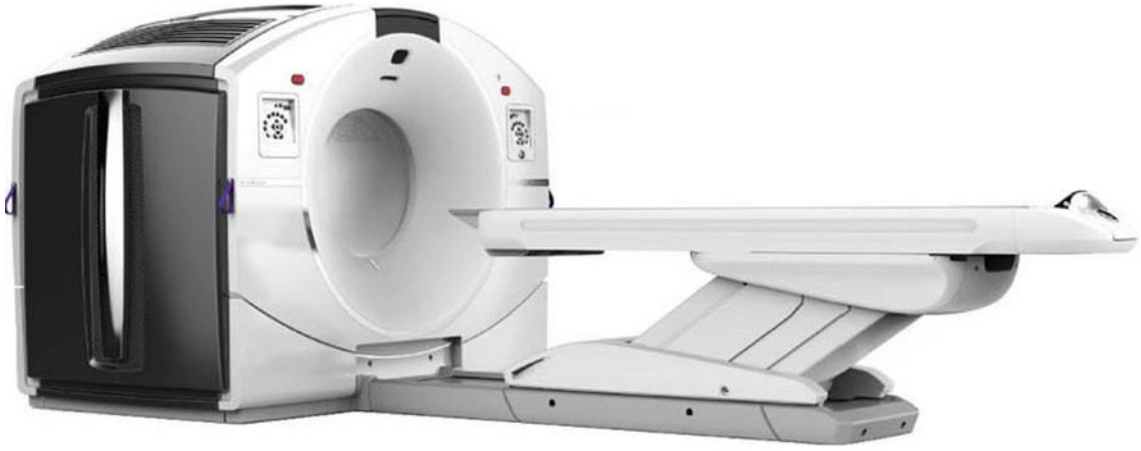
Discovery™ MI PET/CT
Pre-Installation Manual



OPERATING DOCUMENTATION

5661740-1EN
Revision 2

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 trained 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.

A radiation survey must be performed when a pin source has been removed and replaced. See Radiation Survey Form Instructions or contact your EHS Specialist.

Rev 2 (July 21, 2005)

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Important Information

LANGUAGE

ПРЕДУПРЕЖДЕНИЕ (BG)

Това упътване за работа е налично само на английски език.

- Ако доставчикът на услугата на клиента изиска друг език, задължение на клиента е да осигури превод.
- Не използвайте оборудването, преди да сте се консултирали и разбрали упътването за работа.
- Неспазването на това предупреждение може да доведе до нараняване на доставчика на услугата, оператора или пациента в резултат на токов удар, механична или друга опасност.

警告 (ZH-CN)

本维修手册仅提供英文版本。

- 如果客户的维修服务人员需要非英文版本，则客户需自行提供翻译服务。
- 未详细阅读和完全理解本维修手册之前，不得进行维修。
- 忽略本警告可能对维修服务人员、操作人员或患者造成电击、机械伤害或其他形式的伤 害。

警告 (ZH-HK)

本服務手冊僅提供英文版本。

- 倘若客戶的服務供應商需要英文以外之服務手冊，客戶有責任提供翻譯服務。
- 除非已參閱本服務手冊及明白其內容，否則切勿嘗試維修設備。
- 不遵從本警告或會令服務供應商、網絡供應商或病人受到觸電、機械性或其他的危險。

警告 (ZH-TW)

本維修手冊僅有英文版。

- 若客戶的維修廠商需要英文版以外的語言，應由客戶自行提供翻譯服務。
- 請勿試圖維修本設備，除非 您已查閱並瞭解本維修手冊。
- 若未留意本警告，可能導致維修廠商、操作員或病患因觸電、機械或其他危險而受傷。

UPOZORENJE (HR)

Ovaj servisni priručnik dostupan je na engleskom jeziku.

- Ako davatelj usluge klijenta treba neki drugi jezik, klijent je dužan osigurati prijevod.
- Ne pokušavajte servisirati opremu ako niste u potpunosti pročitali i razumjeli ovaj servisni priručnik.
- Zanemarite li ovo upozorenje, može doći do ozljede davatelja usluge, operatera ili pacijenta uslijed strujnog udara, mehaničkih ili drugih rizika.

VÝSTRAHA (CS)

Tento provozní návod existuje pouze v anglickém jazyce.

- V případě, že externí služba zákazníkům potřebuje návod v jiném jazyce, je zajištění překladu do odpovídajícího jazyka úkolem zákazníka.
- Nesnažte se o údržbu tohoto zařízení, aniž byste si přečetli tento provozní návod a pochopili jeho obsah.
- V případě nedodržování této výstrahy může dojít k poranění pracovníka prodejního servisu, obslužného personálu nebo pacientů vlivem elektrického proudu, respektive vlivem mechanických či jiných rizik.

ADVARSEL (DA)

Denne servicemanual findes kun på engelsk.

- Hvis en kundes tekniker har brug for et andet sprog end engelsk, er det kundens ansvar at sørge for oversættelse.
- Forsøg ikke at servicere udstyret uden at læse og forstå denne servicemanual.
- Manglende overholdelse af denne advarsel kan medføre skade på grund af elektrisk stød, mekanisk eller anden fare for teknikeren, operatøren eller patienten.

WAARSCHUWING (NL)

Deze onderhoudshandleiding is enkel in het Engels verkrijgbaar.

- Als het onderhoudspersoneel een andere taal vereist, dan is de klant verantwoordelijk voor de vertaling ervan.
- Probeer de apparatuur niet te onderhouden alvorens deze onderhoudshandleiding werd geraadpleegd en begrepen is.
- Indien deze waarschuwing niet wordt opgevolgd, zou het onderhoudspersoneel, de operator of een patiënt gewond kunnen raken als gevolg van een elektrische schok, mechanische of andere gevaren.

WARNING (EN)

This service manual is available in English only.

- If a customer's service provider requires a language other than English, it is the customer's responsibility to provide translation services.
- Do not attempt to service the equipment unless this service manual has been consulted and is understood.
- Failure to heed this warning may result in injury to the service provider, operator or patient from electric shock, mechanical or other hazards.

HOIATUS (ET)

See teenindusjuhend on saadaval ainult inglise keeles.

- Kui klienditeeninduse osutaja nõuab juhendit inglise keelest erinevas keeles, vastutab klient tõlketeenuse osutamise eest.
- Ärge üritage seadmeid teenindada enne eelnevalt käesoleva teenindusjuhendiga tutvumist ja sellest aru saamist.
- Käesoleva hoiatuse eiramine võib põhjustada teenuseosutaja, operaatori või patsiendi vigastamist elektrilöögi, mehaanilise või muu ohu tagajärjel.

VAROITUS (FI)

Tämä huolto-ohje on saatavilla vain englanniksi.

- Jos asiakkaan huoltohenkilöstö vaatii muuta kuin englanninkielistä materiaalia, tarvittavan käännöksen hankkiminen on asiakkaan vastuulla.
- Älä yritä korjata laitteistoa ennen kuin olet varmasti lukenut ja ymmärtänyt tämän huolto-ohjeen.
- Mikäli tätä varoitusta ei noudateta, seurauksena voi olla huoltohenkilöstön, laitteiston käyttäjän tai potilaan vahingoittuminen sähköiskun, mekaanisen vian tai muun vaaratilanteen vuoksi.

ATTENTION (FR)

Ce manuel d’installation et de maintenance est disponible uniquement en anglais.

- Si le technicien d'un client a besoin de ce manuel dans une langue autre que l'anglais, il incombe au client de le faire traduire.
- Ne pas tenter d'intervenir sur les équipements tant que ce manuel d’installation et de maintenance n'a pas été consulté et compris.
- Le non-respect de cet avertissement peut entraîner chez le technicien, l'opérateur ou le patient des blessures dues à des dangers électriques, mécaniques ou autres.

WARNUNG (DE)

Diese Serviceanleitung existiert nur in englischer Sprache.

- Falls ein fremder Kundendienst eine andere Sprache benötigt, ist es Aufgabe des Kunden für eine entsprechende Übersetzung zu sorgen.
- Versuchen Sie nicht diese Anlage zu warten, ohne diese Serviceanleitung gelesen und verstanden zu haben.
- Wird diese Warnung nicht beachtet, so kann es zu Verletzungen des Kundendiensttechnikers, des Bedieners oder des Patienten durch Stromschläge, mechanische oder sonstige Gefahren kommen.

ΠΡΟΕΙΔΟΠΟΙΗΣΗ (EL)

Το παρόν εγχειρίδιο σέρβις διατίθεται μόνο στα αγγλικά.

- Εάν ο τεχνικός σέρβις ενός πελάτη απαιτεί το παρόν εγχειρίδιο σε γλώσσα εκτός των αγγλικών, αποτελεί ευθύνη του πελάτη να παρέχει τις υπηρεσίες μετάφρασης.
- Μην επιχειρήσετε την εκτέλεση εργασιών σέρβις στον εξοπλισμό αν δεν έχετε συμβουλευτεί και κατανοήσει το παρόν εγχειρίδιο σέρβις.
- Αν δεν προσέξετε την προειδοποίηση αυτή, ενδέχεται να προκληθεί τραυματισμός στον τεχνικό σέρβις, στο χειριστή ή στον ασθενή από ηλεκτροπληξία, μηχανικούς ή άλλους κινδύνους.

FIGYELMEZTETÉS (HU)

Ezen karbantartási kézikönyv kizárólag angol nyelven érhető el.

- Ha a vevő szolgáltatója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészíttetése.
- Ne próbálja elkezdeni használni a berendezést, amíg a karbantartási kézikönyvben leírtakat nem értelmezték.
- Ezen figyelmeztetés figyelmen kívül hagyása a szolgáltató, működtető vagy a beteg áramütés, mechanikai vagy egyéb veszélyhelyzet miatti sérülését eredményezheti.

AÐVÖRUN (IS)

Þessi þjónustuhandbók er aðeins fáanleg á ensku.

- Ef að þjónustuveitandi viðskiptamanns þarfnast annas tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálaþjónustu.
- Reynið ekki að afgreiða tækið nema að þessi þjónustuhandbók hefur verið skoðuð og skilin.
- Brot á sinna þessari aðvörun getur leitt til meiðsla á þjónustuveitanda, stjórnanda eða sjúklings frá raflosti, vélrænu eða öðrum áhættum.

AVVERTENZA (IT)

Il presente manuale di manutenzione è disponibile soltanto in lingua inglese.

- Se un addetto alla manutenzione richiede il manuale in una lingua diversa, il cliente è tenuto a provvedere direttamente alla traduzione.
- Procedere alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto.
- Il mancato rispetto della presente avvertenza potrebbe causare lesioni all'addetto alla manutenzione, all'operatore o ai pazienti provocate da scosse elettriche, urti meccanici o altri rischi.

警告 (JA)

このサービスマニュアルには英語版しかありません。

- サービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。
- このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないでください。
- この警告に従わない場合、サービスを担当される方、操作員あるいは患者 さんが、感電や機械的又はその他の危険により負傷する可能性があります。

경고 (KO)

본 서비스 매뉴얼은 영어로만 이용하실 수 있습니다.

- 고객의 서비스 제공자가 영어 이외의 언어를 요구할 경우, 번역 서비스를 제공하는 것은 고객의 책임입니다.
- 본 서비스 매뉴얼을 참조하여 숙지하지 않은 이상 해당 장비를 수리하려고 시도하지 마십시오.
- 본 경고 사항에 유의하지 않으면 전기 쇼크, 기계적 위험, 또는 기타 위험으로 인해 서비스 제공자, 사용자 또는 환자에게 부상을 입힐 수 있습니다.

BRĪDINĀJUMS (LV)

Šī apkopes rokasgrāmata ir pieejama tikai angļu valodā.

- Ja klienta apkopes sniedzējam nepieciešama informācija citā valodā, klienta pienākums ir nodrošināt tulkojumu.
- Neveiciet aprīkojuma apkopi bez apkopes rokasgrāmatas izlasīšanas un saprašanas.
- Šī brīdinājuma neievērošanas rezultātā var rasties elektriskās strāvas trieciena, mehānisku vai citu faktoru izraisītu traumu risks apkopes sniedzējam, operatoram vai pacientam.

ĮSPĖJIMAS (LT)

Šis eksploatavimo vadovas yra tik anglų kalba.

- Jei kliento paslaugų tiekėjas reikalauja vadovo kita kalba – ne anglų, suteikti vertimo paslaugas privalo klientas.
- Nemėginkite atlikti įrangos techninės priežiūros, jei neperskaitėte ar nesupratote šio eksploatavimo vadovo.
- Jei nepaisysite šio įspėjimo, galimi paslaugų tiekėjo, operatoriaus ar paciento sužalojimai dėl elektros šoko, mechaninių ar kitų pavojų.

ADVARSEL (NO)

Denne servicehåndboken finnes bare på engelsk.

- Hvis kundens serviceleverandør har bruk for et annet språk, er det kundens ansvar å sørge for oversettelse.
- Ikke forsøk å reparere utstyret uten at denne servicehåndboken er lest og forstått.
- Manglende hensyn til denne advarselen kan føre til at serviceleverandøren, operatøren eller pasienten skades på grunn av elektrisk støt, mekaniske eller andre farer.

OSTRZEŻENIE (PL)

Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim.

- Jeśli serwisant klienta wymaga języka innego niż angielski, zapewnienie usługi tłumaczenia jest obowiązkiem klienta.
- Nie próbować serwisować urządzenia bez zapoznania się z niniejszym podręcznikiem serwisowym i zrozumienia go.
- Niezastosowanie się do tego ostrzeżenia może doprowadzić do obrażeń serwisanta, operatora lub pacjenta w wyniku porażenia prądem elektrycznym, zagrożenia mechanicznego bądź innego.

ATENÇÃO (PT-BR)

Este manual de assistência técnica encontra-se disponível unicamente em inglês.

- Se outro serviço de assistência técnica solicitar a tradução deste manual, caberá ao cliente fornecer os serviços de tradução.
- Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica.
- A não observância deste aviso pode ocasionar ferimentos no técnico, operador ou paciente decorrentes de choques elétricos, mecânicos ou outros.

ATENÇÃO (PT-PT)

Este manual de assistência técnica só se encontra disponível em inglês.

- Se qualquer outro serviço de assistência técnica solicitar este manual noutro idioma, é da responsabilidade do cliente fornecer os serviços de tradução.
- Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica.
- O não cumprimento deste aviso pode colocar em perigo a segurança do técnico, do operador ou do paciente devido a choques eléctricos, mecânicos ou outros.

ATENŢIE (RO)

Acest manual de service este disponibil doar în limba engleză.

- Dacă un furnizor de servicii pentru clienți necesită o altă limbă decât cea engleză, este de datoria clientului să furnizeze o traducere.
- Nu încercați să reparați echipamentul decât ulterior consultării și înțelegerii acestui manual de service.
- Ignorarea acestui avertisment ar putea duce la rănirea depanatorului, operatorului sau pacientului în urma pericolelor de electrocutare, mecanice sau de altă natură.

ОСТОРОЖНО! (RU)

Данное руководство по техническому обслуживанию представлено только на английском языке.

- Если сервисному персоналу клиента необходимо руководство не на английском, а на каком-то другом языке, клиенту следует самостоятельно обеспечить перевод.
- Перед техническим обслуживанием оборудования обязательно обратитесь к данному руководству и поймите изложенные в нем сведения.
- Несоблюдение требований данного предупреждения может привести к тому, что специалист по техобслуживанию, оператор или пациент получит удар электрическим током, механическую травму или другое повреждение.

UPOZORENJE (SR)

Ovo servisno uputstvo je dostupno samo na engleskom jeziku.

- Ako klijentov serviser zahteva neki drugi jezik, klijent je dužan da obezbedi prevodilačke usluge.
- Ne pokušavajte da opravite uređaj ako niste pročitali i razumeli ovo servisno uputstvo.
- Zanemarivanje ovog upozorenja može dovesti do povređivanja servisera, rukovaoca ili pacijenta usled strujnog udara ili mehaničkih i drugih opasnosti.

UPOZORNENIE (SK)

Tento návod na obsluhu je k dispozícii len v angličtine.

- Ak zákazníkov poskytovateľ služieb vyžaduje iný jazyk ako angličtinu, poskytnutie prekladateľských služieb je zodpovednosťou zákazníka.
- Nepokúšajte sa o obsluhu zariadenia, kým si neprečítate návod na obluhu a neporozumiete mu.
- Zanedbanie tohto upozornenia môže spôsobiť zranenie poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, mechanické alebo iné ohrozenie.

ATENCION (ES)

Este manual de servicio sólo existe en inglés.

- Si el encargado de mantenimiento de un cliente necesita un idioma que no sea el inglés, el cliente deberá encargarse de la traducción del manual.
- No se deberá dar servicio técnico al equipo, sin haber consultado y comprendido este manual de servicio.
- La no observancia del presente aviso puede dar lugar a que el proveedor de servicios, el operador o el paciente sufran lesiones provocadas por causas eléctricas, mecánicas o de otra naturaleza.

VARNING (SV)

Den här servicehandboken finns bara tillgänglig på engelska.

- Om en kunds servicetekniker har behov av ett annat språk än engelska, ansvarar kunden för att tillhandahålla översättningstjänster.
- Försök inte utföra service på utrustningen om du inte har läst och förstår den här servicehandboken.
- Om du inte tar hänsyn till den här varningen kan det resultera i skador på serviceteknikern, operatören eller patienten till följd av elektriska stötar, mekaniska faror eller andra faror.

OPOZORILO (SL)

Ta servisni priročnik je na voljo samo v angleškem jeziku.

- Če ponudnik storitve stranke potrebuje priročnik v drugem jeziku, mora stranka zagotoviti prevod.
- Ne poskušajte servisirati opreme, če tega priročnika niste v celoti prebrali in razumeli.
- Če tega opozorila ne upoštevate, se lahko zaradi električnega udara, mehanskih ali drugih nevarnosti poškoduje ponudnik storitev, operater ali bolnik.

DİKKAT (TR)

Bu servis kılavuzunun sadece ingilizcesi mevcuttur.

- Eğer müşteri teknisyeni bu kılavuzu ingilizce dışında bir başka lisandan talep ederse, bunu tercüme ettirmek müşteriye düşer.
- Servis kılavuzunu okuyup anlamadan ekipmanlara müdahale etmeyiniz.
- Bu uyarıya uyulmaması, elektrik, mekanik veya diğer tehlikelerden dolayı teknisyen, operatör veya hastanın yaralanmasına yol açabilir.

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Revision History

Revision	Date	Reason for Change
1	21-July-2016	Preliminary release.
2	31-October-2016	Initial release.

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Chapter 1 General Requirements

1 Introduction

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 MI 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 (PM) 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 PM or complete information regarding your site-specific room layout.

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 and coolant lines.
- Supplying electrical power of the required voltage, all necessary power supply cables and grounds, all necessary power cables and grounds to the PDU, 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.

1.3 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.

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.

- **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.

2.1 Project Manager (PM) Tasks

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

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 Project Manager (PM) 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 1-1: 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 the Annulus and VQC Phantoms?			
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 metallic (e.g., copper) 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 Chapter 2, 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.			

3 Regulatory Requirements

3.1 Building Codes, Regulations and Permits

Building Codes and Regulations

The customer shall be responsible to ensure the scan suite meets all building codes and applicable regulations.

Compliance to specifications defined in this manual as well as all federal, state, territory, province, city or local regulations (building codes, etc.) 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 restrictive of the two specifications shall be applied.

GE Surface Penetration Permit

Prior to GE personnel drilling holes in the floor, conduit or any customer surface, a penetration permit for customer approval of the penetrations is required. 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 Service Operations. Consult with your GE PM to obtain a copy of this document.

A GE Penetration Permit is not required if the customer has made other arrangements to drill holes, install anchors, and provide the necessary mounting hardware as specified in this manual.

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 (NFPA). The regulating publications are: 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).

NOTE: CFR: Code of Federal Regulation

OSHA: Occupational Safety and Health Administration

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 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 restrictive of the two specifications shall be applied.

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.

4 Delivery and Handling

4.1 Installation Tasks

The following tasks are to be done by the GE Project Manager (PM).

NOTICE

This document should be reviewed by the GE Program Manager of Install (PM) and site service personnel a minimum of 6 weeks prior to the actual installation.

NOTICE

it is highly recommend that the PM review the product Installation manual prior to starting an installation to ensure no major changes to the install process requires additional pre-work.

Task	Description
Site Dimensions	Project manager 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 Section 4.1.1 and Section 4.1.2 for details.
Delivery Type	Project manager shall determine type of delivery: ground level, loading dock, or tilt-bed truck.
Delivery Equipment	Project manager shall determine if delivery requires special dollies, lifting crates, or riggers. PM shall order any additional delivery equipment and all necessary delivery personnel. **NOTE:** The PET/CT gantries or their 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 PET/CT gantries could result.
Identify Delivery Route	Project manager 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	Project manager shall verify an accessible, dust-free, non-construction-zone delivery route to the scan suite.
Packaging Requirements	Project manager shall order any construction site packaging requirements prior to shipment. Packaging cannot be modified once the system is shipped.
Floor Protection	Project manager shall determine if floor protection is required along facility delivery route and communicates requirement to delivery company/personnel.

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 Gantry 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 PET/CT gantries 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 1-2 represents the minimal requirements when combined with average door width sizes.

Table 1-2: Minimum Clear Doorway Openings and Hallway Widths

Doorway Clear Opening	Hallway
Minimum Width	
1067 mm (42 in.)	No hallway or need to turn sub-systems 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.)

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.

4.2 Shipping Dimensions and Weight

4.2.1 Delivery Sizes and Weights

Table 1-3: 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)	2050 (4520)
CT Gantry with Dollies On, Side Rails Off	2000 (79)	1039 (40.9)	2810 (111)	2022 (4458)
CT Gantry with Dollies Off	1850 (73)	860 (34)	1970 (77)	1671 (3684)
PET Base and Retractor Assembly with Dollies	990 (39)	1054 (41.5)	2438 (96)	662 (1460)
PET Image Ring with Dollies On, Side Protective Braces On (25 cm FOV)	1880 (74)	1118 (44)	2794 (110)	1556 (3430)
PET Image Ring with Dollies On, Side Protective Braces Off (25 cm FOV)	1880 (74)	1040 (41)	2794 (110)	1520 (3350)
PET Image Ring without Dollies (25 cm FOV)	1698 (66.9)	858 (33.8)	2103 (82.8)	1227 (2705)
PET Image Ring Dolly (assembled)	1358 (54)	1118 (44)	2794 (110)	329 (725)
PET Trailer with Dollies	1358 (54)	1054 (41.5)	2438 (96)	216 (475)
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 shipping crate)	1092 (43)	584 (23)	762 (30)	413 (910)
Power Distribution Box	330 (13)	648 (25.5)	832 (32.8)	41 (90)
PARC4 Reconstruction Cabinet (on skid)	1655 (65.2)	1480 (58.3)	980 (38.6)	304 (670)
Console (on skid)	1067 (42)	635 (25)	864 (34)	87 (192)
Chiller (on skid)	1133 (44.6)	660 (26)	851 (33.5)	136 (300)
Chiller Coolant (4 per box; Note 1)	381 (15)	325 (12.8)	325 (12.8)	15 (34)
Annulus Phantom Safe (option; on skid)	914 (36)	914 (36)	914 (36)	217 (480)
Service Storage Cabinet (option; with shipping crate)	1207 (48)	673 (27)	978 (39)	61 (135)
Note 1: System ships with five boxes. Values are per box, which contains four 3.8 L (1 gallon) containers.				

4.2.2 Shipping Methods (Dollies, Skids)

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 Illustration 1-1.

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.

Illustration 1-1: CT Gantry with Shipping Dollies and Side Rails

4.2.2.2 PET Components

The PET Gantry consists of:

- PET Base and Retractor Assembly (see Illustration 1-2). The PET Base dollies have a center stabilizing frame to protect the exposed components.
- PET Image Ring (see Illustration 1-3)
- PET Trailer (see Illustration 1-4)

Illustration 1-2: PET Base and Retractor Assembly, with Shipping Dollies

Illustration 1-3: PET Gantry Image Ring, with Shipping Dollies and Side Rails

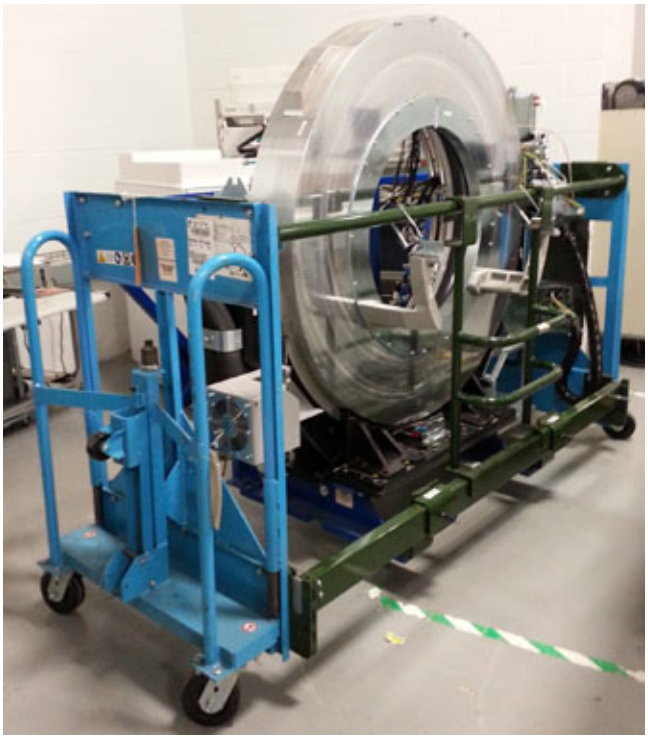


Illustration 1-4: PET Trailer, with Shipping Dollies and Side Rails

4.2.2.3 Patient Table

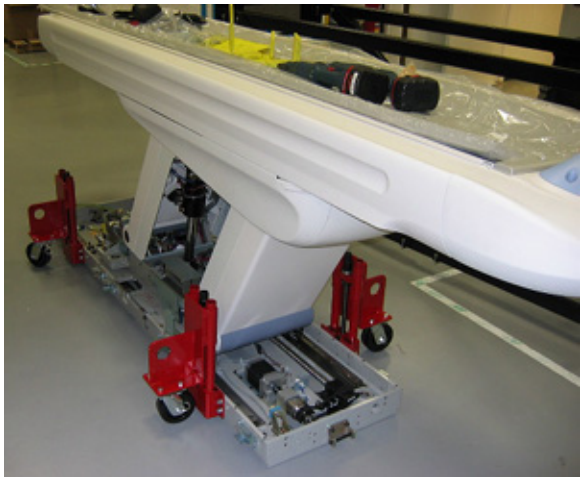
The patient table ships to domestic (North American) installations on a set of dollies with stabilizing side rails (see Illustration 1-5). The secondary base covers ship separately.

Red caster towers ship attached to the ends of the dollies (see Illustration 1-5). They are used for fitting the Table in an elevator and for final positioning of the Table in front of the Gantry (see Illustration 1-6).

NOTE: The patient table ships to international sites in a crate. The installation team uncrates the table and attaches the dollies at the site.

Illustration 1-5: Patient Table with Shipping Dollies

Illustration 1-6: Patient Table on Red Caster Towers



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.

4.2.2.5 PARC4 Reconstruction Cabinet

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

Illustration 1-7: PARC4 Packaging

4.2.2.6 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.

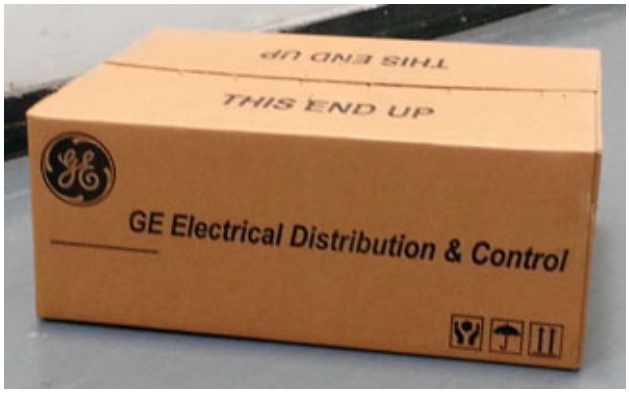
4.2.2.7 Chiller

The Chiller is shipped on a skid. Do not remove the Chiller from the skid until it is in the equipment room.

Illustration 1-8: Chiller Packaging

4.2.2.8 Power Distribution Box

Illustration 1-9: Power Distribution Box Packaging



4.2.2.9 Annulus Phantom Safe (option)

The Annulus Phantom Safe is shipped on a combined crate/skid.

Illustration 1-10: Annulus Phantom Safe on Skid

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.

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 PM 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 PM needs to add the necessary identifier to the order.

4.4 Shipping and Receiving

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 PM 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.

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.

4.4.3 Door Threshold Not Allowed

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.

4.4.4 Floor Load Along Delivery Route

The customer'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.

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 Gantry 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.

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. Prevent extended exposure of the system (maximum two weeks) to temperatures or humidity outside of the following specifications:

- Temperature: When transporting the system, excluding any scanner desktop LCD display monitors, water-filled calibration/IQ phantoms, and chiller coolant, the temperature shall be maintained within the range of -40º to +50º C (-40º to +122º F), inclusive.

  NOTE: See the table below for the shipping temperature and humidity ranges of excluded items.

  Table 1-4: Shipping Temperature Ranges for Excluded Items

Items	Temperature
LCD Monitors	-20° to +60° C (-4° to +140° F)
Water-filled Calibration/IQ Phantoms and Chiller coolant	+5° to +70° C (+41° to +158° F)

- Humidity: When transporting the system, excluding water-filled calibration/IQ phantoms and chiller coolant, all packing material shall remain intact and the relative humidity shall be maintained within the range of 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 to avoid condensation or rapid temperature change. 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.

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 and Chiller from their shipping skids or the PARC4 from it's crate until after they have been delivered to the PET/CT equipment room.

4.5 Storage

If storing a system prior to installation, the system shall be stored in its original packaging in a temperature and humidity controlled environment protected from water and dust. It is advised that storage of the system be *no longer than six months*. If storage is going to exceed six months, contact your PM for long-term storage procedures.

Table 1-5: 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

Storage exceeding six months is not advised.

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Chapter 2 Equipment Requirements

1 System Components

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

Table 2-1: 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; Note 1)
CT Gantry	1787 (3940)	0	4588 (1031)	Rectangular base plate 700 x 1966 (28 x 77) with four round pads, each 64 (2.5) in contact with floor.	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)	1775 (3915)	0	4785 (1076)	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.
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 64 (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.
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.**
Power Distribution Box	39 (86)	0			Mounted on wall (same as A1 mains disconnect)
PARC4	246 (540)	0	737 (166)	Rectangular base with four castors.	Casters are for positioning and service. **See Note 2.**
Op Console Computer	72 (159)	0	318 (71)	Rectangular base with four castors.	
Monitor - LCD (each)	3.2 (7)				
Workspace Table (with 2 monitors)	70 (154)				
Chiller (with coolant)	145 (320)	0	451 (101)	Rectangular base with four castors in contact with the floor.	Casters unlock for positioning and service.
Optional Components					
Universal Power Supply (UPS)	281 (619)	0	689 (155)	Rectangular base with four castors in contact with the floor.	Casters for positioning. Adjust six leveling pads on the floor.
Annulus Phantom Safe	149 (330)	0		Rectangular base with four castors in contact with the floor.	Casters are for moving safe and can be locked to prevent motion.
Service Storage Cabinet	41 (90)	0			

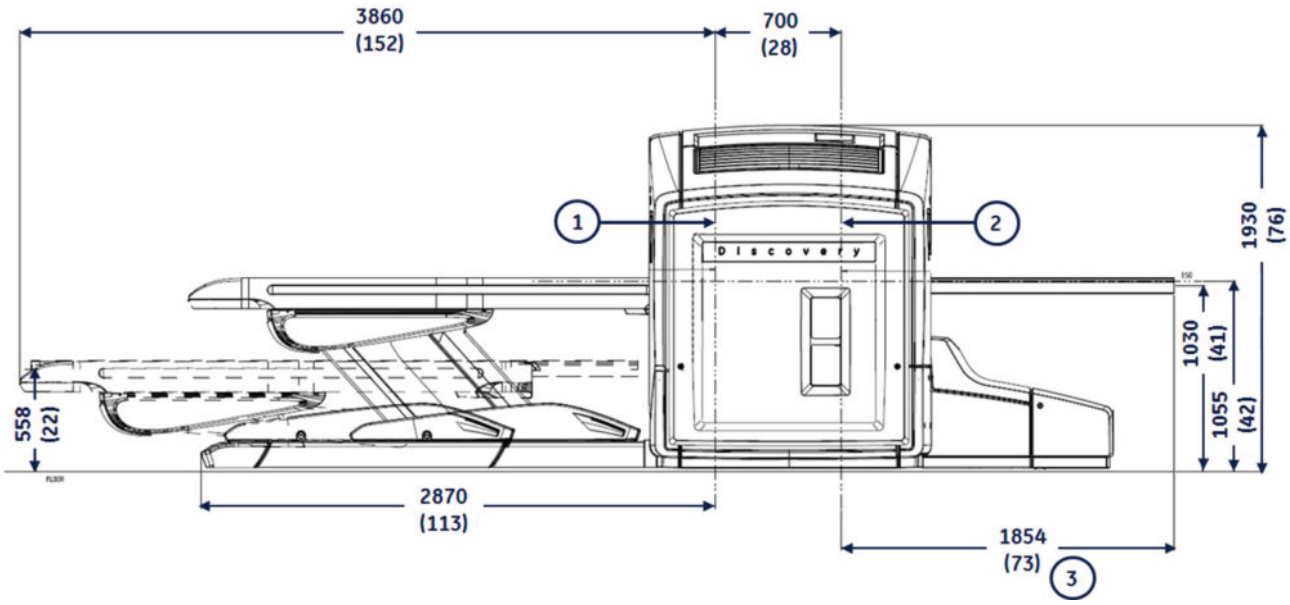
Notes:
1.) Use the GE-supplied mounting hardware only if anchoring the system to 127 mm (5 in.) concrete floors.
2.) May be anchored to floor with supplied angle brackets in seismic zones.

Table 2-2: System Component Dimensions

System Component	A	B	C
	Width mm (in.)	Depth mm (in.)	Height mm (in.)
PET-CT Gantry (overall) without Trailer	2340 (92)	1564 (62)	1930 (76)
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)
Power Distribution Box	500 (19.7)	241 (9.5)	630 (24.8)
PARC4 Reconstruction Cabinet	616 (24.3)	1257 (49.5)	1422 (56)
Operator Console Computer	470 (18.5)	736 (29)	656 (25.8)
Workspace Table 5486188-10 (adjustable height)	1480 (58.3)	895 (35.2)	688-1139 (27.1-44.8)
Chiller	543 (21.4)	705 (28)	787 (31)
UPS (option)	305 (12)	813 (32)	1219 (48)
Service Storage Cabinet (option)	914 (36)	457 (18)	1067 (42)
Annulus Phantom Safe	406 (16)	406 (16)	665 (26.2)

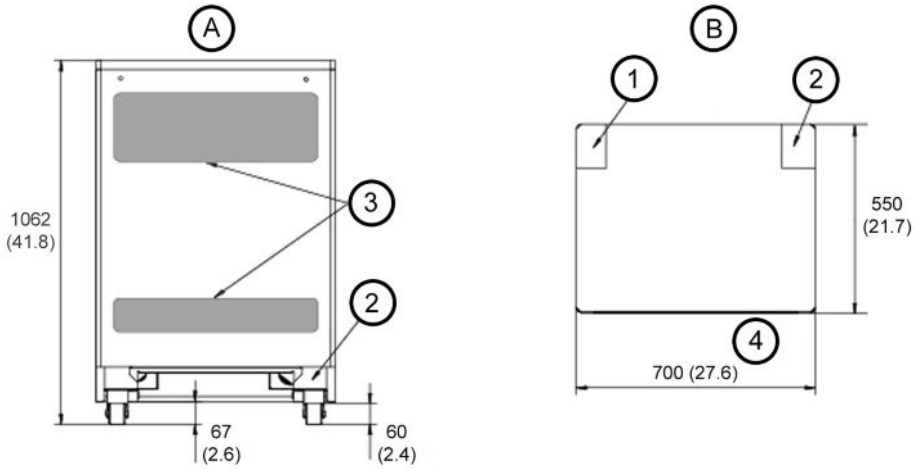
1.2 System Component Diagrams

Illustration 2-1: Gantry and Table Dimensions



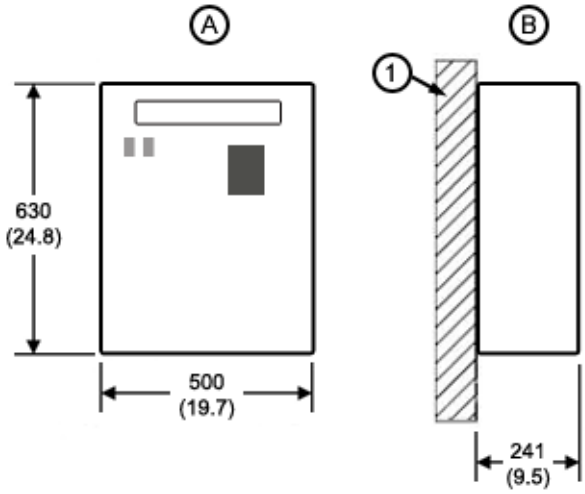
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	CT scan plane centerline
2	PET primary scan plane centerline
3	With Head Extender

Illustration 2-2: Power Distribution Unit (PDU) Dimensions



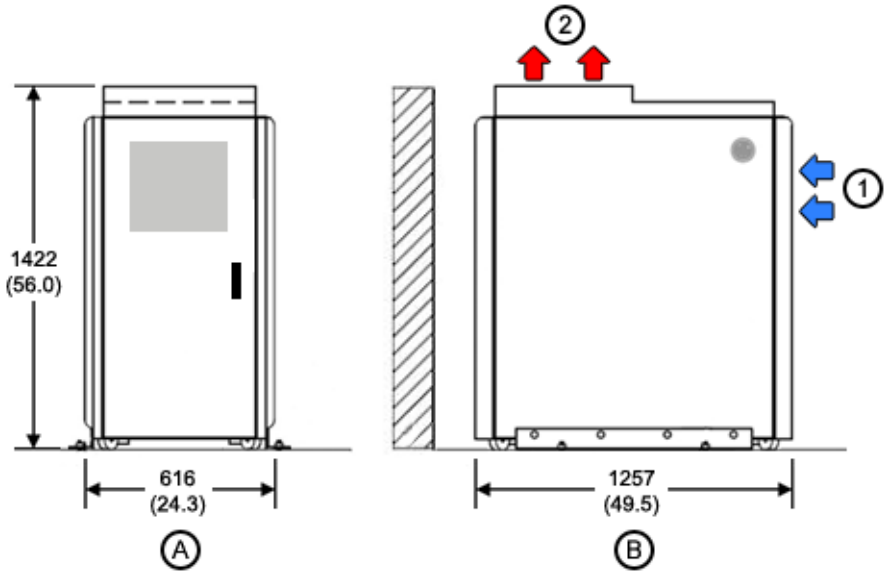
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Rear View	1	I/O Connections Panel
B	Top View	2	AC Power Input Box
		3	Rear vent access
		4	Front

Illustration 2-3: Power Distribution Box



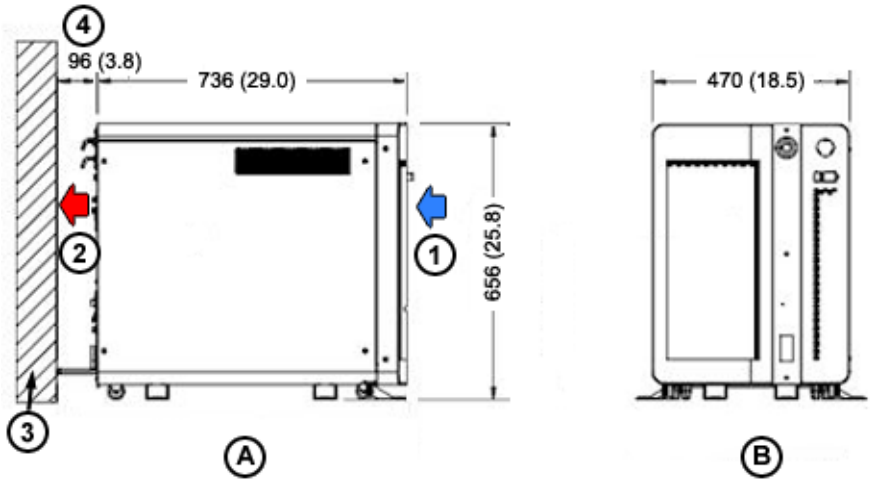
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Wall (mounting surface)
B	Side View	2	

Illustration 2-4: PARC4 Reconstruction Cabinet Dimensions



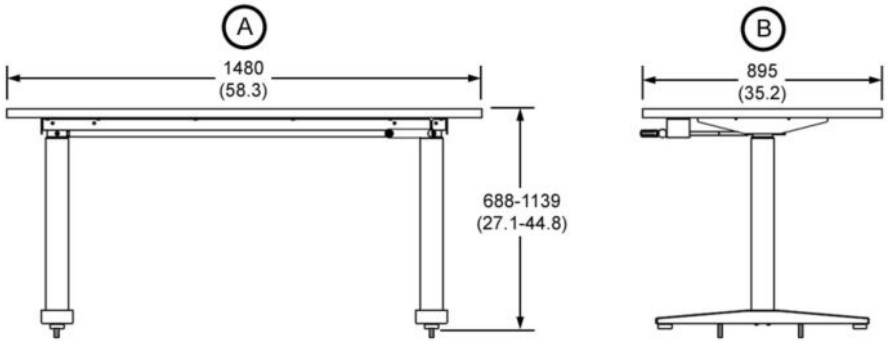
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Air in (front of cabinet)
B	Side View	2	Air out (top of cabinet)

Illustration 2-5: Operator Console Computer Dimensions



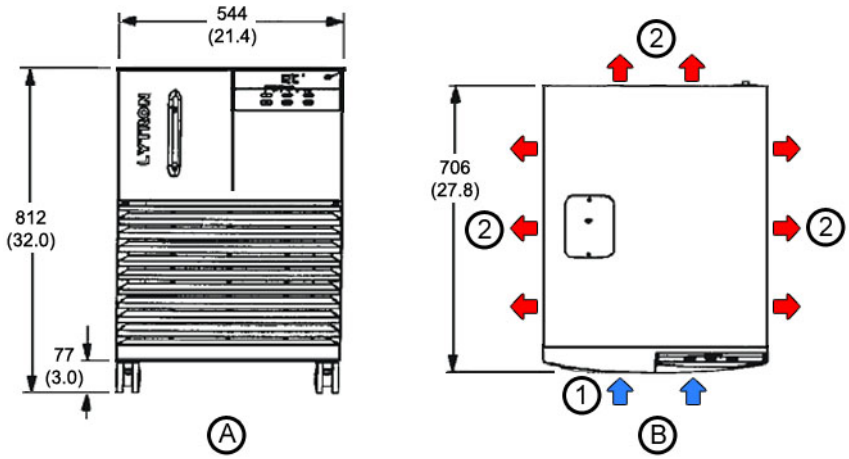
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Side View	1	Air in (front of cabinet)
B	Front View	2	Air out (rear of cabinet)
		3	Wall
		4	Clearance (minimum)

Illustration 2-6: Workspace Table Dimensions (5486188-10)



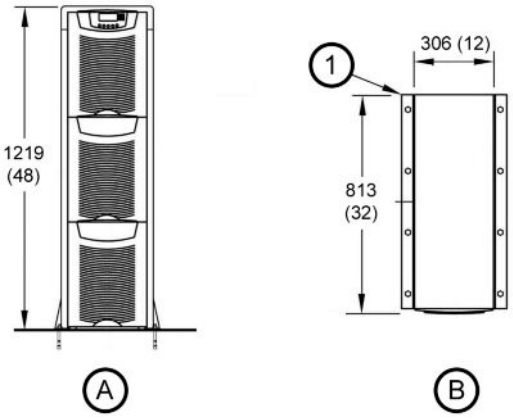
All dimensions are in millimeters; bracketed dimensions are in inches.	
A	Front View
B	Side View

Illustration 2-7: Chiller Dimensions



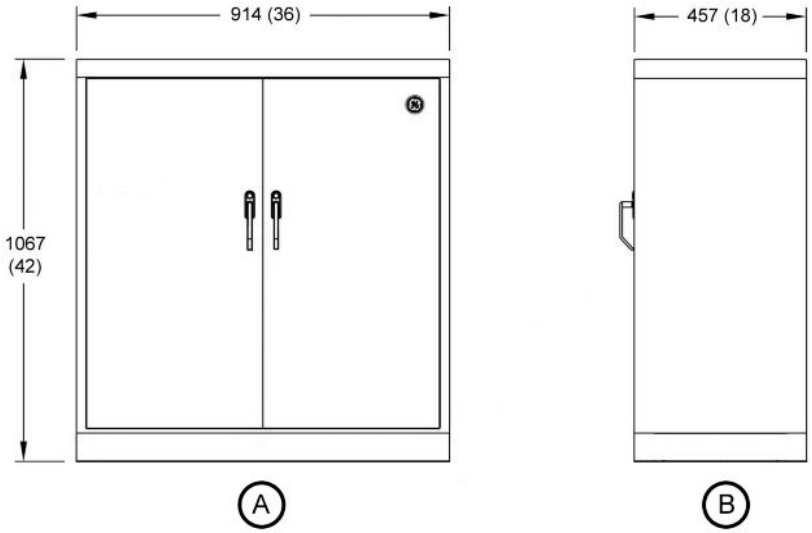
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Air in (front of cabinet)
B	Side View	2	Air out (sides/back of cabinet)
Note: Refer to Section 3.8 “Chiller Requirements” for airflow in/out clearances.			

Illustration 2-8: 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		

Illustration 2-9: Service Storage Cabinet Dimensions (Optional)

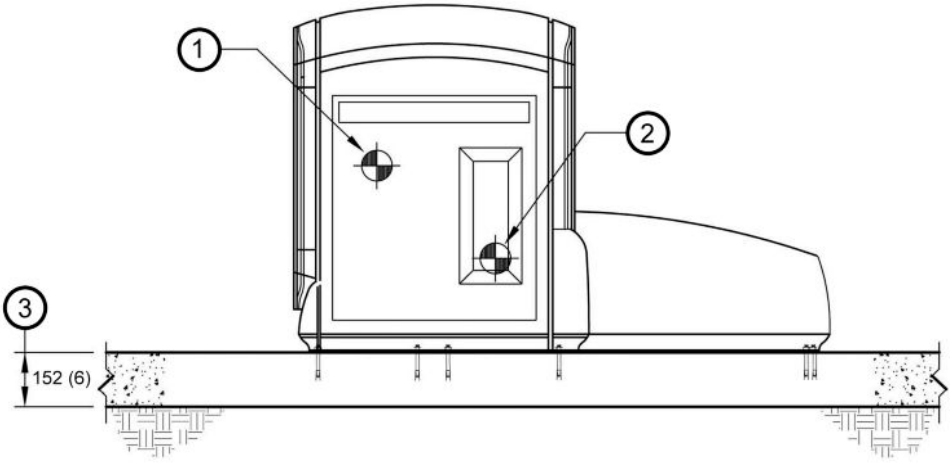


All dimensions are in millimeters; bracketed dimensions are in inches.	
A	Front View
B	Side View

1.3 System Component Center-of-Gravity Diagrams

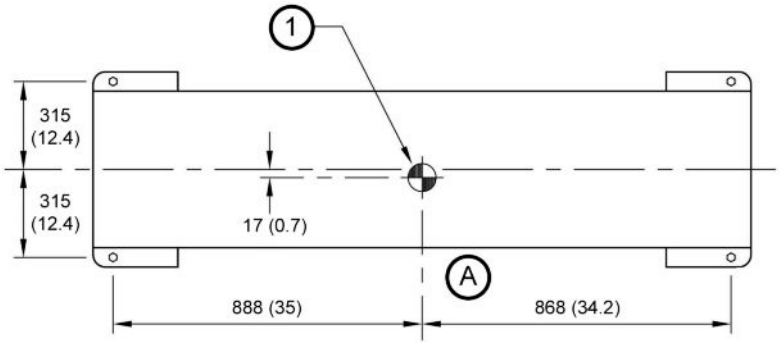
Refer to Illustration 2-10 through Illustration 2-21 for the individual system component center-of-gravity dimensions for the PET/CT system.

Illustration 2-10: CT/PET Gantry Center-of-Gravity (Side View)



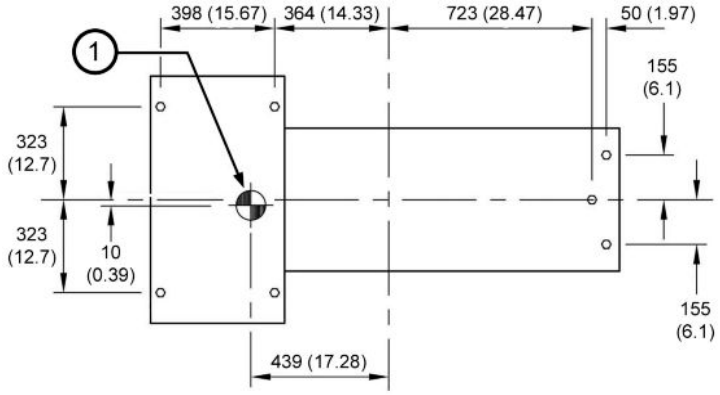
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Center of gravity for CT Gantry (also see Illustration 2-11)
2	Center of gravity for PET Gantry (also see Illustration 2-12)
3	Minimum thickness

Illustration 2-11: CT Gantry Center-of-Gravity (Top View – Plan at Base)



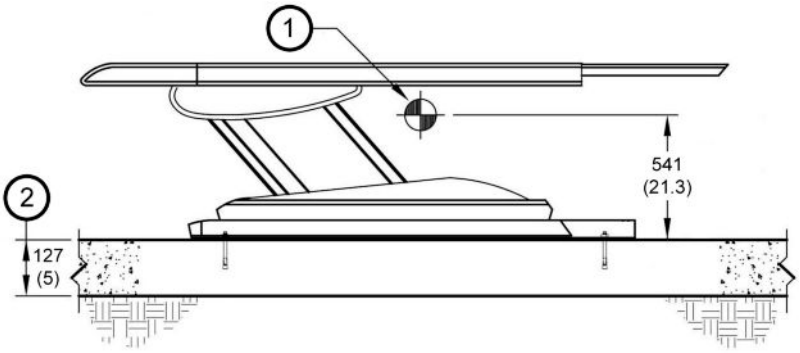
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Center of gravity weight = 1820 kg (4012 lb); Y = 912 mm (35.9 in.)
A	Front of CT Gantry

Illustration 2-12: PET Gantry Center-of-Gravity (Top View – Plan at Base)



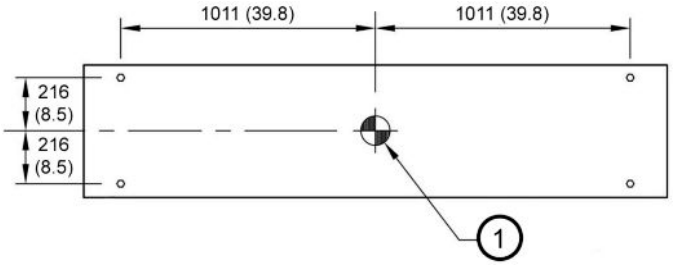
All dimensions are in millimeters; bracketed dimensions are in inches.			
1	Center of gravity weight; Y = 527 (20.75)		
	25 cm FOV: 1776 kg (3915 lb)	20 cm FOV: 1755 kg (3870 lb)	15 cm FOV: 1735 kg (3825 lb)

Illustration 2-13: Patient Table Center-of-Gravity (Side View)



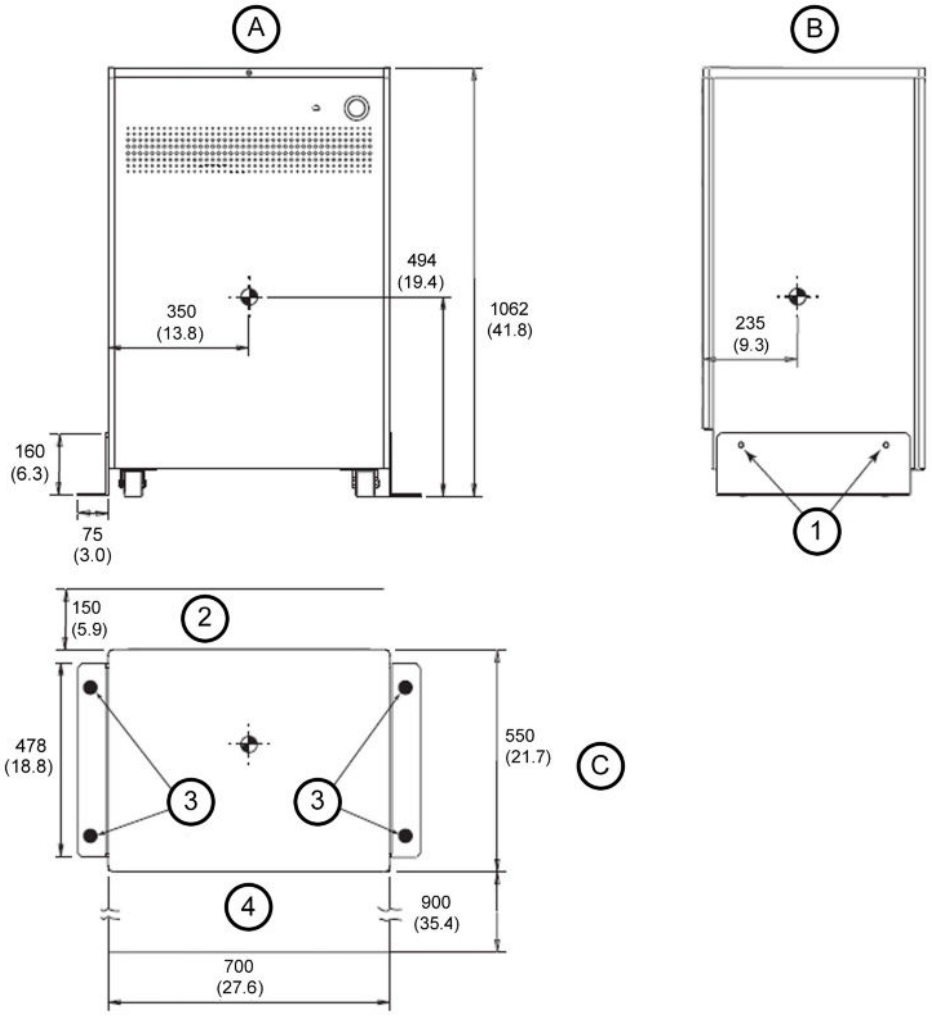
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Center of gravity weight = 1049 kg (2308 lb); includes 227 kg (500 lb) patient
2	Minimum thickness

Illustration 2-14: Patient Table Center-of-Gravity (Top View – Plan at Base)



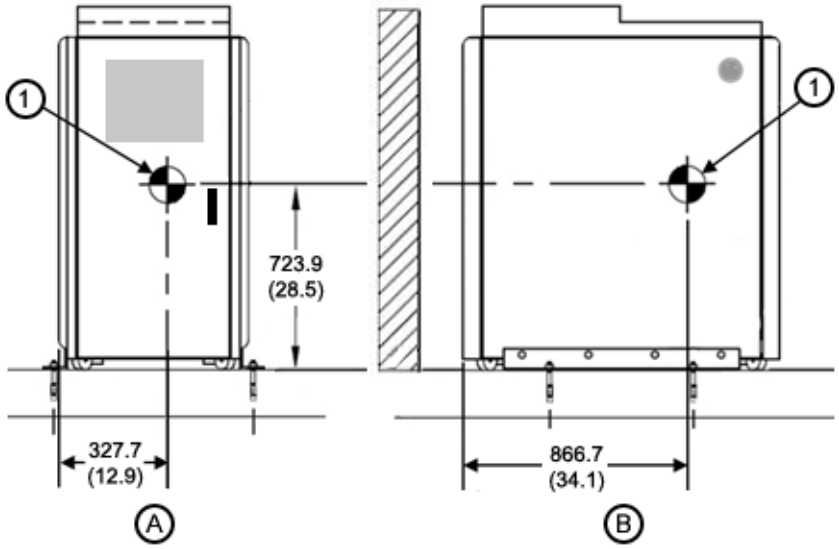
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Center of gravity weight = 1049 kg (2308 lb); includes 227 kg (500 lb) patient. Y (height) = 541 mm (21.3 in.)

Illustration 2-15: Power Distribution Unit (PDU) Center-of-Gravity



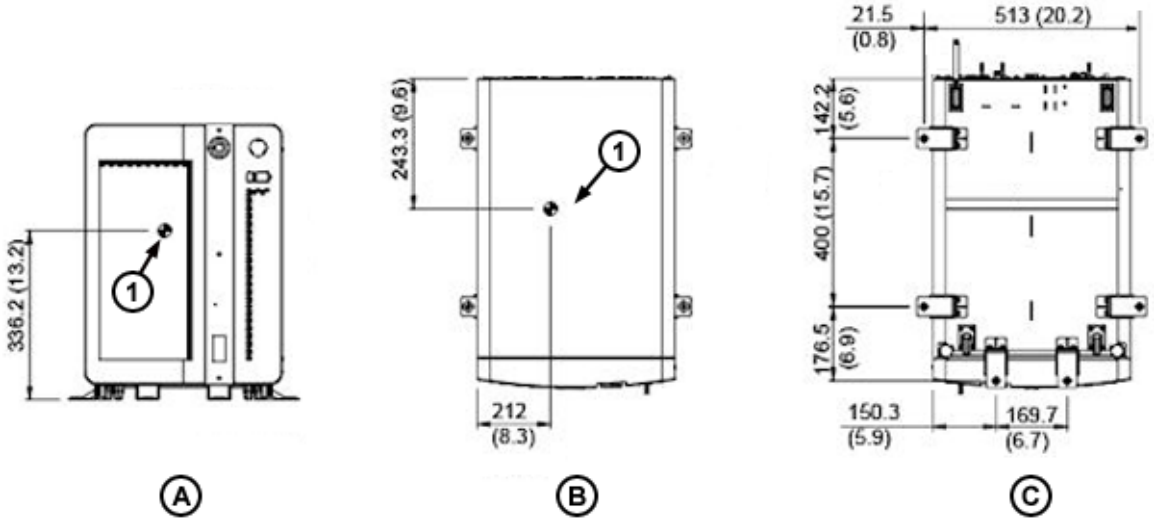
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Seismic mounting holes on PDU
B	Side View	2	Minimum air flow clearance (back of cabinet)
C	Top View	3	Seismic floor mounting holes; 15 mm (0.6 in.)
		4	Front Clearance (minimum)

Illustration 2-16: PARC4 Reconstruction Cabinet Center-of-Gravity



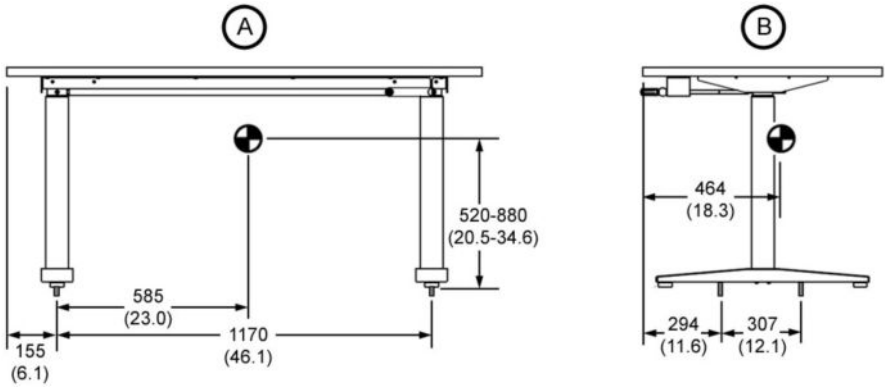
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Center of gravity weight = 246 kg (540 lb)
B	Side View		

Illustration 2-17: Operator Console Computer Center-of-Gravity



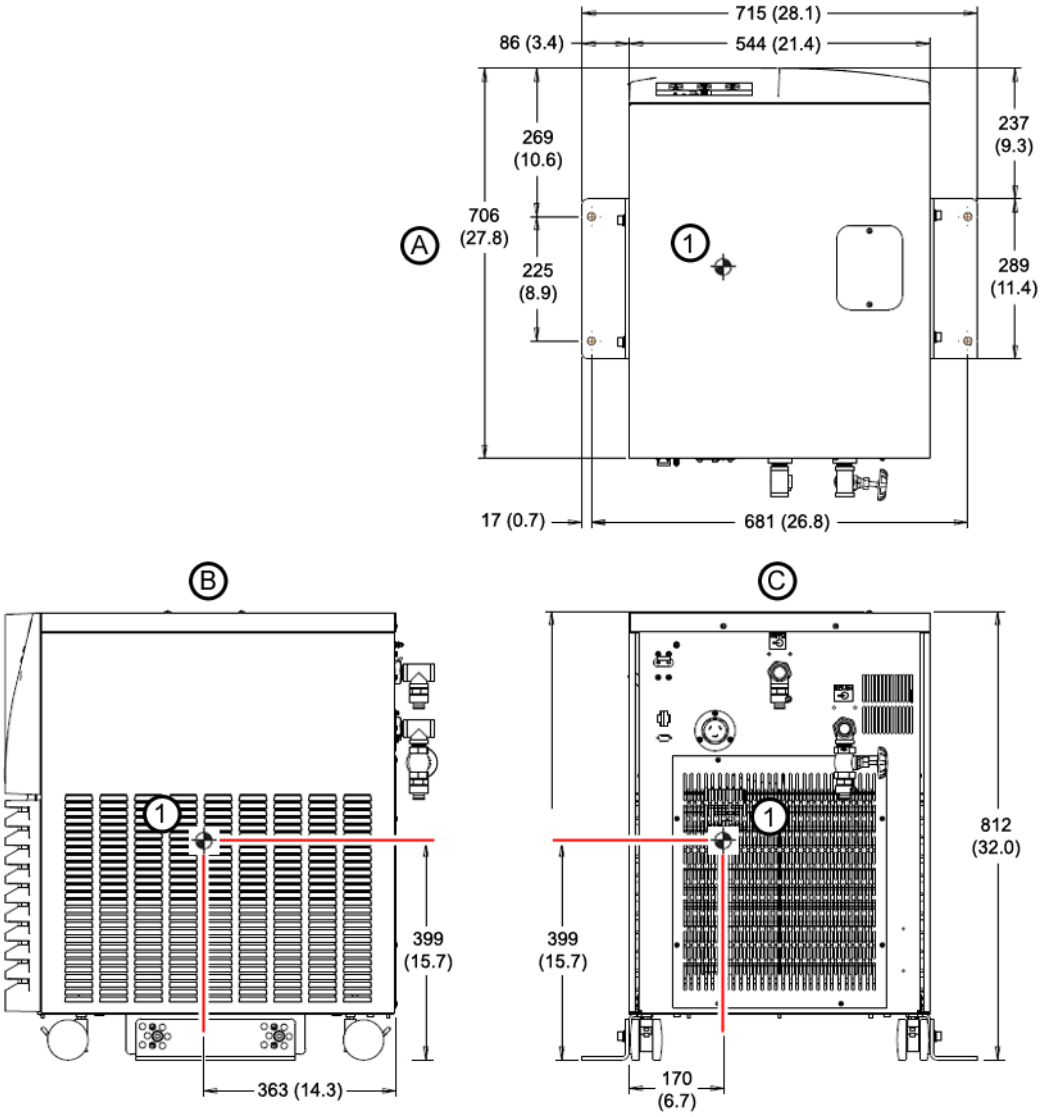
All dimensions are in millimeters; bracketed dimensions are in inches.			
A	Front View	1	Center of gravity weight = 72 kg (159 lb)
B	Top View		
C	Bottom View		

Illustration 2-18: Workspace Table (5486188-10) Center-of-Gravity



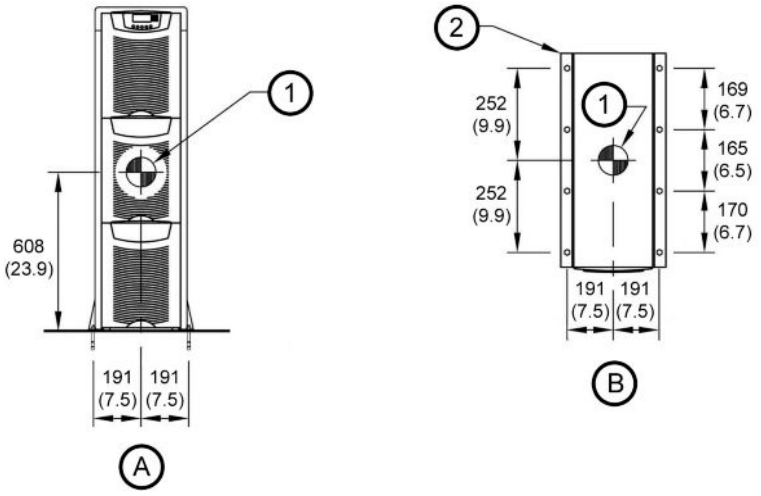
All dimensions are in millimeters; bracketed dimensions are in inches.	
A	Front View
B	Side View
Note: Center of gravity weight = 63.5 kg (139 lb). Y (typical) = 580 mm (22.8 in.) for table height of 765 mm (30 in.)	

Illustration 2-19: Chiller Center-of-Gravity



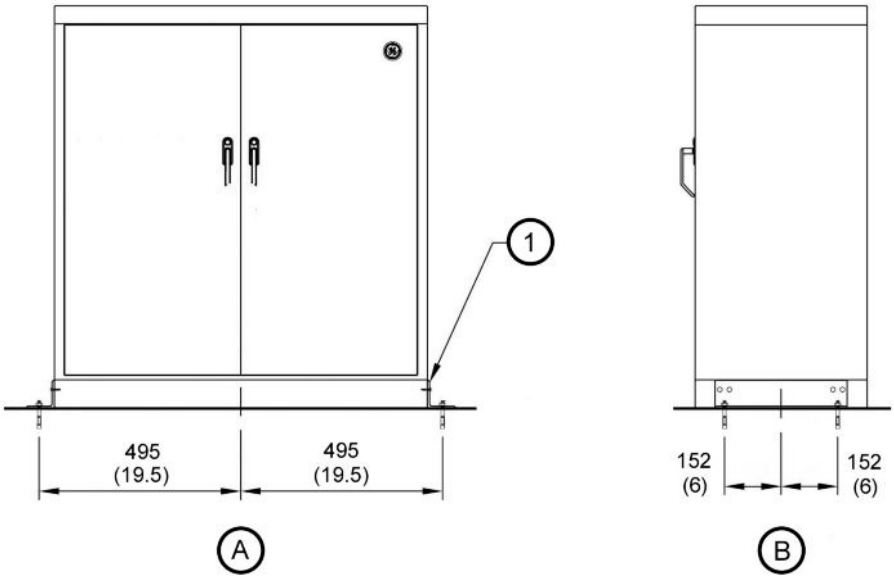
All dimensions are in millimeters; bracketed dimensions are in inches.	
A	Top View
B	Side View
C	Back View
1	Center of gravity weight (with coolant) = 145 kg (320 lb)

Illustration 2-20: 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)

Illustration 2-21: Service Storage Cabinet Center-of-Gravity (Optional)



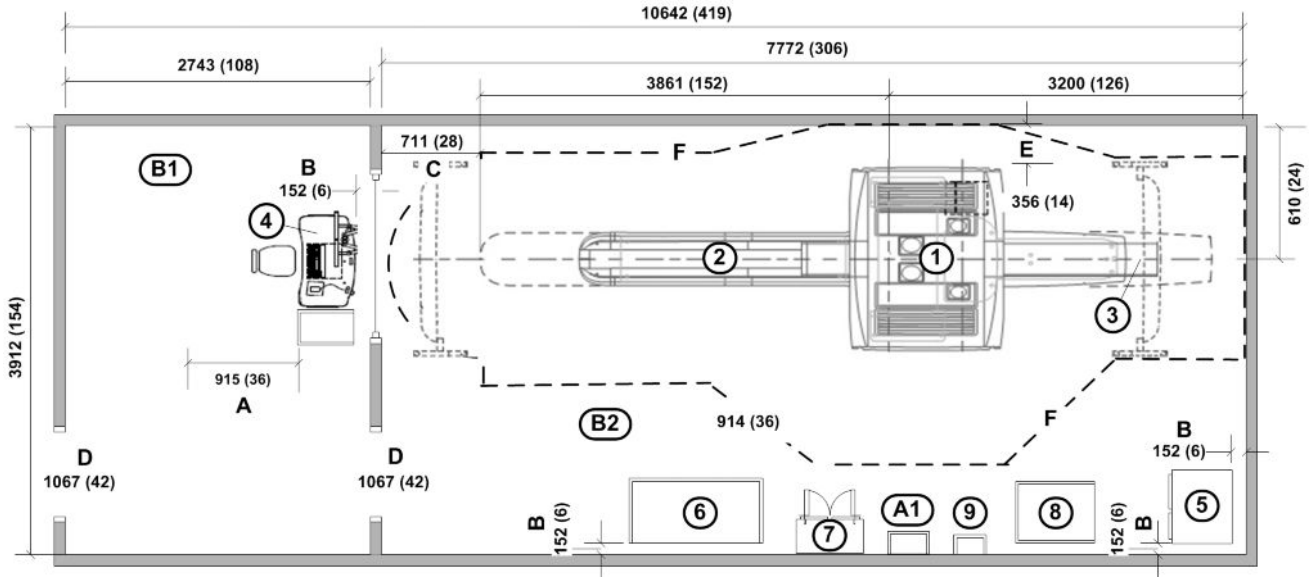
All dimensions are in millimeters; bracketed dimensions are in inches.	
A	Front View
B	Side View
1	L 3" x 3" x 1/4" x 14" bracket mounted to cabinet frame with 4 - #12 S.M. screws (each side)
Note: The Center of Gravity for the optional Storage Cabinet is site specific. It depends on the weight and location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

2 Room Layout

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 Illustration 2-22.

Illustration 2-22: Typical Scan Suite Layout Configuration

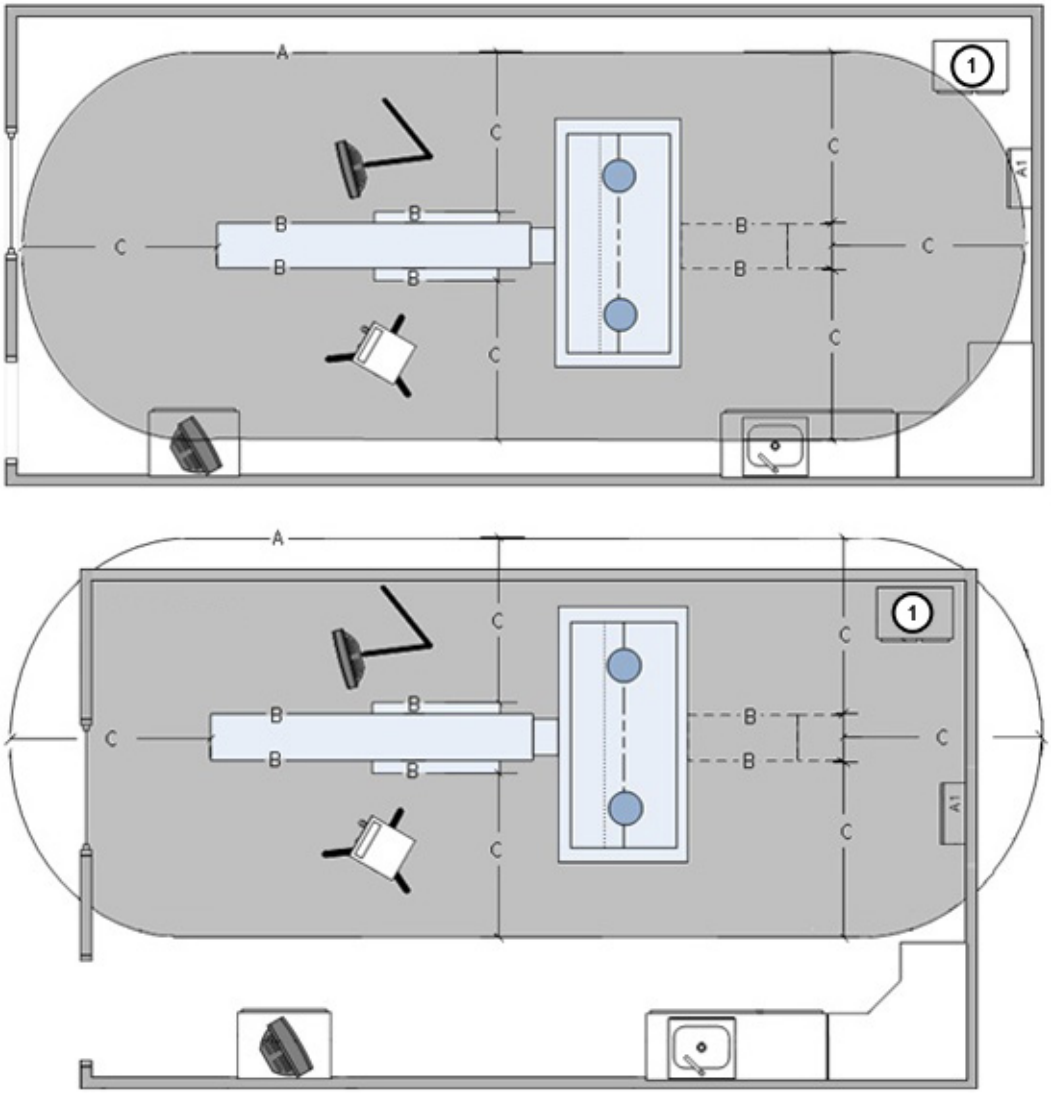


All dimensions are in millimeters (mm) and inches (in.).			
A1	Mains Disconnect	3	Cradle Extender
B1	Control Room	4	Scanner Desktop/Computer
B2	Scan Room	5	Power Distribution Unit (PDU)
1	Gantry	6	PARC4 Reconstruction Cabinet
2	Table	7	Service Storage Cabinet (option)
A	NEC (Powered Service Clearance)	8	Chiller
B	NEC (Minimum Equipment Clearance)	9	Power Distribution Box
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		

The enclosure (Patient Touch) Leakage Envelope, as detailed in Illustration 2-23, 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 PM 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. [Height of envelope from floor-to-ceiling: IEC-3 = 1829.0 mm (6.0 Ft.). UL60601-1 (2.12.20 DV Addition) and GE Healthcare requirement.]

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

Illustration 2-23: 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 Minimum Scan Room Sizing

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 Illustration 2-22 and Illustration 2-23.

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 Illustration 2-22 and Illustration 2-23.

2.3 Minimum Control Room Sizing

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 Illustration 2-22. The control room should also provide a comfortable working environment for the operator. Refer to HVAC Requirements.

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.

2.4 Control Room Scanner Desktop Requirements

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.

2.4.2 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.

2.4.3 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.

2.4.4 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.

3 Hospital Equipment and Service Space Requirements

3.1 Clearances

3.1.1 Operational Clearances

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

3.1.2 Emergency Medical Equipment Clearances

Consider clearances for emergency medical equipment.

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.

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.), or the minimum distance allowed by local laws and codes, whichever is greater, when measured from the floor to the finished ceiling.

3.2 Workplace Requirements

3.2.1 U.S. Code Requirements

The required service space, as noted in Illustration 2-24 and Illustration 2-25, 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 PM 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 2-3 and Table 2-4.

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.)

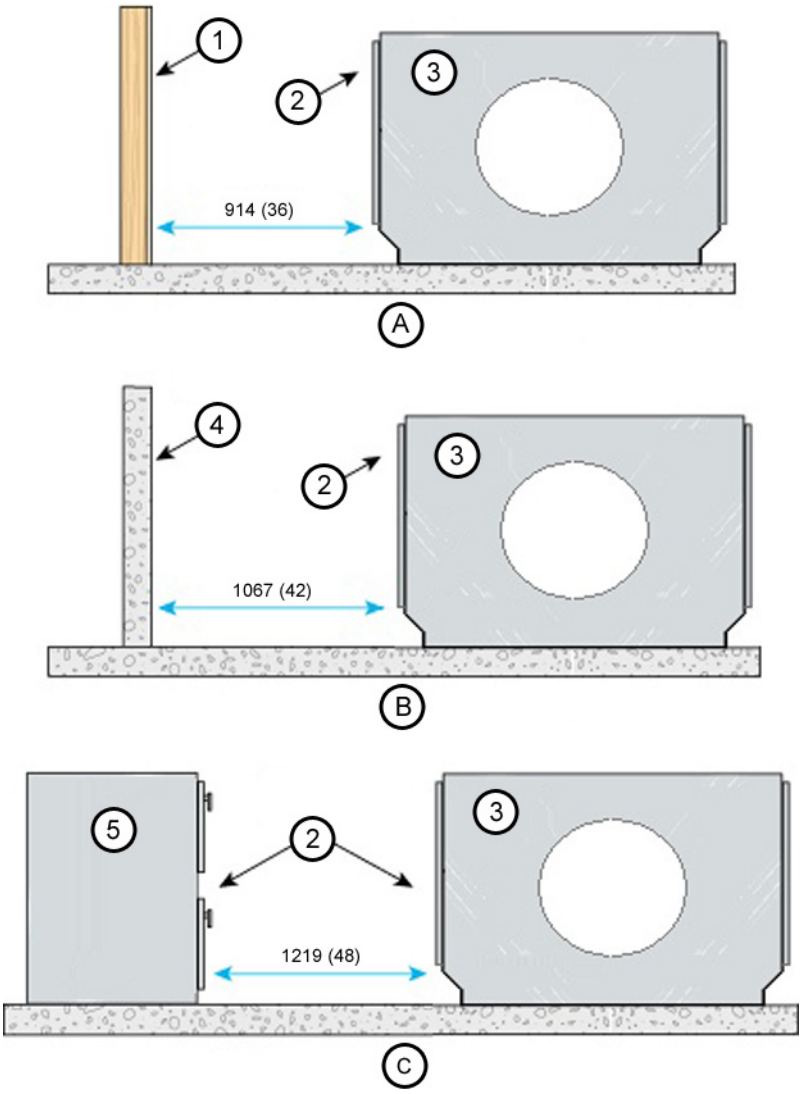
Table 2-3: Work Space Conditions

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 2-4: Small Room Condition

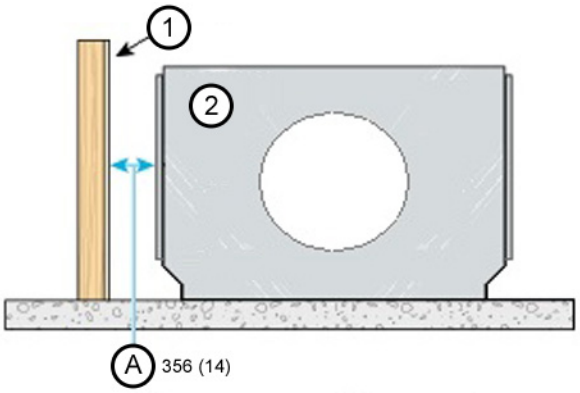
Small Room Condition	Separation Distance mm (in.)
Minimum distance required on the side of the gantry, opposite the Tube-Change side of the gantry.	356.0 (14.0)

Illustration 2-24: 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

Illustration 2-25: 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.

3.2.2 Cover Removal Clearance

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

3.3 Cover Clearance Requirements

3.3.1 Gantry Front Cover – Removal Clearance

Front cover removal requires a minimum clearance space of 3010 mm (118.5 in.). 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. Minimum service clearances are a regulatory requirement.

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.

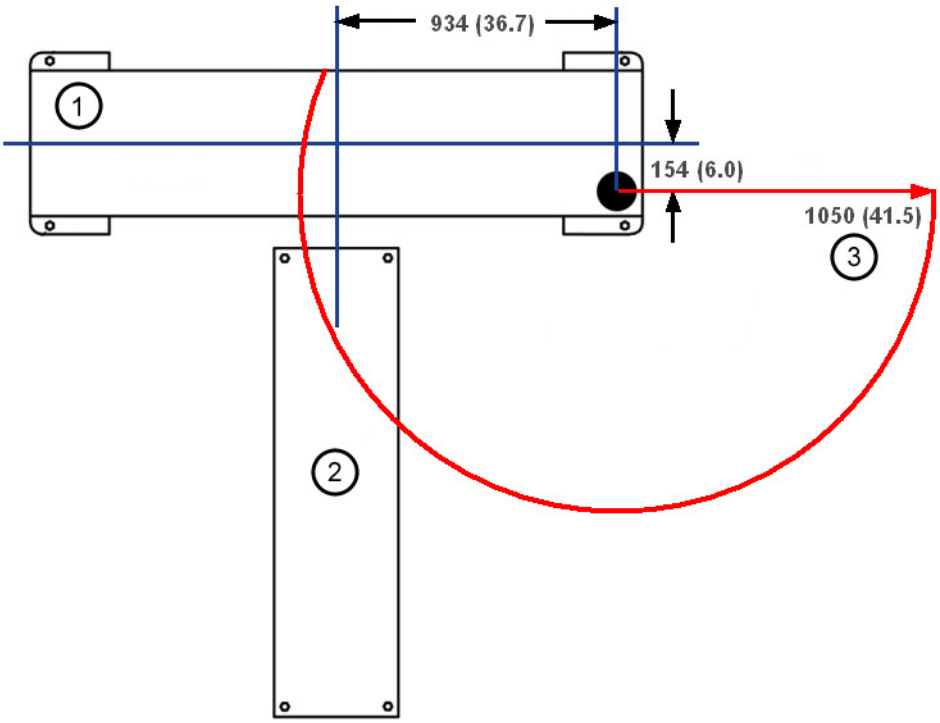
3.3.3 Gantry Rear Cover – Removal Clearance

Rear cover removal requires the use of tilting cover dollies with a minimum clearance width of 2388 mm (94 in.) and a depth of 584 mm (23 in.). 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. Minimum service clearances are a regulatory requirement.

3.4 Gantry Space Requirements

Specifications for Boom Assembly clearance arc are defined in Illustration 2-26. The Boom Assembly is used during Tube and Detector replacement.

Illustration 2-26: Boom Assembly Clearances



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

3.5 PDU Placement Requirements

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

3.6 Scanner Desktop Placement Requirements

3.6.1 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.

3.6.2 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.

3.7 PARC4 Reconstruction Cabinet Placement Requirements

The PARC4 Reconstruction Cabinet is on wheels and can be pulled away from the wall for service. Power connections are brought in through an access panel on the bottom of the cabinet. Front clearance must be at least 152 mm (6 in.) for input air flow. Do not block upwards exhaust air flow on the top-rear area of the cabinet.

3.8 Chiller Requirements

The Chiller is on wheels and can be pulled away from the wall for service. Chiller water lines must be routed in a separate cable trough than all other system cabling (e.g., data, fiber optic, power, ground).

Airflow is critical to optimize performance of the chiller. The front and one side or the back of the unit MUST be kept clear and unobstructed. The remaining two sides or back must have minimum clearance of 18" (456 mm). The top clearance must be at least 152 mm (6 in.). Ensure that the hot air exiting the chiller does not recirculate into the inlet openings. The front of the unit must have a free supply of ambient-temperature air.

3.9 Service Storage Cabinet Requirements

An optional storage cabinet (B77292CA) is available to store all supplied service equipment. (See Table 2-5 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 2-5: Storage Cabinet and Equipment

Item	Size	Weight (total)
Storage Cabinet	46 x 91 x 107 cm (18" 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")	
Coolant (Box of 4 containers)	325 x 325 x 381 (12.8” x 12.8 x 15”)	15 (34)
Detector Service Tools	Various size hand tools	3 (7)

3.10 Verify Site Print

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

4 Anchoring

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.

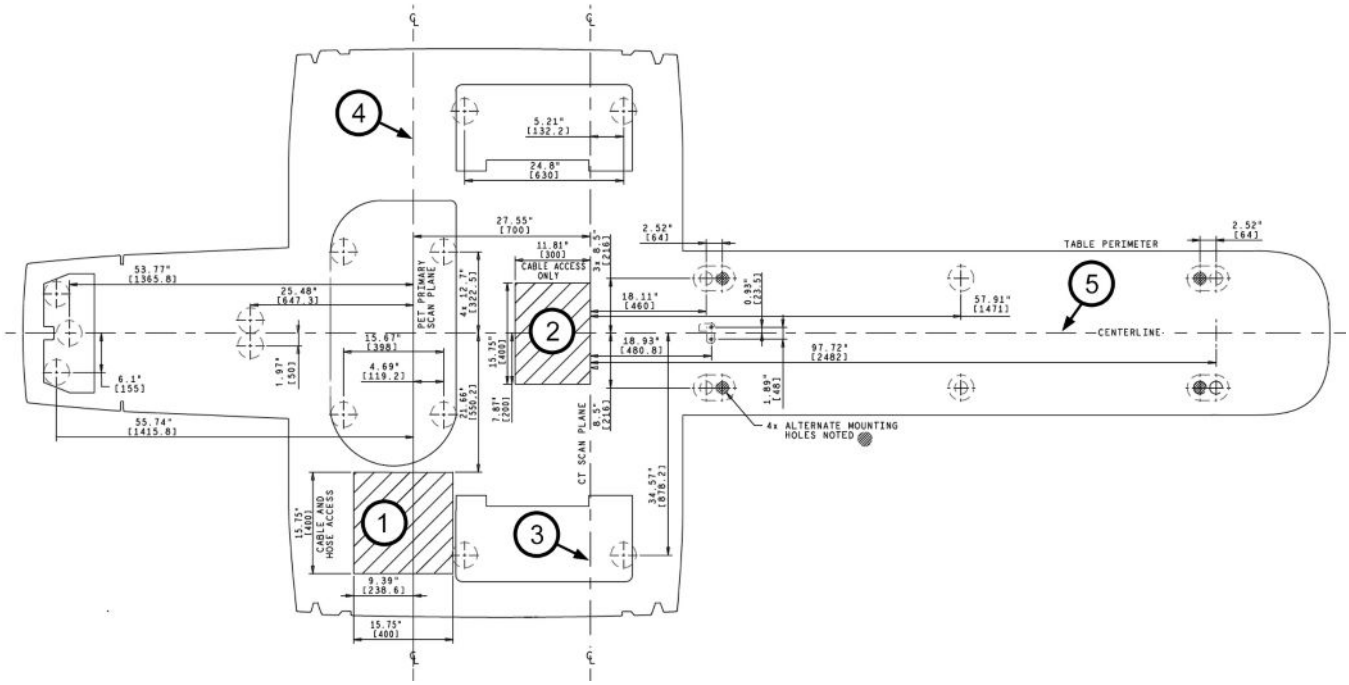
4.1.1 CT Gantry, Patient Table, and PET Base Anchoring – Non-Seismic

The CT Gantry, Patient Table, and PET Base shall be securely anchored to the floor (see Illustration 2-27). The Operator Console, Power Distribution Unit, Chiller, UPS, Adjustable Desk and PARC4 Reconstruction Cabinet do not require anchoring to the floor in a non-seismic installation. Use the floor template (p/n 5992810) to locate the CT Gantry, Patient Table, and PET Base 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 CT Gantry, Patient Table, and PET Base to the floor.

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

Illustration 2-27: Floor Mounting Detail

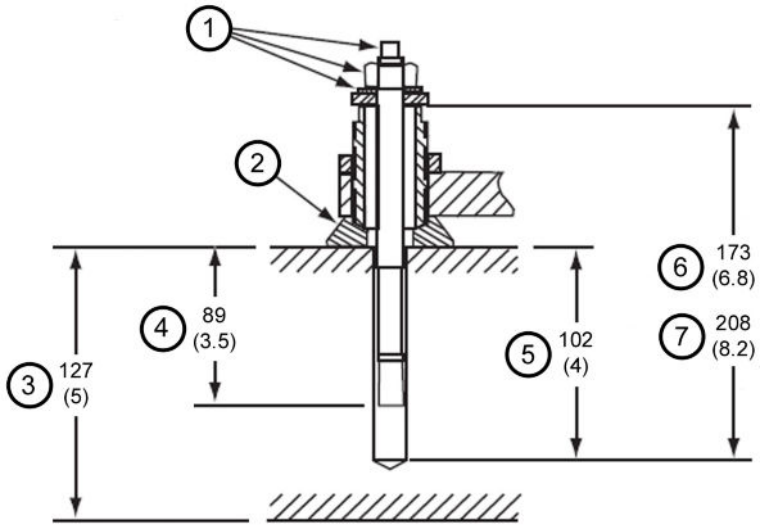


All dimensions are in inches; bracketed dimensions are in millimeters.			
1	Cable and hose access area	3	CT scan plane centerline
2	Cable access area	4	PET primary scan plane centerline
		5	Table centerline

4.1.2 GE-Supplied Anchors

The GE-supplied anchors for the CT Gantry, Patient Table, and PET Base shall only be used for mounting components to a concrete floor, in a non-seismic application. Refer to Illustration 2-28 for anchoring requirements.

Illustration 2-28: 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

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.)

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, and six anchors to mount the PET Base. 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 Illustration 2-28.

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.

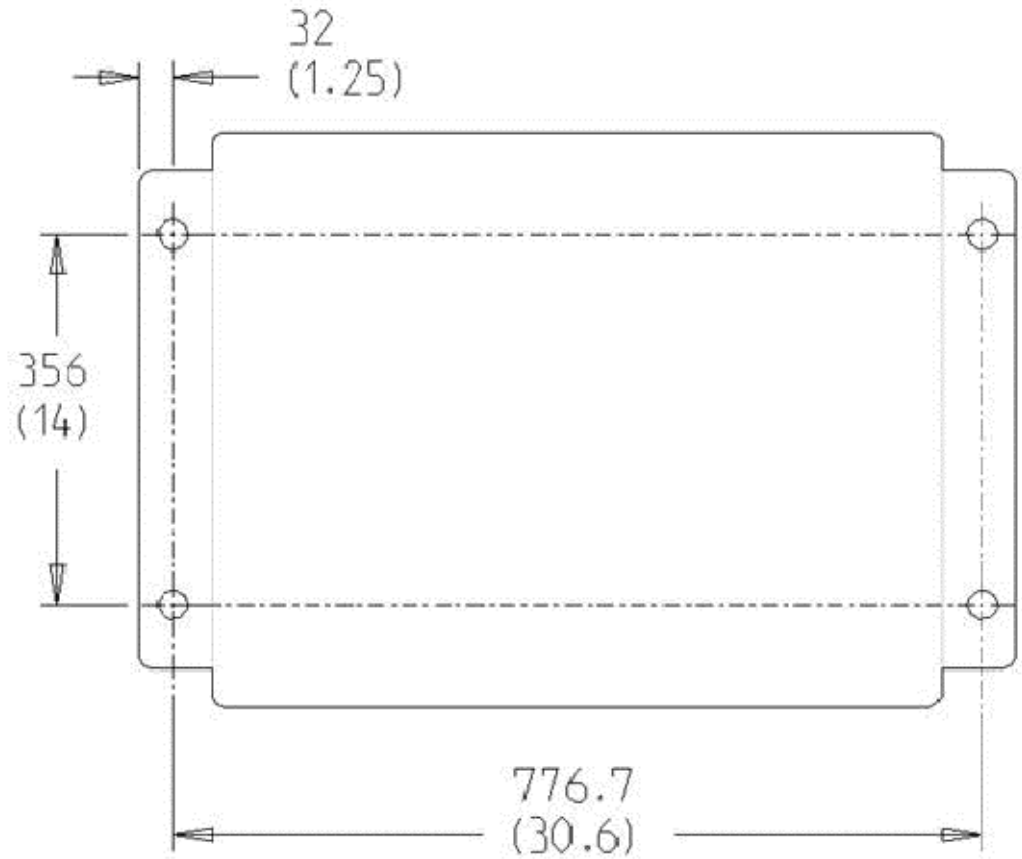
Use of seismic anchoring kit (P3000BK) designed by GE Healthcare will result in an EASE compliant installation. The kit provided by GE Healthcare is designed for anchors that are 5/8 inch (15.9 mm) in diameter. Anchors of this size are not provided by GE Healthcare. The type and length of the anchor must be defined in the alternative seismic anchoring plan and purchased separately by the customer.

The existing 1/2 inch anchors provided by GE Healthcare shall be discarded and NOT used for Seismic installations.

4.2.1 PDU

If site specifications require seismic mounting, use the seismic brackets shipped with the PDU. Refer to Illustration 2-29 for hole locations to mount the PDU so it can be easily removed for service.

Illustration 2-29: Seismic PDU Mounting Hole Locations

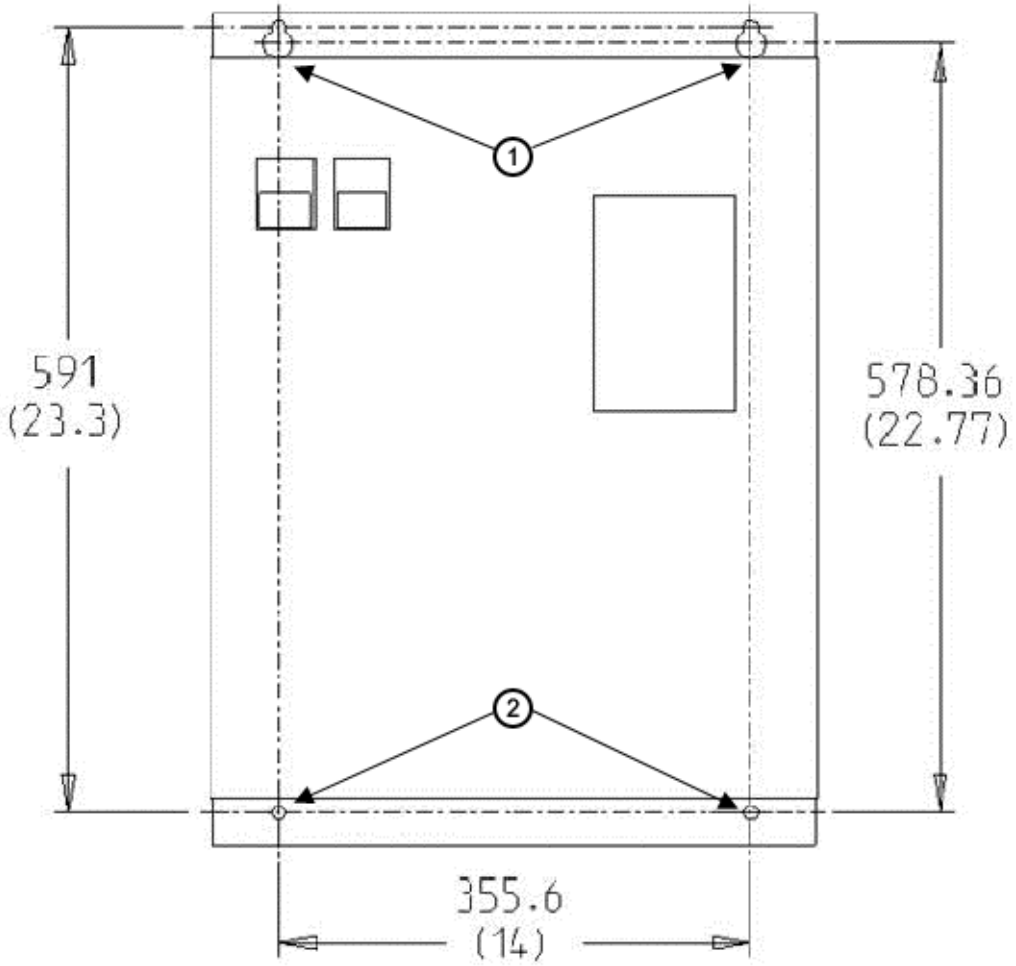


All dimensions are in millimeters; bracketed dimensions are in inches.
Seismic floor mounting holes (4); 15 mm (0.6 in.)
Refer to Illustration 2-15 for additional views.

4.2.2 PDB

If site specifications require seismic mounting, refer to Illustration 2-30 for PDB hole locations.

Illustration 2-30: Seismic PDB Mounting Hole Locations



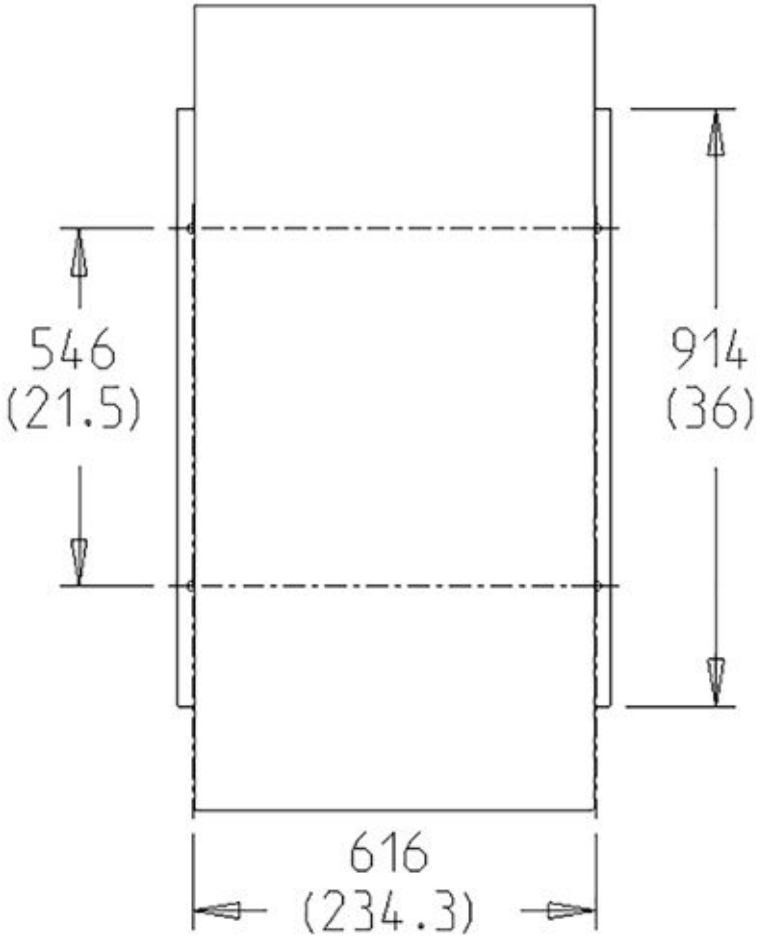
All dimensions are in millimeters; bracketed dimensions are in inches.	
1	Top mounting key holes
2	Bottom mounting 10mm holes

NOTE: 8mm hardware can be used to mount the PDB.

4.2.3 PARC4

If site specifications require seismic mounting, use the seismic brackets shipped with the PARC4. Refer to Illustration 2-31 for hole locations to mount the PARC4 so it can be easily removed for service.

Illustration 2-31: Seismic PARC4 Mounting Hole Locations



All dimensions are in millimeters; bracketed dimensions are in inches.
Seismic floor mounting holes (4); 15 mm (0.6 in.)

4.2.4 Operator Console

If site specifications require seismic mounting, use the seismic brackets shipped with seismic anchoring kit (P3000BK). Refer to Illustration 2-17 (C) for hole locations to mount the Operator Console so it can be easily removed for service.

4.2.5 Workspace Table

If site specifications require seismic mounting, use the seismic brackets shipped with the system. Refer to Illustration 2-18 (A)(B) for hole locations to mount the Workspace Table so it can be easily removed for service.

4.2.6 Chiller

If site specifications require seismic mounting, use the seismic brackets shipped with seismic anchoring kit (P3000BK). Refer to Illustration 2-19 (A) for hole locations to mount the Chiller so it can be easily removed for service.

4.2.7 UPS

If site specifications require seismic mounting, use the seismic brackets shipped separately with the UPS (E4502YA). Refer to Illustration 2-20 (B) for hole locations to mount the UPS so it can be easily removed for service.

Chapter 3 Special Construction Requirements

1 Radiation Protection

1.1 X-Ray Radiation Protection

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 Illustration 3-1 and Illustration 3-2)
- Equipment placement
- Weekly projected workloads (# patient/day technique (kvp*ma))
- Materials used for construction of walls, floors, ceiling, doors, and windows
- Activities in surrounding scan room areas
- Equipment in surrounding scan room areas (such as film developer, film storage)

The illustrations in this Chapter depict measured radiation levels within the scanning room, while scanning a 32 cm or 16 cm CTDI phantom with the technique shown. Use the mAs, kV and aperture scaling factors shown in Table 3-1 to adjust exposure levels to the scan technique used at the site.

Example (from Illustration 3-1): The exposure level for a 120 kV, 800 mA, 1 sec. scan at 1270 mm (50 in.) away from the scan plane is: 10.4 µGy × 0.71 × 800/100 = 59.2 µGy.

NOTE: Actual measurements can vary. Expected deviation equals ±15%, except for the 5 mA and 1 mm 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%.

Table 3-1: Shielding Requirements Scaling

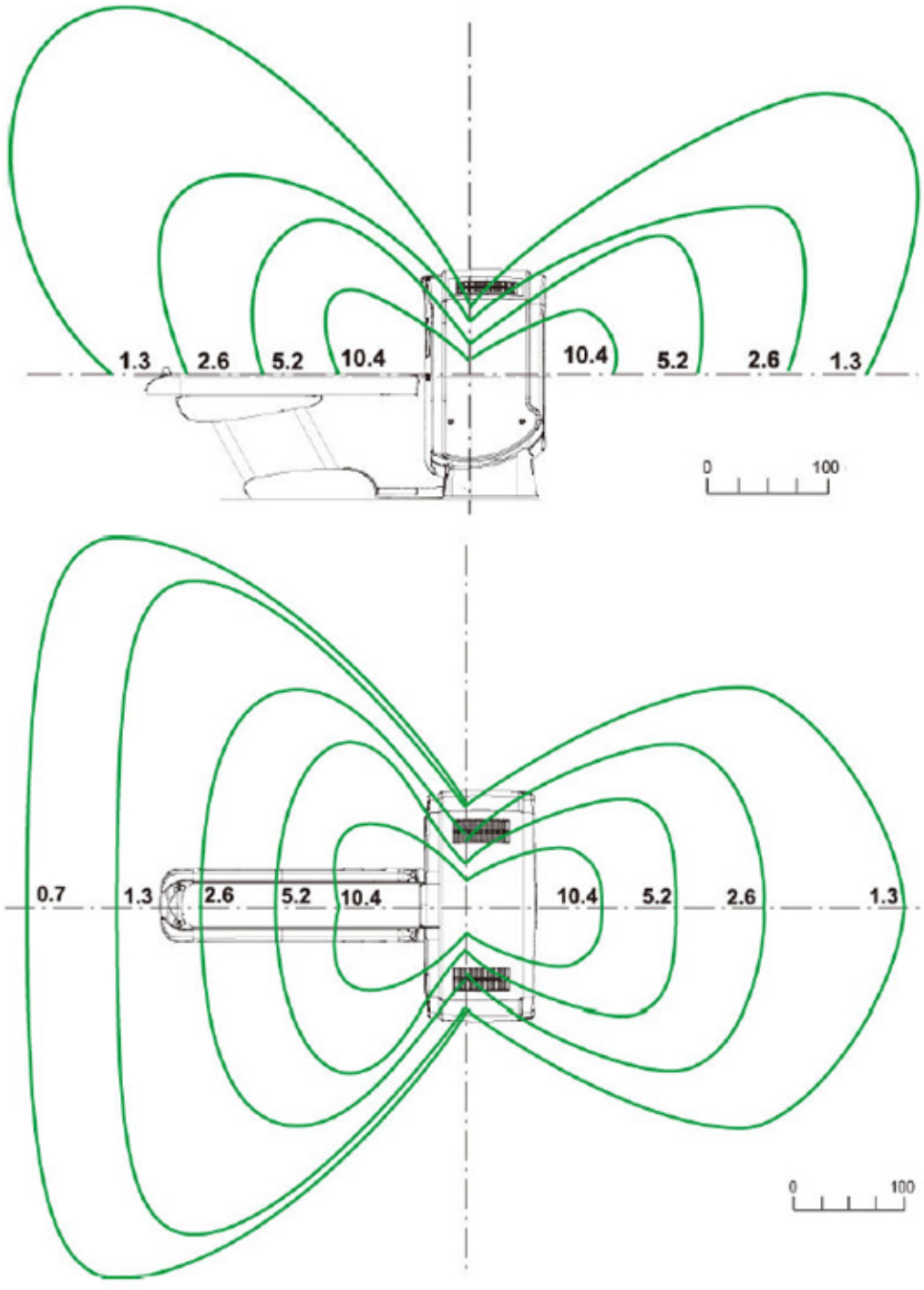
Changed Parameter	Multiplication Factor	Changed Parameter	Multiplication Factor
mAs	new mAs/100	1 mm aperture	0.20
80 kV	0.24	3 mm aperture	0.22
100 kV	0.45	5 mm aperture	0.27
120 kV	0.71	10 mm aperture	0.38
140 kV	1.00	15 mm aperture	0.48
		20 mm aperture	0.59
		30 mm aperture	0.79
		40 mm aperture	1.00

NOTICE

This publication uses µGy (micrograys) to measure radiation levels. The conversion factor from mR to µGy (micrograys) is: 1 mR = 8.69 µGy.

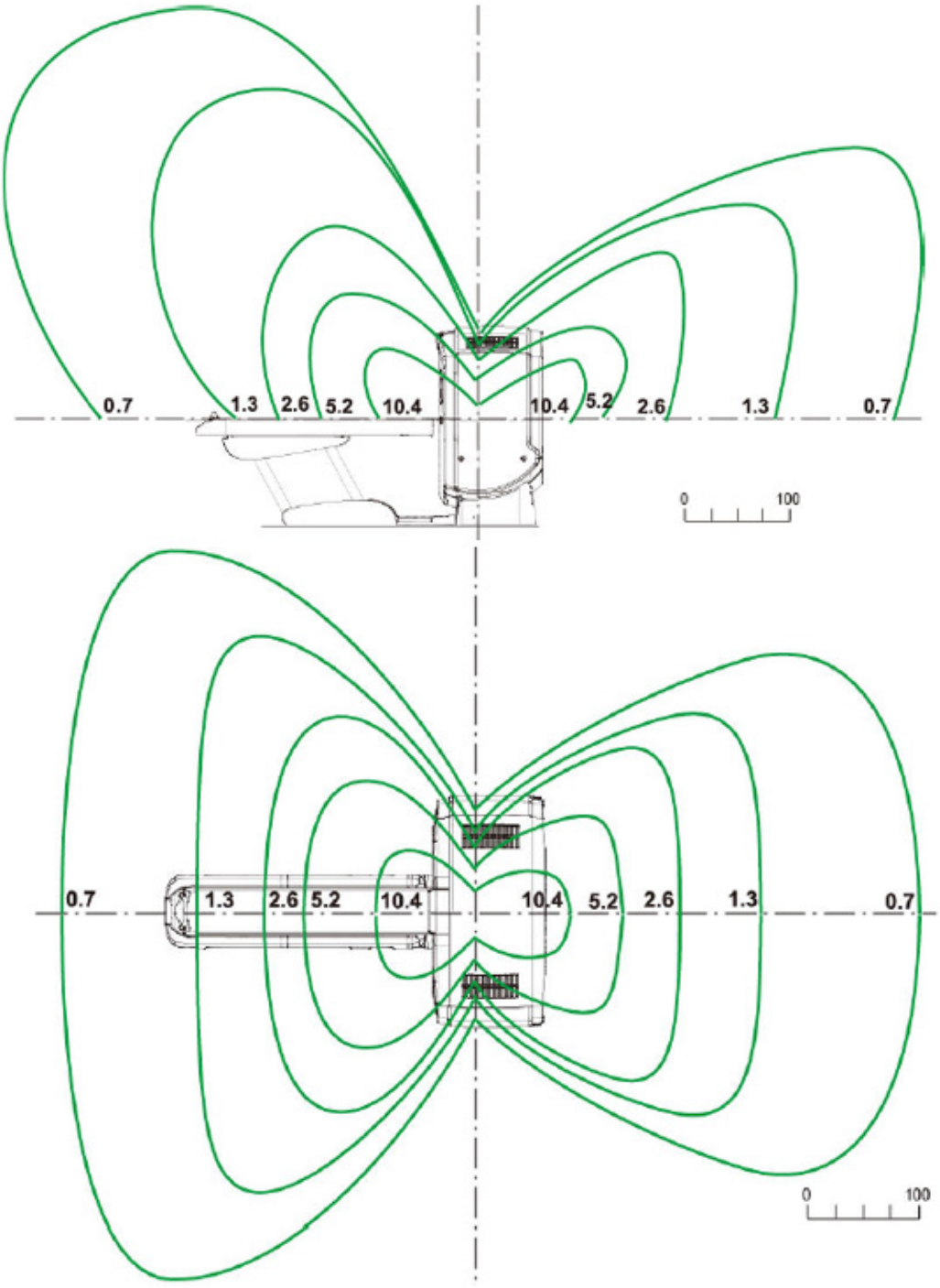
1.1.2 System X-ray Scatter Envelope

Illustration 3-1: Typical Scatter Survey (Large Filter)



Scale units: centimeters. ISO-contour level units: µGy/scan. Technique: 140 kV, 100 mA, 1 sec, 40 mm
Note: The 32 cm CTDI Phantom should be placed on the patient table.

Illustration 3-2: Typical Scatter Survey (Small Filter)



Scale units: centimeters. ISO-contour level units: µGy/scan. Technique: 140 kV, 100 mA, 1 sec, 40 mm
Note: The 16 cm CTDI Phantom should be placed on the patient table.

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.

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 or 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.

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.

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.

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.

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.

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.

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.

2 Electromagnetic Interference (EMI) Consideration

2.1 Electromagnetic Interference (EMI) System Placement

If you know of, or suspect, the presence of excessive electromagnetic interference (EMI), consult your GE Healthcare PM 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.

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.

2.1.2 EMI – PDU

The gantry or patient table shall not be placed within 0.3 meters (12 in.) of the power distribution unit.

Sensitive electronics shall not be placed within 1.0 m (39 in.) of the power distribution unit.

2.1.3 EMI – PARC/Scanner Desktop/Computer Equipment

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

2.1.4 Electromagnetic Immunity

The system is intended for use in the electromagnetic environment specified in Table 3-2. The customer, or the user of the system, shall ensure the system is used in such an environment.

Table 3-2: Electromagnetic Immunity

Immunity Test	EC 60601–1–2 Test Level	Compliance Level	Electromagnetic Environment Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors shall be concrete. 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 ± 1 kV for input/ output lines	± 2 kV for power supply lines ± 1 kV for input/ output lines	Mains power quality should be a typical commercial or hospital environment.
Surge IEC 61000-4-5	5 ± 1 kV differential mode ± 2 kV common mode	± 1 kV differential mode ± 2 kV common mode	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	< 5 % U_T (> 95% dip in U_T) for 5 sec	< 5 % U_T (> 95% dip in U_T) 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	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3 (Alternative method: Full range IEC 61000-4-21 test in lieu of Large, Permanently- Installed Equipment exemption)	3 VRMS 150 kHz to 80 MHz 3 V/m 150 kHz to 80 MHz	3 V 150 kHz to 80 MHz 3 V/m 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 calculated from the equation appropriate for the frequency of the transmitter. Recommended Separation Distance: See Table 3-3 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.

2.1.5 Electromagnetic Separation Distance

Maintain the electromagnetic separation distance as described in Table 3-3 (between 150K to 2.5G Hz).

Table 3-3: Recommended Separation Distances

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 2.5 GHz $d = [\frac{7}{3}]\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
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 2.5 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 2.5 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.

2.1.6 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.

2.2 Electromagnetic Emission

This equipment complies with IEC 60601-1-2 Edition 3 (2007) 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 PM. 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 3-4.

Table 3-4: 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	N/A
Voltage fluctuation/ flicker emissions IEC 61000-3-2	N/A	N/A

3 Vibration Isolation

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.

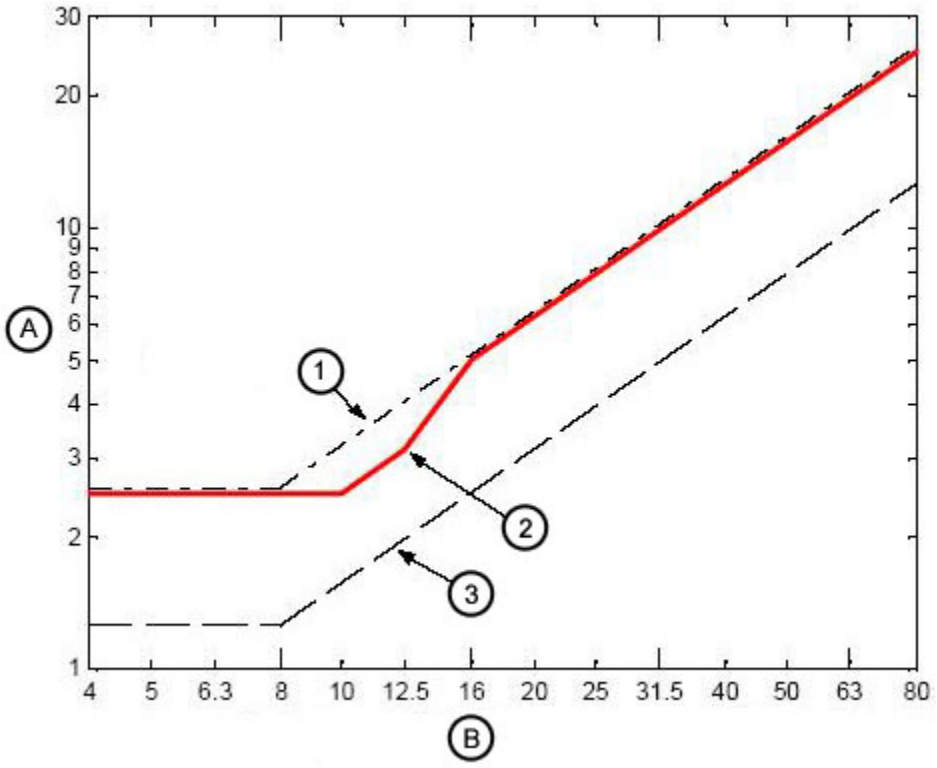
3.2 Frequency/Vibration Range

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

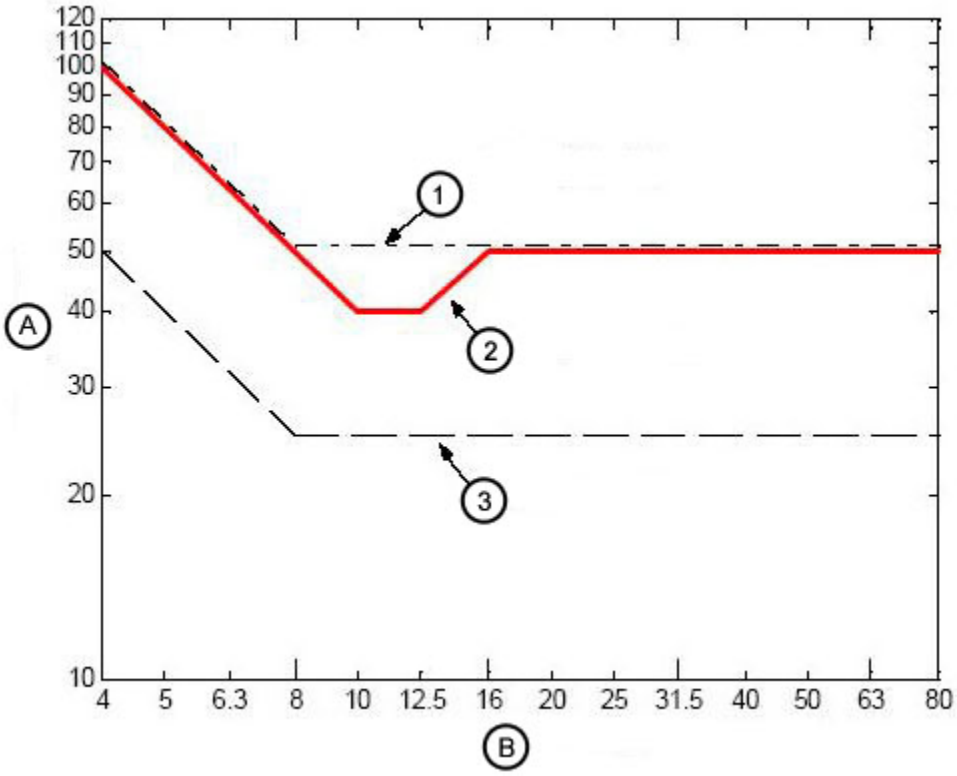
Floor vibration from any source shall not exceed the levels detailed in Illustration 3-3 and Illustration 3-4, as represented by the solid line labeled CT Scanner/Table. These illustrations compare this limit to the limits of what the AISC (American Institute of Steel Construction) and the ISO (International Organization for Standardization) call Class A (VC-A) and Class B (VC-B).

Illustration 3-3: Allowable floor vibration in acceleration units compared to ISO class A and B limits



A	Acceleration [mm/s², rms]	**Frequency [Hz]**	**Acceleration [mm/s², 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

Illustration 3-4: 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

4 Other Construction Considerations

4.1 Patient Viewing Window Dimensions

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

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.

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.

4.4 Finished Wall Requirement

4.4.1 Wall Paint

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

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.

4.5 Option Requirements

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.

4.5.2 GE Options

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

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.

Chapter 4 Environmental Requirements (HVAC)

1 HVAC Requirements

1.1 Temperature and Humidity

Ensure the site provides an HVAC system capable of maintaining the temperature and humidity requirements as specified in Table 4-1 and Table 4-2. 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, PARC4, Chiller and scanner desktop. 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.

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

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

Table 4-1: System Temperature Limits

Maximum allowable ambient room temperature:	26ºC (79ºF)
Recommended ambient room temperature:	22ºC (72ºF)
Minimum allowable ambient room temperature:	18ºC (64ºF)

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 4-1 during room thermal cycling. For example, if the HVAC is capable of ± 2º C control, then the limits would be 20º C - 24º C to maintain absolute limits.

Table 4-2: Humidity (Scan and Control Rooms)

Maximum allowable non-condensing relative humidity:	60%
Minimum allowable non-condensing relative humidity:	30%

1.2 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.

1.3 Heat Output

Table 4-3 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 air INTAKE occurs along the FRONT of the PARC4. PARC4 air EXHAUST occurs at the TOP of the PARC4.

- Chiller air INTAKE occurs along the FRONT of the Chiller. Chiller air EXHAUST occurs at the SIDES of the Chiller.

Table 4-3: System Heat Load*

System Components	Maximum BTU/HR	Maximum Kilowatts
Scan Room:		
CT Gantry	18766	5.5 kW
PET Gantry	9554	2.8 kW
Table	1024	0.3 kW
Power Distribution Unit (PDU)	3400	1.0 kW
PARC4 (Reconstruction Cabinet)	6824	2.0 kW
Chiller	13649	4.0 kW
Scan Room Subtotal:	**53217**	**15.6 kW**
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**	**1.1 kW**
System Total	**56842**	**16.7 kW**

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

1.4 Air Quality

See IEC 60654-4 for air quality guidelines.

1.4.1 Construction Dust Concerns

All construction and cleanup work to the scanner suite must be completed prior to the installation of the CT system. Damage to or early failure of the CT scanner can occur if the scanner is exposed to construction material particles. Ensure NO construction dust occurs in or immediately around the scan suite. Avoid the following:

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

1.4.2 Air-Handling System Initial Start-Up Considerations

Prior to the initial startup, ensure the air-handling system ducts and filters are thoroughly clean and free of dust and other potential airborne contaminants. The air-handling ventilation system could blow dust and other airborne contaminates throughout the scan suite, potentially damaging the CT scanner.

1.4.3 Chemical Contamination Concerns

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).

Asbestos contamination of the working environment caused by the materials used to cover the concrete floor. The customer is responsible for ensuring that the flooring material does not contain asbestos and if necessary, abatement measures prior to install for the purpose of providing a safe work environment.

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Chapter 5 Electrical Requirements

1 Power Requirements

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.

1.2 Regulations

NFPA 70E Standard

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

1.3 Disconnects

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.

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 Illustration 5-1.

Illustration 5-1: Typical Primary Power Disconnect (A1) – Fusible Disconnect and Magnetic Contactor

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.

1.5 Power Feed and Overcurrent Requirements

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.

1.5.2 Voltage

Voltage range: 380 to 480 VAC

1.5.3 Frequency

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

1.5.4 Average Power Demand at Maximum Duty Cycle

Average power demand at maximum duty cycle: 18.7 kVA (60 Hz); 17.9 kVA (50 Hz)

1.5.5 Maximum Power Demand

Maximum power demand is 150 kVA at 0.85 PF at the maximum selected technique of 140 kV and 515 mA.

1.5.6 Under voltage Release Control

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

1.5.7 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.

1.5.8 Voltage Regulation Effects

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

1.5.9 Load Regulation

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

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.

1.7 Sags, Surges, and Transients

1.7.1 Sags and Surges

Sags and surges of the power line shall not exceed the absolute range limits show in Table 5-1.

1.7.2 Transient Voltage

The maximum transient voltage is 1500 V peak.

1.8 Power Source Configuration

1.8.1 Neutral Wire

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

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.

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.

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.

1.9 Dedicated Distribution Transformer

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.

1.9.2 Power Distribution Transformer

The minimum recommended size for a dedicated distribution transformer is: 225 kVA, rated 2.4% regulation at unity power factor. Resultant maximum allowable feeder regulation is 3.4%.

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.

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 = 150kVA @ 0.85 PF: at a Selected Technique of 140 kV, 515 mA.
- Continuous (average) power demand at maximum duty cycle = 14 kVA.
- Maximum allowable total source regulation is 6%.

Table 5-1: Nominal Line Voltage Ranges

Nominal line voltage MUST fall within ONE of these ranges.						
Nominal Line Voltage	380	400	420	440	460	480
Hi-Line Limit, +10%	418	440	462	484	506	528
Lo-Line Limit, -10%	342	360	378	396	414	432
Continuous Line Current	30	29	27	26	25	24
Momentary Line Current	152	144	137	131	126	120
Maximum Line Current	169	160	153	146	139	134
Minimum Recommended Circuit Protection Rating	110	110	100	100	90	90

Table 5-2: Minimum Feeder Wire Size

Feeder Length (Power Substation to A1 Disconnect)	Minimum Feeder Wire Size, AWG or MCM (sq. mm)/ 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)	1 (45)	1 (45)	1 (45)
30 m (100 ft)	1/0 (55)	1/0 (55)	1/0 (55)	1 (45)	1 (45)	1 (45)
46 m (150 ft)	1/0 (55)	1/0 (55)	1/0 (55)	1 (45)	1 (45)	1 (45)
61 m (200 ft)	1/0 (55)	1/0 (55)	1/0 (55)	1 (45)	1 (45)	1 (45)
76 m (250 ft)	2/0 (70)	2/0 (70)	1/0 (55)	1/0 (55)	1 (45)	1 (45)
91 m (300 ft)	3/0 (85)	3/0 (85)	2/0 (70)	2/0 (70)	1/0 (55)	1/0 (55)
107 m (350 ft)	4/0 (100)	3/0 (85)	3/0 (85)	2/0 (70)	2/0 (70)	1/0 (55)
122 m (400 ft)	250 (125)	4/0 (100)	3/0 (85)	3/0 (85)	3/0 (85)	2/0 (70)

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

Table 5-3: Minimum Sub-Feeder Wire Size

Sub-feeder Length (A1 to PDU)	Minimum Sub-feeder Wire, AWG or MCM (sq. mm)					
	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)	1 (45)	1 (45)	1 (45)

The information in Table 5-1, Table 5-2, and Table 5-3 (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.

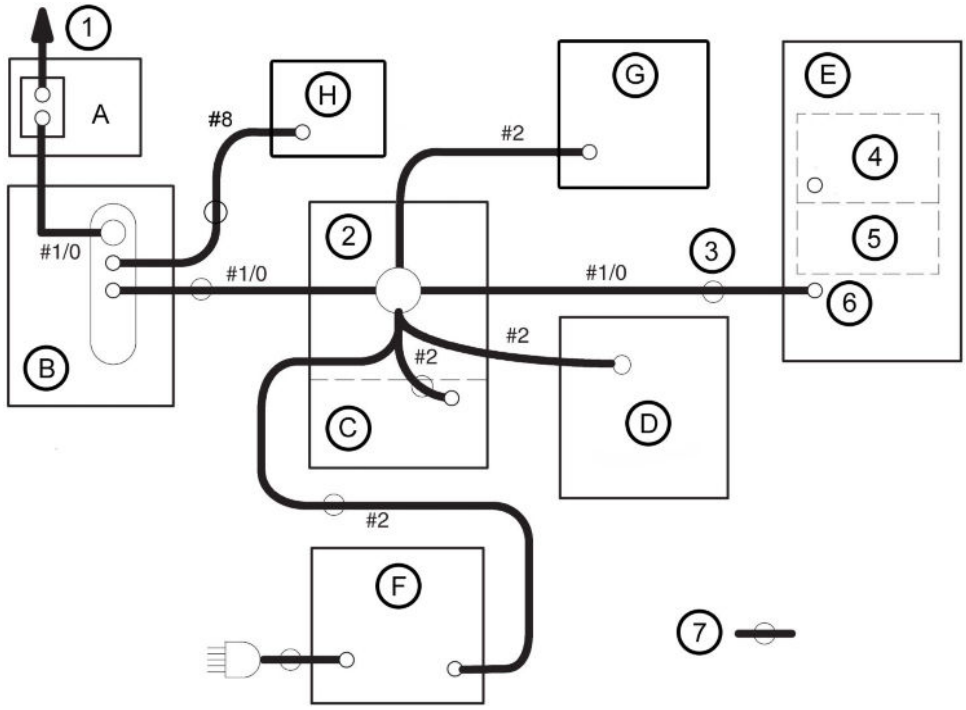
2 Grounding

The design of the scanner uses an equal potential grounding system. Illustration 5-2 and Table 5-4 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.

Illustration 5-2: System Ground Map



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

Table 5-4: 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.

3 System Interconnection and Cabling

3.1 Component Interconnections

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

- Table 5-5 defines the component designators for system equipment, electrical components, options, and communication outlets.
- Table 5-6 details the Standard-Length Cable Kit 5491000-3 (P5051TE) – Supplied by GE Healthcare.
- Table 5-7 details the Additional 64 Slice Standard-Length Cable Kit 5491000-70 (P3000BB) – Supplied by GE Healthcare.
- Table 5-8 details the Long-Length Cable Kit, Optional 5491000-4 (P5051TF) – Supplied by GE Healthcare
- Table 5-9 details the Additional 64 Slice Long-Length Cable Kit 5491000-71 (P3000BC) – Supplied by GE Healthcare.
- Table 5-10 details the PDU/UPS Cables (Standard-Length) – Supplied by GE Healthcare.
- Table 5-11 details the A1/UPS Cables – Supplied by GE Healthcare.
- Table 5-12 details the Miscellaneous Electrical Cables – Supplied by Customer/Contractor.
- Table 5-13 details the Miscellaneous Electrical Components – Supplied by Customer/ Contractor.

3.1.1 Component Designators

Table 5-5: 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
DS	Door Interlock Switch	**Contractor-supplied**
OC1	Operator Console (Scanner Desktop)/computer	System
PDU	Power Distribution Unit	System
PDB	Power Distribution Box	System
PRC4	PARC4 Reconstruction Cabinet	System
CC	Chiller	System
SEO	System Emergency Off	**Contractor-supplied**
WL/AD	X-ray on warning light/ Audible Device	**Contractor-supplied**

3.1.2 Cable Specifications

Table 5-6: 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/CT Gantry to Console Cables												
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	25 (82) [21.9 (72)]	2117848-2 **Note 1**	Fiber Optic - Console to Gantry			NA	NA			2	NA	
103	25 (82) [21.9 (72)]	5432019 **Note 1**	Fiber Optic - Console to Gantry			NA	NA			2	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/CT Gantry to PDU Cables												
52A	8.6 (28.2) [6.1 (20)]	2343528-2 **Note 1**	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	
55A	8.6 (28.2) [4.3 (14)]	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)

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/CT Gantry to PARC4 Cables												
209A	13 (42.6) [9.3 (30.5)]	5339979-6	PARC4 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)
203	13 (42.6) [9.9 (33)]	5313938-7 **Note 1**	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) [6.8 (22.3)]	5313938-8	PARC4 J4 to Switch Port 5	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
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 J5 to SBA J1	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
Miscellaneous Cables												
203	13 (42.6) [12.4 (40.7)]	5313941-2	PDU TS5 to PARC4 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 **Note 1**	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)

Note 1: Extra Cable. Not used for Discovery MI PET/CT systems.

Table 5-7: Additional 64 Slice Standard-Length Cable Kit 5491000-70 (P3000BB) – 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)	
070	6 (19.7) [5 (16.4)]	5125079-6	PDU TS4 (1–5) to Power Distrib Box TS40	2587	FT4	600	208Y/120	90	19 (0.75)	5	8	19.5 (0.8)
071	6 (19.7) [5 (16.4)]	5125079-7	PDU TS4 (6–10) to Power Distrib Box TS40	2587	FT4	600	208Y/120	90	15 (0.60)	5	8	19.5 (0.8)
072	7 (23.0) [5.8 (19.0)]	5641477	PDU Control Bd J6 to Power Distrib Box	758, 1581, 444/1007	FT4/FT1	300	120 VAC	75/80	8.5 (0.33)	2/4 pair	18	8.5 (0.33)
210	13 (42.6) [6.8 (22.3)]	5313938-15	PARC4 J7 to Switch Port 7	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
208	13 (42.6) [8.3 (27.2)]	5452158-3	Fiber Optic - PARC4 J6 to SBA BH J8			NA	NA			2	NA	13 (5)
077	13 (42.6) [9.9 (32.5)]	5627938-2	Chiller to PET Gantry SBA Bulkhead J9	2095/444	FT-4/CM	300	<30 VDC	80/75	5.3/5.8	2/4 pair	22/26	37 (1.5)
076	13 (42.6) [12.8 (42)]	5627939-2	Power Distrib Box TB10 to Chiller Power	2587	FT4	600	208 VAC	90	12 (0.46)	3	10	12 (0.5)
211	13 (42.6) [9.3 (30.5)]	5339979-9	Chiller GND to Raceway GND	1015	VW-1 (FT-1)	600	0	105	11.9 (0.47)	1	10	12.2 (0.5)
103	20.2 (66.1) [17.1 (56.1)]	5478856-2	Fiber Optic - Console to Gantry			NA	NA			2	NA	18 (0.7)

Table 5-8: 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/CT Gantry to Console Cables												
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	25 (82) [21.9 (72)]	2117848-2 **Note 1**	Fiber Optic - Console to Gantry			NA	NA			1	NA	
103	25 (82) [21.9 (72)]	5432019 **Note 1**	Fiber Optic - Console to Gantry			NA				1	NA	10 (0.4)
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/CT Gantry to PDU Cables												
52	19.4 (63.6) [17.2 (56)]	2343528 **Note 1**	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) [15.1 (50)]	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)

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/CT Gantry to PARC4 Cables												
209	25.5 (83.6) [21.8 (71.5)]	5339979-5	PARC4 GND to Raceway GND	1015, 1063, 1284, 1283	VW-1 (FT-1)	600	0	105	11.9 (.47)	1	2	12.2 (0.5)
203	30.5 (100) [27.4 (90)]	5313938 **Note 1**	SBA J7 to Q.Core J6	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
201	30.5 (100) [24.3 (79.7)]	5313938-2	PARC4 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 J5 to SBA J1	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
Miscellaneous Cables												
203	19.4 (63.6) [18.8 (61.7]	5313941	PDU TS5 to PARC4 PDU cable	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 **Note 1**	Q.Core Power from PDU, long	2587	FT-4	600V	120 VAC	90	11.7 (0.46)	3	10	56.4 (2.2)
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)
Note 1: Extra Cable. Not used for Discovery MI PET/CT systems.												

Table 5-9: Additional 64 Slice Long-Length Cable Kit 5491000-71 (P3000BC) – 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)	
070	6 (19.7) [5 (16.4)]	5125079-6	PDU to Power Distrib Box	2587	FT4	600	208Y/120	90	19 (0.75)	5	8	19.5 (0.8)
071	6 (19.7) [5 (16.4)]	5125079-7	Power Distrib Box to PDU	2587	FT4	600	208Y/120	90	15 (0.60)	5	8	19.5 (0.8)
072	7 (23.0) [5.8 (19.0)]	5641477	PDU Control Bd J6 to Power Distrib Box	758, 1581, 444/1007	FT4/FT1	300	120 VAC	75/80	8.5 (0.33)	2/4 pair	18	8.5 (0.33)
210	30.5 (100) [24.3 (79.7)]	5313938-14	PARC4 J7 to Switch Port 7	UL	FT-4	300	<30 VDC	60	6.6 (0.26)	4 pair	24	13 (0.5)
208	30.5 (100) [25.8 (84.6)]	5452158-4	Fiber Optic - PARC4 J6 to SBA BH J8			NA	NA			2	NA	13 (0.5)
077	30 (98.4) [26.9 (88.3)]	5627938	Chiller to PET Gantry SBA Bulkhead J9	2095/444	FT-4/CM	300	<30 VDC	80/75	5.3/5.8	2/4 pair	22/26	37 (1.5)
076	30 (98.4) [29.8 (97.8)]	5627939	Power Distrib Box TB10 to Chiller Power	2587	FT4	600	208 VAC	90	12 (0.46)	3	10	12 (0.5)
211	30 (98.4) [26.3 (86.3)]	5339979-8	Chiller GND to Raceway GND	1015	VW-1 (FT-1)	600	0	105	11.9 (0.47)	1	10	12.2 (0.5)
103	24.6 (80.7) 21.5 (70.7)]	5478856	Fiber Optic - Console to Gantry			NA	NA			2	NA	18 (0.7)

Table 5-10: 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	Power Distribution Box to UPS	2587	FT4	600	208Y/120	90	19 (0.75)	5	8	19.5 (0.8)
061	6 (19.7) [5 (16)]	5125079-2	UPS to Power Distribution Box	2587	FT4	600	208Y/120	90	15 (0.60)	5	8	19.5 (0.8)
110	14 (46) [13.7 (45))	5169224	A1 to UPS	2587	FT4	600	120 VAC	90	14 (0.54)	5	18	25 (1.0)

Table 5-11: A1, PDB, and UPS

PDU Model No.	Maximum Nominal kVA Rating	Required Mains Disconnect (A1) Catalog No.		Required Power Distribution Box (PDB) 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-61	150 kVA	E4502AC (110A) Includes Auto Restart and Integrated UPS Control	E4502AB (90A) Includes Auto Restart and Integrated UPS Control	P3000AK Controls power to the Chiller	B7864PZ PowerWare 9355-15-14GE (14.4 kVa - 40A)
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 5-12: 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	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)	POWER						2 (6)	2 (6)
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 5-13: Miscellaneous Electrical Components – Supplied by Customer/Contractor

Reference	Associated Equipment	Material/Labor Supplied by Customer Contractor	USA Vendor / CAT No. GE Catalog
A1 380V - 480V 50/60 Hz	Circuit Breaker with Magnetic Contactor	Three Pole, 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) Optional remote operator control available from GE Supply, Cat # GESCTR0CS1
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

3.2 Cable Routing Requirements

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 5-6 through Table 5-12.

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.

3.2.2 Future Expansion

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

3.2.3 Routing Power Wiring

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

3.2.4 Power and System Control Wire Separation

Power supply wires and system control lines shall be located in separate conduit or ductwork. Do NOT run coolant lines in cable conduits/ductwork.

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.

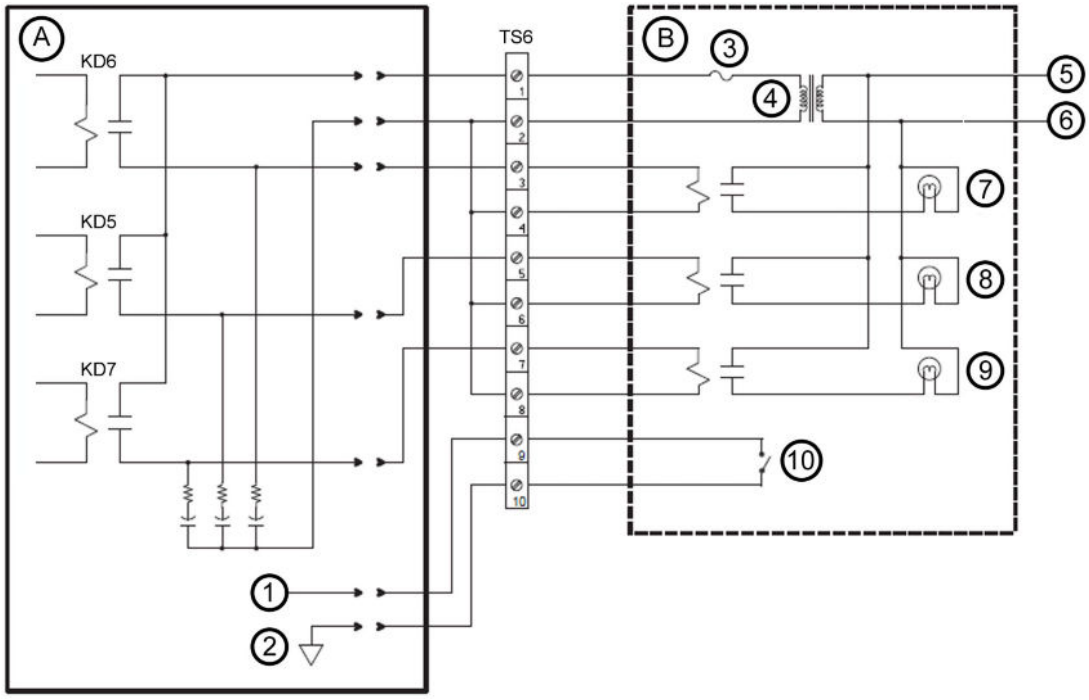
4 Scan Room Warning Light and Door Interlock

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

4.1 X-Ray Warning Light

Illustration 5-3: 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

4.2 Scan Room Door Interlock Connections

NOTE: The terminal blocks detailed in Illustration 5-4 and Illustration 5-5 are located in the power distribution unit (PDU).

Illustration 5-4: TS6 Room Door Interlock Connections – without Door Interlock

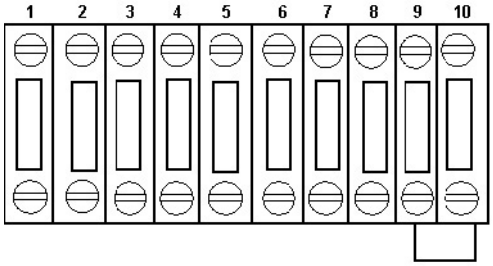
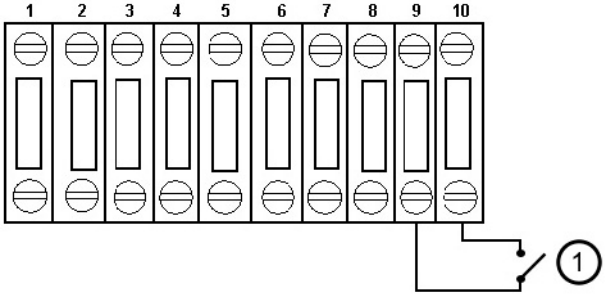


Illustration 5-5: TS6 Room Door Interlock Connections – with Door Interlock



1	Normally open door switch

Chapter 6 Communications Requirements

1 Network Requirements

1.1 Communication Network

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.

1.1.2 Network Speed

Broadband interface type: 10 Gb Ethernet connection.

1.1.3 Network Communication

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

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.

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.

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.).

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 PM 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 PM 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 PM 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 PM to obtain the name of a zone broadband specialist.
- IT Infrastructure Changes- Zone broadband specialist and PM 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 PM 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.

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