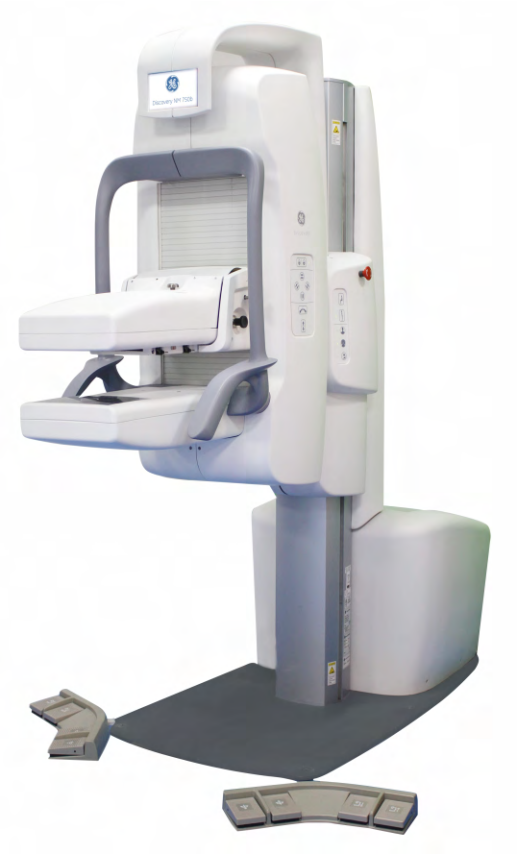
Technical Publications

Direction 5749262-1EN
Rev. 1



Discovery NM 750b

Nuclear Medicine Imaging Systems

Pre-Installation Manual

Revision History

Revision	Date	Description of Changes	Chapter/Pages
5749262_r1	November 2016	Update manual with Biopsy option.	
5411125_r2	May 2013	IEC Ed3 compliance Minor updates	
5411125_r1	September 2011	New Manual	

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 .
BRDINJUMS (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 clienţi necesită o altă limbă decât cea engleză, este de datoria clientului să furnizeze o traducere. • Nu încercaţi să reparaţi echipamentul decât ulterior consultării şi înţelegerii 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.
DIKKAT (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.

Contents

Chapter 2: Equipment Requirements

Chapter 3: Special Construction Requirements

Chapter 4: Environmental (HVAC) Requirements

Chapter 5: Electrical Requirements

Chapter 6: Communications Requirements

Appendix A: Customer Checklist

Appendix B: EMC Compliance

Appendix C: Regulatory Clearances

List of Figures

List of Tables

Before You Start

⚠ WARNING

- Before any attempt is made to use/service the system, the operator and service personnel must be trained, and must read and be acquainted with all **safety-related documents**, accessible via the **Start** main menu.

  Click below to access all documents.
- These, in conjunction with the *Safety* chapter in the *Service Manual*, provide you with all necessary safety-related safety information, will prepare all users to operate the equipment safely and correctly in order to ensure the well-being of the patient, operator and service personnel.

IMPORTANT

- See *Service Manual* for a full list of documents provided with the system.
- The images in this manual are for demonstration only. There may be minor differences that do not affect functionality.

Safety Indications in This Document

This manual uses three safety severity classifications:

DANGER

Danger is used to identify conditions or actions for which a **specific hazard** is known to exist, which **will cause severe or fatal personal injury** or substantial property damage if the instructions are ignored.

WARNING

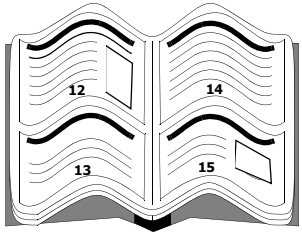
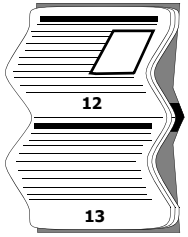
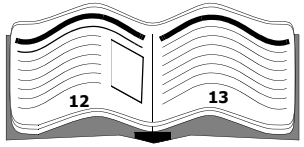
Warnings are used to identify conditions or actions for which a **specific hazard** is known to exist, which **may cause severe or fatal personal injury** or substantial property damage if the instructions are ignored.

CAUTION

Cautions are used to identify conditions or actions for which a **potential hazard** may exist, which **may cause minor personal injury** or property damage if the instructions are ignored.

Printing this Document

This document is created using A5 sheet size. Use the following guidelines when printing:

Print Dialog	**Property***	**Two pages per sheet (A4 or Letter)**	**One page per sheet (A5 or A4/Letter)**	
			A5 is recommended for a compact book and paper saving **A4/Letter** is recommended when large format and print are needed	
				
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	Double-sided	**Double-sided** or (**Print on Both Sides**)		
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	Number of pages per sheet	**2**	**1**	**1**
	Page Borders	**Print Page Borders** (adds visual separation between the two pages)	N/A	N/A

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Conventions in This Document

IMPORTANT
Calls attention to important comments.

NOTE
Contains tips and general comments.

The following conventions are used throughout the manual:

Description	Example
Keys on the operator keyboard, hand-held controller and gantry	**<SET>**, **<Ctrl>**
Software interface buttons	**[OK]**, **[Apply]**, **[Cancel]**
Names of items in the graphical interface including: ■ Names of dialog boxes, windows, tabs, areas and lists ■ Menu items ■ Field and icon labels	 **Configuration** tab; **To Do List** **File** menu **Gantry** icon; **Properties** field
System messages	`Press Y to continue.`
System parameters whose actual values must be defined by the user	Type-in the *`Patient ID`*
Hyperlinks	Figure 3-1
Paths	`D:\Utildb\`
References to other documents	*Operator Manual*
End of a procedure	◆

Chapter 1: General Requirements

1.1 Objectives & Overview

This manual provides all information necessary to prepare the site for the installation of the Discovery NM 750b system, taking into consideration the information required for different professionals such as architects, construction engineers, electrical contractors, and all other personnel involved in construction and preparation of the site.

IMPORTANT

- Good site preparation is essential for a smooth and efficient installation and for proper functioning of the system. Poor site planning may compromise system efficiency and/or patient comfort.
- The information provided in this Pre-Installation Manual is general in its nature, and must always be used in conjunction with the drawings and specifications prepared specifically for your site.

1.2 Customer Responsibilities

It is the customer's responsibility to prepare the site in accordance with all the specifications provided in this manual, and in conjunction with the site-specific drawings. It is essential to verify all aspects of the site configuration before construction is started, as subsequent changes can be costly or impractical.

A detailed checklist is provided in App.A, Customer Checklist. It is the customer's responsibility to ensure that all requirements in the checklist are fulfilled and that the site conforms to all the specifications and requirements in this manual.

The customer is responsible for all aspects of site preparation, including, but not limited to, the following tasks:

- Assigning a project coordinator (see Project Coordination, p.1-6)
- Planning and construction or renovations required for installation of the Discovery NM 750b, in accordance with the specifications included in this manual, including:
  - Room Size, Layout and Considerations
  - Equipment Description, General Construction Requirements and Special Construction Requirements
  - Environmental HVAC Requirements
  - Electrical Requirements
  - Network Requirements
- Complying 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
- Assuring regulatory compliance for the use of radioactive isotopes and preparation of the required isotopes (see Using Radioactive Isotopes, p.1-3)
- Safe storage of the system and auxiliary equipment prior to and during installation
- Floor tile removal and replacement in area of gantry
- Ensuring adequate accessibility for all system components and auxiliary equipment to the site

1.2.1 Using Radioactive Isotopes

Since the Discovery NM 750b involves the use of radioactive isotopes, compliance with Nuclear Regulatory Commission regulations, or similar regulatory requirements (depending on the country), must be adhered to and all permissions obtained well in advance. It is recommended that regulatory compliance is arranged early in the site planning process.

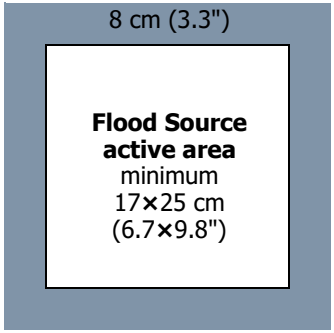
It is essential that all preparations are completed so that required source materials can be obtained prior to installation, including calibration sources. Take into consideration that these sources may have fairly long delivery lead times, yet may also have a short half-life, so that it may not be advisable to store them over long periods of time.

1.2.1.1 Installation Prerequisite – Co^{57} Flood Source

A Co^{57} Square flood source must be pre-ordered and available on site before installation commences, to facilitate QC and Maps creation during the installation process.

QC Flood requirements:

- A Co^{57} Flood with activity of 10 mCi.
- Active area of at least 17×25 cm (6.7×9.8")
- Distance between flood edge and active area < 8 cm (3.3")



The following suitable flood sources are available:

- **Order from GE**:
  E8505JE, IPL Rectangular Co-57 10mCi flood source that measures 36x21 cm (14.25×8.23").
- Purchase from **Eckert & Ziegler (IPL)**
  Catalog number MED3743
- Purchase from **International Isotopes Inc**.
  Catalog number BM55-20 (20 millicuries (740 MBq)).

  Web: http://www.radqual.com Manufacturer (on record with the NRC/FDA):
  International Isotopes Inc., Idaho Falls, Idaho 83401

  Ownership, design and engineering: RadQual, LLC
  email: info@radqual.com

1.2.1.2 Biopsy option Installation Prerequisite – Gd153 Point Source

A Gd153 point source must be pre-ordered and available on site prior to the installation of the Biopsy option, to facilitate QC and Accuracy of the Imaging Unit during the installation process.

Source requirements:

- A Gd153 point source with an activity of 100 µCi.
- The point source is located in a specifically designed metal rod that includes a locking mechanism to a sterile sleeve.
- Active area of 1mm diameter is located at the tip of the rod.
- The distance between the center of the point source and the end of the rod shall not exceed 1mm.

The source is available:

- Purchase from Eckert & Ziegler (IPL) Catalog number HEGL-0145

1.2.2 Project Coordination

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

To insure a successful installation, it recommended that the site nominates a single site project coordinator, preferably a person familiar with similar medical construction projects, manages the entire project. Ideally, the project coordinator is involved in every phase from pre-installation and installation, from conceptual planning through to system start up, working closely with GE Healthcare to ensure that the client upholds all requirements in this Pre-Installation Manual.

1.3 Delivery Requirements

The system is packed for shipment with minimum tear-down of components.

⚠ CAUTION

The system components are sensitive to excessive mishandling, including dropping, shock, vibration, tipping or hoisting. Vibration damage to components may not be evident until after system installation is complete.

- The system components must **never** be dropped. A drop from a height greater than 1 cm (½") may induce structural damage to the frame or other major components.
- To avoid damage to sensitive components, dock-to-dock shipment is recommended. Other methods are acceptable, provided the system is not dropped or otherwise mishandled.

1.3.1 Delivered Containers

The system is delivered in a minimum of three containers (gantry, detectors and other components).

1.3.1.1 Gantry Container

The gantry is shipped in a wooden container designed to provide limited protection against mechanical impact during shipment. The gantry is pre-assembled on the dolly, inside the container. The weights and dimensions of the crates and packages are provided in Table 1-1, p.1-8.

- **Dual Head configuration**:
  The gantry is shipped without the detectors assembled. The detectors are shipped separately.

Figure 1-1:Crated Gantry

Table 1-1: Gantry and Detectors Crates – Weights and Dimensions

Crate	Weight	Dimensions / mm (inches)		
	kg (lbs)	Height	Length	Width
Gantry	500 (1100)	2000 (79)	1800 (71)	900 (35.5)
Detectors (Dual Detectors)	60 (185.8)	650 (25.6)	1300 (51.2)	910 (35.9)

Figure 1-2:Crated Detectors (Dual Head Configuration)

1.3.1.2 System Component Container

Table 1-2: Other Delivery Containers – Weights and Dimensions

Unit	Weight / kg (lbs)	Dimensions / mm (inches)		
		Height	Length	Width
Acquisition station & accessories, including: ■ Computer ■ Keyboard and mouse ■ Monitor 17” ■ Operator and service documentation ■ Installation Kit ■ System cables	60 (185.8)	650 (25.6)	1300 (51.2)	910 (35.9)
Console Cart (optional)	15 (33)	1800 (70.9)	800 (31.5)	120 (4.8)
Biopsy Imaging Unit package (optional) including: ■ Imaging Unit ■ Accuracy Jig ■ Compression Paddle	15 (33)	350 (13.8)	1000 (39.4)	600 (23.7)

1.3.2 General Transportation and Delivery Precautions

1.3.2.1 General Temperature Precautions

Extreme temperatures must be avoided during system transportation and delivery. Ensure that the system is not exposed, for an extended period of time, to temperatures or humidity outside the following specifications.

- Temperature: -20ºC to 60ºC, (-4 to 140 F)
- Maximum Gradient: 5ºC / hour (9ºF / hour)
- Humidity: 10% to 90%, change rate 5% per hour, non-condensing

NOTE

Component freezing occurs if the system is exposed to temperatures below -18º C (0º F) for a period of longer than two days. Allow a minimum of 12 hours for the system to adjust to ambient room temperature, prior to installation of the detectors or the Biopsy option.

1.3.2.2 Detector Precautions

⚠ CAUTION

- The detectors and the Biopsy Imaging Unit are very fragile and must always be handled with extra care.
- The detectors and the Biopsy Imaging Unit are extremely sensitive to temperature gradients (sudden changes in temperature).

Failure to comply with the following instructions could cause irreversible damage to the detector CZT modules.

The detector heads and the Biopsy Imaging Unit must be transported in their original packages, which are designed to provide good mechanical stabilization as well as a certain amount of thermal insulation.

As soon as the detector heads or the Biopsy Imaging Unit are unloaded from the transportation vehicles, they must be moved while still in their original containers to a temperature-controlled area until they are ready to be installed into the system.

If the temperature in the storage or installation areas differs from that of the delivery route and/or ambient temperature, a stabilization period of 1 hour per 5ºC (9ºF) difference must be allowed.

- Temperature: 5ºC to 40ºC, (41ºF to 104ºF)
- Maximum Gradient: 5ºC / hour (9ºF / hour)
- Humidity: 20% to 80%, Change rate 5% per hour, non-condensing

1.3.3 Delivery and Unloading Area and Equipment

A suitable unloading area must be allocated. The unloading area must be large enough to accommodate the packed units, with additional space to allow for some of the system components to be unpacked.

The minimal unload area adjacent to the delivery truck is 5 m x 5 m (16' 4.85" x 16' 4.85"). Make sure that the unloading and storage areas are large enough to maneuver a forklift with crates.

- It is recommended that the delivery site is selected to provide the shortest and smoothest route for component conveyance:
  - If delivered on the installation day, as close as possible to the scan room for installation
  - If delivered prior to the installation day, as close as possible to the storage area
- If a forklift is required in order to unload or move system components:
  - Allocate a forklift that is capable of lifting more than the maximum weight of the heaviest unit.
  - Take into account sufficient floor space to maneuver the forklift near the delivery truck.

1.3.4 Conveyance of Crated System Components within the Site

It is important to verify that the route selected has sufficient clearance and load carrying capacity.

Regardless of whether the system is being delivered from the unloading area to storage, from the unloading area to unpacking area for installation or from storage to the installation area, take care to adhere to the following guidelines:

- Ensure that there is a free path, including an elevator if necessary, to wheel the components to the installation area.
- Do not convey the system (or any component parts) over slopes greater than 4° (4 cm per 100 cm).
- Verify that the route selected has sufficient clearance and load carrying capacity.
- The subsystems may be lifted only with a forklift and only when attached to their original shipping pallets.

⚠ CAUTION

Lifting of the gantry without its original shipping pallet or using a crane may damage the system and is prohibited.

- If the outer crating is removed after delivery, do not detach the subsystems from their original shipping pallets before they are conveyed to the scan room for installation.

- The center of gravity of each item, including lifting height and position, is marked on the subsystem crate. When conveying the subsystems within the site, and particularly if there are slopes in the delivery path, make sure to take the center of gravity into account.
- Always lower system components at the slowest reasonable rate.
- If the system components are to be transferred from an unloading site outside the building, special facilities must be provided to ensure smooth conveyance.
- Uneven temporary ramps may cause vibrations that could damage some components.
- System components may be moved via flat-bed tow truck or by rolling them across **smooth** sidewalks or other paved surfaces.
- When moving the gantry off a flat-bed tow truck, attach the straps to the lowest point possible on the dolly.

1.4 Product Storage and Handling Requirements

All components must be stored in their original crating.

1.4.1 Storage Requirements

If the system is to be stored before installation, store in a temperature and humidity controlled environment, and protect from weather, dirt and dust. Storage longer than three months is not recommended. Meeting these requirements prevents rust and corrosion from forming on bearing surfaces due to condensation.

⚠ CAUTION

Component freezing occurs if the system is exposed to temperatures below -18º C (0º F) for a period of longer than two days.

Gradually adjust the system to ambient room temperature prior to installation, with a change of no more than 5ºC (9ºF) per hour.

Table 1-3: Environmental Conditions for Storage

	System Without Detectors	Detectors and Biopsy Imaging Unit
Temperature	-20ºC to 60ºC, (-4ºF to 140ºF)	5ºC to 40ºC, (41ºF to 104ºF)
Maximum Gradient	5ºC / hour (41ºF / hour)	5ºC / hour (41ºF / hour)
Humidity	10% to 90%, change rate 5% per hour, non-condensing	20% to 80%, change rate 5% per hour, non-condensing
Barometric pressure	Sea level to 3000m	

Chapter 2: Equipment Requirements

2.1 System Components

Figure 2-1:Discovery NM 750b System Components

2.1.1 System Dimensions

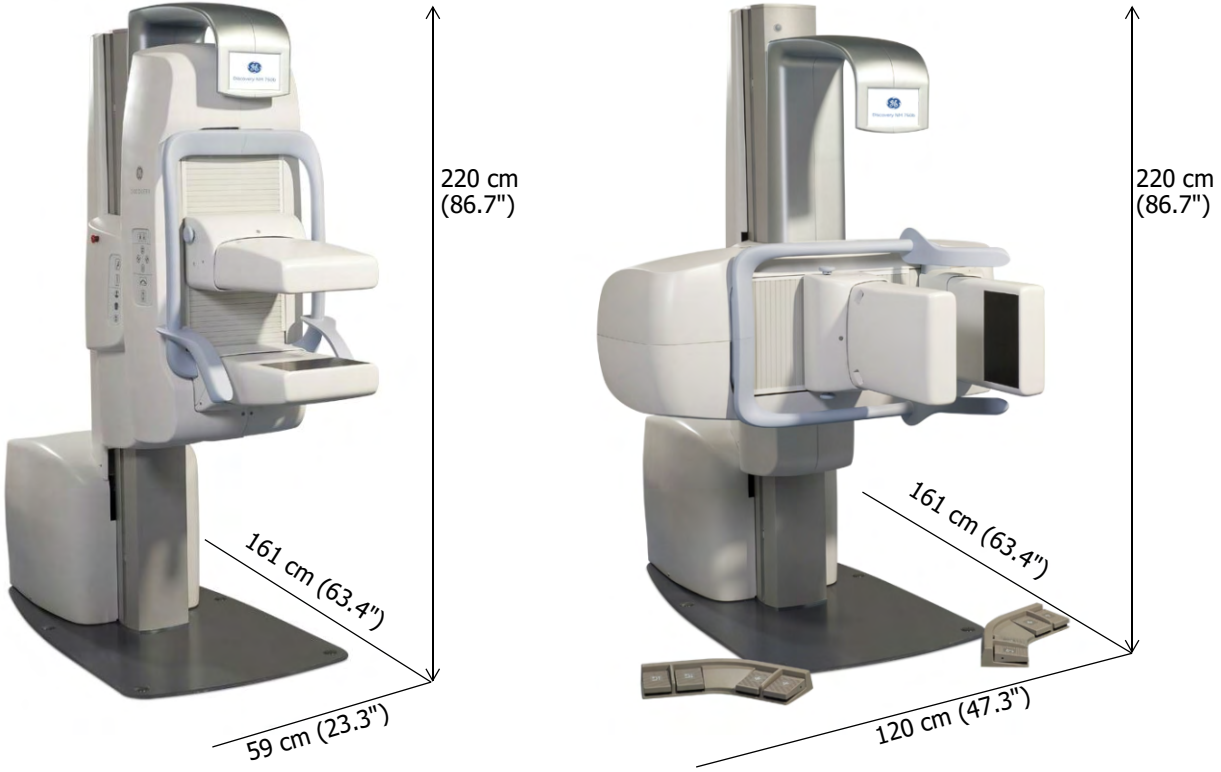


Figure 2-2:System Dimensions

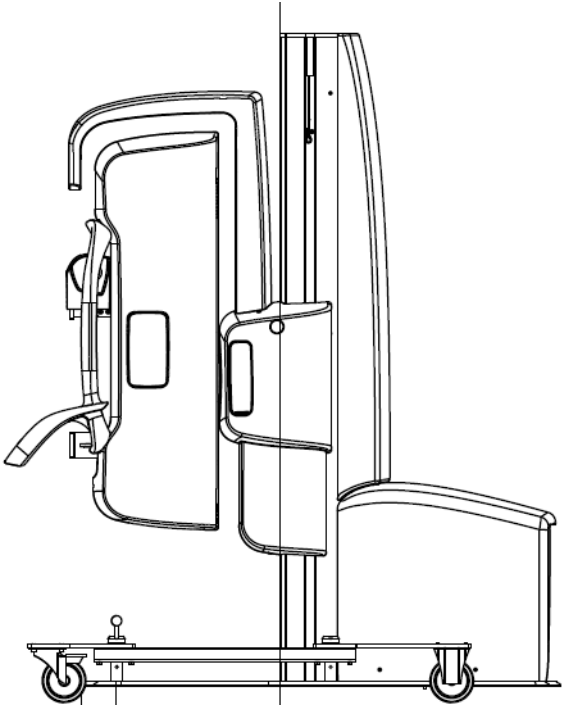


Figure 2-3:Gantry – Assembled on Dolly, Without Detectors

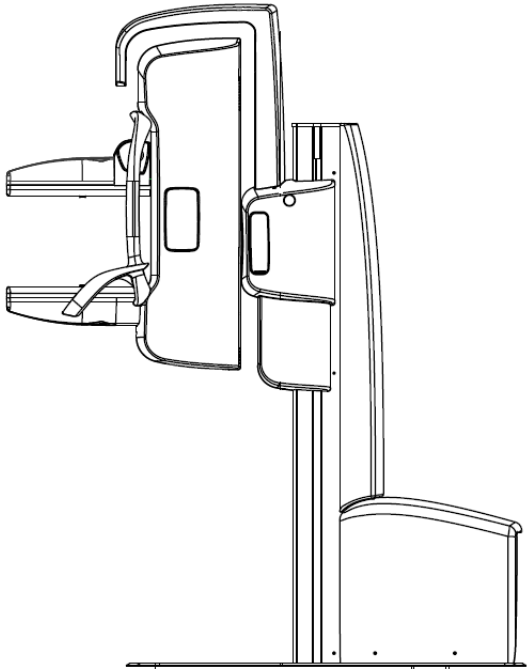


Figure 2-4:Gantry – Full Configuration, Detectors Assembled

Table 2-1: Component Dimensions

Component	Measurements / cm (inch)		
	Height	Length	Width
Gantry assembled to dolly, without detectors. (transportation configuration)	200 (78.8)	180 (71)	75 (29.6)
Gantry, full Configuration with detectors (0º operational configuration)	220 (86.7)	161 (63.4)	59 (23.3)
Gantry, full Configuration with detectors (90º operational configuration)	220 (86.7)	161 (63.4)	120 (47.3)
Console Cart, without keyboard and monitor – (optional)	180 (70.9)	75.9 (29.9)	80.2 (31.86)

2.1.2 Mounting Hole Dimensions and Locations

Two anchors must be drilled in the floor at the rear of the system (Ⓐ Ⓑ).

If one of the holes cannot be used, drill the front hole instead.

The installation kit includes four mounting anchors.

For seismic areas, see section Seismic, p.2-26.

For additional details, see Floor Anchoring, p.2-19.

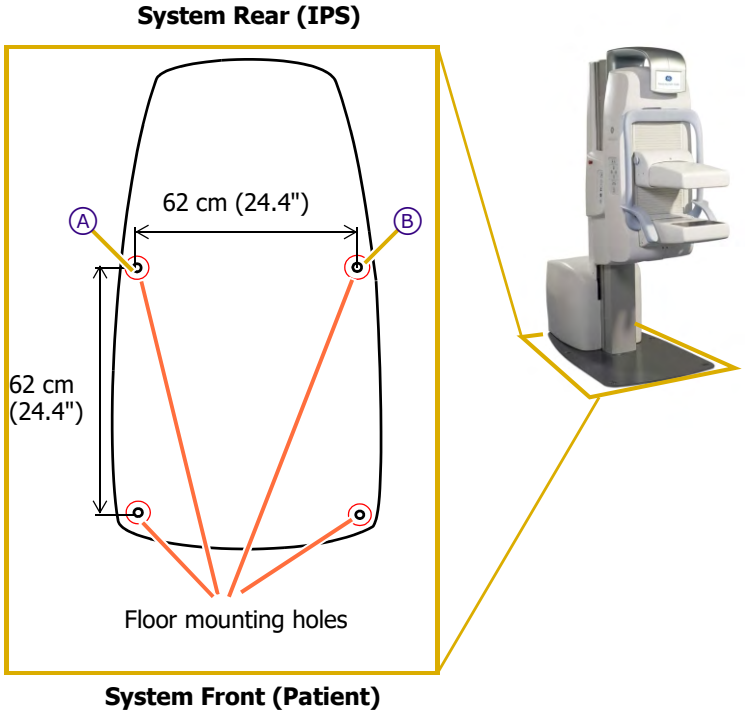


Figure 2-5:Gantry Baseplate Template

2.1.3 Cable Entrance Dimensions & Locations

All cables from the external interfaces to the Discovery NM 750b system are connected to the IPS, located at the rear of the system.
For system cable routing, refer to the *Wiring Diagrams Manual*.

Figure 2-6:Rear Panel Cable Connections

2.1.4 Air Vent Dimension and Location

Detectors are sensitive to temperature changes. In order to prevent changes in detector temperature due to fluctuations in the air condition temperature, it is recommended to locate the air vent on the back side of the system (far from the detectors).

2.1.5 Center of Gravity Locations

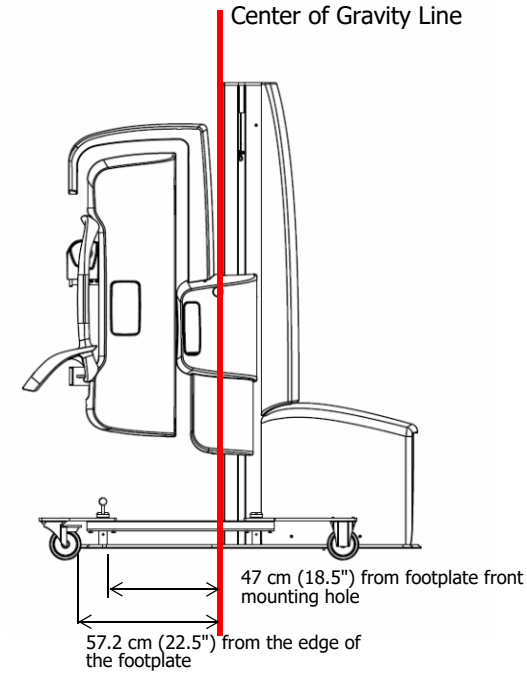


Figure 2-7:Gantry Center of Gravity – On Dolly, Without Detectors

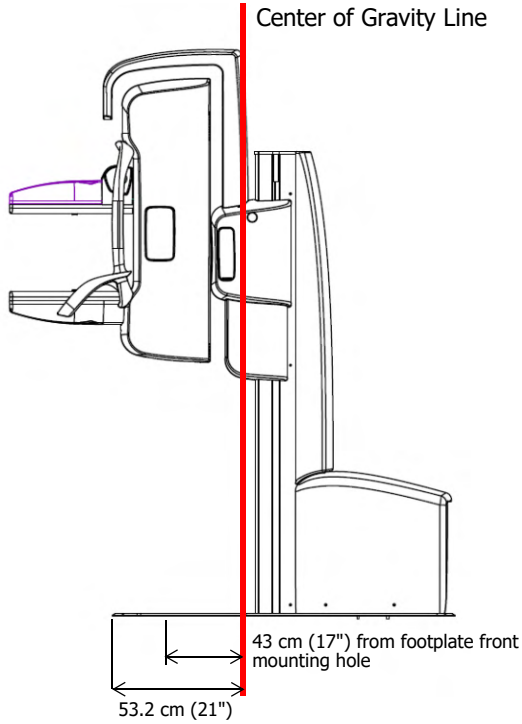


Figure 2-8:Gantry Center of Gravity – on Floor with Detectors Assembled

2.1.6 Weight Per Self-Standing Component

Table 2-2: Component Weight

Component	Kg	lbs
Gantry, without detectors (dual head transportation configuration)	390	860
2 Detectors (dual head transportation configuration)	32	70
Gantry, full configuration with two detectors (operational configuration)	420	920
Console Cart, without keyboard and monitor (optional)	15	33
Biopsy Imaging Unit transportation package (optional)	15	33

2.2 Room Layouts

The Discovery NM 750b system requires a main Scan Room, which contains the following subsystems:

Fixed Components

- Gantry (including acquisition station)

Moving Components

- Console Cart (optional)
- Chair
- Biopsy Option package (optional)

This section provides guidelines for determining the size and layout of the scan and of the above components, and example layouts of typical rooms, illustrating the position and dimensions of the components.

The room layouts provided take into consideration all aspects of operation, operator and patient requirements, safety regulations and service clearance requirements.

2.2.1 Room Dimension Requirements

NOTE
The minimal scan rooms described in this manual may not comply with specific local/regional/country/state requirements (such as OSHA in the USA).

Minimal scan room size, without operator room:

(L x W x H) 3 x 2.3 x 2.5 m^3 (9.84 x 7.55 x 8.2 sq.feet)

(see Figure 2-9, p.2-12 for room with wall mounted monitor)

(see Figure 2-10, p.2-13 for room with console cart)

IMPORTANT
Systems that include the Biopsy option require:

Minimal scan room size, without operator room:

(L x W x H) 4 x 3.3 x 2.5 m^3 (13.12 x 10.83 x 8.2 sq.feet)

- Room length to be 4 meters.
- Patient chair with a laying position in case of emergency.
- For Biopsy procedure in laying position, the minimum room width should also be 3.3 meters

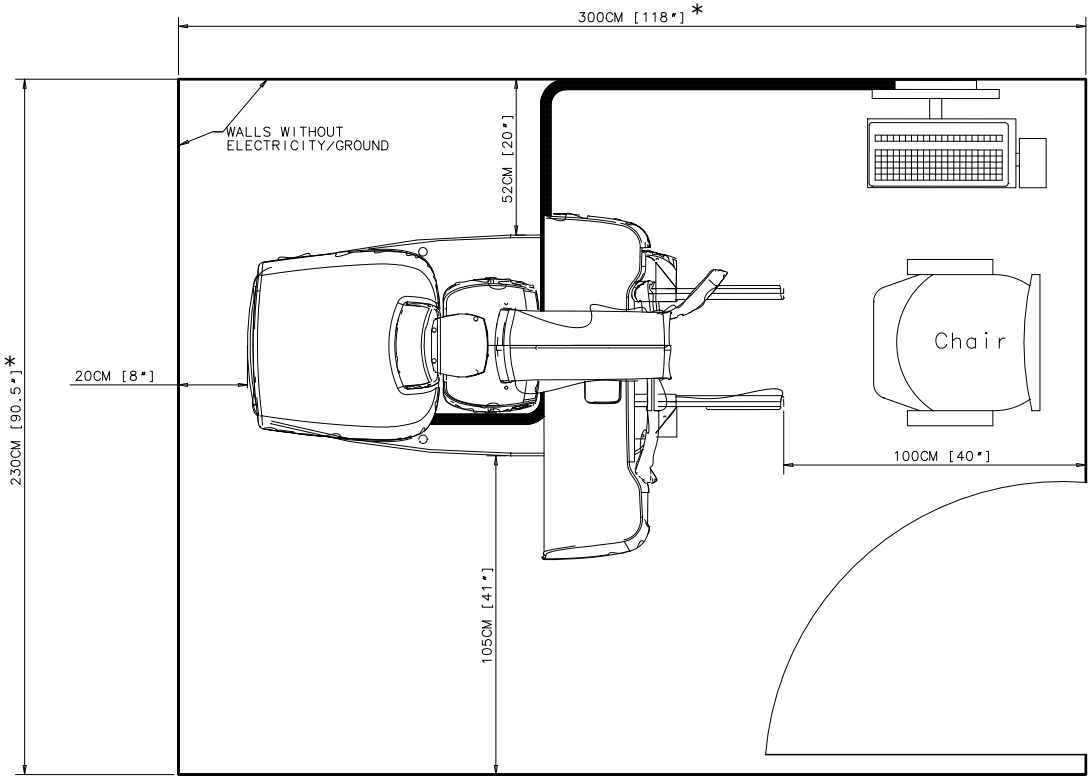
2.2.2 Room Layout Drawings

This section provides typical room layouts, illustrating the position and dimensions of the scan and operator rooms and of the system components.

NOTE

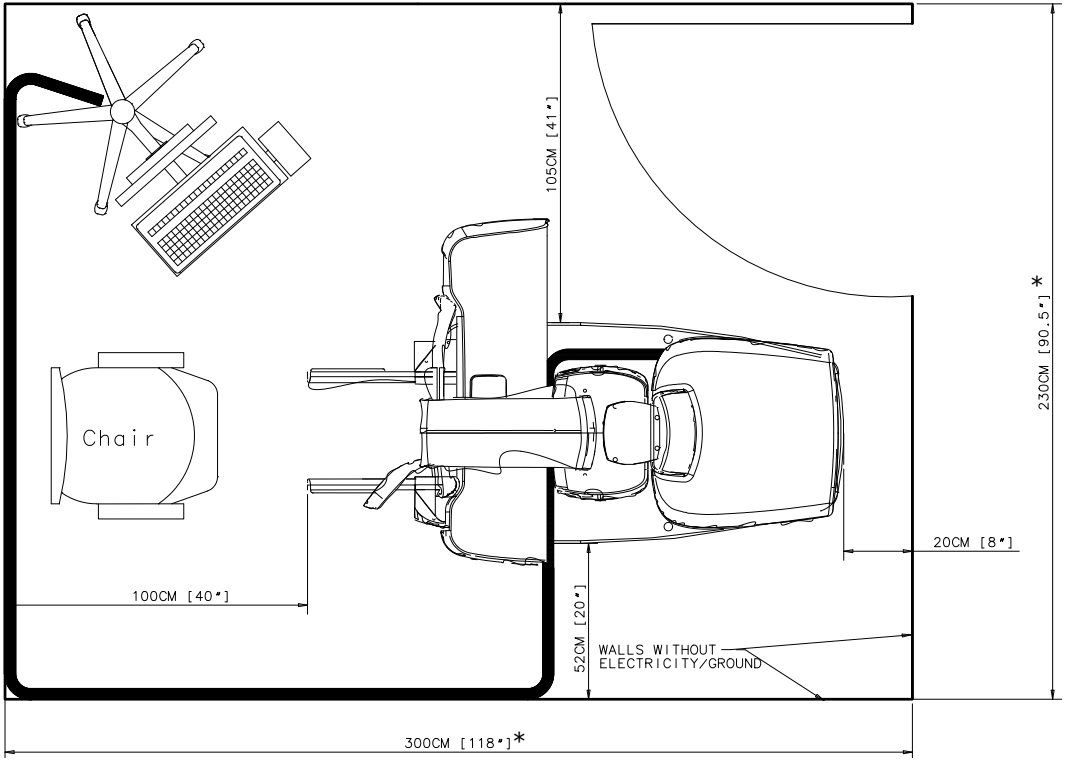
Minimal room layout limitations:

- Do not take into account local requirements
- Operator movement round the system is limited
- For safety of the operators and service engineer – do not install electricity or grounding cables on walls that are less than 71.2 cm (28") from the system.
- For systems with Biopsy option see IMPORTANT, page 2-10



* For systems with a Biopsy option, see IMPORTANT, page 2-10.

Figure 2-9:Minimal Room Layout with Wall Mounted Monitor



* For systems with a Biopsy option, see IMPORTANT, page 2-10.

Figure 2-10:Minimal Room Layout with Console Cart Option

2.2.3 System Mechanical Curves

The gantry movement is indicated in Figure 2-11, p.2-14. In addition, the Console cart and the chair can be moved to different locations in the scan room, as demonstrated in the room layout illustrations.

Component	Minimum	Maximum	Motion Range
Ⓐ Lift motion up/down movement	60.6 cm (23.9")	133 cm (52.4")	72.4 cm (28.5")
	measured from floor		
Ⓑ Upper detector up/down movement	2 cm (0.8")	31 cm (12.2")	29 cm (11.4")
	measured from lower FOV		
Ⓒ C-arm rotation limits	-180°	+180°	N/A

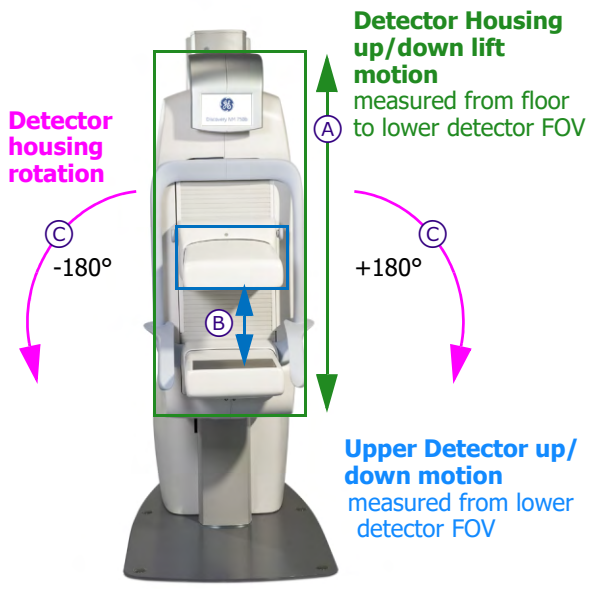


Figure 2-11:Mechanical Curves

2.2.4 Room Layout Considerations

This section describes the considerations you must take into account when selecting a site and planning the room size and layout. In addition, it is the responsibility of the customer to ensure that all aspects of the scan and operator rooms conform to the local requirements.

Scan Room Dimensions and System Placement

The room size and shape and the placement of the system components must enable optimal functional and working conditions, including the best possible relative positioning of the gantry, patient chair, acquisition monitor and keyboard as follows:

- Operator access in scan room, around the gantry and patient chair in order to:
  - Assist patient positioning
  - Perform examination routines
  - Act efficiently and quickly in case of an emergency, including easy access to emergency switch
  - Space, power and network connections for additional equipment such as PACS workstation, image printer, etc.
  - Place chair in laying position (for Biopsy scans)
- Installation and service considerations:
  - Location of power connections
  - Access to communication lines (Ethernet, external hardcopy device)
  - Floor loading capacity and weight of system components, including storage.
  - Service clearance areas (see App.C, Regulatory Clearances)

- Storage cabinet for storage of service tools (optional). Depending on the room layout, it is recommended that sufficient area is allocated for the cabinet.

Proximity of Scan Room to Other Utilities

Avoid detrimental influences from surrounding rooms, such as:

- Radioactive or magnetic sources
- A local wireless environment
- Vibrations

Plan the optimal proximity of the scan room to related utilities. In addition to patient comfort, take into consideration that background radiation activity from such utilities could negatively affect image quality and system calibration. These utilities include:

- Waiting/injection areas, toilets
- Viewing and processing rooms
- Radionuclide storage and preparation area
- Office facilities
- Smoke detectors that use/have radioactive activity

2.3 Room Structural Requirements

2.3.1 Floor Requirements

2.3.1.1 Floor Strength

In order to enable mounting of the system floor anchors, concrete floors must have a minimum cube strength of 120 mm (4.72") thick.

⚠ CAUTION

If the system is installed on a floor type thinner than a 120 mm (4.72") concrete floor, the customer shall, at their expense, provide acceptable anchoring and mounting methods that meet all structural specifications.

2.3.1.2 Floor Loading Requirements

The system mass is 430 kg (950 lbs).

The bearing surface of the base plate is 1 m² (10.76 sq.ft.) (see Mounting Hole Dimensions and Locations, p.2-5).

Table 2-3: Component Weight and Load Distribution

Component	Weight	Load Distribution
Gantry	430 kg (950 lbs)	4 pads, Ø 30 mm each: ■ Front pads: 60 kg each ■ Rear pads: 140 kg each
Chair	< 100 kg (220 lbs)	Variable
Console Cart	15 kg (33 lbs)	
Biopsy option	10 Kg (22lbs)	
Personnel and patient	< 500 kg (1102 lbs)	Variable*

* Normally 2-3 people in room during scan or service operations

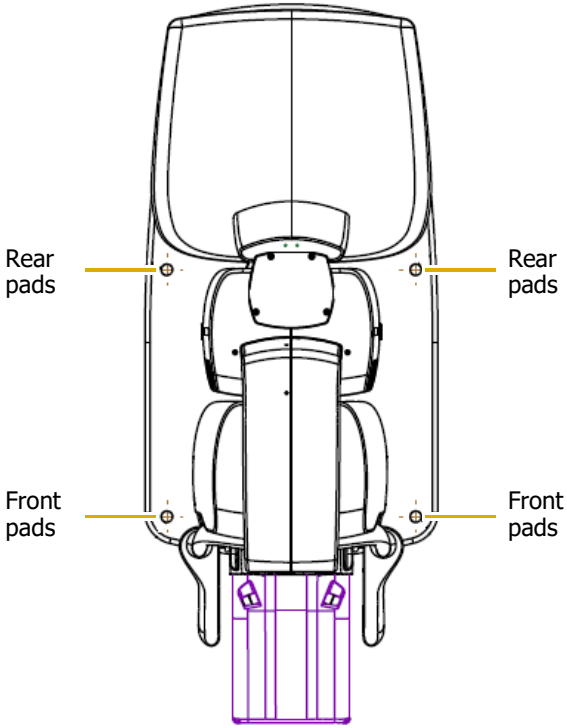


Figure 2-12:Gantry Floor Pads Location

2.3.1.3 Floor Anchoring

The system's floor anchors are designed for use only on concrete floors that meet the minimal 120mm (4.72") concrete floor requirements (see Floor Requirements, p.2-17).

Drilling dimensions:

- Drilling diameter: Ø 16
- Drilling depth: 65 mm
- Anchor size: M10 × 60 mm

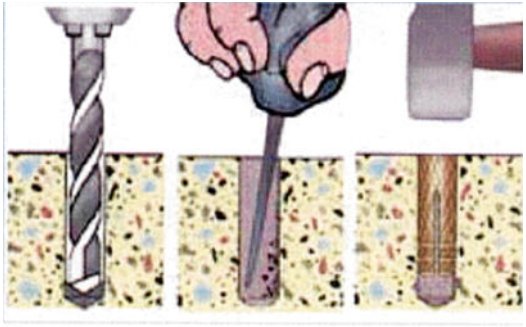


Figure 2-13:Floor Drilling Process

⚠ CAUTION

For concrete floors thinner than 120 mm or different floor types, other anchoring methods might be required. These must comply with the minimum load requirements (see Floor Loading Requirements, p.2-18) and must be installed and tested at the customer's expense, by the customer's structural contractor.

In such a case, the alternative anchors shall be installed during system installation, and this must be coordinated with the installation team.

2.3.1.4 Floor Levelness and Flatness

The scan room floor must be leveled, and its surface must be smooth.

It is recommended that the floor in the entire scan room is leveled and flattened. If this is not possible, it is a minimum requirement for the gantry installation area to be level and flat.

The floor levelness requirement is essential for proper alignment of the gantry, which affects accurate patient positioning and other aspects of system functionality.

⚠ CAUTION

Do not use fill material to compensate for holes or depressions in the floor surface. If necessary, level and flatten the entire floor area.

Table 2-4: Floor Leveling Specifications

Item	Requirement
Floor leveling area	1.4 m x 0.75 m (4' 7.12" x 2' 5.53") under gantry base plate
Slope	±2.5 mm per meter (±1/10" in 39")
Flatness	The surface must be smooth, with deviations of no more than 3 mm (0.1") between depressions and high spots in any 350 cm (11' 5.8") throughout area of the gantry floor plate.
Floor surface	A single poured surface

2.3.1.5 Floor Vibration

Floor vibration requirements are included in the general vibration requirements (see Vibration Specifications, p.2-25).

2.3.1.6 Floor Conductivity

The purpose of this section is to measure the electrical conductivity of the floor surface to the "GND" (Ground).

- The surface of the conductive floor shall provide a patch of electrical conductivity between all persons and equipment making contact with the floor.
- Using a DVM, measure the impedance between the upper surface of the floor – where the Gantry is planned to be positioned, and the System power supply GND terminal in the room. The readout needs to be less than 35 M Ohm.

2.3.1.7 Additional Floor Requirements

The floor finish must take into consideration magnetic field and EMI considerations (see EMI Considerations, p.3-5).

The customer is responsible for the structural analysis of the floor and the proposed mounting method. The customer must hire a structural engineer to design and approve the mounting method, and provide GE with an engineering report. If the results of the structural analysis require stronger anchoring inserts than the defaults supplied in Floor Anchoring, p.2-19, the customer must inform GE Healthcare. Flooring consists of all materials above the structural floor support including sub-flooring and equipment support/mounting. The flooring requirements and recommendations are as follows:

- Flooring materials must support the Discovery NM 750b system equipment mass, refer to Weight Per Self-Standing Component, p.2-8.
- Floors must support the equipment and any transport device used to move the equipment.
- Flooring must be in accordance with local and national codes and requirements.
- Cable routing must be planned so as to avoid trip hazards, and any remaining trip hazards must be clearly marked.

2.3.2 Mounting Requirements (Static and Dynamic Load)

See Component Weight and Load Distribution, p.2-18 and Center of Gravity Locations, p.2-7.

2.3.3 Ceiling Requirements

The top of the system Display Arm can travel up to maximum height of 226.5 cm (89.17"). Recommended Minimum Ceiling Height is 250 cm (98.43").

The distance between bottom Detector plane and the top of the Display Arm is fixed at 93.5 cm (36.81"). The maximum height between bottom detector plane to the gantry floor plate is 133 cm (52.36").

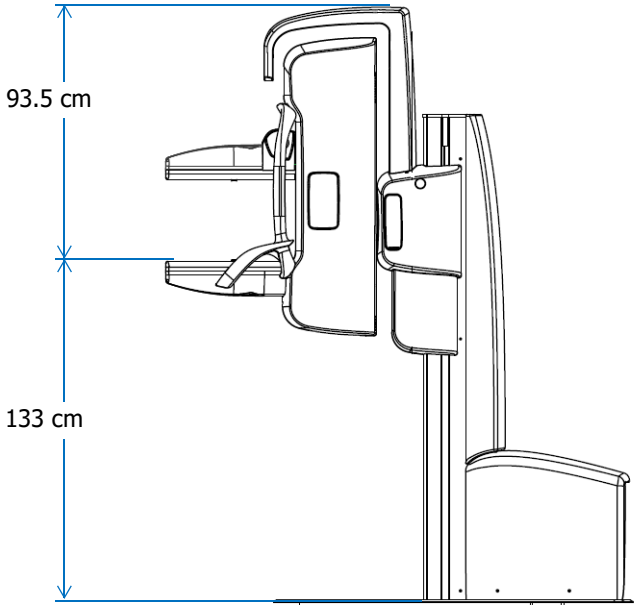


Figure 2-14:Ceiling Height Requirements

2.3.4 Wall Requirements

Operator Room Window

If there is an operator room, the operator must be able to view the patient and the gantry display from the operator room during a scan. The location of the window depends on the position of operator room relative to the scan room. It is recommended that the window is positioned in front of the monitor so that the operator can look at the patient during scan. The recommended patient viewing window dimensions are approximately 120 cm wide by 110 cm high (48" x 42"). Consult a qualified radiological health physicist for radiation protection requirements for the window glass (lead content and thickness), in accordance with Radiation Protection and with local requirements.

Radiation Protection

For details on wall, door and window radiation protection (see Radiation Protection, p.3-1)

Other

Verify that all walls conform to local regulations, such as washability.

2.3.5 Acoustic Specifications

The system creates acoustic noise. In compliance with IEC 60601-1 standard the measured noise (in patient sitting position) is less than 55 dBA. It is recommended that the wall and ceiling surface is of a sound dampening material so that the noise is not reverberated and amplified.

2.3.6 Vibration Specifications

To minimize vibrations, the system must be installed on a solid floor, as far as possible from the following vibration sources:

Table 2-5: Vibrations Specifications

Outside building	Inside building	Other
■ Parking lots	■ Hallways	■ Hospital power plants containing pumps, motors, air handling equipment and air conditioning units
■ Roadways	■ Elevators	
■ Subways		
■ Heliports		
■ Trains		

Steady State Vibration

The maximum steady state vibration transmitted through the floor should not exceed 0.001 m/s2 RMS maximum single frequency above ambient baseline from 0.5 to 80 Hz (measured in any 1 hour during a normal operating period).

2.4 Seismic

Seismic requirements are determined and specified by the hospital design professional of record and must be approved by the specific state or country agency. Seismic attachment hardware shown on seismic calculations may differ from hardware supplied with system. Any additional hardware that is required will be the responsibility of the institution and/or their contractor.

In seismic areas, use all four gantry plate holes in order to mount the gantry to the floor, see Mounting Hole Dimensions and Locations, p.2-5.

Chapter 3: Special Construction Requirements

3.1 Radiation Protection

Radiation shielding regulations differ from one country or state to another. It is the customer's responsibility to ensure that radiation protection and shielding comply with such regulations and requirements during site preparation and system installation and operation.

3.1.1 Background Radiation

When the system is calibrated, background radiation from surrounding areas may adversely affect calibration. Therefore all radiation sources must be suitably shielded, including:

- Waiting/injection areas
- Radionuclide storage and preparation area (sometimes known as "hot lab")

As a general guideline, if the anticipated background radiation in the Scan Room will be higher than 0.1mR/h (1microGy/h), then lead shielding with sufficient thickness must be installed.

NOTE
In most cases, a 2-5 mm lead wall will sufficiently reduce background radiation levels. To optimize costs, it is recommended that you consult with a specialist to determine the minimum lead thickness for the planned installation site.

3.1.2 Scan Room Shielding

The system involves the use and storage of radio nuclides. Appropriate barriers such as walls, lead-shielded glass, lead shields, etc. must be installed to protect staff from unnecessary exposure to radiation.

Patients become significant sources of radioactivity; therefore consideration should be given to maximize the distance between the patient and operator during the uptake and acquisition phases of scan procedures.

Scatter-room shielding requirements must be reviewed by a qualified radiological health physicist taking into consideration:

- Scatter radiation levels within the scanning room
- Equipment Placement
- Weekly projected workloads (#patient/day technique (kvp*ma)
- Materials used for construction of walls, floors, ceilings, doors and windows
- Access to surrounding scan room areas
- Equipment in surrounding scan room area (e.g. film developer, film storage)

⚠ CAUTION

Specific room shielding requirements should be determined by local regulatory considerations, facility policy and if available, the facility physicist.

3.2 Magnetic Field Consideration

Low Frequency Magnetic Field

N/A

Static Magnetic Field Limits

In order to avoid interference on the system, the static field limits from the surrounding environment must be less than 1 Gauss in the scan room.

3.3 RF Shielding

The system is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the system as recommended below, according to the maximum output power of the communications equipment.

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

For transmissions between 150 kHz & 2.5 GHz, adhering to the recommended distance separation will reduce disturbances recorded at the image level, but may not eliminate all disturbances. However, when installed and operated as specified herein, the system will maintain its essential performance by continuing to acquire, display, and store diagnostic quality images safely. For example, in order to avoid image interference risks, a 1 W mobile phone (800 MHz to 2.5 GHz carrier frequency) must be placed 2-3 meters away from the system.

3.4 EMI Considerations

3.4.1 Electrostatic Discharge Environment & Recommendations

In order to reduce electrostatic discharge interference, install a charge dissipative floor material to avoid electrostatic charge buildup.

The relative humidity shall be at least 30%.

The dissipative material shall be connected to the system ground reference, if applicable.

3.4.2 Electro-Magnetic Interference (EMI)

NOTE

If power sub-stations exist under or above the scan room, consider EMI testing to determine if your proposed room meets the published acceptable EMI room limits. This also includes high voltage lines under the scan or operator room floor.

EMI Reduction

If fields of excessive EMI are known or suspected to be present, consult GE Healthcare Sales & Service for recommendations. Consider the following if you attempt to reduce EMI:

- External field strength decreases rapidly with distance from source of magnetic field.
- External magnetic field leakage of a three-phase transformer is much less than that of a bank of three single phase transformers of equivalent power rating.
- Large electric motors are a source of substantial EMI.
- High-powered radio signals are a source of EMI. Ensure sufficiently good screening of cables and cabinets.

Table 3-1: Electro-Magnetic Interference (EMI) Constraints

Component	Ambient magnetic fields		System attributes affected	Comments
	Static	AC		
Gantry	< 10^-4 tesla (1,000 milligauss)	< 10^6 tesla (10 milligauss) peak	Imaging performance	WARNING: The gantry produces an electromagnetic field that radiates outward in all directions. The UPS provides a consistent power supply in normal conditions and during a site-wide power outage. Do not place sensitive electronics, for example computer equipment within 1 m of the gantry or 1 m of the UPS, in any direction (including above or below) **Note:** The UPS and gantry are not classified as sensitive electronics.
Color Monitor	< 10^-3 tesla (10,000 milligauss)		Color purity and display geometry	
Console / Computer Equipment	< 10^-3 tesla (10,000 milligauss)		Data integrity	
Magnetic Media	< 10^-3 tesla (10,000 milligauss)		Data integrity	

3.4.3 Electromagnetic Immunity

The system is intended for use in the electromagnetic environment specified in App.B, EMC Compliance, Table B-2 "EMC Immunity Guidance and Declaration", p.B-2. The customer must assure that the system is installed and used in such an environment.

Chapter 4: Environmental (HVAC) Requirements

⚠ WARNING

Ratings and duty cycles of the system apply only if site environment meets the standards of this section. If environmental specifications are not respected, system operation and image quality may be affected.

Each system module comprises numerous electronic and mechanical components, which are sensitive to extreme temperatures, humidity, dirt and air pollution. The operational environment of any Nuclear Medicine system inevitably has a noticeable effect on its reliability. High temperatures increase the failure rate of almost any electronic component.

Temperature cycling may induce temporary or permanent changes in electronic equipment and/or mechanical components and can influence the performance of the system. Fast temperature changes can cause physical damage to the system. Unfiltered air in the room can cause damage to the hard disk, fan, etc.

Therefore, the units of the Imaging System should be installed only in a clean, dust-free, temperature-controlled environment, as specified below:

- Temperature: 18° to 26°C (64° to 79°F)
- Maximum Gradient: 3°C / hour (5.4°F / hour)
- Humidity: 30% to 60% Change rate 5% per hour, non-condensing

In addition to the specifications listed above, free flow of air is required around the Computer. The system room temperature and humidity are influenced by such factors as volume, temperature, humidity and flow pattern of incoming room air.

4.1 Relative Humidity and Temperature

Maintaining constant temperature and humidity levels is essential in order to ensure system functionality over time.

Operation is guaranteed in the temperature range of 18º to 26ºC (64º to 79ºF) and humidity range of 30 to 60%. When designing the equipment control system, it should be noted that system cooling is required even in winter months.

Many sites have shut down their cooling facilities in the past and have used external atmospheric air to cool the system. The use of external cold air must be carefully controlled, to correct the temperature, humidity and air cleanliness levels, and ensure proper operation of scanner system.

4.2 Heat Output

The following thermal loads are relevant to the site environment:

- Equipment heat dissipation
- Room heaters and lights
- Number of persons in the scan room
- Dissipation through walls, ceilings, floors, doors, windows
- The total thermal load of the Discovery NM 750b is 550W/1876 BTU/H (see details below)

Table 4-1: Thermal Loads (Heat Output)

Equipment	Watts	BTU/Hour
Gantry Max	250	850
Gantry power on	200	680
Acquisition station computer	120	410
Monitor	30	100

NOTE
Cooling requirements do not include cooling for room lighting, personnel or other equipment.

4.3 Air Quality

The system is especially sensitive to the presence of sulfide, chloride and nitrate contaminates, with sulfur being the most damaging element. If high levels of contaminates exist, it is recommended that appropriate air filtration systems are installed.

Chapter 5: Electrical Requirements

5.1 Power Requirements

The Discovery NM 750b is designed to operate on a single-phase AC power source.

A dedicated feeder from the nearest Main Distribution Panel (MDP) should be used to supply power to the system. In accordance with the National Electric Code (U.S.) and similar applicable national and local codes, a protective disconnect device must be provided in the power line supplying the IPS. It must be visible to system service personnel, and must have "lockout/tagout" provisions.

Table 5-1: Power Requirements

Line Voltage	115V/AC 15A, 230V/AC 10A
Voltage tolerance	+10%, -5% from nominal
Load regulation	Maximum 5% for load of 15A
Line frequency	50 Hz or 60 Hz (± 1Hz)
kVA load	1.0 kVA

5.2 Certified Electrical Contractor Statement

All electrical installations that are preliminary to positioning of the equipment at the site prepared for the equipment must be performed by licensed electrical personnel. In addition, electrical feeds into the Power Distribution Unit must be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations, and testing must be performed by qualified GE personnel. 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 electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment must only utilize qualified personnel to perform electrical servicing on the equipment. That is GE Field Engineers, personnel of third-party service companies with equivalent training, or licensed electricians.

5.2.1 Line Voltage Specifications

Line Voltage: 115V/AC 15A, 230V/AC 10A

Voltage Tolerance: +10%, -5% from nominal

Load Regulation: Maximum 5% for load of 15A

5.2.2 Line Frequency Specifications

Line Frequency: 50 Hz or 60 Hz (± 1Hz)

5.2.3 Measured kVa Load Characteristics

A dedicated feeder run from the facility main isolation transformer is recommended to power the system. If a dedicated distribution transformer is provided for the scanner, the minimum recommended transformer size is 1.5 kVA, rated 5% regulation at unity power factor.

In all cases, qualified personnel must verify that the transformer and feeder, at point of take-off, plus the run to the system meet all the requirements provided in this document.

Table 5-2: System Power Characteristics

Maximum power demand	**0.65 kVA @ 0.9 PF**
Continuous (average) power demand at maximum duty cycle	0.6 kVA
Maximum allowable total source regulation	5% for load of 15A
Minimum recommended transformer size	1.0 kVA

NOTE
If local regulations require feeding electronic equipment in either the scan room or the operator room via a separate isolation transformer.

The following tables are based on the use of copper wire, rated 75 C and run in steel conduit. The current rating (ampacity) is determined in accordance with the National Electrical Code (NFPA 70), Table 310-16 (2002).

Ampacity, or Current Rating, is the RMS current which a device can carry within specified temperature limitations in a specified environment, depending upon:

- Temperature rating
- Power loss
- Heat dissipation

The ampacity for a power cable depends on properties of the conductor and the insulation and on environmental conditions adjacent to the cable.

The minimum feeder size is determined by the current rating (ampacity) of the circuit protection device listed below. In some cases a larger size may be necessary in accordance with local regulations for total source.

The Minimum Feeder Wire Size is AWG 12.

Table 5-3: Nominal Line Voltage Ranges

Nominal line voltage (volts)	90	110	120	132	180	200	230	240	260
Hi-Line Limit, +10% (volts)	99	121	132	145	198	220	253	264	286
Lo-Line Limit, -10% (volts)	81	99	108	119	162	180	207	216	234
Continuous line current (amp)	6.4	5.25	4.8	4.4	3.2	2.9	2.5	2.4	2.2
Maximum line current (amp)	7.8	6.4	5.8	5.3	3.9	3.5	3.0	2.9	2.7
Minimum recommended circuit protection rating (amp)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0

5.2.4 Fuse or Circuit Breaker Ratings

- Slow-blow ceramic body fuse, 15.0 A rating

  or

- Type D circuit breaker, 15.0 A rating

5.2.5 Equipment not Powered From the System

- In scan room and in operator room:
  2 one-phase regular power outlets for service tools (such as vacuum cleaner, electric drill, soldering iron etc.).
- For Systems that include the Biopsy option:
  Room should include output for a VAD (Vacuum-Assisted Device) system.

5.2.6 Power Distribution

Power stability (transient etc) requirements: Maximum transient voltages should be limited to 1500 V peak.

Sags and surges of the power line must not exceed the absolute range limits shown in Table 5-3, p.5-4.

NOTE
The electrical rating is described on the system rating label attached to the gantry.

5.3 Grounding

The system has been designed to use an equal potential grounding system.

The primary grounding point is located at the gantry base. All exposed metal surfaces in the patient vicinity are grounded to the reference ground point.

Make sure to comply with both of the following grounding requirements:

- Connecting to the gantry base
- Connect the metal conduit, raceway, or the armor of the armored cable used to power the system, to the gantry ground.
- Grounding wire – only if required by local electrical code:
- Run a dedicated AWG 12 (4.0 mm^2) or larger insulated copper ground wire with the mains cable from the facility ground to the system gantry ground.
- Connect the ground wire to the MDP through which it passes, in accordance with local codes.
- Ensure that the resistance between the gantry ground and the facility earth ground does not exceed 0.5 Ohm.
- Ensure that the total resistance between the gantry ground and earth does not exceed 2.0 Ohm.

NOTE
The shield or armor of armored cable is not sufficient for this purpose.

5.4 Interconnections

Refer to the *Wiring Diagrams Manual*.

5.5 System Cable Information

This section provides technical information regarding system cables connecting different subsystems, in order to facilitate the planning of cable routing.

Table 5-4: System Cable Information

Start / Destination		H/V Separation (Y or N)	Length in Meters	Description
From	To			
Wall	Gantry	Y	5.0	Mains power
Gantry	Console Cart & EMO Unit	N	5.0	Console Cart & EMO bundle. Monitor, Mouse, Keyboard, And Emergency Off Unit.

5.6 Lighting Specifications

The lighting should be planned so there is sufficient light for:

- Scan preparation
- Scan setup
- Patient loading/unloading
- System servicing (lighting must also take into account that relatively bright light is required while servicing the system.)

The lighting should be planned taking into account that operators will be working with computer monitors and reading digital images during much of the day. Reflections in monitors should be avoided and other ergonomic factors taken into account.

Chapter 6: Communications Requirements

6.1 Network Requirements

The system requires the following:

- 1 LAN connection for local site network.
- If the customer requires a separate InSite connection, an additional broad-band network connection wall jack must be installed in the scan room.
- For each extra option (Xeleris, XFL Client PC, printer etc), consult the *Pre-Installation Manual* for that option.
- It is recommended that an additional network connection is located near the system's power supply outlet.

See *System Specifications* in the *System Overview and Safety Manual* for details regarding:

- Network connections
- Network interface technical specifications
- Network information
- Flow specifications
- Required characteristics
- Network configuration

Appendix A: Customer Checklist

The checklist must be completed by the customer and delivered to GE prior to installation.

IMPORTANT

This checklist is general in nature and is intended to assist the customer in verifying site preparation. The checklist does not cover all details in this manual, and it is the customer's responsibility to fully prepare the site, taking into account all details and specifications set out in this manual.

Site Information Contact Information		Contact Persons	Name	Telephone	email
Site name		Site project coordinator			
Department		System administrator			
Street		Chief technologist			
City, State, Zip		Facilities engineer			
Country		Shipping/Receiving			
Telephone		Physician			
Fax		Other			

Safety Declaration		
I hereby confirm that the relevant site personnel have read the Safety and System Overview Manual, Direction in conjunction with this Site Preparation Manual.	Name	
	Position	
	Signature	

Completion Sign Off		
I hereby confirm that pre-installation is complete and that I have examined and confirmed all items in the Pre-Installation Customer Checklist	Name	
	Position	
	Signature	

Site Preparation Time-table

Description		Status	See	Comments
Scheduling	Project schedule verified with GE			
	3rd party vendors scheduled			
	Can meet the committed site ready date			
	Construction completion date matches delivery date			
	Delivery date scheduled for			
	Installation dates scheduled for			
	Applications/training date scheduled for			
	Site Ready (for installation) date scheduled for			
	First Use date scheduled for			

Room Preparation

Description		Status	See	Comments
Pre-construction	Site layout drawings completed and approved			
	Radiologist health physician has reviewed the room layout			
	3rd party vendors identified: _____			
Post-construction: Room measurements & layout	Length			
	Height			
	Width			
Servicing clearance	Meets requirement			
Egress	Sufficient egress space			
Structural and floor preparation	Floor tolerates specified loads			
	Floor leveling meets requirements			
	Floor flatness meets requirements			
Electricity requirements	Main Distribution Panel (MDP/A1) meets requirements and installed.			
	Power line meets requirements			
	Wall outlets available for Installation and service tools.			

Description		Status	See	Comments
Environmental conditions	Air-conditioning meets requirements for system thermal loads			
	Air-conditioning meets humidity requirements			
	Magnetic field in scan room is less than 1 Gauss			
	Room is clean and free of dust			
Room Shielding	Shielding of scan room meets requirements			
Safety	Planned location of emergency off button in scan room is easily accessible by operator			

Unloading, Conveyance and Storage

Description		Status	See	Comments
Temporary storage	System will be delivered on 1st install day Or Some or all components will be stored until installation date			
	Site has sufficient storage area			
	If stored, storage area meets requirements			

Description		Status	See	Comments
Loading dock	Truck can access loading dock Or Site will arrange short truck delivery			
Rigging (required if elevator / doors access is not available)	Rigging company details: Name: _____ Contact person:_____ Phone:_____			
	Rigging company has insurance policy (insurance policy of rigging company is attached.			
Pallet Truck	Site has pallet truck Or Site will arrange for pallet truck			
Delivery route	Delivery route is define by site and meets requirements			
	Delivery route is tested by site			
Installation room	Room can be locked during installation			

Description		Status	See	Comments
Suitability of halls, elevators and doors for conveyance of all components, when mounted on moving kit/wheels Note: All items must refer to conveyance as follows: From truck to installation room (crated or uncrated) or From truck to storage (crated) & from storage to installation room (crated or uncrated)	All door openings, hallways are large enough			
	Pathways can tolerate weight			
	Elevator openings and size are large enough			
	Elevator can tolerate weight			
	Gantry can clear all corners			
	Inclines on the route to the camera room are suitable (weight, size and incline angle)			
	State the incline angle_____			
	There are delicate carpets or tiles along the conveyance route			
	Floor protection is supplied for delicate surfaces			
Waste materials	Site has arranged for disposal of empty wooden cases, foam blocks and large cardboard boxes after installation			

Network

Description		Status	See	Comments
Network cabling & hardware	Installation complete			
Broadband	Installed and tested			
Network definitions &testing	Acquisition station site name, hostname & IP address defined & tested			
Xeleris floating license	**Note:** In installations that include a Xeleris Floating License (XFL), refer to the *Xeleris Site Preparation manual* for minimal requirements for the designated PC.			

Network Definition Details

Item	Hostname	IP	Wired (Y/N)	DICOM Port	AE Title
Acquisition station					
Processing station					
Hardcopy host					
LAN Net Mask					
Gateway to other networks					

Radioactive Isotopes for System Calibration

Description		Status	See	Comments
Isotopes to be used at site are available for installation.	Co57 (Rectangular Flood Source)			

Appendix B: EMC Compliance

This equipment complies with IEC60601-1-2 Edition 2 EMC standard for medical electrical equipment.

The system is suitable to be used in an electromagnetic environment, in compliance with the limits and recommendations provided in the following tables:

- Emission Compliance level and limits
- Immunity Compliance level and recommendations to maintain equipment clinical utility

Table B-1: EMC Emission Declaration

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 are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	
Harmonic emissions IEC 61000-3-2	NA	The system is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Voltage fluctuations/flicker emissions IEC 61000-3-3	NA	

Table B-2: EMC Immunity Guidance and Declaration*

Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	**Contact**: ± 6 kV **Air:** ± 8 kV	**Contact**: ± 6 kV **Air:** ± 8 kV	Floors must be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity must be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	**Power supply lines:** ± 2 kV **Input/output lines:** ± 1 kV	**Power supply lines:** ± 2 kV **Input/output lines:** ± 1 kV	Mains power quality should be that of typical commercial or hospital Environment.
Surge IEC 61000-4-5 Surge IEC 61000-4-5	**Line-line:** ± 1 kV **Line-earth:** ± 2 kV	**Line-line:** ± 1 kV **Line-earth:** ± 2 kV	Mains power quality should be that of typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5% UT** (> 95% dip in UT) for 5 sec	< 5% UT** (> 95% dip in UT) for 5 sec	Mains power quality should be that of 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 be powered from an uninterruptedly power supply or a battery.

Table B-2: EMC Immunity Guidance and Declaration*

Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment Guidance
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. **Note:** UT is the AC mains voltage prior to application of the test level.
Conducted RF IEC 61000-4-6	3 VRMS 150 kHz to 80 MHz	3 VRMS 150 kHz to 80 MHz	Portable and mobile RF communications equipment should be used no 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. For recommended separation distances, see Table B-3, p.B-4
Radiated RF IEC 61000-4-3 (alternative method: IEC 61000-4-21)	3 V/m 80 kHz to 2.5 GHz	3 V/m 80 kHz to 2.5 GHz	

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

Table B-3: Separation Distances for Portable and Mobile RF Communications Equipment

Rated Max Transmitter Output (Watts)	Separation distance according to frequency of transmitter (meters)			Comments
	150 kHz to 80 MHz d=[1.2]square (P)	80 MHz to 800 MHz d=[1.2]square (P)	800 MHz to 2.5GHz d=[2.3]square (P)	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*, should be less than the compliance level in each frequency range†. Interference may occur in the vicinity of equipment marked accordingly.
0.01	0.12		0.23	
0.1	0.38		0.73	
1	1.2		2.3	
10	3.8		7.3	
100	12		23	

* 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, and 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 relocation the system

† Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m

Appendix C: Regulatory Clearances

C.1 Regulatory Clearances

MINIMUM CLEARANCES UNDER U.S. FEDERAL REGULATIONS AND NATIONAL STANDARDS:

29 CFR 1910 (OSHA), NFPA 70E (STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE), AND NFPA 101 (LIFE SAFETY CODE): Figure C-1 is a map of clearance requirements for U.S. regulatory compliance. See clearance tables on the following pages for detailed dimensional clearances. Please note all systems installed in the United States must comply with all Federal and local regulations. For installations outside the United States, country-specific or other local regulatory clearance requirements must be met. See Service Clearances, p.C-8, for additional information.

C.1.1 Regulatory Code Description

Egress: 29 CFR 1910 Subpart E (OSHA) and NFPA 101 (Life Safety Code) define the minimum requirements for means of egress. The requirement most applicable to equipment installation and room layout is minimum width of exit access. Under OSHA 1910.37(f)(6), the minimum width of exit access shall in no case be less than 28" from any potentially occupied point in the room.

Under NFPA 101 (2006 edition) 7.3.4.1, the minimum width of any means of egress is 36". However, NFPA allows this to be reduced to 28" around furniture or equipment, provided that a 36" clearance would otherwise be available without moving permanent walls.

Electrical Clearance: 29 CFR 1910 Subpart S (OSHA) and NFPA 70E (Standard for Electrical Safety in the Workplace) define minimum clearance requirements for the workspace around electrical equipment. Under both OSHA 1910.303(g)(1) and NFPA 70E (2004 edition) 400.15, a minimum clear space of 36" depth (with minimum 30" width and 78" height) must be provided in front of electrical equipment with parts operating at 600 volts or below and likely to require examination, adjustment, servicing, or maintenance while energized.

This safety clearance requirement applies to all GEHC equipment. Although 36" is the minimum clearance for most installations, the standards require an increased minimum clearance distance where parts operate above 150 volts (but still below 600 volts) under the following circumstances:

- If the wall or surface directly facing the electrical equipment is grounded (e.g. brick, concrete, or tile) or includes grounded protrusions (such as medical gas ports, metal door or window frames, water sources and metallic sink structures, metallic cabinetry, electrical disconnects or emergency off panels, air conditioners or vents), then a 42" clearance depth is required.
- If the possibility exists of exposed and unguarded live parts on both sides of the workspace (for example if a power distribution unit were positioned on the wall directly facing the GEHC equipment), then a 48" clearance depth is required.

C.1.2 Regulated Minimum Working Clearance by Major Subsystem

Requirements apply to equipment operating at 600V or less, where examination, adjustment, servicing, or maintenance is likely to be performed while live parts are exposed.

Direction of Service Access is defined as perpendicular to the surface of the equipment being serviced. Required regulatory clearance distances must be maintained and may not be used for storage. This includes normal system operation as well as service inspection or maintenance.

For the system, distances are measured from the enclosure, not the finish covers.

Gantry Subsystem

Work Space Requirement	Minimum Clear Space	Additional Conditions
Direction of service access (all sides)	914 mm (36")	If exposed live parts of 151 - 600 volts are present, 1219 mm (48") on both sides of workspace with the operator between is required. If the opposite wall is grounded and exposed live parts of 151 - 600 volts are present, 1067 mm (42") is required.
Service access width (left-right of workspace)	762 mm (30")	This is the width of the working space in front of the equipment. A minimum of 762 mm (30") or the width of the equipment, whichever is greater, is required.

UPS Subsystem (optional)

Work Space Requirement	Minimum Clear Space	Additional Conditions
Direction of service access (front of UPS)	914.4 mm (36")*	There are no exposed live part hazards with the cover in place. This component is typically serviced from the front with access to the rear. * If exposed live parts of 151 - 600 volts are present, 1219 mm (48") is required on both sides of the workspace with the operator between. * If the opposite wall is grounded and exposed live parts of 151 – 600 volts are present, 1067 mm (42") is required.
Service access width (right side and length of UPS)	762 mm (30")	This is the width of the working space in front of the equipment. A minimum of 762 mm (30") or the width of the equipment, whichever is greater, is required
Head clearance	1981 mm (78")	This is the height of the workspace measured from the floor at the front edge of the equipment to the ceiling or overhead obstruction(s). A minimum of 1981 mm (78") or the height of the equipment, whichever is greater, is required.

C.1.3 Terms and Definitions

Egress: The path of exit from within any room. U.S. regulations require a minimum of 711.2 mm (28") of continuous and unobstructed space, including trip hazards along the path of exit.

Workspace: The dimensional box required for safe inspection or service of energized equipment. It consists of depth, width, and height. The depth dimension is measured perpendicular to the direction of access. The U.S. regulation minimum is 914.4 mm (36"), but additional conditions can increase the minimum dimension requirement. GEHC defines this as the envelope of the component superstructure with the external covers in place.

Service Access Width: The width of the workspace in front of the equipment. A minimum of 762 mm (30"), or the width of the equipment, whichever is greater.

Head Clearance: The height dimension of the workspace. The height of the workspace measured from the floor at the front edge of the equipment to the ceiling or overhead obstruction(s), 1981.2 mm (78"), or the height of the equipment, whichever is greater.

Grounded Wall: Any wall that can be electrically conductive to earth ground. Masonry, concrete, and tile are considered conductive. Additional commonly found aspects of a wall should also be considered grounded. The following is not an all-inclusive list:

- Medical gas ports and plates
- Metal doors and window frames
- Water sources and metallic sink structures
- Metallic wall-mounted cabinetry
- MDP
- Equipment Emergency OFF panels
- Industrial equipment (such as air conditioners and vents)
- Expansion joints
- Surface raceway
- Exposed wall conduits
- Floor outlets boxes

The following are not considered as grounded elements of a common wall:

- Standard wall outlet
- Light switches
- Telephones
- Communication wall jacks
- Ceiling tile grids

C.1.4 Additional Regulatory Clearance Information

Regulatory Caution

Site prints are required for all system installations including relocation and moves. The room layout, as shown on your site print, shall meet all regulatory requirements as described in the installation manual. Additional room components, such as cabinets, reduce room size. Equipment not shown on the site print may void the caution statement, making the room non-compliant. Actual site measurements before installation will be taken to determine room size and compliance.

Egress Clearance

Egress requires a clear, unobstructed route out of the room, around the back the system. If your egress route is not around the back of the gantry, maintain 457 mm (18") of clearance between the back of the gantry, with a continuous width of 3200 mm (126"), 1600 mm (63") on each side of the system center line, on each side to any obstruction so that the front cover can be removed.

Exceptions

Rooms smaller than 3x2.3x2.5 m3 (9.84x7.55x8.2 sq.feet) require construction to meet the minimum requirements. The design center or your GE PMI may have additional recommendations for your room size.

C.2 Service Clearances

Servicing of the system can be safely performed within the regulatory envelopes defined in Regulatory Clearances, p.C-1; however sufficient space must be maintained to remove the covers from the system.

To achieve this clearance for the gantry, clear space must be available to maneuver the gantry covers. One Service Engineer can accomplish this.