to 20 fps with integrated IR (iterative reconstruction - initially ADMIRE) with z-Sharp technology at full image quality. The raw data memory is 3.8 Tbyte.

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

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 images 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. 10,000 pre definable examination protocols

### 7. Cooling System:

Gantry is cooled with a water/water cooling system. An optional split cooling (water/air) is available to reduce reconstruction efforts and costs. System operating temperature: 18-28°C, 20 - 75 % rel. air humidity (not condensing).

### 8. 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 work list via network. DICOM work list: Software module for accepting lists of patient data and exam requirements from a Radiology Information Systems (RIS) via DICOM Get Work list functionality. The program enables very efficient working and ensures 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.

## Description

### Examination card:

The SOMATOM Drive 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 rewindowing 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: coronary, 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 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 and 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.

## 9. Examination and Evaluation Functions:

Topogram: scanning perspectives: a.p., p.a., lat.; length of scan field: 128 - 2000 mm; width of scan field: 512 mm, 2.0 - 21 s. The topogram can be switched off manually when the desired examination length is reached.

Scan field size: 50 cm. Rotation times (360°): 0.28 s (opt.), 0.33, 0.5, 1.0 s.

Slice thickness in sequence: 0.4 (z-UHR\*), 0.5 (z-UHR\*), 0.5, 0.6, 0.75, 1.0, 1.2, 1.5, 2.0, 2.4, 3.0, 4.0, 4.8, 5.0, 6.0, 7.0, 7.2, 8.0, 10.0, 14.4, 15.0, 20.0 mm (\* optional).

The Dynamic Multiscan allows continuous sequence scanning without table movement for fast dynamic contrast studies with maximum slice thickness of 38.4 mm. Scan times (full scan) 0.28 (opt.), 0.33, 0.5, 1.0 s.

Slice thickness in spiral: 0.4 (z-UHR\*), 0.5 (z-UHR\*), 0.5, 0.6, 0.75, 1.0, 1.5, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 10.0 mm (\* optional) real-time image display.

Real-time image display for immediate image preview when every second counts. 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 possible.

Max. scan time 100 seconds with full low-contrast resolution. Volume length 197 cm with full low-contrast

## Description

resolution (max. 200 cm scan range possible using multiple automatic ranges). Selection of the pitch factor between 0.35 and 3.4 depending on scan mode. Selection of up to 33 free definable scan ranges per protocol and individual anatomic sections can be successively combined and then scanned automatically. In addition individual anatomic sections can be successively combined and then scanned automatically. Storage of up to 10,000 examination protocols. Rotation times/cycle (360°): 0.28 s (opt.), 0.33, 0.5, 1.0 s.

Dynamic Multiscan spiral examination without table feed: Continuous multirotational data acquisition in one slice position with up to 100 scans in uninterrupted, continuous sequence without table feed. Scan cycle time: 0.75 - 60 seconds with quantitative evaluation and graphical display of time-density curves.

Adaptive 4D Spiral (optional): Continuous multirotational data acquisition with continuous smooth bi-directional table movement for quantitative evaluation and graphical display of time-density curves over entire organs. It facilitates volume perfusion studies in head (Stroke) and body applications (e.g. liver, kidneys, etc.) for a perfusion range of up to 14 cm/5.51" Moreover it allows dynamic studies up to a scan range of 48.0 cm/18.9" e.g. after aortic stent graft operation or for dynamic vascular (filling) studies of the peripheral vessels.

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.

Image reconstruction and storage: Image reconstruction in full resolution (512 x 512 matrix) takes place during the examination with up to 60 images per second, 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 40 images/second (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.

### 10. 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.

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 Basic Print, Work list, Storage Commitment, MPPS (Modality Performed Procedure Step).

### 11. Integrated CARE Solutions:

CARE Filter: Specially designed X-ray exposure bow-tie filter installed at the tube collimator.. Additional protocol dependent bow-tie filtration e.g. cardiac and pediatric body protocols.

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

### 12. 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.

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## Description

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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.

### 13. IT Security:

The scanner comes with IT security features including:

- Whitelisting based on e.g. Microsoft Device Guard
- Secure Configuration and Hardening

In order to keep the system safe regular deliveries of Service Packs are deployed, typically via SRS. Also, Service Packs will be deployed in case of a security incident, typically via SRS.

Deployment of Service Packs will be discontinued when a new software version becomes available.

For more information please contact your local sales representative.

### 14. The Welcome Package

The computer keyboard, insulated hose pipe for the water cooling and electrical cable set are part of the basic configuration and will be delivered with every system. Your local Siemens Project Manager will contact you for the details of the needed configurations.

Factory installation including mechanical installation and system calibration support, carried out by Logistic & Transportation provider Simon Hegele and CT SCM production staff. Responsibility for a proper project planning and room preparation according to specific system planning guide remains with the local organization, as well as coordination between all involved parties on site.

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System operating temperature (outside the building): -30°C to 50 degree C, 0-100% rel. humidity (not condensing), Ideal for high distance installation (scan room).

Cooling system contains two units (indoor + outdoor unit):

1. water/water exchanger close to the scan room and
2. an additional remote water/air exchanger

The indoor unit of the cooling system may be up to 30m away from the gantry with a height difference of not more than +10m. Additional hoses for 10m and 20m distance are available to extend the distance between the CT gantry and the indoor unit to 50m.

If the distance between the cooling-system and the gantry is longer than 50m an optional additional pump unit is needed.

Standard distance between water/water unit and remote water/air exchanger is 40m with a height difference of not more than +20m. For longer distance between water/water unit and remote water/air exchanger the tube diameter must expand or an optional additional pump is needed.

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The Multi Purpose table allows to quickly exchanging table tops depending on the dedicated use. The standard table top with a curved surface and a width of 45mm for a comfortable positioning of the patient allows for all radiology applications.

The optional flat carbon fibre table top is 530mm wide and fully compliant with TG-66 guidelines with a deflection of <5mm. It features a position recognition system and HU equivalents and a Indexing system.

In addition the optional Trauma table top allows for the connection to the clinical patient transportation shuttle and eliminates the need for unnecessary patient re-positioning. This trauma table top offers a high capacity patient weight limit to support up to 307 kg/676 lbs of patient weight. Its flat surface allows for easy positioning and transfer from and to the table. Special accessories and table width of 530 mm for obese patients enable a safe and comfortable positioning.

It includes a wide range of positioning aids, including a tiltable head holder.

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

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## Description

Innovating for the Patient, as every patient is different they need their own distinct parameters. With the SOMATOM Drive we combine our market leading applications to make this the most Distinct scanner for our customers.

Including:

SureView - Siemens unique pitch independent dose solution

Flash Spiral - Ultra-fast spiral scanning in Dual Source mode with up to 450 mm/s, allows for additional dose saving especially in ECG-triggered scans

Dual Adaptive Dose Shields – The world's first dynamic tube collimation that protects the patient from clinically irrelevant radiation in every spiral scan. Both tubes are equipped with an Adaptive Dose Shield allowing reduced direct peripheral exposure in Spiral CT for the most dose-sensitive body regions while preserving constant high image quality.

CARE Dose 4D - uses at first an automated adjustment of the dose level depending on patient size based on the attenuation values obtained from the standard (singular) topogram along the patient z axis. In addition CARE Dose4D uses a real-time adaptation of the tube current during the scan based on the actual attenuation of the X-ray beam measured around the patient. It delivers significant x-ray dose reduction possible for all body regions scanned compared with standard sequence or spiral scanning;

Up to 2,320 projections are evaluated per second to optimize the mA level instantaneously. In combination with the extreme adjustment speed of the tube current, CARE Dose4D enables consistent high quality images in every anatomical position. Thinner axial slices and/or longer scan ranges become possible because of reduced tube loading; it also enables ultra-low dose examinations for pediatric patients.

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

CARE Child - Dedicated pediatric CT imaging, including 70 kV scan modes and specific CARE Dose4D curves and Pediatric Protocols - Special examination protocols with 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 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 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.

Dose MAP - Siemens unique solution to support dose monitoring, protocol management and benchmarking

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 isocenter adaptation for Head scans.

FAST Cardio Wizard - is intuitive guidance software, fully integrated in the cardio workflow. It allows training the cardiac workflow and provides guidance and support during the examination. It is based on the latest cardio application training material and provides helpful tips to avoid common problems and pit-falls. It features step-by-step training on-screen for various cardiac examinations. Text and images are delivered in a default setting based on Siemens' latest application training, but are fully customizable by the user.

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 Adjust button. The limits for scan time and tube current per scan are defined via the Scan Protocol Assistant. FAST Adjust offers an undo functionality to return to previously set values.

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## Description

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XXL Mode 2cm - Utilize the power of both tube to allow for low kV scanning across a wider range of patient body sizes.

ADMIRE\* - (Advanced Modeled Iterative REconstruction) offers significant dose reduction and image quality improvement, as well as an everyday suitability.

- Superb details, delineation and sharpness of organ borders
- Positive impact on the image quality
- Dose and Image Quality benefits also in thick slice reconstructions, which facilitates a PACS-ready workflow
- Reader-ready reconstructions deliver the desired image impression on the fly

The 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.

\*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.

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We combine the unique features of the SOMATOM Drive, to push the most distinct CT scanner to its maximum potential and unleash the full power of the Straton MX Sigma tube. Includes the DistinCT - Sigma High Power containing, High Power 70 and High Power 80, Dual Power 4cm, 10kV Steps, X-CARE and CARE Contrast III, as well as Tin Filter scanning.

DistinCT - Sigma High Power - combines unique tube related features of the Straton MX Sigma.

High Power 70 - 650 mA is produced at 70 kV

High Power 80 - 750 mA is produced at 80 kV

Scanning with low kV has the potential to lower the dose. Scanning with low kV makes it possible to reduce contrast media. Using less contrast media has a positive impact on the patients' health and reduces expenses for the hospital. Low kV scanning has a beneficial impact on image impression: Scanning with 80 kV might increase the lesion conspicuity or facilitate radiation dose reduction or support IQ improvement at contrast-enhanced hepatic CT

Dual Power 4cm - utilizing both tubes at the same time the system doubles its power whilst maintaining the speed of the system. These CTA protocols enable the use of low kV imaging in a wider variety of patient sizes. Post interventional scanning is often required for vascular patients whose bodies are under stress. Low kV scanning not only reduces the dose for the patient but can support reduced contrast media which can improve patient safety.

10kV steps - The kVs can be automatically pre-selected through CARE kV in finest 10 kV steps based on patient body habitus and examination type for lowest possible dose at constant signal to noise ratio (image quality). 10 kV steps allow a more distinct set of parameters are found for each patient.

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.

CARE Contrast III - supports the consistent application of contrast media protocols on the scanner. Saving and linking contrast protocols to scan protocols is available in the Examination card or as part of the scan protocol manager.

Tin Filter scanning – The Siemens unique Tin Filter is optimizes the shape of the X-ray spectrum by filtering out the low kV spectrum, thus decreasing radiation, while eliminating photons that do not add to image quality but only produce noise in non-contrast scans. This technology can be combined with the techniques like CARE Dose 4D and Iterative Reconstruction to obtain even lower dose values without compromising image quality. Tin Filter usage may be particularly interesting for low-dose non-contrast examinations.

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Innovating for the Radiologist, as every patient is different, Radiologists also vary, and they have their own distinct reconstruction and imaging requirements. With the SOMATOM Drive we combine our market leading applications to make reporting consistent, fast and simple for our customers

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## Description

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Includes:

**VRT** - Volume Rendering Technique standard on the 3D card.

**Workstream 4D** - the standardized workflow guide for confident patient management. Up to 8 pre definable axial, coronal, sagittal and oblique MPR and MIP recon jobs possible. The Asynchronous Recon allows for multiple image reconstructions and reformats, parallel to scanning. With this feature, up to eight reconstruction 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.

WorkStream4D eliminates manual reconstruction steps and reduces the data volume up to a factor of 10, since virtually all diagnostic information is captured in 3D slices.

**Extended FoV** - allows you to capture more information in just one exam, saving valuable time with emergency patients. Up to 78 cm field of view.

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We combine our advanced applications to make reporting of complex and atypical anatomical structures faster and simpler.

Includes:

### **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.

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.

### **FAST Spine #AWP**

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

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 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.

FAST Spine requires Workstream 4D.

### **HD FOV Pro #AWP**

Software program with special reconstruction algorithms that allow for visualization of objects using a FoV up to 65 cm with an image quality suited for radiation therapy planning.

For radiation therapy settings or radiology environments providing radiation therapy planning (RTP), it is important to visualize areas outside of the regular 50 cm CT scan field with sufficient accuracy to precisely plan the radiation treatment. For this reason, special reconstruction algorithms have been created to allow for visualization of objects/for soft tissue using a FoV up to 65 cm with an image quality suited for RTP (e.g. contour recognition for

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## Description

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dose calculation). Thus, it allows for more precise radiation therapy planning for obese patients and patients that are positioned outside the CT isocenter. The image quality for the area outside the standard 65 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 65 cm HD FoV, depending on the anatomy scanned.

### **z-UHR incl. UHR**

Siemens proprietary z-UHR (z-Ultra High Resolution) option enables previously unachievable image detail with 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 or 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.

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Heart View - The option supports ultra-fast FlashSpiral scanning for maximum dose saving and scan times down to a quarter heartbeat. ECG-synchronized Flash Cardio Sequence for dose efficient but versatile low dose cardiac imaging, including high heart rates and functional evaluation.

CT images of the heart are acquired in defined phases of the cardiac cycle by prospective ECG-triggered sequence scanning and retrospective ECG-gated spiral scanning. The ECG signal used for gating the CT images is acquired by an integrated ECG device. The ECG signal is displayed on the gantry front cover and the scan interface. Dual Source acquisition mode with single segment reconstruction enables heart-rate independent temporal resolution of 75 ms (factor 2 higher than single source acquisition with same parameter). Down to 32.5 ms temporal resolution combining HeartView Flash acquisition with robust 2-segment reconstruction.

With prospective ECG-triggered scanning, quick scans are triggered by ECG signals. The revolutionary FlashSpiral Cardio mode collects data projections of the entire heart in ultrafast 250 ms within a single diastolic phase. This performance is a direct result of having 2 X-ray tubes, simultaneously collecting information, combined with unprecedented table feeds above 400 mm/s. All the while a true temporal resolution of 75 ms is applied for each individual image.

The Flash Cardio Sequence mode introduces the Siemens-only dual-step pulsing, that maintains a low dose level during the systolic phase to calculate ejection fraction in addition to coronary imaging, therefore combining low dose coronary imaging with functional information,

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. 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.

Adaptive ECG-synchronized dose modulation (pulsing) allows for optimal dose savings, with advanced irregular and ectopic heartbeat detection algorithm. The MinDose algorithm lets the user save even more dose on the patient examination for dedicated coronary analysis. This special algorithm allows you to decrease dose during ECG-Pulsing.

Cardiac Best Phase Plus - is a dedicated software which automatically calculates and detects the optimal phase for motion-less coronary visualization. The phase is defined as either end-systole, end-diastole or both time points and automatically reconstructed.

Also includes the DirectViewing™ tool, used 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 VRT visualization of the coronaries with heart isolation in up to 20 phases within 15 seconds. DirectViewing™ completes the workflow of Cardio BestPhase™ by giving you the flexibility to individually visualize phases for all coronary arteries.

Ca Scoring #AWP scanning - for quick calcium scoring based risk assessment and coronary age calculation (for single user at Acquisition Workplace)

**FAST Phase** - is an intuitive solution fully integrated in the cardiac workflow designed to help you quickly set up complex and usually time-consuming cardiac procedures reliably and repeatedly. By measuring heart rate and rhythm the system automatically chooses the most appropriate phase of the heart cycle to scan and later to reconstruct based on fully configurable and customizable look up tables. This reduces complexity and helps to standardize cardiac acquisitions by making them more robust and less user-dependent.

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**Description**

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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

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