

WHSE BLDG 297 (WLA) B20047

V.A. Medical Center

VAMC WEST LA

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LOS ANGELES, CA 90073

P.O.# 691-B20047

Qty

Item Description

1

Artis zeego BC Interv. Rad.

Artis zeego for interventional radiology with PURE(r) adds smooth interaction to Siemens' smart technologies. It boosts productivity and enhances outcomes, while increasing image quality and further reducing dose.

The multi-axis system offers a flexible working height and unmatched positioning flexibility thanks to the flexible iso-center. The minimal constructional impact to the ceiling allows meeting the highest hygienic standards, even when the flat panel detector is at the patient. The c-arm adapts to the angulation of the table tops and moves along tables to support a procedure dependent patient positioning and to improve the patient comfort.

The flexible room usage and superb patient positioning allows using the room for many procedures. The various park positions far away from the table are offering tremendous space to access the patient.

The patient table is fitted with a free floating movable patient positioning tabletop, with a maximum patient weight of 250 kg.

High-resolution, dynamic flat detector as40 for fully digital imaging chain, with integrated, removable grid and the MEGALIX Cat Plus 3-focus high-performance X-ray tube.

The CARE+CLEAR package offers the optimal image quality at the lowest reasonable dose and provides efficient and transparent dose monitoring and reporting as standard in every Artis system.

Images are displayed using a display suspension system with two 19" flat displays for live and reference image display in the examination room and a display in the control room."

1

Head-end table tilting

Motorized tilt and stepping of the patient table in longitudinal direction for electrophysiological or peripheral examinations, for example, as well as for stabilizing a patient. Includes a power-assisted tabletop control module.

Notes:

Table tilting reduces the maximum patient weight to 200 kg. As before however, it is possible to install up to 40 kg of additional accessories.

Note: It is mandatory to provide UPS back up with this table option in order to comply with IEC 60601-2-43 CL. 201.15.101. Reason: In the event of power failure a neutral table position

Qty	Item Description
1	<p>suitable for CPR must be reachable within 15 seconds. Please include a suitable UPS from Siemens as required or make sure any existing / planned UPS provision for your installation site will satisfy the requirement</p>
1	<p>PERISTEPPING / PERIVISION Motorized stepping for real-time bolus chasing. Gantry stepping with zeego and ceiling mounted systems, table stepping with floor mounted and biplane systems.</p>
1	<p>Peripheral digital angiography with stepping and online subtraction display.</p> <p>2K acquisition Acquisition and storage of single images and series with a resolution of up to 4.76 megapixels (2480 x 1920) at up to 7.5 f/s.</p>
1	<p>The 2k acquisition is valid for DR, DSA, 3D acquisitions and PERIVISION, and affects full format, Zoom 1, and Zoom 2.</p>
1	<p>Laser crosshairs Laser crosshairs integrated in the cover of the flat detector and tableside operation for easier, quicker and dose-saving positioning of the patient.</p>
1	<p>DYNAVISON DSA/DR Native or subtracted digital rotational angiography with angle triggering.</p>
1	<p>narrow TT thin mat. ins. of std. TT Narrow-shaped carbon fiber patient positioning tabletop with head-end recess, ideal for cardiological applications. Tabletop tapered in the thorax area for maximum freedom of C-arm angulation.</p>
1	<p>Matching the narrow tabletop, special-foam mattress, 4 cm, made of open-pore polyurethane material and a latex-free cover.</p>
1	<p>Note: The narrow patient positioning tabletop with the thin mattress replaces the wide tabletop, including mattress, described in the basic configuration.</p>
1	<p>4P wireless footswitch inst. of cbl Wireless footswitch connection</p>
1	<p>Note: Wireless replaces the wired connection.</p>
1	<p>syngo interv. Onco. Engine Pro as40 A workstation for reconstruction, post-processing and handling of 3D information including specific applications for interventional oncology. The package includes the following functionalities: 3D high-contrast and CT-like soft-tissue imaging (syngo DynaCT), 3D functional imaging providing physiologic blood volume information (syngo DynaPBV Body), 3D roadmap for dynamic overlay of planning data and 3D volumes on live fluoroscopy, 3D/3D fusion functionality for integration of pre-interventional 3D datasets, Workflow support for embolization and needle guidance, extended visualization (e.g. DSA) and post-processing of 2D images or scenes on the XWP (Angio Viewer) incl. 2D functional imaging for visualization of blood flow characteristics (syngo iFlow) and side-by-side comparison of images or scenes (Scene Compare), in-room control for table-side operation of advanced applications, Expert-i functionality for remote operation of the XWP. Only for PURE systems, the package also includes: 3D Wizard for expert step-by-step guidance in 3D acquisition, Parallel patient processing capabilities, Fusion of pre-interventional 3D datasets based on 2 projections (2D/3D Fusion), Marking of points or lines on the 3D geometry or MPRs and overlay of these markings on live fluoroscopy.</p>
1	<p>syngo DynaCT 360 syngo DynaCT 360° Large Volume in conjunction with an Artis zeego system allows the acquisition of a large 3D volume for the DynaCT reconstruction in only six seconds. This results in better image quality, less motion artifacts and the possibility of saving contrast medium.</p>

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Item Description

1

syngo DynaCT Micro

Enables unique detail resolution (+40%) in interventional 3D imaging by using all detector pixels in a 22 cm image size with reduced dose. As a result, the smallest structures such as Cochlear implants or stents can be displayed in the best possible manner.

1

syngo Dyna3D HighSpeed

In conjunction with Artis zeego, as the fastest 3D protocol on the market syngo Dyna3D HighSpeed enables acquisitions to be generated in less than 3 seconds. As a result, moving organs such as the lungs can be displayed with a lot fewer artifacts.

1

syngo DynaCT SMART

Streak Metal Artifact Reduction Technique for syngo DynaCT images.

Metal implants, like coils and stent markers, create artifacts in the reconstructed images that might make it difficult to detect bleedings or restenosis around the ends of the stent, for instance. syngo DynaCT SMART is a dedicated reconstruction algorithm to reduce metal artefacts.. This type of integrated image reconstruction protocol results in 3D volumes with reduced metal artefacts.

1

syngo Dyna4D

syngo Dyna4D enables the visualization of flow patterns in 3D.

With only one C arm scan it provides a view similar to virtually an unlimited number of DSA runs at no additional dose and contrast media.

syngo Dyna4D helps to expand clinical capabilities in the angio suite by optimizing patient selection and supporting individualized treatment strategies.

1

syngo DynaPBV Neuro

syngo Neuro PBV IR (Parenchymal Blood Volume in Interventional Radiology) is an application for displaying the blood volume distribution in the brain.

1

syngo QVA vascular analysis

Vessel analysis with determination of degree of stenosis, distance measurement and calibration.

1

DICOM Attribute Converter

Individual solution via software-/XML-files, to solve compatibility problems.

1

Mem. enhncmnt. 3 (50k - 1k Matrix)

Memory capacity extended by 25,000 images, from 25,000 images to 50,000 images in 1k matrix.

1

Mem. enhncmnt. 4 (100k- 1k Matrix)

Memory capacity extended by 50,000 images, from 50,000 images to 100,000 images in 1k matrix.

1

Vascular analysis

Vessel analysis with determination of degree of stenosis, distance measurement and calibration.

1

Fluoro Loop

Storage and review of dynamic fluoroscopic sequences (Fluoro Loop). This saves an additional acquisition and reduces dose. The maximum storable fluoroscopic time depends on the selected pulse rate, e.g. 34 s at 30 p/s, 68 s at 15 p/s.

1

Automap

Automatic stand positioning depending on the selected reference image and automatic reference image selection depending on the stand positioning.

1

DICOM RIS-Modality Worklist

Import of patient/examination data from an external RIS/HIS patient management system with DICOM MWL (Modality Worklist).

1

DICOM MPPS

Feedback of examination status via DICOM MPPS (Modality Performed Procedure Step) to an

Qty	Item Description
1	<p>external RIS/HIS patient management system. Data such as the dose-area product can be transferred to the RIS.</p>
1	<p>DICOM Print Provision of DICOM Print service for connection to a laser camera or a network printer (postscript-capable).</p>
1	<p>Lower body radiation protection This radiation shield protects the user from scattered radiation when standing at the table side. It can be attached to the accessory rails either on the right or on the left side of the patient positioning table. It provides the user an additional accessory rail. It includes a basic unit (71.5 cm x 75 cm/ 28.2" x 29.5" (l x w); 7.7 kg/ 16.98 lb), one lower body radiation protection pivot swivel element (77 cm x 48 cm/ 30.3" x 18.9" (l x w); 3.8 kg/ 8.4 lb) and three clip-on units (57 cm/ 22.4" x 33 cm/ 12.99" (l x h), 2.2 kg/ 4.85 lb; 27 cm/ 10.6" x 33cm/12.99", 0.9 kg/ 1.98 lb and 27 cm/ 10.6" x 25cm/9.8", 1 kg/ 2.2 lb) with a lead of 0.5 mm/ 0.02" Pb. The maximum weight of the accessory rails is 40 kg (88.2 lb).</p> <p>Product may not be used in conjunction with a TRUMPF or MAQUET surgery table.</p>
1	<p>Mobil upper body rad. Prot. XL This enlarged radiation shield with a curtain provides the user an increased protection from scattered radiation compared to the smaller one. It includes two scattered radiation protection blankets, a protective curtain and a ceiling rail (4m/ 157.5"). The blankets cover the patient's body in order to increase the reduction rate of scattered radiation. The curtain reduces the scattered radiation protection by closing the gap between patient and shield. The shield is made of acrylic glass with lead equivalent of 0.5 mm/0.02" (w x h: 78 cm x 90 cm/ 30.7" x 35.4") which can pivot and rotate around a fixed point with a range of 360 degrees. The shield has a special patient cut-out for interventional examinations. It is mounted on a counter-weighted, height-adjustable support arm that is fixed on a column with a height of 800 mm/ 31.5".</p>
1	<p>Mobil upper body rad. Prot. XL This enlarged radiation shield with a curtain provides the user an increased protection from scattered radiation compared to the smaller one. It includes two scattered radiation protection blankets, a protective curtain and a ceiling rail (4m/ 157.5"). The blankets cover the patient's body in order to increase the reduction rate of scattered radiation. The curtain reduces the scattered radiation protection by closing the gap between patient and shield. The shield is made of acrylic glass with lead equivalent of 0.5 mm/0.02" (w x h: 78 cm x 90 cm/ 30.7" x 35.4") which can pivot and rotate around a fixed point with a range of 360 degrees. The shield has a special patient cut-out for interventional examinations. It is mounted on a counter-weighted, height-adjustable support arm that is fixed on a column with a height of 800 mm/ 31.5".</p>
1	<p>LED Exam Light Ceiling-mounted, flexible positionable examination light with focusable light system. It is fully integrated into the ceiling-installed radiation protection mounting unit.</p> <ul style="list-style-type: none"> - Luminance: 60,000 Lux for 100 cm/ 39.4" distance - Working distance: 70 to 140 cm/ 27.6" to 55.1" - Color rendering index Ra at 4500 Kelvin: 95 - Color temperature: 4,300 Kelvin

Qty	Item Description
1	<ul style="list-style-type: none"> - Focusable light field: 14 to 25 cm/ 5.5" to 9.8" - Diameter of light head: 33 cm/ 13" - Number of LEDs: 19 - Total input power: 20 VA
1	<p>Large Display large work area</p> <p>Large color flat screen display including cables for the examination room, installed on a ceiling-mounted, longitudinally mobile, swiveling, rotating, and height-adjustable display holder with extended working range.</p> <p>Note: If a Large Display is selected, the Artis basic configuration includes a connection kit for the large display instead of the displays for the examination room.</p>
1	<p>Large Display video controller 18</p> <p>Large Display Video Controller 18 is the middle of three different video controller sizes. A maximum of 18 video signals can be connected and displayed simultaneously on the Large Display.</p> <p>The Large Display video controller 18 receives various internal and external video signals for presentation to scale on the Large Display.</p> <p>Up to 18 external and internal video sources can be connected (max. 14 DVI-D and 4 analog (VGA) channels).</p>
1	<p>19" b/w display (ref)</p> <p>A 19" high-contrast b/w-display for reference image display.</p>
1	<p>Injector conn. in the control room</p> <p>Interface for controlling the contrast medium injector in the control room.</p> <p>Injectors can be offered by Siemens Healthcare Accessory Solutions</p>
1	<p>VA kit Artis zee systems</p> <p>Second set of system documentation (operator manual, etc.)</p>
1	<p>Protective glass for Large Display</p> <p>Non-reflecting protective shield that protects the LCD panel of the Large Display from mechanical damage. The protective shield can be attached to and removed from the Large Displays housing.</p> <p>It includes one protection shield that fits 60" Displays.</p> <p>Weight: 4.2 kg/ 9.26 lbs.</p> <p>Depending on the view angle toward the panel, there is a reduction in contrast as well as image blurring.</p> <p>We therefore recommend removing the acrylic glass (which is easy to do) when evaluating diagnostic images.</p>
1	<p>syngo Security Package (SW lic.)</p> <p>SW extension providing enhanced security features including user management and audit trail functionality.</p>
1	<p>Head-end operation w/ trolley</p> <p>Trolley for individual head-end positioning of Artis control modules.</p> <p>It includes a trolley</p> <p>(l x w x h: 62cm x 64cm x 107cm/ 24.4" x 25.2" x 42.13") with two accessory rails (43cm/ 16.93"), an operation module cable extension (5m/ 196.85"), an operation module Data cable (5.2m/ 204.72"), Cable holder and a Control modules connection kit.</p>
1	<p>Head-end holder</p> <p>This mounting frame is used to hold Siemens standard accessories such as shoulder supports and handgrips with support.</p> <p>It includes a holder with accessory rails (17 cm x 1 cm x 2.5 cm/ 6.7" x 0.4" x 0.98"/ l x w x h) on both sides</p> <p>Weight: 1.75kg/ 3.9 lb</p>

Qty	Item Description
1	<p>Maximum Weighth: 40 kg/ 88.2 lb It can only be mounted on the narrow tabletop.</p>
1	<p>Arm holder (pair) The patient's arms can be comfortably placed along the body using these two arm holders. They slide underneath the patient mattress and is held in position by the patient's weight. It includes two pairs of arm holders of different length (540/690 mm - 21.2"/27.2") and height (85/115 mm - 3.35"/4.53"), suitable both for thick and thin patient mattresses. Weight small arm holder: each 0.65 kg/ 1.43lb Weight large arm holder: each 0.95 kg/ 2.09 lb.</p>
1	<p>Product may not be used in conjunction with a TRUMPF or MAQUET surgery table.</p> <p>Tabletop extension Provides additional arm support for large / obese patients. Slides underneath the patient mattress and is held in place by the patient's weight. Patient arms can be fixed with Velcro straps. The kit includes a board made of radiolucent carbon fiber material, four arm pads (two pairs with two different heights) made of washable plastic foam material and Velcro straps of two different lengths. The maximum weight per side is 20 kg (44.09 lb). Length: 45 cm/ 17.7" Width: 85 cm/ 33.5" Weight: 2.3 kg/ 5.07 lb Dimension thick cushion: 10 cm x 34,5 cm x 7 cm/ 3.9" x 13.58" x 2.76" (l x w x h) Weight thick cushion: 0.25 kg/ 0.55 lb Dimension thin cushion: 10 cm x 34,5 cm x 4 cm/ 3.9" x 13.58" x 1.57" (l x w x h) Weight thin cushion: 0.15 kg/ 0.33 lb.</p>
1	<p>Product may not be used in conjunction with a TRUMPF or MAQUET surgery table.</p> <p>Head holder w/ pad set The item is used to position the patient's head during examination and treatment. The patient's head is secured with a cushion or wedge. The item includes a head support and a cushion set. Length: 27 cm/ 10.6" Width: 23 cm/ 9.05" Height: 20 cm/ 7.87" Weight cushion set: 0.25 kg/ 0.55" Weight head support: 1.45 kg/ 3.2".</p>
1	<p>Only for use in combination with narrow tabletop and the thin mattress.</p> <p>Body strap set Can be used to secure patient to the patient table and to compress patient anatomy. It consists of two belts with Velcro straps (l x w: 185 cm x 10 cm/ 72.8" x 3.94"). Product may not be used in conjunction with a TRUMPF or MAQUET surgery table.</p>
1	<p>Initial onsite training 32 hrs Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p>Follow-up training 32 hrs Up to (32) hours of follow-up on-site clinical education training, scheduled consecutively</p>

Qty

Item Description

(Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

1

Follow-up training 12 hrs

Up to (12) hours of follow-up on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. 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.

3

Additional onsite training 24 hours

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.

4

GOVT Training Class (T & L not included)

Tuition for (1) government attendee to attend a classroom course of choice at one of the Siemens training centers. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

1

Eaton Powerware 9355 15 kVA UPS

Includes UPS, battery, maintenance bypass panel, and one year on-site parts and labor coverage (24x7) by Eaton Powerware. This UPS is recommended when protection and uninterruptible power is required for the Artis' C-arm and table. Emergency fluoroscopy is not available with this UPS. If emergency fluoroscopy is required, the 9390 - 160 kVA UPS is recommended for the full system. One UPS per lab.

Additional seismic brackets are required to make this system OSHPD approved.

1

Powerware 9155 Seismic Kit

1

9355 Output Transf Cabinet Siesmic kit

1

Blue anti-fatigue floor mat for hospital

1

PERI BOLUS KIT

1

Vitalinq Model 94A-07

Vitalinq Model 94A-07 Communication System

A combination intercom and music system designed for the active acoustic environments typical of catheterization, electrophysiology and vascular and interventional radiology labs.

The Vitalinq system will include:

1 - 94A-07 Communication Console

1 - monitor microphone

1 - desk microphone

1 - corded headset

1 - headset foot switch

4 - stereo speakers

2 - communication speakers

Operations and Owner's Manual

All cables necessary to complete installation

Installation guidance and 24/7 customer support via an 800 telephone number

All equipment is designed in a modular manner and connected by supplied standard ethernet

Qty	Part No.	Item Description
		cables which have pre-installed connectors. This allows for quick and easy installation, or if necessary over the life of the system, component replacement. Customer or end user shall be responsible for use and maintenance. Installation and on-site service is not included.
1	VLMC07	Vitalinq MC-07 Console Extender Vitalinq MC-07 Console Extender A device which connects to the Vitalinq 94A-07 that can be located away from the 94A-07 console (such as in another room) and to which an additional headset and/or desk microphone can be connected for two-way communication with the procedure room.
1	VLHEADSET	Vitalinq wireless headset Wireless Headset A high quality wireless headset with adaptor cord which can be used in lieu of a corded headset with either the Vitalinq 94A-07 console or the Vitalinq MC-07 Console Extender.
1	AXA_RIG_ZEE GO_GOV	Standard Rigging zeego
1	AXA_ADJ_GO V_32	Offset Initial Training 32 hrs

Additional Rigging/Out of Scope Early Delivery of Zeego Mounting

Additional Rigging/Out of Scope Long Pull

One complimentary biomedical tuition is included with the purchase of this system. This training must be completed before the end of the warranty period.

OPTIONS

Qty

Item Description

1

Mark 7 Arterion, Table Mount Injector

The Arterion Mark 7 Table contrast medium injector allows for the remote installation of the system power supply and installation of the injector head onto a table bracket.

The injector system includes:

Power supply and injector head with corresponding cabling

An adjustable height table bracket for the injector head

A desk mounted user control console with large touch screen

Functions

Pressure limitation:

for 150 ml syringes 689 to 8273 kPa, corresponds to 100 to 1200 psi. .

Flow rates for 150 ml syringes:

0.1 to 45 ml/s in increments of 0.1 ml/s

0.1 to 59.9 ml/min in increments of 0.1 ml/min

rise/fall: 0 to 9.9 s in increments of 0.1 seconds

Release delay for injection or radiation:

0 to 99.9 s in increments of 0.1 s.

Adjustable volume for 150 ml syringes:

1 ml to the max. syringe capacity in increments of 1 ml.

Fill rate:

Variable syringe filling speed 1-20ml/s.

Injection protocols:

Up to 40 injection protocols possible.

Parameters currently displayed on the touch screen display and on the head display:

Injection speed

Injection volume

Remaining volume

Injection duration

Applied pressure

Contrast medium heating:

Nominal 35°C (95°F)+-5°C (9°F)

Injection data memory

Qty

Item Description

Up to 50 injection data items stored

Included in the scope of delivery

Injector standard configuration 150 ml

SIEMENS interface cable

Operator Manual

Service manual

Detailed Technical Specifications

Description

System description:

The Artis zeego – A PURE® system with single plane is an easy-to-use X-ray angiography system for digital acquisitions and is designed to meet the requirements of state-of-the-art angiography and interventional procedures, with a focus on interventional radiology.

C-arm floor-mounted stand:

- New, compact, multiaxial C-arm system with adjustable isocenter height for the highest possible level of examination comfort, with flexible park positions for optimal patient access.
- Stand can travel in RAO/LAO, Cran/Caud, x-, y-, and z-axes.
- 5 programmed working positions and additional 50 user-defined working positions as well as 3 direct positions.
- Intelligent, computer-aided collision monitoring ICP (Intelligent Collision Protection).
- Stand rotation $\pm 90^\circ$ minimum.
- Double oblique projections:
 - LAO/RAO $\pm 200^\circ$ (maximum angulations vary depending on working position)
 - cranial $+45^\circ$ up -65° caudal (maximum angulations vary depending on working position).
- Variable C-arm positioning speeds up to $25^\circ/\text{s}$.
- Variable longitudinal speed up to 15 cm/s, maximum 28 cm/s when the Perivision option is available.
- Variable focus-to-detector distance between 90 cm and 120 cm.
- Isocenter/floor distance adjustable between 103 cm and 141 cm.
- Focus-isocenter distance 78.5 cm
- Rotational angiography used to generate 3D datasets (optional) can be carried out at the head end or in the working position on the left or right-hand side.

Patient table for angiographic examinations

Patient table

- Direct patient access from all sides, both through the swiveling table and large tabletop cantilever.
- Electromechanical release of table swivel at the touch of a button at the table.
- Telescopic foot with motor-driven height adjustment.
- Maximum patient weight: 250 kg. It is possible to install up to 40 kg of additional accessories, plus a further 100 kg for patient resuscitation.

The table can be rotated to ensure quick access to the patient even in emergency situations.

Patient positioning tabletop

Wide-shaped carbon fiber patient positioning tabletop, ideal for universal use. The tabletop is straight all the way to the head area.

Patient mattress

Matching, special-foam mattress, 4 cm, incl. a latex-free cover.

This visco-elastic comfort mattress reacts to temperature and has the special property of adapting to the individual body shape under the influence of body weight and heat.

Application-specific accessories

Description

- Infusion bottle holder
- Unilateral armrest: Carbon fiber armrest for cardiology and arm angiography to slide underneath the positioning mattress.
- Additional hand switch for radiation release and additional control functions.
- Arm holder (1 pair): Two arm holders for comfortable lateral arm positioning along the patient's body.
- Instrument tray: Plastic instrument tray to be positioned at the patient table above the patient. It is swivable and height-adjustable, so that it can be positioned directly or sideways above the patient.

Operating modes

Fluoroscopy

- Digital pulsed fluoroscopy with pulse frequencies of 10 p/s, 15 p/s, and 30 p/s in 1k/12 bit matrix. Additional pulse rates of 0.5 7.5 p/s are also possible with CAREvision.
- Overlay fade: On-line overlay of the reference image onto the active fluoroscopy. This improves efficiency and safety during interventional procedures because additional information which is clinically necessary can be displayed directly in the live fluoroscopy image.

Digital acquisition technology

Digital acquisition technology with frame rates of 0.5 to 30 f/s in 1k/12 bit matrix and digital real-time filtration. Single image and serial acquisitions with time-controlled and manually variable frame rate. The 1k image matrix with a bit depth of 12 bits allows an excellent image contrast by using 4,096 shades of grey. Thus, the image quality meets highest expectations in angiography and fulfills all prerequisites for precise diagnostics and safe interventions.

Digital Subtraction Angiography:

Digital Subtraction Angiography with frame rates of 0.5 to 30 f/s, including pixel shift, remask, roadmap, peak opacification for iodine contrast (MaxOpac), and CO2 contrast (MinOpac); adding of the anatomical background (landmark) from 0 to 100%.

Includes the "Advanced Roadmap" additional function which offers the following clinical benefits:

- DSA image can be selected as a mask for Roadmap
- Zoom can be changed during Roadmap
- Catheter and vascular contrast can be changed separately

Unexpected patient movements in DSA acquisitions will deteriorate image quality. Although this can be corrected via manual pixel shift, it is still inconvenient and time consuming for the user. Auto Pixelshift solves this challenge easily maintaining optimal image alignment.

CLEARmap

Special 2D Roadmap operating mode creating a vessel map from a DSA-scene using Maximum Opacification technique. As an additional operating mode, you can also decide to pick one frame out of a DSA run (i.e. for venous access in Roadmap).

This provides improved image quality compared to conventional Roadmap, and reduces x-ray dose and contrast media.

CLEARmatch

Automatic/Online pixel shift processing for most accurate subtracted image display during Roadmap and DSA based on real time movement detection and compensation.

Six degrees of freedom – vertical, horizontal, rotational, zoom and shearing movement (left and right) - allowing highest possible efficacy. In order to show the most recent information in raw format, the pixel shift operation is applied to the mask image. This optimized way of pixel shifting ensures a perfect match of Roadmap image and native fluoro image, being shown at the Assist monitor.

CARE package

ALARA principle

Siemens follows the ALARA principle: "As Low as Reasonably Achievable"; the CARE package (Combined Applications to Reduce Exposure) was developed based on this research and development principle to protect the examiner and the patient.

Dose saving

- **CAREfilter:** Intelligent control software that minimizes X-ray dose. Not only does this not have a negative

Description

impact on image quality, it can in fact improve it. During fluoroscopy and acquisition, special copper prefilters are automatically inserted into the X-ray beam depending on current X-ray transparency, which is calculated continuously. This is necessary to ensure that the optimal prefilter value is always active. This automation makes work easier for the user because the optimal filter setting need not be adjusted manually for each case.

The adaptive Cu prefiltration has five steps (0.1, 0.2, 0.3, 0.6, 0.9 mm) and is used to lower the reference air kerma and improve radiation quality by reducing the low-energy X-ray radiation.

- *CAREvision*: Pulsed fluoroscopy with additional, reduced pulse rates of 7.5 p/s to 0.5 p/s. Adaptation of pulse rate to the current application requirements for significant reduction of radiation exposure, especially during interventional procedures.
- *CAREprofile*: Radiation-free positioning of the primary and semi-transparent diaphragms by means of graphic display in the LIH (Last Image Hold). Collimator shutters and semi-transparent filters can be adjusted as a graphical overlay on the last-image-hold without any need for fluoroscopy or radiation.
- *CAREposition*: Radiation-free object repositioning by means of graphic display of the X-ray center beam and image edges in the LIH image. With CAREposition it is possible to reposition the object under visual control without radiation.
- In case of table movements the current position of the central beam and the image edges are superimposed on the LIH image as orientation points.
- *Low dose acquisition*: enables dose savings of up to 60 % during the examination. The Low Dose Acquisition protocol can be released with a separate pedal on the footswitch.

Dose monitoring

- *CAREwatch*: Display of the measured dose-area product and the calculated patient reference air kerma on the flat-screen display. Electronics unit with DIAMENTOR measurement chamber integrated in the collimator housing for dose acquisition.
Configurable screens on the data display and imaging system monitor:
During fluoroscopy: Reference air kerma rate.
During fluoroscopy interval: Accumulated reference air kerma or dose-area product, or percentage of the reference air kerma limit (total from fluoroscopy and acquisition).
- *CAREguard*: Monitoring the reference air kerma. If the accumulated reference air kerma exceeds one of the three configurable limits, a warning appears on the live display and tableside on the touchscreen control. This allows ideal monitoring of the accumulated reference air kerma during the examination.
- *CAREmonitor*: Special model-based monitoring of the measured skin entry dose, taking into account the geometric conditions of the system (actual device angulation, table position, patient weight, patient size). It then continually displays whether the skin entry dose applied to a specific region of the patient's body exceeds a specific configurable upper limit. CAREmonitor continually calculates and displays the actual accumulated skin entry dose as a portion of this upper limit. This helps the user to detect a potential patient hazard at an early stage. The patient is therefore better protected against the damaging effects of radiation.

Dose documentation

- *CAREreport*: Dose information as part of the DICOM Structured Report. After each examination, the information is available in DICOM format and can be sent to a DICOM archive together with the image data, for example. Saving dose information in DICOM format also enables flexible analysis and further processing via a DICOM-capable analysis software/database.
- *CARE Analytics*: Standalone PC program for analyzing doses in angiography, CT, and radiological examinations. The data can be exported to statistics programs such as Microsoft Office Excel and SPSS for further analysis. CARE Analytics is available for download from the Siemens Intranet.

CLEAR package

The CLEAR package enables optimized image quality through real-time processing of the image data without increasing the radiation dose.

- *CLEARcontrol*: The new histogram analysis provides a more homogeneous image impression by harmonizing over- and underexposed areas of the image. This is done fully automatically, thus eliminating any further manual user corrections through windowing.
- *CLEARview*: Dose-dependent filtering of the image data efficiently suppresses image noise, enabling clear, sharp images, even for low-dose acquisitions.
- *CLEARvessel*: Every pixel is analyzed in real time, and vessel edges are shown in high contrast without adding noise to the image.
- *CLEARmotion*: Fine moving structures, such as small vessels and guidewires, are detected in the image and motion artifacts are suppressed efficiently. The visibility of small moving vessels and guidewires is improved significantly during fluoroscopy.

Description

In addition there is Dynamic Density Optimization (DDO) for on-line harmonization of native series and single images.

Image generation

X-ray Generator

Microprocessor-controlled high-frequency X-ray generator with automatic dose rate control.

- Power output: 100 kW at 100 kV (DIN 6822), nominal power max. 80 kW (100 kV, 800 mA, 0.1 s) with Megalix tube and the newest flat emitter technology.
- SID tracking: Automatic tube current adaptation to focus-to-detector distance.
- CAREmatic: Automatic X-ray control system for fully automatic calculation and optimization of exposure data based on fluoroscopic data.
- Patient transparency monitoring.
- Tube load monitoring with indication in the live display.

The optimal X-ray parameters depend on the transparency of the patient at the current angulation, measured during fluoroscopy. These parameters are continuously calculated and updated. Test shots are no longer required. This ensures superior image quality and minimum radiation exposure for user and patient with every exposure release.

Tube assembly MEGALIX Cat Plus 125/20/40/80

3-focus high-performance X-ray tube with flat emitter technology, metal center tube in lubricated spiral groove bearing technology for permanent, noise-free rotation.

- Maximum tube voltage 125 kV
- Focus: 0.3/0.6 x 0.6*/1.0 (17/38/80 kW)
- Anode angle 12°
- Maximum anode heat storage capacity: 3,375,000 HU
- Maximum tube current for fluoroscopy: 250 mA

* Image quality improved

High tube power provides brilliant image quality even with heavier patients. In addition there is no need for X-ray pauses even during lengthy cases. The X-ray tube is completely silent, which is an additional benefit for patient and user.

Flat detector as40

The digital high-resolution dynamic flat detector with integrated removable grid is especially designed to fulfill the requirements of angiographic and interventional applications.

The as40 flat detector offers additional operating functions directly on the detector housing, such as angulation, FD rotation (cranial/caudal, RAO/LAO), and change of the focus-detector distance.

154 µm pixel arrays provide highest spatial resolution (3.25 LP/mm) and excellent contrast. Fluoroscopy as well as image acquisition are always done in 14-bit gray scale resolution, allowing excellent detail visibility. Acquisition frame rates of up to 30 f/s are possible.

Usable input formats:

- Overview mode: 30 cm x 38 cm.
- Zoom 1: 30 cm x 30 cm; diagonal 42 cm.
- Zoom 2: 22 cm x 22 cm, diagonal 32 cm.
- Zoom 3: 16 cm x 16 cm; diagonal 22 cm.
- Zoom 4: 11 cm x 11 cm, diagonal 16 cm.
- Zoom 5: 8 cm x 8 cm; diagonal 11 cm.

The very compact design with integrated collision protection provides a maximum C-arm angulation range for excellent patient access.

Description

The flat detector is mounted on a motorized rotating turntable at the C-arm. It can be rotated by 90°, so that it can be adjusted to landscape format or portrait format. Any angle in between can be adjusted.
Motorized adjustment of the detector-patient distance.

Digital data transfer from the detector to the imaging system is done via a high-speed Gigalink fiber-optic cable.

Removable grid:

The grid can easily be removed, saving the user time in examinations not requiring a grid. For example in pediatrics, where dose saving is especially important.

Angio collimator

Compact multileaf collimator for DSA and cardiological applications with rectangular diaphragm, wedge-shaped filter diaphragms and finger-shaped graduated filter.

- Automatic synchronous rotation of detector and collimator unit to compensate image rotation in the different working positions of the stand.
- Manual rotation of the detector and collimator unit using the control right on the detector housing.
- Five-step adaptive Cu pre-filtration (CAREfilter) to reduce the equivalent skin dose and improve radiation quality through dose saving for the soft radiation parts. Filter steps: 0.1; 0.2; 0.3; 0.6; 0.9 mm Cu.
- Independent rotation and shifting of filter diaphragms.
- Electronics unit with DIAMENTOR measurement chamber integrated in the collimator housing, for acquisition of the dose-area product and the calculated patient entry dose (CAREwatch).

StraightView

The flat detector and the multileaf collimator are installed on a motorized rotating turntable on the C-arm. They automatically line up with the table swivel, thus ensuring upright images of objects which are in line with the table. The flat detector and multileaf collimator can also be rotated together at any angle relative to the table, enabling upright presentation and collimation of objects which are not in line with the table.

Image processing

- Positive/negative image display, windowing, contrast/brightness control, electronic display (shutter), image shift (roaming), vertical and horizontal image inversion, magnifying glass, and zoom functions.
- Storing of single images as reference images also during fluoroscopy.
- Quantification: angle/length measurement, automatic and/or manual calibration.
- Text functions: user-definable image annotation, free annotation or by means of text components, comments line for the image, R/L display.
- Fast and direct access to all series, single images, and photo file images via MULTIMAP both in the examination room and in the control room for displaying or post-processing images.

Imaging system

Dual architecture

In order to provide highest level system availability, the imaging system consists of two independent computer systems that manage central tasks such as real-time image processing during fluoroscopy or acquisition as well as post-processing and networking functionality separately from one another. This ensures the best possible system performance and availability.

Image storage capacity

25,000 images in 1k/12 bit image matrix. This can be optionally extended to up to 100,000 images.

Image storage

DVD/CD burner

DVD drive for automatic digital image storage in the background on DVD-/CD-ROM for off-line data exchange in DICOM format.

Networking

Description

- Network interface (1000 BaseT) with the following integrated DICOM services:
- DICOM Send: Sending of images into the DICOM network: The DICOM Send function enables fully automatic transfer of generated image data to a DICOM archive and/or a DICOM workstation. The user can perform his examinations without interruption, while the system is fully automatically transferring the images to the archive scene by scene. This is a background process, and thus does not interfere with the ongoing fluoroscopy or acquisition.
- DICOM Storage Commitment (StC): Feedback from the image archive. The DICOM StC function automatically gives feedback on whether the generated image data were successfully transferred. This provides the necessary certainty to the user before deleting the acquired images locally in the imaging system.
- DICOM-Query/Retrieve: Retrieval of archived images from a digital archive or from a workstation: Already archived image data from a previous examination can be fully retrieved and is then available for review and processing. The user can request CT or MR system images from the archive and display the data as a reference image in the examination room. There is no need for a separate workstation.
- DICOM Structured Report: All the quantification results obtained on the system as well as all dose information on the individual radiation releases can be saved in DICOM SR (enhanced SR) format and transferred to a DICOM network.

Note concerning DICOM interface(s)

The description in the DICOM Conformance Statement downloadable from the Internet is exclusively binding for the functionality of the DICOM interface(s).

Functionalities across interfaces with/between partner systems require explicit validation, since the interpretation of the interface by the partner/target system is not part of the product's responsibility.

A modification of the interface that might be required is not included in the offer; e.g. for the rare case that available configurations are not sufficient. With regard to expenses for interface configurations that might be required, the agreements on maintenance/service of the product apply.

Displays and display suspension system

Display suspension system

Ceiling-mounted, swiveling, rotating, height-adjustable display suspension system with longitudinal travel. It is fitted with two 19" high-contrast b/w displays for live and reference image display in the examination room as standard.

Displays

Live and reference display

Flat-screen displays in monochrome TFT technology with high luminance and extended viewing angle.

- Screen size: 19" (48 cm).
- Resolution: 1280 x 1024 (pixels).
- Guaranteed brightness for the entire service life: 400 cd/m² at a contrast ratio of 500:1.
- Flicker-free and distortion-free image display.
- Ambient light sensor for optimum adaptation of the image display to the room brightness.

19" high-contrast b/w display for live image display in the control room is included as a desktop version with a black frame.

Display of system data

Data for device and table position, dose data, and system messages are displayed in the examination and control room on both the live display and the reference display.

Operation

syngo

The intuitive syngo operating elements allow for managing the whole process from preparation of the patient to image post processing in a safe, reliable, and time efficient way.

Description

Footswitch

A 4-pedal wired footswitch to release fluoroscopy, exposure, and table brake as well as a configurable additional function is included as standard.

In the examination room

For an ideal workflow, full system operation capabilities can be accessed directly at the patient table. These include complete system operation through modular control elements for controlling C-arm movements, the patient table, and the multileaf collimator.

syngo-based touchscreen with multi-functional joystick for operation of the imaging system, including post-processing and quantification as well as selection of the organ programs. The touchscreen is specifically configurable to individual clinical requirements.

This means that the user can operate the system on their own without having to leave the examination room if this is deemed necessary by the situation.

In the control room

Standard Siemens syngo control via country-specific keyboard and mouse for all imaging system functions such as image post-processing, storing, and configuring of organ programs.

Customer Care – the customer care solution from Siemens Healthcare

From the moment you purchase your Siemens system you will benefit from many services that are offered by "Customer Care". These include:

- Initial application training
- Interactive e-learning for various applications
- Free customer magazines
- Arrangements for clinical training via a global network
- Free trial licenses

You will find information on our e-learning program and further details on general "Customer Care" services on the Internet.

* The availability of "Customer Care" services may be restricted for some systems.

User Training

Siemens recognizes the significant investment you are making in purchasing a new imaging system and are determined that you are able to realize the full capability of this new system. Siemens clinical applications training ensures you have every opportunity to fully utilize your new system.

Content of user training: Handover Training and Follow-up Training

- Introduction to the functions, options, and handling of the Angiography system
- Instruction on the use of the Angiography system together with modern, highly-developed applications

Delivery & duration of the user training varies and may be country specific so for additional information please contact your local Siemens representative.

- $\pm 15^\circ$ head up/head down positioning.
- Iso-tilt functionality for maintaining the projection during table tilt along the patient axis.
- Motorized, power-dependent table movement in longitudinal direction when the table is tilted (power-assisted control).
- Electromechanical release of table swivel at the touch of a table button.
- Max. patient weight 200 kg. It is possible to install up to 40 kg of additional accessories.

Excellent image quality from the abdomen to the feet is due to the fact that adjustable parameters such as acquisition frame rate, measuring fields, position of collimator blades and semitransparent filters are stored specifically for each table position. That way the different X-ray transparencies for abdomen, legs and feet can be compensated and a consistent image quality with best possible contrast is achieved.

Description

Just one single injection of contrast media protects the health of the patient and gives the physician an instant, subtracted image display of the peripheral blood vessels.

PERISTEPPING:

Peripheral digital stepping angiography with only a single contrast medium injection under visual control of the bolus flow.

Gantry stepping with zeego and ceiling mounted systems, table stepping with floor mounted and biplane systems.

- Position-dependent variable frame rates.
- Fully automatic exposure control.
- Automatic storage of the collimator setting for each step.

PERIVISION:

Peripheral digital stepping angiography with online subtraction display in an examination procedure with only one single contrast medium injection under visual control of the bolus flow.

- Only one single automatically acquired mask image for each individual position.
- Position-dependent variable frame rates.
- Fully automatic exposure control.

Automatic storage of the collimator setting for each step

-

Angle-triggered digital rotation angiography enables dynamic image display with 3D effect. Dynamic subtraction with optimum alignment of masking and filling, and automatic pixel shift in the entire scene.

- Rotation speed is 60°/s (Artis zeego and Artis ceiling) and 45°/s (Artis floor and Artis biplane).
- Acquisitions with frame rates in 1k matrix from 0.5 to 7.5, 10, 15, 30 f/s (standard) and 60 f/s with reduced spatial resolution can be selected,
- Angle triggering allows a reduction in dose through a reduced acquisition frame rate while at the same time achieving better image quality.

Includes DYNAVISON DR for native rotation angiography and DYNAVISON DSA for subtracted rotation angiography. Reconstruction at the *syngo* X Workplace is not possible with this operating mode.

Note: For biplane systems rotation angiography is available in plane A only.

The visco-elastic comfort mattress for narrow tabletop reacts to temperature and has the special property of adapting to the individual body shape under the influence of body weight and heat.

Contents:

The *syngo* X Workplace is a dedicated workstation for image postprocessing. Its functionality can be extended with additional software functions to suit specific user or clinical needs in angiography, surgery, and cardiology. The use of the licensed software is limited exclusively to the specific *syngo* X Workplace included with this configuration.

***syngo* X Workplace PC**

The high-performance workstation is equipped with an Open GL accelerator board to support 3D applications. To exchange medical images on DICOM-compatible CD-Rs and DVDs, the system is equipped with a CD/DVD burner.

syngo X Workplace can be connected to an existing network via 1000/100/10 Mbit Ethernet.

Examination room: 19" color flat display or Artis Large Display connection kit

With this configuration, if an Artis Large Display is ordered - the configuration includes a connection kit for the Artis Large Display. If an Artis Large Display was not ordered - a display is delivered additionally for the examination room...

Control room: two 19" color flat displays or Artis Cockpit connection kit

In this configuration, there are also two displays for the control room or two connection kits for an Artis Cockpit.

The Siemens 19" LCD color display features very high contrast even under very bright ambient light conditions. The Gamma curve was precisely adapted to the CIE/DICOM recommendation and is thus especially suited for gray scale display.

Description

LCD color display

- 19" (48 cm) screen size
- Resolution: 1280 x 1024 (pixels)
- Excellent brightness for the entire service life: 137 cd/m² at a contrast ratio of 300:1.
- Flicker-free and distortion-free image display
- Anti-glare screen

The controlled background lighting provides stable lighting throughout the entire product life cycle.

syngo X Workplace Basic User Software

The *syngo X Workplace* software features an intuitive and thus easy to learn user interface developed from prototypes tested in close cooperation with users.

Standard functions such as filming or image review, and optional clinical application software, are performed in individual processes on dedicated task cards. A number of functions and input parameters, as well as the language used, can be selected according to individual requirements.

Package includes the following software licenses

Basic software with CD and dongle for the following functions:

- Patient Browser
- Filming
- Viewer
- System services

Patient Browser:

- Patient management.
- DICOM communication with Send, Receive, Query/Retrieve, Print.
- Reading and importing image data from CDs/DVDs.
- Module for writing DICOM CDs/DVDs for data exchange. Writing is in background mode.

Filming:

A virtual filmsheet shows a 1:1 display of the film sheets to be printed. This permits an effective preview of the filming job and the windowing of images, as well as providing a large number of evaluation functions.

Viewer:

The Viewer supports interactive 2D review, evaluation, and documentation functions. Multiple studies from the same patient can be displayed side-by-side for comparison.

- Image display: 1.024² screen matrix, configurable with up to 64 image segments.
- CINE display: Automatic or interactive dynamic presentation technique for the visualization of time and volume series.
- Synchronized viewing of multiple series.
- Measurement and annotation: Text annotation; distance, angle, circle, ROI and pixel lens, depending on information available from the acquisition system.

System services:

Microsoft Office Word, Excel, PowerPoint plus Outlook are supported (not provided!).

- Any user-selectable file, such as cardiac or angiographic acquisitions, DSA or 3D AVI video sequences, can be burned to CD, or exported to USB stick, to prepare quality presentations and demos of pathologies.
- Network module: For connection to a local Ethernet (Gigabit or 100 Mbit) for communication with networked archives, printers, diagnostic and therapy workstations, and teleradiology routers.

Scope of functions

- Network stations can be configured.
- Unlimited selection of stations.

Description

3D image generation

3D rotational angiography

In 3D rotational angiography, a sequence of 2D projection images is acquired by a C-arm performing a fast rotation around the isocenter in which the patient is positioned.

Image data are transferred automatically to a *syngo* X Workplace for time-optimized 3D image data reconstruction.

- All parameters required for the 3D reconstruction are included in the organ program. This enables optimized image quality and easy handling, as well as the fastest possible 3D reconstruction.
- Rotation speed is up to 88°/s (Artis zeego with *syngo* Dyna3D HighSpeed), 60°/s (Artis ceiling), and 45°/s (Artis floor and Artis biplane).
- Angle triggering allows a reduction in dose through a reduced acquisition frame rate while at the same time achieving better image quality. In addition, it allows for accurate subtracted rotational scans.

3D reconstruction and visualization of a volume are performed in real time in volume rendering technique, MPR, and MIP. 3D Rotational angiography is used in particular as support in interventional radiology and neuroradiology in the angiography laboratory. Based on dedicated acceleration hardware the primary reconstruction results are available in full diagnostic quality in the examination room within 19 seconds for high contrast images and less than 42 seconds for soft tissue DynaCT images. Subsequent secondary reconstructions are available even faster.

Note: For biplane systems rotation angiography is available in plane A only.

***syngo* DynaCT**

syngo DynaCT is especially suited to support radiologists and neuro-radiologists during interventional procedures in the angiography suite with both endovascular and non-endovascular procedures. *syngo* DynaCT provides enhanced decision making during oncology procedures such as chemoembolization and RF-ablations. In neuroradiology, *syngo* DynaCT allows the visualization of bleedings, the ventricular system of the brain and microstent placement.

With *syngo* DynaCT it is possible to visualize a soft tissue difference of 10 HU (Hounsfield Units) of an object 5 mm in size, or 5 HU for an object 10 mm in size, in a Thick-MPR display (measured with a CATPHAN 16 CT phantom with the CTP 515 module). Homogeneous image quality is achieved across the entire image. As a result, critical regions such as the base of the skull can be displayed with a lot fewer artifacts.

DynaCT also offers:

- a new reconstruction algorithm optimized for cone beam geometry
- a 20sDR-H 109 kV DynaCT acquisition reducing beam hardening artifacts and therefore improving e.g. detection of bleedings in DynaCTs with intravenous injection of contrast material
- faster 3D acquisition in 4x4 Binning mode

In conjunction with Artis zeego, *syngo* Dyna3D HighSpeed – being the fastest 3D protocol on the market – enables acquisitions to be generated in less than 3 seconds. As a result, moving organs such as the lungs can be displayed with a lot fewer artifacts. In addition, ~30% of contrast material can be saved which is important esp. in procedures requiring injection of a high volume of iodine (e.g. for enhancement of the aorta).

***syngo* DynaPBV Body**

syngo DynaPBV Body provides 3D physiologic information regarding blood volume in lesions and surrounding tissue. The visualization of color-coded blood volume maps is based on a special dual-sweep *syngo* DynaCT acquisition program followed by an elaborated computation of the blood volume steady-state information.

The software can demonstrate e.g. successful complete embolization of tumors, but it can also reveal critical physiologic changes in tissue perfusion e.g. after coil-embolization of side branches feeding non-tumor-bearing tissue, or it can also help in discovering suspicious (re-)perfusion around treated tumors indicating potential tumor recurrence.

3D Image Manipulation

The 3D XWP comes with applications that facilitate interactive volume rendering, accelerated by a high-end 3D graphics card. It offers support for large data records of up to 1,600 images (512 x 512 matrix).

In angiography, surgery, and cardiology, the three-dimensional information is used for diagnosis, planning of

Description

therapy and documentation.

Diagnosis and treatment can be performed in one session. This offers a significant advantage thanks to the fully-integrated workflow, for example the

- Transfer of the projection angle (that has been adjusted by the user in the XWP 3D volume) to the C-arm stand.
- Realtime synchronization between reconstructed volume and C arm position (Volume following the C arm position)
- Indication whether the angulation can be achieved at the C-arm without collision with the patient or table.
- Interventional volume measurement.

Features:

- Reconstruction protocols for visualization of vessels, bones, clips and coils.
- The result of the reconstruction can be native or subtracted.
- Modification of reconstruction area to allow zoom via reconstruction.
- Visualization with shading and light source for an improved three-dimensional impression.
- Interventional volume measurement.
- Link between C arm geometry and reconstructed volume: driving the C arm to exact projection position according to the view of the reconstructed volume and/or setting the volume to follow realtime C arm positions.

Image data:

- Viewing of volume data from AX, CT, MR, and PET modalities.
- Loading of two volume data sets simultaneously.
- Multiple Layouts: single (1on1), double (2 on1) and quadruple (4on1) for MPR display.
- Two displays are supported for simultaneous display of two volumes side-by-side.

Image display modes:

- VRT, Color VRT, MIP, MinIP, and MPR rendering.
- Thin slice renderings for VRT, MIP, and MinIP.
- Variable light source.
- Shading effects.

Volume editing:

- Cut planes.
- Editing of clip planes and control volumes.
- ROI punching.

Presets:

- Series-specific bookmarks, to store and retrieve volume visualization parameters.
- Global presets for series-unspecific application of volume visualization parameters.

Output:

- Radial ranges, including macro range definitions.
- 2D and 3D measurements, measurement grid, distance measurement and annotations.
- AVI format export with selectable compression format and compression ratio.
- TIFF, PNG, BMP, JPEG image export.
- Send to film sheet.
- Sending of parallel ranges results to PACS.

3D accessories

Includes the accessories required for 3D setup and calibration:

- Plexiglas calibration phantoms

Description

- Line phantom for image quality control
- Form filter
- 3D data link

Dual volume visualization

Enables the differentiation between two high-contrast 3D objects that have virtually the same contrast density by choosing different visualization presets for the two simultaneously loaded volumes. This enables clear differentiation between e.g. contrast-filled vessels, bones, stents, clips or coils.

Furthermore, it allows the display of one low-contrast and one high-contrast volume in one view, often realized as embedded MPR where the high-contrast volume is visualized in VRT and the soft-tissue information is shown as MPR slice. This can be used e.g. for visualization of the anatomical structure of tumors in combination with the feeding vessels.

3D roadmap

The operator can overlay any 3D volume or planning data, or excerpts of it, onto the live fluoro image. Via a Fade in – Fade out with the joystick the degree of visibility of the overlaid information can be determined at any time. This tool offers the physician real-time three dimensional guidance for more confidence. It avoids repeated injection of contrast material during fluoroscopy by overlaying a 3D vessel tree instead. The 3D roadmap is automatically updated in real-time according to any table, C-arm, zoom and SID changes. Even changes due to patient movement can be manually updated.

The 3D volume can be overlaid on regular fluoro as well as on subtracted fluoro (Roadmap) or acquisition series. The overlay appears on the display of the syngo X Workplace so the 3D Roadmap information is available in parallel with the regular 2D images of the live display of the acquisition system.

Fusion functionality

A fused CT, MR or PET image can be overlaid with live fluoroscopy in combination with 3D roadmap functionality providing information during interventional procedures that are available neither in 2D X-ray nor in 3D rotational angiography.

The package includes 3D/3D Fusion, which allows to spatially align two 3D volumes from the same or different modality in such way that the anatomical structures overlay each other. Any *syngo* DynaCT or *syngo* Dyna3D image can be fused with datasets from e.g., CT, MR or PET.

For PURE systems only: this package contains also the following functionalities:

The package includes in addition 2D/3D Fusion, which allows to spatially align any pre-acquired 3D volume of the patient with two 2D X-ray projections. This eases the workflow during the procedures and reduces the X-ray dose because no additional 3D acquisition is required.

Workflow support for needle-guidance

Provides a menu guided intuitive 3 step approach for consistent needle positioning results:

Step 1:

Definition and check of the needle path on a DynaCT or an external CT or MR or PET-CT dataset.

Step 2:

Check of automatically proposed progression views that will be used for monitoring the needle procedure.

Step 3:

Alignment and progression of the needle under fluoro control while the planned needle path is overlaid on the live image of the acquisition system. Easy switch between the defined progression views to control the real needle position and direction in all three dimensions.

Subsequently, a control scan can be performed and automatically fused with the planning volume using fusion functionality. *syngo* DynaCT, CT, PET or MR images are accepted for the image fusion.

Registration Algorithms:

- easy-to-use visual alignment with 6 degrees of freedom (3x translation, 3x rotation)
- landmark based registration with convenient landmark editor for point-based registration using anatomical landmarks
- storage of transformation matrix with datasets after registration for later retrieval

Visualization Techniques:

- Side-by-side visualization of both datasets with correlated pointer and correlated scrolling with dog ears
- 2D fade in monochrome or pseudo-color with adjustable balance between the two superimposed data sets.

Description

Workflow support for embolization guidance

Based on a contrast-enhanced DynaCT, CTA or MRA, the actual catheter position as well as the distal ends of the vessels feeding a lesion are marked and the navigation path is automatically calculated. The ability to graphically overlay this path with the current fluoroscopy image even offering a selection of different visualization options such as (centerline, outlines, 3D vessel representation) reduces the use of contrast material and lowers navigation time and hence total fluoroscopy dose during embolization procedures of e.g. tumor-feeding vessels.

As a second feature, segmentation and volume computation of a 3D structure such as a tumor nodule can be done based on CT, MR, PET-CT or late phase DynaCT volume datasets. The segmented object can also be overlaid with live fluoroscopy using the 3D roadmap functionality for improved orientation and target visualization during the intervention. The automatically computed volume can be used for estimation of the amount of (chemo-/radio-) embolic material needed.

For PURE systems only: toolbox functionality also included:

Toolbox is a generic application to interactively mark structures of interest in a 3D volume, e.g. a *syngo* DynaCT image, using points and lines. Analogously to *syngo* 3D Roadmap, these markings are projected onto the live 2D X-ray illustrating the position of the 3D anatomical structure within the live X-ray.

Included functionalities:

- Automatic extraction and overlay of anatomical outlines of the 3D volume on live 2D image.
- Overlay of any lines and dots drawn on the VRT or MPRs on live 2D image.

This functionality provides an easy link between information that may only be visible in the 3D volume (VRT or MPRs) and the fluoroscopy or roadmap images.

2D Image Manipulation

***syngo* Angio Viewer**

The *syngo* Angio Viewer enables dynamic review of DSA scenes (in subtracted or native display) and their post-processing at the *syngo* Workplace, with functions such as:

- Remasking.
- Pixelshift.
- Anatomic background.
- Opacification etc.
- Review of DYNAVISON and PERIVISION scenes

***syngo* iFlow**

syngo iFlow allows the visualization and analysis of blood flow and 2D perfusion in the examined organs. This information is based on the time-to-peak calculations from a routine DSA acquisition and can be applied as simple click-of-the button postprocessing to arbitrary pre-acquired DSA scenes. The calculations can be shown as a color-map of the whole organ. It is also possible to calculate blood flow and perfusion characteristics for regions defined by the user, and display them as ROI (region of interest) curves. These graphics support the analysis of blood flow dynamics in the defined region.

***syngo* Scene Compare**

Dual monitor support for dynamic side-by-side comparison of two scenes or for the evaluation of bi-planar scans in synchronized mode. It can also be used to compare scans to single images. In Interventional Oncology, this functionality can be used to compare pre- and post-interventional 2D scenes or iFlow images for evaluation of changes in blood flow characteristics as a result of the therapy.

Common functions

Inroom control functionality

Allows for remote control of the *syngo* X-Workplace from the examination room via touchscreen and joystick mounted table-side or on a trolley.

For this, a set of functions is offered inroom for e.g. 3D image assessment and manipulation, 3D navigation, multimodality image integration, or for actively following the steps of a pre-defined workflow.

***syngo* Expert-i**

syngo Expert-i enables the physician to interact with the *syngo* X Workplace from virtually anywhere.

When clinical questions arise at the *syngo* X Workplace, a second user with a Windows PC can quickly and efficiently access the *syngo* X Workplace via the network. He or she can assume full control of every application on

Description

the *syngo* X Workplace and can see all screen content that is displayed for the local user on the main monitor. This allows the parties involved to discuss clinical questions via phone and quickly reach solutions on a joint basis.

DICOM

Industrial standard for the transmission of information between DICOM-compatible units from different manufacturers. The scope of functions is described in detail in the DICOM Conformance Statement and in the standard version includes the Transmission/ Reception, Query/ Retrieve and Basic Print functions.

Note concerning DICOM interface(s)

For diagnostic purposes, only hardcopy cameras/laser printers explicitly approved for this system may be used.

The description in the DICOM Conformance Statement downloadable from the Internet is exclusively binding for the functionality of the DICOM interface(s).

Functionalities across interfaces with/between partner systems require explicit validation, since the interpretation of the interface by the partner/target system is not part of the product's responsibility.

A modification of the interface that might be required is not included in the offer; e.g. for the rare case that available configurations are not sufficient. With regard to expenses for interface configurations that might be required, the agreements on maintenance/service of the product apply.

For applications in the abdomen or thorax, the larger field of view (FOV 35 cm x 25 cm, 13.8" x 9.8") allows complete visualization of tumors, their feeding vessels and the surrounding tissue, e.g. in chemoembolizations. The larger FOV also optimally supports vascular treatments in the abdomen such as the placement of stent prostheses. The short acquisition time makes it easier for patients, especially those that are critically ill, to hold their breath during the acquisition.

Based on a special *syngo* DynaCT acquisition program with automatic processing, the blood volume is displayed color-coded. This offers special advantages during neuroradiological interventions (e.g., stroke/malformation) because it allows under- and oversupplied parenchymal areas to be displayed.

Scientific measuring program for objective, accurate and reproducible vessel evaluation:

- Automated contour detection.
- Determination of degree of stenosis.
- Automatic and manual reference diameter determination.
- Automatic and manual calibration methods.
- Distance and angle measurement.

Especially to be used for vessel sizes between 0.5 mm and 50 mm.

Measuring program integrated in the imaging system for objective, precise and reproducible evaluation of vessels.

- Automated contour detection.
- Determination of degree of stenosis.
- Automatic and manual reference diameter determination.
- Automatic and manual calibration methods.
- Distance and angle measurement.

The Vessel analysis allows precise quantification under sterile conditions, direct at table side with the touchscreen control. This speeds up the intervention and makes the procedure safer for the patient. The reports can be easily stored in the patient folder for documentation and to show the correct analysis of dilatations etc.

Especially to be used for vessel sizes between 0.5 mm and 50 mm.

Automap optimizes the procedure workflow, especially during interventions. A selected reference image displaying the needed medical information (e.g. before dilatation) is used as the basis for moving the system to the correlated position automatically. The intervention can be continued immediately without manually repositioning the patient. On the other hand, the system is able to select a reference image for the current device position. In case of

<p>Description</p> <p>changes in device position, this enables the user to see the corresponding reference images quickly and safely.</p>
<p>Note concerning DICOM interface(s) For diagnostic purposes, only hardcopy cameras/laser printers explicitly approved for this system may be used.</p> <p>The description in the DICOM Conformance Statement downloadable from the Internet is exclusively binding for the functionality of the DICOM interface(s).</p> <p>Functionalities across interfaces with/between partner systems require explicit validation, since the interpretation of the interface by the partner/target system is not part of the product's responsibility.</p> <p>A modification of the interface that might be required is not included in the offer; e.g. for the rare case that available configurations are not sufficient. With regard to expenses for interface configurations that might be required, the agreements on maintenance/service of the product apply.</p>
<p>Sent in MPPS:</p> <ul style="list-style-type: none"> - Total dose-area product - Number of exposures - kV per image (DICOM Exposure Dose Sequence) - ms per image - mA per image <p>Note concerning DICOM interface(s) For diagnostic purposes, only hardcopy cameras/laser printers explicitly approved for this system may be used.</p> <p>The description in the DICOM Conformance Statement downloadable from the Internet is exclusively binding for the functionality of the DICOM interface(s).</p> <p>Functionalities across interfaces with/between partner systems require explicit validation, since the interpretation of the interface by the partner/target system is not part of the product's responsibility.</p> <p>A modification of the interface that might be required is not included in the offer; e.g. for the rare case that available configurations are not sufficient. With regard to expenses for interface configurations that might be required, the agreements on maintenance/service of the product apply.</p>
<p>Printing Acquisitions using a Virtual Filmsheet Selecting "Auto-Print" automatically forwards the images stored in the virtual filmsheet to the printer. This optimizes the workflow, eliminating the need for user interaction. In addition, a specific layout can be configured on the virtual filmsheet, which the user can review and edit on the monitor at any time. As a result, printing is only required after the layout has been optimized on the monitor, saving time and costs.</p> <p>Note: For diagnostic purposes, only hardcopy cameras/laser printers explicitly approved for this system may be used.</p> <p>The description in the DICOM Conformance Statement downloadable from the Internet is exclusively binding for the functionality of the DICOM interface(s).</p> <p>Functionalities across interfaces with/between partner systems require explicit validation, since the interpretation of the interface by the partner/target system is not part of the product's responsibility.</p> <p>A modification of the interface that might be required is not included in the offer; e.g. for the rare case that available configurations are not sufficient. With regard to expenses for interface configurations that might be required, the agreements on maintenance/service of the product apply.</p>
<p>The lower body radiation protection can be attached to the accessory rails either on the right or on the left side of the patient positioning table.</p>

Description

It consists of the following shielding units:

- A basic unit shielding the area between accessory rails and the floor. It is flexible and can be adapted to the examiner's preferences.
- One LB radiation protection pivot swivel element that can move out of the way during collisions with the tube and still retain its protective function.
- Two clip-on units pointing upwards from the upper edge of the basic unit with a length of 57 cm and 27 cm.

The scattered radiation shielding units can be attached to the basic unit in an overlapping and fan-shaped way to allow closed, adapted scattered radiation protection even in the lower thorax area.
The maximum load of the accessory rails is 40 kg, the weight of the attached scattered radiation protection is 8 kg.

Mach LED 130F examination light with focusable light system. Can also be installed on the Portegra2 ceiling support of the portable radiation protection panel.
It is therefore fully integrated into the ceiling-installed radiation protection system of the Artis Zee/Q/Zen family.

- Luminance: 60,000 Lux for 100 cm distance
 - Working distance: 70 to 140cm
 - Color rendering index Ra: 95
 - Color temperature: 4,300 Kelvin
 - Focusable spot size: 14 to 25cm
 - Diameter of light head: 33cm
 - Number of LEDs: 19
 - Total input power: 20 VA
 - Max. reach of the spring arm combination: 185 cm
 - Total weight of light head with grip sleeve: 2,4kg
- Lamp power connection 230V or 115V possible

Large color flat display

The large display area allows for both large display and the free positioning of examination-relevant video signals. The fully integrated tableside control allows for selection from among twelve layout variants.

For the diagnostic color display in TFT technology, with high luminance and extended viewing angle, the gamma curve has been adapted particularly for gray scale display according to the CIE / DICOM recommendation.

Video signals such as live, assist and reference images, *syngo X Workplace*, Sensis/recording systems, PACS, HIS/RIS, ultrasound, ECG, external video, endoscope, mapping systems, system and table position, system messages and dose information can be individually positioned and displayed on the Large Display, if connected.

The extended Roadmap function is included, if DSA is available:

- Native live fluoro image during fluoroscopy; otherwise Last Image Hold.
- Native live fluoro image during roadmap / subtracted fluoroscopy; otherwise Last Image Hold.
- Native live acquisition during DSA acquisition; otherwise native max-fill image.

If the dual reference function is available, parallel static reference images are displayed on both reference monitors.

Technical specification for the 60" display:

- Display size (W x H) 60", 133 cm x 74.8 cm
- Screen size 60", 153 cm
- Resolution: 3840 x 2160 (pixels); 8 megapixels at 4 x HD.
- Color depth 16.7 10⁶ colors.
- excellent brightness over the lifetime: 300 cd/m² at a contrast ratio of 4000:1.
- Flicker-free and distortion-free image display.

Description

Technical specification for the 55" display:

- Display size (W x H) 55", 121 cm x 68 cm .
- Screen size 55" 139 cm
- Resolution: 3840 x 2160 (pixels); 8 megapixels at 4 x HD.
- Color depth 1.07 10⁹ colors.
- excellent brightness over the lifetime: 350 cd/m² at a contrast ratio of 1450:1.
- Flicker-free and distortion-free image display.

Technical specification for the 56" display:

- Display size (W x H) at 56", 124.4 cm x 70 cm
- Screen size at 56" (142.2 cm)
- Resolution: 3840 x 2160 (pixels); 8 megapixels at 4 x HD.
- Color depth 16.7 10⁶ colors.
- excellent brightness over the lifetime: 300 cd/m² at a contrast ratio of 800:1.
- Flicker-free and distortion-free image display.

Bypass concept

In case of error, such as controller failure, the Large Display switches automatically to bypass mode and emergency fluoroscopy is displayed on the Large Display.

Backup concept

The Large Display has a backup concept to ensure against power supply failure (2 separate power supplies for the left and right sides of the Large Display).

Display mount

The longitudinally mobile, swiveling, rotating, and height adjustable display holder with extended working range contains a large color flat display.

All cables are integrated.

The double-articulated arm of the "extended working range" display holder provides greater flexibility and a greater positioning range for the Large Display.

Technical data for the display holder:

- Longitudinal travel range 315 cm.
- Height adjustment range 75 cm.
- Swivel range between the articulated joint and the suspension at the ceiling-mounted carriage ± 150 degrees.
- Swivel range between the freely-suspended cantilever arm and the articulated joint ± 120 degrees.
- Display swivel range 330°.

The Large Display video controller 18 receives various internal and external video signals for presentation to scale on the Large Display.

Up to 18 external and internal video sources can be connected (max. 14 DVI-D and 4 analog (VGA) channels).

Important images for diagnostic purposes can be displayed to scale in their original size on the Large Display. Less important, non-diagnostic information can be displayed at a reduced size by the interpolation algorithm for image information integrated in the video controller.

An enlarged or reduced display can be selected individually via the display configurations at the fully integrated tableside control. The video controller then takes over interpolation and adaptation of image size.

In waveform images with high resolution, such as for electrophysiological recording systems, the curves are displayed free of artifacts because of a special interpolation algorithm.

Flat display in monochrome TFT technology:

- Screen size 19" (48 cm).
- Resolution: 1280 x 1024 (pixels).

Description
<ul style="list-style-type: none"> - guaranteed brightness for the entire service life: 400 cd/m² at a contrast ratio of 500:1. - Flicker-free and distortion-free image display. - Ambient light sensor for optimum adaptation of the image display to the room brightness.
<p>Depending on the view angle toward the panel, there is a reduction in contrast as well as image blurring. We therefore recommend removing the glass (which is easy to do) when evaluating diagnostic images.</p>
<p>This SW license enables your system to support enhanced user and system management, including:</p> <ul style="list-style-type: none"> - User authentication to prohibit unauthorized access - Privileges to define user/role based functionality - Permissions to control data access - Audit trails to log system and data access
<p>For Artis tabletops, the two arm holders help to laterally position the arms comfortably along the patient's body. They are slid laterally underneath the mattress, level with arms, and fixed by the patient's body weight. The patient's arms can be immobilized with commercially available securing straps (not included). Two pairs of arm holders of different length and height (matching the mattress height) are supplied, that are suitable both for thick and thin mattresses.</p> <p>An arm holder weighs 8 kg.</p> <p><i>Ordering information that can be deleted from the final version of the offer follows: Not in conjunction with the Surgery table and multi-section metal / carbon tabletop or the multi-section Surgery metal / carbon tabletop RoW.</i></p> <p><i>Already included in the following basic configurations:</i></p> <ul style="list-style-type: none"> - Combination Interventional cardiology / radiology - Interventional radiology - Neuroradiology - Combination Interventional radiology / cardiology - Vascular surgery - Neurosurgery <p><i>Can also be ordered as an option.</i></p>
<p>The lateral table extension is used especially in angiography and general radiology for big and obese patients as an additional armrest. It is slid underneath the positioning mattress and fixed by the patient's weight.</p> <p>The lateral table extension consists of radiolucent carbon fiber material, which avoids disturbing edges and shadows in the image. Arm pads made of washable plastic foam material are available on both sides. The patients's arms are immobilized by Velcro straps.</p> <p>Max. load per side 20 kg.</p> <p><i>Ordering information that can be deleted from the final version of the offer follows: Not in conjunction with the Surgery table Delivered as an option only, not included in the basic configuration.</i></p>
<p>The head holder is used to position the patient's head during the examination. Using the cushions or wedges, the patient's head is secured in the head holder.</p> <p>Cushions with large, medium, and small dimensions are included to support the head.</p> <p>The head holder is attached to the narrow tabletop with two knurled screws and a mounting device. Possible only with the 4 cm thick special foam mattress.</p> <p><i>Ordering information that can be deleted from the final version of the offer follows: Possible only in connection with the narrow tabletop and thin mattress, the neuro tabletop used previously is no longer possible.</i></p>

Description
<p><i>Not in conjunction with the Surgery table. Already included in the following basic configurations: - Neuroradiology - Neurosurgery Can also be ordered as an option.</i></p>
<p><i>Ordering information that can be deleted from the final version of the offer follows: Not in conjunction with the multi-section Surgery metal / carbon tabletop or the multi-section Surgery metal / carbon tabletop RoW. Delivered as an option only, not included in the basic configuration.</i></p>
<p>This UPS is recommended when protection and uninterruptible power is required for the C-arm and table. Emergency fluoroscopy is not available with this UPS. If emergency fluoroscopy is required, the 9390 - 160 kVA UPS is recommended for the full system. One UPS per lab.</p> <p>Operation:</p> <ul style="list-style-type: none"> - Since this UPS is working completely uninterrupted, a power failure is observed when no radiation is available and the display shows "No X-ray please wait". - The Emergency power lamp (red) will light on the power display during a power failure. All stand movements are possible and the image system functions are protected against data loss. Guaranteed back up time: 10 min. - Restoring of hospital's main power supply is indicated when the generator boots again (also green Hospital power lamp lights). Full exposures are available after apx. 75 seconds. <p>Includes UPS, battery, maintenance bypass panel, and one year on-site parts and labor coverage (24x7) by Eaton Powerware.</p> <p>Additional seismic brackets are required to make this system OSHPD approved.</p>
<p>The Powerware 9155 UPS Seismic Kit protects the UPS and Extended Battery Modules (EBMs) through Zone 4 seismic activity, based on NEBS GR-63-CORE Seismic Zone 4 Testing.</p>
<p>NT60010835 Interstate Mat Corporation Anti-fatigue Mat</p> <p>Industrial-grade anti-fatigue floor mat that provides comfort and durability. As a high-quality product designed to fight fatigue, it provides support for tired, aching feet, legs and back. Beveled edges for safety. Size 3'x5'.</p>