

Príloha č.1: Technická špecifikácia jednorovinového angiografického systému s príslušenstvom

Položka	Popis	Počet
	Artis Q ceiling	
1	Artis Q ceiling Neurorad. 14434096	1
2	Automap 14432948	1
3	4P wireless footswitch inst. of cbl 14432905	1
4	Mem. expansion 3 (50k - 1k Matrix) 14432940	1
5	Laser crosshairs 14432894	1
6	Fluoro Loop 14432947	1
7	2K acquisition 14432915	1
8	PERISTEPPING / PERIVISION 14432925	1
9	DYNAVISION DSA/DR 14434151	1
10	ECG-triggered FL 14432957	1
11	Vascular analysis 14432943	1
	syngo X Workplace - Artis Q / Artis zeego -Artis zee	
12	syngo interv. Neuro Engine Pro as40 14432834	1
13	syngo DynaCT Micro 14434185	1
14	syngo DynaCT SMART 14446025	1
15	syngo Dyna4D 14446026	1
16	syngo DynaPBV Body 14440505	1
17	syngo EVAR Guidance 14443019	1
18	syngo NeedleGuidance 14446029	1
19	syngo Embolization Guidance 14432961	1
20	syngo 3D Basic SW license 14432985	1
21	syngo DICOM SR Viewer #X 14432979	1
22	Lower body radiation protection 14432953	1
23	Moveable upper body rad. protection 14434157	1

Položka	Popis	Počet
24	LED Exam Light 14440512	1
	<u>Options and accessories Artis Q/Artis Q.zen/Artis zeego</u>	
25	Neuroradiology Professional 14442927	1
26	Neuroradiology Premium narrow 14442928	1
27	Intercom - Comfort 14440411	1
28	Large Display diagn. protection 14443011	1
29	Narrow tabletop with thin mattress 14440499	1
30	Head holder w/ pad set 14440441	1
	<u>Additional control sites Angio/Card for Artis Q/Q.zen/zeego -Artis zee</u>	
31	Sec. operation in the control room 14434231	1
32	Secondary Device Control (C Room) 14440508	1
33	Secondary Footswitch Ctrl (C Room) 14440511	1
	<u>Emergency Power supply UPS for Artis Q/Artis Q.zen/Artis zeego -Artis zee</u>	
34	System UPS 14434132	1
35	DICOM Print 14432917	1
36	DICOM RIS-Modality Worklist 14432950	1
37	DICOM MPPS 14432951	1
38	StreamLink 14442987	1
	<u>Elevate programs for Artis Q/Artis Q.zen/Artis zeego</u>	
39	AX ELEVATE #R ROW Buy Back(dTA/dTC) 14440541	1
40	Factory Inst. Artis ceiling (EU) 14440493	1
	<u>CPQ Entry Overview AX Accessories</u>	
	<u>CPQ AX Injectors</u>	
41	Arterion Mark 7 pedestal 10502391	1
	<u>CPQ AX Other Accessories</u>	
42	BUCHSTEINER Angio Set 09709130	1
43	BUCHSTEINER Peri-Angio Set	1

Položka	Popis	Počet
	09709148	
	<u>Displays Artis Q /Q.zen/zeego -Artis zee - in the exam. room</u>	
44	Large Display 14434172	1
45	Large Display video controller 9 14434175	1
46	LD panel size 60" 14443013	1
47	Infinity Delta – Patient Monitor	1

Artis Q ceiling

1 **Artis Q ceiling Neurorad.**

Artis Q ceiling for interventional neuroradiology

The Artis Q product line is setting new standards in interventional imaging.

The Artis Q ceiling for interventional neuroradiology now features PURE®. PURE adds smooth interaction to Siemens' smart technologies. It is designed to boost productivity and enhance outcomes for certain clinical applications, while increasing image quality and reducing dose.

The GIGALIX X-ray tube concentrates high pulse power on small, square-shaped focal spots (flat emitter technology for all focal spots). This provides unprecedented image quality for confidence in challenging situations.

The ceiling-mounted C-arm offers highly flexible positioning. The motorized rotation of the C-arm from a head-end position to a lateral position allows for free head access and full patient coverage without rotating the table.

The patient table is fitted with a freely movable patient positioning tabletop.

The as40HDR flat detector is optimized for the requirements of radiology.

Digital acquisition technology and digital subtraction angiography with up to 7.5 f/s in 1k matrix are available.

The complete CARE+CLEAR package offers optimal image quality at the lowest reasonable dose.

Live and reference images are displayed on two 19" flat screens in the exam room. In the control room live images are displayed on a third screen.

System description:

The single plane X-ray angiography system for digital acquisitions was designed to meet the requirements of modern angiography and interventional procedures, with a focus on interventional neuroradiology.

C-arm ceiling-mounted stand:

System cable outlet at the ceiling carriage, on the patient's left side.

- Up to 5 preprogrammed work positions, additional 50 user-definable work positions and 3 direct positions can be stored and recalled from table side.
- One single joystick for patient angle oriented operation of C-arm and change of source image distance (SID).
- Integrated computerized collision protection
- C-arm positioning 0° to the head end and variable up to 135° to the left and right side along the patient longitudinal axis.
- Double oblique projections of ±100° in orbital movements and up to 330° (+180°/-150°) in rotational movements.
- Variable C-arm speeds up to 25°/s.
- Variable focal-spot-to-detector distance between 90 cm and 120 cm.
- Isocenter-floor distance 108 cm.
- Focus-isocenter distance 78.5 cm.

MULTISPACE.T

The stand can be positioned on the left or right of the patient or at the head end, or at any angle in between. It can be moved longitudinally to any position along the length of the patient and also has a park position at a sufficient distance from the patient.

In Focus allows the projection angle to the patient to remain unchanged when rotating the C-arm around the table.

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IsoTilt allows the projection angle to the patient to remain unchanged when tilting the patient table (if the tilting function is available).

Both In Focus and IsoTilt improve the efficiency of an examination because there is no need to spend time adjusting the projection angle.

Patient table configuration

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.

Tabletop

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.

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

- Unilateral armrest: Carbon fiber armrest for cardiology and arm angiography to slide underneath the positioning mattress.
- Infusion bottle holder
- 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.
- Arm holder (1 pair): Two arm holders for comfortable lateral arm positioning along the patient's body.
- Head holder, flat: Head holder made of washable plastic foam for secure positioning of the skull (flat skull shapes) during skull examinations. The skull is immobilized in a positioning device in order to prevent motion artifacts.
- Head holder, deep: Head holder made of washable plastic foam for secure positioning of the skull (long skull shapes) during skull examinations. The skull is immobilized in a positioning device in order to prevent motion artifacts.
- Catheter bracket at foot end: Instrument tray for positioning at the foot end of the patient table.
- Hand switch for radiation release and additional control functions.

If narrow tabletop is selected:

- Pad set skull positioning: For laterally supporting the head in the head support. A head wedge and two pads each are included to support heads with large, medium, and small dimensions.
- Head holder for Artis: The head holder is used for immobilizing the patient's head during examinations and treatments. The patient's head is fixed in the head holder using the pads or the wedge.

Operating modes

Fluoroscopy

- Digital pulsed fluoroscopy with pulse frequencies of 7.5 p/s, 10 p/s, 15 p/s, and 30 p/s in 1k/12 bit matrix. Pulse

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rates of 0.5 - 4 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 7.5 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 7.5 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 can be corrected easily with Auto Pixelshift. This saves time for the user and improves image quality.

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. 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 with as20 detector: Pulsed fluoroscopy with additional, reduced pulse rates of 0.5, 1, 2, 3, 4, 6 p/s. Adaptation of pulse rate to the current application requirements for significant reduction of radiation exposure, especially during interventional procedures.
- CAREvision with as40HDR detector: Pulsed fluoroscopy with additional, reduced pulse rates of 0.5, 1, 2, 3, 4 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 67 % 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.

- CLEARpulse optimizes the X-ray pulse in two ways: the high pulse power allows for additional filtration to reduce radiation. In addition CLEARpulse shortens the X-ray pulse through the use of grid-pulsed flat emitter technology

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in concert with a high anode rotation speed. The required X-ray energy can be provided in a shorter period of time, thereby shortening the X-ray pulse by up to 43% at constant tube voltage. Moving objects like coronary arteries can be visualized sharper and with less blurring artifacts.

- 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.

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 (IEC 60601-2-7 and IEC 60601-2-54).
- SID tracking: Automatic tube current adaptation to focal-spot-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.

GIGALIX 125/30/40/90 - X-ray tube assembly

Triple-focus high-performance X-ray tube assembly with unique flat emitter technology for generating extremely high tube currents of max. 250 mA in fluoroscopy and 1000 mA in acquisition. This provides very good image quality even with heavier patients or steep angulations. The focus is always quadratic and permits outstanding perceptibility of small structures with a nominal quadratic focus of 0.3/0.4/0.7. The anode has a high heat storage capacity of 5.2 MHU and the metal center tube with liquid bearing technology allows a maximum cooling power of 1520 kHU/min. This means that pauses are not required during radiation, even for lengthy procedures. The X-ray tube is almost silent, which is an additional benefit for patient and user.

as40HDR flat detector

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

The detector features 16-bit analog-to-digital conversion, resulting in a gray scale resolution of 65,536 gray scales. This in turn improves contrast resolution in 3D imaging with *syngo* DynaCT.

The increased scintillator layer thickness of 750 μm results in a high DQE (Detective Quantum Efficiency) of 77%, thereby improving image quality at low radiation doses.

154 μm pixel arrays provide highest spatial resolution (3.25 LP/mm) and excellent contrast. Acquisition frame rates of

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up to 60 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 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.

The as40HDR 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.

Removable grid:

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

Angio collimator

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

- Independent rotation and shift of filter blades
- Automatic synchronous rotation of detector and collimator unit to compensate image rotation at the different examination positions of the support stand.
- Rotation also possible via table side control enabling upright images of objects or body parts not aligned with the table e.g. arms.
- 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.
- Electronics unit with DIAMENTOR dose measurement chamber integrated in the collimator housing, for acquisition of the dose-area product and the calculated patient entry air Kerma at the patient entrance reference point (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

- Image display as positive and negative, windowing, contrast and 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 for acquisition and fluoroscopy
- Quantification: angle and length measurements, automatic and 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, reference images, and photo file images via MULTIMAP. Access possible both in the examination 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 50,000 / 100,000 images.

Image export and networking

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

- 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 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.

Display and display suspension

Displays in the exam room

Live and Assist displays are 19" TFT color and gray scale flat-screen displays with high luminance and extended viewing angle.

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- Screen size: 19" (48 cm)
- Resolution: 1,280 x 1,024 (pixels)
- Excellent brightness for the entire service life: 400 cd/m² at a contrast ratio of 1000:1
- Flicker-free and distortion-free image display
- Ambient light sensor for optimum adaptation of the image display to the room brightness

Reference images are shown on the Assist display.

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

Displays in the control room

19" high-contrast display for live image display in the control room is included as a desktop version.

Display suspension

Ceiling-mounted, swiveling, rotating, and height-adjustable display suspension system with longitudinal travel. It features two 19" high-contrast TFT displays for live and reference image display in the examination room (Standard configuration - unless modified).

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.

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 operation capabilities for the system 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.

Siemens Remote Service SRS™

Prepared for Siemens Remote Service SRS™ (during warranty, then with service contract):

- Hardware and software remote diagnosis.
- System remote configuration, e.g. adding of a DICOM node.

Early warning system ensuring system operation.

syngo Evolve

syngo Evolve is a service feature that is offered as a separate sales option. It is a key component of our upgrade strategy and allows you to take advantage of technological advancements.

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.

2 **Automap**

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

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 changes in device position, this enables the user to see the corresponding reference images quickly and safely.

3 **4P wireless footswitch inst. of cbl**

Wireless footswitch connection

Note: Wireless replaces the wired connection.

4 **Mem. expansion 3 (50k - 1k Matrix)**

5 **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 (with biplane systems only plane A).

6 **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.

7 **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.

The 2k acquisition is valid for DR, DSA, 3D acquisitions and PERIVISION, and affects full format, Zoom 1, and Zoom 2.

8 **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.

Peripheral digital angiography with stepping and online subtraction display.

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.

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

9 **DYNAVISION DSA/DR**

Native or subtracted digital rotational angiography with angle triggering.

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 DYNAVISION DR for native rotation angiography and DYNAVISION 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.

10 **ECG-triggered FL**

R-wave-triggered fluoroscopic pulse release for motion reduction also for low pulse rates.

With ECG-triggered fluoroscopy a steady catheter display is possible even with moving objects. This allows the use of low pulse rates and therefore results in a substantially lower dose as compared to standard fluoroscopy.

11 **Vascular analysis**

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

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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.

syngo X Workplace - Artis Q / Artis zeego -Artis zee

12 **syngo interv. Neuro Engine Pro as40**

A workstation for reconstruction, post-processing and handling of 3D information including specific 2D and 3D applications for interventional neuroradiology.

The package includes the following functionalities:

- 3D high-contrast and CT-like soft-tissue imaging (syngo DynaCT) - - 3D roadmap for dynamic overlay of planning data and 3D volumes on live images (fluoroscopy or roadmap)
- In-room control for table-side operation of advanced applications
- Expert-i functionality for remote operation of the XWP
- 3D functional imaging providing physiologic blood volume information (syngo DynaPBV Neuro), dedicated workflow support and measurements for aneurysm analysis and 3D stenosis measurements.
- Extended visualization and post-processing functionalities for DSA and native scenes (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).
- 3D Wizard for expert step-by-step guidance in 3D acquisition
- Parallel patient processing capabilities
- Full fusion functionality (2D/3D and 3D/3D) for integration of pre-interventional 3D datasets also from other modalities
- Marking of points or lines on the 3D information and overlay of these markings on live images (e.g. fluoroscopy).

Contents:

The syngo X Workplace is a dedicated workstation for image postprocessing and live image guidance. 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.

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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.

LCD color display

- 19" (48 cm) screen size
- Resolution: 1280 x 1024 (pixels)
- Excellent brightness for the entire service life: 180 cd/m² at a contrast ratio of 800:1.
- 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.

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- 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.

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, 60°/s (Artis ceiling), and 45°/s (Artis floor and Artis biplane).
- Dual-Volume visualization, allowing a clear and easy differentiation of e.g. devices and contrast-enhanced vessels
- 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 bleeds, 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
- DynaCT protocols optimized for intravenous injection of contrast material, including a dedicated, integrated bolus-watching phase
- faster 3D acquisition in 4x4 Binning mode

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syngo DynaPBV Neuro

syngo DynaPBV Neuro provides 3D physiologic information regarding blood volume distribution in the cerebral 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. Blood volume maps of the complete brain can be obtained and specific regions of interest can be drawn, quantitatively analyzed and compared.

In addition syngo DynaPBV Neuro allows for reconstructing a native DynaCT volume (e.g. for bleeding detection) and a DynaCT-Angio volume (contrast-enhanced DynaCT volume).

This unique application offers special advantages during neuroradiological interventions (e.g., stroke/malformation) because it allows under- and oversupplied parenchymal areas to be clearly visualized intraprocedurally in the angio room.

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 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.

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.
- 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.

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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.

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 such as of tumors in relation to 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 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 2D/3D Fusion as well as 3D/3D Fusion:

2D/3D Fusion - 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.

3D/3D Fusion – 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.

Toolbox functionality:

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:

- 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.

Workflow support for 3D stenosis measurement

The application 3D stenosis measurement allows analyzing a vessel segment using 3D views, e.g. MPR, VRT. Based on a 3D volume the user marks the vessel of interest with two mouse clicks. The vessel is automatically segmented and the centerline of the vessel is calculated. The vessel can be displayed with a curved MPR along this centerline and key stenosis parameters are calculated such as smallest and biggest area of all cross sections along the vessel's course in the analyzed range. Additionally, the users can "scroll" interactively along the vessel while detailed stenosis parameters are calculated for each MPR such as minimum diameter, maximum diameter and area of the vessel's stenosis cross-section as well as minimum luminal diameter and minimum luminal area.

Workflow support for neuro aneurysm analysis

With three simple mouse clicks, a cerebral aneurysm and its parent vessel is segmented in the *syngo* DynaCT image. Based on this segmentation, a complex analysis of the aneurysm is performed by the workstation and the aneurysm dome height and width, the ostium neck, angle and length as well as the ostium area and cutting plane are measured automatically. The application also determines the centerline of the parent vessel and displays the vessel as a curved MPR along this centerline.

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 any DSA scene (=> no dedicated acquisition needed). 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. 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.

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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 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.

13 ***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.

14 ***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.

15 ***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.

16 ***syngo* DynaPBV Body**

syngo Dyna PBV (Parenchymal Blood Volume) Body is an application for displaying the blood volume distribution in

the abdomen.

Only in connection with syngo Dyna PBV Neuro.

Based on a special *syngo* DynaCT acquisition program with automatic processing, the blood volume is displayed color-coded. Under or oversupplied parenchymal areas in the abdomen can be displayed.

syngo DynaPBV Body provides physiological image information regarding lesions. As a result, individually differing response behavior to embolization can be better identified.

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.

– 17 **syngo EVAR Guidance**

A dedicated application providing easy and automatic 3D image guidance during EVAR procedures.

Pre-acquired CT datasets are processed to automatically provide the relevant information for 3D image guidance; typically in less than 1 minute. The application provides:

Fully automatic mesh modeling of the aortic wall

Fully automatic generation of ostia target rings of main branched vessels

Automated proposal of stent graft landing zones

Automatic calculation of optimal C-arm angulations for stent deployment and radiation-free C-arm positioning

The important anatomical landmarks can be overlaid with the live fluoroscopy or DSA for continuous dynamic 3D image guidance during the procedure.

The *syngo* EVAR Guidance workflow includes the following steps:

Create Vessel Tree - Automatic detection of the aorta and the main branching vessels (such as the left and right renal arteries). Additional vessels can be added with just one click. The vessel's centerline is marked to provide an easy indication of segments' length. Bones can be removed automatically from the abdominal CT dataset.

Define landmarks – A vessel mesh model is created to allow for automatic generation of important landmarks:

- Ostia rings - for each branching vessel a ring is generated to clearly mark the vessel ostia.
- Landing zone rings – corresponding to each branching vessel, landing zone rings are calculated, suggesting possible landing zone. These rings can be easily adjusted along the aorta.
- For each vessel an optimal C arm angle is calculated and stored into the system memory. During the procedure, these stored positions can be easily driven to, without the use of radiation. The selection between the stored positions for the vessels is easily done via the table side control.
- To allow for a flexible workflow, the segmentation results, the aortic mesh model and landmarks are saved when the patient study is closed. They are stored with the case and recalled when the patient study is opened again. Preparation of the case be done at any time before the procedure.

Overlay – The outlines of the aortic mesh model and/or the landmarks can be overlaid onto the live fluoroscopy image, following image fusion (registration). Both 2D/3D fusion and 3D/3D fusion are possible. The fusion process can be achieved from table side without having to step back into the control room.

18 **syngo NeedleGuidance**

A software module for planning and control of needle procedures.

The application enables the planning of one or multiple needle paths based on intraoperative *syngo* DynaCT images, or a preoperative 3D volume of a CT, PET/CT or MR system, in combination with Fusion functionality. Optimal progression views for easy control during needle insertion are calculated and suggested by the system and the planned needle path is overlaid on the live 2D image for easy guidance. Interventions such as vertebroplasties, kyphoplasties, pedicle screwing, biopsies, drainages and ablations can be performed on the angiography system with

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greater confidence.

syngo Needle Guidance workflow provides a 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.

19 **syngo Embolization Guidance**

syngo Embolization Guidance is an application for planning and performing embolizations.

For Application Software VD2 the easy one-click syngo Embolization Guidance application automatically detects and highlights tumor-feeding vessels for targeted embolization of the liver – supporting complete tumor embolization, which is important for an effective and safe treatment.

Disclaimer for Application Software VD2:

The products/features here mentioned are not commercially available in all countries. Due to regulatory reasons their future availability cannot be guaranteed. Please contact your local Siemens organization for further details.

For Application Software VD2 *syngo* Embolization Guidance offers a specific workflow for liver embolization procedures:

Workflow support for embolization procedures

The specialized workflow for liver embolization procedures allows to increase process efficiency:

Based on a 3D acquisition, the lesion or treatment area can be defined by drawing a diameter line with just one click. Then the algorithm automatically detects the position of the catheter and identifies and visualizes vessels going from the current position of the catheter to the defined lesion. The software locates even small and distal tumor-feeding vessels. The easy handling of the software allows the user to operate it from tableside, eliminating the need to leave the exam room in order to perform the planning.

Independent of the software version and the anatomic region, the following workflow support for embolization procedures is available:

Based on a contrast-enhanced DynaCT, CTA or MRA a proximal and (multiple) distal point(s) can be manually defined in vessels. The *syngo* Embolization Guidance algorithm automatically identifies the course of the vessel or vessel tree in between these points. The created vessel tree can then be adjusted by adding or removing vessels, changing colors and choosing different options for visualization (centerline, outlines, 3D vessel representation, ruler view, foreshortening view).

As a second feature, segmentation and volume computation of a 3D structure such as a tumor nodule can be done based on CT, PET-CT, MRI or late phase DynaCT volume datasets. The automatically computed volume can be used for estimation of the amount of (chemo-/radio-) embolic material needed.

The ability to graphically overlay 3D objects such as tumor-feeding arteries, or vessel paths in general, with the current fluoroscopy image reduces the use of contrast material and lowers navigation time and hence total fluoroscopy dose during embolization procedures of e.g. tumor-feeding vessels.

The ability to superimpose the segmented lesion or target area onto live fluoroscopy may give additional hints on targeted and non-targeted embolization during the procedure, e.g. in case anastomoses open up when the catheter is positioned more and more distally during the procedure.

20 **syngo 3D Basic SW license**

Basic 3D viewer platform for display of 3D series with Multiplanar Reconstruction (MPR), Surface Shaded Display (SSD) and Maximum Intensity Projection (MIP).

Input check for data consistency

3D series list function with consistency check of 3D series that are suitable for 3D processing. Overlapping 3D series can be merged to a single consistent 3D series.

Data set preparation

The data to be displayed can be limited through the clip box or the function "irregular volume of interest", which filters out disturbing information.

Image processing

Multi-Planar Reconstruction (MPR) for interactive movement through 3D volumes in any direction

- Real-time reconstruction of secondary cuts in orthogonal, oblique or double oblique orientation with freely selectable slice thickness (MPR thick, MPR thin) and slice distance.
- Calculation of curved cuts is possible.
- Automatic generation of parallel or radial areas.
- Frequently used area settings can be stored.
- Reference lines can be determined in the reference topogram or from a 3D surface reconstruction.

Maximum Intensity Projection (MIP) for angiographic display:

- Projection of the pixels with the highest intensity (vascular information) on any plane for display and diagnosis of e.g. aneurysms, plaques, stenoses, vascular anomalies or vascular exits.
- Thin MIP function for the projection within a slab of the data set.
- Automatic generation of radial areas. The resulting series can be viewed in three-dimensional display by means of the Movie function.

Shaded Surface Display (SSD) for the surface display of complex anatomies:

- Three-dimensional display of surfaces from a series of adjacent slices by means of an adjustable threshold value with quick preview and high image quality mode. It is used to display and analyze different anatomies, such as the interior of the skull, pelvis, hips, etc. in order to plan surgical procedures.
- The 3D objects can be tilted and rotated on the monitor in real-time by means of a virtual trackball.
- Automatic generation of radial series of SSD displays.

Since MPR, MIP or SSD are different visualization filters of the same data set, the user is free to switch between these modes and can also magnify the current display segment. Reconstructed images or areas can be stored or transferred to film sheets.

21 **syngo DICOM SR Viewer #X**

syngo DICOM SR Viewer allows to display DICOM Structured Reports on a syngo Workplace.

For optimized display of reports that were created with *syngo* applications, the *syngo* DICOM SR Viewer is delivered with dedicated templates. Unknown report types (e.g. from other vendors) are displayed by using a generic template.

22 **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

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(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).

Product may not be used in conjunction with a TRUMPF or MAQUET surgery table.

23 **Moveable upper body rad. protection**

This radiation shield protects the user from scattered radiation.

For room heights up to 290 cm/ 114.2".

It includes a ceiling rail (4m/ 157.5"), a ceiling mounted and movable stand (80 cm or 57cm/ 31.5" or 22,4"), a support arm (75 cm x 90 cm/ 29.5" x 35.4") and an acrylic glass.

The shield is made of acrylic glass with lead equivalent of 0.5 mm

(w x h: 61 cm x 76 cm/ 24" x 29.9"), which can pivot and rotate around a fixed point with a range of 360 degrees.

The operation range is limited when used with Artis floor/biplane MN.

Max. weight: 18 kg/ 39.68 lb

Product may not be used in conjunction with a TRUMPF or MAQUET surgery table.

24 **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.

- 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

- 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

Options and accessories Artis Q/Artis Q.zen/Artis zeego

25 **Neuroradiology Professional**

This package contains all items, which are frequently used in everyday practice in Interventional Neuroradiology.

Cable clips ECG

Bendable anesthesia screen

Body strap set

Cable clips ECG:

Cable clips for securing the ECG cable to the patient tabletop.

It includes 10 cable clips.

Product may not be used in conjunction with a TRUMPF or MAQUET surgery table.

Bendable anesthesia screen:

This flexible anesthesia screen holder serves as a holder for sterile drape (anesthesia screen) placed between the head and abdomen of the patient.

It includes one anesthetic arm and brackets for mounting it onto the accessory rails.

Weight: 1 kg/ 2.21 lb, With holders: 1.75 kg/ 3.86 lb

Length: 143 cm/ 56.4"

It requires the presence of accessory rail modules to which it will be mounted.

Popis

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.

26 **Neuroradiology Premium narrow**

This package complements the Professional package with additional positioning and protection devices for special, advanced work in Interventional Neuroradiology. It is intended for use with narrow tabletops.

Acc. rail module, narrow tabletop

Head-end operation w/ trolley

Accessory rail expansion

Tabletop extension

Arm rest for radial access small

Guide wire board radial access

Shoulder supports (2 pcs.)

Head-end holder

Acc. rail module, narrow tabletop:

This mounting frame is a table module with accessory rails for mounting control modules on the tabletop near the patient's abdomen.

It includes a radiolucent carbon fiber board with accessory rails attached to the right and left slides over the outer edges of the patient tabletop.

Maximum weight: 40 kg/ (88.19 lb)

Weight: 5.8 kg/ (12.79 lb)

Width carbon fiber board: 47.5 cm/ 18.7"

Width with accessory rails: 54.5 cm/ 21.46"

Length accessory rails: 45 cm/ 17.7"

Length: 48 cm/ 18.9 "

Can only be used with narrow tabletops. May not be used with MediGuide Technology.

Head-end operation w/ trolley:

Trolley for individual head-end positioning of Artis control modules.

It includes a trolley (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.

Accessory rail expansion:

This accessory rail extension enables positioning of the control modules over each other (parallel in two planes).

It is attached to the lateral accessory rail of the patient positioning table.

It includes one accessory rail extension.

Length: 43.5 cm/ 17.13"

Length inner surface: 41.5 cm/ 16.34"

height: 24 cm/ 9.45"

Width: 17.5 cm/ 16.89"

Weight: 2.05 kg/ 4.52 lb

Max. Load: 6.2 kg/ 14.33 lb

Product may not be used in conjunction with a TRUMPF or MAQUET surgery table.

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).

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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

Product may not be used in conjunction with a TRUMPF or MAQUET surgery table.

Arm rest for radial access small:

This armrest is designed primarily for radial access.

The armrest is rotatable and locks every 22.5° degrees from 0° to 180° (8 steps). It can be fixed on both sides of the tabletop.

It includes an armboard, a pad, form-cushions and a fixation strap.

The armrest is made of radiolucent carbon fiber material that is easy to clean.

The pad is made of open-pore polyurethane material.

The armrest can be mounted on the narrow tabletop, Artis one and neuro tabletop.

Max. weight: 10 kg/ 22.05 lb

Weight: 2.5 kg/ 5.5 lb

Guide wire board radial access:

Carbon fiber board for storage of guide-wire or instruments while performing radial access procedures.

It includes an additional framed cushion.

The arm rest is made of radiolucent carbon fiber material which is easy to clean.

The arm rest can be slid underneath the patient mattress at the patient's pelvis area and is held in position by the patient's weight.

The "L" shaped board is 600 mm/ 23.6" long and 200 mm/ 7.9" wide; the cushion shelf space is 150 mm/5.9" long and 130mm/ 5.1" wide.

Weight: 0,8 kg/ 1.8 lb

Maximum weight: 0.5 kg/ 1.5 lb

Shoulder supports (2 pcs.):

This item prevents the patient from sliding while the tabletop is in a Trendelenburg position.

The padded shoulder supports (26 cm/ 10.2" x 15 cm/ 5.9" (h x w)) with a washable plastic cover are attached to steel bracket holders that can be fixed to the head-end holder of the tabletop.

It may only be used in combination with the narrow tabletop and with the head-end holder.

Head-end holder:

This mounting frame is used to hold Siemens standard accessories such as shoulder supports and handgrips with support.

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

Weight: 1.75kg/ 3.9 lb

Maximum Weight: 40 kg/ 88.2 lb

It can only be mounted on the narrow tabletop.

27 **Intercom - Comfort**

Intercom system for communication between examination room and control room.

It includes

- a microphone with a control box for the control room

- a microphone with an adaptive acoustic filter for background noise suppression for the examination room

- a footswitch for conversation selection for the examination room

The microphone of the examination room is installed on the ceiling.

28 **Large Display diagn. protection**

The high quality laminated glass protective screen protects the panel of the monitor against mechanical damage and

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fluid ingress on the front.

It is suited for clinical image evaluation.

Features:

The laminated glass enforces high mechanical strength and resistivity against mechanical impact, the special coating reduces reflections for a continuous image quality, excellent spectral transmission of at least 98%, can be added to existing Artis Large Display installations.

Weight: approx. 12kg (55") up to 16kg (60")

Note: Observe the maximum permissible load of the display suspension, a combination with other options mounted to the display suspension might be restricted.

29 **Narrow tabletop with thin mattress**

This tabletop is for maximum freedom of C-arm angulation.

It includes a carbon fiber patient tabletop and a set of three Velcro body straps for securing and compressing the patient.

Maximum weight: 240 kg (529.1 lb).

Maximum weight in connection with tilting table: 200 kg (440.93 lb).

Weight: 10 kg/ 22 lb.

Length: 2287±1mm/ 90±0.04".

Width head-end: 228mm/ 8.98".

Width middle body: 450 mm/ 17.7".

Width lower body: 525 ±0.5mm/ 20.7±0.02".

Matching this tabletop a mattress and a mattress cover is included. This mattress adapts to the individual body shape under the influence of body weight and heat.

It is made of open-pore polyurethane material.

Mattress thickness: 40±5 mm (1.6±0.2").

Mattress weight: 5 kg (11 lb).

30 **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/ 9.06"

Height: 20 cm/ 7.87"

Weight cushion set: 0.25 kg/ 0.55 lb

Weight head support: 1.45 kg/ 3.2 lb.

Only for use in combination with narrow tabletop and the thin mattress.

Additional control sites Angio/Card for Artis Q/Q.zen/zeego -Artis zee

31 **Sec. operation in the control room**

Interface for connecting the additional system control from the control room.

Rail profile for hanging control modules (e.g. the table module) in the control room.

Safety button for switching off all system functions from the control room.

Rail profile (short table attachment) for table operation

- Weight: 1.4 kg
- Rail length: 12 cm
- Width: 20 cm
- Height: 14.5 cm

Rail profile (long table attachment) for device operation (with or without table operation)

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- Weight: 2.8 kg
- Rail length: 25 cm
- Width: 20 cm
- Height: 14.5 cm

32 **Secondary Device Control (C Room)**

33 **Secondary Footswitch Ctrl (C Room)**

Additional footswitch for radiation release including configurable control functions

Emergency Power supply UPS for Artis Q/Artis Q.zen/Artis zeego -Artis zee

34 **System UPS**

– 35 **DICOM Print**

Provision of DICOM Print service for connection to a laser camera or a network printer (postscript-capable).

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.

Note:

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.

36 **DICOM RIS-Modality Worklist**

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

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.

37 **DICOM MPPS**

Feedback of examination status via DICOM MPPS (Modality Performed Procedure Step) to an external RIS/HIS patient

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management system.

Data such as the dose-area product can be transferred to the RIS.

Sent in MPPS:

- **Total dose-area product**
- **Number of exposures**
- **kV per image (DICOM Exposure Dose Sequence)**
- **ms per image**
- **mA per image**

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.

38 **StreamLink**

Downscaling and streaming of the large display content via IP network. Supports up to two streaming destinations for remote display on a Windows PC, e.g. in a conference or lecture room. StreamLink also supports recording of Examination Room display for later download.

The video stream can be accessed directly after system startup. There is no further operator interaction needed.

Requires a separate Windows PC (Windows 7 or 8) for the recipient, with the VLC player plugin for either Internet Explorer 10 or higher / Firefox 22 or higher.

Streaming to X-Workplace or other Artis systems is not supported, because no VLC player is available on those systems.

Elevate programs for Artis Q/Artis Q.zen/Artis zeego

39 **AX ELEVATE #R ROW Buy Back(dTA/dTC)**

AX Elevate program for ceiling-mounted AXIOM Artis systems (monoplane) with flat detectors that will be replaced by a new Artis Q or Artis Q.zen system.

AX Elevate is the Siemens managed system upgrade program, which helps you replace your existing system with a new one, allowing you to benefit from modern technologies and functionalities. The old system will be bought back by Siemens.

40 **Factory Inst. Artis ceiling (EU)**

The position comprises the following services

Check of system parameters

Check and adjust stand and table

Check and adjust dose parameters

Adjust isocenter

Check emergency stop, collision protection and emergency power supply

Check and adjust image quality

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Check options e.g. perivision, dynavision, MPPS, ECG recording station, printer, external video sources, Large Display, zee Cockpit, video switch, network settings
Remote connection
Country-specific Measurement

Mechanical installation of the system is included in the price

CPQ Entry Overview AX Accessories

CPQ AX Injectors

41 Arterion Mark 7 pedestal

Fully automatic microprocessor-controlled contrast medium injector with volume, flow and time control. The Arterion Mark 7 Pedestal contrast medium injector can be positioned anywhere at the patient table on a mobile unit, for direct operation of all functions in the examination room.

The injector system includes:

- A mobile pedestal stand with electronics unit, a contrast medium temperature regulator and a connection cable to the hand switch and an interface cable to Siemens Artis system.
- A support arm with injector head and a control lever for moving the injector head.
- A user control console with large touchscreen and corresponding additional monitoring display on the injector head.

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: 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 1-20 ml/s.

Injection protocols:

- Up to 40 injection protocols possible.

The touchscreen display continuously shows the following protocol parameters and their actual values obtained after an injection:

- Injection speed
- Injection volume
- Remaining volume
- Programmed pressure

The head display shows the following, currently programmable protocol parameters:

- Injection speed

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- Injection volume
- Remaining volume
- Programmed pressure

Contrast medium temperature regulator:

- Nominal 37 °C (corresponds to 98 °F)

Injection data memory

- 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 (English).

Power supply

100 to 240 VAC; 50/60 Hz.

CPQ AX Other Accessories

42 **BUCHSTEINER Angio Set**

Positioning aid with integrated transparency compensation for general angiography, DSA and digital radiography. The compensating bodies adapt ideally to every body shape, stabilize the patient and reduce disturbing motion artefacts. At the same time density differences in the region of inhomogeneous body regions (e.g. skull, neck, chest) are compensated for and blooming (blind spots) is prevented. A significant time and dose saving results for the examiner, since the patient has to be positioned only once for all table positions. The image quality is decisively improved.

Scope of supply:

- 1 ring 30 cm diameter
- 2 cushions 15 cm x 25 cm
- 1 cushion 15 cm x 35 cm

43 **BUCHSTEINER Peri-Angio Set**

Positioning aid for positioning the legs with integrated transparency compensation for general angiography, DSA and digital radiography.

The compensating bodies adapt ideally to every body shape, stabilize the patient and reduce disturbing motion artefacts. At the same time density differences in the region of inhomogeneous body regions (e.g. skull, neck, chest) are compensated for and blooming (blind spots) is prevented. A significant time and dose saving results for the examiner, since the patient has to be positioned only once for all table positions. The image quality is decisively improved.

The density differences in the regions on the side of and between the legs are compensated for. For better orientation an X-ray scale can be inserted in the central web.

Scope of supply:

- 1 mat 50 cm x 100 cm
- 1 leg cushion 15 cm x 80 cm
- 1 foot cushion 25 cm x 45 cm
- 1 scale 75 cm

Displays Artis Q /Q.zen/zeego -Artis zee - in the exam. room

44 **Large Display**

Preparation for the large color flat screen display on a ceiling-mounted, longitudinally mobile, swiveling, rotating, and height-adjustable display holder in the examination room.

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.

The type of large display can be chosen with a separate position.

Display mount

- Preparation for the large 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.

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

Popis

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 normal working range contains a large color flat display. All cables are integrated.

Technical data for the display holder:

- Longitudinal travel range 217.5 cm with 300 cm rails.
- Longitudinal travel range 337.5 cm with 425 cm rails.
- Height adjustment range 85 cm.
- Swivel range (max. system rotation) 300 degrees.
- Display swivel range 330 degrees.

Note: *The type of large display can be chosen with a separate position.*

45 **Large Display video controller 9**

Large Display Video Controller 9 is the smallest of three different video controller versions. A maximum of 9 video signals can be connected and displayed simultaneously on the Large Display.

The Large Display video controller 9 receives various internal and external video signals for presentation to scale on the Large Display.

Up to 9 external and internal video sources can be connected (max. 7 DVI-D and 2 analog (VGA) channels).

The Large Display video controller 9 receives various internal and external video signals for presentation to scale on the Large Display.

Up to 9 external and internal video sources can be connected (max. 7 DVI-D and 2 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.

46 **LD panel size 60"**

Large color flat screen display (including cables) for the examination room, with a panel diagonal of 60". This large display version comes in an extra big format to clearly identify the smallest details even from bigger viewing distance.

Large color flat display

This large display has an extended viewing area which allows to display content in larger size while retaining good image quality.

For the diagnostic color display in TFT technology, with high luminance and extended viewing angle, the gamma curve

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has been adapted particularly for gray scale display according to the CIE / DICOM recommendation.

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: 350 cd/m² at a contrast ratio of 4000:1.
- Flicker-free and distortion-free image 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).

47 Infinity Delta Patient monitor