

Brilliance CT 64-channel configuration

with Essence technology

The Brilliance CT 64-channel configuration is designed to help you conduct the most advanced multislice CT studies possible. These systems enable you to achieve the highest level of performance in neurovascular studies, coronary artery imaging, pulmonary imaging and critical care. Expect new discoveries in routine studies and breakthroughs in clinical applications.

The unique Essence technology is at the core of the Brilliance CT 64-channel scanner. Consisting of industry exclusive X-ray tube, detector and reconstruction advancements to deliver optimal image quality, Essence technology provides the inherent design features that enable new levels of clinical performance.

PHILIPS

Essence technology

The Brilliance CT 64-channel scanner utilizes Essence technology to provide the image quality enhancements required by clinicians to support high levels of patient care. Essence technology is an optimal combination of X-ray tube, detector and reconstruction innovations.

X-ray Tube Features	Clinical Value
Spiral Groove Bearing	Precise anode rotation stability for a virtually motion-free focal spot and for better image quality
Segmented Anode	12 individual anode segments compensate for heating and cooling cycles for higher reliability
Smart Focal Spot	Dynamic focal spot motion doubles the number of projections and improves in-plane spatial resolution

Nano-Panel Detector Features	Clinical Value
TACH 2 Detector Electronics	Second generation of TACH technology further reduces the electronic noise enabling improved image quality at low radiation doses
Ultra High Resolution (up to 24 Lp/cm spatial resolution)	High spatial resolution means better definition of small structures

RapidView Reconstruction Features	Clinical Value
3D Cone Beam Reconstruction Algorithm (COBRA)	COBRA provides high image quality without cone beam artifacts
Adaptive Multicycle Reconstruction	Part of the Rate Response CV Toolkit for cardiac CT imaging, these features optimize every voxel for the optimal temporal resolution
Ultra High Resolution Matrices	768 ² and 1024 ² reconstruction matrices take advantage of high resolution imaging
Quad Core processors	Philips utilizes innovations in computer technology to continuously improve reconstruction performance



MRC X-ray Tube



Nano-Panel Detectors



RapidView Reconstruction with
Quad Core Processors

The CT user environment

Brilliance is a flexible, scalable CT work environment for planning, scanning, visualization, and archiving. The Brilliance Workspace offers a range of clinical applications at the scanner console. The Extended Brilliance Workspace* delivers advanced clinical applications to a dedicated PC. And finally, the Brilliance Workspace Portal* makes it possible for users to work efficiently with extremely large data sets from a typical laptop or home computer, wherever they are.

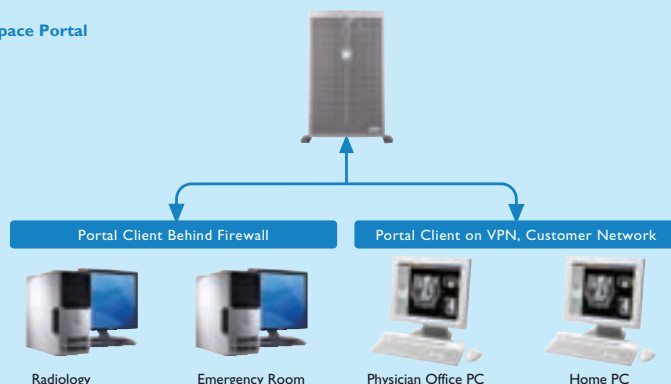
Brilliance CT Workspace



Extended Brilliance Workspace



Brilliance Workspace Portal



Console

The console runs Brilliance Workspace on a Dell PC with dual monitors (1,280 x 1,024 Flat Panel LCD each). An optional slave monitor can display the images from the main console at a remote location, such as the radiology reading room.

Standard Applications	Optional Applications
CT Viewer	Virtual Colonoscopy
MPR	AVA-Stenosis
SSD 3D	AVA-Stent Planning
MIP	CT Perfusion
Volume Rendering	Advanced Brain Perfusion
CT Endoscopy	Lung Nodule Assessment
Q-CTA	Lung Emphysema
Test Injection	CT Reporting
Combine Images	CT/MR Image
Scan Tools Pro:	Dental Planning
DICOM Modality Worklist	Cardiac Viewer
Split Study	Heartbeat-CS
Prefetch Study	Cardiac CT Angio
Automatic Procedure Selection	LV/RV Analysis
Bolus Tracking	EP Planning
Spiral Auto Start	Stereotaxis

* Optional

Gantry and table

Gantry

Feature	Specification
X-ray tube and Detectors Architecture	Third generation; Rotate-rotate
Rotation times	0.4*, 0.5, 0.75, 1, 1.5, 2 seconds for full 360° scans 0.28*, 0.33, seconds for partial angle 240° scans
Gantry aperture, mm	700mm
Intercom system	Two-way connection between the gantry and console areas
Gantry tilt, degrees	-30° to +30° with 0.5° increments
Controls located on Gantry (left and right, front and back)	Tilt, Couch In/Out, Couch Up/Down, Emergency Stop, X-Ray Indicator
Controls located at Operator's Console	Tilt, Couch In/Out, Couch Up/Down, Emergency Stop, X-Ray Indicator, Start Scan, Pause
Focus-detector distance	1040mm
Focus-isocenter distance	570mm

AutoVoice

A standard set of commands for patient communication before, during, and after scanning is available in the following languages:

- English
- French
- Spanish
- Italian
- Japanese
- Hebrew
- Arabic
- Russian
- Georgian
- Turkish
- German
- Danish
- Swedish

Customized messages can also be created.

Patient Table

Feature	Specification
Vertical range, mm	578 to 1028mm with 1.0mm increment
Manual longitudinal stroke, mm	1900mm
Scannable range, mm	1750mm
Z-position accuracy	±0.25mm
Longitudinal speed, mm/s	0.5 – 143mm/s
Max Load Capacity with Accuracy, lb	450 lbs (204kg) with 0.25mm Z-axis accuracy 650 lbs (295kg) with 0.25mm Z-axis accuracy on Bariatric Patient Support*
Floating tabletop	Carbon-fiber table top with foot pedal and hand control for easy positioning and quick release.

* Optional

Accessories

Standard Accessories



Patient restraint kit



Elevated head holder



Table extension



Coronal head holder – supine



Table pad



Cushions and pads



Arm rests



IV poles

Optional Accessories



Infant cradle



Therapy table top



Flat head holder



Radiology Flat Top Kit



Load and unload foot pedals



Interventional couch controls

Scan and image acquisition

Generator

Feature	Specification
Output capacity	60 kW
kV	80, 120, 140 kVp
mA	20-500 mA; 1 mA increments

X-ray Tube

Feature	Specification
Anode storage capacity	8 MHU
Anode max cooling rate	1608 kHU/min
Focal spot (IEC)	Large: 1.0mm x 1.0mm Small: 0.5mm x 1.0mm
Anode diameter	200mm
Anode rotation speed	105 Hz (6300rpm)
Target angle	7°
Maximum On-Time (@ maximum power; 120kV, Large Focal Spot)	23 sec @ 500 mA

Detector

Feature	Specification
Material	Solid-State GOS with 43,008 elements
Dynamic range	1,000,000:1
Slip ring	Optical - 5.3 Gbps transfer rate
Data sampling rate	Up to 4640 views/revolution/element
Slice collimations available	64 x 0.625mm, 40 x 0.625 mm, 32 x 1.25mm, 16 x 2.5mm, 2 x 0.5mm
Slice thickness (Spiral mode)	0.55 - 7.5mm variable
Slice thickness (Axial mode)	0.5 - 12mm
Scan angles	240°, 360°, 420°
Scan field of view	250mm, 500mm

Image Quality

Feature	Specification			
Spatial Resolution	Cut-off	2%	10%	50%
Ultra High mode (lp/cm)	24.0	23	16	8
High mode (lp/cm)	16.0	15	12	6
Standard mode (lp/cm)	13.0	12	9	5
Noise	0.27% [120kVp, 250mAs, 10mm, 0.75 sec, 250mm FOV, UA Filter; 21.6cm water equivalent phantom]			
Low-contrast resolution	4.0mm @ 0.3% [120kVp, 250mAs, 10mm, 0.75 sec, 250mm FOV, UB Filter; 27mGy at surface of CATPHAN phantom]			
Absorption range	-1024 to +3072 Hounsfield units			

Scanning modes

Spiral Scanning

- Multiple contiguous slices acquired simultaneously with continuous table movement during scans
- Multiple, bidirectional acquisitions
- Spiral exposure: Up to 100 seconds
- Spiral pitch: 0.13 to 1.5 (user-selectable)

Axial Scanning

- Multiple-slice scan with up to 64 contiguous slices acquired simultaneously with incremental table movement between scans
- Fused modes for reconstructing thick slices from thin slice acquisitions

Clinical enhancements

Bolus Tracking

An automated injection planning technique to monitor actual contrast enhancement and initiate scanning at a predetermined level.

Spiral Auto Start (SAS)

Spiral Auto Start integrates the injector with the scanner, allowing the technologist to monitor the contrast injection and to start and stop the scan (with the predetermined delay) while in the scan room.

Rate Responsive CV Toolkit*

Enables cardiac imaging and includes an ECG monitor; Retrospective Tagging, Prospective Gating, the Cardiac Viewer; Heartbeat-CS and CT Reporting. Uses the Philips Adaptive Multicycle Reconstruction to optimize the temporal resolution.

Step & Shoot Cardiac*

Enables low dose, high quality cardiac CT imaging. This axial prospective ECG-gated acquisition technique achieves full heart coverage with sub-millimeter, isotropic resolution within a short breath-hold. Includes automatic arrhythmia detection and handling.

Heartbeat CS Pro*

Includes ECG Prospective Gating. The scanner automatically triggers axial multislice scan acquisitions using an ECG signal. Philips patented Beat-to-Beat Variable Delay Algorithm enables accurate and reproducible calcium scoring studies.

Continuous CT (CCT)*

This application provides visual guidance for interventional procedures using a foot pedal and a remote monitor. Exposures, taken once per rotation in either single or continuous mode, are limited to a 240 degree axial centered beneath the patient to shield the clinician's hands from direct X-ray exposure.

CT Fluoroscopy Package*

This application provides near real-time guidance for interventional procedures (up to 8 fps) using a foot pedal and a remote monitor. The Fluoro mode is particularly useful in complicated procedures involving breathing and abdomen motion.

Jog Scan*

Jog Scan provides up to 80mm of imaging area for perfusion studies. The scanner acquires two 40mm volumes of interest by translating the couch back and forth – doubling the standard perfusion coverage.

Pulmonary Toolkit*

Pulmonary Toolkit enables the user to trigger a scan at a particular breath level (axial and/or spiral prospective gating), minimizing artifacts caused by respiratory motion. This allows better chest imaging of patients who cannot hold their breath.

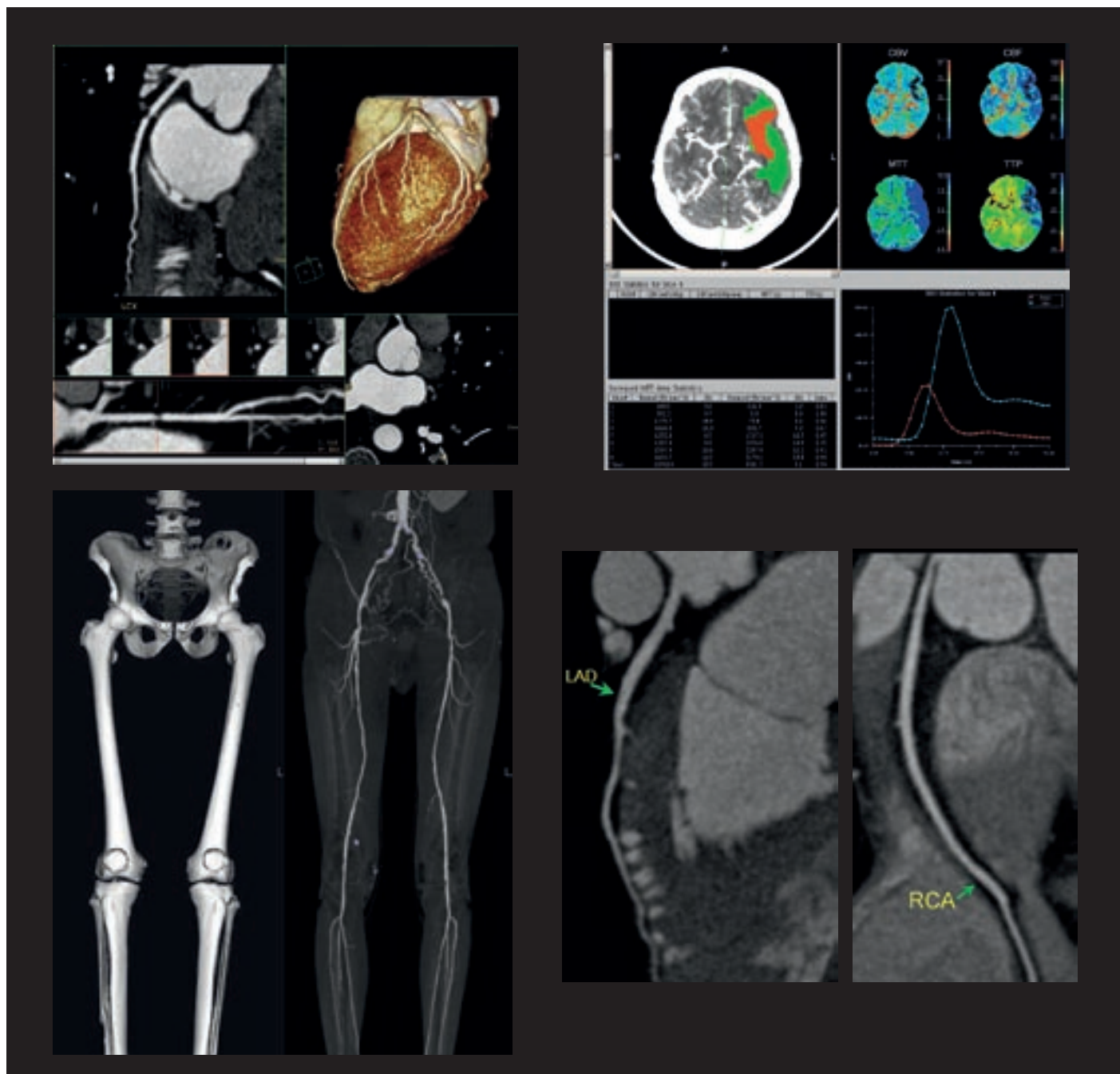
Pulmonary Toolkit Oncology*

Pulmonary Toolkit Oncology includes the Pulmonary Toolkit features plus Retrospective Spiral (4D CT). This feature results in the ability to generate multiple phases allowing for visualization of motion during the respiratory cycle and delineating a target volume.

*Optional

Clinical examples

Protocol	Collimation	Rotation (sec)	Pitch	Slice Width (mm)	Scan Coverage (mm)
Coronary CTA*	64x0.625	0.4	0.2	0.9	120
Brain Perfusion with Jog Scan*	32x1.25	0.5	-	10	80
CTA Runoff	64x0.625	0.75	0.9	2.0	1304
Step & Shoot Cardiac*	64x0.625	0.4	-	0.9	128



* Optional

Dose management

DoseWise is a philosophy, a set of principles and practices, focused on lowering radiation dose for patients and staff. Philips focuses on system design optimization, current (mA) optimization and increasing dosage awareness to reduce the cumulative risk of radiation while obtaining high-quality images.

DoseRight ACS (Automatic Current Selection)

Optimizes the dose for each patient based on the planned scan by suggesting the lowest possible mAs settings to maintain constant image quality at low dose throughout the exam.

DoseRight D-DOM (Dynamic Dose Modulation)

Automatically controls the tube current rotationally, increasing the signal over areas of higher attenuation (lateral) and decreasing signal over area of less attenuation (AP).

DoseRight Z-DOM (Longitudinal Dose Modulation)

Automatically controls the tube current, adjusting the signal along the length of the scan, increasing the signal over regions of higher attenuation (shoulders, pelvis) and decreasing the signal over regions of less attenuation (neck, legs).

Dedicated Pediatric Protocols

Developed in collaboration with top children's hospitals, Brilliance age and weight-based infant and pediatric protocols optimize image quality with low dose.

Dose Performance Data

CTDI vol	Measurement
Head	11.0 mGy / 100 mAs
Body	5.6 mGy / 100 mAs

Using IEC standard phantoms

* Optional

Reconstruction

RapidView Reconstruction generates up to 20 images per second using a 512² matrix.

Reconstruction Field of View

- 50 to 500mm continuous
- 25 to 250mm (Ultra High mode)

Image Matrix

- 512², 768² and 1,024²

Cone Beam Reconstruction

Philips patented Cone Beam Reconstruction Algorithm (COBRA) enables true three-dimensional data acquisition and reconstruction in spiral scanning.

Adaptive Filtering

Adaptive filters reduce pattern noise (streaks) in non-homogenous bodies, improving overall image quality.

Adaptive Multicycle Reconstruction

(Part of Rate Responsive CV Toolkit*)

Image data can be prospectively gated or retrospectively tagged. COBRA automatically delivers the best temporal resolution possible (as low as 53mseconds).

Evolving Reconstruction

Real-time 256² matrix image reconstruction and display in step with spiral acquisition or off-line. Images can be modified for window width and level, zoom and pan prior to larger matrix reconstruction. At the end of the acquisition, all images are updated with the desired viewing settings.

Off-Line Reconstruction

Off-Line (batch) background image reconstruction of user-defined groups of raw data files with automatic image storage.

Networking

The Brilliance CT supports 10/100/1000 Mbps (10/100/1000BaseT) network speeds. For optimal performance, Philips recommends a minimum of 100Mbps network speed (1Gbps preferred) and for the CT network to be segmented from the rest of the hospital network.

Archiving

The full implementation of the DICOM 3.0 communications protocol in the Brilliance Workspace allows connectivity to DICOM 3.0 compliant scanners, workstations, and printers; supports IHE requirements for DICOM Connectivity.

Type	Hard Drive	DVD RAM ¹	EOD ¹	CD
Capacity	292 GB	4.7 GB	9.1 GB	700 MB
Images	500,000 ²	15,000 ³	15,000 ²	1200 ²
Patients ⁴	1,667	50	50	4

¹ Either DVD-RAM or EOD is standard, dependent on selected options

² 512² matrix uncompressed

³ 512² matrix compressed

⁴ Based on 300 images per study

DICOM CD Writer

A DICOM CD Writer option stores DICOM images and associated image viewing software on very low cost CD media. Images on these CDs can be viewed and manipulated on PCs meeting the minimum specifications. Ideally suited for individual result storage and referring physician support.

Filming

This function allows the user to set up and store filming parameters. Pre-stored protocols can be set to include auto-filming. The operator can film immediately after each image, at the end of a series, or film after the end of a study and review images before printing. The operator can also automatically film the study at three different windows and incorporate "Combine Images" functionality to manage large datasets. Basic monochrome and color DICOM print capability are supported.

DICOM

Brilliance Workspace supports IHE requirements for DICOM connectivity and can work with DICOM 3.0-compliant PACS, scanners, workstations, and printers. It supports IHE requirements for scheduled workflow and other integration profiles as defined in IHE Statement. Brilliance Workspace includes DICOM service classes to communicate with the following modalities:

- CT
- MR
- Nuclear Medicine including PET/CT
- Computed Radiography
- Radiography & Fluoroscopy (R&F)

Brilliance Workspace includes the following DICOM functionality:

- Service Class User & Provider (CT, MR, NM, Secondary Capture)
- DICOM Print
- DICOM Modality Worklist User
- Query/Retrieve User and Provider
- Modality Performed Procedure Step User
- Storage Commitment User
- Removable Media

Site planning

Contact the Philips Site Planning department for specific requirements pertaining to optional imaging/viewing/power equipment, floor space and electrical, mechanical, structural or environmental specifications.

Power Requirements

- 200/208/240/380/400/415/480/500 VAC
50/60 Hz 100kVA
- Three-phase distribution source

Console Uninterrupted Power Supply (UPS)*

Provides up to 30 minutes of backup power for host computer, reconstruction, and monitors.

Environmental Requirements

Temperature:

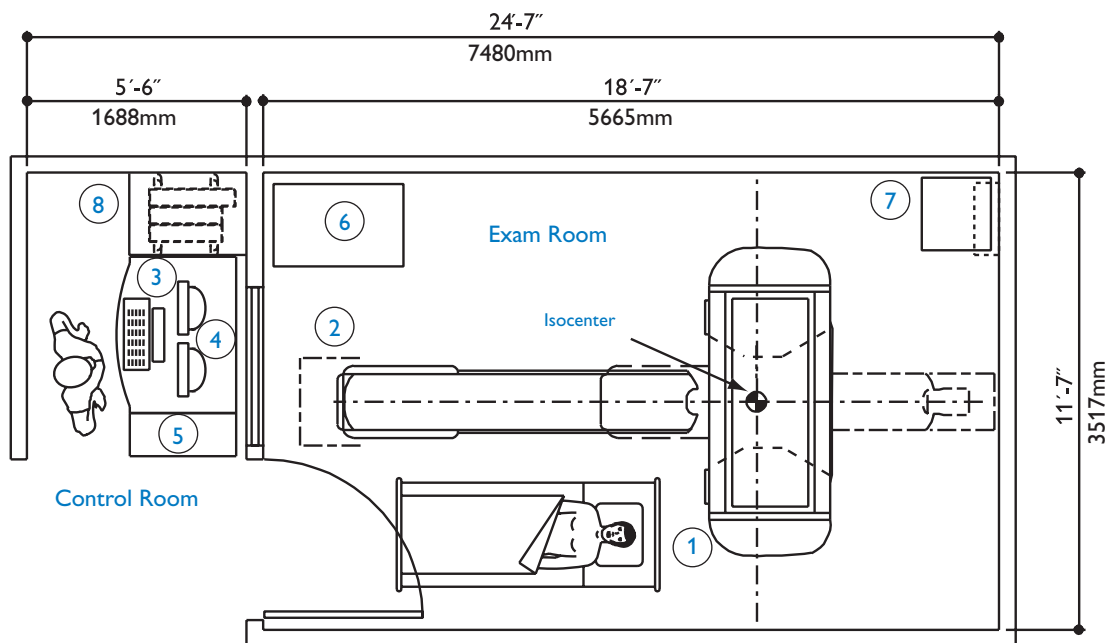
- Gantry room: 18° to 24° C (64° to 75° F)
- Control room: 15° to 24° C (59° to 75° F)
- Storage/Transport: -5° to +35° C (23° F to 95° F)

Humidity:

- Gantry/Control: 35% to 70% non-condensing
- Storage/Transport: 10% to 90% non-condensing

Heat Dissipation:

- Gantry: 18,000 BTU/hr
- Computer: 2,559 BTU/hr
- Reconstruction: 5,293 BTU/hr



Dimensions and weights

	weight	height	width	depth
① gantry	1941kg (4280lbs.)	203cm (80")	239cm (94")	94cm (37")
② patient table	385kg (850lbs.)	101cm (40")	69cm (27")	249cm (98")
③ console table*	56kg (125lbs.)	76cm (30")	119cm (47")	91cm (36")
④ LCD monitor**	10kg (22lbs.)	49cm (19")	49cm (19")	22cm (9")
⑤ computer cabinet	118kg (260lbs.)	76cm (30")	33cm (13")	90cm (36")
⑥ recon cabinet	151kg (332lbs.)	76cm (30")	64cm (25")	90cm (36")
⑦ transformer (xfmr)	271kg (598lbs)	112cm (44")	56cm (22 ")	53cm (21")
⑧ console UPS*	130kg (286lbs.)	46cm (18")	63cm (25")	66cm (26")

* Optional

** Dimensions and weights for one unit

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Printed in The Netherlands.
4522 962 31921/728 * MAY 2008