

NM SPECT, VAMC  
MUSKOGEE, OK  
PO# 623-B68016

Qty	Item Description
1	<b>Symbia Evo</b> The Symbia Evo is a variable angle dual detector SPECT imaging system with an open gantry designed to maximize patient comfort and fast data acquisition. Equipped with Foresight Digital detectors, the Symbia Evo offers the industry's leading image quality for general purpose imaging as well as dedicated Cardiac SPECT applications. The Symbia Evo can be upgraded to Symbia Intevo Excel, Intevo 2, 6, or 16.  The Symbia Evo comes equipped with a user-friendly software interface which is seamlessly integrated with the Windows 7 operating system.
1	<b>Additional System Manuals</b> Additional user manual for the above selected MI system.
2	<b>Low Profile 3/8" Detectors</b> The low profile high resolution, digital detector assembly includes a .95 cm (3/8 in.) thick NaI (TI) crystal.
1	<b>Caudal Tilt</b> Caudal tilt on Detector 2 allows for precise positioning of static and dynamic acquisitions.
2	<b>Low Energy_Hi_Res Collimator Symbia</b> Low energy (140 keV), high resolution, parallel hole collimator
2	<b>Medium Energy Collimator Symbia</b> Medium energy (300 keV), parallel hole collimator
1	<b>Symbia Productivity Package</b> <del>The productivity package automates collimator exchange and quality control, increasing the productivity of the Symbia Intevo and Evo camera systems.</del>
1	<b>AQC Web Based Training</b> AutoQC web based training is available on the Siemens training website.
1	<b>AutoQC Source Registration Kit</b> Source registration kit for Symbia Automatic Quality Control option. This kit contains information on updating site radioactive materials license, contact information for source vendor, and user instructions.
1	<b>AutoQC source kit</b> This source kit contains includes 1 - Gd-153 line and 1 - Co-57 point source required for the

Qty

**Item Description**

automatic quality control option.

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**Internal ECG for Symbia**

The internal ECG gating system provides ECG triggering for the nuclear subsystem for nuclear cardiology examinations. In addition, for Symbia Intevo Excel, 2, 6 and 16, and T2, T6, and T16 cameras, the internal ECG gate provides ECG triggering to the CT subsystem for CT applications that require ECG gating.

The ECG gate is built into the Symbia patient bed and is controlled by the Symbia acquisition workplace. The leads are AHA (American standard) color coded. They connect near the head of the patient bed and travel with patient, thus never interfering with scanning.

The ECG waveform is displayed on the touch-screen Patient Positioning Monitor.

1

**Under Floor PHS Cable SPECT**

This option includes a kit for installing the cable between patient bed and the Symbia gantry under the floor.

1

**PHS Extended Pivot**

The PHS extended pivot option extends the range of pivot for the patient bed in gurney mode.

1

**Monitor: 19 inch LCD**

The 19" LCD Monitor is an economic monitor solution

1

**Extra Hand Controller**

Provides an extra hand controller for the scanner.

1

**Organ Processing for Symbia**

This upgrade will add organ processing capabilities to your acquisition workplace.

1

**Planar 1/2 Time Imaging**

Planar 1/2 Time Imaging provides shortened Planar acquisition times.

1

**Cardiology Engine Cedars**

The Cardiology Engine Cedars assists in the diagnosis and quantitative assessment of coronary artery disease by enabling the visualization of SPECT studies as well as quantified perfusion assessment.

1

**Remote Diagnostic Services**

Siemens Remote Services. A broadband VPN connection is required for full remote service functionality and optimal system uptime.

1

**SPECT US Installation**

This option includes the mechanical installation of the Symbia Evo series scanners.

1

**Symbia.net**

Symbia.net is an economical solution for reading of SPECT and SPECT-CT studies. The system can be optionally configured with full MI processing capabilities. The Symbia.net can be configured as a client-server system by adding the Server Management option. PET functionality is available on multi-seat systems.

1

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**Monitor: 19 inch LCD**

The 19" LCD Monitor is an economic monitor solution

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**4 Quadrant Phantom**

A 4 quadrant 2.0-2.5.30.3.5 mm standard pattern slightly modified for use with Symbia Imaging Systems

Qty	Item Description
1	<p data-bbox="402 386 824 415"><b>UPS for Symbia Camera Systems</b></p> <p data-bbox="402 420 1294 495">Uninterruptible power supply option that provides 10 minutes of back up power to the SPECT gantry enabling the proper shut down in the event of a power loss. Also provides noise filtering and transient suppression.</p> <p data-bbox="402 529 1294 579">Specifications:5.0 KVA Input configuration: 200-240 VAC, 50/60 Hz, L6-30P Output configuration: 208 VAC, L6-30R</p>
1	<p data-bbox="402 596 760 625"><b>UPS for e.soft/c.cam (60 Hz)</b></p> <p data-bbox="402 630 1294 680">Uninterruptible power supply option that provides 10 minutes of back up power enabling the proper shut down of the system in the event of a power loss.</p>
1	<p data-bbox="402 701 747 730"><b>Initial onsite training 32 hrs</b></p> <p data-bbox="402 735 1294 907">Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p data-bbox="402 928 889 957"><b>Initial onsite training 32 hrs Gov Offset</b></p>
1	<p data-bbox="402 978 795 1008"><b>MI SPECT Project Management</b></p> <p data-bbox="402 1012 1294 1150">A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemens equipment. The assigned PM will work with the customer's facilities management, architect or building contractor to assist you in ensuring that your site is ready for installation. Your PM will provide initial and final drawings and will coordinate the scheduling of the equipment, installation, and rigging, as well as the initiation of on-site clinical education.</p>

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

This educational offering must be completed by the later of (12) months from purchase of training or if applicable, completion of installation. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

Offset Part 14421656 Additional System Manuals

Project # 2016-2287, Philips BrightView system, de-install: 6/2017, expires: 12/30/2016 @

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**OPTIONS**

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**OPTIONS**

<b>Qty</b>	<b>Item Description</b>
2	<b>High Energy Collimator Symbia.</b> High energy (364 keV) parallel hole collimator
1	<b>Symbia Collimator Cart</b> The collimator cart is designed to hold extra collimators and allows collimator exchange without pivoting the bed.
1	<b>Additonal onsite training 12 hours</b> Up to (12) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist if applicable. This educational offering must be completed (12) months from date of purchase order. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.
1	<b>GOV'T ONLY - MI SPECT Training Class</b> Tuition for (1) government attendee to attend a classroom course of choice at one of the Siemens training centers. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

# Detailed Technical Specifications

## Description

The Symbia Evo has the following base features:

- Gantry
- Patient Bed
- Acquisition Workplace
- SPECT Acquisition Features

### Gantry

The gantry has two Variable Angle SPECT detectors and an, open design with 102 x 78 cm (40.2 x 30.7 in) patient opening. The two Foresight Digital SPECT detectors can be configured for a myriad of applications including 76° or 90° for cardiac applications and at 180° or numerous other configurations for all other whole body and general protocols. The unobstructed gantry base permits planar imaging of seated and standing patients and patients on wheelchairs, or on standard imaging tables, gurneys and hospital beds. Optional caudal tilt of one detector allows for optimum detector positioning of static and dynamic acquisitions. The contemporary design of the gantry incorporates Siemens-typical design elements.

The gantry supports circular orbits and non-circular orbits using autocontour. Autocontour, with infrared real-time body contouring, is a standard component which minimizes patient to collimator distance to 1.2 cm (0.45 inches) in Whole Body and SPECT noncircular orbit acquisition modes.

All motorized motions of the patient bed, gantry and detectors are controlled from the hand controller which can be plugged into either side of the gantry.

The Patient Positioning Monitor (PPM) is a touch screen flat panel display monitor which can be rotated for a wide range user access and visibility. It is used for the following functions:

- Patient Positioning with window and persistence adjustment
- Acquisition Parameter display (elapsed time, time remaining, view number, count rate, etc.)
- Detector and bed position information
- Gantry Control (reconfiguration, collimator change, offset zoom)

### Patient Bed

The patient-oriented design of the imaging bed consists of 40.0 cm (15.8 inch) wide and 2.6 mm (0.10 inch) aluminum pallet, supporting patient weights up to 227 kg (500 lbs). Minimum bed height is 53 cm (21 inches) for easy patient access. Programmable table positions for wheelchairs and gurneys minimize the transport efforts of patients and staff. Integrated rulers on each side of the patient bed, allow for quick whole body set up. The patient bed can easily be removed for rail-free access of sitting/standing patients, wheelchairs, imaging tables, gurneys and hospital beds.

A fully integrated source holder is provided for quick and convenient quality control.

Since patient comfort plays an important role in high quality medical imaging, the Symbia Evo comes equipped with the following comfort accessories:

- a head holder to support and stabilize the head during brain SPECT examinations
- a SPECT armrest to support upper arms and hands during SPECT examinations
- a whole body armrest to support the arms and keep them within the detector field of view during whole body examinations
- a set of patient support straps to help patient lie still on bed

### Acquisition Workplace

The syngo-based high performance acquisition workstation provides a wide range of clinical acquisition protocols utilizing a graphical user interface, keyboard and mouse.

## Description

### SPECT Acquisition Features

#### **SPECT Acquisition Modes:**

- Planar static and dynamic
- Whole Body
- SPECT
- Gated SPECT
- Dynamic SPECT
- Whole Body SPECT

#### **Workflow Features:**

The system combines acquisition, post-processing (optional), and display into user customizable workflows that automate many clinical routines, remembering parameters for each clinical protocol, the workflow will automatically print, archive, and distribute your results to other devices on your network.

#### **Quality Control:**

Automatic and manual motion correction features aids in the improvement of the quality of the acquired images. Besides correcting for motion, gated studies can be beat normalized and quality control images such as sinograms and linograms created to document the results.

#### **3D Orientation:**

Reorient acquired SPECT volumes interactively to achieve the desired image orientation. Cardiac and general orientations are supported. If desired, the orientation applied to one volume can be automatically applied to up to 3 additional volumes.

#### **Image Registration:**

Multiple techniques provide accurate registration of acquired images including translation and rotation in three primary planes, optional automatic registration and landmark registration. The choice of output matrix size is a standard feature.

#### **Reconstruction:**

The reconstruction engine can reconstruct up to 5 volumes concurrently. Standard SPECT as well as wholebody, dynamic and gated cardiac volumes can be created. An advanced technique that provides high image quality comes standard with our system.

Flash 3D is a 3D iterative image reconstruction solution which offers the best reconstruction resolution in the market today following NEMA requirements. Flash 3D reconstruction uses a measured 3D collimator beam model in the iteration process. Correct modeling of the collimator distributes the activity over the slices for more accurate reconstruction. With Flash, the spatial resolution of the collimator is modeled to maintain the precise shape of the lesion. As a result, images are reconstructed with more counts in the correct volume, increasing image contrast.

The key components behind Flash 3D technology are:

- Ordered Subset Expectation Maximization (OSEM) reconstruction algorithm using 3D collimator modeling to increase resolution and decrease noise, while maintaining the exact shape of organs and lesions, when compared to filtered back projection reconstruction.
- Scatter Correction that uses patient specific scatter projection estimates to form a generalized dual-or triple energy window method to compensate for scatter during the iterative reconstruction process.

Symbia utilizes energy independent low profile digital Foresight detectors.

Detector assembly technical specifications:

- True rectangular FOV of 38.7 x 53.3 cm (15.25 x 21 in.)

## Description

- 59 photomultiplier tubes – 53, 7.6 cm (3 in.) and 6, 5.1 cm (2 in.) diameter tubes
- .95 x 59.1 x 44.5 cm (3/8 x 23 x 17.4 in.) NaI (TI) crystal material

The Low Profile Digital Foresight Detector features:

- Balanced performance between energy resolution and spatial resolution
- One, 10-bit high-speed flash ADC per PMT
- Variable PMT selection ensures high resolution for all multi-energy and multi-peak applications
- Optimized dynamic digital integration time to improve high count rate capability
- Individual PMT pile-up correction for improved performance at high count rates
- Energy independence maintains clinical performance at all energies including multi-peak and dual isotope studies
- Location independence maintains consistent spatial resolution across the field of view
- Crystal variation correction for optimal uniformity and linearity across all energies

Single source (Co-57 or Tc-99m) tunes the detector for all energies

The low energy high resolution collimator has the following technical specifications:

- 148,000 hexagonal holes
- Sensitivity: 202 cpm/microCurie
- Resolution: 7.5mm at 10 cm
- Weight: 22 kg (49 lbs)

The medium energy collimator has the following technical specifications:

- 14,000 hexagonal holes
- Sensitivity: 275 cpm/microCurie
- Resolution: 12.5 mm at 10 cm
- Weight: 64 kg (140 lbs)

The productivity package includes the following features:

- Integrated Collimator Changer
- Automatic Collimator Exchange
- Automatic Quality Control

### Integrated Collimator Changer

Innovative collimator exchange system that is mounted beneath the patient bed. Saves time and effort when changing collimators. Holds two sets of low or medium energy collimators including SMARTZOOM collimators.

### Automatic Collimator Changer

Fully automated changing of collimators within the integrated collimator changer. Collimator removal or exchange is initiated from the patient positioning monitor.

### Automatic Quality Control

Automatic quality control is performed via self-shielding Gd-153 line and Co-57 point sources. The sources are housed in the patient bed and are extended automatically as part of the camera's quality control procedures. The daily, weekly, and monthly procedures are customer scheduled and performed automatically without manual intervention.

The useful life of the 370 MBq (10 mCi) Gd-153 line, used for daily extrinsic floods and monthly multi-head registration procedures, is 2 years. The useful life of the 1.85 MBq (50 µCi) Co-57 point, used for intrinsic floods, is

## Description

1 year.

Sources that have been replaced are returned to the source vendor for disposal. Return shipment costs are not included in the purchase price.

This option does not include the cost of any room modifications for sub-floor installation of the cable.

The extended pivot increases the range from 33 degrees to 45 degrees to allow better handling of wide hospital beds.

The Monitor: 19 in. LCD technical features are:

- 19" active display
- Optimal picture resolution of 1280 x 1024
- Anti-glare panel surface
- Up to 170 degree viewing angle

The Symbia scanner comes standard with a single hand controller that can be plugged into either side of the gantry. This option adds an additional hand controller for added efficiency in accessing the motorized motions for the patient bed, gantry, and detectors.

Organ processing provides generic tools for the manipulation of NM images. In addition, it provides dedicated processing protocols for the many different types of exams performed in nuclear medicine departments. Features provided are:

- Cardiac: Planar Gated Blood Pool, First Pass, Shunt
- Lung: Perfusion, Ventilation, V/Q
- Thyroid
- Renal: GFR, ERPF, MAG3, Transplant, TER, Ace Inhibitor
- Gastric
- Hepatobiliary
- Brain: Patlok, Lassen, IMP, IMP-ARG, NIMS
- GSA Liver
- Parathyroid: Scaled subtraction
- Image manipulation tools: Series Filter, Series Arithmetic,
- Series Reformat, and Series ROI and Curve
- Manual Fusion

The Planar ½ Time Imaging package is based upon a statistical, adaptive de-noising and de-blurring process for planar imaging. It can be used to:

- Shorten the acquisition time of planar imaging, and/or
- Reduce the dose administered to the patient, and/or
- Enhance the image quality of statistically poor imaging results

The Cardiology Engine provides the Cedars Cardiac SPECT Suite, a comprehensive set of quantitation programs for the evaluation of SPECT Myocardial Perfusion Imaging

The engine calculates a comprehensive set of cardiac parameters including ejection fractions, volumes, wall motion including right ventricular free wall motion in QBS, wall thickening, perfusion (%). QPS allows for the quantitation of prone SPECT data and of serial perfusion changes. Both 20 and AHA-17 segment scoring models are available. In addition to calculating an Eccentricity Index, QGS also calculates a more regional measure of LV shape known as the Shape Index. Displays include gated slices with contours, a motion frozen display which results in better resolution and contrast by eliminating motion of the cardiac cycle, interactive 3D images, and polar maps. Manual over-ride of contours and DICOM compatible output are additional features. Outputs include DICOM secondary capture files, result files as well as the ability to generate an AVI file format. The Cedars application is

## Description

an OEM product developed and supported by Cedars Sinai.

Applications include: Cedars SPECT Suite

A broadband connection is required for full remote service functionality and optimal system uptime. The Siemens Remote Service option allows for remote access to your networked workstations. Hardware may need to be purchased.

Features include:

- Image Transfer
- Remote updates including Virus Protection
- Error log retrieval
- Remote Workflow revisions
- Remote configuration
- License management
- Remote workstation control via netmeeting

Installation includes:

- Complete system assembly
- Alignment
- System startup
- Calibrations
- Performance verification to factory specifications

Symbia.net is a clinical workplace that offers:

System Features:

- Workflow based architecture
- DICOM networking, printing
- User configurable displays
- 3D Orientation
- Image Fusion

Access to reading capabilities from anywhere (requires Server Management option)

- Any standard PC, Mac, or iPad with a network connection can be set up as a client
- Up to 10 concurrent users can access the clinical network simultaneously

Easy installation and operation

- Symbia.net easily integrates with existing cameras, RIS and PACS
- A virtually unlimited number of client computers can be installed remotely (requires Server Management option)
- Designed for the needs of nuclear medicine with a user friendly interface and advanced automation features

Optional Extensions

- Server Management option
  - Supports up to 10 concurrent users
  - 1 seat at the workplace
  - Up to 9 floating client licenses
- Cardiology Engines
- Oncology Engines
- Neurology Engines
- MI Processing Engine

**Description**

- Advanced SPECT/CT Reconstruction
- MI Cardiac Process Engine

The Cardiology Engine provides the Cedars Cardiac SPECT Suite, a comprehensive set of quantitation programs for the evaluation of SPECT Myocardial Perfusion Imaging

The engine calculates a comprehensive set of cardiac parameters including ejection fractions, volumes, wall motion including right ventricular free wall motion in QBS, wall thickening, perfusion (%). QPS allows for the quantitation of prone SPECT data and of serial perfusion changes. Both 20 and AHA-17 segment scoring models are available. In addition to calculating an Eccentricity Index, QGS also calculates a more regional measure of LV shape known as the Shape Index. Displays include gated slices with contours, a motion frozen display which results in better resolution and contrast by eliminating motion of the cardiac cycle, interactive 3D images, and polar maps. Manual over-ride of contours and DICOM compatible output are additional features. Outputs include DICOM secondary capture files, result files as well as the ability to generate an AVI file format. The Cedars application is an OEM product developed and supported by Cedars Sinai.

Applications include: Cedars SPECT Suite

The Monitor: 19 in. LCD technical features are:

- 19" active display
- Optimal picture resolution of 1280 x 1024
- Anti-glare panel surface
- Up to 170 degree viewing angle

Specifications:

1.4 KVA

Input configuration: 120 VAC, 5-15P

Output configuration: 120 VAC, (6) 5-15R

This educational offering must be completed by the later of (12) months from purchase of training or if applicable, completion of installation. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.

The high energy collimator has the following technical specifications:

- 8,000 hexagonal holes
- Sensitivity: 135 cpm/microCurie
- Resolution: 13.4 mm at 10 cm
- Weight: 125 kg (275 lbs)

Due to the weight of these collimators, it is recommended that an individual collimator cart containing only the 2 high energy collimators be utilized.

The collimator cart is automatically clamped to the patient bed once positioned by the user. The clamping mechanism allows precise collimator exchange to occur.

<b>Description</b>
<p>The collimator cart is designed to hold 2 sets of collimators, or 1 set in combination with a pinhole collimator.</p> <p>Due to the weight of the high energy collimators, it is recommended that an individual collimator cart containing only the 2 high energy collimators be utilized.</p>