

Description

System configuration

Patient positioning

Patient positioning table easily accessible from all sides, tiltable from +90° to max. 20° Trendelenburg position.

- Table height adjustable from 65 cm to 112 cm (min. fluoro height 82 cm)
- Patient positioning tabletop 210 cm x 80 cm with examination range over the entire radiolucent part (193 cm x 53 cm). Motorized longitudinal travel \pm 80 cm and transverse travel \pm 17.5 cm.
- Foot rest attachable at head or foot end, up to a load of 230 kg.
- Comprehensive collision protection within the travel range of the image receptor.

Patient weight:

- Up to 150 kg - No restriction.
- 150 kg -182 kg (400 lbs) Patient longitudinal travel \pm 40 cm with slow movement, table tilt unrestricted.
- Between 181 kg and 230 kg if tabletop is in center position. Table tilt from + 90° to - 15°.
- Between 231 kg and 275 kg if tabletop is in center position.

Interventions up to a patient weight of 250 kg (plus 50 kg still possible for CPR).

Flat detector image receptor

- Distance focus - tabletop 60 cm.
- SID from 89 cm to 125 cm.
- Primary collimator with rectangular format.
- Highly selective anti-scatter grid Pb 15/80, grid ratio 15:1, 80 lines/cm. Grid focusing for SID 100 cm.

Transparent grids improve the image quality by reducing scattered radiation on the film.

Flat detector:

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

- Semi-conductor material: Amorphous silicon (a-Si) with CsI-(scintillator)
- Size 43 cm x 43 cm
- Pixel size: 148 μ m (6.76 pixel per mm)
- Physical size of matrix: 2880 x 2880 (8.3 million pixels)
- Size of active matrix: 2840 x 2874 (8.2 million pixels)
- Detail resolution: 3.4 LP/mm
- Acquisition depth: 16 bits

148 μ m pixel arrays provide highest spatial resolution and excellent contrast. Fluoroscopy as well as image acquisition are always done in 14-bit gray scale resolution, allowing excellent detail visibility. Acquisition frame rates of up to 8 f/s are possible.

Usable input formats:

- Overview: 43 cm x 43 cm; diagonal 60 cm.
- Zoom 1: 30 cm x 30 cm; diagonal 42 cm.
- Zoom 2: 22 cm x 22 cm; diagonal 32 cm.
- Zoom 3: 15.5 cm x 15.5 cm; diagonal 21 cm.

Description

Operation

Ergonomic tableside user interface on the system, comfortable for both left- and right-handed users. Integrated system operation and total tableside examination control.

- OPTI Grip for fast and easy movement of the flat detector image receptor and single-handed system operation.
- Touch user interface for interactive control of all system functions.

Footswitch FL/R:

The footswitch combination with two separate switch pedals provides ergonomic work support. During fluoroscopy-guided patient examinations, the user's hands remain free for the examination.

Fluoroscopy is switched on and off by foot. During fluoroscopy, targeted radiographic acquisitions can be released by foot, as well.

Accessories included in basic version

- Hand grip, front, axial adjustment.
- Hand grip rail, back, axial adjustment.
- Grip protection rail, head end, removable.
- Shoulder supports (1 pair), three-dimensional adjustment.
- Foot board, axial adjustment by 44 cm, can be used at head end or foot end.
- Protective film for fluids
- Radiation protection, complete
- Counterweight for radiation protection

OPTITOP 150/40/80HC-100 undertable X-ray tube assembly

X-ray tube OPTITOP 150/40/80 HC-100:

- Single-track, dual-focus rotating anode tube with compound anode (rhenium-tungsten, molybdenum, graphite)
- High heat storage capacity and high thermal load capacity for small focal spots. Integrated overpressure safety device in the tube protective housing.
- 150 kV nominal voltage acc. to IEC 60613.
- Nominal radiographic anode input power acc. to IEC 60613 (focal spot nominal values acc. to IEC 60336):
47 kW: small focus 0.6
85 kW: large focus 1.0
- Anode speed $\geq 8,500$ rpm, anode angle 12° .
- Heat storage capacity of the anode 580 kJ (783 kHU) acc. to IEC 60613.
- Nominal radiographic anode input power acc. to IEC 60613 (focal spot nominal values acc. to IEC 60336)

Generator Polydoros

High-frequency X-ray generator with multipulse voltage waveform for diagnostic acquisition techniques. The multi-pulse voltage waveform enables high data accuracy, precise reproducibility and short exposure times.

- Rating:
65 kW at 100 kV acc. to IEC 60601-2-7.
max. 800 mA at 79 kV
- Tube voltage 40 kV to 150 kV.
- Fluoroscopy, 450 W from 40 kV/0.2 mA to 110 kV/23 mA, pulsed fluoroscopy
- Shortest exposure time 1 ms (with IONTOMAT automatic exposure control). Free selection of the exposure data in 3- and 2-point technique.
- 1-point technique with continuously falling load (with IONTOMAT).
- Plani-IONTOMAT for tomography (option).
- CAREMATIC system for 0-point technique.
- Time and mAs post indication (with IONTOMAT operation).
- Fluoro mean value indication.
- Organ programs can be edited by the user.
- Tube load computer with opto-acoustic warning indicator.

Description

Power connection:
3 phase current: 400 V (-15, +10%); 50/60 Hz.
Option: 440/480 V.

Multileaf collimator

Undertable multileaf collimator with rectangular collimation for automatic format collimation. Motor-driven Cu prefilters.

CAREMAX

Electronic unit with KermaX-Plus, a measurement chamber integrated into the collimator housing for acquisition and fluoro systems to record the dose area product and/or standardized patient entry dose.

19" Flat display

- TFT flat-screen display for live image display in the control room.
- Flicker-free and distortion-free image display.
- Screen size: 19"(48 cm).
- Resolution: 1280 x 1024 pixels.
- Maximum brightness: ≤ 800 cd/m².

Imaging system

High-resolution digital imaging system with innovative image display, DICOM network connection and syngo-like user interface. It was optimized for general fluoro and multi-functional workplaces.

With the FLUOROSPOT Compact both single acquisitions and series from 0.5 to 8 images per second in 1440² matrix can be made and reviewed dynamically.

The digital acquisition process produces continuously high-quality images for all fluoroscopy-guided contrast medium examinations, skeletal acquisitions and interventional procedures.

Operating modes:

- Digital radiography (DR) with up to 2, 880²/12-bit matrix.
- CAREVISION: Pulsed fluoroscopy with selectable pulse frequencies 3 f/s, 7.5 f/s, 10 f/s, or 15 f/s in 1024²/12-bit matrix.
- High-speed fluoro at 30 f/s in Zoom 2 (22 cm x 22 cm) and Zoom 0 (43 cm x 43 cm)
Pulsed fluoroscopy is especially suitable for time-intensive examinations to reduce the radiation dose for physician, staff, and patient.
- Display and storage of the last fluoroscopic image after switching off radiation (Last Image Hold).
- Single image and serial mode up to 1,440²/12-bit or 1,024²/12-bit matrix (depending on zoom).
- Serial mode (max. 8 f/s) with variable frame rate in three steps (max. 1,440²/12-bit matrix).
- DDO (Dynamic Density Optimization) for on-line harmonization of native series and single images.
- Live auto-windowing during fluoroscopy
- Live auto-shutter during fluoroscopy

Image processing:

- Real-time edge enhancement, positive/negative image display, windowing, contrast/brightness, electronic display (shutter), image shift (roaming), vertical and horizontal image inversion, and magnifying glass and zoom functions.
- DiamondView Plus: multi-scaling procedure for image post-processing with high detail contrast and reduced noise. Filter size and strength are weighted differently and are used for adaptation to the overall image content. DiamondView Plus enhances the signal exploitation of the dynamic range and improves the organ-specific detail contrast (soft tissue and bone). Can be preset in the organ program, and can subsequently be selected or deselected.
- Storing of single images as reference images also during fluoroscopy.
- Quantification: angle/length measurement, automatic and/or manual calibration.
- Text functions: User-defined image annotation, free annotation or using text components, comment line for the image, R/L display, image report and image quality graphics.
- Image gallery for harmonization (visualization support for image post-processing)

Description

Image display:

Image review and display in 100 Hz progressive display (1,024² matrix) through high-resolution, flicker-free flat-screen displays.

- Screen layout with 4, 9, 16, 25, or 36 images of an examination.
- Display of R/L marks.

Image storage capacity:

50,000 images for permanent storage in 1k/12-bit matrix and 2,000 images for permanent storage in 2840 x 2880 matrix.

DVD / CD burner (DICOM)

DVD drive for automatic digital image storage on CD/DVD for offline data exchange in DICOM, TIFF, and AVI format.

Connectivity

- DICOM Send: Digital, unidirectional image transfer of single images or complete folders to a network in DICOM format.
- DICOM Print: Provision of DICOM Print service for connection to a laser camera or a network printer (postscript-capable).
- DICOM Storage Commitment (StC): The network/archive sends a receipt acknowledgment for images/folders to the image system in DICOM format.
- DICOM Dose structured report: Enables transfer of dose report to archiving or viewing station.

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 system borders 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.

syngo Remote Assist

syngo Remote Assist is a standalone service option.

With *syngo Remote Assist*, Siemens uses a secure broadband VPN connection (VPN = virtual private network) to establish a connection to your Siemens imaging console in order to offer you direct, real-time support and training. This seamless and simultaneous virtual interaction will contribute to improvements in image quality and optimization of system use.

Siemens Remote Service

System Management software package to support Siemens Remote Service (SRS) with the following functions:

- Basic package Siemens Remote Service for Diagnostics and Repair, Quality Assurance and Software Maintenance.
- System remote configuration, e.g. adding of a DICOM node.
- Early warning system to secure system operation.
- The functions are made available in accordance with the maintenance contract package.

Prerequisite for the early warning system is a permanent connection to the system via LAN and router. It is the project manager's task to make this available on-site.

Power connection for the entire X-ray system

Basic version: 3/N/PE ~400 V (±10%) for 50/60 Hz line frequency.

Option: 3/N/PE ~440/480 V (±10%) at 50/60 Hz via line adaptation transformer.

Description

Customer Care. Life - the customer care solution by Siemens Healthcare

From the moment you purchase your Siemens system you will benefit from many services that are offered by Customer Care. Life* offers, e.g.:

- initial application training,
- interactive e-learning for various applications,
- free customer magazines,
- arrangements for clinical training via a global network,
- and free trial licenses

You will find detailed information on our e-learning program and further details on general Customer Care. Life services on the internet.

* Not all services of the Customer Care. Life offerings are necessarily available for all systems.

Components for basic configuration are described in the following.

Performance data :

- 80 kW at 100 kV (IEC 60601-2-7), 1,000 mA at 80 kV.
- Fluoroscopy, 450 W from 40 kV/0.2 mA to 110 kV/23 mA, pulsed fluoroscopy

DICOM MWL (Modality Worklist):

Import of patient/examination data from an external RIS/HIS patient management system.

DICOM MPPS (Modality Performed Procedure Step):

Sending of dose data, patient data, and examination data to an external RIS/HIS patient management system.

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DICOM Query/Retrieve service as SCU (Service Class user)

Supported formats:

DICOM XRF (X-Ray Radiofluoroscopy)

DICOM XA (X-Ray Angiography)

DICOM CR (Computed Radiography)

DICOM SC (Secondary Capture)

Images must be generated by FLUOROSPOT Compact (*syngo* FLC)

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With regard to expenses for interface configurations that might be required, the agreements on

Description

maintenance/service of the product apply.

- This SW license enables the Workplace System to support enhanced user and system management, including: user authentication to prohibit unauthorized access.
- privileges to define user/role based functionality.
- permissions to control data access.
- audit trails to log system and data access.

Technical details of display:

- Screen size 19" (48 cm)
- Resolution: 1280 x 1024 pixels
- Maximum brightness (typical): $\leq 800 \text{ cd/m}^2$
- Flicker-free and distortion-free image display
-

System Configuration

Ysio Max is a universal digital radiographic workplace with various flat detectors (MAX wi-D, MAX static) for image acquisition.

The Ysio Max digital workplace is especially suited for a high patient throughput. As a universal workplace, the system is primarily used in X-ray departments of hospitals, in radiological and partly radiological offices with high patient throughput and standardized acquisition technology.

Basic system components:

- A ceiling-mounted tube assembly support with X-ray tube assembly and motorized multileaf collimator.
- An imaging and control station with application and evaluation programs, as well as DICOM system interfaces.
- CD/DVD drive for digital image storage on CD-R/DVD for offline data exchange in DICOM format.

Tube assembly support

with X-ray tube assembly and motorized collimator.

All projection-relevant tube assembly positions can be manually adjusted with handles symmetrically mounted to the tube assembly collimator unit.

The ceiling-mounted tube assembly support can be adjusted in 3 axes for longitudinal, transverse, and height adjustment (x, y, and z-axes).

- Horizontal travel range in longitudinal direction 346 cm.
- Horizontal travel range in transverse direction 220 cm.
- Vertical lift 180 cm.

In 2 further axes (α - and β -axes) the tube assembly collimator unit can be manually adjusted for oblique acquisitions of the recumbent patient, or for horizontal, oblique, or lateral acquisitions on the portable detector, or for free bedside acquisitions.

- Rotation around the vertical axis of the ceiling-mounted support from $+154^\circ$ to -182° . Lock-in positions every 90° .
- Rotation around the horizontal axis of the tube assembly support arm $\pm 140^\circ$. Lock-in positions at 0° and $\pm 90^\circ$.

X-ray tube assembly OPTITOP 150/40/80 HC-100:

Single-track dual-focus rotating anode tube with compound anode (rhenium-tungsten, molybdenum, graphite), with high heat storage capacity and high load capacity for small focal spots. Integrated overpressure safety device in the tube protective housing.

- 150 kV nominal voltage acc. to IEC 613.
- Nominal power (focal spot nominal values acc. to IEC 336):

Description

40 kW: small focus 0.6
80 kW: large focus 1.0

- Anode speed $\geq 8,500$ RPM, anode angle 12° .
- Heat storage capacity of the anode 580 kJ (783 kWh) acc. to IEC 613.
- Total filtration (IEC 601-1-3) ≥ 2.5 mm Al equiv.

Multileaf collimator:

With full field and laser line light localizer. Rectangular collimation, manual and motorized, via organ programs.

- Multileaf collimator rotatable by $\pm 45^\circ$ around the center beam axis, e.g. for correct positioning of objects.
- A tape measure is integrated to check the focus-to-object distance.
- To improve radiation quality through dose reduction of the soft radiation parts, Cu filters (0.1 Cu; 0.2 Cu and 0.3 Cu) are inserted into the primary beam projection, depending on the organ program selected. They can also be selected manually.

Option:

A measuring chamber for the dose area product can be integrated into the multileaf collimator.

Controls and displays

The control elements at the tube assembly and the multileaf collimator are ergonomically arranged for single-handed operation.

Controls and displays at the tube assembly support (MAXTouch):

Multifunctional control display with color touchscreen for adaptation of acquisition parameters directly in the examination room.

Displays include:

- The collimation size of the acquisition field (in cm x cm).
- The selected SID.
- The selected Cu additional filters.
- Rotation from the 0-position.
- Tube assembly and detector centering.
- Operating states such as "ACSS/Manual", "Ready", "Selected", etc.
- Current detector angle (MaxAlign feature) – to eliminate the need to guess the tube angle and to protect the patient by reducing repeat exposures. Available with MAX wi-D and MAX mini.

The display follows the tube assembly orientation.

The following functions can be set manually at the multileaf collimator:

- Full field light localizer with timer for optical display of the collimated acquisition format and an optionally coverable laser line light localizer.
- The collimation of the acquisition format set last can be retrieved via a memory button.
- The rectangular collimation of the radiation field is pre-defined through the organ program and can be set manually by means of two dials.
- The motorized insertion of the Cu additional filters is controlled via the organ program, but can also be selected freely.

Imaging and control station (syngo FLC)

The entire control and communication of the radiography system incl. digital image processing takes place from a central operating site - the imaging and control station.

It includes:

- A high-end PC imaging system, based on Windows 7 with *syngo* user interface.
Storage of original data 14 bit.
Storage of image data 12 bit.
Storage capacity approx. 10,000 images.
- Keyboard and mouse.
- One 19" color flat-screen as control display or diagnostic display.

Description

- Manual button for exposure release.

Functions of the imaging and control station

Patient and study administration:

- Importing of patient lists and examinations from the HIS/RIS
- Manual patient registration
- Patient, study, and image data management
- Configuration functions

Acquisition and postprocessing:

- Organ program selection and configuration
- Selection of generator and diaphragm parameters.
Parameterization of image preprocessing: enhancement, harmonization, edge enhancement, and look-up tables (LUT)
- Display of current acquisition between 1.5 and 3.5 seconds (preview); complete image in 3.5 to 6 seconds max. depending on detector type
- Display of image markers (L/R, a.p./p.a.)
- DiamondView Plus: multi-scaling procedure for image post-processing with high detail contrast and reduced noise

DiamondView is a multi-scale procedure, i.e. filter size and strength are weighted differently and are used for adaptation to the overall image content.

- DiamondView enhances the signal exploitation of the dynamic range and improves the organ-specific detail contrast (soft tissue and bone).
- DiamondView can be selected via the "Pre-processing card".
- By entering "0", the image can be displayed without DiamondView.

Image processing functions:

- Image rotation
- Horizontal/vertical image mirroring
- Image zoom
- Pan
- Windowing
- Filters for edge enhancement and noise reduction

Image documentation and archiving:

- Image transfer to the network
- Automatic, user-configurable data distribution (DICOM Send, see also system interfaces DICOM)
- Automatic filming with virtual film sheet (DICOM Print, see also system interfaces DICOM)
- Image data export (12 bit) on CD/DVD

Workflow

Routine workflows are largely automated.

- Prior to exposure the patient data is transferred via the patient management system (HIS/RIS: option) or entered through the control console. The exposure parameters are selected through the organ programs.
- Then the patient or the acquisition system is positioned and exposure is released.
- The exposure released at the central system control is read out within a few seconds by the detector. It is displayed at the control display for orientation and made available in DICOM format at the imaging system output for sending e.g. to reporting workstations, image networks, laser cameras, etc.
- Clinical Assurance Program (CAP): Collection of deleted images, studies and patient data, including evaluation capabilities.

Password protection:

System access protected by password.

Description

Option:

Security Package: SW option with enhanced security features such as User Management and Audit Trail function (if offered, see text of the corresponding components).

DICOM system interfaces

- 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 or a DICOM workstation. The user can perform his examinations without interruption while the system fully automatically transfers the images to the archive. This image data transfer takes place entirely in the background and thus does not affect acquisitions performed at the same time.
- 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 way the user can be sure that the acquisitions stored locally in the imaging system can be deleted.
- DICOM Print: Printing of images by means of a virtual filmsheet on a DICOM laser camera.
Selecting "Auto-Print" automatically forwards the images stored in the virtual filmsheet to the laser camera. 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.

Options:

- DICOM Modality Worklist/MPPS (if offered, see tender further down).
- DICOM Query/Retrieve (if offered, see tender further down).

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syngo Remote Assist

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With *syngo* Remote Assist, Siemens uses a secure broadband VPN connection (VPN = virtual private network) to establish a connection to your Siemens imaging console in order to offer you direct, real-time support and training. This seamless and simultaneous virtual interaction will contribute to improvements in image quality and optimization of system use.

Siemens Remote Service

Prepared for optional Siemens Remote Service SRS (during warranty period, subsequently with service contract):

- Hardware and software remote diagnosis.
- System remote configuration, e.g. adding of a DICOM node.
- Early warning system to secure system operation.
- Functions according to the selected maintenance package.

Customer Care. Life - the customer care solution by Siemens Healthcare

From the moment you purchase your Siemens system you will benefit from many services that are offered by "Customer Care. Life", e.g.:

- initial application training,
- interactive e-learning for various applications,
- free customer magazines,

Description

- arrangements for clinical training via a global network,
- and free trial licenses

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

* "Customer Care. Life" offerings are not necessarily available to the full extent for all systems.

CAREMAX plus Dose Area Product (DAP) meter is connected to the collimator via CAREMAX adapter cable. The Dose Area Product (DAP) is being displayed on the system control console TUI and recorded in the exam protocol.

Technical details:

- CsI scintillator, amorphous silicon (a-Si).
- Detector acquisition matrix approx. 2872 x 2354
- Pixel size 148 µm
- Acquisition depth (gray scales) 16 bit
- Acquisition formats up to 34,9 cm x 42,5 cm (13,7" x 17")
- Thickness 19mm
- Data transfer via W-LAN
- Operation time:
 - min. 3.5 hours during regular utilization
 - min. 6 hours in standby mode
- Detector weight 3 kg
- Max. load 150 kg (patient lying down) and 100 kg (patient standing)

Technical details:

- Grid ratio 5:1, 85 lines/cm
- Grid focusing for source-image-distance (SID) of 115 cm (45")
- Dimensions (W x H x D): 472.1 mm x 410.1 mm x 28.4 mm (18.58"x 16.14"x 1.1")
- Weight: 1.1 kg (2.4 lbs)

Technical details:

- Grid ratio 13:1, 92 lines/cm
- Grid focusing for source-image-distance (SID) of 115 cm (45")

Space for 3 batteries, with LED indicator for charge status. The charger connects to a wall socket using a power cord.

This item includes the following components:

- 1x battery charger
- 1x power supply
- 1x battery

Technical details:

- Length: 198 cm (78")
- Width: 66 cm (26") (of which 53.5 cm is padded)
- Thickness: 2.5 cm (1")
- Weight: 2.7 kg (5,9")

Description

Technical details:

- Dimensions: 24,7 cm x 7,4 cm x 0,7 cm
- Weight: 100 g
- Battery capacity: 3,35 Ah
- Max. voltage: 7,4V

Technical details:

- Screen size 19" (48 cm)
- Resolution: 1280 x 1024 pixels
- Maximum brightness (typ.): ≤ 800 cd/m²
- Flicker-free and distortion-free image display