GE HealthCare

Discovery IQ PET/CT

Pre-Installation Manual

5495000-1EN
Revision 9

Important...X-Ray Protection

X-ray equipment if not properly used may cause injury. Accordingly, the instructions herein contained should be thoroughly read and understood by everyone who will use the equipment before you attempt to place this equipment in operation. The General Electric Company, Healthcare Technologies, will be glad to assist and cooperate in placing this equipment in use.

Although this apparatus incorporates a high degree of protection against x-radiation other than the useful beam, no practical design of equipment can provide complete protection. Nor can any practical design compel the operator to take adequate precautions to prevent the possibility of any persons carelessly exposing themselves or others to radiation.

It is important that anyone having anything to do with x-radiation be properly trained and fully acquainted with the recommendations of the National Council on Radiation Protection and Measurements as published in NCRP Reports available from NCRP Publications, 7910 Woodmont Avenue, Room 1016, Bethesda, Maryland 20814, and of the International Commission on Radiation Protection, and take adequate steps to protect against injury.

The equipment is sold with the understanding that the General Electric Company, Healthcare Technologies, its agents, and representatives have no responsibility for injury or damage which may result from improper use of the equipment.

Various protective materials and devices are available. It is urged that such materials or devices be used.

Important...Radioactive Material Handling

Only employees formally training in radioactive materials handling and this equipment are authorized by the GE Healthcare Radiation Safety Officer to use radioactive materials to service this equipment.

GE Healthcare Services is required to notify the applicable U.S. state agency PRIOR to any source service event involving pin source handling. See NUC/PET Radioactive material guides for specific instruction or contact your EHS Specialist.

Rev 2 (July 21, 2005)

Language Policy

DOC0371395 - Global Language Procedure

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Contents

Revision History (5495000-1EN PIM)

Revision	Date	Reason for Change
9	05-Nov-2024	Chapter 1 Updated Table 3 on page 12, modifed PARC4.X Reconstruction Cabinet (on skid) to PARC4.X Reconstruction Tall Cabinet (on skid), updated PARC4.X Reconstruction Mini Cabinet dimensions. Updated Shipping Methods (Dollies, Skids) on page 13, modifed PARC4.X Reconstruction Cabinet to PARC4.X Reconstruction Tall Cabinet, added PARC4.X Reconstruction Mini Cabinet. Chapter 2 Updated Table 5 on page 25, modifed PARC4.X Cabinet to PARC4.X Tall Cabinet, updated PARC4.X Mini Cabinet dimensions. UpdatedTable 6 on page 27, modifed PARC4.X Cabinet to PARC4.X Tall Cabinet, updated PARC4.X Mini Cabinet dimensions. modifed PARC4.X Cabinet to PARC4.X Tall Cabinet, Figure 17 on page 31. Updated 2.1 System Components on page 25. modifed PARC4.X Cabinet to PARC4.X Tall Cabinet, Figure 35 on page 44. Updated 2.1 System Components on page 25 Updated Scan Suite Configuration on page 47. Updated Anchoring Requirements – Seismic Installation on page 65. Chapter 3 Updated Electromagnetic Immunity on page 75. Updated Table title to RF Wireless Frequencies Immunity Specification and Separation Declaration for EMC **edition 4.1** in Table 14 on page 81. Updated Electromagnetic Emission on page 82.

8	28-Sep-2022	Chapter 1 Added PARC4.X Reconstruction Mini Cabinet dimensions to Table 3 on page 12 Chapter 2 Added Reconstruction Mini Cabinet details to Table 5 on page 25 Added PARC4.X Reconstruction Mini Cabinet dimensions to Table 6 on page 27 Added 2.1 System Components on page 25 Added Figure 35 PARC4.X Reconstruction Mini Cabinet Center-of-Gravity Chapter 3 Removed EMI-PDU section Chapter 5 Changed maximum duty cycle from 10kVA to 30kVA Added new section Idle Power Demand Updated Table 24 Changed usable length from 4.3m to 6.1m - for 5339979-2 Changed usable length from 15.1m to 17.2m - for 5339979 Raceway GND to PDU - GND

7	16-Nov-2020	Updated Cover Page image. Whole Document: Changed Reference of "PARC4" text to "PARC4.X". Chapter 1 General Requirements Added Note to 1.2 System Siting Requirements on page 2. Chapter 2 Equipment Requirements Updated PET-CT Gantry (overall) without Trailer dimension, PARC4.X Reconstruction Cabinet dimension, Compact PARC4.X dimension and Workspace Table 5486188-10 (adjustable height) dimension in Table 6 on page 27. Updated Figure 12 on page 28, Figure 13 on page 28 and Figure 17 on page 31. Added Open console with Z8G4 dimensions Figure 19 on page 33. Updated Figure 20 on page 34. Updated Figure 21 on page 34. Added OpenOC16 with Z8G4 Console Center-of-Gravity Figure 34 on page 43. Figure 42 on page 48. Updated Replacement Parts and Service Equipment Space on page 52. Updated Ceiling Height Requirements on page 52. Updated Gantry Front Cover – Removal Clearance on page 56. Updated Gantry Rear Cover – Removal Clearance on page 56. Updated PARC4.X Reconstruction Cabinet Placement Requirements on page 58. Updated Storage cabinet dimensions Table 9 on page 59. Updated Figure 47 on page 61, Figure 48 on page 62 and Figure 49 on page 63. Updated Minimum Number of Anchors on page 65. Chapter 3 Special Construction Requirements Updated 3.2.1.2 EMI – PDU. Chapter 4 Environmental Requirements (HVAC) Updated Table 16 on page 88 and Table 17 on page 88. Chapter 6 Communication Requirements Added new section 6.2 Digital Service and Connectivity Requirements on page 114.
6	16 – Sep-2019	Added notes to illustration 2–26.
	19 – Aug-2019	Chapter 3 Special Construction Requirement Added Table 3–5: RF wireless frequencies immunity specification and separation declaration for EMC edition 4 Updated Illustration 2-26, with new layout
	03 – July-2019	Chapter 2 Equipment Requirements Added section 3.4 Visibility Updated Illustration 2-26, with new layout

	11– Apr-2019	Added a note to all references of Aluminium Gantry. Aluminium Gantry is available in Installed Base only, not shipped after December 2018. *Chapter 1 General Requirement* Updated Table 1–3 Estimated Loading Dock Delivery Sizes and Weights with PET detachable base, Open Q.core and Open Console Values. Renamed Console as Op Console Computer (NIO16) and Open console as Op Console (Open OC16). Added new illustration 1:4 PET Detachable Base with Shipping Dollies, for Weldment Gantry and the Note on Red caster dollies. Updated Section 4.3 Delivery Types and System Lifting and Rigging Restrictions in Delivery and Handling *Chapter 2 Equipment Requirements* Updated Table 2-1: System Component Weight/Load with PET detachable base, Open Q.core and Open Console Values. Renamed Console as Op Console Computer (NIO16) and Open console as Op Console (Open OC16). Updated Table 2–2:System Component Dimensions with Open Q.core/Op OC values Updated illustration 2–4 to Q.Core and Operator Console Computer Dimensions (NI016). Added new illustration 2–5: Open Q.Core and Operator Console Computer (Open OC16) Dimensions. Updated Illustration 2–10: Service Storage Cabinet Dimensions (Optional). Added illustration 2–12:CT/PET Gantry Center-of-Gravity (Side View) (Weldment Gantry with Detachable Base). Added illustration 15: 25 cm FOV PET Gantry Center-of-Gravity (Top View – Plan at Base) (Weldment Gantry with Detachable Base). Updated Illustration 2:19– Q.Core and Operator Console Computer (NIO16) Center-of-Gravity. Added new illustration 2:2 Gantry and Table Dimensions (Weldment Gantry with Detachable Base). Updated section 2.1 Scan Suite Configuration. Added new illustration 2–26: Typical Scan Suite Layout Configuration (Weldment Gantry with Detachable Base) Updated Section 3.3.1 and 3.3.3 with reference to room layout illustrations Added illustration 2:33 Floor Mounting Detail (Weldment Gantry with Detachable Base). Updated Section 4.1.1 with PARC4. Updated section 4.1.4 Minimum Number of Anchors
	11–Dec-2018	Updated IEC 4.0 changes in *Chapter 3 Special Construction Requirements* Table 3-2: Electromagnetic Immunity. Updated 2.1.5 Electromagnetic Separation Distance. Added new Table 3–3: Spot Frequencies. Updated Table 3-3 (New Table 3.4): Recommended Separation Distances. Updated 2.2 Electromagnetic Emission. Incorporated A1 (Bevco) panel CAPA updates in *Chapter 5 Electrical Requirements* Updated Table 5-5: Component Designators — Added EPO; Table 5–9 A1 UPS — added two catalog numbers E4502BC (110A), E4502BB (90A); Table 5-10: Miscellaneous Electrical Cables – Supplied by Customer/Contractor — updated wiring details for A1 SEO; Table 5–11 Miscellaneous Electrical Components – Supplied by Customer/Contractor — added two catalog numbers E4502BC (110A), E4502BB (90A).

5	24–Aug-2018	Update Seismic details for the new Weldment Gantry *Chapter 2 Equipment Requirements* Updated Table 2–1: Weight of PET Gantry (25 cm FOV) (Aluminium gantry), Weight of PET Gantry (25 cm FOV)(Weldment gantry). Updated Table 2–1: Updated Table 2–1: Depth and Height of PET-CT Gantry (overall) without Trailer. Updated Illustrations 2-14, 2-15 and 2–16.
4	27-Nov-2017	Updates for Weldment Gantry *Chapter 1*: Updated Table 1-3: for PET Image Ring without Dollies (25 cm FOV) weight and dimensions. Added a row for weldment gantry. Modified existing row for aluminium gantry. Added details for Compact PARC4. Added Illustration 1-3 for weldment gantry. Modified 1–2 Caption for aluminium gantry. Section 4.5 Updated Storage as Temporary Storage *Chapter 2*: Updated Table 2-1: System Component Weight/Load. Added a row each for weldment gantry and Compact PARC 4. Modified existing row for aluminium gantry. Updated Table 2-2: System Component Dimensions. Updated table for weldment/aluminium gantry and added a row for compact PARC 4. Updated Illustration 2-11 for weldment gantry. Updated section 4.1.1 for floor template P/N. Added illustration 2–5 and 2–17 for compact PARC4. Added Illustration 2–27 for weldment gantry. Added note to Illustrations 2-26 and 2-27. *Chapter 3* Updated section 2.1.2. Section 4.4.2 — removed redundant note.*Across the Manual* Modified Project Manager (PM) as Project Manager of Installation (PMI).
3	10-Jan-2017	Updated for PARC4 upgrade option. *Chapter 1*: Updated Table 1-3 for PARC4 size and weight dimensions. Added section 4.2.2.6 for PARC4 shipping methods. Updated section 4.4.7 for unpacking PARC4. *Chapter 2*: Updated Table 2-1 for PARC4 system component weight load . Updated Table 2-2 for PARC4 system component dimensions. Added Illustration 2-4 and table below for PARC4 dimensions. Added Illustration 2-15 and table below for PARC 4 center-of-gravity. Updated table below Illustration 2-17 typical scan suite layout for PARC4. Added section 3.8 for PARC4 placement requirements. *Chapter 4*: Updated section 1.1.2 for Q.Core/PARC4. Renamed section 1.2 from “System Cooling Requirements” to “Heat Output” to match other products. Added heat output for PARC4. Updated Table 4-3 for PARC4 heat output. *Chapter 5*: Updated table below Illustration 5-2 system ground map for PARC4. Updated Table 5-5 for PARC4 component designators. Updated Table 5-6 for PARC4 cables. Updated Table 5-7 for PARC4 cables.
2	22-Oct-2015	HCSDM00355980 – *Chapter 1*: Updated Section 4.1.1 minimum doorway/hallway widths; replaced Illustration 1-1 with Table 1-2 to cover additional doorway sizes. Updated Section 4.5 temperature and humidity values. *Chapter 2*: Added optional Service Storage Cabinet to Table 2-2 and section 1.2. Created separate dimension and COG illustrations for Q.Core/Op Console Computer. Added UPS dimension illustration. Updated Section 2.1 typical scan suite illustration (corrected metric value for suite width from 3200 to 3912; removed IEC3 min. body pinch point). *Chapter 5*: Updated Table 5-6 (replaced 5125259 with 2117848-2) and 5-7 (removed 5125259; replaced 5120645 with 5419981). ECO 2174410 – *Chapter 2*: Updated Table 2-1, Table 2-2, section 1.2 and section 1.3 for new Workspace Table 5486188-10.
1	14-Apr-2014	Initial release.

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1 General Requirements

1.1 Introduction

1.1.1 Objective and Scope of this Manual

This manual is the official guide and informational resource for planning and preparing a location for the installation of the Discovery IQ PET/CT system. The responsibility of arranging and paying for all work associated with site planning, site preparation, and system installation rests solely with the buyer/purchaser of the system.

This manual guides you through the pre-installation siting and regulatory requirements. Keep in mind, this manual cannot address or answer each and every site specific question or concern. Contact your GE Healthcare Project Manager of Installation (PMI) for answers to any additional questions or concerns not addressed in this manual. Prior to any construction or approval, General Electric Headquarters Architectural Planning must review all PET/CT preliminary concepts, site plans, and final working drawings associated with the installation of the system. Contact your GE PMI or complete information regarding your site-specific room layout.

1.1.2 Responsibility of the Customer

It is the responsibility of the customer (buyer/purchaser) to prepare the site in accordance with all the specifications provided in this manual and in conjunction with site-specific drawings and applicable regulations. It is essential to verify all aspects of the site configuration before construction has begun, as subsequent changes can be costly or impractical. A detailed pre-installation checklist is provided in this manual. It is the responsibility of the customer to ensure all requirements on the checklist are fulfilled and that the site conforms to all specifications and requirements detailed in this manual.

Pre-Installation requirements shall include the procurement and installation of all required materials and services necessary to prepare the room to be ready for installation of the PET/CT system. The customer is responsible for all aspects of site preparation, including:

- Assigning a project coordinator.
- Planning and construction requirements for the installation of the PET/CT system in accordance with all national, state, or local regulatory requirements for the country in which the installation occurs, for example:
    - Fire control devices as required by local codes.
    - Permits, inspections, radiation licensing, etc.
    - Earthquake-related regulations.
- Selecting a location suitable for the installation of the PET/CT system.
- Constructing or renovating the site.
- All design work associated with preparing the installation site for the PET/CT system and all architectural, mechanical, and electrical drawings associated with the design of the site.

- All alterations or modifications to products not specifically included in the sales contract.
- A clean and safe work environment for installation of the PET/CT system.
- A location with proper lighting, a level finished floor, finished walls, and a finished ceiling.
- A support structure in the floor, walls, and ceiling suitable for mounting all system components as specified in the site design.
- Installation of all required conduit, ducts, and raceways to safely route all cables.
- Supplying electrical power of the required voltage, all necessary power supply cables and grounds, all necessary power cables and grounds to the PDU and system cabinet, and an Emergency-Off switch in the scan room.
- Installation of all properly-sized junction boxes, outlets with covers, line safety switches, and fittings installed at the locations specified in the site design.
- All Non-GE wires and cables as specified in this document:
    - The electrical contractor shall ring out and tag all wires at both ends.
    - Wires shall be continuous and without splices.
    - Ground wires shall conform to product requirements.
    - Color-coded wires shall be used whenever possible, to enable easier identification.
- All work shall conform to IBC (International Building Code) and local building and safety codes.

NOTE

GE Healthcare does not provide or install the wires, conduits, junction boxes, or ducting illustrated in this publication, unless specifically stated.

1.1.3 Site Project Coordinator

The site project coordinator is the primary contact and liaison between GE Healthcare and all site related functions, between the purchaser, the construction planners, architects, contractors, and any other site administrative personnel.

To ensure a successful installation, it is recommended that a single/individual site project coordinator manage the entire project. Ideally, the project coordinator is a person familiar with all phases of pre-installation and installation of similar medical device construction projects, from conceptual planning through to system start up. The site project coordinator shall be responsible for working closely with GE Healthcare to ensure the client (buyer/purchaser) upholds all requirements in this manual.

1.2 System Siting Requirements

- ***System Site Print***

  A system installation, relocation, or move requires a site print. The PET/CT room layout shall match the layout detailed on the site print.

- ***Regulatory Code & System Requirements***

A site shall meet all regulatory code and system requirements associated with; service, structural, flooring, vibration, HVAC, electrical, IT network, radiation protection, operational clearance requirements, and all applicable codes.

- ***Floor Specification***

  The floor shall have a minimum concrete thickness of 127 mm (5 in.).

  The floor shall be no greater than 6 mm (0.250 in.) out of level over a 3048 mm (10 ft.) range, with level defined as the horizontal surface between the highest and lowest points.

  NOTE

  If the concrete floor has a floor covering installed over it (such as floor tile), 17 or more openings 101.6 mm (4 in.) in diameter will be cut into the floor covering to ensure the table and gantry rest on the concrete. (Openings are cut during installation.)

  Shims shall not be used to level the gantry or patient table.

  NOTE

  The PET weldment gantry moves backwards during service on detachable rails, therefore concrete floor strength and levelness should be met behind the PET gantry as well. Please refer to the floor mounting details section for detachable rails position.

- ***Related Hospital Equipment Clearances***

  Carefully check/verify the room layout for the necessary clearances required of any related hospital equipment. Good judgment is required to avoid compromising important system features. There shall be ample maneuvering space around the patient table for a hospital cart, any emergency equipment, and all personnel, etc.

1.2.1 Project Manager of Installation (PMI) Tasks

GE Healthcare Project Manager (PMI) will assist buyer with system siting requirements.

1.2.2 Customer Requirements for Site Readiness

- ***Site Readiness Completion and Verification***

  Installation cannot proceed until all site-readiness requirements have been completed and verified. A site is ready when all renovations/modifications have been completed and the scan suite meets all regulatory, code, and system requirements, system delivery needs, and all requirements for any options.

- ***Contractor's Final Confirmation***

  Final confirmation of installation site readiness shall be made by all contractors associated with the project; structural engineer/architect, HVAC contractor, electrical contractor, qualified radiological health physicist, cleaning service, etc.

- ***Schedule of Site-Ready Visit***

To ensure timely system delivery and installation, the customer shall complete all necessary work listed in this Pre-Installation Manual and schedule a site-ready PMI visit prior to system delivery.

- ***Pre-installation Checklist***

  The customer shall also verify site readiness by filling out and signing the following Pre-Installation Checklist. The checklist shall be completed *six weeks prior to scheduled delivery date*.

Table 1 Customer Pre-Installation Checklist - Required Information for Site

Complete prior to scheduled delivery date. Today's Date:			
Hospital Name:			
(as it appears on the system screen)			
Network ID numbers/IP Addresses:	List IP Numbers and Address		
☐ AW			
AW Direct Connect Address:			
☐ Camera			
Camera Setup Information			
☐ PACS			
☐ Other _____			
☐ Other _____			
Do you want HIPAA enabled?	☐ Yes	☐ No	
Do you want automatic downloads enabled?	☐ Yes	☐ No	
Commitment Dates:			
Action Item	Action Item Completed?		Comments
	Yes	No	
Have the facilities department, contractor, and GE Healthcare certified the project schedule?			
Will committed site-ready date be met?			
Does construction completion date meet or precede the delivery date?			

Is the Power & Ground survey complete? Hospital Contact Name/No. _____ _____			
Is the site-ready visit scheduled?			
Is the delivery date scheduled?			
Does the delivery date require adjustment?			
Is the installation date scheduled?			
Does the installation date require adjustment?			
Is the installation timing determined?			
☐ Weekdays			
☐ Weekend			
☐ Quick Install			
If Weekend or Quick Install selected, have all sub-contractors been notified?			
Is the system first-use date scheduled?			
Are system applications/training dates scheduled?			
☐ On-Site Training Date: _____			
☐ Healthcare Institute Training Date: _____			

Equipment Compatibility:

Action Item	Action Item Completed?		Comments
	Yes	No	
Has the order been reviewed for completeness and compatibility with existing equipment?			
☐ Remote Monitors			
☐ AW Relocation			
☐ Cardiac Option			

☐ Injectors			
Are interfaces to existing or new accessories ordered and planned accordingly?			
Are cables of the correct length on order?			
Have the locations of the following peripherals (or options) been included in the site drawings?			
☐ EKG Monitor			
☐ Injector Control			
☐ Laser camera			
☐ UPS			
☐ 2nd Monitor			
☐ Respiratory Gating			

Site Planning Requirements:

Action Item	Action Item Completed?		Comments
	Yes	No	
Were final drawings approved and distributed to the contractors?			
Are final drawings signed off to approve equipment layout and orientation?			
Has the surface penetration permit been obtained and signed?			
Do the actual room dimensions match those on the final drawings?			
Has VQC Phantom been ordered by customer?			
Has DQA (Annulus) Phantom been ordered by customer?			
Optional: Has customer purchased Annulus Phantom safe accessory?			
Is RAM license valid?			
Is Radiation Safety Officer ready to receive VQC Phantom?			

Has the radiologist health physician reviewed and approved the room layout shielding requirements?			
Have any additional requirements or questions about the installation been discussed with GE Healthcare?			List additional items:
Is there a person assigned to review and verify that all installation requirements are met?			
Have the specific site requirements been discussed with all contractors?			
Has the responsibility of cabling, installing, and interfacing any GE approved accessories not on the order been discussed with GE Healthcare?			
Are all third-party vendors identified, notified, and scheduled?			
Have all Regulatory, Code, & System Requirements been met?			
Has it been verified there is no plumbing or any grounded surface within 1.83 m (6 ft.) of the table or gantry?			
Will the existing network, broadband, and camera cable drops reach all required locations for the PET/CT scanner?			List any issues or concerns:
Is this installation using the system anchoring method defined by GE or an alternate Method?			
Optional: Has the Storage Cabinet (B77292CA) been purchased with the system? If not verify that adequate storage space has been defined for all service tools purchased with the system. Refer to Section 3.9, Storage Cabinet Requirements.			
Network Installation:			
Action Item	Action Item Completed?		Comments
	Yes	No	
Have IP address and host names been obtained?			

Will a network camera be used?			
Required: Is the network installed, are the network jacks installed, and is the entire network tested?			
Required: Is the broadband VPN installed and setup?			
Required: Are network software options ordered?			
☐ HIS RIS Option			
☐ DICOM Print			
☐ AW			

Delivery and Miscellaneous:			
Action Item	Action Item Completed?		Comments
	Yes	No	
Have arrangements been made in the schedule to allow adequate time for remodeling, if required (such as construction, floor or ceiling work, painting, or other cosmetic work)?			
Have arrangements been made to clean the floor after equipment removal and prior to the installation of the new equipment?			
Is de-installation of existing equipment required?			
Is there a trade-in of existing equipment?			
☐ GoldSeal			
Has the delivery route been identified with the proper hospital personnel?			
Have the elevators and doors been checked for size and weight constraints?			
Have the appropriate arrangements been made with traffic for delivery?			

Will any acceptance, performance, or bio-medical testing be required?			
Are trash and recycling bins available for the disposal of paper, cardboard, etc.			

1.3 Regulatory Requirements

The following codes, standards, and laws are referenced in this section:

- OSHA 29 CFR 1910
- NFPA 70E (Standard for Electrical Safety in the Workplace)
- NFPA 101: (Life Safety Code)
- NFPA 99: (Standard for Health Care Facilities)
- ADA Amendments Act of 2008 (Americans with Disabilities Act)

1.3.1 Building Codes, Regulations and Permits

Building Codes and Regulations Scan suite shall meet all building codes and applicable regulations.

GE Healthcare Surface Penetration Permit A GE surface penetration permit shall be approved by the appropriate facility or building representative. (Drilling holes into a concrete floor is an example of surface penetration.) The GE surface penetration permit can be obtained through GE Healthcare Service Operations, EHS Support Central.

1.3.2 Clearance Regulations

Federal & National Association Regulations

Clearance regulations for all systems installed in the U.S. are determined by various federal agencies and the National Fire Protection Association. The regulating publications are: IEC ed3, OSHA 29 CFR 1910, NFPA 70E (Standard for Electrical Safety in the Workplace), NFPA 101: (Life Safety Code), NFPA 99: (Standard for Health Care Facilities), and the ADA Amendments Act of 2008 (Americans with Disabilities Act).

Federal and Foreign Regulations

All systems installed within the U.S. and its territories shall comply with all federal, state, and local regulations. Compliance to specifications defined in this manual as well as all country, federal, state, territory, province, city or local regulations shall be the responsibility of the customer. If a federal, state, territory, province, city, or local regulation is in conflict with a specification defined in this manual the most conservative of the two specifications shall be applied

1.3.3 Codes, Clearances, and Service Space Regulation

Federal, State, and Local Codes The diagrams and dimensions used throughout this manual, detail required clearances for proper system operation and servicing only. The customer shall be responsible

for ensuring all federal, state, and local codes and clearances are followed and maintained, regarding facility egress and all other related requirements.

1.4 Delivery and Handling

1.4.1 Installation Tasks

The following tasks are to be done by the GE PMI.

Task	Description
Site Dimensions	PMI shall measure and verify all site dimensions to ensure the facility can accommodate the delivery of the system (and any related components or equipment), from the delivery drop-off point to the scan suite. **NOTE** Refer to Minimum Clear Doorway Opening Widths and Hallway Widths on page 11 and Minimum Clear Doorway Opening Heights and Unobstructed Hallway Heights on page 11 for details.
Delivery Type	PMI shall determine type of delivery: ground level, loading dock, or tilt-bed truck.
Delivery Equipment	PMI shall determine if delivery requires special dollies, lifting crates, or riggers. PMI shall order any additional delivery equipment and all necessary delivery personnel. **NOTE** The CT gantry or its sections cannot be lifted or transported by any means other than the GE support cradle and dolly system on which is was shipped. Otherwise, serious damage to the gantry could result.
Identify Delivery Route	PMI shall identify the delivery route, which may include any elevators, doorways, and hallways necessary to accommodate the delivery of all system components. **NOTE** The buyer or buyer's Structural Engineer of record is responsible for making sure the floor material and design along the delivery route (loading dock, halls and rooms) meets the forces and weight requirements for the delivery of the individual subsystems to the final installation location within the facility.
Non-Construction-Zone Route to Scan Suite	PMI shall verify an accessible, dust-free, non-construction-zone delivery route to the scan suite.

Packaging Requirements	PMI shall order any construction site packaging requirements prior to shipment. Packaging cannot be modified once the system is shipped.
Floor Protection	PMI shall determine if floor protection is required along facility delivery route and communicates requirement to delivery company/personnel.

1.4.1.1 Minimum Clear Doorway Opening Widths and Hallway Widths

The scan room shall have at least one doorway with a minimum unobstructed clear doorway opening width of 1067 mm (42 in.). This accommodates the CT Gantry with covers and dollies attached, but side rails removed. This also accommodates the PET Image Ring with dollies attached, but side protective braces removed. The customer is responsible for removing or protecting any doorway threshold (if one exists) in order to move the scanner subsystems in and out of the room.

Often the table and the gantry will need to be turned in the hallway to enter the scan room. If there is enough room in the hallway, the minimum doorway width will be smaller. If the hallway is smaller in width, the doorway width must increase. Table 2 on page 11 represents the minimal requirements when combined with average door width sizes.

Table 2 Minimum Clear Doorway Openings and Hallway Widths

Doorway Clear Opening	Hallway
Minimum Width	
1067 mm (42 in.)	No hallway or need to turn subsystems to enter the room
Minimum Width Needed to Turn Subsystem	
1067 mm (42 in.)	3048 mm (120 in.)
1219 mm (48 in.)	2591 mm (102 in.)
1397 mm (55 in.)	2438 mm (96 in.)
1829 mm (72 in.)	1803 mm (71 in.)

1.4.1.2 Minimum Clear Doorway Opening Heights and Unobstructed Hallway Heights

The minimum clear doorway opening heights shall be 2032 mm (80 in.) and unobstructed hallway heights shall be 2439 mm (96 in.) in the path of the subsystems.

1.4.2 Shipping Dimensions and Weight

1.4.2.1 Delivery Sizes and Weights

Table 3 Estimated Loading Dock Delivery Sizes and Weights

Item	Height mm (in.)	Width/Depth mm (in.)	Length mm (in.)	Weight kg (lb)
CT Gantry with Dollies On, Side Rails On	2000 (79)	1290 (51)	2810 (111)	1982 (4370)
CT Gantry with Dollies On, Side Rails Off	2000 (79)	1067 (42)	2810 (111)	1967 (4310)
PET Base and Retractor Assembly with Dollies	990 (39)	1054 (41.5)	2438 (96)	662 (1460)
PET Detachable Base Assembly with Dollies	670 (26.3)	1080 (42.5)	496 (19.5)	287 (632.7)
PET Image Ring with Dollies On, Side Protective Braces On (25 cm FOV)	1880 (74)	1118 (44)	2794 (110)	1315 (2900)
PET Image Ring with Dollies On, Side Protective Braces Off (25 cm FOV)	1880 (74)	1040 (41)	2794 (110)	1282 (2826)
PET Image Ring without Dollies (25 cm FOV) (Aluminium Gantry*)	1819 (72)	720 (28)	2120 (83)	1002 (2210)
PET Image Ring without Dollies (25 cm FOV) (Weldment Gantry)	1750 (69)	850 (33)	2120 (83)	950 (2094)
PET Image Ring Dolly (assembled)	1358 (54)	1118 (44)	2794 (110)	312 (690)
PET Trailer with Dollies (25 cm FOV)	1358 (54)	1054 (41.5)	2438 (96)	254 (560)
Table (Blue Dollies On)	1410 (55.5)	864 (34)	3836 (151)	1241 (2736)
Table (Blue Dollies Off, Red Castors On)	1410 (55.5)	1016 (40)	3086 (121.5)	1295 (2856)
Table (Tilting Dollies On)	1778-2032 (70-80)	965 (38)	2489-2921 (98-115)	1147 (2530)
Power Distribution Unit (with cardboard packaging)	1092 (43)	584 (23)	762 (30)	413 (910)
Q.Core on Skid	1067 (42)	635 (25)	864 (34)	87 (192)
PARC4.X Reconstruction Tall Cabinet (on skid)	1655 (65.2)	1480 (58.3)	980 (38.6)	304 (670)
PARC4.X Reconstruction Mini Cabinet (on skid)	1032 (40.9)	847 (33.3)	1352 (52.2)	251(553)
Open Q.core (on Skid)	576 (22.7)	400 (15.7)	671 (26.4)	91 (200.6)
Compact PARC4.X (on skid)	990 (39)	1480 (58.3)	980 (38.6)	225 (496)
Op Console Computer (NIO16) on Skid	1067 (42)	635 (25)	864 (34)	87 (192)

Estimated Loading Dock Delivery Sizes and Weights continued				
Item	**Height mm (in.)**	**Width/Depth mm (in.)**	**Length mm (in.)**	**Weight kg (lb)**
Op Console (Open OC16) (on Skid)	576 (22.7)	400 (15.7)	671 (26.4)	91 (200.6)
Annulus Phantom Safe (option)	914 (36)	914 (36)	914 (36)	217 (480)
* Aluminium Gantry is available in Installed Base only, not shipped after December 2018.				

1.4.2.2 Shipping Methods (Dollies, Skids)

1.4.2.2.1 CT Gantry

The CT Gantry ships with the front and rear covers attached to its front and rear cover brackets. During installation, the rear cover is transferred to the PET Gantry, and the rear cover brackets are removed from the CT Gantry. The assembly is mounted between two dollies Figure 1 on page 13.

Two side rails are bolted to the dollies to stabilize dollies and protect the CT Gantry. The dolly elevating casters lift the CT Gantry off its base and roll it into position.

Figure 1 CT Gantry with Shipping Dollies and Side Rails

1.4.2.2.2 PET Components

The PET Gantry consists of:

- PET Base and Retractor Assembly Figure 2 on page 14. The PET Base dollies have a center stabilizing frame to protect the exposed components.
- PET Image Ring Figure 5 on page 15
- PET Trailer Figure 6 on page 16

Figure 2 PET Base and Retractor Assembly, with Shipping Dollies for Aluminium Gantry

NOTE

Aluminium Gantry is available in Installed Base only, not shipped after December 2018.

Figure 3 PET Base and Retractor Assembly, with Shipping Dollies for Weldment Gantry

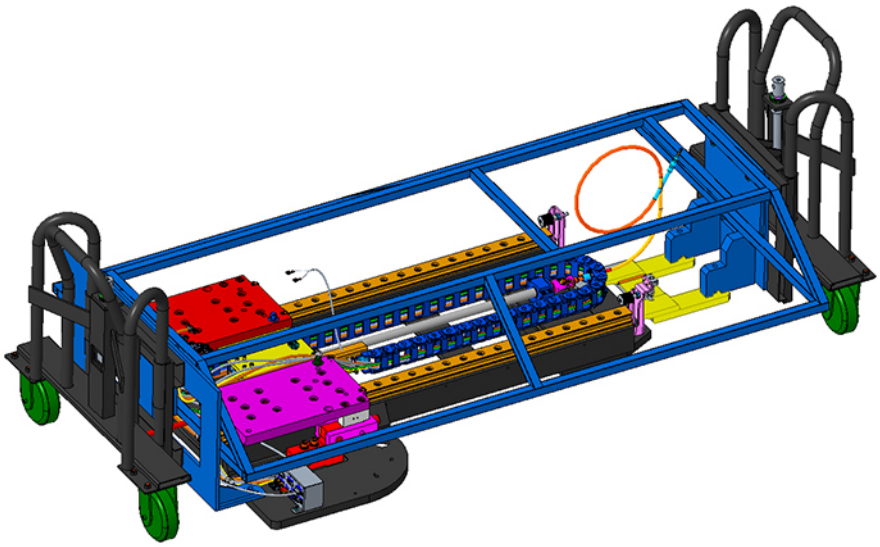
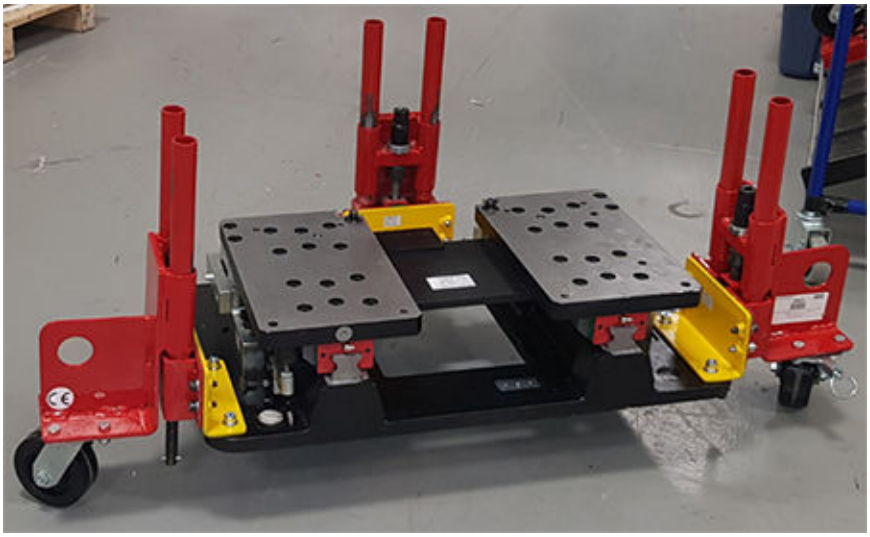


Figure 4 PET Detachable Base with Shipping Dollies, for Weldment Gantry



NOTE

The detachable base is shipped to international sites in a crate. The installation team removes the detachable base from the crate and attaches the red caster dollies at the site. Use the red caster dollies that are shipped along with the patient table. Refer Patient Table on page 16.

Figure 5 PET Gantry Image Ring, with Shipping Dollies and Side Rails

Figure 6 PET Trailer, with Shipping Dollies and Side Rails

1.4.2.2.3 Patient Table

The patient table ships to domestic (North American) installations on a set of dollies with stabilizing side rails Figure 7 on page 16. The secondary base covers ship separately.

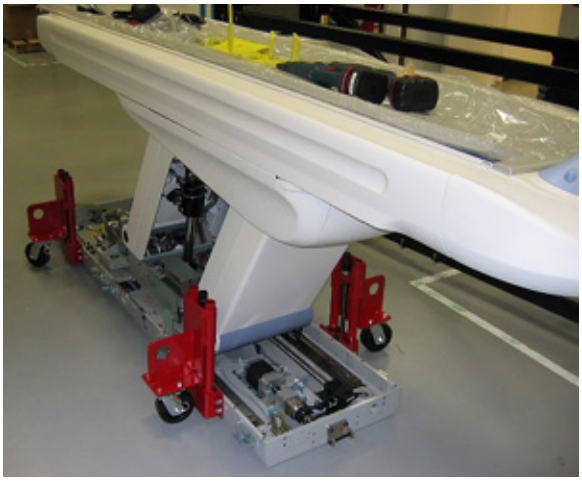
Red caster towers are attached to the ends of the dollies and shippedFigure 7 on page 16. They are used for fitting the Table in an elevator and for final positioning of the Table in front of the Gantry Figure 8 on page 17.

NOTE

The patient table ships to international sites in a crate. The installation team removes the table from the crate and attaches the dollies at the site.

Figure 7 Patient Table with Shipping Dollies

Figure 8 Patient Table on Red Caster Towers



1.4.2.2.4 PDU

The PDU is shipped on a skid. Do not remove the PDU from the skid until it is in the room ready for installation.

1.4.2.2.5 Q.Core

The Q.Core is shipped on a skid. Do not remove the Q.Core from the skid until it is in the room ready for installation.

1.4.2.2.6 PARC4.X Reconstruction Tall Cabinet

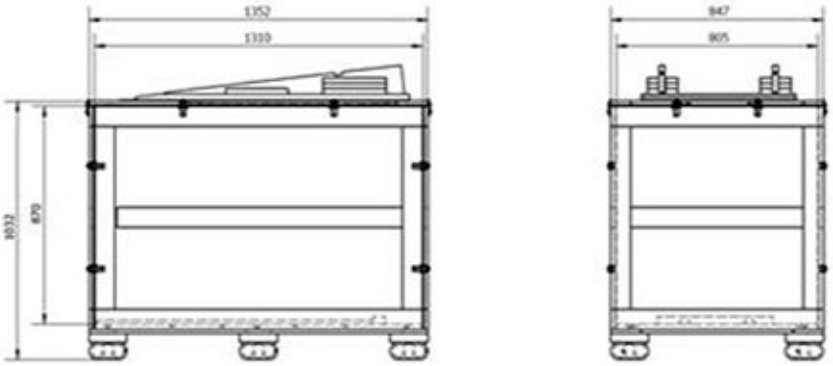
The PARC4.X is shipped on a skid. Do not remove the PARC4.X from the skid until it is in the room ready for installation.

Figure 9 PARC4.X Reconstruction Tall Cabinet Packaging

1.4.2.2.7 PARC4.X Reconstruction Mini Cabinet

The PARC4.X is shipped on a skid. Do not remove the PARC4.X from the skid until it is in the room ready for installation.

Figure 10 PARC4.X Reconstruction Mini Cabinet Packaging



1.4.2.2.8 Operator Console

The Console is shipped on a skid. Do not remove the Console from the skid until it is in the equipment room. The keyboard table is shipped with the Console, but not assembled.

1.4.2.2.9 Annulus Phantom Safe (option)

The Annulus Phantom Safe is shipped on a combined crate/skid Figure 11 on page 19.

Figure 11 Annulus Phantom Safe on Skid

1.4.3 Delivery Types and System Lifting and Rigging Restrictions

Lift-Gate and Rollback Truck Deliveries

DANGER

PERSONAL INJURY OR DEATH, EQUIPMENT DAMAGE. TIP HAZARD.

Gantry is very heavy and may tip over if tilted past 10 degrees.

When transporting a system to the final destination, do not exceed tilt angle equal to, or greater than 10 degrees in either direction of axis.

Loading Dock Deliveries (Preferred method)

Facilities with a loading dock in the receiving areas can generally accommodate delivery of the system by semi-tractor trailer. This is the preferred method for system delivery. Dock-to-dock shipment minimizes the possibility of dropping the PET/CT gantries or damaging other subsystems during the transition from the trailer to the facility. This method also allows for the most efficient packing and unpacking of the system.

Rollback Truck Deliveries

If a rollback delivery truck is used, a GE representative shall personally supervise the delivery of the PET/CT scanner to ensure the system is safely delivered without damage. To avoid damaging the gantry, the representative shall direct the driver to attach strapping to the lowest point (not the wheels) of each dolly. When the gantry is lowered from the back of the delivery truck, it shall be

lowered at the slowest reasonable rate without jerking the gantry. Otherwise, serious damage to the gantry could occur.

Ground (Non-Loading Dock) Deliveries

Facilities without a loading dock require a Lift Gate or Tilt Bed truck. Such deliveries require unloading the system components from the truck bed to ground level and then transported to the facility over a smooth surface such as a concrete sidewalk or driveway or paved area. These paved surfaces must be able to support the weight of the subsystems. It may be necessary to protect these surfaces as well.

Lift-Gate Truck

If a truck equipped with a lift-gate is used, the delivery truck requires a lift gate rated for at least a 2722.0 kg (3.0 Tons) capacity. When the PET/CT gantries and table are lowered to ground level, it should be lowered at a steady rate using the slowest speed as possible to minimize G-loads when the lift gate reaches the ground. Keep PET/CT gantries and table level during movement to avoid flipping. Failure to smoothly transition the table and PET/CT gantries to ground level may cause serious damage to the table, PET/CT gantries, or their transport dollies.

Tilt Bed Truck Delivery

Use a tilt bed truck is permitted provided that the tilt does not exceed 10 degrees pitch.

If a tilt bed delivery truck is used, a GE representative shall supervise the delivery of the PET/CT scanner to ensure the system is safely delivered without damage. To avoid damaging the table and PET/CT gantries, the representative shall direct the driver to attach strapping to the lowest point (not the wheels) of each dolly. When the table and PET/CT gantries are moved from the back of the delivery truck to ground level, both shall be lowered at the slowest reasonable steady rate until wheel contact is made at ground level. Movement should be temporarily halted when the dolly wheels come in contact with the ground. Further movement should resume minimizing any G-loads as the final wheels meet ground level. Failure to smoothly transition the table and PET/CT gantries to ground level may cause serious damage to the table, PET/CT gantries, or their transport dollies.

Rigging

The PET/CT gantry assemblies shall not be lifted by their dollies. The PET/CT gantry assemblies shall not be transported across any surface by any means other than the dollies provided by GE. The PET/CT gantry assemblies have no lifting points on them and are not designed to be lifted by any special rigging attached to the PET/CT gantry assemblies themselves.

DANGER

POSSIBLE SEVERE PERSONAL INJURY OR DEATH.

The dollies are not designed to be used as an attachment point for any method of lifting the subsystems.

attaching lifting straps, cables or mechanisms to the dolly handles or any other part of the dolly is strictly prohibited.

NOTICE

If it is determined that the subsystems must be lifted by crane or other lifting method the PMI or person responsible for local siting of the system shall NOT proceed with the installation without consulting directly with GE Engineering.

Lifting the subsystems by crane or other lifting method should always be avoided. All alternate methods of delivery should be evaluated including the removal of any obstructions, doorways, walls, and windows.

If lifting is still required:

1. The entire PET/CT gantry assemblies and both gantry transport side dollies must be placed on a lifting platform. GE does not provide a lifting platform.

   The CT Stationary Assembly shall be lowered to its transport position with the gantry base in contact with the platform. The CT Rotating Assembly shall be lowered to its transport position resting on the dolly transport pads in contact with the platform.

   NOTE

   If the platform has limited space, the gantry transport side dollies may be removed during the lift. Once the lift is completed, the gantry transport side dollies must be installed back on the gantry assembly.

2. The entire patient table must be on its dollies and lifted while sitting on a lifting platform.

   The patient table on its dolly shall be lowered to its transport position so the table base is in contact with the platform.

3. The platform must be designed such that no lifting straps or cables come in contact with any part of the PET/CT gantries or table subsystems or their side dollies.

4. The lifting platform shall bear the entire load. No part of the subsystem shall bear any load during the lift.

NOTE

If delivery requires vertical or horizontal lifting, the PMI needs to add the necessary identifier to the order.

1.4.4 Shipping and Receiving

1.4.4.1 Handling Restrictions

- *Forklift Restrictions:* Never lift the gantry using a forklift under the gantry frame.
- *Shock Restrictions:* The system cannot tolerate shock or vibration. System components cannot be tipped, dropped, or hoisted. The PMI shall communicate these restrictions to everyone involved with handling the system components.

- *Rolling on Surfaces:* System components shall be rolled across smooth surfaces (sidewalks, parking lots, tile flooring, etc.) only. If a smooth surface is not available (such as a sidewalk or driveway with cracks or uneven joints, or across a tiled floor with deep or rough joint lines), then floor protection shall be used to move the system across the uneven surface.
- *Shipping Crate/Packaging Integrity:* Do not damage or puncture the shipping crate or packaging.

1.4.4.2 Floor Protection

To protect the floor during delivery, floor protection shall be used along the entire delivery path and throughout the scan suite, where necessary.

1.4.4.3 Door Threshold Protection

The customer is responsible for removing or protecting any doorway threshold (if one exists), in order to move the scanner subsystems in and out of the room.

1.4.4.4 Floor Load Along Delivery Route

The buyer or buyer's Structural Engineer of record is responsible for making sure the floor material and design along the delivery route (loading dock, halls and rooms) meets the forces and weight requirements for the delivery of the individual subsystems to the final installation location within the facility.

1.4.4.5 Dollies

- U.S. Installations – Shipments within the United States typically involve the use of dollies (pre-installed on the gantry sections and table) for moving the gantry sections and table to the can suite and lean carts and pallets for other parts. After completing the installation, return all dollies, the gantry shipping cage, and lean carts to UMI using the shipping document found in Box #1. http://www.umi-dollyshop.com. Pallets are not re-usable.
- Zero Clearance Dollies (Mini) (For CT Gantrys only) – Deliveries involving small elevators with a depth of at least 2692 mm (106 in.) require zero clearance dollies. Zero clearance dollies allow movement of the gantry in tight areas; avoid using them for normal dock or van deliveries. To order zero clearance dollies, go to: http://www.umi-dollyshop.com.
- Tilting Dollies (for Patient Table) – Deliveries involving small elevators with a depth of at least 2438 mm (96 in.) require tilting dollies. If storing the patient table prior to installation, do not order tilting dollies as there is a limited number of dollies available. If you are unable to obtain tilting dollies, substitute riggers in place of the dollies to deliver the table. To order tilting dollies for the patient table, go to: http://www.umi-dollyshop.com.
- Installations Outside U.S. – For shipments outside the United States, customers may purchase dollies at: http://www.umi-dollyshop.com. DO NOT return dollies or the gantry shipping cage to the U.S. Instead, forward dollies and cage to the local GE office or warehouse. The gantry sections and table subsystems are shipped with dollies attached placed on a pallet for transport. Pallets are not re-usable.

1.4.4.6 Delivery Temperature and Humidity Tolerance

NOTICE

Failure to adhere to temperature requirements during delivery and storage will likely result in equipment damage.

Avoid extreme temperatures during system transportation and delivery.

When transporting the system, all packing material shall remain intact. Prevent extended exposure of the system (maximum two weeks) to temperatures or humidity outside of the following specifications:

- Temperature: -25° to +50° C (-13° to +122° F), inclusive
- Humidity: 10% to 90%, inclusive

After delivery to the scan suite and before unpacking any system components, allow 12 hours for the equipment to adjust to room temperature. This 12 hour warm up period is not required if the shipping environment meets the same temperature and humidity requirement as the Scan Room and the system components are already at steady room temperature.

1.4.4.7 Unpacking System

Do not remove any protective wrapper or packaging from any system component until all construction is complete and all construction dust is removed from the installation site.

Retain the packaging surrounding the scanner desktop and UPS.

Do not remove the Console or Q.Core/PARC4.X from their shipping skids until after they have been delivered to the CT equipment room.

1.4.5 Temporary Storage

If storing a system prior to installation, the system shall be temporarily stored in its original packaging in a temperature and humidity controlled environment protected from water and dust. The temporary storage period must *not exceed six months*.

Table 4 Humidity and Ambient Temperatures for Storage*

Ambient temperature shall be maintained within a range of:	0 to +30° C (+32° to +86° F)
Maximum rate of change in the temperature shall be no greater than:	3°C (5.4°F) per hour
Relative humidity (non-condensing) shall be maintained within a range of:	up to 70% RH
Maximum rate of change in the relative humidity shall be no greater than:	5% RH per hour
* Delivery van/truck storage shall meet these same requirements.	

NOTICE

Temporary storage exceeding six months is not advised.

2 Equipment Requirements

2.1 System Components

2.1.1 Component Weight/Load, Dimensions, and Center of Gravity

Table 5 System Component Weight/Load

System Component	Net Weight kg (lbs)	Maximum Uplift Load N (lb)	Maximum Compressive load N (lb)	Load Pattern mm (in.)	Normal Method of Mounting mm (in.) (GE-supplied[1])
CT Gantry	1810 (3987)	0	5274 (1185)	Rectangular base plate 700 x 1966 (28 x 77) with four round pads, each 63.5 (2.5) in contact with floor. Individual pad loadings are 941 lb., 959 lb., 1035 lb., and 1055 lb.	Hilti Kwik-Bolt II 12.7 mm (1/2 in.) diameter by 203 mm (8 in.) long per P/N 2106573 at four leveling pads into the concrete floor.
PET Gantry (25 cm FOV) (Aluminium gantry*)	1840 (4057)	0	5106 (1046)	While in the imaging position, the effective PET load area is 398 x 645 (15.7 x 25.4) with 7 pads each 63.5 (2.5) as well as 2 pads that do not get anchored (support only)	Hilti Kwik-Bolt II 12.7mm (1/2 in.) diameter by 8 in. (203mm) long per P/N 2106573 at seven leveling pads into concrete floor.
PET Gantry (25 cm FOV) (Weldment gantry)	1400 (3086)	0	5106 (1046)	While in the imaging position, the effective PET load area is 398 x 645 (15.7 x 25.4) with 7 pads each 63.5 (2.5)	Hilti Kwik-Bolt II 12.7mm (1/2 in.) diameter by 8 in. (203mm) long per P/N 2106573 at seven leveling pads into concrete floor.
PET Gantry (25 cm FOV) (Weldment gantry with detachable base)	1250 (2755)	0	5106 (1046)	While in the imaging position, the effective PET load area is 398 x 645 (15.7 x 25.4) with 4 pads each 63.5 (2.5)	Hilti Kwik-Bolt II 12.7mm (1/2 in.) diameter by 8 in. (203mm) long per P/N 2106573 at four leveling pads into concrete floor.
Patient Table	1049 (2308) Includes 227 (500) Patient	890 (200)	4926 (1107)	Rectangular base 550 x 2134 (21.7 x 84.0) with 6 round pads, each 63.5 (2.5) in contact with the floor.	Hilti Kwik-Bolt II 12.7mm (1/2 in.) diameter per 8 in. (203 mm) long per P/N 2106573 at four leveling pads into concrete floor.

System Component Weight/Load continued					
System Component	**Net Weight kg (lbs)**	**Maximum Uplift Load N (lb)**	**Maximum Compressive load N (lb)**	**Load Pattern mm (in.)**	**Normal Method of Mounting mm (in.) (GE-supplied[1])**
Power Distribution Unit (PDU)	370 (813)	0	1070 (240)	Four Casters support area of 700 x 550 (27.6 x 21.7).	Casters are for positioning and service. **See Note 2.**
Q.Core	87 (192)	0			
PARC4.X Tall Cabinet	246 (540)	0	737 (166)	Rectangular base with four castors.	Casters are for positioning and service. **See Note 2.**
PARC4.X Mini Cabinet	182.2 (401.7)	0	527 (118.5)	Rectangular base with four castors.	Casters are for positioning and service. **See Note 2**.
Compact PARC4.X	165 (364)	0	737 (166)	Rectangular base with four castors.	Casters are for positioning and service. **See Note 2**.
Open Q.Core	61 (134)	0	287.5 (64.6)	Rectangular base with four castors.	
Op Console Computer (NIO16)	72 (159)		318 (71)		
Op Console Computer (Open OC16)	61 (134)		287.5 (64.6)		
Monitor - LCD (each)	10 (22)				
Workspace Table 5486188-10 (with 2 monitors)	70 (154)				
Optional Components					
Universal Power Supply (UPS)	281 (619)	0	689 (155)	Rectangular base 305 x 813 (22 x 32) with four castors, each in contact with the floor.	Casters are for positioning. Set on floor. Adjust the six leveling pads on the floor.

System Component Weight/Load continued					
System Component	**Net Weight kg (lbs)**	**Maximum Uplift Load N (lb)**	**Maximum Compressive load N (lb)**	**Load Pattern mm (in.)**	**Normal Method of Mounting mm (in.) (GE-supplied[1])**
Annulus Phantom Safe	149 (330)	0		Rectangular base 406 x 406 (16 x 16) with four castors, each in contact with the floor.	Casters are for moving safe and can be locked to prevent motion.

Notes:

1.) Use the GE-supplied mounting hardware only if anchoring the system to 127 mm (5 in.) concrete floors.

2.) Seismic angle brackets are included and shipped with the PDU and Tall Cabinet PARC4.X/Compact PARC4.X. For Mini Cabinet order seismic bracket kit separtely: **P/N B7919WP**

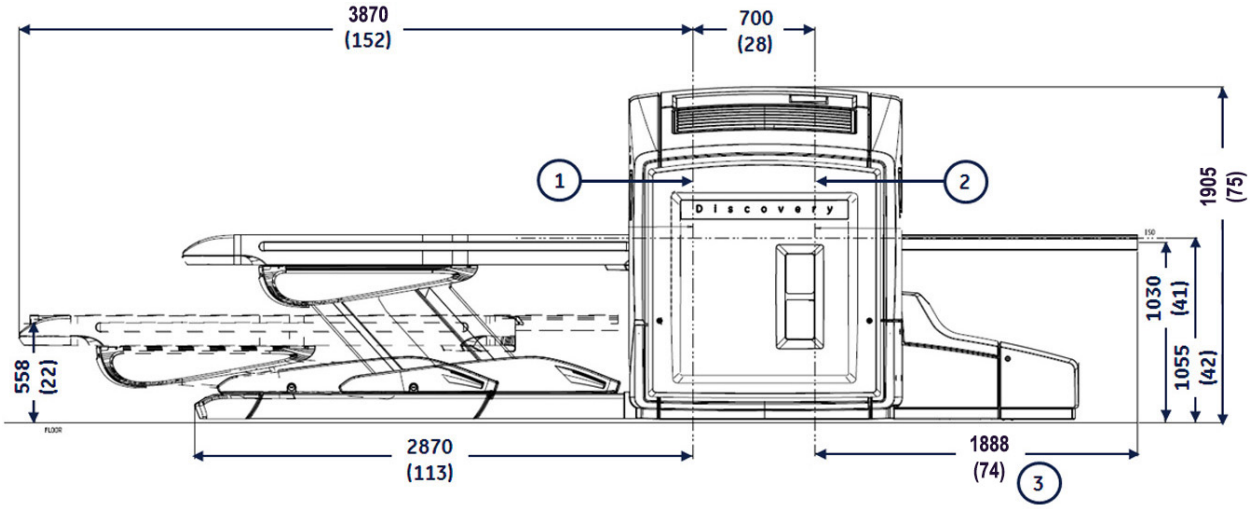
3.) Aluminium Gantry is available in Installed Base only, not shipped after December 2018.

Table 6 System Component Dimensions

System Component	A	B	C
	Width mm (in.)	**Depth mm (in.)**	**Height mm (in.)**
PET-CT Gantry (overall) without Trailer	2235 (88)	2120 (83)	1905 (75)
Table (at max elevation; 1" [25 mm] below Gantry ISO center)	660 (26)	3454 (136)	1067 (42)
Power Distribution Unit (PDU)	700 (27.6)	550 (21.7)	1062 (41.8)
Q.Core	470 (19)	740 (29)	655 (26)
Open Q.core/Op OC	400 (15.7)	616 (24.2)	576 (22.6)
PARC4.X Reconstruction Tall Cabinet	614 (24.1)	1358 (53.4)	1420 (55.9)
PARC4.X Reconstruction Mini Cabinet	622 (24.5)	1163 (45.8)	801 (31.5)
Compact PARC4.X	620 (24.2)	1200 (47.2)	810 (31.9)
Operator Console Computer	470 (19)	740 (29)	655 (26)
Workspace Table 5486188-10 (adjustable height)	1486 (58.5)	902 (35.5)	688-1139 (27.1-44.8)
UPS (Optional)	305 (12)	813 (32)	1219 (48)
Service Storage Cabinet (Optional)	914 (36)	610 (24)	1067 (42)
Annulus Phantom Safe	406 (16)	406 (16)	665 (26.2)

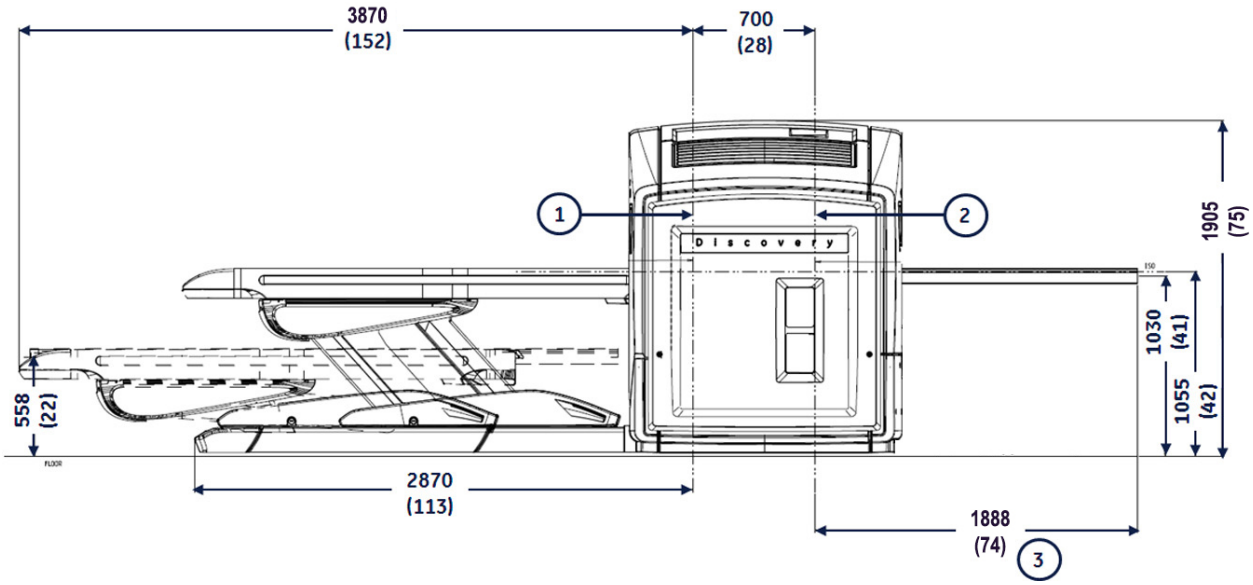
2.1.2 System Component Diagrams

Figure 12 Gantry and Table Dimensions



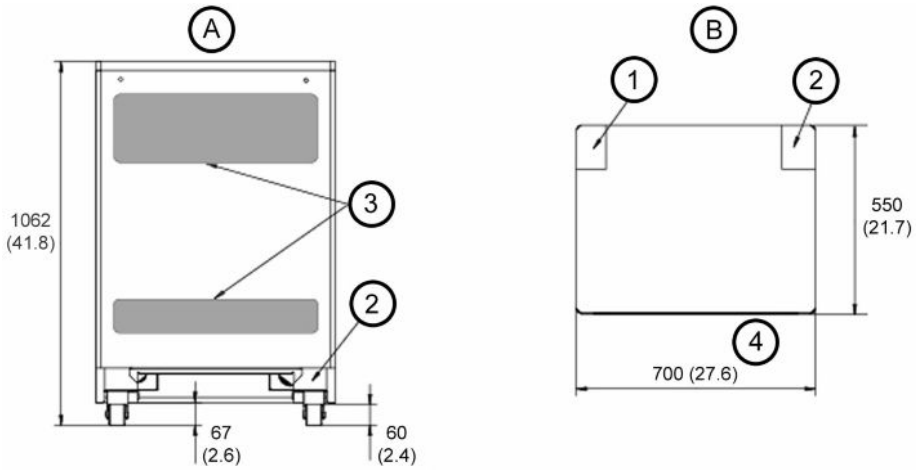
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	CT scan plane centerline
2	PET primary scan plane centerline
3	With Head Extender

Figure 13 Gantry and Table Dimensions (Weldment Gantry with Detachable Base)



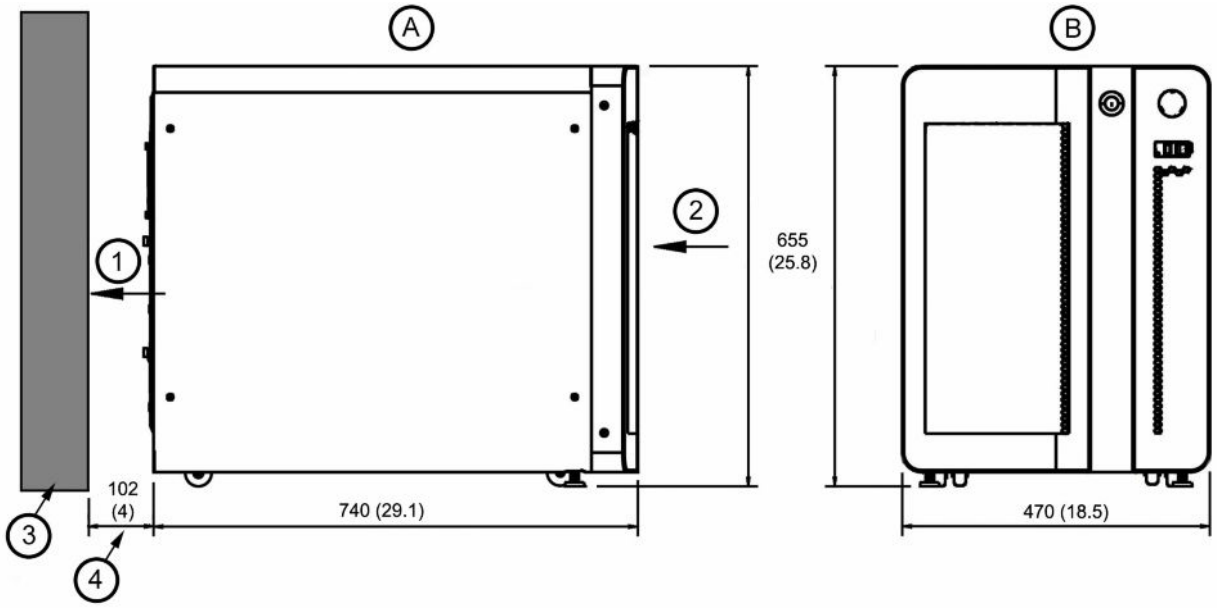
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	CT scan plane centerline
2	PET primary scan plane centerline
3	With Head Extender

Figure 14 Power Distribution Unit (PDU) Dimensions



All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Rear View	1	I/O Connections Panel
B	Top View	2	AC Power Input Box
		3	Rear vent access
		4	Front

Figure 15 Q.Core and Operator Console Computer Dimensions (NI016)



All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Side View	1	Air out
B	Front View	2	Air in
		3	Wall
		4	Clearance (minimum)

Figure 16 Open Q.Core and Operator Console Computer (Open OC16) Dimensions

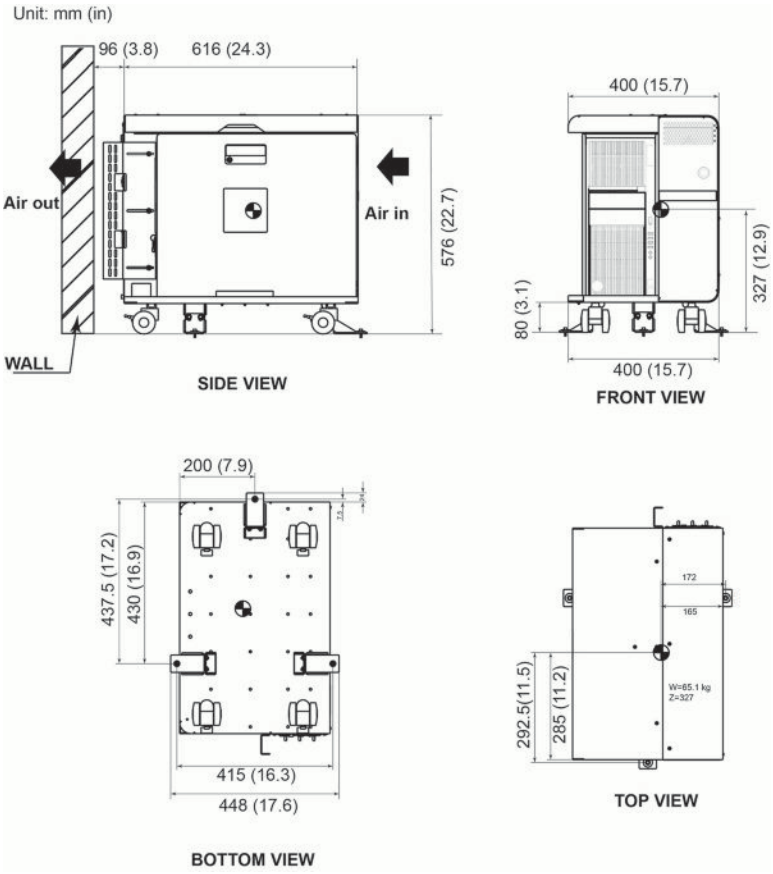
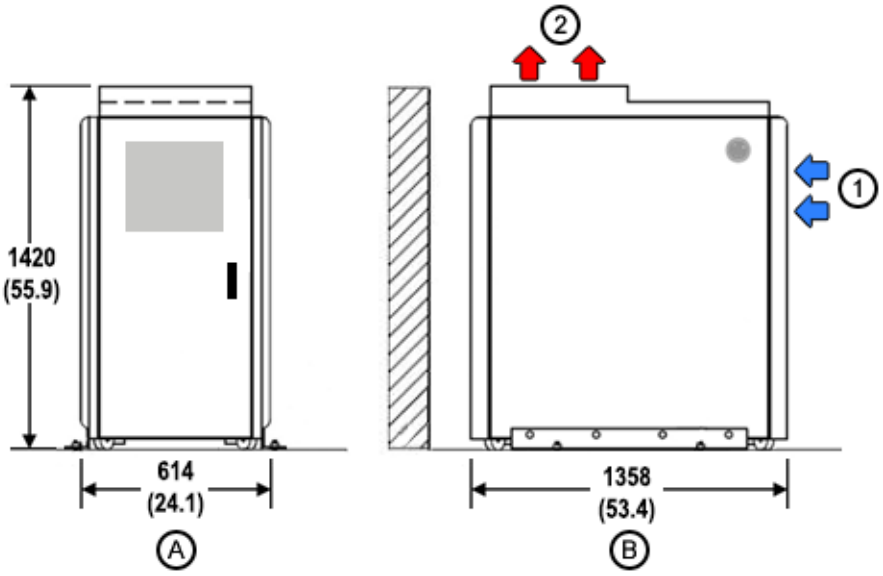
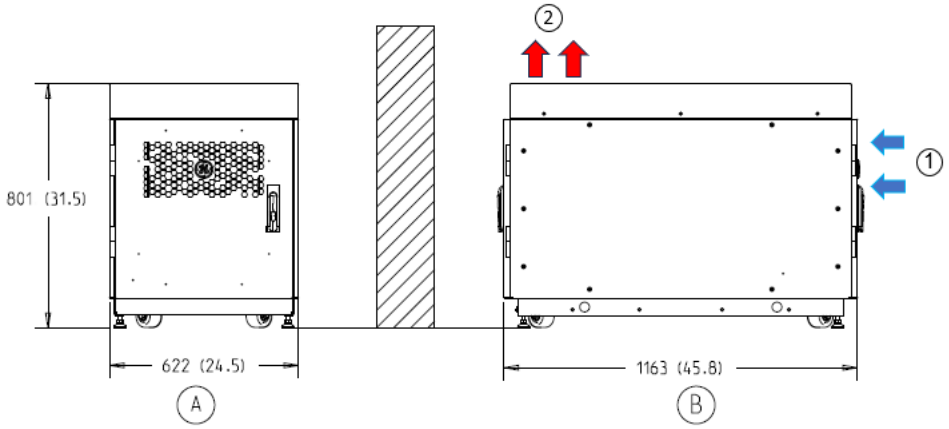


Figure 17 PARC4.X Reconstruction Tall Cabinet Dimensions



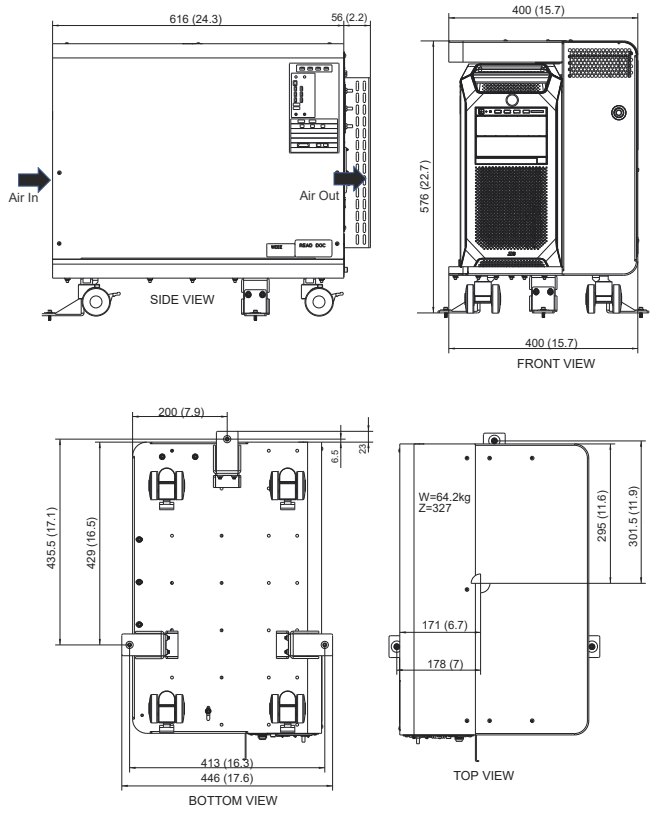
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Air in (front of cabinet)
B	Side View	2	Air out (top of cabinet)

Figure 18 PARC4.X Reconstruction Mini Cabinet Dimensions



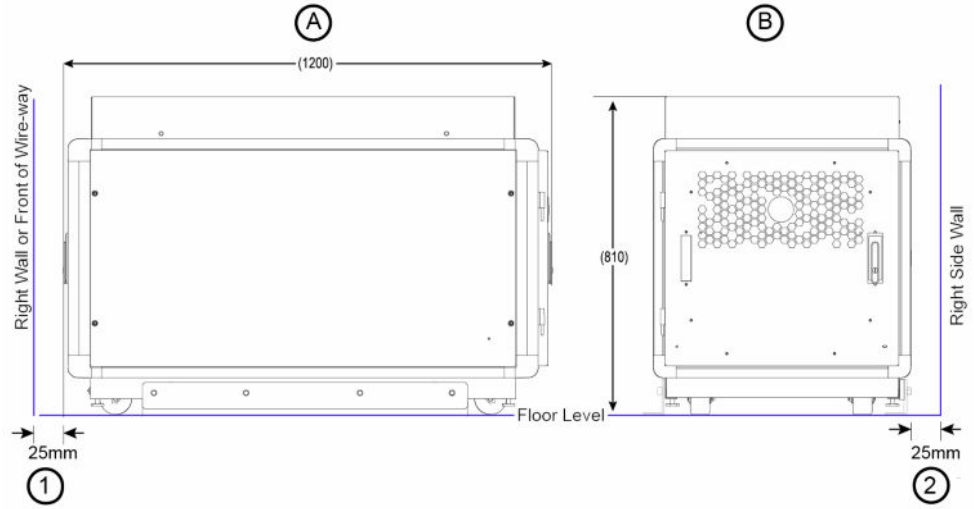
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Air in (front of cabinet)
B	Side View	2	Air out (top of cabinet)

Figure 19 Open Console with Z8G4 Dimensions



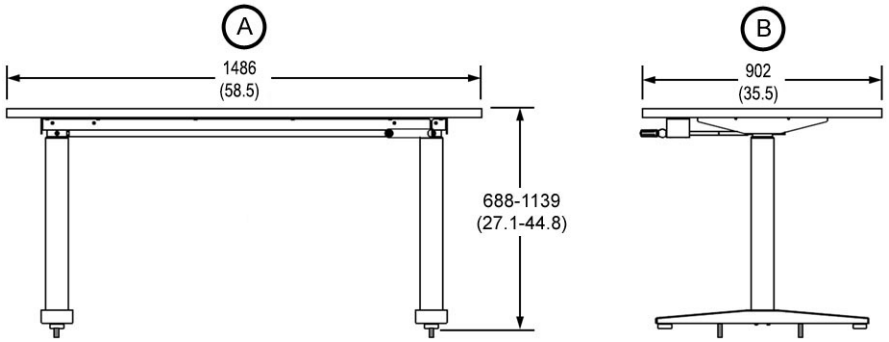
Description	Width	Depth	Height	Weight
Open Console with Z8G4	400 mm (15.7 in)	672 mm (26.5 in)	576 mm (22.7 in)	64.2 kg (142 lb) (w/o package) 90.5 kg (199.5 lb) (with package)

Figure 20 Compact PARC4.X Reconstruction Cabinet Dimensions



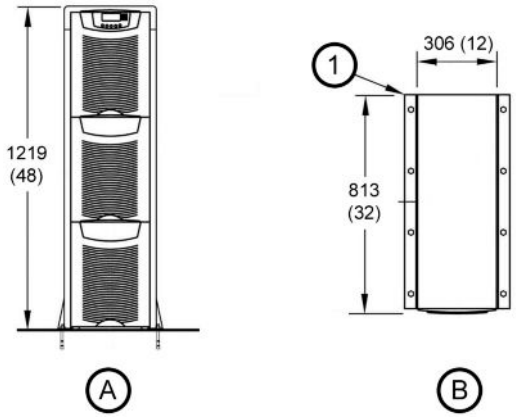
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1 & 2	Clearances
B	Side View		

Figure 21 Workspace Table Dimensions (5168666-10)



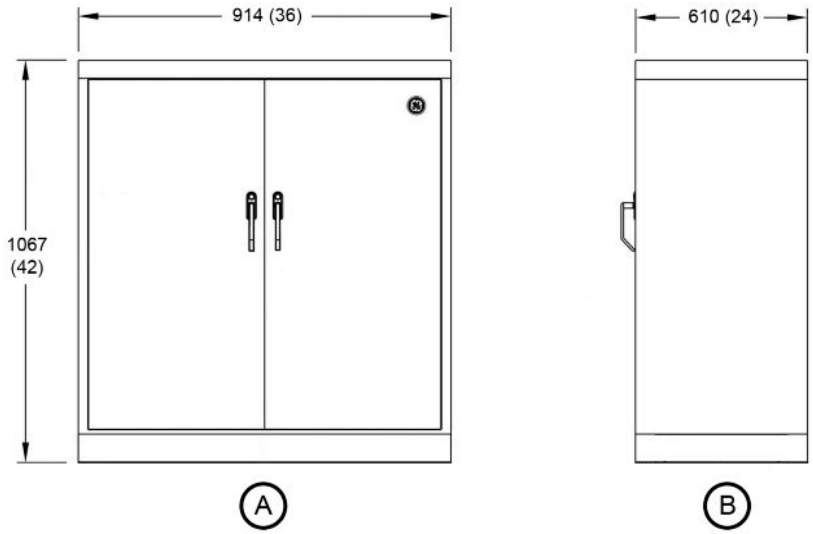
All dimensions are in millimeters; bracketed dimensions are in inches.	
A	Front View
B	Side View

Figure 22 Uninterruptible Power Supply (UPS) Dimensions (Optional)



All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Pre-manufactured mounting bracket (by GE)
B	Top View		

Figure 23 Service Storage Cabinet Dimensions (Optional)

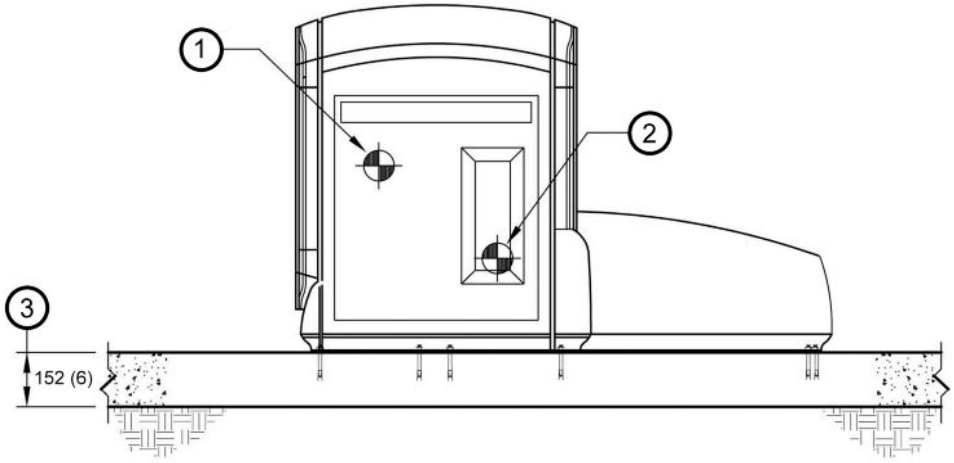


All dimensions are in millimeters; bracketed dimensions are in inches.	
A	Front View
B	Side View

2.1.3 System Component Center-of-Gravity Diagrams

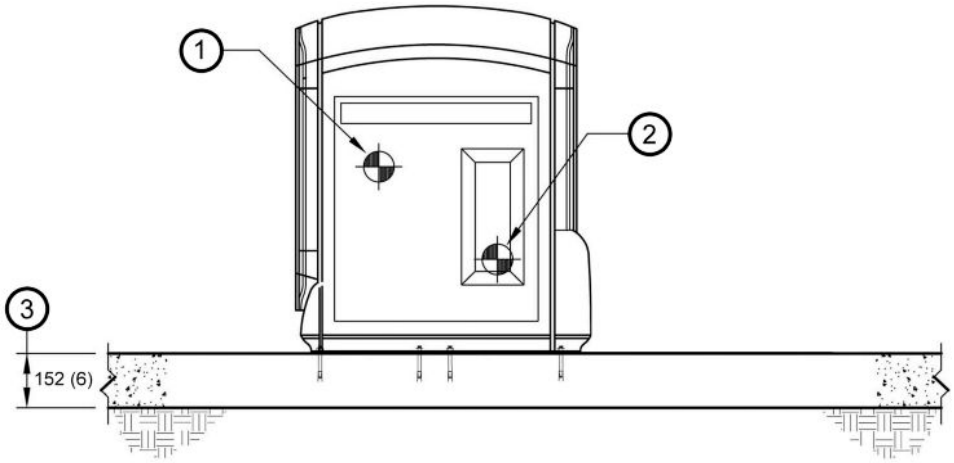
Refer to Figure 24 on page 36 through Figure 40 on page 46 for the individual system component center-of-gravity dimensions for the PET/CT system.

Figure 24 CT/PET Gantry Center-of-Gravity (Side View)



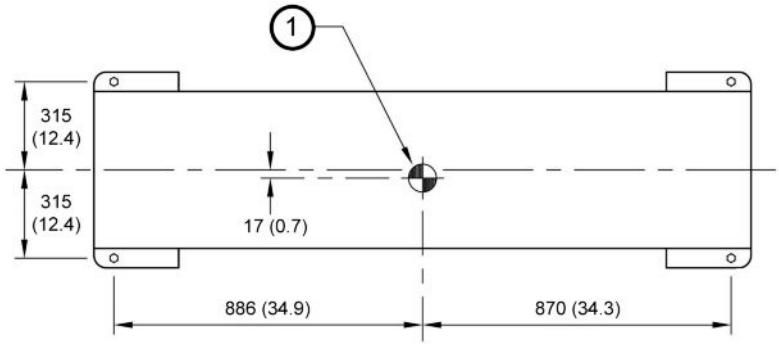
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Center of gravity for CT Gantry (also see Figure 26 on page 37)
2	Center of gravity for PET Gantry (also see Figure 27 on page 38)
3	Minimum thickness

Figure 25 CT/PET Gantry Center-of-Gravity (Side View) (Weldment Gantry with Detachable Base)



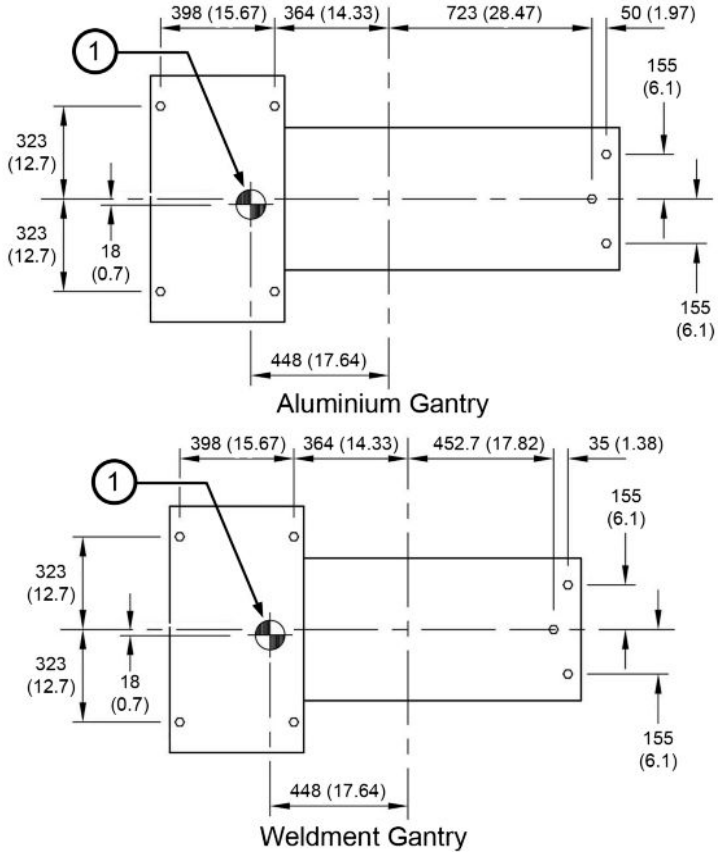
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Center of gravity for CT Gantry (also see Figure 26 on page 37)
2	Center of gravity for PET Gantry (also see Figure 28 on page 39)
3	Minimum thickness

Figure 26 CT Gantry Center-of-Gravity (Top View – Plan at Base)



All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Center of gravity weight = 1810 kg (3987 lb); Y = 913 mm (35.9 in.)

Figure 27 25 cm FOV PET Gantry Center-of-Gravity (Top View – Plan at Base)

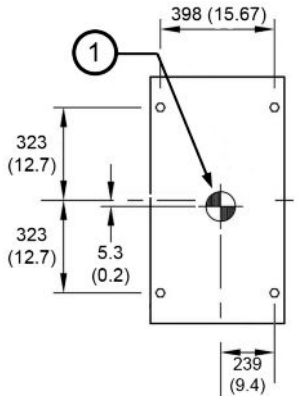


NOTE

Aluminium Gantry is available in Installed Base only, not shipped after December 2018.

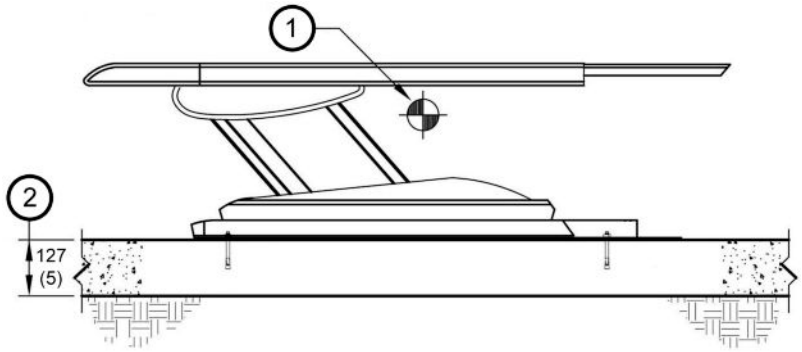
All dimensions are in millimeters; bracketed dimensions are in inches.			
1	Aluminium Gantry	Center of gravity weight; Y = Height	
		25 cm FOV = 1840 kg (4057 lb); Y = 565 mm (22.2 in.) 20 cm FOV = 1790 kg (3946 lb); Y = 551mm (21.7In)	15 cm FOV = 1765 kg (3891 lb); Y = 544mm (21.4In) 10 cm FOV = 1740 kg (3836 lb); Y = 537mm (21.1In)
2	Weldment Gantry	Center of gravity weight; Y = Height	
		25 cm FOV = 1400 kg (3086 lb); Y = 565 mm (22.2 in.) 20 cm FOV = 1380 kg (3042 lb); Y = 551mm (21.7In)	15 cm FOV = 1360 kg (2998 lb); Y = 544mm (21.4In) 10 cm FOV = 1340 kg (2954 lb); Y = 537mm (21.1In)

Figure 28 25 cm FOV PET Gantry Center-of-Gravity (Top View – Plan at Base) (Weldment Gantry with Detachable Base)



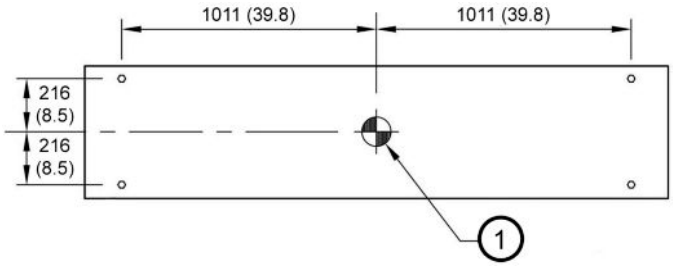
All dimensions are in millimeters; bracketed dimensions are in inches.			
1	Center of gravity weight; Y = 700 (27.5)		
	25 cm FOV: 1108 kg (2443 lb)	20 cm FOV: NA	15 cm FOV: NA

Figure 29 Patient Table Center-of-Gravity (Side View)



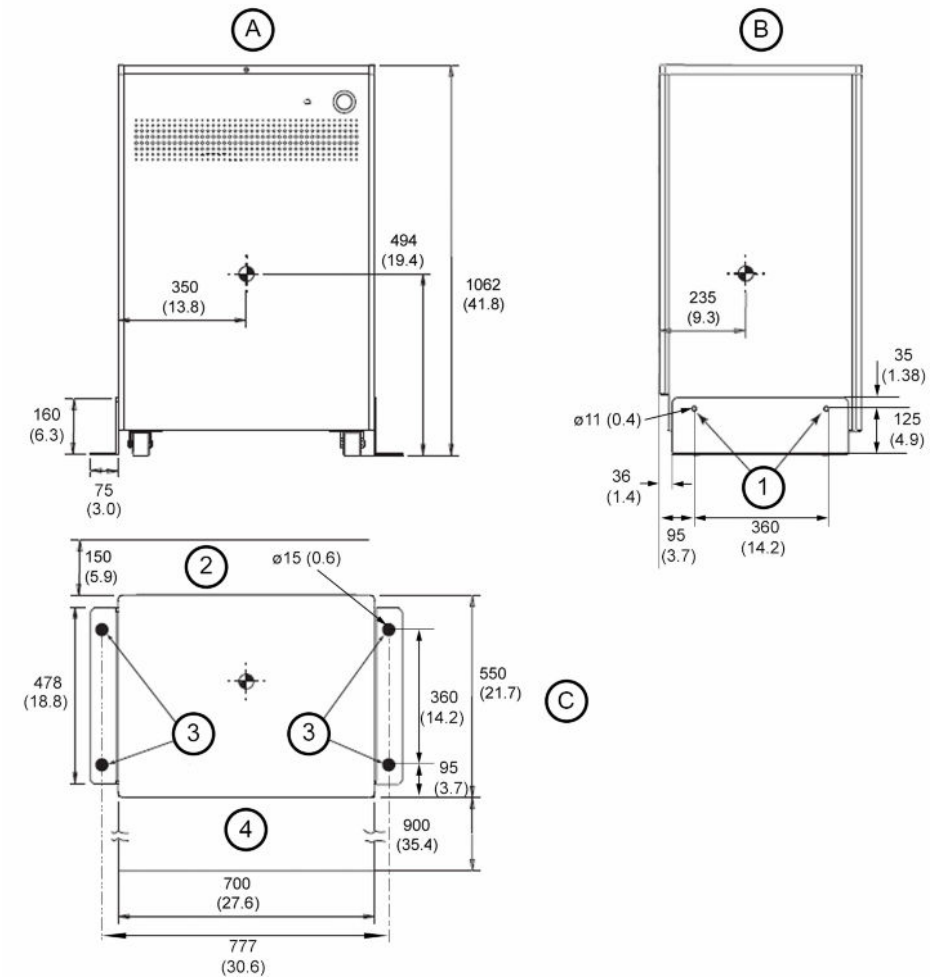
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Center of gravity weight = 1049 kg (2308 lb); includes 227 kg (500 lb) patient
2	Minimum thickness

Figure 30 Patient Table Center-of-Gravity (Top View – Plan at Base)



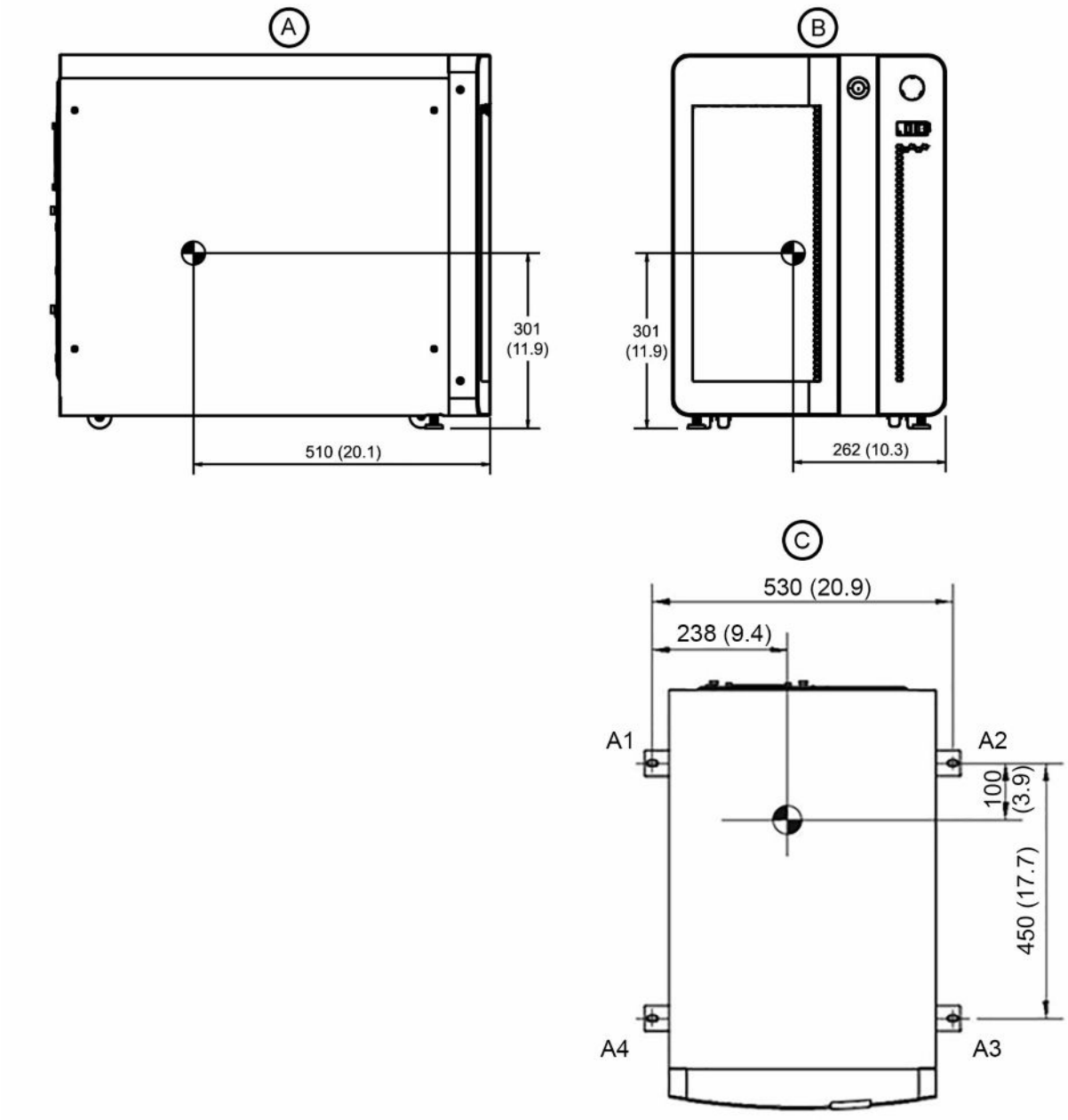
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Center of gravity weight = 1049 kg (2308 lb); includes 227 kg (500 lb) patient. Y (height) = 541 mm (21.3 in.)

Figure 31 Power Distribution Unit Center-of-Gravity (NGPDU)



All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Seismic mounting holes; 11 mm (0.4 in.)
B	Side View	2	Minimum air flow clearance
C	Top View	3	Seismic floor mounting holes; 15 mm (0.6 in.)
		4	Clearance (minimum)

Figure 32 Q.Core and Operator Console Computer (NIO16) Center-of-Gravity



All dimensions are in millimeters; bracketed dimensions are in inches.	
A	Side View
B	Front View
C	Top View

Figure 33 Open Q.core and Open Console (Open OC16) Center-of-Gravity

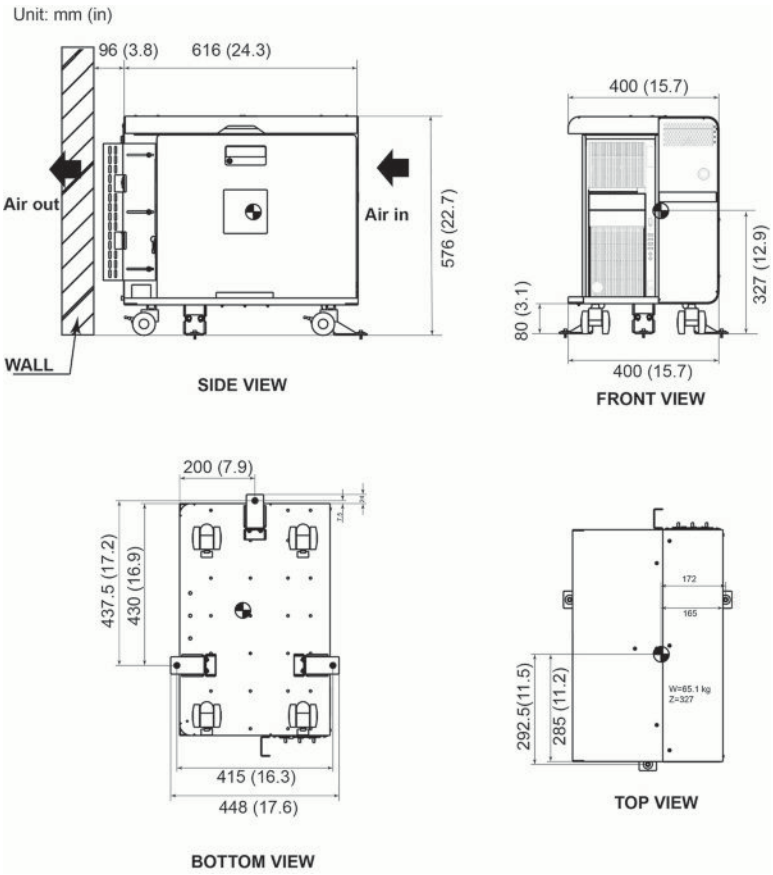


Figure 34 OpenOC16 with Z8G4 Console Center-of-Gravity

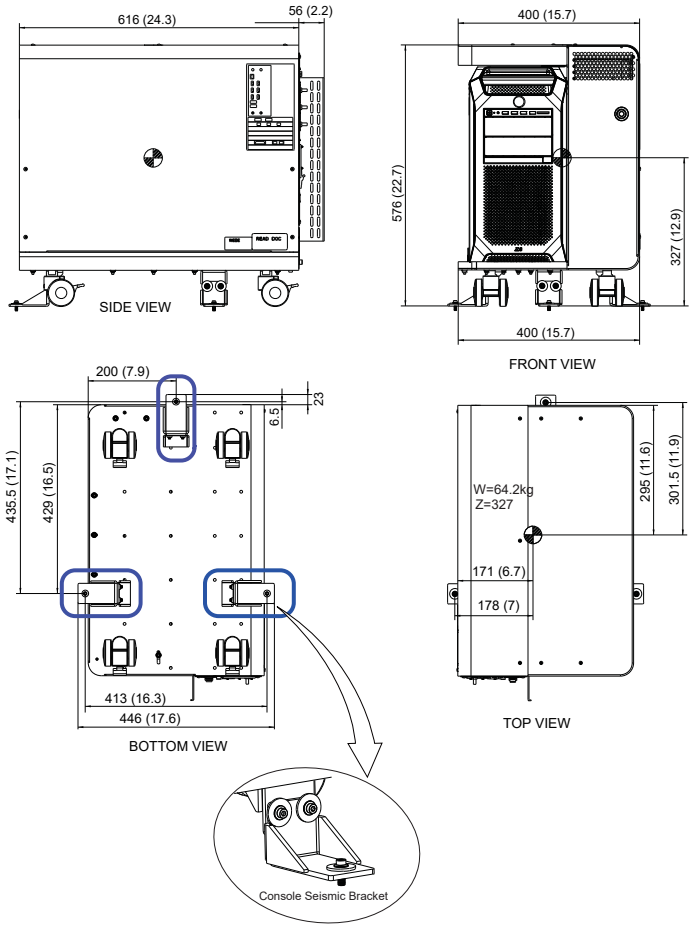
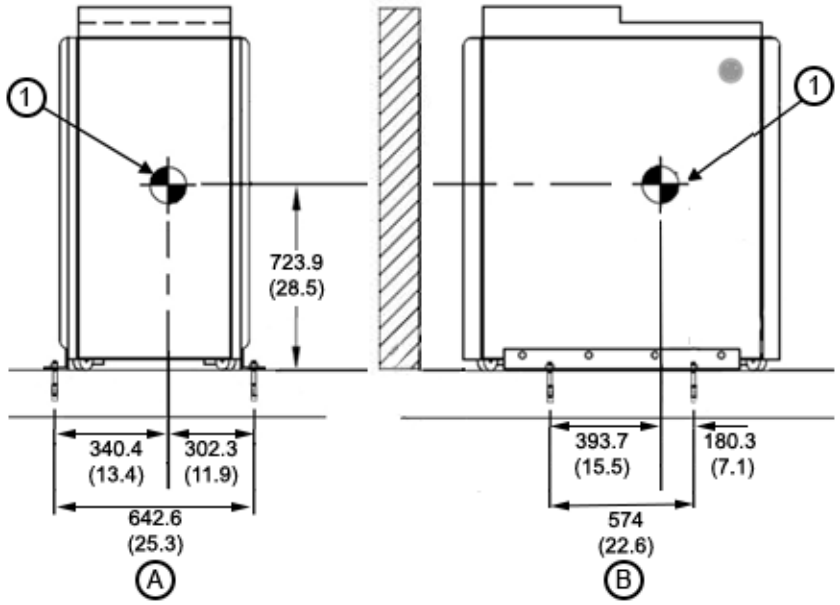
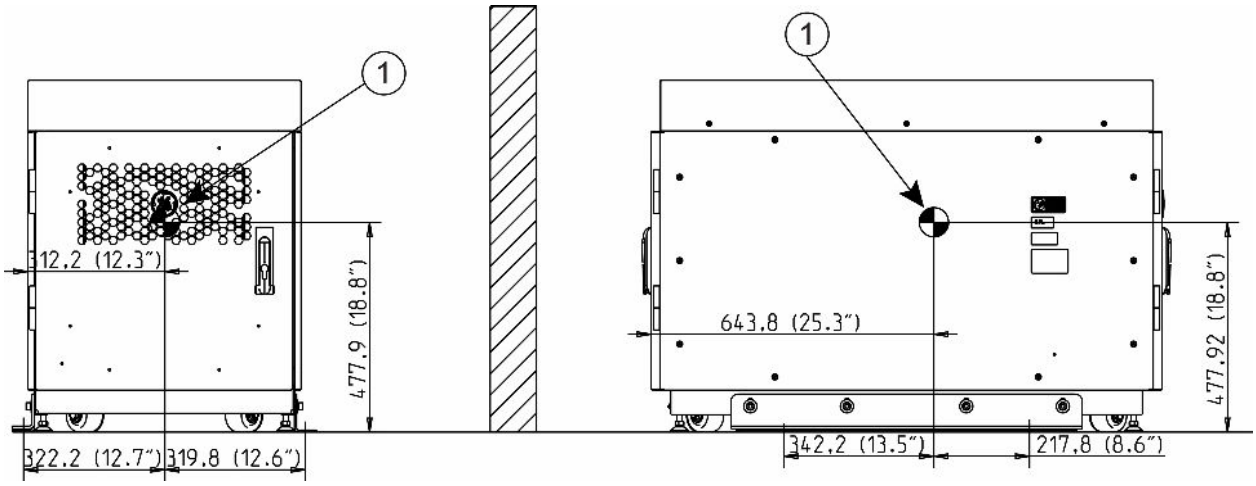


Figure 35 PARC4.X Reconstruction Tall Cabinet Center-of-Gravity



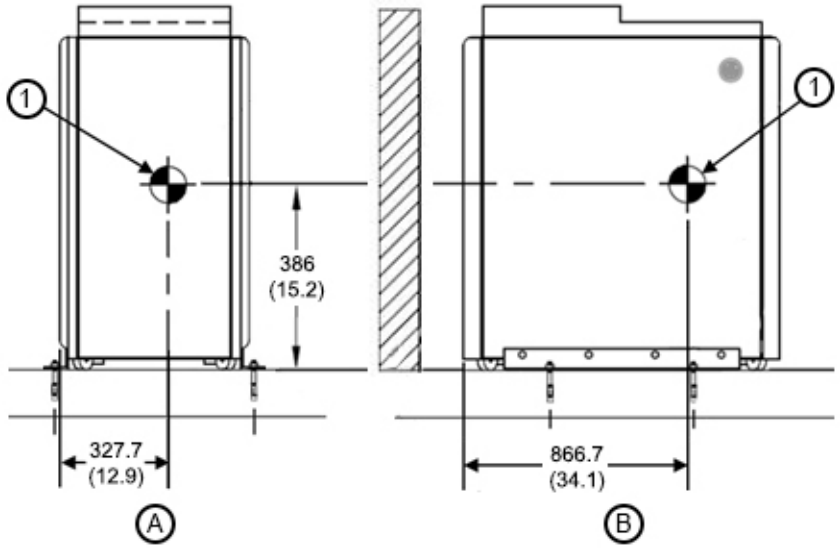
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Center of gravity weight = 246 kg (540 lb)
B	Side View		

Figure 36 PARC4.X Reconstruction Mini Cabinet Center-of-Gravity



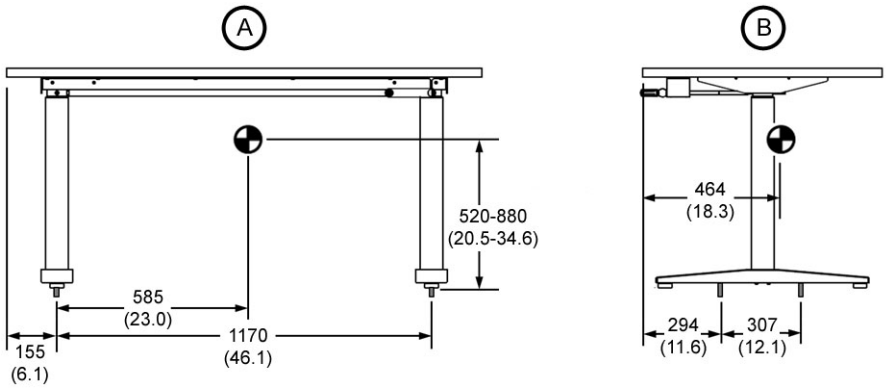
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Center of gravity weight = 182.2 kg (402 lb)
B	Side View		

Figure 37 Compact PARC4.X Reconstruction Cabinet Center-of-Gravity



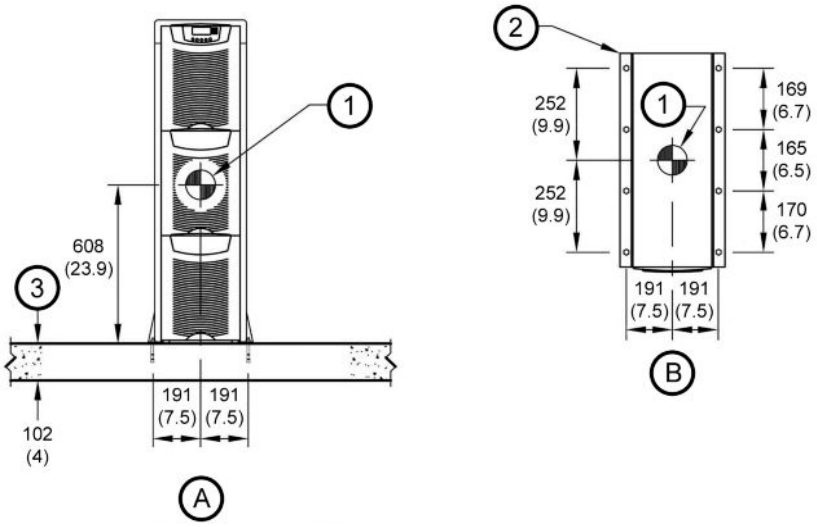
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Center of gravity weight = 165 kg (364 lb)
B	Side View		

Figure 38 Workspace Table (5486188-10) Center-of-Gravity



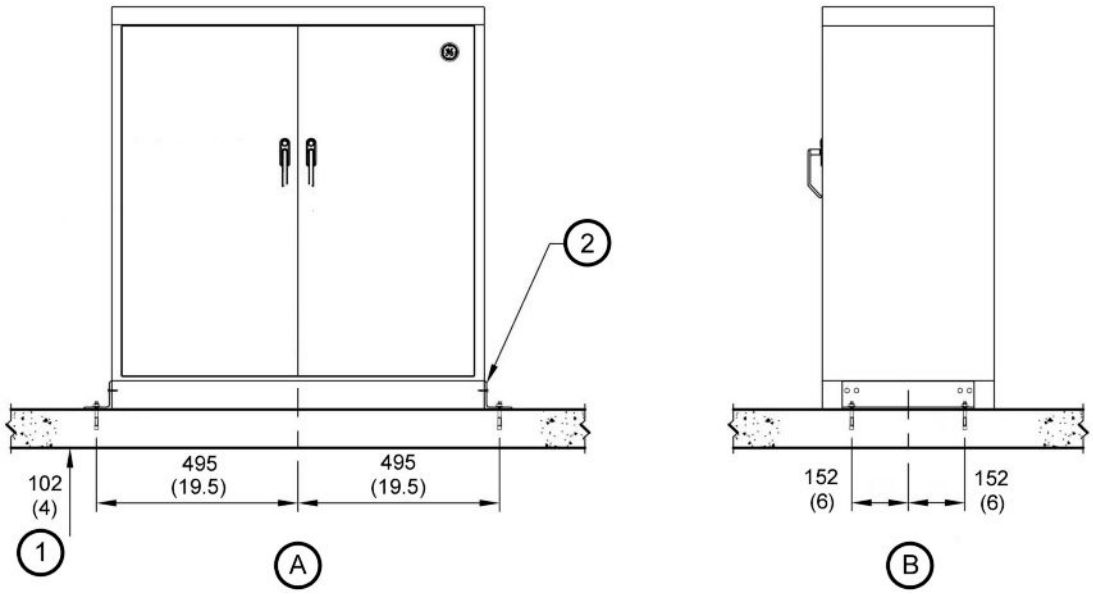
All dimensions are in millimeters; bracketed dimensions are in inches.	
A	Front View
B	Side View
Note: Center of gravity weight = 63.5 kg (139 lb). Y (typical) = 580 mm (22.8 in.) for table height of 765 mm (30 in.)	

Figure 39 Uninterruptible Power Supply (UPS) Center-of-Gravity (Optional)



All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Center of gravity weight = 281 kg (619 lb)
B	Top View (plan at base)	2	Pre-manufactured mounting bracket (by GE)
		3	Minimum thickness

Figure 40 Storage Cabinet (Optional)



All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Minimum thickness

B	Side View	2	L 3" x 3" x 1/4" x 14" bracket mounted to cabinet frame with 4 - #12 S.M. screws (each side)
Note: The Center of Gravity for the optional Storage Cabinet is site specific. It depends on the weight and location of items placed in the cabinet.			

2.2 Room Layout

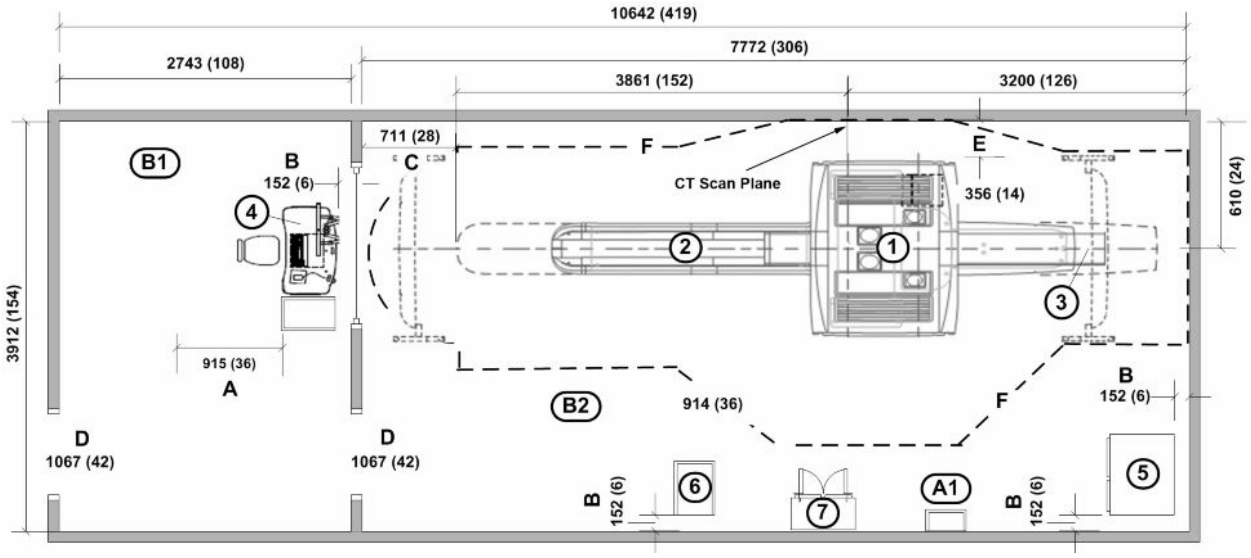
2.2.1 Scan Suite Configuration

A scan suite, which includes a control room and a scan room, requires a minimum room size to safely support all PET/CT service activities. An example of a typical system configuration is detailed in Figure 42 on page 48and Figure 41 on page 47 .

NOTICE

The illustration 1 and illustration 2 defines the minimum area required to enable installation, operation and service of the system in safe conditions. These do not take into account local requirements. If local requirements are stricter, they must be followed. See Regulatory Requirements. There is no option for permanent objects around the CT (i.e. wall ducts, sink, cabinet, etc.).

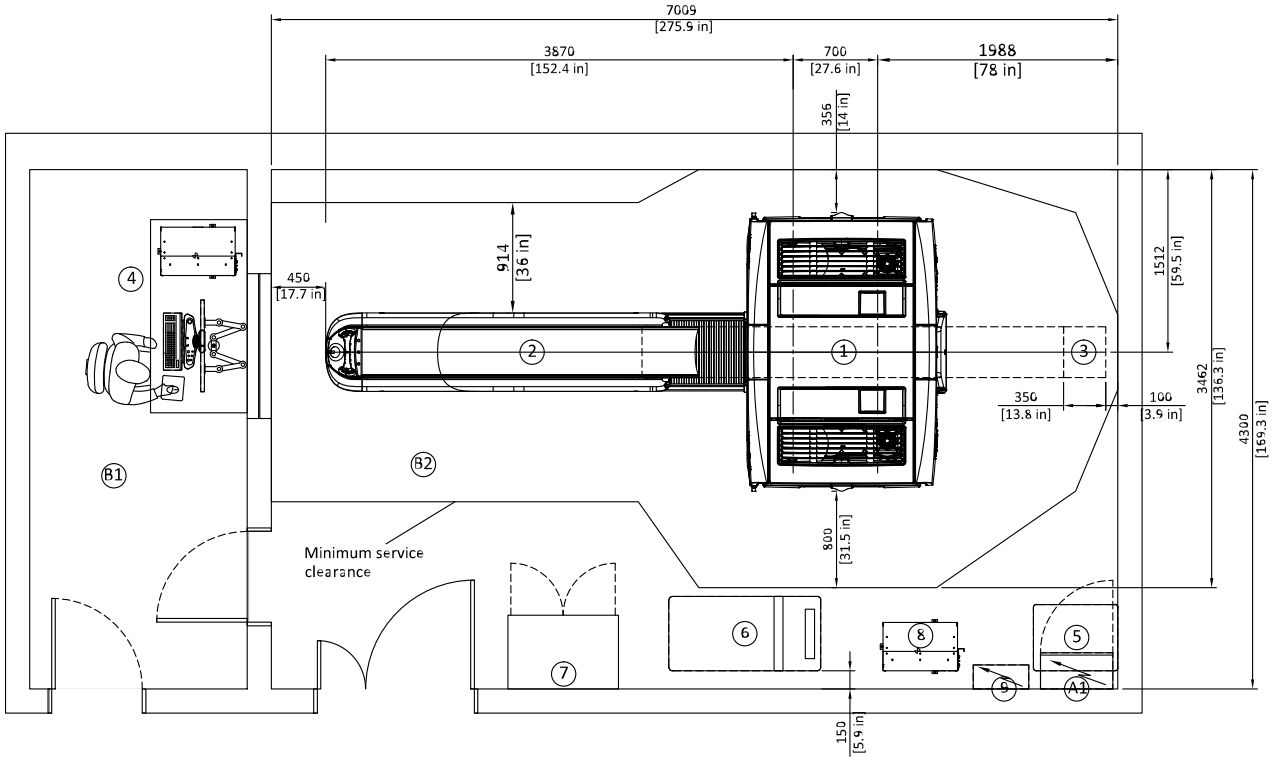
Figure 41 Typical Scan Suite Layout Configuration



All dimensions are in millimeters (mm) and inches (in.).			
A1	Mains Disconnect	3	Cradle Extender

B1	Control Room	4	Scanner Desktop/Computer
B2	Scan Room	5	Power Distribution Unit (PDU)
1	Gantry	6	Q.Core or PARC4.X
2	Table	7	Service Cabinet (option)
A	NEC (Powered Service Clearance)		
B	NEC (Minimum Equipment Clearance)		
C	Safe Work space Egress		
D	Clear door opening sized for minimum clearance needed for installation and removal of subsystems only		
E	Small Room Dimension (gantry base without cover cannot be any closer to wall than this distance)		
F	Cover Management Clearance Envelope		

Figure 42 Typical Scan Suite Layout Configuration (Weldment Gantry with Detachable Base)



All dimensions are in millimeters (mm) and inches (in.).			
A1	Mains Disconnect	4	Scanner Desktop/Computer (NIO16/ Open OC 16)
B1	Control Room	5	Power Distribution Unit (PDU)

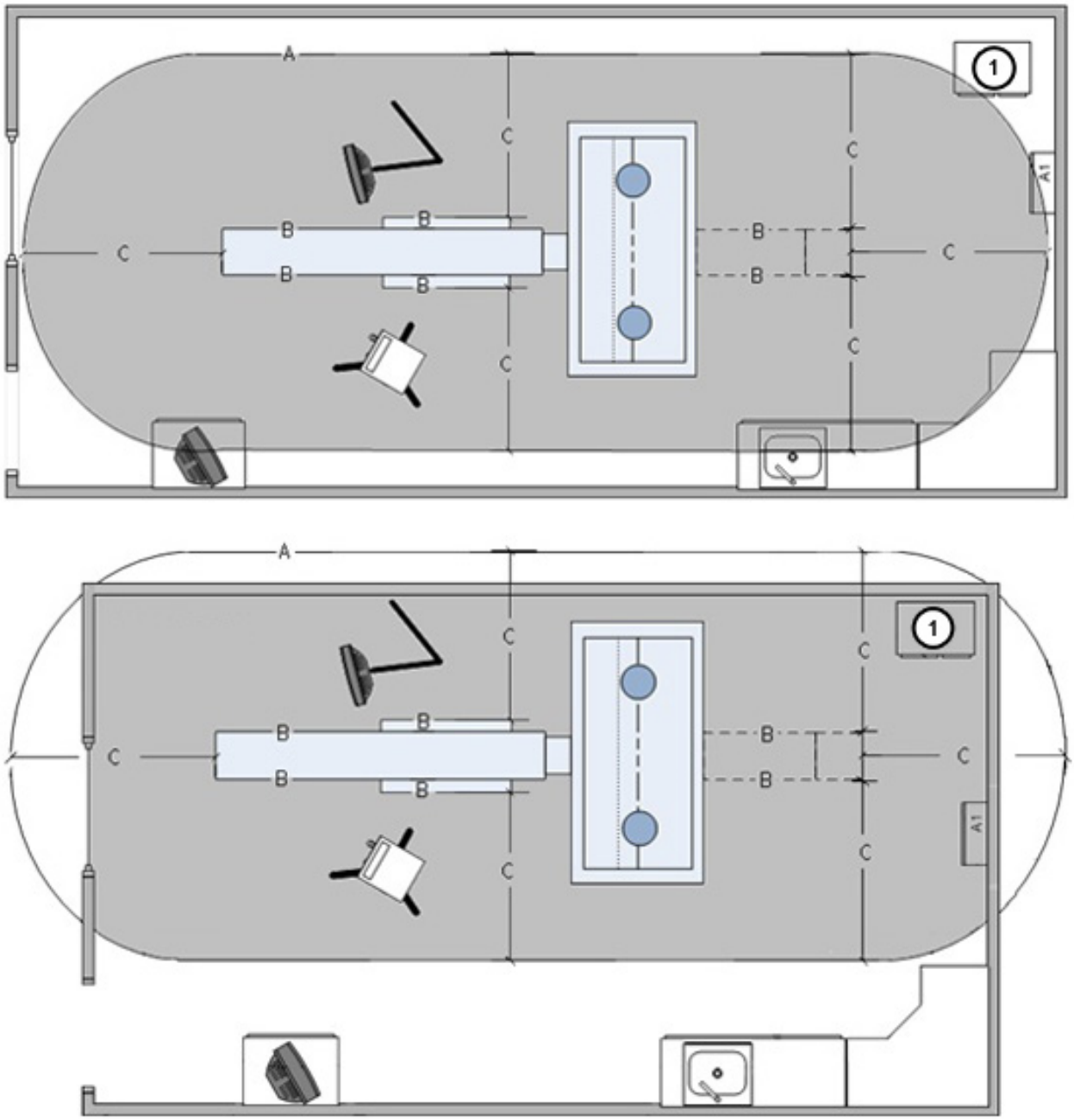
B2	Scan Room	6	PARC4.X Reconstruction Cabinet (Either Item 6 or item 8 is shipped)
1	Gantry	7	Service Cabinet (option)
2	Table	8	Q.core/Open Q.core (Either Item 6 or item 8 is shipped)
3	Cradle Extender	9	Power Distribution Box
* Defines the minimum area required to enable installation, operation and service of the system in safe conditions			
** Does not take into account local requirements. If local requirements are stricter, they should be followed. See Chapter 1, Regulatory Requirements.			
*** No option for permanent objects around the CT (i.e. wall ducts, sink, cabinet, etc.)			
**** 2m extender option adds 65cm to the table travel. Room clearance area should be considered accordingly.			
***** Equipment on casters (such as PARC4.X) can penetrate into the system service clearance area, as long as it's possible to clear this area from any equipment during service activity.			

The enclosure (Patient Touch) Leakage Envelope, as detailed in Figure 43 on page 50, defines a zone in the Scan Room only, where the enclosure leakage must be tested. Areas that fall outside of this envelope DO NOT need to be tested. The intent of this graphic is to provide the PMI with a view of potential electrical devices, plumbing fixtures, hospital gas outlets, and metal surfaces that may fall within this scan room envelope, which may require additional grounding prior to customer turnover.

NOTE

The enclosure leakage envelope has nothing to do with Regulatory Work Space Clearance or Safe Egress requirements for Service Personnel (NFPA 70E).

Figure 43 Leakage Envelope – Scan Room



1 = PDU, A = Patient Care Perimeter Envelope, B = Equipment Perimeter, C = Width and Height		
Reference	Dimension [C]	
—	Width	Height
IEC Ed 3	1829.0 mm (6.0 Ft.)	1829.0 mm (6.0 Ft.)

2.2.2 Minimum Scan Room Sizing

2.2.2.1 Scan Room Operational Space Requirement

For a minimum scan room layout, the customer should consider room workflow, patient care accessibility, critical-care equipment space requirements, and applicable local building codes. Refer to the dimensions detailed in Figure 42 on page 48, Figure 41 on page 47 and Figure 43 on page 50.

2.2.2.2 Scan Room Equipment Accessibility

Minimum scan room layout provides limited equipment accessibility on the left side of the gantry, particularly when loading patients or when positioning equipment between the gantry and wall. Refer to the dimensions detailed in Figure 42 on page 48, Figure 41 on page 47 and Figure 43 on page 50.

2.2.3 Minimum Control Room Sizing

2.2.3.1 Control Room Considerations and Requirements

The control room shall be suitably sized for the scanner desktop. Refer to the dimensions detailed in Figure 42 on page 48,Figure 41 on page 47 and Figure 43 on page 50. The control room should also provide a comfortable working environment for the operator. Refer to HVAC Requirements.

2.2.3.2 Autoinjector Control Placement

Provide a suitable work area for placement of the autoinjector control, within reach of the scanner desktop. Autoinjector controls vary in size, depending on the manufacturer. Refer to the manufacturer’s installation instructions.

2.2.4 Control Room Scanner Desktop Requirements

2.2.4.1 Scanner Desktop Configuration

The scanner desktop shall remain in the same configuration it was shipped. System components shall not be disassembled, removed, or rearranged.

Once the system is installed, do not relocate any system or operator components to a different counter, table, or location in the room.

2.2.4.2 Scanner Desktop Clearance

To ensure the exhaust fans located on the back of the scanner desktop vent without obstruction, maintain 152 mm (6 in.) of clear, unobstructed space along the sides of the desktop.

2.2.4.3 Scanner Desktop Power

No other electrical devices may be connected to the scanner desktop components. All other devices shall be connected to their own electrical outlet or power source.

2.2.4.4 Scanner Desktop Cables

Scanner desktop cables shall remain as shipped. Cables cannot be cut or lengthened to relocate the desktop monitor to a remote table or counter.

2.3 Hospital Equipment and Service Space Requirements

2.3.1 Clearances

2.3.1.1 Operational Clearances

Review operational clearances to verify daily use items will properly fit (beds, carts, wheelchairs, etc.).

2.3.1.2 Emergency Medical Equipment Clearances

Consider clearances for emergency medical equipment.

2.3.1.3 Replacement Parts and Service Equipment Space

Prior to the installation of the system, verify there will be adequate space in the scan room to receive and install all replacement parts and provide room for all service equipment that will be used during the installation.

X-ray Tube Box has W x L x H dimensions of 700mm x 1015mm x 737mm (27.5" x 39.88" x 29.00"), and room design should ensure adequate access to deliver the tube box to the right side of the CT Gantry.

2.3.1.4 Ceiling Height Requirements

The minimum ceiling height above the table and gantry shall measure at least 2286.0 mm (90.0 in.), within the entire service clearance area; or the minimum distance allowed by local laws and codes, whichever is greater, when measured from the floor to the finished ceiling.

2.3.2 Workplace Requirements

2.3.2.1 U.S. Code Requirements

The required service space, as noted in Figure 44 on page 55Figure 44 on page 55 and Figure 45 on page 56, has several conditions defined by the (U.S.) National Electrical Code (NEC). These conditions are defined by the wall type and accessibility/exposure to: electrical power panels, electrical outlets,

surface mounted conduits, plumbing, hospital gases, or surface ground points directly opposite exposed CT equipment.

Work space clearances apply to equipment operating at 600V or less, where examination, adjustment, servicing, and maintenance is likely to occur with live parts exposed. System servicing requires a space for one service engineer to accomplish all system component replacement tasks without the need of special tools or equipment.

There shall be sufficient working space in the scan room to allow adequate egress during service operations that require both front and rear cover removal. If the customer and PMI have any concern that the site will not provide adequate work space for egress under these conditions, the necessary provisions should be made to accommodate this event.

The customer shall maintain the required regulatory clearance distances and not use these areas for storage. This applies during normal system operation and during service inspection and routine maintenance.

This work space is defined where the cover has been removed in an area where service is performed, with power applied to the system. The conditions of this space are as follows:

Service Space: Also defined as Working Space by: IEC/NFPA 70e (Table 110.26) 2011 Edition. GE Healthcare also requires the following minimum work space requirements for the safe servicing of the product:

Working Space: Work space for equipment operating at 600 Volts, nominal, or less, to ground, and likely to require examination, adjustment, servicing, or maintenance while energized. Refer to the conditions in Table 7 on page 54 and Table 8 on page 54.

IEC/NFPA 70e (Table 110.26) 2011 Edition GE Healthcare requires the following minimum work space requirements for the safe servicing of the product.

Terms Defined for “Work Space Conditions”

- **Grounded Surface/Wall:** Made of concrete, masonry, brick, ceramic tile, or a wall that contains surface mounted electrical boxes, conduits, or ducting.
- **Ungrounded Surface/Wall:** Made of wood or other insulated construction material that will not create a path to ground when touched.
- **Obstructions:** Surface mounted floor ducts or other trip hazards, walls, pilasters, support columns, and equipment covers stored temporarily that would block direct access to an exit from the room.
- **Head Clearance:** Head clearance represents the height dimension of the work space, as measured from the floor directly in front of the equipment to the ceiling (or overhead obstruction). It requires a minimum of 1981 mm (78.0 in.), or the height of the equipment, whichever is greater.
- **Powered On Service – Work Space Egress - 712.0 mm (28.0 in.):** Any work space around the perimeter of the system or subsystem, shall have at least one unobstructed route to a direct exit of the room. The width of the exit route shall not be less than 712.0 mm (28.0 in.) along the entire length of the route. This emergency egress route must be free of obstructions and trip hazards, including equipment covers that may have been removed for service.

- **Small Room – (Not Recommended):** A condition of installation where the gantry may be placed a minimum of 356.0 mm (14.0 in.) from a wall where access to electrical power or the wall is not required. (Limited to the side of the gantry, opposite the Tube-Change side of the gantry.)

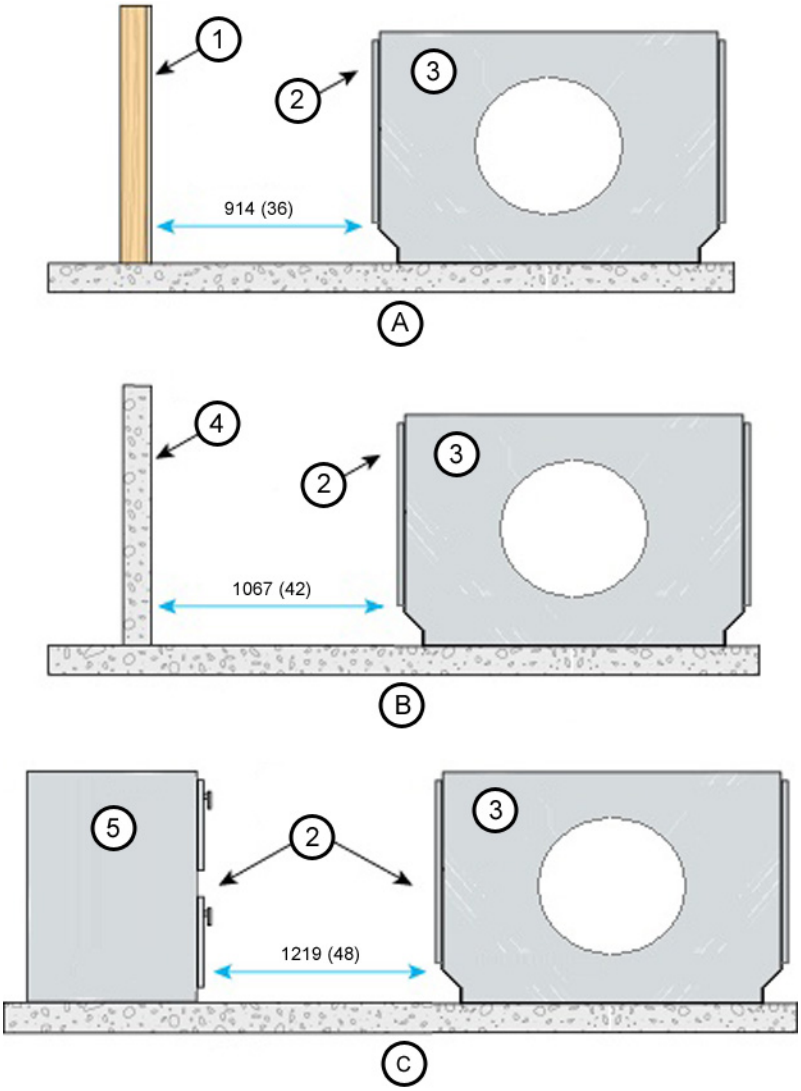
Table 7 Work Space Conditions

Dimension	Condition Number	Condition	Separation Distance mm (in.)
Length/ Depth	1	If the depth of the working space is directly facing an ungrounded surface or wall without live voltage panels (600V or less) and without surface mounted ducts or conduits.	914.0 (36.0)
	2	If the depth of the working space is directly facing a grounded surface or wall.	1067.0 (42.0)
	3	If the depth of the working space is directly facing a surface or wall with live voltage panels (600V or less), grounded surface mounted ducts, or conduits.	1219.0 (48.0)
Width	4	Minimum width of the working space in front of the electrical equipment, unless the width of the equipment is larger.	762.0 (30.0)
		If the equipment is wider than 762.0 mm (30.0 in) the width of the equipment shall become the width of working space.	Size of Equipment
		The working space shall permit at least a 90 degree opening of equipment doors.	—
Height	5	Minimum Height of the working space shall be clear and extend from the grade (floor), unless the height of the equipment is higher.	2000.0 (78.0)
		If the equipment is taller than 2000.0 mm (78.0 in.), the required height of the working space shall become the height of the equipment.	Height of Equipment

Table 8 Small Room Condition

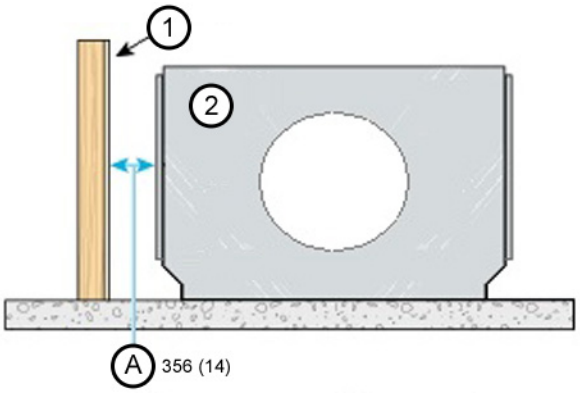
Small Room Condition	Separation Distance mm (in.)
Minimum distance required on the side of the gantry, opposite the Tube-Change side of the gantry.	356.0 (14.0)

Figure 44 Work Space Conditions



All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Condition 1	2	Exposed live parts
B	Condition 2	3	Scanner or subsystem
C	Condition 3	4	Grounded parts, concrete, etc.
1	Effectively insulated	5	A1, other electrical equipment power panels

Figure 45 Small Room Condition



All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Effectively insulated
2	Scanner or subsystem
A	Small Room Condition. No live parts to service on this side.

2.3.2.2 Cover Removal Clearance

System servicing requires sufficient space to remove all covers from the system.

2.3.3 Cover Clearance Requirements

2.3.3.1 Gantry Front Cover – Removal Clearance

Front cover removal requires a minimum clearance space, as specified in Typical Scan Suite Layout Configuration (Weldment Gantry with Detachable Base) and Typical Scan Suite Layout Configuration. The cover is removed using a pair of dollies that allow the service engineer to remove the cover from the gantry, tilt the cover 90° to roll it to the foot end of the table, and then tilt the cover an additional 90° so it is upsidedown, relative to its normal installation position.

2.3.3.2 Gantry Front Cover – Service Clearance

Once the front cover of the gantry is removed, the service engineer shall have the ability to reposition the cover to an area that satisfies the minimum regulatory service clearance. The cover cannot be placed in an area where it will encroach on the minimum service area.

2.3.3.3 Gantry Rear Cover – Removal Clearance

Rear cover removal requires the use of tilting cover dollies with a minimum clearance, as specified in Typical Scan Suite Layout Configuration (Weldment Gantry with Detachable Base) and Typical Scan

Suite Layout Configuration. Minimum service clearance space allows the service engineer to move the cover either straight back or off to one side of the table. The rear cover and dollies cannot extend into the service clearance space, even if the system is positioned diagonally.

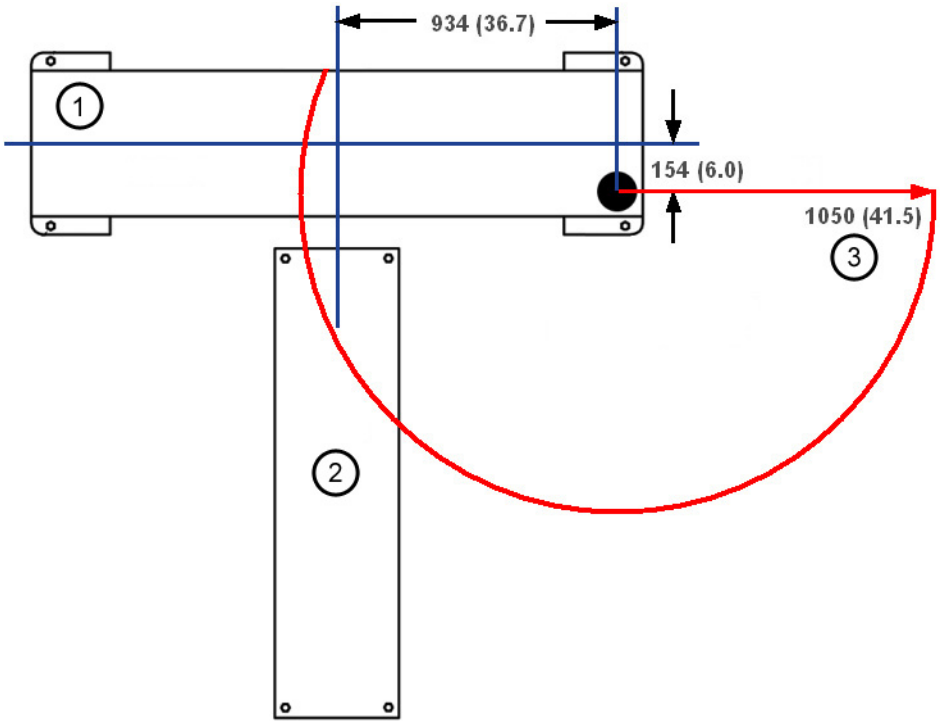
2.3.4 Visibility

Always ensure that the operator has good visibility to the patient from the scan room, even if this requires the preparation and installation of patient surveillance camera.

2.3.5 Gantry Space Requirements

Specifications for Boom Assembly clearance arc are defined in Figure 46 on page 57. The Boom Assembly is used during Tube and Detector replacement.

Figure 46 Boom Assembly Clearances



All dimensions are in millimeters; bracketed dimensions are in inches.	
1	CT Gantry
2	Table
3	Clearance radius

2.3.6 PDU Placement Requirements

When positioning the PDU, consider regulatory compliance. Also, refer to the room layout illustrations in Room Layouts.

2.3.7 Scanner Desktop Placement Requirements

2.3.7.1 Scanner Desktop Depth

The site shall maintain a working space at all times, with a minimum depth of 1219 mm (48 in.), extending the full width of the scanner desktop for service activity.

2.3.7.2 Scanner Desktop Operating Space

The console is on wheels. As some service activities require access to the rear of the console, be sure to maintain sufficient space for moving the console to allow rear service access.

2.3.8 Q.Core Placement Requirements

The Q.Core unit is on wheels and is serviced from the left side. Power connections are located in the rear.

2.3.9 PARC4.X Reconstruction Cabinet Placement Requirements

The PARC4.X is on wheels and can be pulled away from the wall for service. Upon completion of service, the PARC4.X shall be placed no closer than 152.4 mm (6.0 in.) on any side near a wall. On both ends of the PARC4.X, a clearance of 600 mm (23.6 in) is required to open the doors for service. If replacing components inside the PARC4.X, the PARC4.X can be pulled away into an area that has 960 mm (37.7 in) of clearance space. Do not block upwards exhaust flow and thermostats shall not be in the PARC4.X exhaust.

2.3.10 Trailer Requirements

NOTE

This is not applicable to weldment gantry.

Trailer is serviced from the right and left sides with power on and the gantry in the home position. Gantry-expanded power-on service is not recommended.

2.3.11 Storage Cabinet Requirements

An optional storage cabinet (B77292CA) is available to store all supplied service equipment. (See Table 9 on page 59 for equipment list.) The storage cabinet should be located in the scan room suite area for easy service access.

A storage cabinet or defined storage space is required to store service equipment purchased with the system. If the optional storage cabinet has not been ordered with the system (See Pre-Install

Checklist— Site Planning Requirements) adequate space must be provided to store this equipment. GE Healthcare recommends that the storage of the service equipment be located as close as possible to the scan suite.

NOTE

The service equipment is the property of the customer and shall NOT be removed from the site and/or stored off-site by GE Healthcare personnel.

Table 9 Storage Cabinet and Equipment

Item	Size	Weight (total)
Storage Cabinet	61 x 91 x 107 cm (24" D x 36" W x 42" H)	45.3 kg (100 lb) (approximately)
QA Phantom (water filled)	23 x 15 cm (9" x 6")	4.5 kg (10 lb)
Phantom Holder	25 x 25 cm (10" x 10")	3.6 kg (8 lb)
FE Documents & CD/DVD		4.5 kg (10 lb)
35 CM Poly (Circle)	35 x 8 cm (14" x 3")	6.8 kg (15 lb)
48 CM Poly (Circle)	48 x 8 cm (19" x 3")	11.3 kg (25 lb)
Stool	48 x 48 cm (19” x 19”)	1 kg (2 lb)
Blue Tote	81 x 51 x 32 cm (30" x 20’ x 17")	2 kg (4 lb)
Install Support Kit (box)	30 x 30 x 38 cm (12" x 12" x 15")	9.1 kg (20 lb)
Tube Hoist Kit	77 x 8 cm and 38 x 15 cm (30" x 3" and 15" x 6")	13.6 kg (30 lb)
Balance Weight Kit	(2 boxes)	33 kg (73 lb)
Spatial Resolution Phantom	23 x 15 x 8 cm (9" x 6" x 3")	

2.3.12 Verify Site Print

The customer shall ensure all equipment, storage cabinets, countertops, and sinks appear on the site print, in their proper location.

2.4 Anchoring

2.4.1 Anchoring Requirements – Non-Seismic Installation

WARNING

POTENTIAL FOR PATIENT INJURY!

AN IMPROPERLY SECURED TABLE MAY TIP, DISLODGING THE PATIENT.

PATIENT SAFETY DURING SYSTEM OPERATION REQUIRES PROPER ANCHORING OF SYSTEM COMPONENTS.

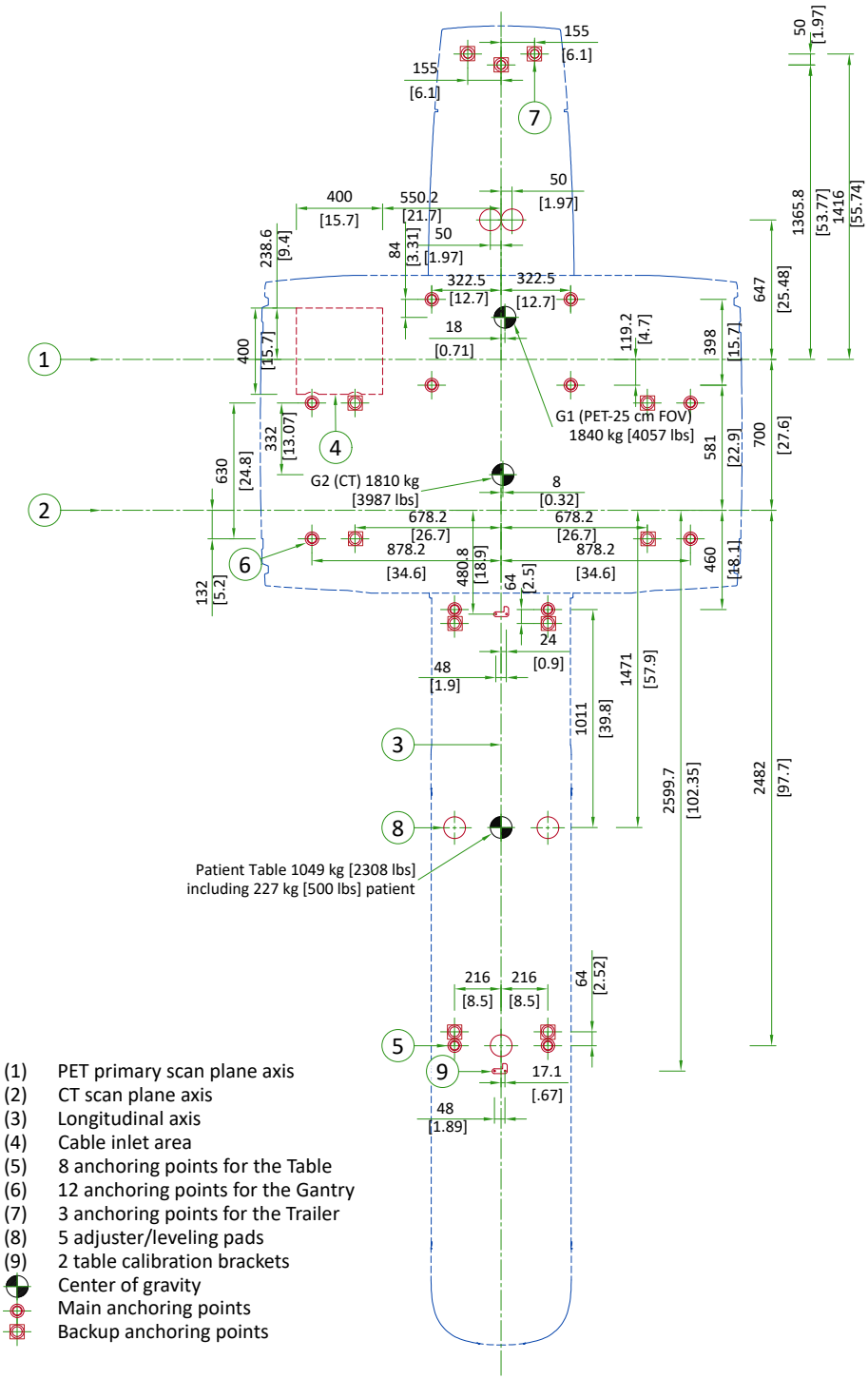
2.4.1.1 Gantry, Patient Table, and Trailer Anchoring – Non-Seismic

The Gantry, Patient Table, and Trailer shall be securely anchored to the floor (seeFigure 47 on page 61 or Figure 48 on page 62 depending on the PET Gantry received). The scanner desktop, Power Distribution Unit, and system recon cabinet (Q.Core/PARC4.x) do not require anchoring to the floor in a non-seismic installation. Use the floor template (p/n 5992810) or its dimensions to locate the Gantry, Patient Table, and Trailer support positions within the scan room, making sure that any anchors that pass through the supports clear all structural beams and interferences in the floor.

It is the responsibility of the buyer/purchaser of the system to have a licensed structural engineer work in conjunction with a qualified contractor to use either the GE-supplied floor anchor hardware or provide an equivalent anchoring system to mount the gantry and patient table to the floor.

The buyer/purchaser shall consult a licensed architect, licensed structural engineer, qualified contractor, or the PMI to resolve all anchoring issues.

Figure 47 Floor Mounting Detail (Aluminium Gantry)



(1) PET primary scan plane axis
(2) CT scan plane axis
(3) Longitudinal axis
(4) Cable inlet area
(5) 8 anchoring points for the Table
(6) 12 anchoring points for the Gantry
(7) 3 anchoring points for the Trailer
(8) 5 adjuster/leveling pads
(9) 2 table calibration brackets
Center of gravity
Main anchoring points
Backup anchoring points

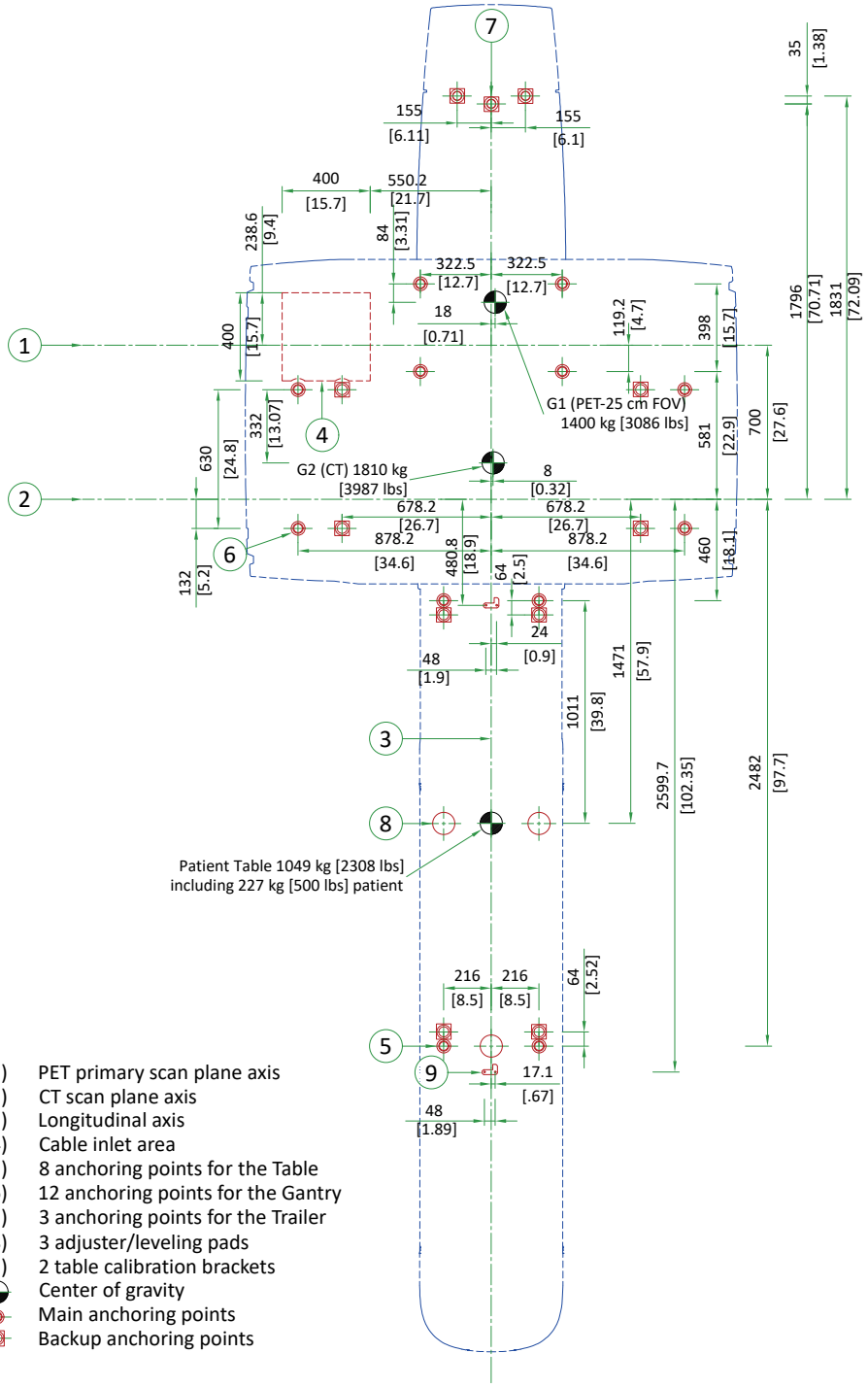
NOTE

Aluminium Gantry is available in Installed Base only, not shipped after December 2018.

NOTE

The CT anchoring location has to be used as the reference for the system installation; instead of the present practice of using the PET rear anchoring location as the reference.

Figure 48 Floor Mounting Detail (Weldment Gantry)

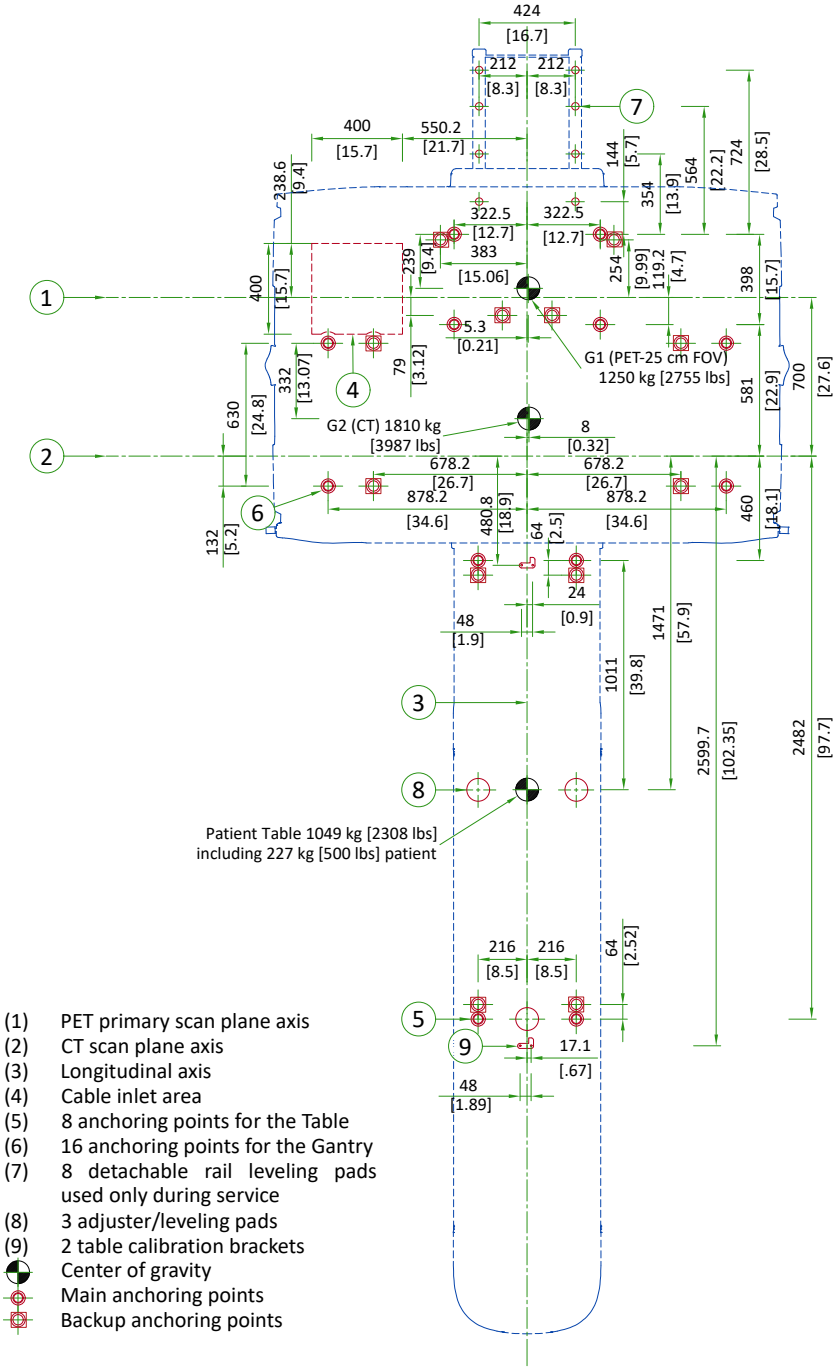


(1) PET primary scan plane axis
(2) CT scan plane axis
(3) Longitudinal axis
(4) Cable inlet area
(5) 8 anchoring points for the Table
(6) 12 anchoring points for the Gantry
(7) 3 anchoring points for the Trailer
(8) 3 adjuster/leveling pads
(9) 2 table calibration brackets
Center of gravity
Main anchoring points
Backup anchoring points

NOTE

The CT anchoring location has to be used as the reference for the system installation; instead of the present practice of using the PET rear anchoring location as the reference.

Figure 49 Floor Mounting Detail (Weldment Gantry with Detachable Base)

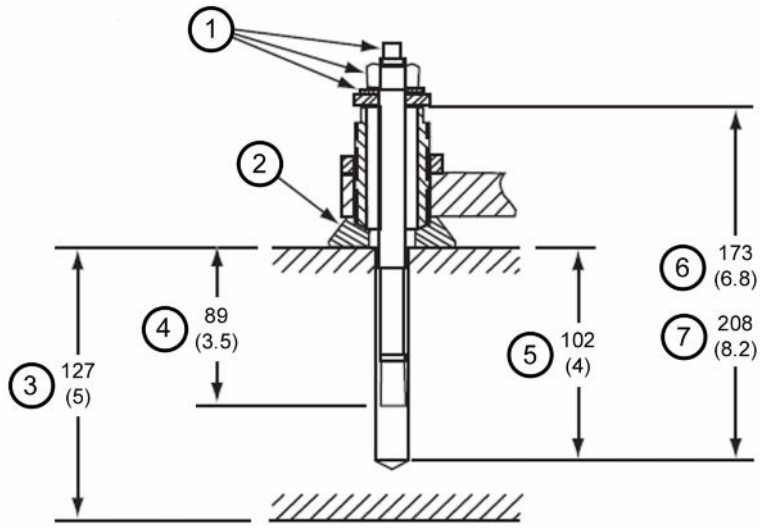


(1) PET primary scan plane axis
(2) CT scan plane axis
(3) Longitudinal axis
(4) Cable inlet area
(5) 8 anchoring points for the Table
(6) 16 anchoring points for the Gantry
(7) 8 detachable rail leveling pads used only during service
(8) 3 adjuster/leveling pads
(9) 2 table calibration brackets
Center of gravity
Main anchoring points
Backup anchoring points

2.4.1.2 GE-Supplied Anchors

The GE-supplied anchors for the Gantry, Patient Table, and Trailer shall only be used for mounting components to a concrete floor, in a non-seismic application. Refer to Figure 50 on page 64 for anchoring requirements.

Figure 50 GE-Supplied Floor Anchor Cross-Section



All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Anchor Assembly
2	63.5 mm (2.5 in) diameter leveling pad 9.7 mm (0.38 in) height for short 8 inch rod 44.5 mm (1.75 in) height for long 10 inch rod
3	Floor depth
4	Minimum anchor embedment
5	Drill depth
6	For short 8 inch rod
7	For long 10 inch rod

2.4.1.3 Anchor Placement

Each floor anchor shall be installed to clear any structural object hidden or buried in the floor. (Hidden objects could be floor beams, rebar, and concrete wire mesh.)

2.4.1.4 Minimum Number of Anchors

Non-Seismic installations shall use a minimum of fours floor anchors to mount the CT Gantry, four floor anchors to mount the Patient Table, four anchors to mount the PET Base and three anchors to mount the Trailer.

Any anchors showing more than 21 mm (~0.9 in.) of thread above the torqued nut shall require the installation of a second anchor in the closest adjacent mounting location. The second anchor shall meet the same requirements in Figure 50 on page 64.

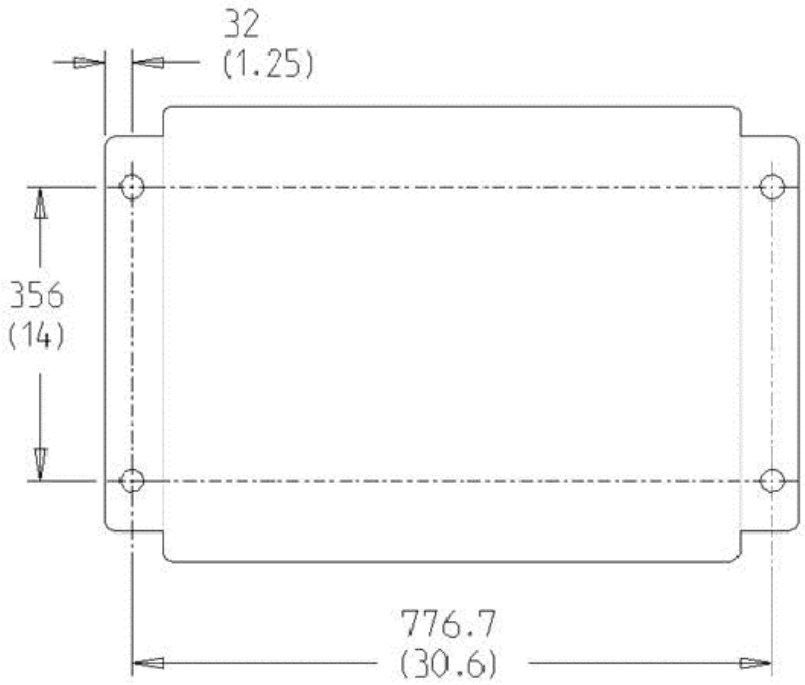
2.4.2 Anchoring Requirements – Seismic Installation

For a seismic installation, the customer shall refer to all applicable state/local laws and building codes. The customer shall consult with a structural engineer, site contractor, or architect for seismic installation requirements pertaining to all scanner components/sub-systems. The customer can also contact a GEHC Project Manager to obtain additional seismic calculations and information. Seismic anchoring is considered to be an alternate anchoring method. An alternative installation plan that meets all required seismic codes for the region the product is located in, should be developed for sites requiring seismic installations. Development of this plan is the responsibility of the customer. Generally, this requires the customer to contract the services of a Structural Engineering firm to develop the seismic anchoring plan prior to install. The alternative seismic installation plan should be executed at time of installation in place of the existing anchoring method defined in the product install manual. This plan must be retained by the customer, since it must be reviewed by service personnel at time of de-installation. Use of seismic anchoring kit (S5253SC) designed by GE Healthcare will result in an EASE compliant installation. Use only anchoring means provided by the customer's structural engineer.

2.4.2.1 PDU

If site specifications require seismic mounting, use the seismic brackets shipped with the PDU. Refer to Figure 51 on page 66 for hole locations to mount the PDU so it can be easily removed for service.

Figure 51 Seismic PDU Mounting Hole Locations



All dimensions are in millimeters; bracketed dimensions are in inches.
Seismic floor mounting holes (4); 15 mm (0.6 in.)
Refer to Power Distribution Unit (PDU) Center-of-Gravity for additional views.

2.4.2.2 PARC4.X

if site specifications require seismic mounting:

- For the PARC tall cabinet, use the seismic brackets shipped with Tall Cabinet PARC4.X.

  Refer to Figure 52 on page 67 for hole locations to mount the Tall Cabinet PARC4.X, so it can be easily removed for service.

- For the Mini Cabinet, use the seismic hardware kit (**P/N:B7919WP**). This seismic kit (P/N: B7919WP) must be ordered separately.

  Refer to Figure 53 on page 67 for hole locations to mount the Mini Cabinet PARC4.X, so it can be easily removed for service.

Figure 52 Seismic PARC4.X Tall Cabinet Mounting Hole Locations

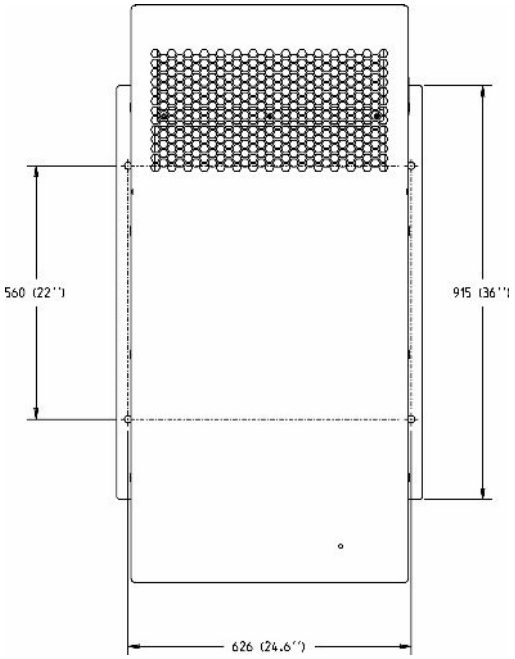
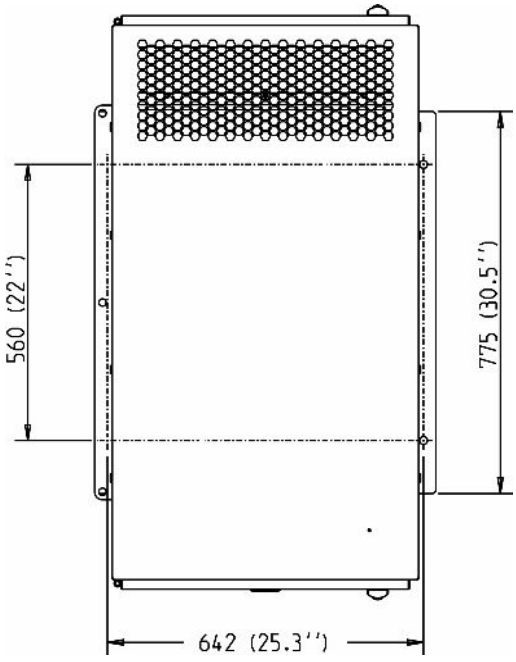


Figure 53 Seismic PARC4.X Mini Cabinet Mounting Hole Locations



All dimensions are in millimeters; bracketed dimensions are in inches.
Seismic floor mounting holes (4); Diameter 16 mm (0.63 in.)

2.4.2.3 Operator Console

If site specifications require seismic mounting, use the seismic brackets shipped with the Open console and the seismic anchoring kit (S5253SC). Refer to Figure 32 on page 41, Figure 34 on page 43 and Figure 33 on page 42(C) for hole locations to mount the Operator Console so it can be easily removed for service.

2.4.2.4 Workspace Table

If site specifications require seismic mounting, use the seismic brackets shipped with the system. Refer to Figure 38 on page 45 (A)(B) for hole locations to mount the Workspace Table so it can be easily removed for service.

2.4.2.5 UPS

If site specifications require seismic mounting, use the seismic brackets shipped with the system separately with the UPS (E4502YA). Refer to Figure 22 on page 35 (B) for hole locations to mount the UPS so it can be easily removed for service.

3 Special Construction Requirements

3.1 Radiation Protection

3.1.1 X-Ray Radiation Protection

3.1.1.1 Shielding Requirements

A qualified radiological health physicist shall verify the scan room radiation barrier is properly designed and installed, taking into consideration:

- Scatter radiation levels within the scanning room (see Figure 54 on page 71 and Figure 55 on page 72).
- Equipment placement
- Weekly projected workloads (# patient/day technique (kvp*ma))
- Materials used for construction of walls, floors, ceiling, doors, and windows
- Access to surrounding scan room areas
- Equipment in surrounding scan room areas (such as film developer, film storage)
- For small and medium filter survey, the 20 cm water phantom should be placed on the phantom headholder inserted into the end of the patient table.

The four scatter surveys depict measured radiation levels within the scanning room at the indicated distances, while scanning a 16cm CTDI phantom for the Head Scan mode and 32cm CTDI phantom for the Body Scan Mode. The mAs, kV and aperture scaling factors are provided in Table 10 on page 69 and they can be utilized to adjust the exposure levels to the typical usage at the site.

For example: The exposure level for a 120kV, 800 mA, 1sec scan at 50" (127 cm) away from the scan plane is: 5.2 µGy (from Figure 55 on page 72) × 0.71 (from Table 10 on page 69) × 800/100 (from Table 10 on page 69) = 29.5 µGy.

NOTE

Actual measurements can vary. Expected deviation equals ±15%, except for the 5mA and 1.25mm techniques, where variation may be greater (up to a factor of 2), due to the inherent deviation in small values. The maximum deviation anticipated for tube output equals ±40%. Isocurves already include the deviation margins.

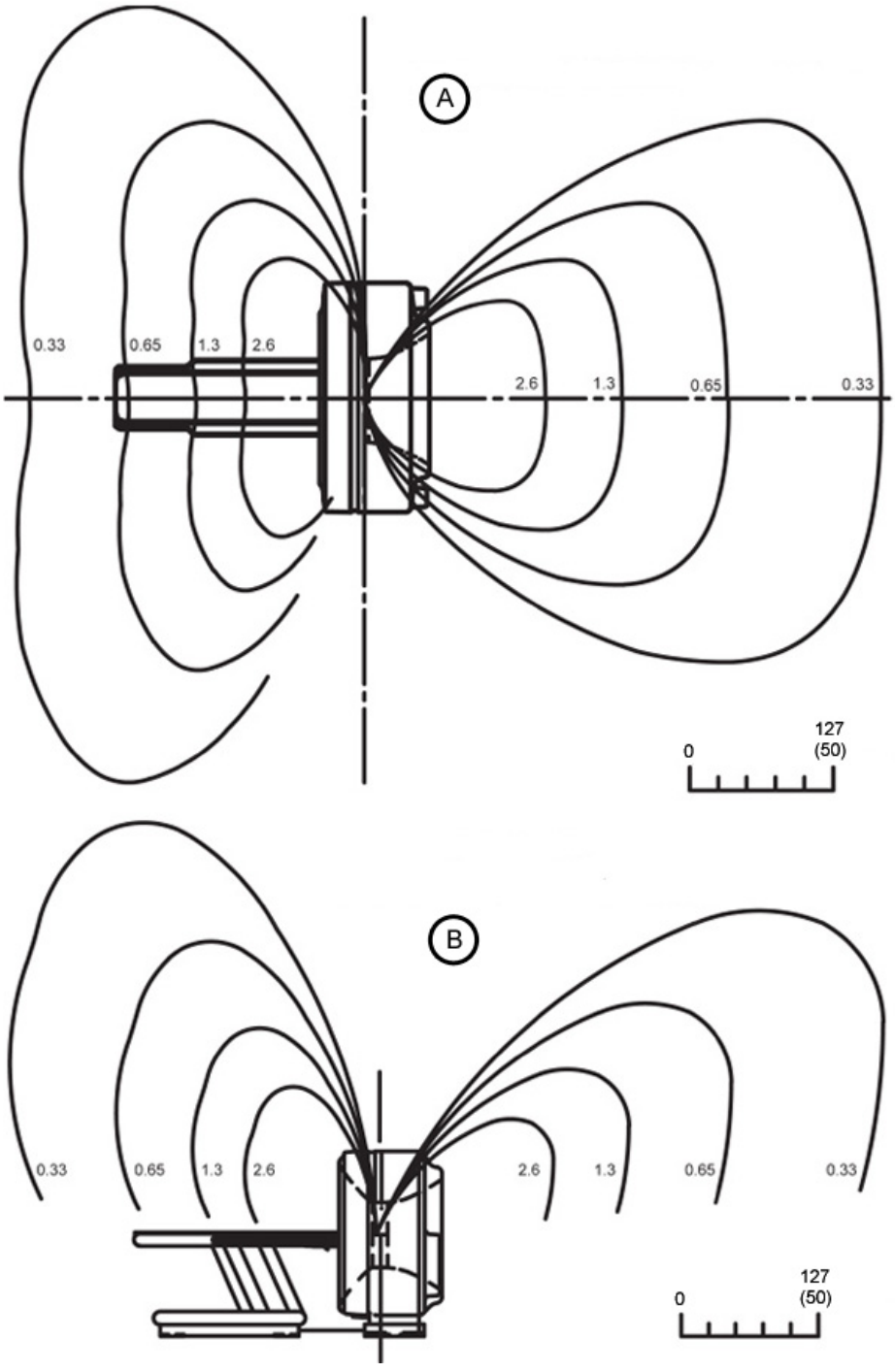
Table 10 Shielding Requirements Scaling

Changed Parameter	Multiplication Factor	Changed Parameter	Multiplication Factor
mAs	new mAs/100	1.25 mm aperture	0.20
80 kV	0.24	2.5 mm aperture	0.22

Shielding Requirements Scaling continued			
Changed Parameter	**Multiplication Factor**	**Changed Parameter**	**Multiplication Factor**
100 kV	0.45	5 mm aperture	0.27
120 kV	0.71	10 mm aperture	0.38
140 kV	1.00	20 mm aperture	0.59
		40 mm aperture	1.00

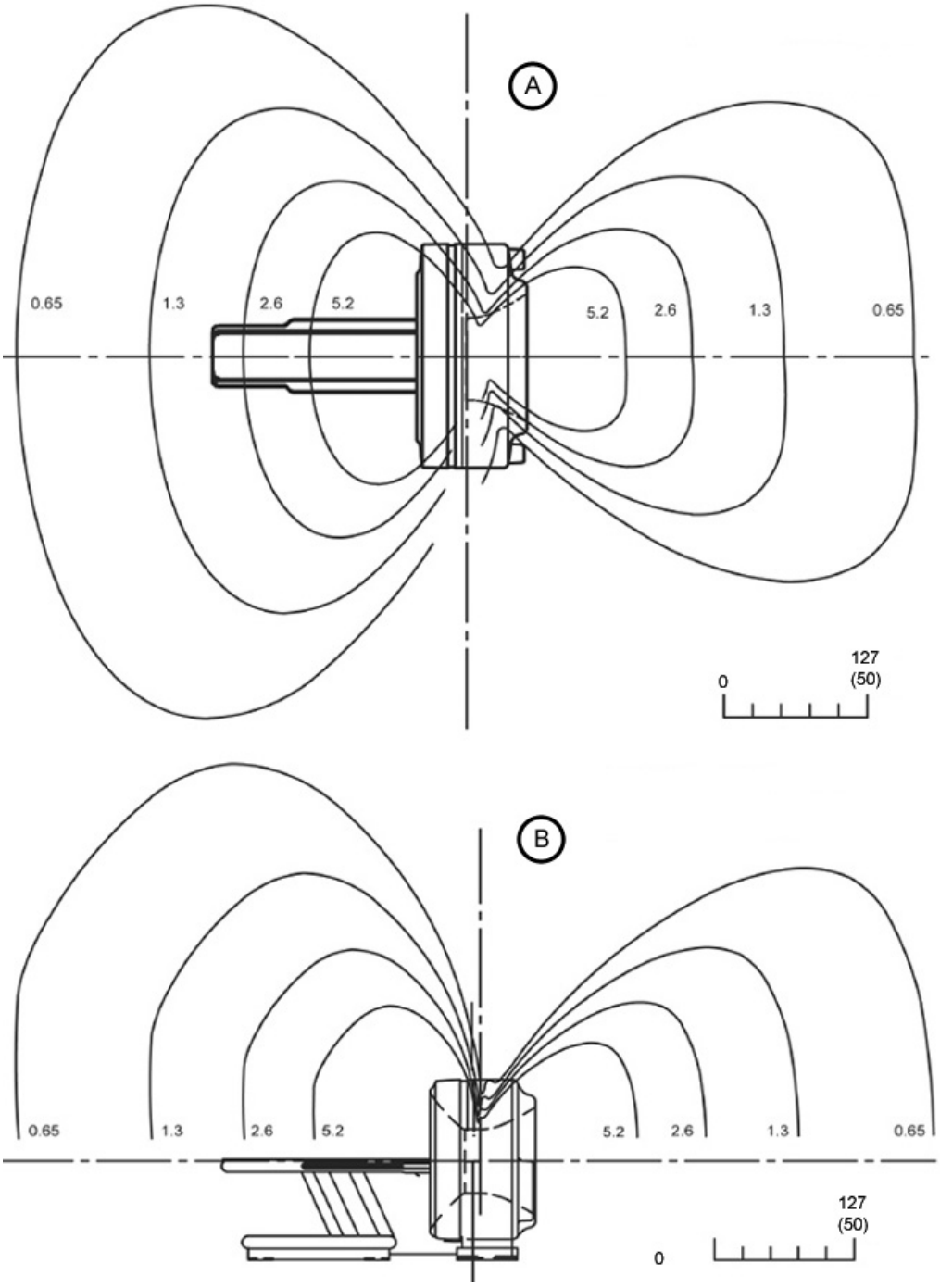
3.1.1.2 System X-ray Scatter Envelope

Figure 54 Typical Scatter Survey (Small & Medium Filter)



Scale units: centimeters (inches). ISO-contour level units: µGy/scan. Technique: 140 kV, 100 mA, 1 sec, 4x5.00 mm			
A	Head Phantom (top view)	B	Head Phantom (side view)

Figure 55 Typical Scatter Survey (Large Filter)



Scale units: centimeters (inches). ISO-contour level units: µGy/scan. Technique: 140 kV, 100 mA, 1 sec, 4x5.00 mm			
A	Body Scatter (top view)	B	Body Scatter (side view)

3.1.2 Gamma Ray Protection

A number of radioactive substances, of various levels of stability are used by the PET unit of the PET/CT system. This material is necessary in imaging procedures. Before the suite is operational, unstable material may be on the premises. It is very important to recognize that clear and significant hazards from ionizing radiation may exist at the site, as it is undergoing preparation. Other equipment may be in place and operational at this time. This may include such equipment as X-ray systems and CT scanners (other than the CT Gantry within the PET/CT system). Calibration source may be on the site at some time during the preparation process, as well as after the PET imager has been put into operation. A cyclotron may be operational at the site. Definite steps should be taken to ensure the safety of workers, patients, and visitors, during all phases of the construction, installation and operation of the facility.

NOTE

By the time the site is ready to have radioactive material brought in, the licensing process must be complete. The site must be properly licensed before receiving radioactive material.

3.1.2.1 Protection of Equipment

It is important that background radiation be kept to a minimum. The coincidence detection used in a PET system allows a moderate amount of external singles events. The PET/CT system has been found to have less than 1% deadtime if the external field is below 1 mR/hr from a single source. Because area background can be more general than a single source, a lower limit is appropriate. If the area dose rate is maintained to less than 0.2 mR/hr (due to 511 or lower energy gamma rays) at the covers, detector deadtime should not exceed 1%.

Radioactive sources must be stored in approved shielded containers. It is recommended that any radioactive source not specifically designed to be housed in the gantry's lead storage container be stored in a separate room (hot lab) adjacent to, and accessible from, the Scan Room. This hot lab should be near the cyclotron (if used). Doses should be prepared in the same area.

Consideration should be given to the placement of the gantry in relation to existing X-ray, Magnetic Resonance, or Nuclear diagnostic equipment. Magnetic interference above 1.0 gauss, at the surface of PET components, can adversely affect the image quality. Good shielding techniques must be implemented in order to avoid this type of interference.

Some procedures involve the use of radioactive water. This will result in the patient exhaling radioactive carbon dioxide. This carbon dioxide must be contained in order to avoid adversely affecting the image quality. Some PET procedures require the use of radioactive gases. This too can result in compromising image quality if not properly controlled.

3.1.2.2 Protection of Personnel

The escape of radioactive gases, if not properly confined, can cause unnecessary exposure to clinical staff. All sources must be properly stored in appropriate enclosures to provide adequate protection to all in the suite.

3.1.2.3 Barriers, Partitions and Shielding

Appropriate barriers such as walls, lead-shielded glass, lead shields etc. must be installed to protect staff from unnecessary exposure to radiation. A qualified radiological health physicist must be consulted in the design of walls and safety barriers to assure proper attenuation.

Keep in mind that patients become significant sources of radioactivity. Consideration should be given to maximize the distance between the patient and operator during the uptake and acquisition phases of scan procedures.

3.1.2.4 External Sources of Radiation

A number of common radio nuclides are used in the PET/CT system.

These radio nuclides are either produced at the site or brought to the site from an outside source.

In either case, these nuclides have relatively short half-life (2 min. to 110 min.) and as such decay to benign levels fairly quickly.

Typical positron emitting isotopes include: Carbon-11, Nitrogen-13, Oxygen-15, and Fluorine-18.

3.1.2.5 PET Alignment (VQC) Phantom

The PET Alignment (VQC) phantom is used during the Check Image Alignment procedure. This special phantom contains spheres (commonly referred to as “marbles”).

The five (5) small spheres embedded in the phantom are a source of very low radiation (0.7 MBq Germanium-68 per sphere; total 3.5 MBq for p/n 5308767 phantom).

The average life of the phantom is 2.5 to 4.0 years. Individuals using this phantom must be trained to handle radioactive materials as well as maintain proper source handling procedures while handling the phantom.

This may include local site-specific procedures for the safe handling of radioactive material.

3.1.2.6 PET Annulus Phantom

The PET Annulus phantom (DQA Phantom) is used for the Daily Quality Assurance (DQA) procedure.

The Annulus Phantom is made of ABS plastic and filled with Epoxy Ge-68 radioactive resin material (nominal activity 55.0 MBq (±20%)).

Individuals using this phantom must be trained to handle radioactive materials as well as maintain proper source handling procedures while handling the phantom.

This may include local site specific procedures for the safe handling of radioactive material.

3.2 Electromagnetic Interference (EMI) Consideration

3.2.1 Electromagnetic Interference (EMI) System Placement

If you know of, or suspect, the presence of excessive electromagnetic interference (EMI), consult your GE Healthcare PMI or GE Sales and Service for recommendations to reduce EMI fields. Consider the following to reduce EMI:

- EMI field strength decreases rapidly with distance from the source of the electromagnetic field.
- EMI from a three-phase transformer is much less than a bank of three single-phase transformers of equivalent power.
- Large electric motors are a substantial source of EMI.
- High-powered radio signals are a source of EMI.
- Maintain good shielding of cables and electronic cabinets.
- Consider and measure EMI where the facility power is running near the scan room.
- Pay attention to power substations and high-voltage power lines near the scan facility.
- If you have any concerns, measure for all EMI to confirm the site meets all required specifications.

3.2.1.1 EMI – Gantry

The gantry shall be located in an area where the ambient static magnetic field is less than 10E-4 tesla (1000 milligauss) and the ambient AC magnetic field is less than 10E-6 tesla (10 milligauss); otherwise, EMI will affect the image quality of the scanner.

3.2.1.2 EMI – Q.Core/Scanner Desktop/Computer Equipment

The Q.Core, scanner desktop, and its associated computer equipment shall be located in an area where the ambient static magnetic field is less than 10E-3 tesla (10,000 milligauss).

3.2.1.3 Electromagnetic Immunity

The system is intended for use in the electromagnetic environment specified in Table 11 on page 76. The customer, or the user of the system, shall ensure the system is used in such an environment.

Table 11 Electromagnetic Immunity

Immunity Test	EC 60601–1–2 Test Level	Compliance Level	Electromagnetic Environment Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±15 kV air	±8 kV contact ±15 kV air	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines 100Khz rate ± 1 kV for input/output lines 100Khz rate	±2 kV for power supply lines, 100Khz rate ±1 kV for input/output lines, 100Khz rate	Mains power quality should be a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line-line ±2 kV line-earth	±1 kV line-line ±2 kV line-earth	Mains power quality should be a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4- 11	0% UT for 5 sec	0% UT for 5 sec	Mains power quality should be a typical commercial or hospital environment. If the user of the system requires continued operation during power mains interruptions, it is recommended that the system is powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

NOTE

UT equals the alternating current mains voltage prior to application of the test level.

Electromagnetic Immunity continued			
Immunity Test	**EC 60601–1–2 Test Level**	**Compliance Level**	**Electromagnetic Environment Guidance**
Conducted RF IEC 61000-4-6	6Vrms in ISM bands 150 kHz to 80 Mhz	6 Vrms in ISM bands 150 kHz to 80 Mhz	Do not use portable and mobile RF communications equipment closer to any part of the system, including cables, than the recommended separation distance (d) calculated from the equation appropriate for the frequency of the transmitter. Recommended Separation Distance (d): $d = [\frac{3.5}{3}]\sqrt{P}$ See Table 13 on page 79 where P is the maximum output power rating of the transmitter in watts (W), according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated fields in close proximity IEC 61000-4-39	65A/m at 134.2kHz (PM 2.1kHz 50%) 7.5A/m at 13.56MHz (PM 50kHz 50%)	65A/m at 134.2kHz (PM 2.1kHz 50%) 7.5A/m at 13.56MHz (PM 50kHz 50%)	Close proximity radiated fields should be at levels characteristic of a typical location in a professional healthcare facility environment.

Electromagnetic Immunity continued			
Immunity Test	**EC 60601–1–2 Test Level**	**Compliance Level**	**Electromagnetic Environment Guidance**
Radiated RF Fields / Proximity Fields from Wireless Transmitters IEC 61000-4-3	3 V/m 80 MHz to 2.7 GHz 80% AM 1 kHz 9V/m to 28 V/m spot frequencies 385/450/710/745 /780/810/870/ 930/1720/1845/ 1970/2450/5240/ 5500/5785 MHz PM 18Hz or 217Hz (50% duty cycle) see Table 13 on page 79for more details.	3 V/m 80 MHz – 2.7 GHz 80% AM 1 kHz 9 V/m to 28 V/m spot frequencies 385/450/710/745 /780/ 810/870/930/172 0/1845 / 1970/2450/5240/ 5500/ 5785 MHz PM 18 Hz or 217 Hz (50% duty cycle) see Table 13 on page 79for more details.	Do not use portable and mobile RF communications equipment closer to any part of the system, including cables, than the recommended separation distance (d) calculated from the equation appropriate for the frequency of the transmitter. Recommended Separation Distance (d): $d = [\frac{3.5}{3}]\sqrt{P}$ (800 MHz to 2.7 GHz) $d = [\frac{7}{3}]\sqrt{P}$ refer toTable 13 on page 79 where P is the maximum output power rating of the transmitter in watts (W), according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol: 
[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the system is used exceeds the applicable RF compliance level above, the system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the system. [b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.			

Table 12 Spot Frequencies

Spot Frequency (Mhz)	Band (Mhz)	Service	Maximum Power (Watts)
385	380-390	TETRA 400	1,8
450	430-470	GMRS 460 FRS 460	2,0
710	704-787	LTE Band 13, 17	0,2

Spot Frequencies continued			
Spot Frequency (Mhz)	**Band (Mhz)**	**Service**	**Maximum Power (Watts)**
745			
780			
810	800-960	GSM 800/900 TETRA 800 IDEN 820 CDMA 850 LTE Band 5	2
870			
930			
1720	1700-1990	GSM 1800 CDMA 1900 GSM 1900 DECT LTE Band 1, 3, 4, 25 UTMS	2
1845			
1970			
2450	2400-2570	Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE Band 7	2
5240	5100-5800	WLAN 802.11 a/n	0,2
5300			
5785			

3.2.1.4 Electromagnetic Separation Distance

Maintain the electromagnetic separation distance as described in Table 13 on page 79 (between 150K to 2.7GHz).

Table 13 Recommended Separation Distances from Portable and Mobile RF Communications Equipment

Rated Maximum Output Power (P) of Transmitter Watts (W)	**Separation Distance (Meters) by Frequency of Transmitter**		
	150 kHz to 80 MHz $d = [\frac{3.5}{3}]\sqrt{P}$	**80 MHz to 800 MHz** $d = [\frac{3.5}{3}]\sqrt{P}$	**800 MHz to 2.7GHz** $d = [\frac{7}{3}]\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74

Recommended Separation Distances from Portable and Mobile RF Communications Equipment continued			
Rated Maximum Output Power (P) of Transmitter Watts (W)	**Separation Distance (Meters) by Frequency of Transmitter**		
	150 kHz to 80 MHz $d = [\frac{3.5}{3}]\sqrt{P}$	**80 MHz to 800 MHz** $d = [\frac{3.5}{3}]\sqrt{P}$	**800 MHz to 2.7GHz** $d = [\frac{7}{3}]\sqrt{P}$
1	1.17	1.17	2.33
10	3.69	3.69	7.38
100	11.7	11.7	23.3

For transmitters rated at a maximum output power not listed above, the separation distance can be estimated using the equation in the corresponding column, where power (P) is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE

At 80 MHz to 800 MHz, the separation distance for the higher frequency range applies.

NOTE

These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

As an example, keep a 1 W mobile phone (800 MHz to 2.7 GHz carrier frequency) at least 2.3 m from the PET/CT system (to avoid image interference risks).

Limitations Management:

Adhering to the distance separation recommended in (150 KHz to 2.7 GHz) reduces disturbances recorded at the image level, but may not eliminate all disturbances. However, when installed and operated as specified, the system maintains its essential performance by continuing to acquire, display, and store diagnostic quality images safely.

Table 14 RF Wireless Frequencies Immunity Specification and Separation Declaration for EMC edition 4.1

Portable RF communication equipment (including peripherals such as antenna cables and external antenna) at frequencies noted below should be used no closer than 30 cm (12 in) to any part of the system, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result. Minimum separation distances for higher IMMUNITY TEST LEVELS shall be calculated using the following equation:

$$d = \left[\frac{6}{E}\right]\sqrt{P}$$

Where P is the maximum power in W, d is the minimum separation distance in m and E is the IMMUNITY TEST LEVEL in V/m.

Test Frequency (Mhz)	Band (Mhz)	Service	Modulation	Maximum Power (Watts)	Distance (m)	IMMUNITY TEST LEVEL (V/m)
385	380-390	TETRA 400	Pulse modulation 18 Hz	1,8	0,3	27
450	430-470	GMRS 460 FRS 460	FM ± 5 kHz deviation 1 kHz sine	2	0,3	28
710	704-787	LTE Band 13, 17	Pulse modulation 217 Hz	0,2	0,3	9
745						
780						
810	800-960	GSM 800/900 TETRA 800 IDEN 820 CDMA 850 LTE Band 5	Pulse modulation 18 Hz	2	0,3	28
870						
930						
1720	1700-1990	GSM 1800 CDMA 1900 GSM 1900 DECT LTE Band 1, 3, 4, 25 UTMS	Pulse modulation 217 Hz	2	0,3	28
1845						
1970						
2450	2400-2570	Bluetooth WLAN 802.11 b/g/n RFID 2450 LTE Band 7	Pulse modulation 217 Hz	2	0,3	28

RF Wireless Frequencies Immunity Specification and Separation Declaration for EMC edition 4.1 continued

Portable RF communication equipment (including peripherals such as antenna cables and external antenna) at frequencies noted below should be used no closer than 30 cm (12 in) to any part of the system, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result. Minimum separation distances for higher IMMUNITY TEST LEVELS shall be calculated using the following equation:

$$d = \left[\frac{6}{E}\right]\sqrt{P}$$

Where P is the maximum power in W, d is the minimum separation distance in m and E is the IMMUNITY TEST LEVEL in V/m.

Test Frequency (Mhz)	Band (Mhz)	Service	Modulation	Maximum Power (Watts)	Distance (m)	IMMUNITY TEST LEVEL (V/m)
5240	5100-5800	WLAN 802.11 a/n	Pulse modulation 217 Hz	2	0,3	9
5500						
5785						

3.2.1.5 Cable Shielding and Grounding

All interconnect cables to peripheral devices must be shielded and properly grounded, except when technologically prohibited. Use of cables not properly shielded and grounded may result in the equipment causing radio frequency interference.

GE Healthcare is not responsible for any interference caused by using other than recommended interconnect cables or panels, or by unauthorized changes or modifications to this equipment.

Unauthorized changes or modifications could void the users' authority to operate the equipment.

3.2.2 Electromagnetic Emission

This equipment complies with IEC 60601-1-2:2014 + AMD1:2020 (Edition 4.1) EMC standard for medical devices.

NOTE

This system complies with the EMC standard when used with supplied cables. If cables of different lengths are required, contact your PMI. Cables cannot be cut, shortened, lengthened, or spliced.

The system is suitable to be used in an electromagnetic environment, in compliance with the limits and recommendations provided in Table 15 on page 83.

Table 15 Electromagnetic Compliance

Emissions Test	Compliance	Electromagnetic Environment Guidance
RF emissions CISPR 11	Group 1	The system uses RF energy only for its internal function. Therefore, its RF emissions are very low and not likely to cause interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	When installed in such a shielded location, the scanner is suitable for use in all establishments other than domestic, and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	N/A	The system is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Voltage fluctuation/ flicker emissions IEC 61000-3-3	N/A	The system is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.

3.3 Vibration Isolation

3.3.1 Scanning Facility Vibration Isolation

The scanning facility shall be isolated from vibration such as; hospital power plants, pumps, motors, air handling equipment, air conditioning units, nearby rooms with exercise equipment or where exercise occurs, hallway foot traffic, elevators, parking lots, roads, subways, trains, and heliports; otherwise, vibration will affect the image quality of the scanner.

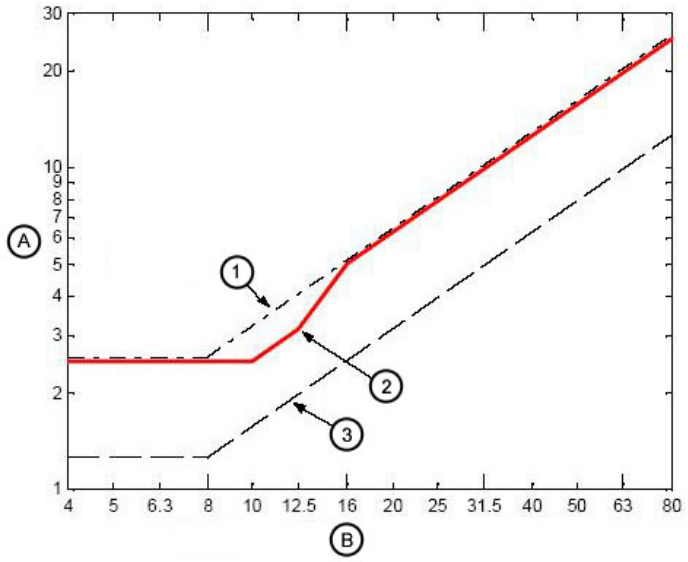
3.3.2 Frequency/Vibration Range

CT systems are sensitive to vibration and may display limited performance if exceeding the vibration limits listed below. The band of frequencies in which systems exhibit the most sensitivity appears at or near the resonant frequencies of the gantry and the patient table, the latter of which varies depending on patient mass and location. These frequencies fall within the following ranges:

- Patient Table: 2 – 10 Hz
- Gantry: 8 – 14 Hz

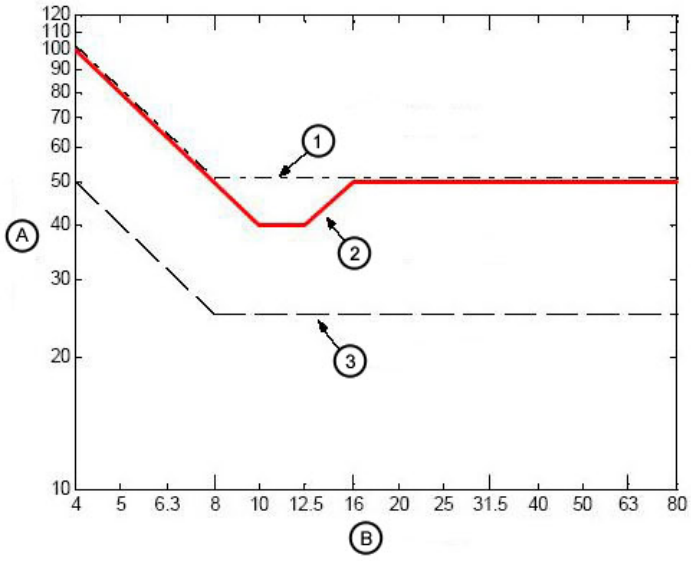
Floor vibration from any source shall not exceed the levels detailed in Figure 56 on page 84 and Figure 57 on page 84, as represented by the solid line labeled CT Scanner/Table. These illustrations compare this limit to the limits of what the AISC (American Institute of Steel Construction) and the ISO (International Organization for Standardization) call Class A (VC-A) and Class B (VC-B).

Figure 56 Allowable floor vibration in acceleration units compared to ISO class A and B limits



A	Acceleration [mm/s^2, rms]	Frequency [Hz]	Acceleration [mm/s^2, rms]
B	One-Third-Octave Band Center Frequency [Hz]	42	2.5
1	VC-A (50 µm/s)	10	2.5
2	CT Scanner/Table	12.5	3.1
3	VC-B (25 µm/s)	16	5
		80	25

Figure 57 Allowable floor vibration in velocity units compared to ISO class A and B limits



A	Velocity [µm/s, rms]	Frequency [Hz]	Velocity [um/s, rms]
B	One-Third-Octave Band Center Frequency [Hz]	4	100
1	VC-A (50 µm/s)	10	40
2	CT Scanner/Table	12.5	40
3	VC-B (25 µm/s)	16	50
		80	50

3.4 Other Construction Considerations

3.4.1 Patient Viewing Window Dimensions

The recommended patient viewing window is: 1219 mm wide x 1067 mm high (48 in. x 42 in.).

3.4.2 Support Structure Installation

Approved steelwork or equivalent support structure for mounting equipment to walls, ceilings, and floors shall be installed prior to the system installation.

3.4.3 Chemical Contamination Concerns

WARNING

THE SILVER, COPPER, GOLD FILMS USED IN THE CT SYSTEM ARE ESPECIALLY SENSITIVE TO CHEMICAL CONTAMINATION.

the presence of sulfide, chloride and nitrate contaminates (with Sulfur being the most damaging), can damage the ct system.

If high levels of contaminates exist, consider installing an appropriate air filtration system.

The scanner shall not be installed in the same room with a wet film processor. Certain scanner components could become contaminated by the chemicals contained in the processor.

Ensure any sulfide, chloride, or nitrate contaminate levels are at acceptable levels (Class 1). See IEC 60654-4 for air quality guidelines.

3.4.4 Finished Wall Requirement

3.4.4.1 Wall Paint

The scan and control room walls shall be painted prior to the system installation.

3.4.4.2 Wall Paint - Exception

A primer coat of paint is acceptable for system installation. After the system is installed, any final coats of paint shall be applied by brush. Spray painting in not permitted as it can seriously damage CT system components.

NOTE

Spray painting in not permitted. Spray painting can seriously damage CT system components.

3.4.5 Option Requirements

3.4.5.1 Non-GE Installed Options

Buyer/purchaser shall confirm all non-GE installed options have been reviewed and final locations determined. Prior to system installation, the buyer/purchaser shall be responsible for pre-installing all ceiling mounting plates/pedestals for non-GE installed options prior to system delivery.

3.4.5.2 GE Options

Buyer/purchaser shall confirm all GE-installed options have been reviewed and final locations determined.

3.4.5.3 Options Power and Control Cables

Buyer/purchaser shall install all power source/connections and all control cables for all options prior to system delivery.

4 Environmental Requirements (HVAC)

4.1 HVAC Requirements

The following standard is referenced in this section: IEC 60654-4

4.1.1 Climate Requirements

4.1.1.1 Air Quality

All construction, finish, and construction cleanup work of the scanner suite shall be completed prior to the installation of the CT system to prevent exposing the system to construction material contamination.

4.1.1.1.1 Construction Dust Concerns

Ensure NO construction dust occurs in or immediately around the scan suite. Avoid:

- concrete dust
- drywall dust
- ceiling tile dust
- sawdust or wood shavings
- dust tracked into CT suite from adjoining rooms

Failure to protect the CT system from these types of dust may result in damage to the system and early system failure.

4.1.1.1.2 Chemical Contamination Concerns

WARNING

THE SILVER, COPPER, GOLD FILMS USED IN THE CT SYSTEM ARE ESPECIALLY SENSITIVE TO CHEMICAL CONTAMINATION.

the presence of sulfide, chloride and nitrate contaminates (with Sulfur being the most damaging), can damage the ct system.

If high levels of contaminates exist, consider installing an appropriate air filtration system.

The scanner shall not be installed in the same room with a wet film processor. Certain scanner components could become contaminated by the chemicals contained in the processor.

It is the responsibility of the buyer/purchaser to insure any sulfide, chloride, or nitrate contaminate levels are at acceptable, low levels (Class 1). See IEC 60654-4 for air quality guidelines.

4.1.1.2 Temperature and Humidity Requirements

Ensure the site provides an HVAC system capable of maintaining the temperature and humidity requirements as specified in Table 16 on page 88 and Table 17 on page 88. The environmental conditions at the site shall be maintained at all times (including overnight, weekends, and holidays). Environmental conditions apply to the Table, Gantry, Power Distribution Unit, Q.Core/PARC4.X and scanner desktop.

NOTE

Exceeding the environmental specifications may adversely affect system operation and image quality.

Table 16 System Temperature Limits

Maximum rate of change in the temperature shall be no greater than:	3°C (5.4°F) per hour
Maximum allowable ambient room temperature:	26°C (79°F)
Recommended ambient room temperature:	22°C (72°F)
Minimum allowable ambient room temperature:	18°C (64°F)

NOTE

Be certain to account for ANY cooling equipment cycle-control range, ensuring that the maximum and minimum ambient room temperatures do not exceed those shown in Table 16 on page 88 during room thermal cycling. For example, if the HVAC is capable of ± 2° C control, then the limits would be 20° C - 24° C to maintain absolute limits.

Table 17 Humidity (Scan and Control Rooms)

Maximum rate of change in the relative humidity shall be no greater than:	5% RH per hour
Maximum allowable non-condensing relative humidity:	60%
Minimum allowable non-condensing relative humidity:	30%

4.1.1.3 Altitude Operating Range

The system shall be operated within an altitude range of -150 m to 2400 m (-492 ft. to 7875 ft.) sea level.

4.1.1.4 Environmental Conditions Verification

The temperature and humidity of the installation site shall be recorded before and after system installation to verify the environmental conditions of the site are met. Any necessary changes shall be made to maintain the proper environmental conditions.

4.1.1.5 Patient Comfort

Consider patient comfort needs when designing or modifying the HVAC system for the scan suite. To prevent cold air from venting onto patients, position air supply ducts in exam room so they do not discharge onto the patient Table. Position ducts over Gantry.

4.1.2 Heat Output

Table 18 on page 89 details the heat load produced by the PET/CT system and its various components. Use the BTU/Wattage ratings listed to determine the requirements of the HVAC system.

- Gantry air INTAKE occurs along the BOTTOM of the Gantry.
- Gantry air EXHAUST occurs along the TOP of the Gantry.
- PARC4.X air INTAKE occurs along the FRONT of the PARC4.X. PARC4.X air EXHAUST occurs at the TOP of the PARC4.X.

Table 18 System Heat Load*

System Components	Maximum BTU/HR	Maximum Kilowatts
Scan Room:		
CT Gantry	18766	5.50 kW
PET Gantry	4095	1.20 kW
Table	1024	0.30 kW
Power Distribution Unit (PDU)	3400	1.00 kW
Q.Core (Recon Cabinet)	1500	0.72 kW
PARC4.X (Reconstruction Cabinet)	4436	1.3 kW
Scan Room Subtotal:	28785 (31721 with PARC4.X)	8.72 kW (9.3 kW with PARC4.X)
Control Room:		
Operator Console	2860	0.84 kW
LCD Monitor (2 units, 170 BTU/50 Watts each)	340	0.10 kW
Peripheral Media Tower (PMT)	425	0.13 kW
Control Room Subtotal:	3625	1.07 kW
System Total	32410 (35346 with PARC4.X)	9.79 kW (10.37 kW with PARC4.X)

* Does not include heat load from room lighting, non-PET/CT equipment, personnel, etc.

4.1.3 Air-Handling System Initial Start-Up Considerations

Prior to the initial start-up of the scan suite air-handling system, ensure the air-handling system ducts and filters are thoroughly clean of dust and other potential airborne contaminants.

After new construction or scan suite renovation, the air-handling ventilation system, on initial startup, could blow dust and other airborne contaminates throughout the scan suite, potentially damaging the PET/CT scanner.

5 Electrical Requirements

5.1 Power Requirements

5.1.1 Certified Electrical Contractor Statement

All electrical Installations that are preliminary to positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. In addition, electrical feeds into the Power Distribution Unit shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations and testing shall be performed by qualified GE personnel or by a person or persons trained by GE for the purpose of installing, de-installing, moving, servicing and maintaining the CT scanner. The products involved (and the accompanying electrical installations) are highly sophisticated, and special engineering competence is required. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE's electrical work on these products will comply with the requirements of the applicable electrical codes. The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE's field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

5.1.2 Regulations

NFPA 70E Standard

All electrical work shall comply with NFPA 70E: Standard for Electrical Safety in the Workplace.

5.1.3 Disconnects

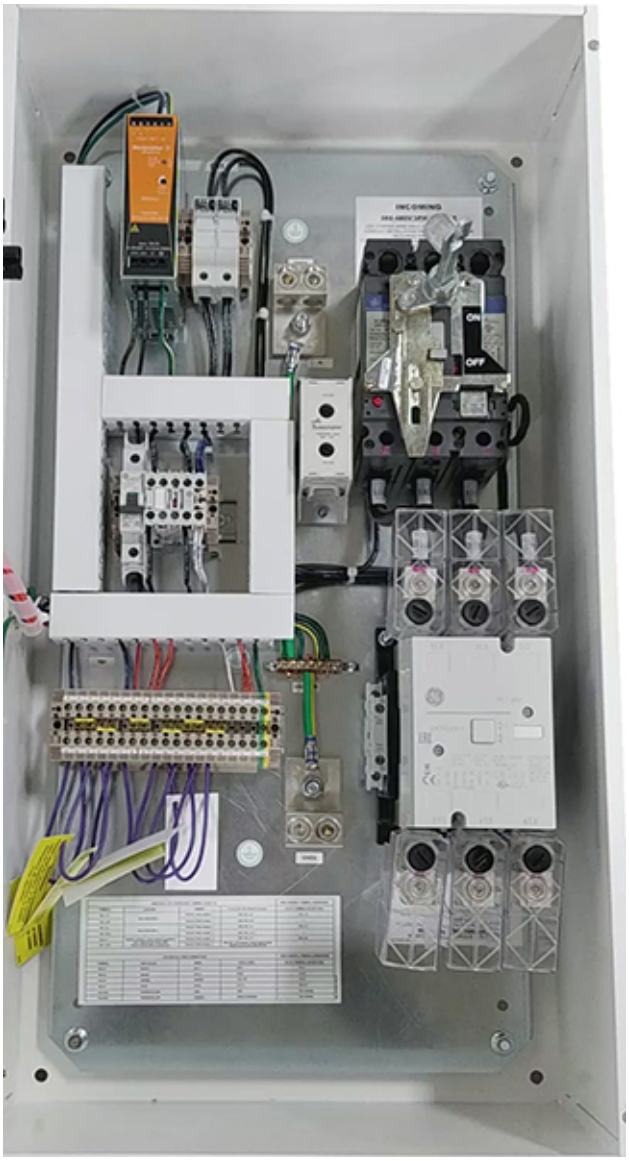
5.1.3.1 Emergency Off Switch

The A1 mains disconnect shall provide over-current protection for the entire system and have at least one Emergency OFF switch within the scan suite, near the scanner desktop.

5.1.3.2 Local Disconnects

The A1 mains disconnect with Lock-out and Tag-out (LOTO) capability shall be installed within the scan suite "(OSHA Title 29 CFR). See Figure 58 on page 92.

Figure 58 Typical Primary Power Disconnect (A1) – Fusible Disconnect and Magnetic Contactor



5.1.4 Electrical and Junction Boxes

All electrical boxes and junction boxes shall be installed as specified by the architectural, mechanical, or electrical drawings associated with the design of the site.

5.1.5 Power Feed and Overcurrent Requirements

5.1.5.1 Power Feed

The system shall operate on a three-phase electrical power supply input that is provided with a 4-wire grounded-wye configuration. No delta configuration is available. Qualified personnel shall verify the

power transformer and feeder lines (at the point of take-off) leading to the PET/CT scanner, meet all requirements stated in this document.

5.1.5.2 Voltage

Voltage range: 200/220/240 VAC; 380-480 VAC

5.1.5.3 Frequency

Frequency ranges: 50 or 60 Hz, +/- 3 Hz

5.1.5.4 Average Power Demand at Maximum Duty Cycle

Average power demand at maximum duty cycle: 30 kVA

5.1.5.5 Idle Power Demand

Idle power demand is 10 kVA without rotation and X-ray.

5.1.5.6 Maximum Power Demand

Maximum power demand is 90 kVA at 0.85 PF at a selected technique of 140 kV and 380 mA.

5.1.5.7 Under voltage Release Control

The preferred disconnect, will utilize under voltage release control, rather than shunt trip devices.

5.1.5.8 Overcurrent Protection

To prevent power loss to other loads during an unexpected system fault, the power feeder shall have overcurrent protection such that the downstream overcurrent protection devices clear the fault before an up-stream overcurrent protection device opens.

5.1.5.9 Voltage Regulation Effects

To minimize voltage regulation effects, keep power wiring between the facility main distribution panel and the PDU as short as possible.

5.1.5.10 Load Regulation

Total load regulation, measured at the PDU input terminals, shall not exceed 6%.

5.1.6 Phase Imbalance

The difference between the highest line-to-line voltage and lowest line-to-line voltage shall not exceed 2% of the lowest line-to-line voltage.

5.1.7 Sags, Surges, and Transients

5.1.7.1 Sags and Surges

Sags and surges of the power line shall not exceed the absolute range limits show in Table 19 on page 95.

5.1.7.2 Transient Voltage

The maximum transient voltage is 1500 V peak.

5.1.8 Power Source Configuration

5.1.8.1 Neutral Wire

If a neutral wire is used, it shall be terminated in the A1 disconnect.

5.1.8.2 Dedicated Feeder (A1 Mains)

A dedicated main distribution panel (A1 Mains) or MDP (Mains Disconnect Panel), shall be used to supply power to the scanner. The A1 mains shall be located in the same room as the PDU.

5.1.8.3 Protective Disconnect Device Location

The protective disconnect shall be located within 10 m (32 ft.) of the PDU and be visible to personnel servicing the PDU.

5.1.8.4 Protective Disconnect Device with LOCK-OUT/TAG-OUT

The National Electrical Code (NFPA 70) states there shall be a protective disconnect device with a LOCK-OUT and TAG-OUT provision in the power supply line leading to the PDU.

5.1.9 Dedicated Distribution Transformer

5.1.9.1 Dedicated Feeder (A1 Mains)

It is recommended a dedicated distribution transformer from the facility's main isolation transformer supply power to the PET/CT Scanner.

5.1.9.2 Power Distribution Transformer

The minimum recommended size for a dedicated distribution transformer is: 112.5 kVA, rated 2.4% regulation at unity power factor. Resultant maximum allowable feeder regulation is 3.4%.

5.1.9.3 Using an Existing Distribution Transformer

Do not use an existing distribution transformer to power a system if other X-ray equipment, using rapid film changers, is connected to the existing transformer.

5.1.10 System Power Requirements

The customer shall ensure the site meets all minimum system power requirements listed below before installation can begin.

- Maximum power demand = 90kVA @ 0.85 PF: at a Selected Technique of 140 kV, 380 mA.
- Continuous (average) power demand at maximum duty cycle = 10 kVA.
- Maximum allowable total source regulation is 6%.

Table 19 Nominal Line Voltage and Current Ranges

Nominal line voltage MUST fall within ONE of these ranges.									
Nominal Line Voltage	200	220	240	380	400	420	440	460	480
Hi-Line Limit, +10%	220	242	264	418	440	462	484	506	528
Lo-Line Limit, -10%	180	198	216	342	360	378	396	414	434
Continuous Line Current	58	52	48	30	29	27	26	25	24
Momentary Line Current	260	236	217	137	130	124	118	113	108
Maximum Line Current	289	262	241	152	144	137	131	126	120
Minimum Recommended Circuit Protection Rating	150	150	150	110	110	100	100	90	90

Table 20 Minimum Feeder Wire Size

Feeder Length (Power Substation to A1 Disconnect)	Minimum Feeder Wire Size, AWG or MCM (sq. mm)/ VAC								
	200 VAC	220 VAC	240 VAC	380 VAC	400 VAC	420 VAC	440 VAC	460 VAC	480 VAC
15 m (50 ft)	1/0 (55)	1/0 (55)	1/0 (55)	2 (35)	2 (35)	3 (30)	3 (30)	3 (30)	3 (30)
30 m (100 ft)	2/0 (70)	1/0 (55)	1/0 (55)	2 (35)	2 (35)	3 (30)	3 (30)	3 (30)	3 (30)
46 m (150 ft)	4/0 (100)	3/0 (85)	2/0 (70)	2 (35)	2 (35)	3 (30)	3 (30)	3 (30)	3 (30)
61 m (200 ft)	5/0 (125)	4/0 (100)	4/0 (100)	2 (35)	2 (35)	3 (30)	3 (30)	3 (30)	3 (30)
76 m (250 ft)	6/0 (170)	5/0 (125)	5/0 (125)	1 (45)	1 (45)	2 (35)	2 (35)	2 (35)	3 (30)
91 m (300 ft)	7/0 (215)	6/0 (170)	5/0 (125)	1/0 (55)	1/0 (55)	1 (45)	1 (45)	2 (35)	2 (35)

Minimum Feeder Wire Size continued									
Feeder Length (Power Substation to A1 Disconnect)	**Minimum Feeder Wire Size, AWG or MCM (sq. mm)/ VAC**								
	200 VAC	**220 VAC**	**240 VAC**	**380 VAC**	**400 VAC**	**420 VAC**	**440 VAC**	**460 VAC**	**480 VAC**
107 m (350 ft)	8/0 (275)	7/0 (215)	6/0 (170)	2/0 (70)	1/0 (55)	1/0 (55)	1 (45)	1 (45)	1 (45)
122 m (400 ft)	8/0 (275)	7/0 (215)	7/0 (215)	2/0 (70)	2/0 (70)	1/0 (55)	1/0 (55)	1/0 (55)	1 (45)

NOTE

In all cases the recommended ground wire is a 1/0 (55 sq. mm) ground wire.

Table 21 Minimum Sub-Feeder Wire Size

Sub-feeder Length (A1 to PDU)	**Minimum Sub-feeder Wire, AWG or MCM (sq. mm)**								
	200 VAC	**220 VAC**	**240 VAC**	**380 VAC**	**400 VAC**	**420 VAC**	**440 VAC**	**460 VAC**	**480 VAC**
9.75 m (32 ft)	1/0 (55)	1/0 (55)	1/0 (55)	2 (35)	2 (35)	3 (30)	3 (30)	3 (30)	3 (30)

The information in Table 19 on page 95, Table 20 on page 95, and Table 21 on page 96 (above) assumes the use of copper wire, rated 75° C and run in steel conduit. All ampacity is determined in accordance with the National Electrical Code (NFPA 70), Table 310-16 (2002). The ampacity of the circuit protection device listed above determines the minimum feeder size, except where total source regulation limits require a larger size.

NOTE

Power feeders running under the scan room floor, as well as power vault substations under the floor, above the scan suite, or in adjacent rooms, may cause excessive EMI fields. The responsibility for meeting all site EMI requirements rests with the customer.

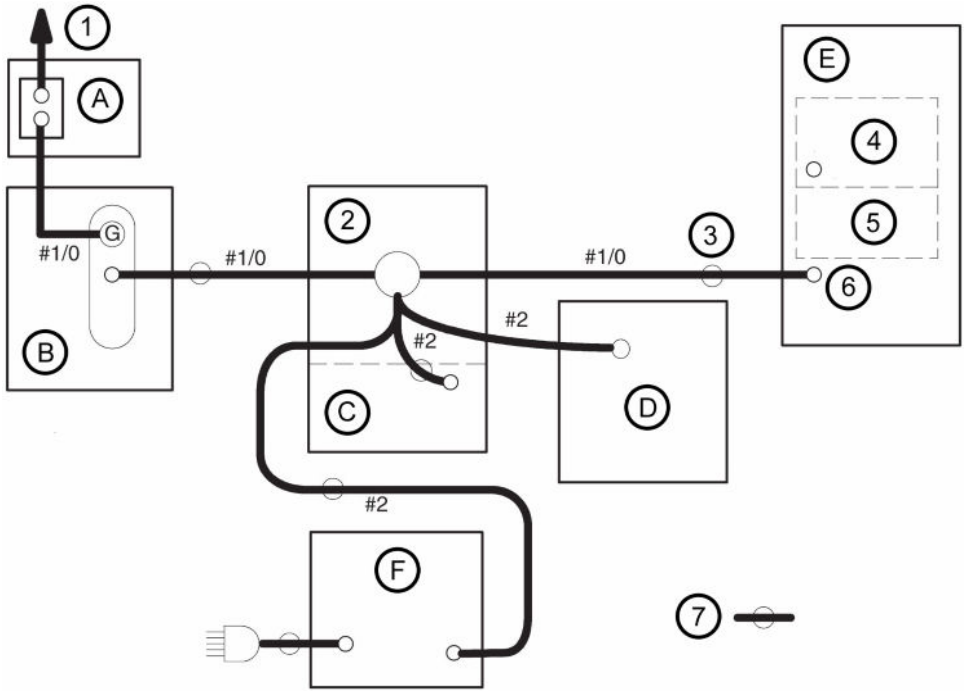
5.2 Grounding

The design of the scanner uses an equal potential grounding system. Figure 59 on page 97 and Table 22 on page 97 detail the required ground system. Three primary grounding points exist, they include:

- A system power ground point located in the PDU.
- A reference ground point located between the gantry and the table base.
- A patient ground point located at the front of the table base.

The electrical contractor shall ground ALL patient-accessible metal surfaces to the same potential as the A1 Disconnect. The electrical contractor shall bond the ground wire to any intermediate distribution panel the ground wire passes through, in accordance with all local codes.

Figure 59 System Ground Map



Note: Shield/signal grounds are not shown.			
A	A1 Power Disconnect	1	To power vault ground
B	Power Distribution Unit (PM)	2	Table/Gantry junction raceway
C	Table (CT1)	3	Part of Gantry
D	Q.Core or PARC4.X Reconstruction Cabinet (PRC4)	4	Rotating Assembly frame
E	Gantry (CT2)	5	Tilt Mech
F	Operator's Console/Computer (OC1)	6	Frame
		7	Ground wire in supplied cable

Table 22 System Ground Points

Ground Points	Description
Bonding Power from A1 to PDU	The metal conduit, raceway, or armored cabling used to run power from the A1 Disconnect to the PDU shall be bonded in accordance to the NEC.
Dedicated Ground	A dedicated 1/0 (55 mm^2), or larger, insulated copper ground wire shall be installed between the main distribution panel and the PDU, in accordance with the NEC.

Grounding Power, A1, and PDU	All three-phase wires with ground running between the power source, the A1 Disconnect, and the PDU shall be installed in accordance to the NEC.
Maximum Resistance Between PDU and Facility Ground	The resistance between the PDU ground and the facility Earth ground shall not exceed 0.5 ohm.
Maximum Resistance Between PDU and Earth	The resistance between the PDU ground and Earth ground shall not exceed 2 ohms.
Cable Shielding and Grounding	All interconnect cables to peripheral devices shall be shielded and properly grounded, except where technologically prohibited.

5.3 System Interconnection and Cabling

5.3.1 Component Interconnections

The customer and electrical contractor shall refer to the following system, network, and power interconnection requirements:

- Table 23 on page 98 defines the component designators for system equipment, electrical components, options, and communication outlets.
- Table 24 on page 99 details the Standard-Length Cable Kit 5491000-3 (P5051TE) – Supplied by GE Healthcare.
- Table 25 on page 103 details the Long-Length Cable Kit, Optional 5491000-4 (P5051TF) – Supplied by GE Healthcare
- Table 26 on page 106 details the PDU/UPS Cables (Standard-Length) – Supplied by GE Healthcare.
- Table 27 on page 107 details the A1/UPS Cables – Supplied by GE Healthcare.
- Table 28 on page 107 details the Miscellaneous Electrical Cables – Supplied by Customer/Contractor.
- Table 29 on page 108 details the Miscellaneous Electrical Components – Supplied by Customer/Contractor.

5.3.1.1 Component Designators

Table 23 Component Designators

Designator	Applies to:	Source
A1	Primary power disconnect	Contractor-supplied
BBNC	Broadband Network Connection	Contractor-supplied
CT1	Patient Table	System
CT2	Gantry	System

Component Designators continued		
Designator	**Applies to:**	**Source**
DS	Door Interlock Switch	Contractor-supplied
EPO	Emergency Power Off	Contractor-supplied
OC1	Operator Console (Scanner Desktop)/computer	System
PDU	Power Distribution Unit	System
PRC4	PARC4.X Reconstruction Cabinet	System
SEO	System Emergency Off	Contractor-supplied
SM	Slave Monitor	Option
WL/AD	X-ray on warning light/ Audible Device	Contractor-supplied

5.3.1.2 Cable Specifications

Table 24 Standard-Length Cable Kit 5491000-3 (P5051TE) – Supplied by GE Healthcare

Run #	**Length, Actual [Usable] m (ft)**	**Part Number**	**Description**	**UL Cable Information**								**Pull Size mm (in.)**
				UL Style	**Flame Rating**	**Voltage Rating**	**Actual Voltage**	**Temp. Rating (C)**	**Dia. mm (in.)**	**# of Cond.**	**Wire Size (AWG)**	
PET Gantry to Console Cable Collector 5485380												
56	25.5 (83.7) [22.1 (73)]	5339979-3	Console GND to Raceway GND	1238	VW-1 (FT-1)	600	0	105	11.9 (0.47)	1	2	12.2 (0.5)
102	26.4 (86.6) [22.9 (75)]	2373436-2	Gantry to Console LAN	RG-22	FT-4	1900	<30 VDC		5.9 (0.23)	8	24	15 (0.6)
101	26.4 (86.6) [22.9 (75)]	5419981	Console to MSUB J9	RG-22	FT-4	300	<30 VDC	80	11.2 (0.44)	25	22	17x58 (0.7x2.3) 19x51 (0.7x2.0)
103 **Note1**	25 (82) [21.9 (72)]	2117848-2**(Not Used)**	Fiber Optic - Console to Gantry			NA	NA			1	NA	

Standard-Length Cable Kit 5491000-3 (P5051TE) – Supplied by GE Healthcare continued												
Run #	**Length, Actual [Usable] m (ft)**	**Part Number**	**Description**	**UL Cable Information**								**Pull Size mm (in.)**
				UL Style	**Flame Rating**	**Voltage Rating**	**Actual Voltage**	**Temp. Rating (C)**	**Dia. mm (in.)**	**# of Cond.**	**Wire Size (AWG)**	
XX	25 (82) [21.9 (72)]	5432019	Fiber Optic - Gantry to Console			NA	NA			1	NA	
200	30.5 (100) [22.9 (75)]	5313938-6	J7 to Console, Respiratory	UL	FT-4	300	<30 VDC	60	6.8 (0.26)	4 pair	24	13 (0.5)
XX	28.2 (92.5) [24.8 (82)]	5193969-4	Cable - LAN	UL	FT-4			60			24	40 (1.5)
XX	30.5 (100) [27.7 (91)]	5169456	Gantry to Injector	2464	FT-4	300		80	6.6 (0.26)		22	40 (1.5)
XX	30.5 (100) [7.6 (25)]	5199717	Gantry to RPM Unit	UL	FT-4	300	<15 VDC		5.9 (0.23)	4	22	15 (0.5)
PET Gantry to PDU Cable Collector 5485383												
52A **Note1**	8.6 (28.2) [6.1 (20)]	2343528-2 **(Not Used)**	PDU to Gantry 120VAC	2587	FT-4	600	208Y/120	90	13.8 (0.54)	5	8	56.4 (2.2)
52A	8.6 (28.2) [6.1 (20)]	2343528-4	PDU to Gantry 120VAC	2587	FT-4	600	208Y/120	90	13.8 (0.54)	5	8	56.4 (2.2)
50A	8.6 (28.2) [6.1 (20)]	2343529-2	HVDC from PDU to Gantry	2587	FT-4	600	350 VDC	90	19 (0.75)	3	(2) 4, (1) 8	22 (0.9)
51A	8.6 (28.2) [6.1 (20)]	2343530-2	Axial Drive Power PDU to Gantry	2587	FT-4	600	440Y/254	90	12.3 (0.48)	4	14	

Standard-Length Cable Kit 5491000-3 (P5051TE) – Supplied by GE Healthcare continued												
Run #	**Length, Actual [Usable] m (ft)**	**Part Number**	**Description**	**UL Cable Information**								**Pull Size mm (in.)**
				UL Style	**Flame Rating**	**Voltage Rating**	**Actual Voltage**	**Temp. Rating (C)**	**Dia. mm (in.)**	**# of Cond.**	**Wire Size (AWG)**	
55A	8.6 (28.2) [6.1 (20)]	5339979-2	Raceway GND to PDU - GND	1238	VW-1 (FT-1)	600	0	105	11.9 (0.47)	1	2	12.2 (0.5)
100A	9.9 (32.5) [6.1 (20)]	5120646-2	PDU to MSUB J11		FT-4	300	<30 VDC	80	11.2 (0.44)	25	22	17x58 (0.7x2.3) 19x51 (0.7x2.0)
PET Gantry to Q.Core Cable Collector 5485385												
209A	13 (42.6) [9.6 (32)]	5339979-6	Q.Core GND to Raceway GND	1238	VW-1 (FT-1)	600	0	105	11.9 (0.47)	1	2	12.2 (0.5)
203	13 (42.6) [9.9 (33)]	5313938-7	SBA J7 to Q.Core J6	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
201	13 (42.6) [8.4 (28)]	5313938-8	Q.Core J4 to Switch Port 5	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
PET/CT Gantry to PARC4.X Cables												
209A	13 (42.6) [9.3 (30.5)]	5339979-6	PARC4.X GND to Raceway GND	1015, 1063, 1284, 1283	VW-1 (FT-1)	600	0	105	11.9 (0.47)	1	2	12.2 (0.5)
201	13 (42.6) [6.8 (22.3)]	5313938-8	PARC4.X J4 to Switch Port 5	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)

Standard-Length Cable Kit 5491000-3 (P5051TE) – Supplied by GE Healthcare continued												
Run #	**Length, Actual [Usable] m (ft)**	**Part Number**	**Description**	**UL Cable Information**								**Pull Size mm (in.)**
				UL Style	**Flame Rating**	**Voltage Rating**	**Actual Voltage**	**Temp. Rating (C)**	**Dia. mm (in.)**	**# of Cond.**	**Wire Size (AWG)**	
202	13 (42.6) [8.4 (28)]	5313938-9 **Note 1**	PARC-II J5 to Switch Port 7	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
206	13 (42.6) [8.3 (27.2)]	5313938-13	PARC4.X J5 to SBA J1	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
Miscellaneous Cables in Kit 5491000-3												
203	13 (42.6) [9.6 (32)]	5313941-2	PDU TS5 to PARC4.X Bulkhead	2587	FT-4	600	208Y/120	60	19 (0.75)	5	10	25 (1.0)
203	13 (42.6) [9.6 (32)]	2343531-4	Q.Core Power from PDU, short	2587	FT-4	600	120 VAC	90	11.7 (0.46)	3	10	56.4 (2.2)
053A	19.9 (65.3) [16.6 (54)]	2343531-2	PDU TS5 to Console Power	2587	FT-4	600	120 VAC	90	12.2 (0.48)	3	10	56.4 (2.2)
206	13 (42.6) [8.4 (28)]	5313938-13	Q.Core J5 to SBA J1	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
Note 1: Extra Cable. Not used for Discovery IQ systems.												

Table 25 Long-Length Cable Kit, Optional 5491000-4 (P5051TF) – Supplied by GE Healthcare

Run #	Length, Actual [Usable] m (ft)	Part Number	Description	UL Cable Information								Pull Size mm (in.)
				UL Style	Flame Rating	Voltage Rating	Actual Voltage	Temp. Rating (C)	Dia. mm (in.)	# of Cond.	Wire Size (AWG)	
PET Gantry to Console Cable Collector 5485380												
56	25.5 (83.7) [22.1 (73)]	5339979-3	Console GND to Raceway GND	1238	VW-1 (FT-1)	600	0	105	11.9 (0.47)	1	2	12.2 (0.5)
102	26.4 (86.6) [22.9 (75)]	2373436-2	Gantry to Console LAN	RG-22	FT-4	1900	<30 VDC		5.9 (0.23)	8	24	15 (0.6)
101	26.4 (86.6) [22.9 (75)]	5419981	Console to MSUB J9	RG-22	FT-4	300	<30 VDC	80	11.2 (0.44)	25	22	17x58 (0.7x2.3) 19x51 (0.7x2.0)
103 **Note1**	25 (82) [21.9 (72)]	2117848-2 **(Not Used)**	Fiber Optic - Console to Gantry			NA				1	NA	10 (0.4)
XX	25 (82) [21.9 (72)]	5432019	Fiber Optic - Gantry to Console			NA				1	NA	
200	30.5 (100) [22.9 (75)]	5313938-6	J7 to Console, Respiratory	UL	FT-4	300	<30 VDC	60	6.8 (0.26)	4 pair	24	13 (0.5)
XX	28.2 (92.5) [24.8 (82)]	5193969-4	Cable - LAN	UL	FT-4			60			24	40 (1.5)
XX	30.5 (100) [27.7 (91)]	5169456	Gantry to Injector	2464	FT-4	300		80	6.6 (0.26)		22	40 (1.5)
XX	30.5 (100) [7.6 (25)]	5199717	Gantry to RPM Unit	UL	FT-4	300	<15 VDC		5.9 (0.23)	4	22	15 (0.5)

Long-Length Cable Kit, Optional 5491000-4 (P5051TF) – Supplied by GE Healthcare continued												
Run #	**Length, Actual [Usable] m (ft)**	**Part Number**	**Description**	**UL Cable Information**								**Pull Size mm (in.)**
				UL Style	**Flame Rating**	**Voltage Rating**	**Actual Voltage**	**Temp. Rating (C)**	**Dia. mm (in.)**	**# of Cond.**	**Wire Size (AWG)**	
PET Gantry to PDU Cable Collector 5485382												
52 **Note1**	19.4 (63.6) [17.2 (56)]	2343528 **(Not Used)**	PDU to Gantry 120VAC	2587	FT-4	600	208Y/120	90	13.8 (0.54)	5	8	56.4 (2.2)
52	19.4 (63.6) [17.2 (56)]	2343528-3	PDU to Gantry 120VAC	2587	FT-4	600	208Y/120	90	13.8 (0.54)	5	8	56.4 (2.2)
50	19.4 (63.6) [17.2 (56)]	2343529	HVDC from PDU to Gantry	2587	FT-4	600	350 VDC	90	19 (0.75)	3	(2) 4, (1) 8	22 (0.9)
51	19.4 (63.6) [17.2 (56)]	2343530	Axial Drive Power PDU to Gantry	2587	FT-4	600	440Y/254	90	12.3 (0.48)	4	14	
55	19.4 (63.6) [17.2 (56)]	5339979	Raceway GND to PDU - GND	1238	VW-1 (FT-1)	600	0	105	11.9 (0.47)	1	2	12.2 (0.5)
100	21.4 (70.2) [18.9 (62)]	5120646	PDU to MSUB J11		FT-4	300	<30 VDC	80	11.2 (0.44)	25	22	17x58 (0.7x2.3) 19x51 (0.7x2.0)
PET Gantry to Q.Core Cable Collector 5485384												
209	25.5 (83.6) [22.1 (73)]	5339979-5	Q.Core GND to Raceway GND	1238	VW-1 (FT-1)	600	0	105	11.9 (.47)	1	2	12.2 (0.5)
203	30.5 (100) [27.4 (90)]	5313938	SBA J7 to Q.Core J6	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)

Long-Length Cable Kit, Optional 5491000-4 (P5051TF) – Supplied by GE Healthcare continued												
Run #	**Length, Actual [Usable] m (ft)**	**Part Number**	**Description**	**UL Cable Information**								**Pull Size mm (in.)**
				UL Style	**Flame Rating**	**Voltage Rating**	**Actual Voltage**	**Temp. Rating (C)**	**Dia. mm (in.)**	**# of Cond.**	**Wire Size (AWG)**	
201	30.5 (100) [25.9 (85)]	5313938-2	Q.Core J4 to Switch Port 5	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
PET/CT Gantry to PARC4.X Cables												
209	25.5 (83.6) [21.8 (71.5)]	5339979-5	PARC4.X GND to Raceway GND	1015, 1063, 1284, 1283	VW-1 (FT-1)	600	0	105	11.9 (.47)	1	2	12.2 (0.5)
201	30.5 (100) [24.3 (79.7)]	5313938-2	PARC4.X J4 to Switch Port 5	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
202	30.5 (100) [25.9 (85)]	5313938-3 **Note 1**	PARC-II J5 to Switch Port 7	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
206	30.5 (100) [25.8 (84.6)]	5313938-12	PARC4.X J5 to SBA J1	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
Miscellaneous Cables in Kit 5491000-4												
203	19.4 (63.6) [15.8 (52)]	5313941	PDU TS5 to PARC4.X Bulkhead	2587	FT-4	600	208Y/120	60	19 (0.75)	5	10	25 (1.0)
203	19.4 (63.6) [16 (52.6)]	2343531-3	Q.Core Power from PDU, long	2587	FT-4	600V	120 VAC	90	11.7 (0.46)	3	10	56.4 (2.2)

Long-Length Cable Kit, Optional 5491000-4 (P5051TF) – Supplied by GE Healthcare continued												
Run #	**Length, Actual [Usable] m (ft)**	**Part Number**	**Description**	**UL Cable Information**								**Pull Size mm (in.)**
				UL Style	**Flame Rating**	**Voltage Rating**	**Actual Voltage**	**Temp. Rating (C)**	**Dia. mm (in.)**	**# of Cond.**	**Wire Size (AWG)**	
053	24.5 (80.4) [21.2 (69)]	2343531	PDU TS5 to Console Power	2587	FT-4	600	120 VAC	90	12.3 (0.48)	3	10	56.4 (2.2)
206	30.5 (100) [25.9 (85)]	5313938-12	Q.Core J5 to SBA J1	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
Note 1: Extra Cable. Not used for Discovery IQ systems.												

Table 26 UPS Cables (Standard-Length) – Supplied by GE Healthcare

Run #	**Cable Length, Actual [Usable] m (ft)**	**Part Number**	**Description**	**UL Cable Information**								**Pull Size mm (in.)**
				UL Style	**Flame Rating**	**Voltage Rating**	**Actual Voltage**	**Temp. Rating (C)**	**Dia. mm (in.)**	**# of Cond.**	**Wire Size (AWG)**	
060	6 (19.7) [5 (16)]	5125079	PDU to UPS	2587	FT4	600	± 350V DC	90	19 (0.75)	5	8	22 (0.9) Dia.
061	6 (19.7) [5 (16)]	5125079-2	UPS to PDU	2587	FT4	600	440Y/254	90	15 (0.60)	5	8	22 (0.9) Dia.
110	14 (46) [13.7 (45))	5169224	A1 to UPS	2587	FT4	600	208Y/120	90	14 (0.54)	5	18	25 (1.0) Dia.

Table 27 A1 UPS

PDU Model No.	Maximum Nominal kVA Rating	Required Mains Disconnect (A1) Catalog No.		Optional Partial UPS Kit Catalog No. (See Note 2)
		Europe and Asia (380-400V or 420V) (See Note 1)	North America (440V or 460-480V)	
NGPDU-71	90 kVA	E4502AC (110A) Includes Auto Restart and Integrated UPS Control	E4502AB (90A) Includes Auto Restart and Integrated UPS Control	B7864PZ PowerWare 9355-15-14GE (14.4 kVa - 40A)
NGPDU-71	90 kVA	E4502BC (110A) Includes Auto Restart and Integrated UPS Control	E4502BB (90A) Includes Auto Restart and Integrated UPS Control	
Note 1: Additional A1 Disconnects for Europe available through European Sales Team **Note 2:** REQUIRES one of the A1 mains disconnect detailed at left, or equivalent.				

Table 28 Miscellaneous Electrical Cables – Supplied by Customer/Contractor

Customer Installed Wiring		Description	Cables Supplied			Plug Pulling Dimensions		Wire and Cable Pigtails m (ft)	
Qty	Size AWG (mm^2)		Part No	Length m (ft)	Dia. in. (mm)	From m	To	From	To
RUN NO. 1 FROM PRIMARY POWER SOURCE TO FACILITY DISCONNECT (POWER SOURCE - A1) Maximum Run Length *									
3	*	POWER						1 (3)	1 (3)
1	1/0 (50)	GROUND						1 (3)	1 (3)
RUN NO. 2 FROM FACILITY DISCONNECT TO POWER DISTRIBUTION UNIT (A1 - PM) Maximum Run Length *									
3	*	POWER						1 (3)	1 (3)
1	1/0 (50)	GROUND						1 (3)	1 (3)
-	-	NEUTRAL - Not Required						1 (3)	1 (3)
RUN N0. 3 FROM FACILITY DISCONNECT TO SYSTEM EMERGENCY OFF (A1 - SEO)									
2	14 (2)	Partial UPS EPO Circuit						2 (6)	2 (6)
2	14 (2)	Facility Disconnect EPO Circuit						2 (6)	2 (6)

Miscellaneous Electrical Cables – Supplied by Customer/Contractor continued									
Customer Installed Wiring		**Description**	**Cables Supplied**			**Plug Pulling Dimensions**		**Wire and Cable Pigtails m (ft)**	
1	14 (2)	GROUND						2 (6)	2 (6)
RUN NO. 4 POWER DISTRIBUTION UNIT TO WARNING LIGHT / AUDIBLE DEVICE CONTROL (PDU - WL/AD)									
2	14 (2)	WARNING LIGHT / AUDIBLE DEVICE 24 VOLT							
		CONTROL TS6 1, 2, 3, 4, 5, 6, 7, 8							
RUN NO. 5 POWER DISTRIBUTION UNIT TO SCAN ROOM DOOR INTERLOCK (PDU - DOOR SWITCH)									
2	14 (2)	SCAN ROOM DOOR INTER LOCK TS6 9, 10							
*REFER TO LOCAL BUILDING CODES FOR AWG (MM^2) WIRE SIZES.									
RUN NO. n/a BBNC									
1	customer determined	Hospital Broadband Network Connection (Wall Jack: Placed on the wall behind the console.)							

Table 29 Miscellaneous Electrical Components – Supplied by Customer/Contractor

Reference	Associated Equipment	Material/Labor Supplied by Customer Contractor	USA Vendor / CAT No. GE Catalog
A1 200V - 240V, 380V - 480V 50/60 Hz	Circuit Breaker with Magnetic Contactor	Three Pole, 200V - 240V or 380V - 480V, Combination breaker with magnetic contactor. Includes control transformer, optional UPS interface, On/Off controls and auto-restart feature, if GE-supplied.	Recommend: • E4502AC (110A) • E4502AB (90A) **Note:** For systems with UPS, refer to Table 27 on page 107 for A1 panel. Optional remote operator control available from GE Supply, Cat # GESCTR0CS1
A1 200V - 240V, 380V - 480V 50/60 Hz	Circuit Breaker with Magnetic Contactor	Three Pole, 200V - 240V or 380V - 480V, Combination breaker with magnetic contactor. Includes control transformer, optional UPS interface, On/Off controls and auto-restart feature, if GE-supplied.	Recommend: • E4502BC (110A) • E4502BB (90A) **Note:** For systems with UPS, refer to Table 27 on page 107 for A1 panel. Optional remote operator control available from GE Supply, Cat # GESCTR0CS1

Miscellaneous Electrical Components – Supplied by Customer/Contractor continued			
Reference	**Associated Equipment**	**Material/Labor Supplied by Customer Contractor**	**USA Vendor / CAT No. GE Catalog**
BBNC (required)	Broad-band Network Connection	Broad-Band network connection wall jack, located within 1m (39inches) of Operator Console location, for internal hospital networking and InSite Broad-Band connectivity. Cabling to conform to facility's IT standards.	
	System Components	Reference the system installation drawings supplied by Installation Support Services within your geographic area.	
		Room Warning Light Controller	E4500AM

5.3.2 Cable Routing Requirements

5.3.2.1 Properly Sized Conduit, Duct Work, and Floor Troughs

Install appropriate conduits, duct work, and floor troughs for all system cables. Refer to Table 24 on page 99 through Table 28 on page 107.

NOTE

To minimize the need for additional junction boxes, use either a cable raceway system or a raised computer floor. The system uses prefabricated cables with large plugs.

5.3.2.2 Future Expansion

Ensure all cable passageways have additional capacity for future cable installations.

5.3.2.3 Routing Power Wiring

All three-phase power wires and ground line shall run in the same conduit or raceway duct.

5.3.2.4 Power and System Control Wire Separation

Power supply wires and system control lines shall be located in separate conduit or ductwork.

5.3.2.5 Cabling External to CT components

All customer supplied equipment and GE options with cables outside the covers of the CT system components need to be taken into account for room planning. Ensure routing of cables avoids trip hazards and cable damage during system operation.

5.4 Scan Room Warning Light and Door Interlock

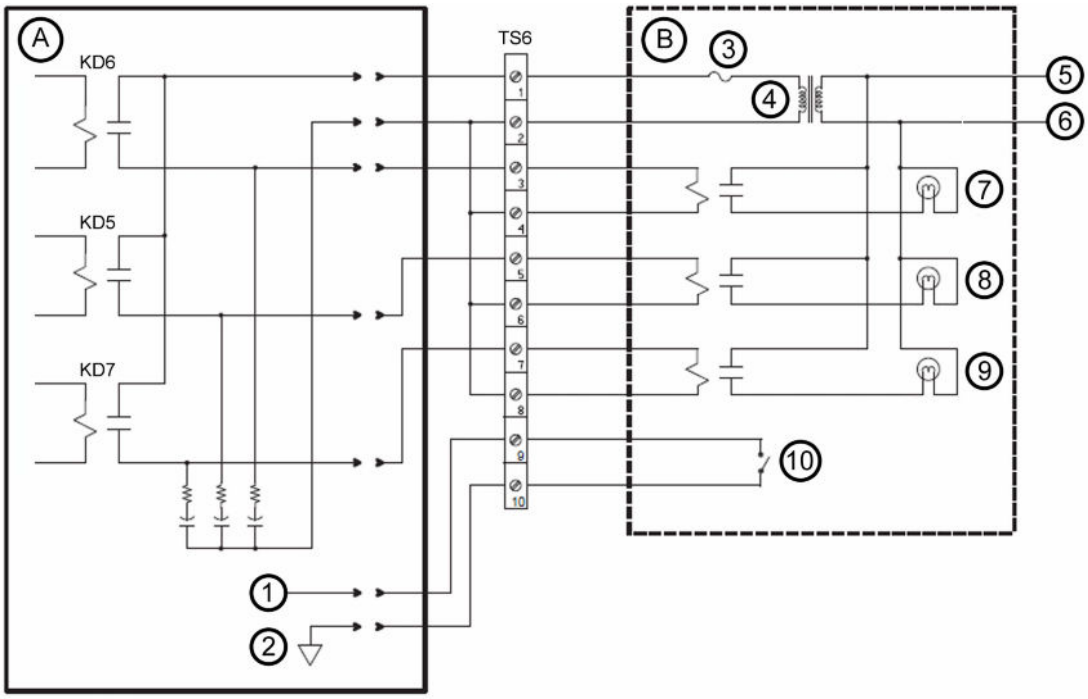
The scan room shall have a scan warning light and door interlock connected to the scan system as detailed in the following diagrams.

NOTE

The x-ray door contact (supplied by the customer) is: 15V DC @ 10 ma

5.4.1 X-Ray Warning Light

Figure 60 TS6 X-Ray Warning Light Connections



A	PDU	5	Line
B	Facility supplied room light	6	Neutral
1	EXP_INTLK signal	7	X-RAY light or Audible Device
2	PGND	8	SYS-ON light
3	Fuse	9	READY light (Room Warning lamp)
4	24V secondary	10	Door Switch

5.4.2 Scan Room Door Interlock Connections

NOTE

The terminal blocks detailed in Figure 61 on page 111 and Figure 62 on page 111 are located in the power distribution unit (PDU).

Figure 61 TS6 Room Door Interlock Connections – without Door Interlock

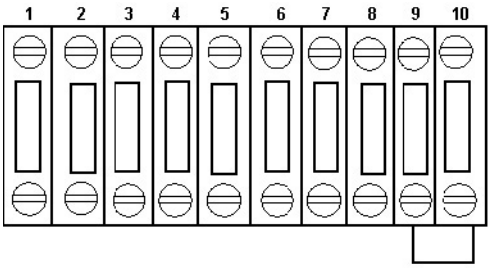
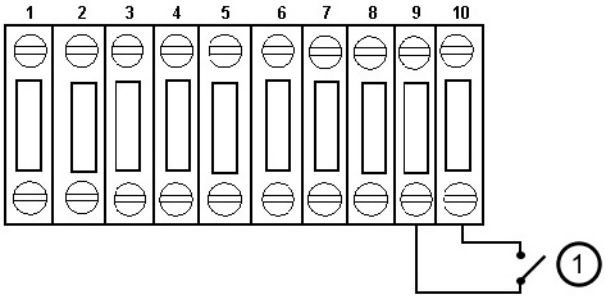


Figure 62 TS6 Room Door Interlock Connections – with Door Interlock



1	Normally open door switch

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6 Communications Requirements

6.1 Network Requirements

6.1.1 Communication Network

6.1.1.1 Network Wall Outlet

The customer shall provide an RJ45 wall outlet within 2 m (6.6 ft.) of the scanner desktop location.

6.1.1.2 Network Speed

Broadband interface type: 100 Mb Ethernet connection.

6.1.1.3 Network Communication

The customer shall ensure a network broadband line is installed and active.

6.1.1.4 Patch Cable

The customer shall provide a patch cable, not to exceed 3.05 m (10 ft.), to connect the scanner desktop to a wall outlet.

6.1.1.5 Cable Duct Work

The customer shall complete any cable duct work or conduit installation required for routing network cables to workstation, camera, and scanner desktop.

6.1.1.6 Communication Run to RJ45 Wall Outlet

The customer shall ensure the communication run from the hospital/facility network switch to the RJ45 wall outlet does not exceed 88 m (290 ft.).

6.1.2 Broadband Connectivity Information

The customer is responsible for providing the dedicated network IP address for the CT scanner. The nearest GE Zone Broadband Specialists typically become involved to ensure that the needs for the broadband connection and connectivity has been met. Not all areas of the globe have a zone broadband specialist. Typically, these individuals are trained to ensure that all required information is provided by the customer in support of the installation. If the zone does not have a broadband specialist then the PMI should work with the customer to gather the required information in support of the installation.

The CT scanner is typically installed in a medical facility. The facility may or may not have dedicated ***In house*** network IT support personnel for the facility. If there is dedicated In House network IT

personnel the customer and PMI should work with the zone broadband specialists (If one exists) to acquire the required broadband information to support the installation. Refer to Customer Pre-Installation Checklist for details.

For smaller facilities and clinics there may not be dedicated in house network IT personnel. If that is the case, the PMI should work with zone broadband specialist (If one exists) in advance to obtain the required broadband information and ensure that then needs of the broadband connection and connectivity have been met prior to the installation. Refer to the Customer Pre-Installation Checklist for details.

- Customer shall contact PMI to obtain the name of a zone broadband specialist.
- IT Infrastructure Changes- Zone broadband specialist and PMI will work with customer to complete identified infrastructure changes.
- VPN Compatable Appliance- Zone broadband specialist shall provide a VPN compatible appliance to support the IPSec tunneling protocol and 3DES data encryption.
- Coordinate VPN activities- Site IT contact shall coordinate VPN activities between radiology/ cardiology department and Information Technology department.
- Internet Service Provider- Customer and/or zone broadband specialist or dedicated in house network personnel responsible for providing the system IP address shall utilize an Internet Service Provider that supports static routing.
- Customer, Site and System Contact information- Customer shall provide GE PMI with an accurate site address, contact name, contact phone number, and contact email address for customer IT person or network support personnel.
- Ensuring Broadband Infrastructure Requirements- Site IT contact will work as liaison to assure site broadband connectivity meets GE requirements, as determined by mutual assessment with GE connectivity team.
- Equipment Assessment- Site IT contact shall complete an equipment assessment with GE connectivity team to determine site broadband readiness.

6.2 Digital Service and Connectivity Requirements

6.2.1 Background

GE Healthcare provides digital service and asset management through its InSite Connectivity Platform.

InSite RSvP (Remote Service Platform) is the latest connectivity platform that will eventually replace the existing InSite 1 connectivity infrastructure in the systems.

GE can proactively monitor the key operational parameters of your medical systems to provide early warning of potential issues to head off costly and unscheduled downtime. The GE online engineers can recalibrate key operational parameters to help ensure optimal system performance or can dispatch a field engineer to assist in mitigating the issue. Additionally, automated software downloads require reliable connectivity platform to ensure software updates and upgrades in a timely manner to keep the system working efficiently. Software downloads also significantly reduce the time it takes to upgrade your GE Healthcare devices, which means the scheduled system downtime and clinical workflow interruptions are greatly reduced.

The two major technical components of InSite RSvP are Agent and Server. The Agent is installed on the GE Healthcare equipment at the customer sites while the Server resides within GE Healthcare. The role of the Agent is to:

- monitor device performance data on an ongoing basis,
- establish secure communications to the Server via the Internet,
- and send fault information and log files to the Server

The Server uses the secure Web Services to communicate with the Agent. It processes the performance and fault information provided by the Agent.

6.2.2 InSite RSVP Connectivity Requirements

The Agent establishes connectivity from behind the safety of your corporate fire wall, adhering to all the security policies set up by your network administrators. To your network, the Agent is just another computer on the LAN. To set up the InSite 2.0 Agent at your site, the only networking requirements are as follows:

1. A physical connection or a route to an existing enterprise LAN
2. Allow outbound Internet access for the device using HTTPS protocol over port 443

GE Healthcare Field Engineer will configure network connections for InSite RSVP connectivity according to the site IT requirements.

Customer IT personal would need to ensure the following details to enable connectivity at install:

1. DNS IP Address or Proxy IP address and authentication information as applicable is made available when requested by the GE Field Engineer or Project manager of Installation
2. In case it is required to white list, only certain URLs being used by GE Healthcare, here is a list that could be used:
    a. Enterprise production: https://insite.gehealthcare.com:443
    b. Flexera URL: https://gehealthcare-ns.flexnetoperations.com

InSite RSVP utilizes existing the outbound broadband internet connection. It uses the Secure Sockets Layer (SSL) and complies with the existing fire wall rules and Web proxies. Once the Agent has established a secure tunnel, the connection is visible only to InSite RSvP clients and services (applications or users).

NOTE

For GEHC personnel:

1. If a customer is not able to provide the internet connection then GEHC needs to provide the internet connection along with the required router device.
2. If a customer has GEHC provided internet connection or has GEHC provided router device running on the customer provided internet connection then consult the customer if the same set is to be used.

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