

Data sheet (EHR)

syngo Dynamics

Software Version VA40D

siemens-healthineers.com/syngo-dynamics



Introduction

Siemens Healthineers' Cardiovascular Imaging and Information System, *syngo* Dynamics, is used for the acceptance, transfer, display, storage, archive, and manipulation of digital medical images, as well as, quantification and report generation.

With *syngo* Dynamics you can rapidly read multi-modality images and create reports for your cardiovascular patients. Studies from across your enterprise can be accessed quickly, and are available at your fingertips. Customizable templates enable you to tailor evidence-based structured reporting to efficiently meet your needs and workflow.

All of this creates a solid basis for your decision making. In addition, you can conveniently access the system from wherever you are¹.

Integration with Cerner Cardiovascular Imaging Management System

The *syngo* Dynamics Image Review and Common Reporting components are integrated with Cerner Cardiovascular Imaging Management System (CVIM) Powered by *syngo* Dynamics - an Electronic Health Record System (EHR).

Typically these components are accessible from the Worklist that CVIM provides. This allows users to read patient studies, double-check measurements and re-measure images, enter observations on worksheets, and update and verify patient reports, all from within Cerner Cardiology Workflow System.

Why *syngo* Dynamics?

Caring for patients with cardiovascular disease is complex and is constantly evolving.

Cardiovascular departments are being challenged with rising costs, increasing amounts of disparate data and decentral-ized work environments, requiring innovation and value creation - and your IT platforms must keep up.

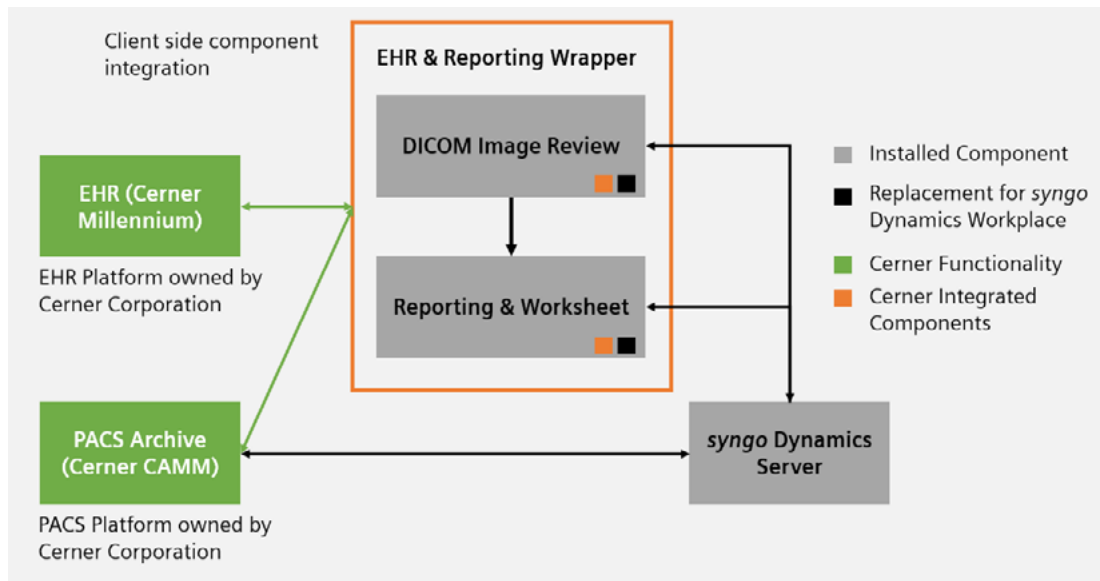
Just like many EHRs, the Cerner CVIM environment is designed for users dispersed across the spectrum of clinical, financial and operational responsibilities and can be typically deployed through-out the medical facility.

Building on Experience

syngo Dynamics continues a long tradition of departmental IT excellence by adding the global knowledge reach of Siemens Healthineers. We bring together expertise in all aspects of cardiology and information and image management – *syngo* Dynamics has grown into a true multimodality, multifunctional system.

syngo Dynamics VA40 is designed for customers using the integration with the Cerner Cardiovascular Imaging Management System (CVIM) Powered by *syngo* Dynamics - an EHR system.

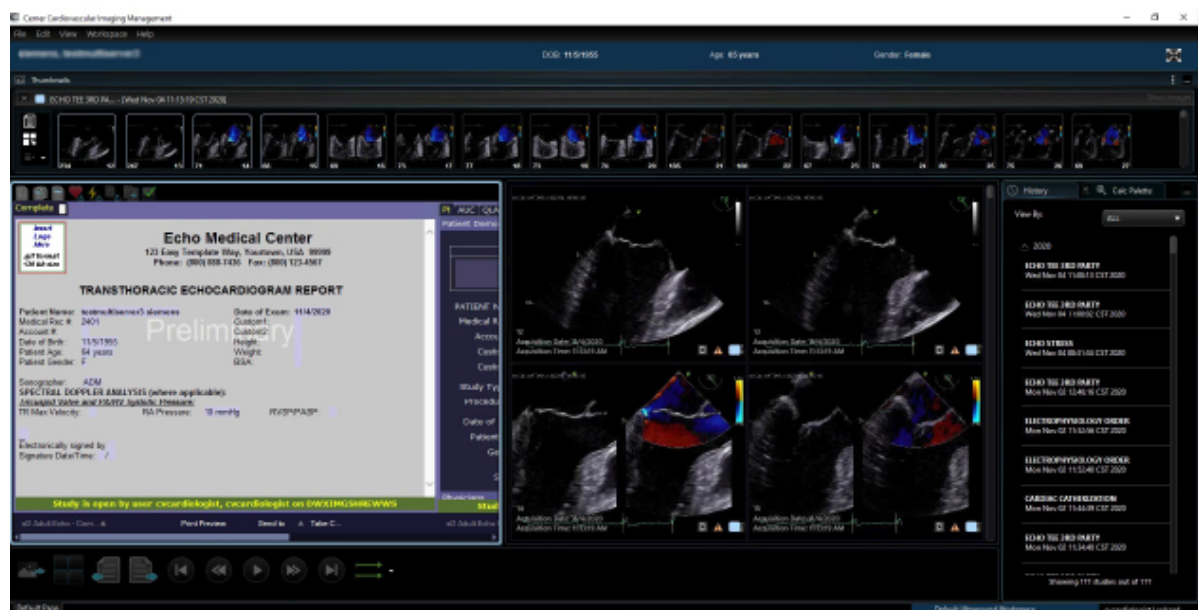
¹ Prerequisites include: Internet connection to clinical network, DICOM compliance, meeting of minimum hardware requirements and adherence to local data security regulations.



syngo Dynamics integrated with Cerner CVIM is a powerful solution that combines patient's electronic medical records and comprehensive cardiovascular image reading and reporting into a single system. This integrated solution helps to improve communication and user experiences through a single point of access to full breadth reading and reporting functionalities from Cerner CVIM.

User Interface Integration of syngo Dynamics with CVIM

An example of the User Interface integration of syngo Dynamics with Cerner CVIM is illustrated below.



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System security

„It's more than just information or technology. It's about efficiently enabling the best patient care.“

Security features

syngo Dynamics security features can help your site develop policies to comply with privacy and security regulations for controlling access to Protected Health Information (PHI).

However, the system administrator is responsible for actual compliance with laws and regulations. The syngo Dynamics privacy and security package activates the following features.

- HIPAA-compliant audit trail logging
- HIPAA-compliant administrator defined levels of study access
- Ability to encrypt network traffic between the client and server
- Enhanced audit logging
- Restriction of where administrative consoles can be run
- Support for Transparent Data
- Encryption (TDE)
- Securing SSL implementations
- Support for Transaction Log Shipping of MVF and AcusonDB databases

Virus protection

Virus protection is vital to protect the syngo Dynamics system and its data from malicious viruses, worms, or Trojans. The system administrator is fully responsible for installing and updating the virus protection software.

Key benefits

IT Systems help you deliver quality outcomes efficiently

Care teams have access to the patient's clinical information from various sources. Administrators gain an understanding of critical metrics needed to improve performance, quality and reimbursement. IT investment is secured with an integrated, modular and scalable infrastructure.

Transform your data

- Customizable and fully automated clinical workflows and structured cardiology reports
- Strict efficiency, security and ease-of-use standards your organization requires to stay competitive

Improve access to care

- Access to relevant data to enable the best, most efficient care possible

Optimize clinical operations

- Totality of your organization's discrete cardiology data in one platform
- Seamless third-party integration
- Easy, cross enterprise connectivity with the key pathway to improve care today and be tomorrow's leader

Modalities supported

- Ultrasound - Cardiac and Vascular
- Angiography
- Electrophysiology
- General Ultrasound - OB/GYN
- Nuclear Medicine (supported using Corridor4DM)
- CR, DX, SC (Secondary Capture)
- Intravascular Ultrasound (IVUS)
- Optical Coherence Tomography (OCT)

Siemens Healthineers best practice integration and services

- Patient context sharing with third-party application launch tool
- INVIA Corridor4DM® v2018 (including definitions required for PET protocol reporting)
- Nuclear Cardiology Native-View (in absence of INVIA Corridor4DM 2018)
- Philips QLAB V12.0, V13.0, and V15.0
- Philips Pie Medical Imaging (PMI) CAAS v8.2
- GE EchoPAC Plug-in V203.49 and V204.x
- AXIS Clinicals registry support (Cath PCI v5.x, IMPACT Registry V2.0.1)
- Merge Hemo v10.0.x
- TomTec Arena Version V2.31.0 and V2.40
- Optical Coherence Tomography
- GE* Mac-Lab® v6.5 and v6.8
- GE* Prucka CardioLab® v6.5 and v6.8
- Philips Witt Series IV v7.96 and v8.1
- Philips Xper
- Sensis hemodynamic system VC12M, VIBE VD11B, and VIBE VD12A
- OpenLink 25.0.3
- ResMd 5.4

- syngo Ultrasound Application Suite (sUSAS) VA17A
- Epsilon-EchoInsight Zero FootPrint 5.0.1.x

Sensis hemodynamic system integration real-time, bidirectional connectivity is still available as default configuration. Customer can opt to configure Sensis data as 'read-only' real-time send to syngo Dynamics. The same applies for Hemo & EP Sensis.

- Access to full-quality DICOM view option
- AXIOM Artis interface
- Artis zee® cockpit interface
- Intravascular Ultrasound (IVUS) support
- Optical Coherence Tomography (OCT) support
- Fractional Flow Reserve (FFR) support through Sensis
- syngo Dynamics Structure Reporting

System features

Evidence-based reporting

Advanced worksheets and reports – Custom modify worksheets and reports, Phrases on worksheet, Single-click macro diagnosis, Report table filtering of worksheet data, Full measurement and calculation package, Customizable calculations (including gender-based), Specialized pediatric and fetal reporting, Embedded images in report, Highlights of out-of-range limits, Select-only fields in worksheet templates, Parent-child configured fields, Automatically expand defined abbreviations

Study type and protocol report standardization

Preview of additional information such as Study Types and Study Dates

Change study states to mark as read, verified, and complete

Check for template conflicts and allow template check-in without forcing users to log out and back into the system

* GE EchoPAC, Mac-Lab, and CardioLab are trademarks of the General Electric Company

Carry forward data, Mandatory fields, Historical graphs, Military ID Rank

Compare up to 4 studies at a time (current plus 3 prior images, but up to 2 reports at a time)

Collaborative reporting (simultaneous reporting and documentation)

Expedite critical reporting by taking control of locked studies

Alignment with accepted clinical standards and guidelines

Auto-population of measurement and reporting elements

Compliance with national accreditation standards and registry protocols;

Multi-vendor registry support

DICOM SR support (to include proprietary measurement import from qualified Philips ultrasound devices)

Export of data to third-party through DICOM PR support such as ResolutionMD® and other DICOM SR capable softwares

Radiation Dose display per study through DICOM SR

Interface with advanced third-party applications. New and improved Ionosoft Coronary Tree Diagram version that does not use Adobe Flash. See **Siemens Healthineers Best Practice Integration and Services** in the Datasheet

Enhancement of hemodynamic and intra-procedural documentation

Advanced ultrasound image display

Advanced cardiovascular angiography quantification and analysis

Augment free text reporting through the use of voice recognition software

Exchange of data between disparate Healthcare communications standards

Report upload (observations, measurements, calcs or definitions)

Alert notification when verifying studies assigned to another physician

Export of discrete study data and billing data

Unlock and re-lock reports for locked, read, and unread studies

Support for healthcare connectivity initiatives, quality measures, IHE profiles

System features

Specialty reporting (such as OB/GYN , General Ultrasound Imaging, and Cardiovascular Angiography)

Fetal biometry measurements; autopopulate worksheet and report

Historical fetal growth curves

Advanced 3D ultrasound image display and post processing integration

Within the OB/GYN features, the anchor method supports the following calculations:
Last Menstrual Period (LMP), Estimated Delivery Date (EDD), Fetal Biometry Measurements, Growth Percentiles

Point-of-Care documentation with enhanced Coronary Tree Reporting (CTR)

Support for Congenital Heart and Vascular diagrams for CATH and ECHO studies

Artis Zee Cockpit

Support of Pie Medical Imaging (PMI) CAAS with DICOM SR import to include:
CAAS QCA, CAAS QVA, CAAS LVA, CAAS RVA, CAAS QCA3D

Image review

Display different image types – clips and still images

Specific color swatches for image theaters; Active viewport border matches the color swatch

DICOM field and header display

Displaying of clips – Highly flexible stress echo image and non-stress echo image display, Playing and stopping clips, Stepping clips frame by frame, Changing clip speed, Adjusting clip margins, Enlarging clips, Workflow tools to organize, optimize and anonymize images (Gamma correction and edge enhancement, DSA mask selection), Viewing of image annotations and overlays (presentation states) on original images in third-party systems, Displaying prior study images, Performing measurements and calculations on images

Compare up to 4 studies at a time (current plus 3 prior images, but up to 2 reports at a time)

Collaborative reporting (simultaneous reporting and documentation)

Expedite critical reporting by taking control of locked studies

Displaying measurements by image frame

Locating measurements drawn on an image or clip from the Calcs Measurement Palette or locate a measurement in the Calcs Measurement Palette from the image or clip

Biplane synchronization

Viewing all series of US, XA, and NM study as one group

Advanced ultrasound image display
 Advanced 2D/3D and volume image display support for ultrasound images via third-party integration

Waveform archive, CARTO, ablation HPI, CTI

Advanced cardiovascular angiography quantification and analysis

Embedded CARTO map image through Sensis
 Fractional Flow Reserve (FFR) support through Sensis

Sensis Coronary Tree Illustrator support

Ability to modify stress echo images
 Chronological display per acquisition time

Enterprise view deployment

Hardware independent application (complying to the Siemens Healthineers recommendations for the application)

Microsoft® Active Directory integration for user authentication and password

Critical results flag via HL7

Demographic reconciliation and order association

Floating licenses

Native monitor resolution Servers scaled to fit your needs

Server – Windows®

- Windows 2016 Server Standard Edition (64-bit) or Windows 2019 Server Standard Edition (64-bit) (check MS upgrade documentation to verify there is sufficient free space available prior to upgrade)
 - See **SQL Server Configuration for SL, DL, and EL servers** in the following pages. **For additional information about the supported Microsoft SQL Server, refer the quick reference guide on the Microsoft website.**
 - Microsoft .NET Framework version 4.7.2
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Hardware/Software requirements for SL Server

Hardware requirements for SL Server:

CPU:	1x Intel Xeon Scalable processor (Haswell/Broadwell or greater) 8 cores per CPU or equivalent virtual CPUs	
Memory:	32 GB (Recommended to reserve 50% of the server memory for SQL server)	
Video resolution:	Tested with monitor resolutions of 1280 × 1024 up to 2560 × 1600, with aspect ratios of 4:3, 16:9 and 16:10, portrait and landscape orientation	
RAID controller:	RAID controller supporting RAID 1, RAID 5 and RAID 6 with software monitoring feature RAID Write Cache Enabled with a 2 GB flash-backed write cache with RAID card battery	
syngo Dynamics SL Server		
Hard Disk Space:	C: System Disk	200 GB partition (4 KB cluster size)
	F: Database	500 GB (64 KB cluster size)
	G: Cache	300 GB (64 KB cluster size)
	T: ThumbnailCache	5 GB (4 KB cluster size)
	W: WebImageCache	5 GB (64 KB cluster size)
Ethernet controller:	One 1000 Mbps (1 Gbps) NIC controller, or two NIC controllers with redundant fail-over	
Database backup:	At least 36 GB uncompressed capacity network-attached storage	
Power supply:	Uninterrupted power supply	

Software requirements for SL Server:

Operating system:	Microsoft Windows Server 2016 Standard Edition (64-bit) or Microsoft Windows Server 2019 Standard Edition (64-bit)
	All latest Microsoft patches must be installed
Database server:	SQL Server 2016 SP2 Standard or Enterprise Edition (64-bit) or SQL Server 2019 Standard or Enterprise Edition (64-bit)
	Tested on English language edition of SQL Server; SQL Server Enterprise edition is required for Database encryption
Software framework:	Microsoft .NET Framework version 4.7.2
Extensions:	Install MSMQ (Enable MSMQ)

Monitors: The quality of displayed images highly depends on the quality and settings of monitors, graphics cards and graphics drivers. It is the customer's responsibility that client monitors are compatible with graphics cards and graphics drivers. It is also the customer's responsibility to use suitable monitors for diagnostic purposes. Country-specific regulations/laws may apply.

In the United States, monitors (displays) should not be used for diagnosis, unless the monitor (display) has specifically received 510(k) clearance for this purpose.

Hardware/Software requirements for DL Server

Hardware requirements for DL Server:

CPU:	2x Intel Xeon Scalable processor (Haswell/Broadwell or greater) 8 cores per CPU or equivalent virtual CPUs	
Memory:	64 GB (Recommended to reserve 50% of the server memory for SQL server)	
Video resolution:	Tested with monitor resolutions of 1280 × 1024 up to 2560 × 1600, with aspect ratios of 4:3, 16:9 and 16:10, portrait and landscape orientation	
RAID controller:	RAID controller supporting RAID 1, RAID 5, and RAID 6 with software monitoring feature RAID Write Cache Enabled with a 2 GB flash-backed write cache with RAID card battery	
syngo Dynamics DL Server		
Hard Disk Space:	C: System Disk	200 GB partition (4 KB cluster size)
	F: Database	1 TB (64 KB cluster size)
	G: Cache	300 GB (64 KB cluster size)
	T: ThumbnailCache	5 GB (4 KB cluster size)
	W: WebImageCache	5 GB (64 KB cluster size)
Ethernet controller:	One 1000 Mbps (1 Gbps) NIC controller, or two NIC controllers with redundant fail-over	
Database backup:	At least 36 GB uncompressed capacity network-attached storage	
Power supply:	Uninterrupted power supply	

Software requirements for DL Server:

Operating system:	Microsoft Windows Server 2016 Standard Edition (64-bit) or Microsoft Windows Server 2019 Standard Edition (64-bit)
	All latest Microsoft patches must be installed
Database server:	SQL Server 2016 SP2 Standard or Enterprise Edition (64-bit) or SQL Server 2019 Standard or Enterprise Edition (64-bit)
	Tested on English language edition of SQL Server; SQL Server Enterprise edition is required for Database encryption
Software framework:	Microsoft .NET Framework version 4.7.2
Extensions:	Install MSMQ (Enable MSMQ)

Monitors: The quality of displayed images highly depends on the quality and settings of monitors, graphics cards and graphics drivers. It is the customer's responsibility that client monitors are compatible with graphics cards and graphics drivers. It is also the customer's responsibility to use suitable monitors for diagnostic purposes. Country-specific regulations/laws may apply.

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Hardware/Software requirements for EL Server

Hardware requirements for EL Server:

CPU:	4x Intel Xeon Scalable processor (Haswell/Broadwell or greater), 8 cores per CPU or equivalent virtual CPUs	
Memory:	64 GB (Recommended to reserve 50% of the server memory for SQL server. If available memory is greater than 64 GB, limit SQL Server to use 32 GB less than total available memory.)	
Video resolution:	Tested with monitor resolutions of 1280 × 1024 up to 2560 × 1600, with aspect ratios of 4:3, 16:9 and 16:10, portrait and landscape orientation	
RAID controller:	RAID controller supporting RAID 1, RAID 5 and RAID 6 with software monitoring feature RAID Write Cache enabled with a 2 GB flash-backed write cache with RAID card battery Second RAID controller in case External RAID integrated	
syngo Dynamics EL Server		
Hard Disk Space:	C: System Disk	200 GB partition (4 KB cluster size)
	F: Database	1 TB (64 KB cluster size)
	G: Cache	300 GB (64 KB cluster size)
	T: ThumbnailCache	5 GB (4 KB cluster size)
	W: WebImageCache	5 GB (64 KB cluster size)
Ethernet controller:	One 1000 Mbps (1 Gbps) NIC controller, or two NIC controllers with redundant fail-over	
Database backup:	At least 36 GB uncompressed capacity network-attached storage	
Power supply	Uninterrupted power supply	
Fan:	Redundant Fans	

Software requirements for EL Server:

Operating system:	Microsoft Windows Server 2016 Standard Edition (64-bit) or Microsoft Windows Server 2019 Standard Edition (64-bit)
	All latest Microsoft patches must be installed
Database server:	SQL Server 2016 SP2 Standard or Enterprise Edition (64-bit) or SQL Server 2019 Standard or Enterprise Edition (64-bit)
	Tested on English language edition of SQL Server; SQL Server Enterprise edition is required for Database encryption
Software framework:	Microsoft .NET Framework version 4.7.2
Extensions:	Install MSMQ (Enable MSMQ)

Monitors: The quality of displayed images highly depends on the quality and settings of monitors, graphics cards and graphics drivers. It is the customer's responsibility that client monitors are compatible with graphics cards and graphics drivers. It is also the customer's responsibility to use suitable monitors for diagnostic purposes. Country-specific regulations/laws may apply.

In the United States, monitors (displays) should not be used for diagnosis, unless the monitor (display) has specifically received 510(k) clearance for this purpose.

Hardware/Software requirements for Image Review and Reporting Client

CPU:	One multi-core processor
Memory:	16 GB RAM or greater
Storage:	Dual SAS 146GB 15k RPM (RAID1)
Video resolution:	1600x1200
Video Card:	NVIDIA GeForce 9600GT (or higher)
Display:	2 High quality commercial LCD or LED monitors (Size: 22")
Network:	1GigE (1000Mbps)
Operating system:	Microsoft Windows 10 x64 patch 1803 or higher
Software Framework:	Microsoft .NET Framework Version 4.7.2
PDF Reader:	Tested with Adobe Acrobat Reader 8.0
Remote Service Tools:	Java JDK 8u261
Tested on VM:	Verified on Virtual Machines with Processor 4 core equivalent virtual CPUs (Environment needs resources available to handle 100% CPU Utilization); RAM to allocate upto 16 GB
Intranet Connection:	Local Area Network Enterprise required
Internet Connection:	Firewall and other Internet access is the responsibility of the customer
Point to Point modem:	ISDN line recommended

Monitors: The quality of displayed images highly depends on the quality and settings of monitors, graphics cards and graphics drivers. It is the customer's responsibility that client monitors are compatible with graphics cards and graphics drivers. It is also the customer's responsibility to use suitable monitors for diagnostic purposes. Country-specific regulations/laws may apply.

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Disk Input/Output performance per second (IOPs) specifications

The recommended disk IOPS configuration is as follows:

- 95% of all operations used up to 300 IOPS
- 4% of operations used 700 IOPS
- 1% of operations used 1200 IOPS

The above recommendation is based on observations in the *syngo* Dynamics performance tests for an EL server. These recommendations can be considered for SL and DL servers as well. For optimal performance, disk IOPS of 700 and above.

is necessary across all disks.

The server used for test was under the following load.

- 20 simulated modalities
- 80 simulated clients
- HSM Archiving
- Offloaded encoder
- 7000/hour HL7 stream
- Report upload on Verification

Statistics for optimal performance

For optimal performance, minimum hardware requirements may need to be scaled in order to accommodate the desired number of concurrent users. The following table contains the required information.

Sizing tier of image data management server	Total number of acquisition devices	Concurrent users accessing portal viewing
SL Server	4	Unlimited
DL Server	13	Unlimited
EL Server	74	Unlimited

Product availability may vary from country to country and is subject to varying regulatory requirements. Please contact your local representative for availability.

The information in this document contains general technical descriptions of specifications and options as well as standard and optional features which do not always have to be present in individual cases.



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Some of the specifications described herein may not be currently available in all countries. Please contact your local Siemens Healthineers Sales representative for the most current information.

Caution: US federal law restricts the herein described devices to sale by or on the order of a physician.

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