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Symbia Intevo

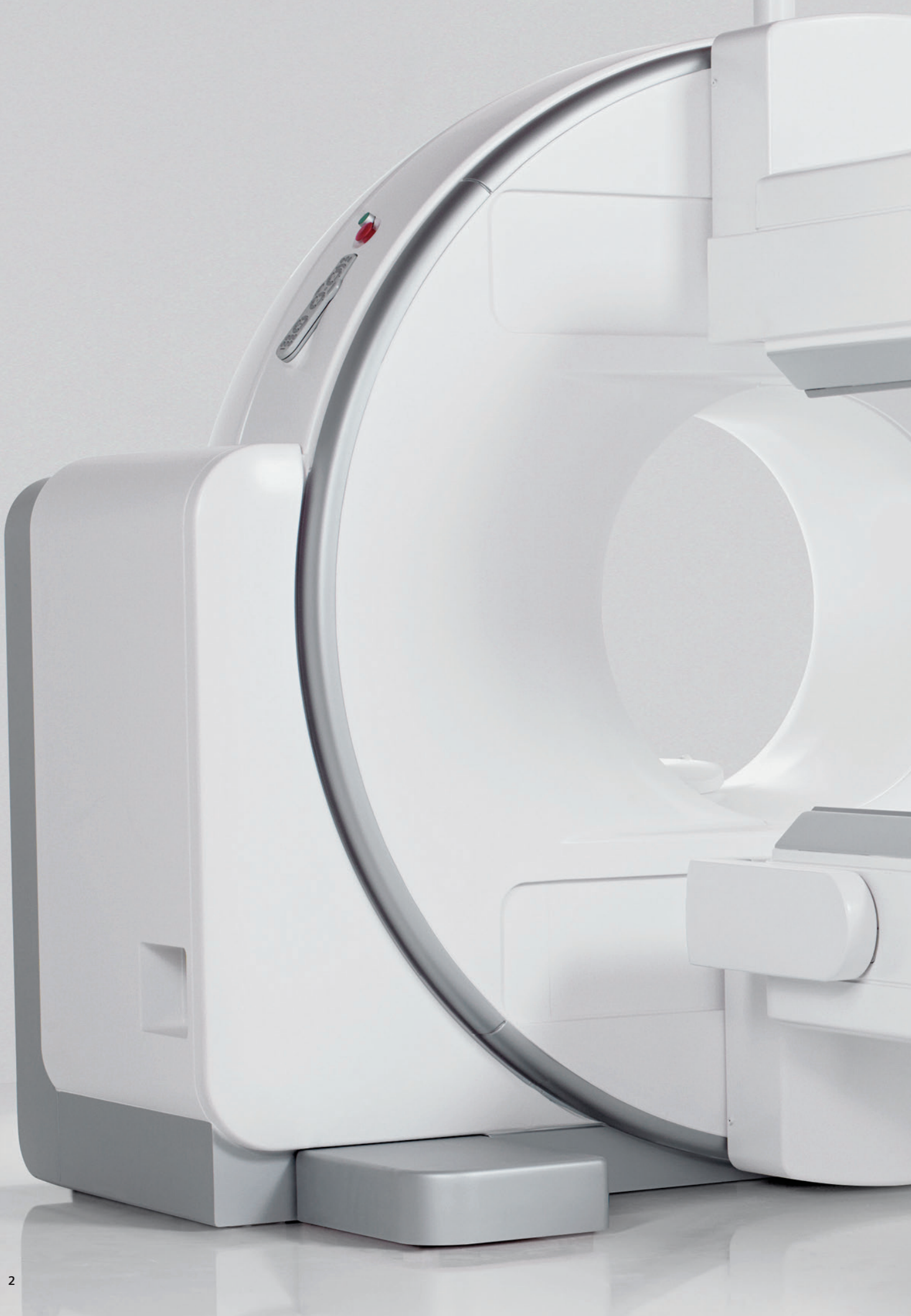
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Symbia Intevo*

System Specifications

* See disclaimer on page 3.

Answers for life.





Symbia Intevo* xSPECT,* the difference between seeing and knowing.

Diagnostic imaging is expected to deliver definitive and timely answers to clinical questions. And, in today's increasingly competitive and rapidly changing healthcare environment, these answers must also be provided in the safest and most efficient way possible.

The ability to find these answers sooner than traditional anatomical modalities has made nuclear medicine a cornerstone of diagnostic imaging. However, despite the high sensitivity of today's SPECT/CT scanners that permit early disease detection, the modality is restricted in its ability to provide definitive and timely answers.

Its limited specificity, resulting from the use of mechanically fused images, often requires the need for follow-up procedures that delay patient care and potentially increase costs. To address these challenges, Siemens is once again pioneering hybrid imaging.

Through a new, accurate alignment method and the resulting total integration of SPECT and CT, a revolutionary new modality is emerging: xSPECT. Now, with Symbia Intevo,TM the world's first xSPECT system, physicians have the potential to not only image disease, but also leverage the high resolution to see the unseen and more confidently interpret images. Moreover, Symbia Intevo's unique quantitative* capabilities may provide the ability to monitor and adjust treatments earlier by accurately measuring even small differences.

To address the additional needs of improving patient safety and increasing efficiency, Symbia Intevo was designed to offer innovative technologies that allow the administration of the lowest dose while still imaging patients faster than ever before.

* Symbia Intevo and xSPECT 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.

Features

	Key Highlight Features	Symbia Intevo 2, 6 and 16
High-Definition SPECT	Reconstruction frame-of-reference	CT frame-of-reference
	SPECT reconstruction matrix size	256x256, 128x128, 64x64
	Advanced reconstruction	xSPECT iterative or Flash3D iterative
	Zone Map (tissue classification)	Yes with xSPECT Bone
	Detectors rotational uniformity	Yes
	Detectors rotational accuracy	0.1°
	Detector caudal tilt	Yes, +16°/-16°
	CT focal spot size	Symbia Intevo 2: 0.8 x 0.7 mm/8°, Intevo 6: 0.8 x 0.5 mm/7° and 0.8 x 0.7 mm/7°, Intevo 16: 0.8 x 0.5 mm/7° and 0.8 x 0.7 mm/7°
	Table flex	Rear bed support prevents flex
	Reconstruction workstation	64-bit architecture
	CT continuous scan length	Symbia Intevo 2: 166 cm, Intevo 6: 168 cm, Intevo 16: 186 cm
	Gantry deflection matrix	Yes, 3D fully adaptive gantry deflection matrix
	Point spread function	Yes, 3D measured point spread function
	Collimator characterization	Yes, 3D measured collimator hole, shape and size
Quantify the Difference	Automated quantification	Yes, xSPECT Quant
	Quantitative volumetric analysis	Yes, in units of Bq/ml or SUV or HU units or counts-per-voxel
	Quantitative uncertainty %	<=10%*
	Reproducible quantification	Yes, with a unique monthly quantitative calibration
	Quantitative calibration source	Yes, NIST precision ⁵⁷ Co source, unique to Siemens
Adapt the Lowest Dose	CT Dose modulation	Yes, 4D and fully automatic
	Flexible CT voltage settings	Yes, 80 kV, 110 kV, 130 kV
	CTDI Dose Values - Abdomen AC	1.20 mGy @130 kV
	CTDI Dose Values - Cardiac AC	1.56 mGy @130 kV or 1.00 mGy @110 kV or 0.4 @80 kV
	CTDI Dose Values - Parathyroid AC	1.80 mGy @130 kV
	LEHR collimator sensitivity @10 cm	202 cpm/μCi**
	SMARTZOOM collimator sensitivity @28 cm (recommended)	810 cpm/μCi at 28 cm*** (unique to Siemens)
	Double the Throughput	Average Autocontour distance
	Quality control	Yes, fully automated with 2 shielded sources embedded in the patient bed
	Unique cardiac collimator	Yes, SMARTZOOM with 810 cpm/μCi***
	Collimator exchange	Fully automatic with integrated set of collimators

* Accuracy data validated using phantom studies for objects larger than 3 times system resolution.

** Values measured in accordance with NEMA Standards Publication NU-1 2007 using 3/8" crystal and a 5 cm diameter phantom.

*** Values measured in accordance with NEMA Standards Publication NU-1 2007 using 3/8" crystal.

SPECT Specifications

Gantry Dimensions	Symbia Intevo
Height	225 cm (7 ft 4.7 in)
Width	231 cm (7 ft 7 in)
Depth	203 cm (6 ft 8 in)
Axis of Rotation (from Floor)	104 cm (3 ft 5 in)
Weight*	3,506 kg (7,714 lbs)
Min./Max. Patient Opening (HE Coll)	12 cm (4.7 in)/65.4 cm (25.7 in)
Min./Max. Patient Opening (LEHR Coll)	19.2 cm (7.6 in)/72.6 cm (28.6 in)
Patient Positioning Monitor	15" flat panel color LCD display
Tunnel Opening	70 cm aperture (27.6 in)
Tunnel Length	89 cm (35 in)
Distance between SPECT and CT Field of View (FOV)	136 cm (53.3 in)
SPECT Motions	Symbia Intevo
Average Autocontour Distance	1.1 cm (0.45 in)
Max. Radial and Lateral Speed	72 cm/min (28.3 in/min)
Max. Lateral Position Left/Right	37.5 cm (14.7 in)/10 cm (4 in)
Max. Clockwise (CW)/Counter-Clockwise (CCW) Rotation Detector 1	405°/-135°
Ring Rotation Range	540°
Rotational Uniformity	Yes
Rotational Accuracy	0.1°
Rotational Speed	0.03-3.0 RPM
Center of Rotation	≤0.25 pixel (64x64 matrix)
Max. Caudal Tilt	+16°/-16°

* Gantry weight: NM gantry 2,374 kg (5,224 lbs) + CT gantry 1,132 kg (2,490 lbs)

SPECT Specifications

Patient Bed Specifications		Symbia Intevo
Width		81.9 cm (32.2 in)
Length		248.0 cm (8 ft 1.6 in)
Weight without Integrated Collimator Changer (ICC)/ Automated Collimator Changer (ACC)		950 kg (2,096 lbs)
Height		112.0 cm (3 ft 8 in)
Vertical Motion Range		48.0-112.0 cm (19-44 in)
Vertical Speed		72 cm/min (28 in/min), maximum
Pallet Material		Carbon fiber
Pallet Thickness		15 mm (.6 in)
Pallet Width		40.0 cm (15.8 in)
Attenuation at 140 keV		<10%
Max. Patient Weight		227 kg (500 lbs)
Max. Deflection of Patient Pallet		<2.0 mm (<0.08 in) for 92 kg (200 lbs) patient
Max. Scan Length in Whole-Body Mode		200 cm (6 ft 6.7 in)
Horizontal Motion Accuracy		0.7 mm (0.03 in)
Min./Max. Horizontal Speed		3-600 cm/min (1.2-236 in/min)
		Optional Pallets
		Symbia Intevo
Pediatric	Material	Carbon fiber composite
	Thickness	0.6 cm (0.25 in)
	Width	25.4 cm (10 in)
	Length	145 cm (57 in)
	Weight	7.3 kg (16 lbs)
	Attenuation at 140 keV	<10%
	Max. Patient Weight	27 kg (60 lbs)
Scintimammography	Material	Carbon fiber composite
	Thickness	1.6 cm (0.63 in)
	Width	35.6 cm (14 in)
	Length	190.5 cm (75 in)
	Weight	7.7 kg (17 lbs)
	Attenuation at 140 keV	<10%
	Max. Patient Weight	135 kg (300 lbs)
Radiotherapy Planning	Material	Carbon fiber composite
	Thickness	1.5 cm (0.6 in)
	Width	53 cm (20.9 in)
	Length	203.5 cm (80.1 in)
	Weight	9 kg (20 lbs)
	Attenuation at 140 keV	<10%
	Max. Patient Weight	227 kg (500 lbs)*

SPECT Specifications

Rear Pallet Support	Symbia Intevo
Width	26.3 cm (10.3 in)
Length	104.3 cm (3 ft 5.1 in)
Weight	188.3 kg (415.2 lbs)
ECG Trigger	Symbia Intevo
Integration	Internal (inside patient bed) or external
Framing Modes	Forward or forward/backward by thirds
Buffered Beat Window	Yes
Bad Beat Rejection	Yes
Criteria for Framing Images	Frames/R-R interval
Beat Acceptance Window	Automatic or manual selection
Collimator Exchanger Cart	Symbia Intevo
Height	101.4 cm (3 ft 3.9 in)
Width	82.8 cm (2 ft 8.6 in)
Depth	120.4 cm (3 ft 11.4 in)
Weight*	181.4 kg (400 lbs)
Detector Dimensions	Symbia Intevo
FOV	53.3x38.7 cm (21x15.25 in)
Diagonal FOV	65.9 cm (25.9 in)
Crystal	Symbia Intevo
Size	59.1x44.5 cm (23.25x17.5 in)
Diagonal	73.9 cm (29.1 in)
Thickness	9.5 mm (3/8 in) or 15.9 mm (5/8 in)
Photomultiplier Tubes	Symbia Intevo
Total Number	59
Diameter	53-7.6 cm (3 in) and 6-5.1 cm (2.4-2 in)
Type	Bialkali high-efficiency box-type dynodes
Array	Hexagonal
Detector Shielding	Symbia Intevo
Back	9.5 mm (0.375 in)
Sides	12.7 mm (0.5 in)
Min./Max. in Patient Direction**	27.9/36.4 mm (1.1/1.435 in)
Brain Reach***	7.6 cm (3 in)

* Without collimators.

** For any point on the pallet at maximum 183 cm (6 ft) from the detector while the detector is at 25.4 cm (10 in) radial position.

*** Distance from the edge of the detector housing to the edge of the FOV.

SPECT Specifications

Detector Specifications*	3/8"	5/8"
Intrinsic Spatial Resolution		
FWHM in CFOV	≤3.8 mm	≤4.5 mm
FWHM in UFOV	≤3.9 mm	≤4.6 mm
FWTM in CFOV	≤7.5 mm	≤8.7 mm
FWTM in UFOV	≤7.7 mm	≤8.9 mm
Intrinsic Spatial Linearity		
Differential in CFOV	≤0.2 mm	≤0.2 mm
Differential in UFOV	≤0.2 mm	≤0.2 mm
Absolute in CFOV	≤0.4 mm	≤0.5 mm
Absolute in UFOV	≤0.7 mm	≤1.0 mm
Intrinsic Energy Resolution		
FWHM in CFOV	≤9.9%	≤9.9%
Intrinsic Flood Field Uniformity (Uncorrected)		
Differential in CFOV	≤2.5%	≤2.5%
Differential in UFOV	≤2.7%	≤2.7%
Integral in CFOV	≤2.9%	≤2.9%
Integral in UFOV	≤3.7%	≤3.7%
Multiple Window Spatial Registration		
	≤0.6 mm	≤1.0 mm
Intrinsic Count Rate Performance in Air		
Maximum Count Rate	310 kcps	310 kcps
Intrinsic Spatial Resolution at 75 kcps		
FWHM in UFOV	≤4.1 mm	≤4.6 mm
FWTM in UFOV	≤7.8 mm	≤8.9 mm
Intrinsic Flood Field Uniformity at 75 kcps (Uncorrected)		
Differential in CFOV	≤2.5%	≤2.5%
Differential in UFOV	≤2.7%	≤2.7%
Integral in CFOV	≤2.9%	≤2.9%
Integral in UFOV	≤3.7%	≤3.7%
Detector with Collimator Specifications*	3/8"	5/8"
System Spatial Resolution Without Scatter (LEHR at 10 cm)		
FWHM in CFOV	≤7.5 mm	≤7.8 mm
FWTM in CFOV	≤13.6 mm	≤14.9 mm
System Spatial Resolution With Scatter (LEHR at 10 cm)		
FWHM in CFOV	≤8.3 mm	≤8.9 mm
FWTM in CFOV	≤18.6 mm	≤19.5 mm

* Values are determined at the manufacturer's facility using methods described in NEMA Standards Publications NU 1-2007 "Performance measurements of Scintillation Cameras." The specialized phantoms and software required to reproduce these measurements are available from Siemens.

SPECT Specifications

Detector with Collimator Specifications*	3/8"	5/8"
System Planar Sensitivity (LEHR at 10 cm)		
Absolute	202 cpm/ μ Ci	225 cpm/ μ Ci
System Planar Sensitivity (ME at 10 cm)		
Absolute ^{111}In	430 cpm/ μ Ci	565 cpm/ μ Ci
Detector with Collimator Tomographic Specifications*	3/8"	5/8"
Reconstructed Spatial Resolution Without Scatter at 15 cm Radius (LEHR)		
Filtered Back Projection		
Central Transaxial	≤ 10.2 mm	–
Central Axial	≤ 10.8 mm	–
Peripheral Radial	≤ 9.8 mm	–
Peripheral Tangential	≤ 8.4 mm	–
Peripheral Axial	≤ 9.0 mm	–
Reconstructed Spatial Resolution Without Scatter at 15 cm Radius (LEHR)		
Flash 3D Iterative Reconstruction		
Central Transaxial	≤ 4.4 mm	–
Central Axial	≤ 4.4 mm	–
Peripheral Radial	≤ 4.0 mm	–
Peripheral Tangential	≤ 3.9 mm	–
Peripheral Axial	≤ 4.2 mm	–
Reconstructed Spatial Resolution With Scatter (LEHR)		
Filtered Back Projection		
Center	≤ 10.7 mm	≤ 11.5 mm
Radial	≤ 10.9 mm	≤ 12.0 mm
Tangential	≤ 7.9 mm	≤ 8.8 mm
Reconstructed Spatial Resolution With Scatter (LEHR)		
Flash 3D Iterative Reconstruction		
Center	≤ 5.8 mm	–
Radial	≤ 5.0 mm	–
Tangential	≤ 4.1 mm	–
System Volume Sensitivity (LEHR)		
UFOV $\pm 7\%$	12,000 (cts/sec)/ (MBq/cm ²)	–
Detector-Detector Sensitivity Variation (LEHR, $^{99\text{m}}\text{Tc}$)		
	$\leq 5.0\%$	–

* Values are determined at the manufacturer's facility using methods described in NEMA Standards Publications NU 1-2007 "Performance measurements of Scintillation Cameras."

SPECT Specifications

Detector with Collimator Whole-Body Scanning Specifications*				3/8"	5/8"		
Whole-Body System Spatial Resolution Without Scatter at 10 cm/min Scan Speed (LEHR at 10 cm)							
FWHM Perpendicular				≤7.5 mm	–		
FWHM Parallel				≤7.9 mm	–		
FWTM Perpendicular				≤14.0 mm	–		
FWTM Parallel				≤14.2 mm	–		
Collimators	LEHR	LEAP	LEUHR	LEFB	ME	HE	SMART-ZOOM
	Low Energy High Resolution	Low Energy All Purpose	Low Energy Ultra High Resolution	Low Energy Fan Beam	Medium Energy	High Energy	IQ•SPECT
Isotope	^{99m} Tc	^{99m} Tc	^{99m} Tc	^{99m} Tc	⁶⁷ Ga	¹³¹ I	^{99m} Tc
Hole Shape	Hex	Hex	Hex	Hex	Hex	Hex	Hex
Number of Holes (x1000)	148	90	146	64	14	8	48
Hole Length	24.05 mm	24.05 mm	35.8 mm	35 mm	40.64 mm	59.7 mm	40.25 mm
Septal Thickness	0.16 mm	0.2 mm	0.13 mm	0.16 mm	1.14 mm	2 mm	0.2-0.4 mm
Hole Diameter Across the Flats	1.11 mm	1.45 mm	1.16 mm	1.53 mm	2.94 mm	4 mm	1.9 mm
Sensitivity at 10 cm*	202 cpm/μCi	330 cpm/μCi	100 cpm/μCi	280 cpm/μCi	275 cpm/μCi	135 cpm/μCi	285 cpm/μCi** 810 cpm/μCi at 28 cm**
Geometric Resolution at 10 cm*	6.4 mm	8.3 mm	4.6 mm	6.3 mm	10.8 mm	13.2 mm	6.95 mm
System Resolution at 10 cm	7.5 mm	9.4 mm	6.0 mm	7.3 mm	12.5 mm	13.4 mm	7.4 mm***
Septal Penetration	1.5%	1.9%	0.8%	1.0%	1.2%	3.5%	N/A
Exit Surface	N/A	N/A	N/A	44.5 mm	N/A	N/A	52x60 cm
Weight	22.1 kg (48.7 lbs)	22.6 kg (49.8 lbs)	28 kg (61.8 lbs)	28.4 kg (62.5 lbs)	63.5 kg (140.1 lbs)	124.7 kg (275 lbs)	47.2 kg (104 lbs)

* Values measured in accordance with NEMA Standards Publication NU-1 2007 using 3/8" crystal.

** Values measured using a 5 cm diameter phantom.

*** Values measured with lines spaced 2 cm apart at the center of the collimator.

SPECT Specifications

Pinhole Collimator*	Isotope		
	^{99m} Tc	¹²³ I	¹³¹ I
Hole Shape	Round	Round	Round
Number of Holes	1	1	1
Cone Aperture	4 mm	4 mm	4 mm
	6 mm	6 mm	6 mm
	8 mm	8 mm	8 mm
Cone Length	219.3 mm	219.3 mm	219.3 mm
Diameter at Base of Cone (approximate)	220 mm	220 mm	220 mm
Sensitivity at 10 cm with 4 mm	123 cpm/μCi	111 cpm/μCi	67 cpm/μCi
Sensitivity at 10 cm with 6 mm	271 cpm/μCi	243 cpm/μCi	133 cpm/μCi
Sensitivity at 10 cm with 8 mm	478 cpm/μCi	426 cpm/μCi	221 cpm/μCi
Geometric Resolution at 10 cm with 4 mm	6.2 mm	6.3 mm	7.5 mm
Geometric Resolution at 10 cm with 6 mm	9.3 mm	9.3 mm	10.6 mm
Geometric Resolution at 10 cm with 8 mm	12.3 mm	12.4 mm	13.6 mm
System Resolution at 10 cm with 4 mm	6.6 mm	6.6 mm	7.6 mm
System Resolution at 10 cm with 6 mm	9.5 mm	9.5 mm	10.7 mm
System Resolution at 10 cm with 8 mm	12.5 mm	12.5 mm	13.7 mm
Weight	80.3 kg (177 lbs)	80.3 kg (177 lbs)	80.3 kg (177 lbs)

* Values measured in accordance with NEMA Standards Publication NU-1 2007 using 3/8" crystal.

CT System Hardware

Gantry Dimensions	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
Aperture	70 cm	70 cm	70 cm
Scan Field	50 cm	50 cm	50 cm
Rotation Time	0.5 s 0.6 s 1.0 s 1.5 s	0.6 s 0.8 s 1.0 s 1.5 s	0.8 s 1.0 s 1.5 s
Temporal Resolution (Min.)*	125 ms	150 ms	–
Data Acquisition System	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
Max. Number of Slices/Rotation	16	6	2
Number of Physical Detector Rows	24	16	2
Number of Physical Detector Channels/Slice	736	736	672
Number of Detector Elements	17,664	11,776	1,344
Total Channels per Slice	1,472	1,472	1,344
Number of Projections	Up to 1,250 (1 s/360°)	Up to 1,875 (1 s/360°)	Up to 1,500 (1.5 s/360°)
Sequence Acquisition Modes	4x0.6 mm 12x0.6 mm 16x0.6 mm 2x5 mm 12x1.2 mm 2x8 mm 16x1.2 mm	6x1 mm 6x2 mm 6x3 mm 2x5 mm	2x1 mm 2x1.5 mm 2x4 mm 2x5 mm 1x2 mm 1x3 mm 1x5 mm 1x8 mm 1x10 mm
Spiral Acquisition Modes	4x0.6 mm 16x0.6 mm 16x1.2 mm	6x0.5 mm 1x1 mm 6x1 mm 6x2 mm 6x3 mm 2x5 mm	2x1 mm 2x1.5 mm 2x2.5 mm 2x4 mm 2x5 mm

* Requires syngo® Heartview CT option.

CT System Hardware

Tube Assembly	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
Tube	DURA 422 MVHigh performance CT X-ray tube	DURA 422 MVHigh performance CT X-ray tube	DURA 352 MVHigh performance CT X-ray tube
Tube Current	20-345 mA	20-345 mA	30-240 mA
Tube Voltage	80, 110, 130 kV	80, 110, 130 kV	80, 110, 130 kV
Tube Anode Heat Storage Capacity	5.0 MHU	5.0 MHU	3.5 MHU
Focal Spot Size According to IEC 60336	0.8x0.5 mm/7° 0.8x0.7 mm/7°	0.8x0.5 mm/7° 0.8x0.7 mm/7°	0.8x0.7 mm/8°
CARE Filter	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
CARE Filter Tube	Equivalent to 5.5 mm Al at 140 kV	Equivalent to 5.5 mm Al at 140 kV	Equivalent to 5.5 mm Al at 140 kV
CARE Filter beam limiting device	0.5 mm Al	0.5 mm Al	Equivalent to 0.25 mm Al (75 kV/HVL 1.8 mm Al)
Generator	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
Max. Power	50 kW	50 kW	40 kW

CT System Software

Topogram	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
Length (Max.)	184 cm (6 ft)	184 cm (6 ft)	184 cm (6 ft)
Scan Times	2.1-19.3 s	2.1-19.3 s	2.1-19.3 s
Views	a.p., p.a., lateral	a.p., p.a., lateral	a.p., p.a., lateral
Sequence Acquisition	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
Reconstructed Slice Widths	0.6, 1.2, 2.4, 3.6, 4.8, 5.0, 8.0, 9.6, 10.0, 16.0**, 19.2 mm	1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 9.0, 10.0, 12.0, 18.0 mm	1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 8.0, 10.0 mm
Scan Times Full Scan (360°)	0.5**, 0.6, 1.0, 1.5 s (±5%)	0.6, 0.8, 1.0, 1.5 s (±5%)	0.8, 1.0, 1.5 s (±5%)
Partial Scan Times (240°)	0.35*, 0.42 s (±5%)	0.4, 0.53 s (±5%)	0.53, 0.67 s (±5%)
Number of Uninterrupted Scans Per Range	99	99	99
Number of Ranges in Autorange	8	8	8
Standard Scan Cycle Time (±10%)	1.8 s at 0.6 s scan time, 1.75 s at 0.5 s scan time*	2.1 s at 0.6 s scan time, 2.4 s at 0.8 s scan time*	2.5 s 1.0 s at scan time
Multislice Spiral Acquisition	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
Reconstructed Slice Widths	0.6, 0.75, 1.0, 1.5, 2.0, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0 mm	0.63**, 0.75**, 1.0, 1.25, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 8.0, 10.0 mm	1.0, 1.25, 2.0, 3.0, 5.0, 6.0, 8.0, 10.0 mm
Scan Times Full Scan (360°)	0.5, 0.6, 1.0, 1.5 s	0.6, 0.8, 1.0, 1.5 s	0.8, 1.0, 1.5 s
Reconstruction Increment	0.1-10 mm	0.1-10 mm	0.1-10 mm
Pitch Factor	0.4-1.5 (with cone beam correction), 0.4-2.0 (without cone beam correction), 0.33 (ECG - gated studies)	0.4-1.8	0.5-2.0
Volume Pitch	6.4-32.0	3.0-10.8	1.0-4.0
Spiral Scan Time Max.	100 s	100 s	100 s
CT Scan Range	0-200 cm	0-200 cm	0-200 cm
Continuous Scan Length	186 cm (6 ft 1 in)	168 cm (5 ft 6 in)	166 cm (5 ft 4 in)

* Requires syngo® Heartview CT option.

** Requires high resolution option.

CT System Software

Dynamic Multiscan	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
Dynamic Scan Cycle Time ($\pm 10\%$)	0.9 s at 0.6 s scan time, 0.75 s at 0.5 s scan time*	0.9 s at 0.6 s scan time, 1.2 s at 0.8 s scan time	1.2 s at 0.8 s scan time, 1.5 s at 1.0 s scan time
Image Reconstruction	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
Real-Time Display*	512x512	512x512	512x512
Slice Thickness	0.6-19.2 mm	1.0-18.0 mm	1.0-10.0 mm
Scan Field	50 cm	50 cm	50 cm
Recon Field	5-50 cm, 5-70 cm**	5-50 cm, 5-70 cm**	5-50 cm, 5-70 cm**
Recon Time	up to 16 images/s	up to 8 images/s	up to 5 images/s
Recon Matrix	512x512	512x512	512x512
HU Scale	-1,024 to +3.071	-1,024 to +3.071	-1,024 to +3.071
Extended HU Scale	-10,240 to +30,710	-10,240 to +30,710	-10,240 to +30,710
Phantom CATPHAN (16 cm)	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
Object Size	3 mm	3 mm	3 mm
Contrast Difference	3 HU	3 HU	3 HU
Dose at Surface	21.5 mGy*** at 102 mAs	19.7 mGy*** at 100 mAs	19.7 mGy*** at 100 mAs
Technique	0.6 s, 10 mm, 130 kV	0.6 s, 10 mm, 130 kV	0.8 s, 10 mm, 130 kV
Phantom CATPHAN (20 cm)	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
Object Size	5 mm	5 mm	5 mm
Contrast Difference	3 HU	3 HU	3 HU
Dose at Surface	16.6 mGy*** at 100 mAs	15.8 mGy*** at 90 mAs	15.8 mGy*** at 90 mAs
Technique	0.6 s, 10 mm, 130 kV	0.6 s, 10 mm, 130 kV	0.8 s, 10 mm, 130 kV
High Contrast Resolution	Symbia Intevo 16	Symbia Intevo 6	Symbia Intevo 2
0% MTF ($\pm 10\%$)	17.5 lp/cm, 0.29 mm	17.5 lp/cm, 0.29 mm	15.5 lp/cm, 0.32 mm
2% MTF ($\pm 10\%$)	15.6 lp/cm, 0.32 mm	15.1 lp/cm, 0.32 mm	14 lp/cm, 0.36 mm
Technique: Tungsten Wire in Air	160 mAs, 130 kV, 1 s, 2.4 mm	160 mAs, 130 kV, 0.8 s, 1.0 mm	60 mAs, 130 kV, 1.5 s, 1.0 mm

* Requires syngo® Heartview CT option.

** The reconstruction area outside the standard 50 cm FOV is for visualization purposes only and is not of diagnostic image quality.

*** Air KERMA, measured on the surface of the phantom with max. deviation $\pm 30\%$.

CT System Software

Homogeneity		Symbia Intevo 16		Symbia Intevo 6		Symbia Intevo 2	
Cross Field Uniformity in a 20 cm Water Phantom Positioned Near the Center of Rotation		Typical ± 2 HU (Max. ± 4 HU)		Typical ± 2 HU (Max. ± 4 HU)		Typical ± 2 HU (Max. ± 4 HU)	
Dose, CTDI ₁₀₀ Values*		Symbia Intevo 16		Symbia Intevo 6		Symbia Intevo 2	
Phantom \emptyset							
		110 kV	130 kV	110 kV	130 kV	110 kV	130 kV
16 cm	A	14.1	21.3	13.3	20.1	14.4	21.7
	B	15.2	22.3	13.6	20.3	15.7	23.3
32 cm	A	4.1	6.6	3.9	6.2	4.2	6.7
	B	8.2	13.5	7.6	11.6	8.4	12.8

A is at the center and B is 1 cm below the surface. All values are in mGy/100 mAs.

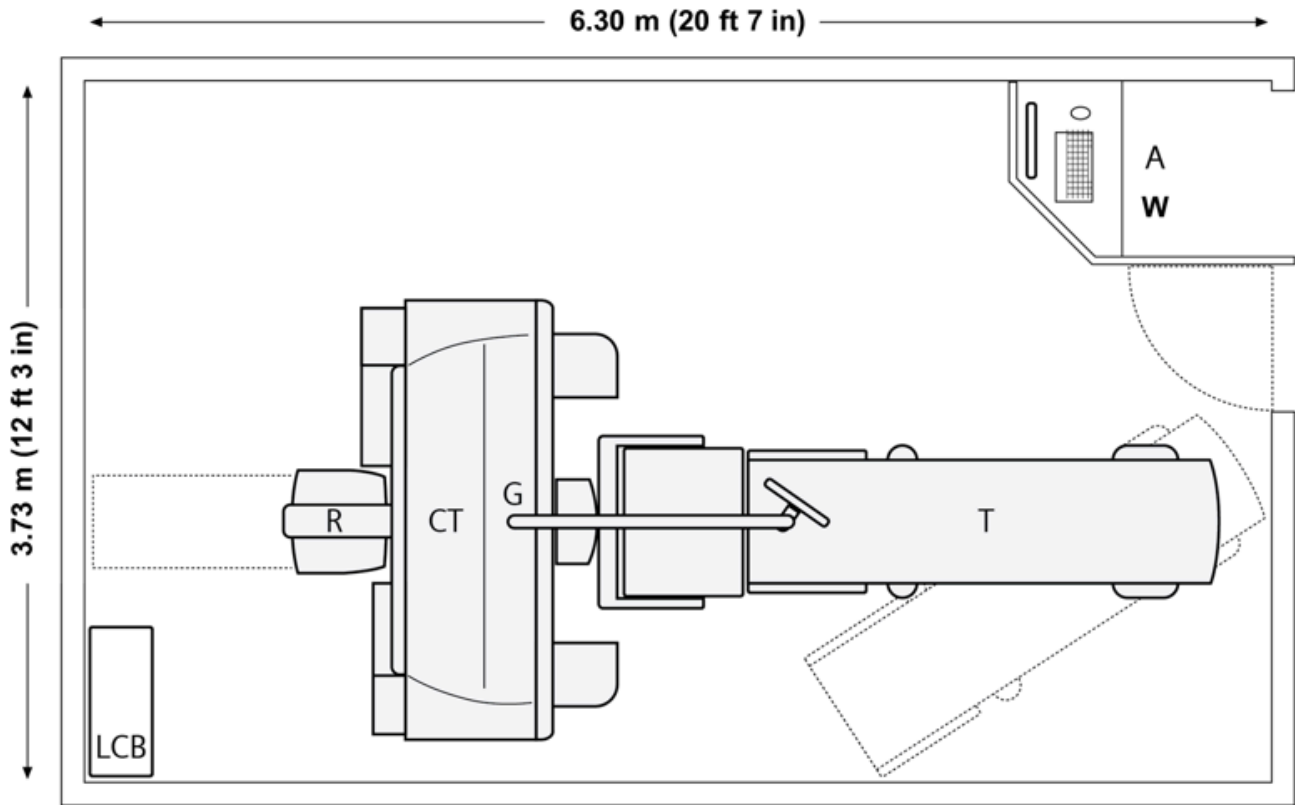
* PMMA Phantom. Absorbed dose for reference material air. Max. deviation $\pm 30\%$. Expected deviation $\pm 15\%$. Slice > 1 mm. Please note that these specifications are CTDI₁₀₀ values while.

xSPECT Advanced Specifications

Advanced Bone Imaging	Symbia Intevo 2, 6 and 16
Context based information	Yes, applied to ^{99m} Tc diphosphonate Bone SPECT
Extra modality information	Zone Map (a map with up to 6 tissue zones)
CT zone classification	Cortical bone, spongiuous bone, soft tissue, air, adipose (fat), metal
Reconstruction software	xSPECT Bone
Reconstruction matrix size	256x256
Attenuation map	Linear attenuation coefficients @ 140 keV
Quantification	Symbia Intevo 2, 6 and 16
System calibration source	NIST traceable precision ⁵⁷ Co source
System calibration procedure	Monthly
Quantitative uncertainty	<=10%*
Data format	Data is saved in PET format
Reconstruction software	xSPECT Quant
Volumetric analysis software	Symbia.net
Quantitative volumetric analysis	In units of Bq/ml, SUV, HU units or count rate-per-voxel
Advanced Reconstruction Workstation	Symbia Intevo 2, 6 and 16
Manufacturer	HP
Workstation Series	HP Z820
Operating System Pre-installed	Windows XP Professional
Software Architecture	64-bit
Power Supply	850 W (88% Efficient wide-ranging, active Power Factor Correction)
Data Handling Matrix Size	256x256, 128x128, 64x64
Standard Advanced Reconstruction	xSPECT iterative (for advanced data), Flash 3D iterative (for basic data)
Optional Advanced Reconstruction	xSPECT Bone, xSPECT Quant, IQ•SPECT

* Accuracy data validated using phantom studies for objects larger than 3 times system resolution.

Symbia Intevo – Minimum Room Size



Room Size	3.73 m (12 ft 3 in) x 6.30 m (20 ft 7 in)
Ceiling Height	2.44 m (8 ft 0 in)
Hung Ceiling Height	2.29 m (7 ft 5 in)

Example layout. Please request site specific plans for your project.

Installation Specifications

Label	Item Name	Weight	Heat Output
G	Symbia Intevo Gantry	2,369 kg (5,224 lbs)	3,413 BTU/h, 1.0 kW
CT	CT Components	1,129 kg (2,490 lbs)	<3,413 BTU/h, <1.0 kW
T	Symbia Intevo Imaging Table	950 kg (2,096 lbs)	
R	Symbia Intevo Rear PHS	188.3 kg (415.2 lbs)	
A	Acquisition Computers		2,389 BTU/h, 0.7 kW*
LCB	Line Connection Box		1,365 BTU/h, 0.4 kW
W	Advanced Reconstruction Workstation		2,142 BTU/h, 0.8 kW
Power Requirements			
SPECT Input Voltage		Single-Phase 200/208/220/230/240 VAC ~ 50/60 Hz	
CT Input Voltage		Three-Phase 380/400/420/440/460/480 VAC ~ 50/60 Hz	
Electrical Supply		For Symbia Intevo 2: 46.2 kVA** For Symbia Intevo 6, Intevo 16: 72.2 kVA**	
Environment			
Floor Loading		5.1 kg/sq cm (72 lbs/sq in) maximum under the gantry	
Ambient Operating Temperature		18-30° C (64-86° F)	
Allowable Temperature Change		4.4° C (8° F) per hour	
Humidity		20-80% non-condensing	
Allowable Humidity Change		5%/hour	
Heat Dissipation		10,580 BTU/h, 3.1 kW***	
Maximum Altitude		2,438 m (8,000 ft)	

* Symbia Intevo 2 has a lower heat dissipation value of 1,365 BTU/h, 0.4 kW.

** Maximum power consumption during CT operation.

*** In idle mode, values higher during CT operation mode. Symbia Intevo 2 has a lower heat dissipation value of 1,365 BTU/h, 0.4 kW.

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