

GE Healthcare

BrightSpeed Elite, Edge, Excel

Pre-Installation Manual

OPERATING DOCUMENTATION



5141177-100

Rev 15

© 2017, General Electric Company

All Right Reserved

Effectivity:

The information in this manual applies to the following BrightSpeed Series CT Systems:

- BrightSpeed Elite
- BrightSpeed Edge
- BrightSpeed Excel

IMPORTANT PRECAUTIONS

LANGUAGE

ПРЕДУПРЕЖДЕНИЕ (BG)	Това упътване за работа е налично само на английски език. <ul style="list-style-type: none">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。 <ul style="list-style-type: none">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。 <ul style="list-style-type: none">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、機械性或其他危險。
警告 (ZH-TW)	本維修手冊僅有英文版。 <ul style="list-style-type: none">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. <ul style="list-style-type: none">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. <ul style="list-style-type: none">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)	<p>Denne servicemanual findes kun på engelsk.</p> <ul style="list-style-type: none">• 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)	<p>Deze onderhoudshandleiding is enkel in het Engels verkrijgbaar.</p> <ul style="list-style-type: none">• 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)	<p>This service manual is available in English only.</p> <ul style="list-style-type: none">• 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)	<p>See teenindusjuhend on saadaval ainult inglise keeles</p> <ul style="list-style-type: none">• 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)	<p>Tämä huolto-ohje on saatavilla vain englanniksi.</p> <ul style="list-style-type: none">• 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)	<p>Ce manuel d'installation et de maintenance est disponible uniquement en anglais.</p> <ul style="list-style-type: none">• 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.

<p>WARNUNG (DE)</p>	<p>Diese Serviceanleitung existiert nur in englischer Sprache.</p> <ul style="list-style-type: none"> 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.
<p>ΠΡΟΕΙΔΟΠΟΙΗΣΗ (EL)</p>	<p>Το παρόν εγχειρίδιο σέρβις διατίθεται μόνο στα αγγλικά.</p> <ul style="list-style-type: none"> 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.
<p>FIGYELMEZTETÉS (HU)</p>	<p>Ezen karbantartási kézikönyv kizárólag angol nyelven érhető el.</p> <ul style="list-style-type: none"> Ha a vevő szolgáltatója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészítése. Ne próbálja elkezdni 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.
<p>AÐVÖRUN (IS)</p>	<p>Þessi þjónustuhandbók er aðeins fáanleg á ensku.</p> <ul style="list-style-type: none"> Ef að þjónustuveitandi viðskiptamanns þarfnast annas tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálþjónustu. 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.
<p>AVVERTENZA (IT)</p>	<p>Il presente manuale di manutenzione è disponibile soltanto in lingua inglese.</p> <ul style="list-style-type: none"> 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.
<p>警告 (JA)</p>	<p>このサービスマニュアルには英語版しかありません。</p> <ul style="list-style-type: none"> 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)	<p>본 서비스 매뉴얼은 영어로만 이용하실 수 있습니다 .</p> <ul style="list-style-type: none"> • 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)	<p>Šī apkopes rokasgrāmata ir pieejama tikai angļu valodā.</p> <ul style="list-style-type: none"> • 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)	<p>Šis eksploatavimo vadovas yra tik anglų kalba.</p> <ul style="list-style-type: none"> • 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)	<p>Denne servicehåndboken finnes bare på engelsk.</p> <ul style="list-style-type: none"> • 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)	<p>Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim.</p> <ul style="list-style-type: none"> • 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)	<p>Este manual de assistência técnica encontra-se disponível unicamente em inglês.</p> <ul style="list-style-type: none"> • 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)	<p>Este manual de assistência técnica só se encontra disponível em inglês.</p> <ul style="list-style-type: none">• 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.
ATENȚIE (RO)	<p>Acest manual de service este disponibil doar în limba engleză.</p> <ul style="list-style-type: none">• 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)	<p>Данное руководство по техническому обслуживанию представлено только на английском языке.</p> <ul style="list-style-type: none">• 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)	<p>Ovo servisno uputstvo je dostupno samo na engleskom jeziku.</p> <ul style="list-style-type: none">• 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 serviser, rukovaoca ili pacijenta usled strujnog udara ili mehaničkih i drugih opasnosti.
UPOZORNENIE (SK)	<p>Tento návod na obsluhu je k dispozícii len v angličtine.</p> <ul style="list-style-type: none">• Ak zákazníkovi poskytovateľ služieb vyžaduje iný jazyk ako angličtinu, poskytnutie prekladateľských služieb je zodpovednosťou zákazníka.• Nepokúšajte sa o obsluhu zariadenia, kým si neprečítate návod na obsluhu a neporozumiete mu.• Zanedbanie tohto upozornenia môže spôsobiť zranenie poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, mechanické alebo iné ohrozenie.

ATENCION (ES)	<p>Este manual de servicio sólo existe en inglés.</p> <ul style="list-style-type: none">• 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)	<p>Den här servicehandboken finns bara tillgänglig på engelska. .</p> <ul style="list-style-type: none">• 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)	<p>Ta servisni priročnik je na voljo samo v angleškem jeziku.</p> <ul style="list-style-type: none">• 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)	<p>Bu servis kılavuzunun sadece ingilizcesi mevcuttur.</p> <ul style="list-style-type: none">• 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.

DAMAGE IN TRANSPORTATION

All packages should be closely examined at time of delivery. If damage is apparent, have notation "damage in shipment" written on all copies of the freight or express bill before delivery is accepted or "signed for" by a General Electric representative or a hospital receiving agent. Whether noted or concealed, damage MUST be reported to the carrier immediately upon discovery, or in any event, within 14 days after receipt, and the contents and containers held for inspection by the carrier. A transportation company will not pay a claim for damage if an inspection is not requested within this 14 day period.

To file a report:

- Call 1-800-548-3366 and use option 8.
- Fill out a report on <http://egems.med.ge.com/edq/home.jsp>
- Contact your local service coordinator for more information on this process.

Rev. June 13, 2006

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 Medical 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'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.

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, Medical Systems Group, 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, Medical Systems Group, 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.

LITHIUM BATTERY CAUTIONARY STATEMENTS



CAUTION
Risk of
Explosion

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.



ATTENTION
Danger
d'Explosion

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

OMISSIONS & ERRORS

Customers, please contact your GE Sales or Service representatives.

GE personnel, please use the GEMS CQA Process to report all omissions, errors, and defects in this publication.

Revision History

Revision	Date	Reason for change
15	05/11/17	Chapter 4, Section 6.3: Added Figure 4-15 for OpenOC Chapter 4, Section 9.0: Added Figure 4-23 for OpenOC rear view Chapter 6, Section 1.0: Added Open Console Information on Table 6-1 Added section 1.1.1 for Anchor edge information Chapter 6, Section 2.0: Added Figure 6-10 for OpenOC Center-of-Gravity Chapter 7, Section 6.0: Added OpenOC information for console delivery consideration Chapter 9, Section 3.0: Added cable connections for OpenOC
14	03/30/15	Chapter 7, Section 1.0: Added Rigging statement according to global requirement

Revision	Date	Reason for change
13	08/15/13	<p>Chapter 1: added floor template (P/N5341997) for GT1700 Table in Section 1.0 added Pre-installation Block Diagram in Section 3.0 Updated the EMC standard description in Section 4.0</p> <p>Chapter 2: added floor template (P/N5341997) for GT1700 Table in Section 6.0</p> <p>Chapter 3: updated option list in Section 1.0</p> <p>Chapter 4: Changed Balance Weight kit to 33kg. Added the illustrations of BSD Elite Gantry and Table in Section 6.1 added TIO and NIO16 console illustration in Section 6.3. Added Illustrations of Freedom Workspace Table (Narrow) (part 5168666-3) and Freedom Workspace Table (Wide) (part 5168666-2) in Section 6.4. Updated Section 7.1 and 7.2 System Operation. Added the cradle carrying capability of 227kg (GT1700 Table) in Section 8.0 Added illustrations of NIO16 and TIO console rear bulkhead in Section 9.0. Added Section 11.0 Patient Environment.</p> <p>Chapter 5: added Section 5.0 System Component Noise Levels. Updated the cooling requirement table in Section 2.0 Updated Figure 5-1 Sample Room Layout, showing approximate EMI requirements in Section 4.0</p> <p>Chapter 6: updated floor loading specification table in Section 1.0. added GT1700 table illustration in Section 2.0. Updated Table 6-2 Gantry and Table Mounting Requirements in Section 2.0 Added Seismic Mounting illustrations of FWS, TIO and NIO16 console in Section 2.0. Added a warning and note in Section 2.0.</p> <p>Chapter 7: Added a column of Weight in Table 7-1 Size of Gantry & Dollies, with and without Side Rails in Section 7.0 added GT1700 Table dimensions with dolly in Section 8.0 added TIO and NIO16 console shipment considerations in Section 9.0</p> <p>Chapter 9: Added Section 8.0 Recommended Power Distribution System (For Europe) Added the tables of GEMS supplied cables (Standard Run) for TIO and NIO16 in Section 3.0. Added the tables of Extended cables for TIO and NIO16 in Section 3.0. Added the System Interconnect Diagrams with TIO and NIO16 Console in Section 3.0. Added the tables of Supplied cables (Long Run) for TIO and NIO16 in Section 3.0. Added the Fuse Kit table for BSD Meri (2385412-4 BOM, rev 2) in Section 5.0 Updated Table 9-9 BrightSpeed Series Partial UPS Back-up Options in Section 6.0.</p> <p>Appendix: Deleted the appendix "CT Installation Site Ready Form" and added "Alternate Cover Removal Options"</p>
12	10/11/10	<p>Chapter 5: Updated Figure 5-1 Equipment EMI "Envelopes"</p> <p>Chapter 6: Updated Floor Levelness Requirement</p> <p>Chapter 8: Added Warning Message on Section 2.2 and 3.0</p>

Revision	Date	Reason for change
11	11/04/08	<p>Chapter 3: updated option list in Section 1.0</p> <p>Chapter 4: added new FWS Table (part 5168666) illustration in Section 6.4</p> <p>Section 7.0 updated Injector AC power cable.</p> <p>Section 8.0 updated Floor Levelness</p> <p>Chapter 5: Added the Notice for environmental requirement at beginning of Section 1.0</p> <p>Section 1.1: Updated Temperature (Scan Room & Control Room) according to SRS requirement.</p> <p>Section 3.0: Updated Altitude values according to SRS requirement.</p> <p>Section 4.0 updated Figure 5-1 of EMI requirement</p> <p>Chapter 6: updated floor loading specification in Section 1.0</p> <p>added FWS seismic info in section 2.0</p> <p>Chapter 8, section 4.0: updated Figure 8-1 System Ground Map</p> <p>Chapter 9, section 3.0: updated System Interconnect Diagram</p> <p>Section 3.4: updated table of GEMS Supplied Cables for Options</p> <p>Section 5.0 Updated the Fuse Kit BOM</p>
10	12/03/07	<p>Important Precautions: updated content for Damage In Transportation</p> <p>Chapter 4: updated gantry width</p> <p>Section 2.1.2 updated Regulated Minimum Working Clearance by Major Subsystem</p> <p>Section 6.4 updated for FWS Seismic information</p> <p>Added note to Section 8.4 Floor levelness</p> <p>Added network specs to Section 9.0 Network Connections</p> <p>Chapter 5: Section 4.0 added note</p> <p>Section 4.2 added EMI of color monitor</p> <p>updated Figure 5-1 Sample Room Layout, showing approximate EMI requirements</p> <p>Chapter 6: updated gantry width</p> <p>Chapter 9: added LOTO requires to Section 7.1 Primary Power Disconnect</p>
9	8/13/07	<p>Updated measurements to metric to meet European standards and compliance. General revision of manual.</p> <p>Important Precautions: updated by adding Bulgarian warnings</p> <p>Chapter 4:</p> <p>Added Section 8.7: Ceiling Requirement</p> <p>Removed FWS extended cables Table to Chapter 9, Section 3.2</p> <p>Chapter 5: updated Section 2.0 Cooling Requirement</p> <p>Chapter 7:</p> <p>Updated section 7.0/8.0/9.0 shipping considerations</p> <p>Updated Section 6.0 System transportation temperature.</p> <p>Chapter 9: Updated Section 5.0 for Fuse Kit</p>
8	6/28/07	<p>Important Precautions: updated multi-language warnings</p> <p>Chapter 4: Added Section 4.0 for Short Footprint consideration</p>
7	4/29/07	Chapter 8: Updated Power Source Configuration
6	12/12/06	<p>Chapter 3: Updated option catalog numbers</p> <p>Appendix: Changed FCT to CT</p>

Revision	Date	Reason for change
5	9/30/06	<p>Chapter 1: Added Section 4 Medical Electrical Equipment for EMC.</p> <p>Chapter 4: Added Limited Access Room information.</p> <p>Chapter 5: Deleted Section 4.8 EMC Edition 2 Compliance - duplicate with newly added Chapter 1, Section 4.</p> <p>Chapter 9: Updated Figure 9-1 System Interconnect Diagram to include Options. Added Section 3.3 Cable list of options, Section 5 Fuse. Added Note: Use dry cleaning for electro components.</p>
4	6/27/06	<p>Chapter 3: Updated Table 3-1 BrightSpeed System Options</p> <p>Chapter 4: Updated recommended room layout and minimum room layout. Updated Section 8.4 - Floor Levelness.</p> <p>Chapter 6: Updated seismic mounting bracket in Figure 6-7 Power Distribution Unit.</p> <p>Appendix B: Updated <i>CT Installation Site Ready Form</i>.</p>
3	3/31/06	<p>Chapter 4: Updated room size dimensions and typical room layout; Updated Figure 4-4: Typical Control Room Layout with Freedom Workspace (FWS) Desktop;</p> <p>Chapter 6: Updated Table 6-1: BrightSpeed System Floor Loading;</p> <p>Chapter 8: Added note that 75KVA rating is for BrightSpeed Excel (4 slice) only.</p>
2	2/15/06	<p>Chapter 4: Added Freedom Workspace (FWS) extended cables length information.</p>
1	1/24/06	Initial Release.

Table of Figures

Figure 2-1	Hole Locations	43
Figure 3-1	Base Scanner System with HPower Table	47
Figure 3-2	BrightSpeed Elite Base Scanner System with GT1700 Table.....	48
Figure 4-1	Regulatory Clearance Requirements for BrightSpeed System Configurations	50
Figure 4-2	Minimum Service Clearance	62
Figure 4-3	Boom Assembly Clearance	63
Figure 4-4	Short Footprint Calculation diagram.....	66
Figure 4-5	Minimum Room layout for Short Footprint function	67
Figure 4-6	Recommended Control Room Layout with Freedom Workspace (FWS).....	68
Figure 4-7	Table and Gantry (Side View) for BSD Elite/Edge/Excel with HPower Table	70
Figure 4-8	Gantry shown tilted +30° (top) and -30° (bottom) for BSD Elite/Edge/Excel with HPower Table	71
Figure 4-9	Table and Gantry (Side View) for BSD Elite (with GT1700 Table).....	72
Figure 4-10	Gantry shown tilted +30° (top) and -30° (bottom) for BSD Elite (with GT1700 Table)	73
Figure 4-11	Power Distribution Unit (NGPDU)	74
Figure 4-12	Operator's Console with Standard Table	75
Figure 4-13	TIO Operator's Console	76
Figure 4-14	NIO16 Operator's Console.....	77
Figure 4-15	OpenOC16 Console	78
Figure 4-16	Freedom Workspace Table (part 5160735)	79
Figure 4-17	Freedom Workspace Table (part 5168666)	80
Figure 4-18	Freedom Workspace Table Wide (part 5168666-2).....	81
Figure 4-19	Freedom Workspace Table Standard (Narrow) (part 5168666-3)	82
Figure 4-20	LCGOC/GOC4/AIO Console Rear Bulkhead	87
Figure 4-21	TIO Console and Host Computer Rear	88
Figure 4-22	NIO16 Console with Z800 Host Computer Rear	89

Figure 4-23	OpenOC with Z840 Host Computer Rear	90
Figure 4-24	Typical Scatter Survey (Head Filter).....	93
Figure 4-25	Typical Scatter Survey (Body Filter)	94
Figure 4-26	Fluoro Stand Position	95
Figure 4-27	Scatter Plot of Fluoro - Body	95
Figure 4-28	Scatter Plot of Fluoro - Head	96
Figure 5-1	Sample Room Layout, showing approximate EMI requirements.....	104
Figure 6-1	Gantry and Table Anchor with 2106573 (8 in.) Anchor Bolt	110
Figure 6-2	Gantry and Table Anchor with 5487992-2 (7 in.) Anchor Bolt	111
Figure 6-3	Gantry	112
Figure 6-4	Gantry Anchor Location	112
Figure 6-5	Patient Table (H-Power)	113
Figure 6-6	Patient Table (GT1700)	114
Figure 6-7	Power Distribution Unit (NGPDU).....	115
Figure 6-8	FWS Assembly (5168666-3)	116
Figure 6-9	GOC4/LCGOC/AIO Operator Console	117
Figure 6-10	TIO and NIO16 Console Seismic Mounting Hole Position.....	118
Figure 6-11	OpenOC Center-of-Gravity	119
Figure 7-1	Gantry with dollies	125
Figure 7-2	Console packing	127
Figure 7-3	Package Symbols (Storage).....	130
Figure 7-4	Proper Gantry Strap Location	132
Figure 8-1	System Ground Map.....	138
Figure 9-1	System Interconnect Diagram (With GOC4/LCGOC Console and GOB Board).....	146
Figure 9-2	System Interconnect Diagram (With All-In-One Console and IPC Board).....	147
Figure 9-3	System Interconnect Diagram (With TIO Console and IPC Board).....	148
Figure 9-4	System Interconnect Diagram (NIO16 Console with Z800 Host PC)	149

Figure 9-5	System Interconnect Diagram (OpenOC with Z840 Host PC)	150
Figure 9-6	Interconnection Runs	157
Figure 9-7	Typical UPS Interconnect.....	160
Figure 9-8	Primary Power Disconnect (A1)	161
Figure 9-9	Primary Power Disconnect (A1) - Fusible Disconnect and Magnetic Contactor	162
Figure 9-10	Typical TS6 Warning Light & Door Interlock Connections	163
Figure 9-11	TS6 Room Door Interlock Connections - With a Door Interlock.....	163
Figure 9-12	TS6 Room Door Interlock Connections - Without a Door Interlock.....	163
Figure 9-13	Power Distribution Interconnect Box (for Europe) 1/2.....	164
Figure 9-14	Power Distribution Interconnect Box (for Europe) 2/2.....	165
Figure A-1	Standard Service Access	169
Figure A-2	Front Cover Removal and Storage to Left Side	170
Figure A-3	Front Cover Removal and Storage to Right Side.....	171
Figure A-4	Front Cover Removal with Table Up, Storage to Left Side	172
Figure A-5	Front Cover Removal with Table Up, Storage to Right Side.....	173
Figure A-6	Rear Cover Removal and Storage Straight Back.....	174
Figure A-7	Rear Cover Removal and Storage to Left or Right Side	175
Figure A-8	Rear Cover, Gantry Angled, Storage in Corner	176

Table of Tables

Table 1-1	Emission Declaration	36
Table 1-2	Immunity Declaration	37
Table 1-3	Immunity Declaration con't.....	38
Table 1-4	Separation Distances	39
Table 3-1	BrightSpeed System Options	45
Table 4-1	List of Scan Room Layouts	49
Table 4-2	List of Control Room Layouts	49
Table 4-3	Console Subsystem	51
Table 4-5	Gantry Subsystem.....	52
Table 4-4	NGPDU Subsystem	52
Table 4-6	Table Subsystem	53
Table 4-7	UPS Subsystem	54
Table 4-8	A1 Disconnect Subsystem	54
Table 4-9	Equipment to be stored in storage cabinet.....	69
Table 4-10	Dimensions of Accessories	70
Table 4-11	Shielding Requirements Scaling	92
Table 5-1	Cooling Requirements (Worksheet)	101
Table 6-1	BrightSpeed System Floor Loading	105
Table 6-2	GE-Supplied Anchor Specifications	108
Table 6-3	Gantry and Table Mounting Requirements	109
Table 7-1	Size of Gantry & Dollies, with and without Side Rails	125
Table 7-2	H-Power Table Shipping Dimensions	126
Table 7-3	GT1700 Table Dimensions with dollies.....	126
Table 8-1	Nominal Line Voltage	136
Table 8-2	Minimum Feeder Wire Size	137

Table 8-3	
Minimum Feeder Wire Size	137
Table 9-1	
Component Designators	139
Table 9-2	
GEMS Supplied Cables (Optional, Short Run) - UL Information	140
Table 9-3	
GE Healthcare Supplied Cables for GOC or TIO (Standard Run) (2281840-5)- UL Information	141
Table 9-4	
GE Healthcare Supplied Cables for NIO16 Console (Standard Run) (2281840-14)- UL	
Information.....	142
Table 9-5	
Extended Cables	143
Table 9-6	
TIO Console Extended Cables	143
Table 9-7	
GE Healthcare Supplied NIO16 Console with Z800 Cables.....	144
Table 9-8	
GE Healthcare Supplied OpenOC16 Console with Z840 Cables	145
Table 9-9	
GEMS Supplied Cables (Optional, Long Run) - UL Information.....	151
Table 9-10	
GE Healthcare Supplied Cables for GOC or TIO (Optional, Long Run) (2281840-4)- UL	
Information.....	152
Table 9-11	
GE Healthcare Supplied Cables for NIO16 Console (Optional, Long Run) (2281840-13)- UL	
Information.....	153
Table 9-12	
GEMS Supplied Cables for Options - UL Information.....	154
Table 9-13	
Runs 1, 2, 3, 4 and 5 Connections	156
Table 9-14	
Contractor-Supplied Components	158
Table 9-15	
FUSE KIT BS 90KVA (2385412-2 BOM, rev 2).....	158
Table 9-16	
FUSE KIT for BSD Meri (2385412-4 BOM, rev 2)	159
Table 9-17	
BrightSpeed Series Partial UPS Back-up Options.....	160

Table of Contents

Chapter 1

Introduction..... 29

Section 1.0

Site Readiness..... 29

Section 2.0

Responsibility of Purchaser..... 30

2.1 Customer Room Prep Items 30

2.2 Purchaser Site Preparation Work 31

2.3 Manufacturer's System Level Siting Requirements 31

2.3.1 Meeting Site Ready Requirements 32

2.3.2 Quick Installs 32

2.3.3 "Two-Step" and Upgrade Installs 32

2.3.4 Site Ready Inspection Visit 33

Section 3.0:

Pre-Installation Checklist..... 34

Section 4.0

Medical Electrical Equipment for EMC..... 36

4.1 General Scope 36

4.2 Electromagnetic Emission 36

4.3 Electromagnetic Immunity 37

4.3.1 Limitations Management : 39

4.4 Use Limitation : 40

4.4.1 External components 40

4.5 Installation Requirements & Environment Control : 40

4.5.1 Cable Shielding & Grounding 40

4.5.2 This product complies the radiated emission as per CISPR11 Group 1 Class A standard limits 40

4.5.3 Subsystem & Accessories Power Supply Distribution 40

4.5.4 Stacked Components & Equipment..... 40

4.5.5 Low Frequency Magnetic Field 40

4.5.6 Static Magnetic Field Limits 40

4.5.7 Electrostatic Discharge Environment & Recommendations 40

Chapter 2

Pre-Installation Overview..... 41

Section 1.0

Dust/Dirt Contamination 41

Section 2.0

Chemical Contamination 41

Section 3.0

Walls, Ceiling and Floor..... 41

Section 4.0	
Broad-band.....	42
Section 5.0	
Phone Line (for optional modem)	42
Section 6.0	
Review	42
 Chapter 3	
System Catalog	45
Section 1.0	
Option Catalog Numbers	45
Section 2.0	
Base Scanner System	47
2.1 Application.....	47
2.2 Configuration	47
 Chapter 4	
Room Planning	49
Section 1.0	
Required Systems Clearances	49
Section 2.0	
Regulatory Clearances.....	50
2.1 Regulatory Clearances.....	50
2.1.1 Regulatory Code Description	51
2.1.2 Regulated Minimum Working Clearance by Major Subsystem	51
2.1.3 Terms and Definitions	55
2.2 Additional Regulatory Clearance Information.....	56
2.2.1 Minimum Room Size (Limited Access)	56
2.2.1.1 Regulatory Caution	56
2.2.1.2 Egress Clearance	56
2.2.1.3 Operational Caution.....	56
2.2.2 System Specifications (BrightSpeed).....	57
2.2.2.1 Recommended Room Size.....	57
2.2.2.2 Typical Room Size.....	57
2.2.2.3 Minimum Room Size.....	57
2.2.3 How to Measure	58
2.2.4 Minimum Room Size & Requirement Layouts	59
2.2.5 Recommended Room Size & Requirement Layouts.....	61
Section 3.0	
Service Clearances.....	62
3.1 Service Clearances for Single Service Engineer	63
3.2 Gantry Service Clearance	63
3.3 Power Distribution Unit (NGPDU) Service Clearance.....	64
3.4 Console Service Clearance.....	64

Section 4.0	
Short Footprint Consideration	65
4.1 Introduction of Short Footprint function.....	65
4.2 Instruction of using Short Footprint function	65
Section 5.0	
Recommended Layouts	68
5.1 Control Room Considerations.....	68
5.2 Storage Cabinet.....	69
5.3 Advantage Workstation (AW)	69
Section 6.0	
Component Dimensions	70
6.1 Table and Gantry	70
6.2 Power Distribution Unit	74
6.3 Operator's Console	75
6.4 Freedom Workspace Table	79
Section 7.0	
Minimum Dimensions and Clearances.....	83
7.1 Options	83
7.2 System Operation	83
7.3 Injector Control	83
Section 8.0	
Structural Requirements	84
8.1 Table and Gantry Mounting Requirements.....	84
8.2 Floor Anchors	84
8.3 Floor Strength	85
8.4 Floor Levelness	85
8.5 Floor Vibration	85
8.5.1 Steady State Vibration	85
8.5.2 Transient Vibration.....	85
8.5.3 Equipment Location	86
8.6 Walls: Scan Window	86
8.7 Ceiling Requirement	86
Section 9.0	
Network Connections	87
9.1 US Broad Band Process Overview.....	91
9.2 Customer Broad-Band Responsibilities	91
Section 10.0	
Radiation Protection	92
Section 11.0	
Patient Environment	97
Chapter 5	
Environmental Conditions	99
Section 1.0	
Temperature and Humidity Specifications	99

1.1	Temperature (Scan Room & Control Room).....	99
1.2	Humidity (Scan Room & Control Room)	100
1.3	Other Guidelines	100
Section 2.0		
Cooling Requirement		101
Section 3.0		
Altitude		101
Section 4.0		
Electro-Magnetic Interference (EMI)		102
4.1	Gantry and Table	102
4.2	Color Monitor.....	102
4.3	Console / Computer Equipment	102
4.4	Magnetic Media	102
4.5	PDU.....	102
4.6	EMI Reduction.....	103
4.7	UPS.....	103
4.8	Equipment EMI "Envelopes"	104
Section 5.0 System Component Noise Levels		104

Chapter 6

Floor Loading and Weights

105

Section 1.0		
Floor Loading.....		105
1.1	Floor Loading and Anchoring Guidelines	107
1.1.1	Anchor Edge Distance Definition	107
1.2	GE Supplied Anchoring	107
1.2.1	Specifications of GE-supplied Anchors	108
Section 2.0		
Mounting Data, Including Seismic		109

Chapter 7

Delivery and Storage Requirements

121

Section 1.0		
Delivery to the Facility.....		121
1.1	Loading Dock Deliveries (Preferred methods)	121
1.2	Ground (Non-Loading Dock) Deliveries	121
1.2.1	Lift-Gate Truck	121
1.2.2	Tilt Bed Truck	121
1.2.3	Forklift Truck	122
1.2.4	Rigging	122
Section 2.0		
Delivery to the Scan Suite.....		123
2.1	Lifting.....	123
2.1.1	Stairway Deliveries.....	123

2.2	Floor Protection	123
2.3	Un-Loading and Un-packing the System	123
Section 3.0		
Dollies.....		124
3.1	Installations within the United States	124
3.2	Zero Clearance Dollies	124
3.3	Tilting Table Dollies	124
3.4	Installation Outside of the United States.....	124
Section 4.0		
Gantry Considerations.....		125
Section 5.0		
Table Considerations.....		126
5.1	HP-Power Table	126
5.2	GT1700 Table.....	126
Section 6.0		
Console Considerations		126
Section 7.0		
PDU Considerations.....		128
Section 8.0		
Storage Requirements		129
8.1	Short Term Storage (Less than 6 months)	129
8.2	Construction-Site Storage.....	129
8.3	Long Term Storage (6 months or more)	129
Section 9.0		
Extreme Temperature Transportation and Deliveries.....		130
Section 10.0		
Site Environmental Considerations.....		131
10.1	Dust/Dirt Contamination.....	131
10.2	Chemical Contamination.....	131
Section 11.0		
Handling Requirements		131
11.1	Transportation.....	131
11.2	Handling Requirements	131
11.2.1	Avoid Dropping	132
11.2.2	Avoid Shocks and Vibrations	132
11.2.3	Avoid Tipping	132
11.3	Inclines and Flat-bed Truck Removal	132

Chapter 8	
Power Requirements	133

Section 1.0	
Introduction	133

Section 2.0	
System Input Power	134
2.1 Power Source Configuration	134
2.2 Rating	134
2.3 Regulation	135
2.4 Phase Imbalance	135
2.5 Sags, Surges & Transients	135
2.6 Grounding	135
Section 3.0	
Recommended Power Distribution System	136
Section 4.0	
Ground System	138
 Chapter 9	
Interconnection Data	139
Section 1.0	
Introduction	139
Section 2.0	
Component Designators	139
Section 3.0	
Interconnect Runs, Wiring and Cables	140
3.1 GEMS Supplied (Optional, Short Run)	140
3.2 GEMS Supplied (Freedom Workspace Table Extended Cables Kit)	143
3.3 GEMS Supplied (Optional, Long Run)	151
3.4 GEMS Supplied (Cables of Options)	154
3.5 Contractor (Customer) Supplied	156
Section 4.0	
Contractor Supplied Components	158
Section 5.0	
Fuse	158
Section 6.0	
UPS Interconnect	160
Section 7.0	
Typical Customer Supplied Wiring	161
7.1 Primary Power Disconnect	161
7.2 Scan Room Warning Light & Door Interlock	163
Section 8.0	
Recommended Power Distribution System (For Europe)	164
 Appendix A	
Alternate Cover Removal Options	167

Section 1.0

Alternate Cover Removal Options 167

1.1 Overview 167

1.2 Front Cover Removal..... 167

1.3 Rear Cover Removal 168

1.4 Condition References 168

Chapter 1

Introduction

This direction contains physical and electrical data necessary for planning and preparing a site.

Pre-installation work is defined as site preparation for installation of the GE CT scanner. It is the responsibility of the purchaser to arrange and pay for this work. Pre-installation work includes:

- Installation of electrical conduit, junction boxes, ducts, outlets, and line safety switches.
- Installation of interconnection wiring that is AWG stranded copper. The electrical contractor shall ring out and tag all wires at both ends. Color-coded wires are recommended for easier identification. Wires shall be continuous without splices. Ground wires must conform to local codes.
- Any site renovation.
- Alterations and modifications to products not specifically included in the sales contract.

All work must conform to local building and safety codes. Unless specifically mentioned, GE Healthcare does not provide or install wires, conduits, junction boxes, and ducts as illustrated in this publication.

All CT site plans, preliminary concepts and final working drawings must be reviewed by General Electric Headquarters Architectural Planning prior to construction or approval.

Contact your local General Electric sales representative for complete information regarding your site-specific room layout.

Section 1.0

Site Readiness

Site ready is a requirement that must be achieved to install a CT product. For your convenience, a site ready visit inspection shall be performed at least three (3) days prior to the installation date. The site inspection must conclude with a minimum of a conditional pass status to be ready on the requested installation delivery date. Site ready inspections on the delivery date will not be acceptable unless prior arrangements have been made.

Pre-Installation and Site Ready Tools:

- Floor template for BrightSpeed with H-Power Table (P/N 5160024)
- Floor template for BrightSpeed with GT1700 Table (P/N 5341997)
- Pre-Installation check List
- Pre-Installation Block Diagram
- Site Room Layouts
- Power and Grounding Inspection
- Pre-Installation Support

Section 2.0

Responsibility of Purchaser

2.1 Customer Room Prep Items

The CT air intake is near the bottom of the gantry. Fine dust as listed below will be deposited throughout the gantry, table, console and PDU electronics. This fine dust cannot be completely removed and can be damaging to electronic components.

For these reasons, the scanner should be the last item installed in your CT suite area.

“Pre-installation” is work necessary to plan and prepare a site for installation of equipment.

Pre-installation work helps the user (customer) avoid:

- Application delay and scheduling
- Surprise siting discoveries
- Installation confusion
- Waste of manpower

The following **MUST** be completed before installation work can begin for a GE CT scanner:

- Completely finished:
 - Wall painted or have final wall covering
 - Ceiling tiles installed and no remaining ceiling work is required
 - Final floors covering installed with no remaining dust causing floor work required
 - All room millwork installed as shown on the site print
 - All plumbing work in the CT suite is completed
 - No construction in or around the scan suite AREA that will produce:
 - * Concrete dust
 - * Drywall dust
 - * Ceiling tile dust
 - * Wood sawdust or shaving
 - * Dust tracked into the CT suite area
- Active Broad Band connection
 - A completed network connection is required for ALL CT installations.
 - A GE Healthcare network specialist may be required to complete the VPN connection. This may take a week or longer to schedule.
- Power available to A1, with provision for Lockout/Tagout at the A1 disconnect
 - If a UPS is required, a GE A1 breaker* will be needed to complete this installation. Refer to the electrical section for more details.



NOTICE

SERVICE NOTICE: An improperly prepared site (i.e., one that is in a state of construction) can result in increased installation time.

A CT scanner installed in a dirty environment is more prone to contamination, which can result in decreased reliability and increased scanner downtime.

2.2 Purchaser Site Preparation Work

This list below will describe many of the items to consider when planning for a system replacement or designing a room for new equipment

- Determine room dimensions and verify that doorways are large enough for the scanner system.
- Install appropriate conduits and duct work for system cables. If additional components are required in the CT suite, their connection consideration must be determined and completed.
- Install junction boxes of correct size with covers at locations shown in installation plan.
- A1 main disconnect installation
- Install power supply of correct voltage output and adequate KVA rating.
- Install local disconnects, including proper over-current protection.
- Install “steelwork” or other suitable support work for mounting equipment on walls or from ceiling.
- Camera should be on-site at the time of installation.
- Complete all suite and room alterations and modifications.
- Verify that room shielding is adequate for the system being installed
- Review structural requirement - including floor vibration, levelness, and thickness
- Review HVAC requirements including system regulation and patient comfort.
- Review operational clearances to see if your daily used items fit, such as beds and carts.
- Emergency medical equipment should also be considered
- Storage cabinets and sink (if required) must be shown on the site print
- These contractors and others may be required to help confirm that the site meet all installation requirements:
 - Structural Engineer and /or Architect
 - HVAC contractor
 - Electrical contractor
 - Qualified radiological health physicist

The above items can be found in chapter 2 through 9 in this manual.

It is suggested that this work be completed at least three days prior to delivery

2.3 Manufacturer’s System Level Siting Requirements

These siting requirements are the minimum that must be met in order to install a new or replacement system.

- Network Communication in place and active
- Meets all scan room regulatory and service requirements
- Meets all minimum scan room structural requirements
- Meets minimum scan room HVAC requirements
- Meets minimum scan room electrical requirements
- Reviewed radiation protection section in the Pre-Installation manual
- All in room items shown on the final GE Healthcare site print and the final print is on site
- No construction in the scan room or neighboring suite areas

It is suggested that this work be completed at least three days prior to delivery

2.3.1 Meeting Site Ready Requirements

The site ready visit will take place at least three days prior to the delivery date. The site ready visit is intended to verify that all of the siting requirements are met and the site is ready for installation.

The site ready visit will result in a report to the project manager indicating one of the following:

Pass - All required items are present, completed and the site is ready for installation.

Conditional Pass - is issued when 80% of all of the tasks are completed and all parties agree that the 20% will be completed by the installation delivery date.

If a "Conditional Pass" is granted on the inspection date, the project manager must present conclusive evidence that unfinished tasks are completed and that the site is ready for delivery one business day prior to delivery.

Fail - is issued when less than 80% of the tasks are completed and all parties cannot agree that the remaining work will be completed by the requested installation delivery date.

Failed sites will be rescheduled when all items are completed.

2.3.2 Quick Installs

Quick installations are described as sites with minimum room improvements required. These include, but are not limited to the following items:

- Existing electrical disconnect device, wire size and grounds meet all of the above requirements.
- Existing structural items including floor thickness meet all of the above requirements
- Existing HVAC capacity and regulation meet all of the above requirements
- Existing CT suite meets all of the above regulatory and minimum size requirements
- Existing facility can accommodate the delivery and meet all of the above delivery requirements

Quick Installs are subject to the following restrictions:

- Quick installs must have a new room print that accurately reflects the rooms to be upgraded.
- Existing floor anchors from a non-BrightSpeed system CANNOT be reused.
- New floor anchors must be a minimum of 4" from any existing floor penetrations.

Quick Installs typically involve a weekend de-install and room prep completion, with a next business day delivery and install.

2.3.3 "Two-Step" and Upgrade Installs

A "Two-Step" installation is the practice of temporarily installing one CT system in a site with the intention of upgrading the site to a different CT system at a later date.

- For a "two-step" installation to be considered, the room must meet the minimum room requirements for the project being upgraded.
- As with any upgrade installation, "two-steps" are subject to ALL of the siting requirements imposed by the upgrade/final system. This includes the recommended room size as well as electrical, structural and HVAC requirements.
- Two-steps and other upgrades may be done as "Quick" Installs. In this case, all requirements described in Section 2.3.2 (above) also apply.
- It is the customer's responsibility to check that all requirements are met.
- Rooms that do not meet the minimum requirements for the final product must either upgrade (or enlarge) their room, or consider the "Left-Side Limited Access" option.

2.3.4 Site Ready Inspection Visit

Must meet all in section 1 and 2 plus these additions reviewed at the site ready visit.

The GE Healthcare project manager will review the site delivery process with you to determine how to best transfer the equipment from the transportation truck to your room.

This site ready inspection will review and check these items:

Delivery information

- Determine delivery route into the scan room
- Determine if tilt dollies or riggers are required
- Determine if elevators, doorways and hallways are adequate for delivery
- Determine if floor protection is required
- Determine if a tilt bed truck is required for ground delivery and ordered.

Regulatory Requirement

- Room size meets the minimum requirements
- Site print is present and accurately reflects the room size and layout.
- No grounded walls are present in the regulatory clearance areas
- All regulatory clearances space is met
- Room meets all local codes

Manufacturer Requirements: As listed in section 2 - all requirements are met

Purchaser's Site Preparation Work: As listed in section 1 - all actions are completed

Section 3.0: Pre-Installation Checklist

Global Site Readiness Checklist	
Customer Name: Customer Name	PMI Name:
GON Number:	FSE Name:
Equipment:	Country / City:
Required site assessment milestones	Date of completion (dd/mm/yy)
1) Check site before Delivery/Storage	Storage Site Ready Date
2) Check site before installation start	Actual Site Ready Date (SRD)

Place an "X" in either Y or N column

Site Ready Checks before Delivery/Storage	Y	N
Sufficient & secured storage space is planned with the customer.		
Environmental requirements for storage place are met per GE requirements.		
All permits, plans and permissions received for rigging and/or delivery.		
Rooms that will contain equipment, including staging areas if applicable, are dust free. Precautions must be taken to prevent dust from entering rooms containing equipment.		
Adequate delivery route from truck to final place of installation has been reviewed with all stakeholders, all communications/notifications have occurred, arrangements have been made for special handling (rigging, elevator, fork lift, etc.)		
All floors along delivery route will support weight of the equipment, temporary reinforcements arranged if needed.		
Site Ready Checks at Installation	Y	N
General Site Planning		
Room dimensions, including ceiling height, for all Exam, Equipment/Technical & Control rooms meets GE specifications.		
Ceiling support structure, if indicated on the GE drawing, is in the correct location, at the correct height, levelness and spacing has been measured.		
Rooms that will contain equipment, including staging areas if applicable, are construction debris free. Precautions must be taken to prevent debris from entering rooms containing equipment.		
Finished ceiling is installed. If applicable ceiling tiles installed per PMI discretion.		
Adequate delivery route from truck to final place of installation has been reviewed with all stakeholders, all communications/notifications have occurred, arrangements have been made for special handling (rigging, elevator, fork lift, etc.). All floors along delivery route will support weight of the equipment, temporary reinforcements arranged if needed.		
System power & grounding (PDB/MDP) is available as per GE specifications, installed at point of final connection and ready to use. Lock Out Tag Out is available.		
Adequate room illumination installed and working.		
Cable ways (floor/wall/ceiling/Access Flooring) are available for installation of GE cables and are of correct length and diameter. Surface floor duct can be installed at time of system installation.		
HVAC systems Installed, and the site meets minimum environmental storage requirements.		
Network outlets installed and computer network available and working.		
Floor levelness/flatness is measured and within tolerance, and there are no visible defects per GEHC specifications.		

Customer supplied countertops where GE equipment will be installed are in place.			
Specific			
Doors and windows complete or scheduled to be installed. If applicable, radiation protection (shielding) finished & radioprotection regulatory approval for installation obtained.			
	STATUS OF WORK		
GENERAL COMMENTS			
SYSTEM CAN BE DELIVERED		PMI Name:	
SITE READY FOR INSTALLATION		PMI Signature:	

Section 4.0

Medical Electrical Equipment for EMC

4.1 General Scope

This equipment complies with IEC60601-1-2: 2001+A1: 2004 (ED2.1) and IEC 60601-1-2: 2007 (ED3) (if the system rating plate of the scanner marked with IPX0) EMC standard for medical electrical equipment.

The BrightSpeed System is suitable to be used in the electromagnetic environment, as per the limits & recommendations described in the tables hereafter:

- Emission Compliance level & limits (see [Table 1-1](#))
- Immunity Compliance level & recommendations to maintain equipment clinical utility (see [Table 1-2](#), [Table 1-3](#), and [Table 1-4](#)).

Note: This system complies with above mentioned EMC standard when used with supplied cables up to maximum lengths referenced in the MIS MAPS or system cable interconnect diagrams.

4.2 Electromagnetic Emission

Table 1-1 Emission Declaration

EMC Emissions Guidance & Declaration for BrightSpeed System		
The BrightSpeed System is intended for use in the electromagnetic environment specified below. The customer or the user of the BrightSpeed System should assure that it is used in such an environment.		
Emissions Test	Compliance	Electromagnetic Environment Guidance
RF emissions CISPR 11	Group 1	The BrightSpeed 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	Not applicable	The BrightSpeed 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 61000-3-2	Not applicable	

4.3 Electromagnetic Immunity

Table 1-2 Immunity Declaration

EMC Immunity Guidance & Declaration for BrightSpeed System			
The BrightSpeed System is intended for use in the electromagnetic environment specified below. The customer or the user of the BrightSpeed System should assure that it is used in such an environment.			
Immunity Test	IEC 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 should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line-line ± 2 kV line-earth	± 1 kV line-line ± 2 kV line-earth	Mains power quality should be that of 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 that of a typical commercial or hospital environment. If the user of the BrightSpeed System requires continued operation during power mains interruptions, it is recommended that the BrightSpeed System be powered from an uninterruptible power supply or a battery.
Powerfrequency (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 : U_T is the a.c. mains voltage prior to application of the test level.			

Table 1-3 Immunity Declaration con't


EMC Immunity Guidance & Declaration for System			
The System is intended for use in the electromagnetic environment specified below. The customer or the user of the System should assure that it is used in such an environment.			
Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment Guidance
<p>Conducted RF IEC 61000-4-6</p> <p>Radiated RF IEC 61000-4-3 (alternative method: IEC 61000-4-21)</p>	<p>3 V_{RMS} 150kHz to 80 MHz</p> <p>3 V/m 80 MHz to 2.5 GHz</p>	<p>3 V 150kHz to 80 MHz</p> <p>3 V/m 80 MHz to 2.5 GHz</p>	<p>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.</p> <p>Recommended Separation Distance</p> $d = \left[\frac{3.5}{3} \right] \sqrt{P}$ <p>(see Table 1-4)</p> $d = \left[\frac{3.5}{3} \right] \sqrt{P}$ <p>80 MHz to 800 MHz (see Table 1-4)</p> $d = \left[\frac{7}{3} \right] \sqrt{P}$ <p>800 MHz to 2.5GHz (see Table 1-4)</p> <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 metres (m).</p> <p>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.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p>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 re-orienting or relocating the System.</p> <p>b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p> <p>Note : These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.</p>			

Table 1-4 Separation Distances

Recommended separation distances between portable and mobile RF communications equipment and the BrightSpeed System.			
The BrightSpeed System is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the BrightSpeed System can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the BrightSpeed System as recommended below, according to the maximum output power of the communications equipment.			
Rated Maximum Output Power (P) of Transmitter Watts (W)	Separation distance according to frequency of transmitter		
	150 kHz to 80 MHz	80 MHz to 800MHz	800 MHz to 2.5 GHz
	$d = \left[\frac{3.5}{3} \right] \sqrt{P}$	$d = \left[\frac{3.5}{3} \right] \sqrt{P}$	$d = \left[\frac{7}{3} \right] \sqrt{P}$
	Separation Distance meters	Separation Distance meters	Separation Distance meters
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 P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. Note 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			

4.3.1 Limitations Management :

Adhering to the distance separation recommended in [Table 1-4](#), between 150kHz & 2.5GHz, 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, a 1W mobile phone (800MHz to 2.5GHz carrier frequency) shall be put 2.3 meters apart from the BrightSpeed System (in order to avoid image interference risks).

4.4 Use Limitation :

4.4.1 External components

The use of accessories, transducers, and cables other than those specified may result in degraded ELECTROMATHNETIC COMPATIBILITY of the BrightSpeed System .

4.5 Installation Requirements & Environment Control :

In order to minimize interference risks, the following requirements shall apply.

4.5.1 Cable Shielding & Grounding

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

4.5.2 This product complies the radiated emission as per CISPR11 Group 1 Class A standard limits

The BrightSpeed System is predominantly intended for use, in non-domestic environments, and not directly connected to the Public Mains Network. The BrightSpeed System is predominantly intended for use (e.g. in hospitals) with a dedicated supply system, and with a X-ray shielded room. In case of using in a domestic environment (e.g. doctor's offices), in order to avoid interferences, it is recommended to use a separated AC power distribution panel & line with a X-ray shielded room.

4.5.3 Subsystem & Accessories Power Supply Distribution

All components, accessories subsystems, systems which are electrically connected to the BrightSpeed System, must have all AC power supplied by the same power distribution panel & line.

4.5.4 Stacked Components & Equipment

The BrightSpeed System should not be used adjacent to or stacked with other equipment; if adjacent or stacked use is necessary, the BrightSpeed System should be observed in order to verify normal operation in the configuration in which it will be used.

4.5.5 Low Frequency Magnetic Field

In case of a digital BrightSpeed System, the Gantry (digital detector) shall be apart 1meter from the generator cabinet, and 1meter apart from the analog (CRT) monitors. These distance specifications will minimize the low frequency magnetic field interference risk.

4.5.6 Static Magnetic Field Limits

In order to avoid interference on the BrightSpeed system, static field limits from the surrounding environment are specified.

Static field is specified less than <1 Gauss in Examination room, and in the Control Area.

4.5.7 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 percent.

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

Chapter 2

Pre-Installation Overview

Before a BrightSpeed system can be installed, all pre-installation requirements must be complete.

- Chapter 4, Sections [8.0](#) and [9.0](#)
Structural Requirements
- Chapter 4, Section [10.0](#)
Radiation Protection
- Broadband standard
- Site Ready Visit
- [Chapter 5, Environmental Conditions](#),
Sections [1.0](#) & [2.0](#) Temp, Humidity & Cooling
- [Chapter 8, Power Requirements](#)
(Site Power Audit Required)
- [Chapter 9, Interconnection Data](#)

Site-specific items must be verified before the installation can begin.

Section 1.0

Dust/Dirt Contamination

The BrightSpeed systems (consisting of: Console, PDU, Table and Gantry) are highly susceptible to airborne contaminants, especially concrete and drywall dust. Due to the possibility of contamination, these systems should NEVER be installed in a construction site.



NOTICE

Any site with unfinished floors, walls or ceilings is considered a construction site, and is not suitable for system installation.

Section 2.0

Chemical Contamination

Wet film processors must never be installed in the same room as the scanner, due to the possibility of chemical contamination of BrightSpeed Series components. Such chemicals can contribute to increased equipment failures, increased system downtime, and decreased reliability. Film processor equipment installation must meet the manufacturer's requirements (e.g. ventilation specifications) and all applicable national and local codes. Also, consideration's should be given to the location of this equipment and chemical fumes relative to human contact as it relates to locating this equipment and chemicals in the control room.

Section 3.0

Walls, Ceiling and Floor

All walls, ceiling, and flooring must be completed before installation can begin.
For structural requirement, refer to Chapter 4, [Section 8.0, on page 84](#).

Section 4.0

Broad-band

For information on Broad-band requirements, refer to Chapter 4, [Section 9.0, on page 87](#).

Section 5.0

Phone Line (for optional modem)

Two phone lines must be installed at or near the console and be operational prior to installation.

- 1-Analog line (for modem use)
- 1-Voice line

Section 6.0

Review

The BrightSpeed Series systems use adjustable leveling pads to support the gantry and table. The gantry has four (4) primary leveling pads. The table has five (5) pads used for leveling it.

Using the GE print to establish the room layout, make sure all the operating and service clearances shown on the print are observed. Using the template (P/N 5160024/5341997) shipped with the system, locate the anchor holes. Make sure they clear structural interferences in the floor.

Clean the area. Free the mounting surface of any material that may interfere with the positioning and leveling of the system.

- 1.) Lay out the 2 floor templates.
- 2.) Start with the Gantry template—align per the GE print.
- 3.) Place the table template over the top of the Gantry template. Align the scan and table center-lines and secure the templates to the floor. Make sure there are no potential clearance issues.
- 4.) Check the level of the floor (See [Figure 2-1](#)) across the templates. This should be measured on the template over the table/gantry area, as shown in [Figure 2-1](#) below.
FLOOR LEVELNESS SPECIFICATION: 6 mm (1/4 in.) over 3 m (10 ft.)

Note: Tiles (or other resilient flooring) around all holes will be cut during the installation process.

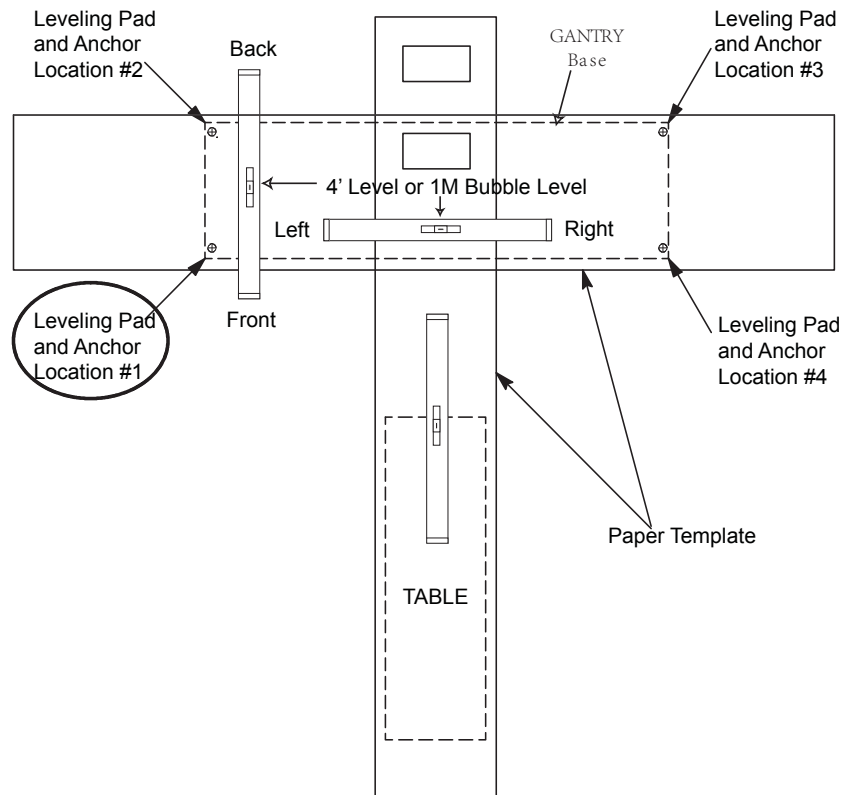


Figure 2-1 Hole Locations

Chapter 3

System Catalog

Section 1.0

Option Catalog Numbers

The following is a list of system options requiring site planning work for the BrightSpeed system. *Contact your local GE Medical Systems Sales representative for a complete list of all system options or visit us at www.gehealthcare.com. Refer to the instruction manuals supplied with specific options for respective details.*

CATALOG NUMBER	OPTION DESCRIPTION
B7850LD/B78502LD	International Dolly Set
B79302CA	Single-piece desktop kit
B79312CA	Side-by-side desktop kit (Freedom WorkSpace)
B78442CA*	Freedom Workspace Standard
B78452CA*	Freedom Workspace kit Wide
B7866AB	SmartScore Option, EKG Monitor and Recording Device
B7900WB*	SmartScore 4.0 Package
B7500PL	ConnectPro Option (SW & Bar Code Reader), provides a direct interface to HIS/RIS
B7500LN*	ConnectPro HIS/RIS SW Key (LINUX) Hospital Info Sys/Radiology Sys Info
B7540RB	Bar Code Reader
B7877BC*	Bar Code Reader (USB)
B7710LN	Boom in a Room monitor
B71182CA	Long Cable Set
B71172CA	Short Cable Set
B7700MG	Global Modem Kit
B77302CA	BSD Global USB Modem
B7850TC	Rear Cable Cover Assembly
B7700SB	Limited Access Option
B75792CA/ B75022BS	Gantry Accessory I/F HW
B75802CA	AC Outlet Box for OC
B75822CA/ B75002BE	Xtream Injector
B75832CA/ B75012BE	Enhanced Xtream Injector
B78462CA*	Recon Enhancement
E6315JE*	DIACOR CARBON OVERLAY VCT
B75812CA	16FPS Upgrade

Table 3-1 BrightSpeed System Options

CATALOG NUMBER	OPTION DESCRIPTION
B75212BS/B78892AC*	ASIR Upgrade

Note: The catalog number with * is only for BrightSpeed Elite System with TIO/NIO16 console.

Table 3-1 BrightSpeed System Options

Section 2.0

Base Scanner System

2.1 Application

The CT scanner system includes hardware and software to support patient data acquisition and image analysis for whole-body computed tomography.

2.2 Configuration

The base scanner system is configured as shown. All scan and analysis functions are controlled from the operator's console (not shown).



Figure 3-1 Base Scanner System with HPower Table



Figure 3-2 BrightSpeed Elite Base Scanner System with GT1700 Table

Chapter 4

Room Planning

Section 1.0 Required Systems Clearances

Consult your local GE Sales and Service Representative about your specific needs.

Some possible room size dimensions are shown in the tables below.

Recommended Scan Room Size	Typical Scan Room Size	Clearance Requirements
3962 x 6299 mm (13ft. x 20ft. 8in.)	3912 x 5868 mm (12ft. 10in. x 19ft. 3in.)	see Figure 4-1

Table 4-1 List of Scan Room Layouts

Limited Access Rooms (width only):

Recommended Ctrl Room Size (Standard Console Table)	Recommended Ctrl Room Size (Freedom Workspace Console Table)
3962 x 2743 mm (13ft. x 9ft.)	3861 x 2500 mm (12ft. 8in. x 8ft. 2in.)

Table 4-2 List of Control Room Layouts

Minimum Width: 3353 mm (11ft.); 356 mm (14in.) cover to wall

Average Width: 3708 mm (12ft. 2in.); 711 mm (28in.) cover to wall

Short Footprint (length only):

Minimum length: 5480 mm (18ft.)

Additional component dimensions are available in [Figure 4-7](#) through [Figure 4-16](#) of this document. Consult your local General Electric Project Manager of Installation for your appropriate room specifications.

For equipment clearance requirements, refer to [Section 2.0](#). Remember, sufficient Regulatory and Service clearances must be maintained around equipment for full operation, service and safety.

Cable length is an important consideration in room layout. A set of short cables (B71172CA) and a set of long cables (B71182CA) are optional for BrightSpeed system.

Note, also, that where possible, the cables should enter the gantry from the rear, utilizing the rear cable cover assembly. Alternate cable entry is possible at the center of the gantry (refer to the Installation template).

- Excess cable length cannot be stored behind the console or PDU.
- Long cable must not be cut or shortened.
- Excess cable may be stored in conduits, a cable storage box if present, or the floor duct, provided sufficient space is available. Observe the fill rate for each option. If there are questions regarding local electrical or building codes, consult the project electrical contractor or electrician.
- All NEC 70-E Electrical Regulations regarding conduit or duct fill must be observed.

Section 2.0 Regulatory Clearances

2.1 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 4-1 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.

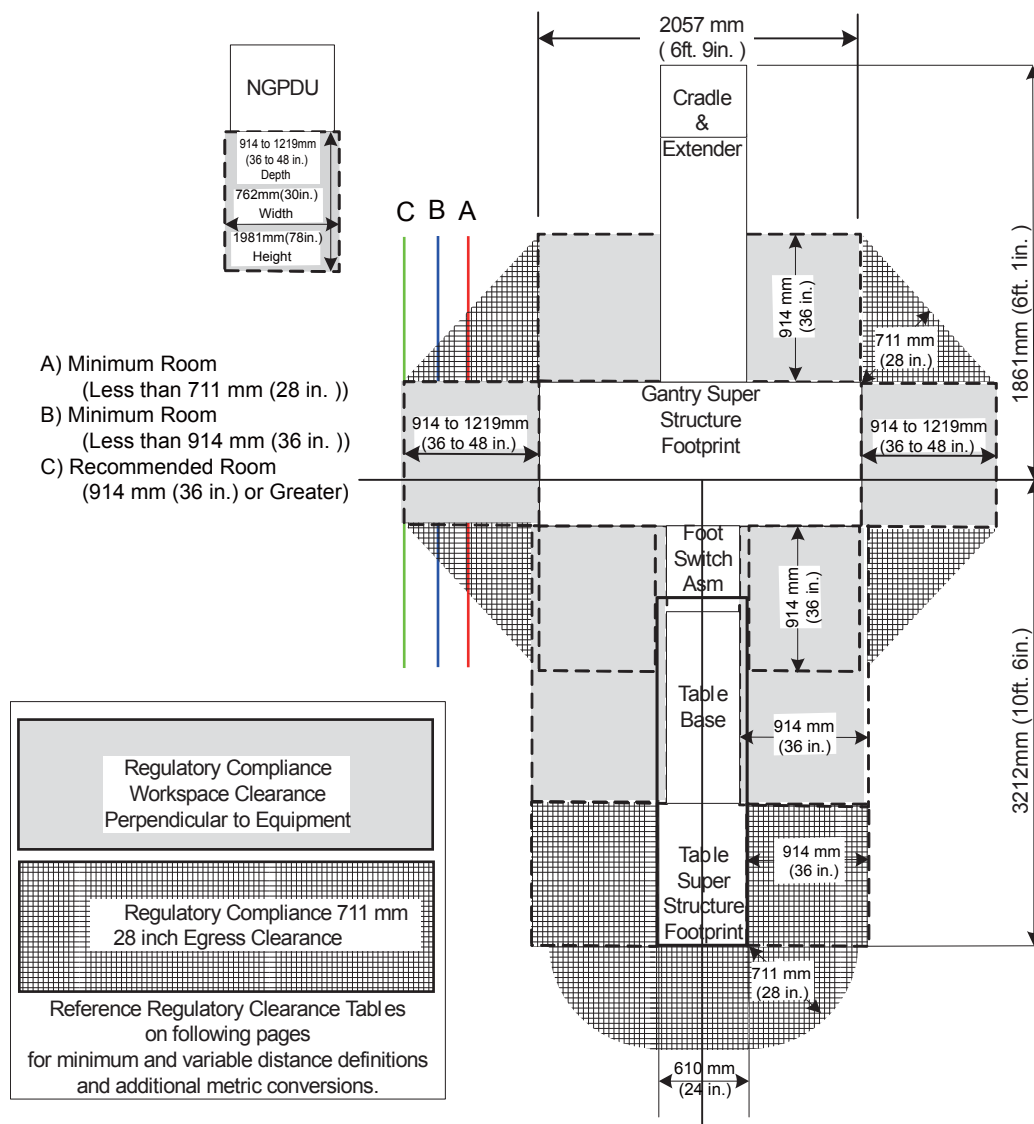


Figure 4-1 Regulatory Clearance Requirements for BrightSpeed System Configurations

Note: See [Section 3.0](#) for Service Clearances

2.1.1 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 in. 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 in. However, NFPA allows this to be reduced to 28 in. around furniture or equipment, provided that a 36 in. 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 in. depth (with minimum 30 in. width and 78 in. 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 in. 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 in. 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 in. clearance depth is required.

2.1.2 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..

Work Space Requirement	Minimum Clear Space	Additional Conditions
Direction of Service Access: front of console	914 mm (36 in.)	There are no exposed live part hazards with the cover in place. If the console is placed under a counter, the front edge of the console must be even with the vertical edge of the console workspace. Note: This component is typically serviced from the front with access to the rear.
Service access width: Front of console	762 mm (30 in.)	This is the width of the workspace in front of the equipment. A minimum of 762 mm (30 in.) or the width of the equipment, whichever is greater, is required.

Table 4-3 Console Subsystem

Work Space Requirement	Minimum Clear Space	Additional Conditions
Head clearance	1981.2 mm (78 in.)	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 1981.2 mm (78 in.) or the height of the equipment, whichever is greater, is required.

Table 4-3 Console Subsystem

Work Space Requirement	Minimum Clear Space	Additional Conditions
Direction of Service Access (Front of NGPDU)	914.4 mm (36 in.)*	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 in.) 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 in.) is required.
Service Access Width (Left-Right of workspace)	762 mm (30 in.)	This is the width of the working space in front of the equipment. A minimum of 762 mm (30 in.) or the width of the equipment, whichever is greater, is required.
Head Clearance	1981 mm (78 in.)	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 in.) or the height of the equipment, whichever is greater, is required.

Table 4-4 NGPDU Subsystem

- For the gantry and table, distances are measured from the enclosure, not the finish covers.

Work Space Requirement	Minimum Clear Space	Additional Conditions
Direction of Service Access (All Sides)	914 mm (36 in.)	If exposed live parts of 151 - 600 volts are present, 1219 mm (48 in.) 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 in.) is required.

Table 4-5 Gantry Subsystem

Work Space Requirement	Minimum Clear Space	Additional Conditions
Service Access Width (Left-Right of workspace)	762 mm (30 in.)	This is the width of the working space in front of the equipment. A minimum of 762 mm (30 in.) or the width of the equipment, whichever is greater, is required.

Table 4-5 Gantry Subsystem

Work Space Requirement	Minimum Clear Space	Additional Conditions
Direction of Service Access (Table Head or Foot)	914 mm (36 in.)	There are no exposed live parts hazards with the cover in place. This component is typically serviced from all four sides. this is the width of the workspace on each side of the equipment. A minimum of 914.4 mm (36 in.), or the width of the equipment, whichever is greater, is required.
Direction of Service Access (Table Sides)	914 mm (36 in.)*	*This distance can be reduced to 711 mm (28 in.) provided a written and signed approval is obtained by the local team from the local AHJ (Authority Having Jurisdiction). The signed document must be on file with GE.
Direction of Service Access (Table Foot)	711 mm (28 in.)	For the front gantry cover removal, a minimum of 457 mm (18 in.) is allowed only if an unobstructed egress space of 711 mm (28 in.) is maintained around the equipment for room exit. This also means no trip hazards exist along the path of egress.
Service Access Width (Left-Right of workspace)	762 mm (30 in.)	This is the width of the working space in front of the equipment. A minimum of 762 mm (30 in.) or the width of the equipment, whichever is greater, is required.

Table 4-6 Table Subsystem

Work Space Requirement	Minimum Clear Space	Additional Conditions
Direction of Service Access (Front of UPS)	914.4 mm (36 in.)*	<p>There are no exposed live part hazards with the cover in place.</p> <p>This component is typically serviced from the front with access to the rear.</p> <p>*If exposed live parts of 151 - 600 volts are present, 1219 mm (48 in.) is required on both sides of the workspace with the operator between.</p> <p>*If the opposite wall is grounded and exposed live parts of 151 - 600 volts are present, 1067 mm (42 in.) is required.</p>
Service Access Width (Right side and length of UPS)	762 mm (30 in.)	This is the width of the working space in front of the equipment. A minimum of 762 mm (30 in.) or the width of the equipment, whichever is greater, is required.
Head Clearance	1981 mm (78 in.)	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 in.) or the height of the equipment, whichever is greater, is required.

Table 4-7 UPS Subsystem

Work Space Requirement	Minimum Clear Space	Additional Conditions
Direction of Service Access (Front of A1 Disconnect)	914.4 mm (36 in.)*	<p>There are no exposed live part hazards with the cover in place.</p> <p>This component is typically serviced from the front with access to the rear.</p> <p>*If exposed live parts of 151 - 600 volts are present, 1219 mm (48 in.) is required on both sides of the workspace with the operator between.</p> <p>*If the opposite wall is grounded and exposed live parts of 151 - 600 volts are present, 1067 mm (42 in.) is required.</p>
Service Access Width (Right side and length of A1 Disconnect)	762 mm (30 in.)	This is the width of the working space in front of the equipment. A minimum of 762 mm (30 in.) or the width of the equipment, whichever is greater, is required.
Head Clearance	1981 mm (78 in.)	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 in.) or the height of the equipment, whichever is greater, is required.

Table 4-8 A1 Disconnect Subsystem

2.1.3 Terms and Definitions

Egress: The path of exit from within any room. U.S. regulations require a minimum of 711.2 mm (28 in.) 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 in.), 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 in.), 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 in.), 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. This 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
- A1 main disconnect panel
- 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

2.2 Additional Regulatory Clearance Information

2.2.1 Minimum Room Size (Limited Access)

The CT Gantry Left Side Limited Access Initiative provides the capability to reduce the minimum room size for CT Systems while still meeting all installation requirements and specifications. This adds left side flexibility, allowing the CT system to be sited in rooms with widths 559 mm (22 in.) smaller than the current minimum room width. Left-side access and egress may be restricted. Refer to your site's installation print for your room's detail.

If you are using the square meters (square feet) to determine compliance, remember that the front cover clearance is wider than the regulatory clearance along the table length, and that the cover park position is behind the table in the home position. The cover is removed on tilting dollies and can be moved side-to-side to reach the park position of 457 mm (18 in.), if this is not an egress route.

Wall duct and conduit on walls within the regulatory clearance areas shall be 1067mm (42 in.), measured from the covers to the obstruction. Servicing of the CT System can be safely performed within the regulatory envelopes, however sufficient space must be maintained to remove system covers, and replace large system components. To achieve this clearance for the gantry, clear space must be available to maneuver the gantry covers mounted on the service dollies. Surface floor raceway cannot be used in the egress route areas. OSHA ramps are available. The FE lifting the rear or front cover to avoid floor obstructions is not an EHS-approved service procedure. One Service Engineer shall be able to accomplish all service component replace tasks listed without the need for special tools or equipment, such as a tube change, detector change, and HV tank.

2.2.1.1 Regulatory Caution

Site prints are required for all system installations including relocation and moves. CT 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.

2.2.1.2 Egress Clearance

Egress requires a clear, unobstructed route out of the room, either around the back of the gantry or around the back of the table. If your egress route is not around the back of the table, maintain 457 mm (18 in.) of clearance between the back of the table, with a continuous width of 3200 mm (126 in.), 1600 mm (63 in.) on each side of the table center line, on each side to any obstruction so that the front cover can be removed. Refer to the Pre-Installation manual for more details on service clearances.

Exceptions

Rooms smaller than 3353 mm x 6096 mm (11 ft. x 20 ft.), require construction to meet the minimum requirements. The design center or your GE PMI may have additional recommendations for your room size.

2.2.1.3 Operational Caution

In a minimum room layout 356 mm - 686 mm (14 in. - 27 in.), the customer should consider workflow, customer access for patient care, and critical-care operations space requirements. Additionally, there may be limited equipment access on the gantry left side when loading patients or when positioning patient equipment in the room between the gantry and the wall. Detailed customer installation tasks are detailed in the product Pre-Installation manual, Chapters 1-4.

2.2.2 System Specifications (BrightSpeed)

2.2.2.1 Recommended Room Size

This room configuration offers the most flexibility for future upgrades. It has sufficient workspace and space to add millwork, while meeting all regulatory requirements. This room would be compatible with most two-step future installations.

Recommended Room Size

3962 x 6299 mm (13ft. x 20ft. 8in.)

Same Regulatory requirements apply

2.2.2.2 Typical Room Size

This room size and configuration is commonly found on most sites and allows for some future upgrades. It has sufficient workspace but limited space to add millwork and meet all regulatory requirements. This room may be compatible with some two-step future installations.

Typical Room Size

3912 x 5868 mm (12ft. 10in. x 19ft. 3in.)

Same Regulatory requirements apply

2.2.2.3 Minimum Room Size

This room size and configuration is the smallest functionally acceptable space for this product. Size and layout often eliminate these rooms for future upgrade considerations. Due to limited size, equipment and regulatory requirements, this room often has limited workspace, and very limited or no in-room millwork, but still meets all regulatory requirements. This room is not compatible with two-step future installations

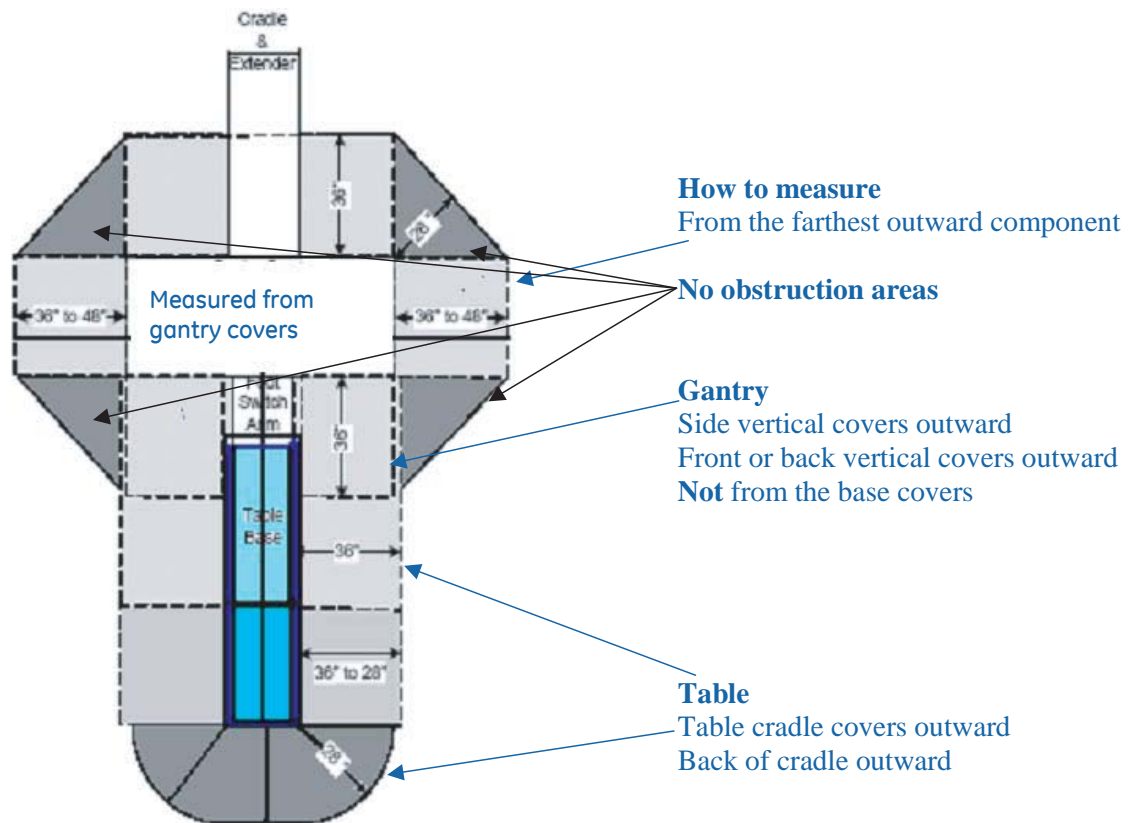
If you are using the square footage (Sq M) to determine compliance, remember that the front and rear cover clearances are wider than the regulatory clearance along the table length, and that the cover park position is behind the table in the home position. The rear cover is also on wheels and must be able to be removed from behind the gantry for service.

Minimum Room Size

3353 x 6096 mm (11ft. x 20ft.)

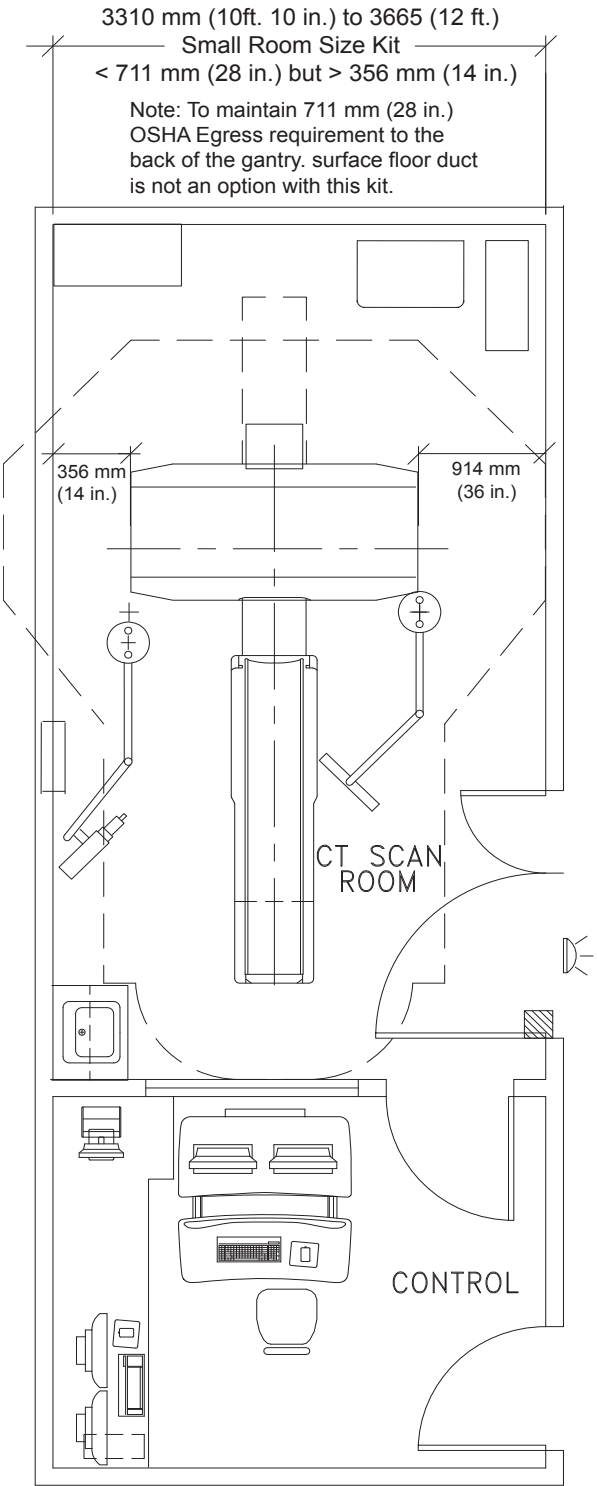
Same Regulatory requirements apply, with the addition of no energized left side service.

2.2.3 How to Measure

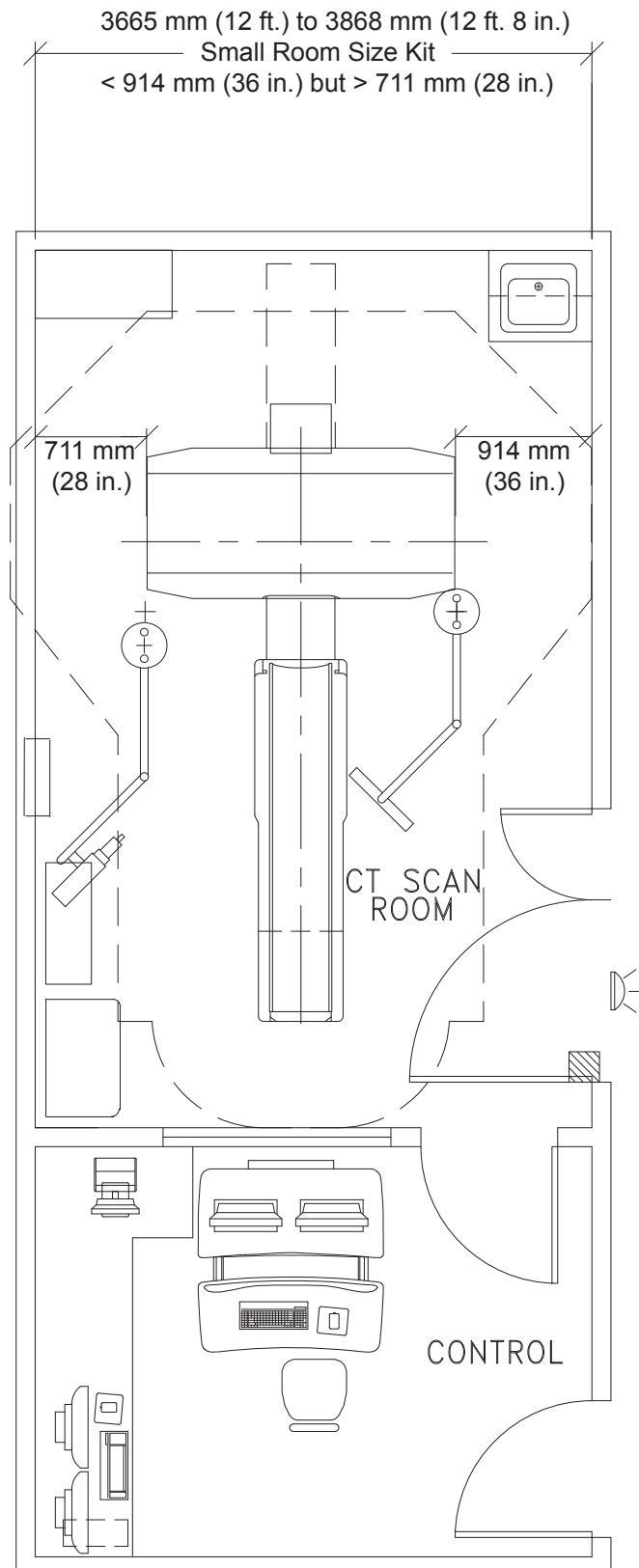


2.2.4 Minimum Room Size & Requirement Layouts

Room A - Less than 711 mm (28 in.) but greater than 256 mm (14 in.) measured from the covers to the left sidewall. In this configuration service, egress and workspace are compromised around the gantry.

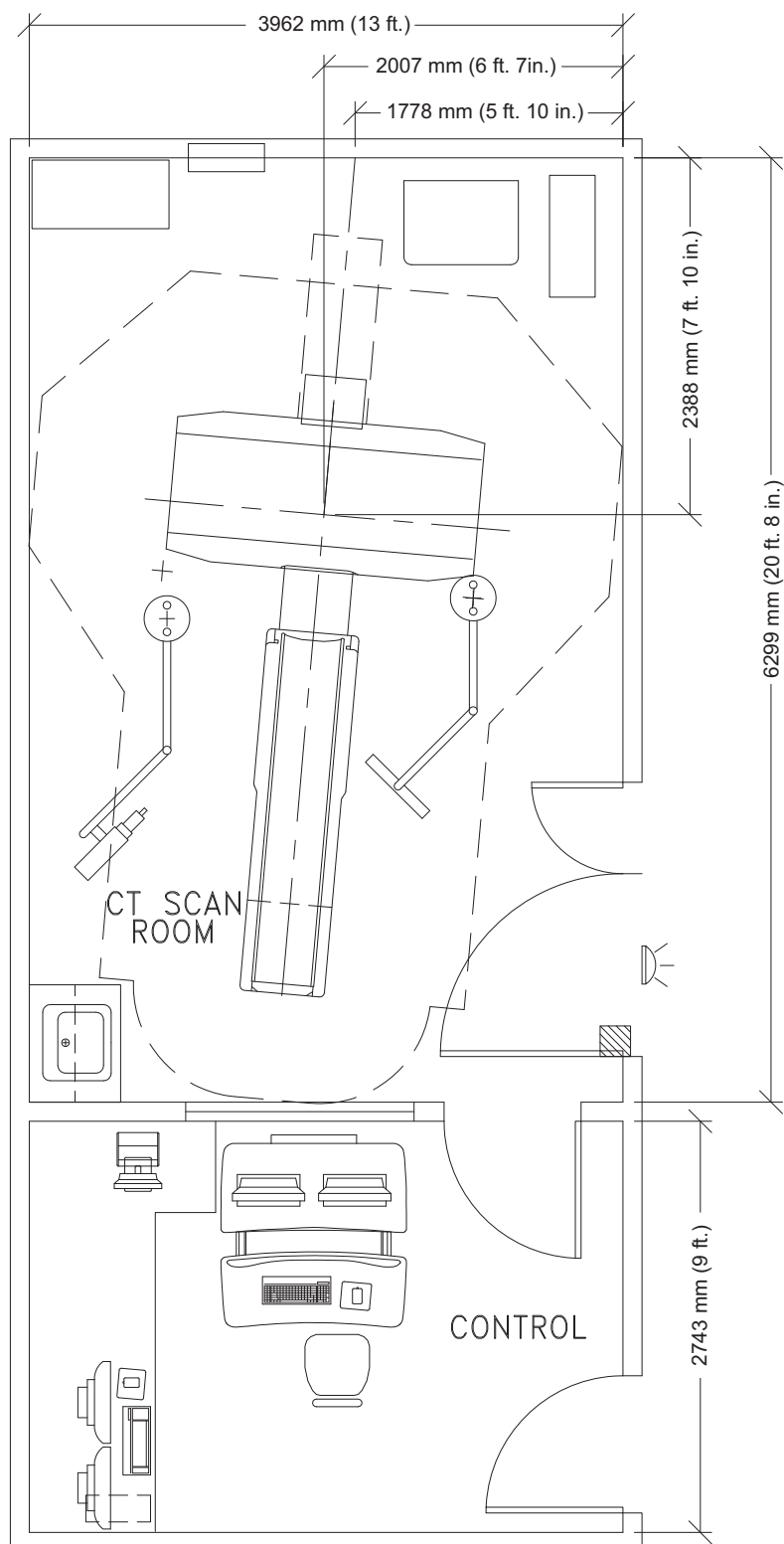


Room B - Less than 36 in. but greater than 28 in. measured from the covers to the left sidewall. In this configuration service, egress and workspace are acceptable around the gantry.



2.2.5 Recommended Room Size & Requirement Layouts

Note: Your room layout may meet the Recommended or Typical room requirements but look different than the room shown below. Contact your sales person to have a detail room layout completed for your site.



Section 3.0 Service Clearances

Servicing of the CT System can be safely performed within the regulatory envelopes defined in [Section 2.1](#), 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 mounted on the service dollies. One Service Engineer can accomplish this.

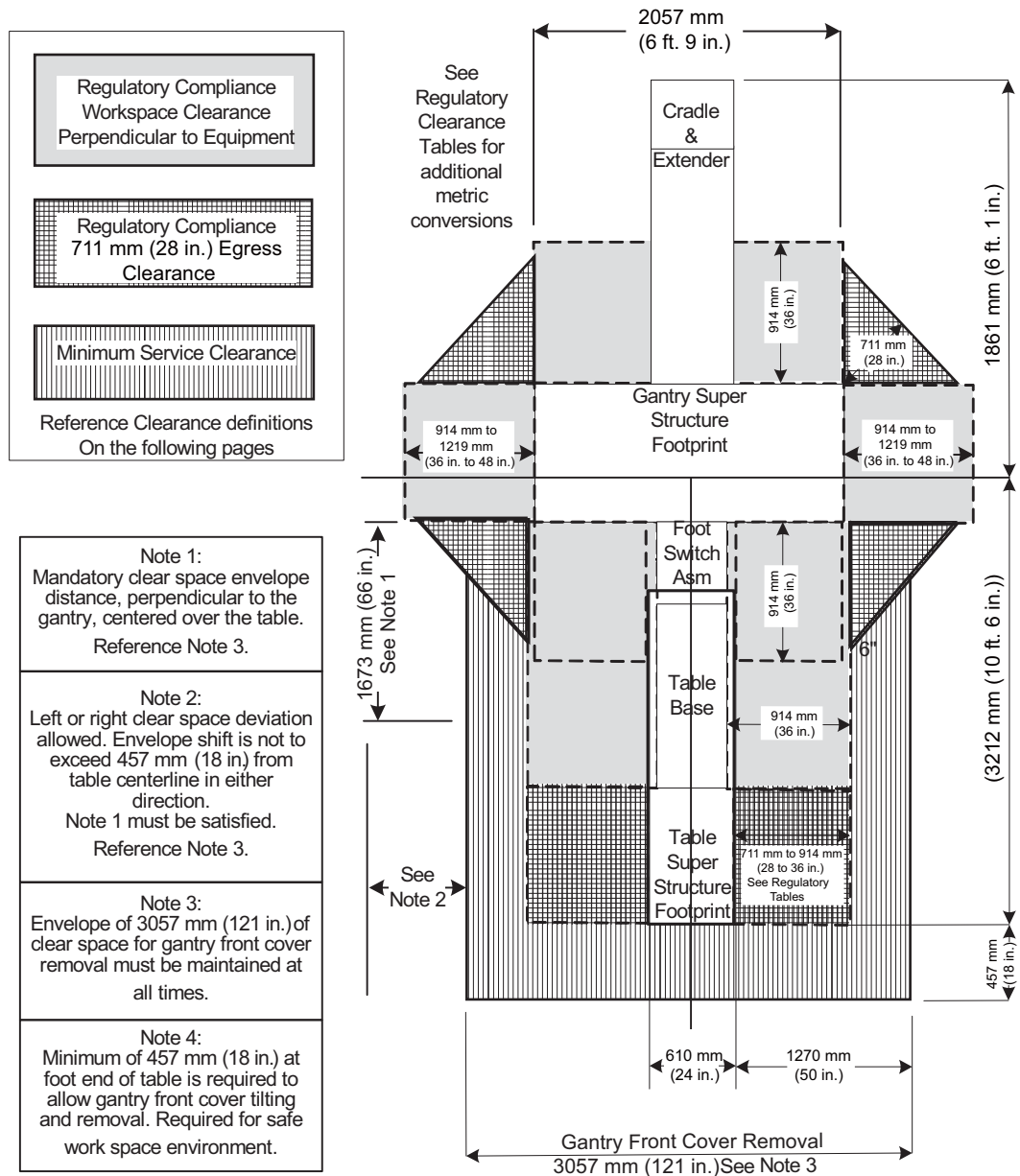


Figure 4-2 Minimum Service Clearance

3.1 Service Clearances for Single Service Engineer

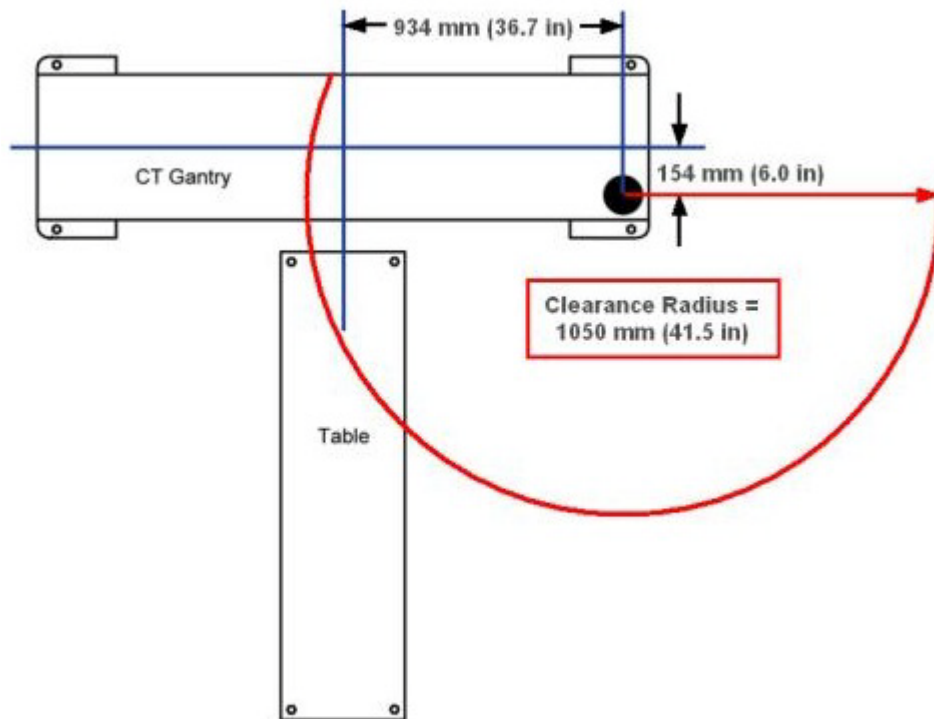
- Gantry front cover removal requires the use of the “Tilting Cover Dollies”. These dollies allow the Service Engineer to separate the cover from the gantry, tilt the cover 90 degrees, roll the cover to the foot end of the table, and then tilt the cover an additional 90 degrees such that the front cover is now upside down relative to the normal system mounted condition. [Figure 4-2](#) illustrates the minimum clear space required to achieve this operation. The gantry front cover must be removed to a position that satisfies the minimum regulatory clearances.
- The gantry rear cover, with service dollies installed, requires a width 2244 mm (88 in.) and a depth of 610 mm (24 in.) of clearance for removal. Sufficient space must be calculated to move the cover either straight back or to a side of the table to satisfy the minimum regulatory clearance shown in [Figure 4-2](#). This means the rear cover cannot violate the workspace on the rear or either side of the gantry.
- If gantry service requires both the front and rear covers be removed, then these covers must be positioned within the room in such a manner as to not violate the regulatory clearances on any side of the gantry. This may necessitate removing the covers from within the suite. This should be discussed with the customer and provisions made to accommodate this potential event.
- A single Service Engineer can safely perform servicing of the table. Sufficient clear space must be available to maintain regulatory clearances when the table covers or cradle are removed.
- In your room layout design, service shall have clear and unobstructed access to the gantry tube change area for all major component replacements. These components must be able to reach the service area without lifting or rigging by one service engineer. Major components include:
 - CT X-ray tube in crate
 - High voltage tank(s) in crate
 - Slipping in crate
 - Detector assembly

Be aware of cabinet placement, and how surface floor ducts are used in room configurations.

3.2 Gantry Service Clearance

Specifications for Boom Assembly clearance arc are defined in . The boom assembly is used during tube and detector replacement. The minimum ceiling height within the clearance radius is 2286 mm (90 in.).

Figure 4-3 Boom Assembly Clearance



3.3 Power Distribution Unit (NGPDU) Service Clearance

Positioning of this component must be considered for regulatory compliance as defined in [Section 2.1](#), Regulated Minimum Working Clearance by Major Subsystem. See Regulatory Tables.

3.4 Console Service Clearance

The console does not present an exposed live parts hazard. However, a minimum working space depth of 1219.2 mm (48 in.) and full width of the console be maintained at all times for service activity. Additionally sufficient space needs to be provided for repositioning of the console and side clearance for rear service access. Egress as well as other service requirement shall be considered when siting the console. See [Figure 4-6](#) for a Recommended control room layout.

Section 4.0

Short Footprint Consideration

4.1 Introduction of Short Footprint function

If the site room length cannot satisfy the requirements for standard mode. Short Footprint mode can be considered.

Short Footprint mode is to set limitation to table cradle scannable limitation(A) so that cradle cannot move in out of the limitation. The scannable range is limited accordingly.

Short Footprint features are as follows:

- Cradle Movement limitation can be set at any position.
- Table Height Limitation can not be set (no change for footprint at Gantry Front side).
- Scannable range is depends on the Gantry Rear space (distance to the wall), but need to consider the Service Clearance and country's local regulation for Gantry Rear space.

4.2 Instruction of using Short Footprint function



NOTICE

Cradle limitation must comply with country or local regulatory clearance requirements.

Cradle movement limitation set for short footprint must be approved by customer during pre-installation.

- 1.) Refer to [Figure 4-4](#) , use floor template with ruler to prearrange the layout and calculate the cradle scannable limitation (A).
- 2.) Make GE siting print to meet regulatory and service clearance requirements.
- 3.) Record the distance from cradle limitation to wall (X) and cradle scannable limitation (A) for installation.

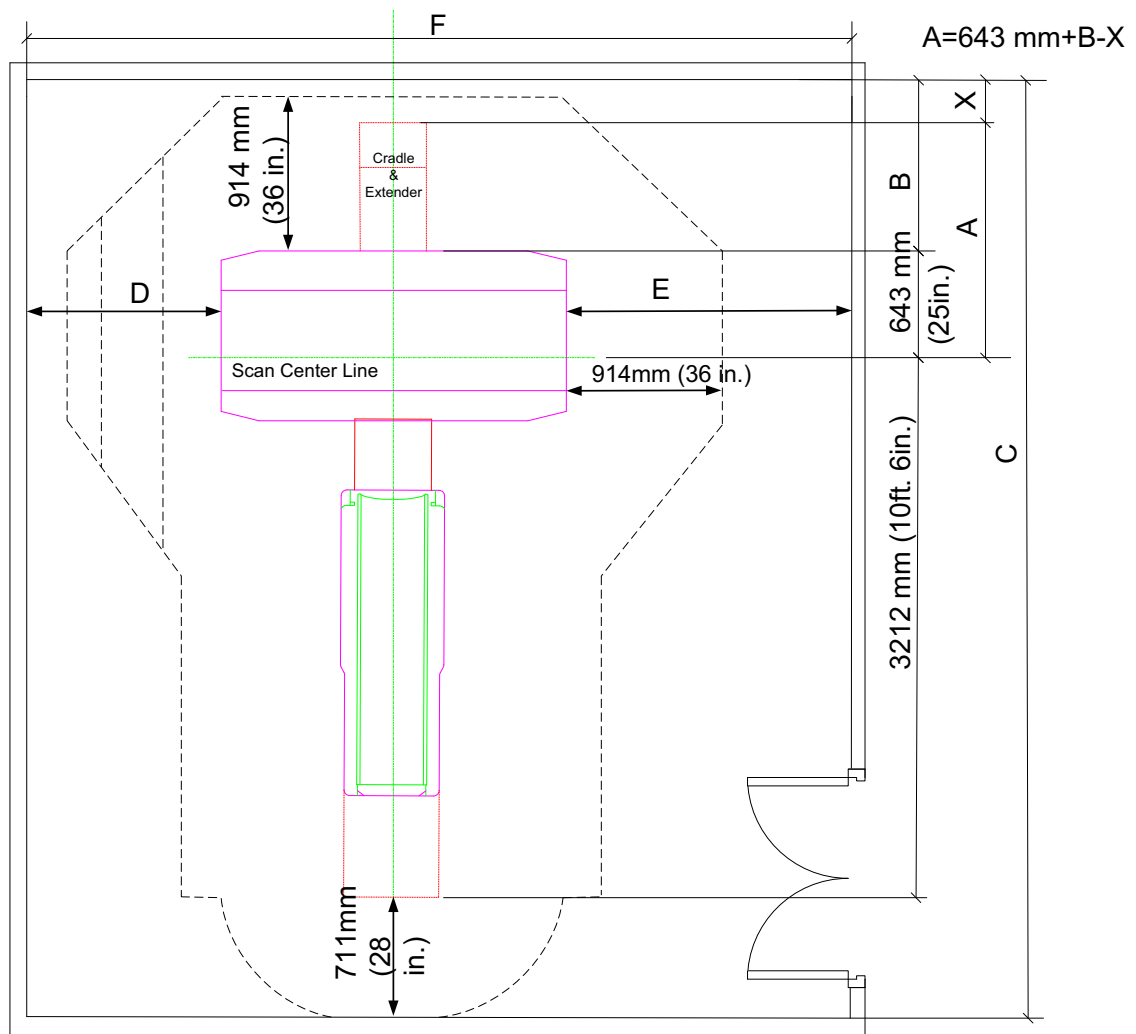


Figure 4-4 Short Footprint Calculation diagram

A: Cradle Scannable Limitation, the value to be set using Short Footprint function

A(Scannable Range(approx.)) = 643mm(Scan Center Line to Gantry Rear Cover)
+ B(Gantry Rear Cover to Wall) - X(Safety Clearance to prevent hitting cradle to wall).

B: Gantry rear cover to wall, no less than 914 mm (36 in.)

Note: When the length from Gantry rear cover to wall is 914mm, cradle scannable limitation would be 1457mm (Shown in [Figure 4-5](#)).

D: Gantry left side to wall, no less than 356mm (14 in.). Refer to Section 3.0 for details about Limited Access.

E: Gantry right side to wall, no less than 914 mm (36 in.). If Short Footprint is set for a short room length, bigger gantry side clearance is required to remove Gantry rear cover, or no removal of rear cover is accepted.

X: Distance from cradle limitation to wall.



NOTICE

It is Suggested that safety clearance from cradle IN-limit to wall should be no less than 100 mm.

Figure 4-5 shows minimum room layout with Short Footprint function (Gantry rear cover can be removed).

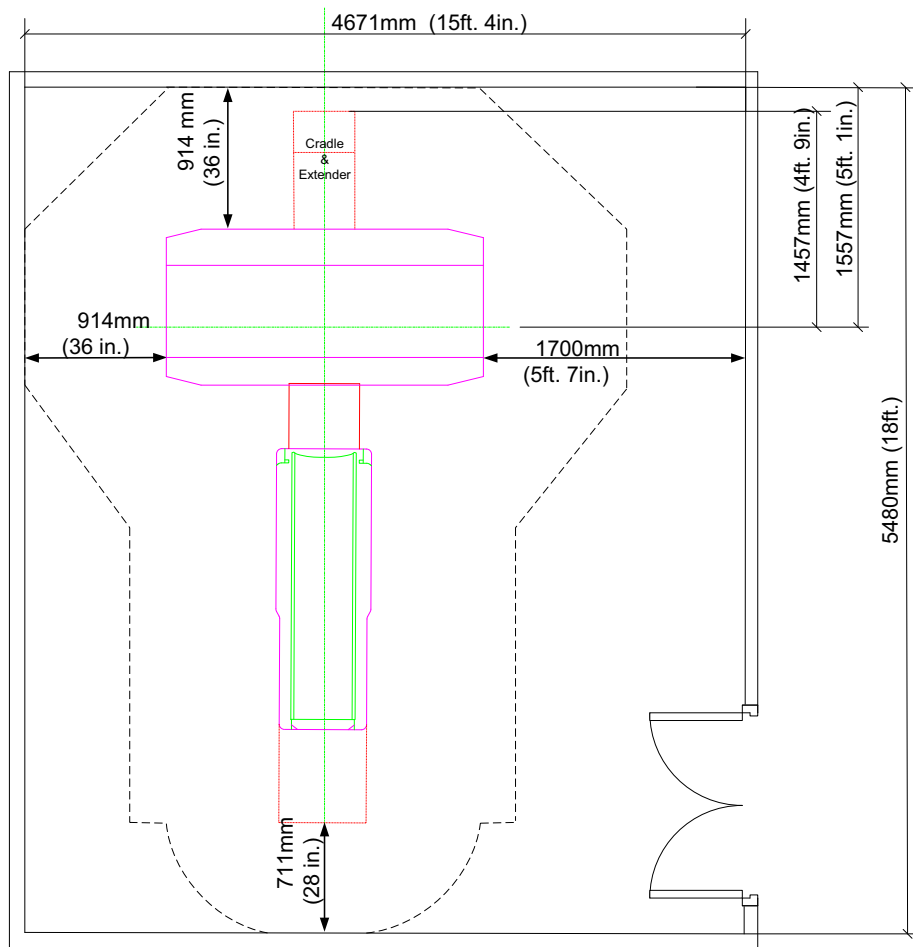


Figure 4-5 Minimum Room layout for Short Footprint function

Section 5.0

Recommended Layouts

5.1 Control Room Considerations

Two kinds of Console configurations are available:

- Standard Console: Console + Single Piece Desktop;
- Console with FWS: Console + Freedom Workspace Table (See [Figure 4-6](#)).

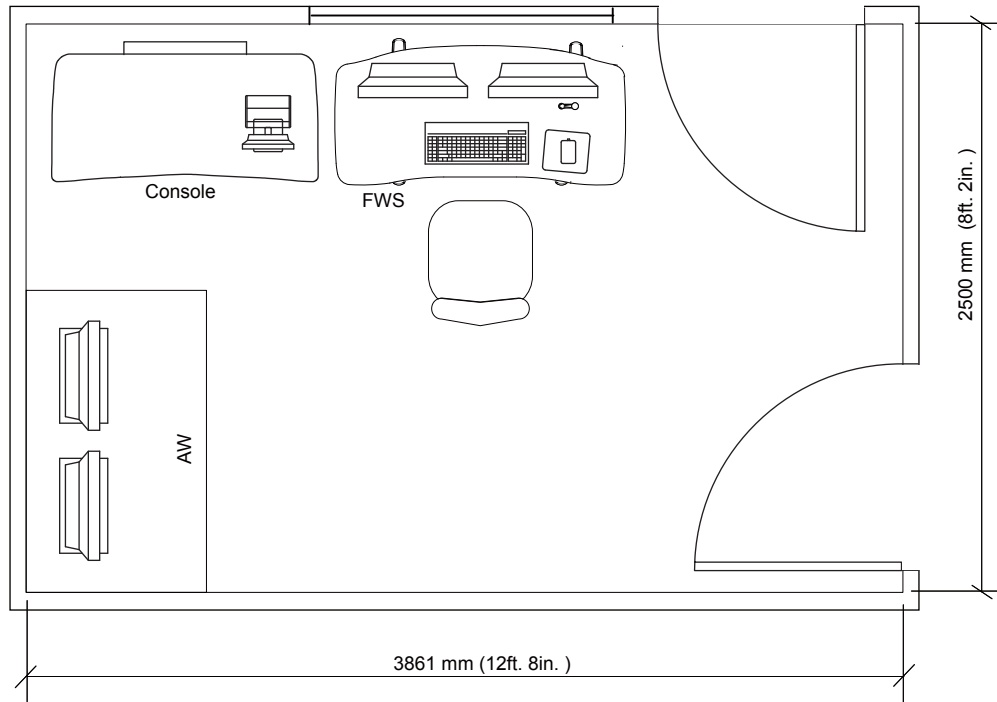


Figure 4-6 Recommended Control Room Layout with Freedom Workspace (FWS)



NOTICE

If a Freedom Workspace (FWS) console table is ordered, it **MUST** be placed **side by side** with the console. It can be placed on either side of the console. The Extended Cables Kit is shipped in FWS Console Table Assembly. The extended cable length is **3 m** (see Chapter 9 [Section 3.2](#) for details).

- The control room must provide a suitable operating environment for the console electronic, and operator working comfort.
- The console cannot be dismantled of, have components removed or rearranged in configurations other than as shipped.
- If operationally possible, the monitor desktop and user desktop components may be removed and placed on a counter-top, providing the cable lengths shipped are not altered or changed. The operator console cabinet then can be remote mounted, provided the cooling requirements are met. Maintain 152mm (6 in.) on all sides; and venting is required.
- A suitable work area, which is within reach of the operator's console, should be provided for placement of the injector control. Injector controls differ in dimensions depending on the brand selected.
- A PACS, workstation, image printer, or filming device are often placed in the operator console

control room area, and sometimes may be directly linked to the operator console.

- Additional components although linked via network or ethernet cable, are not powered from the CT operator console.
- Additional room power and network connection should be considered when reviewing the console work space.

5.2 Storage Cabinet

A storage cabinet is provided by GE Healthcare to store all supplied service equipment (see [Table 4-9](#) for equipment list). This storage cabinet (457 mm D x 914 mm W x 1067 mm H) (18 in. D x 36in. W x 42in. H; ~90 lbs) should be located in the scan room suite area, for easy service access.

ITEM	SIZE	WEIGHT (TOTAL)	
QA Phantom (water filled)	20 x 15 cm (7.9 in. x 5.9 in.)	5.5 kg	12 lb
35CM Phantom	35 x 7 cm (13.8 in. x 2.8 in.)	8.2 kg	18 lb
48CM Phantom	48 x 7 cm (18.9 in. x 2.8 in.)	11.4 kg	25 lb
Phantom Holder	25 x 25 cm (9.8 in. x 9.8 in.)	3.6 kg	8 lb
FE Box	30 x 38 x 30 cm (11.8 in. x 15 in. x 11.8 in.)	6.8 kg	15 lb
Rear Cover Dollies	158 x 82 cm (62.2 in. x 32.3 in.)	11.4 kg	25 lb
Front Cover Dollies	85 x 20 cm and 85 x 15 cm (33.5 in. x 7.9 in. and 33.5 in. x 5.9 in.)	15.9 kg	35 lb
Install Support Kit (box)	30 x 30 x 38 cm (11.8 in. x 11.8 in. x 15 in.)	9.1 kg	20 lb
Tube Hoist Kit	77 x 8 cm and 38 x 15 cm (30.3 in. x 3.1 in. and 15 in. x 5.9 in.)	9.1 kg	20 lb
Balance Weight Kit		33 kg	73 lb

Table 4-9 Equipment to be stored in storage cabinet

A storage Cabinet is provided as option (B77292CA)

5.3 Advantage Workstation (AW)

Refer to Advantage Workstation Pre-Installation Manual and Installation/Service Manual.

Section 6.0

Component Dimensions

DESCRIPTION	WIDTH		DEPTH		HEIGHT	
	INCH	MM	INCH	MM	INCH	MM
Color printer	23	584	18	457	7	178
Remote Color Monitor (LCD)	16.25	413	8	203	16	406

Table 4-10 Dimensions of Accessories

6.1

Table and Gantry

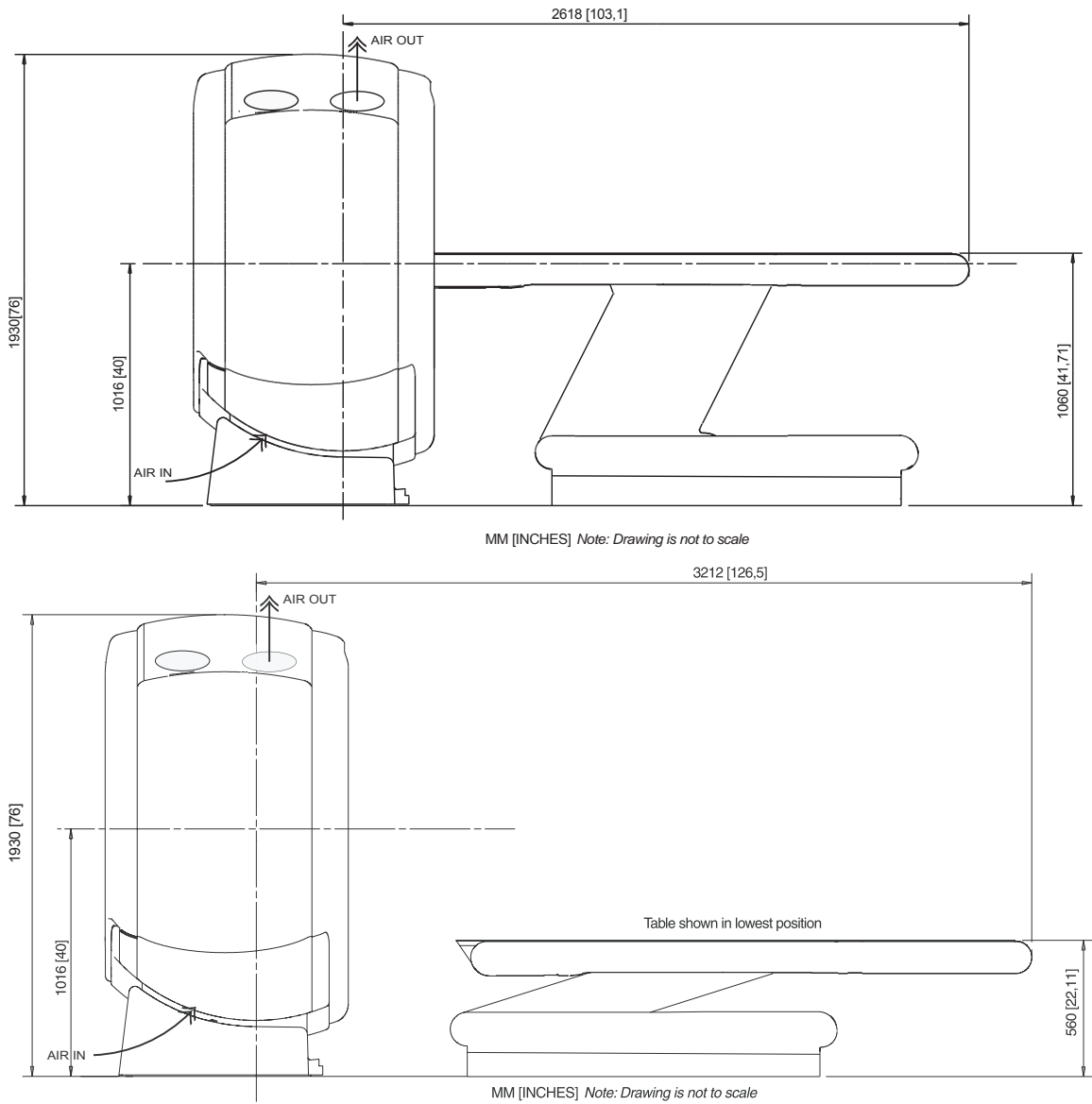


Figure 4-7 Table and Gantry (Side View) for BSD Elite/Edge/Excel with HPower Table

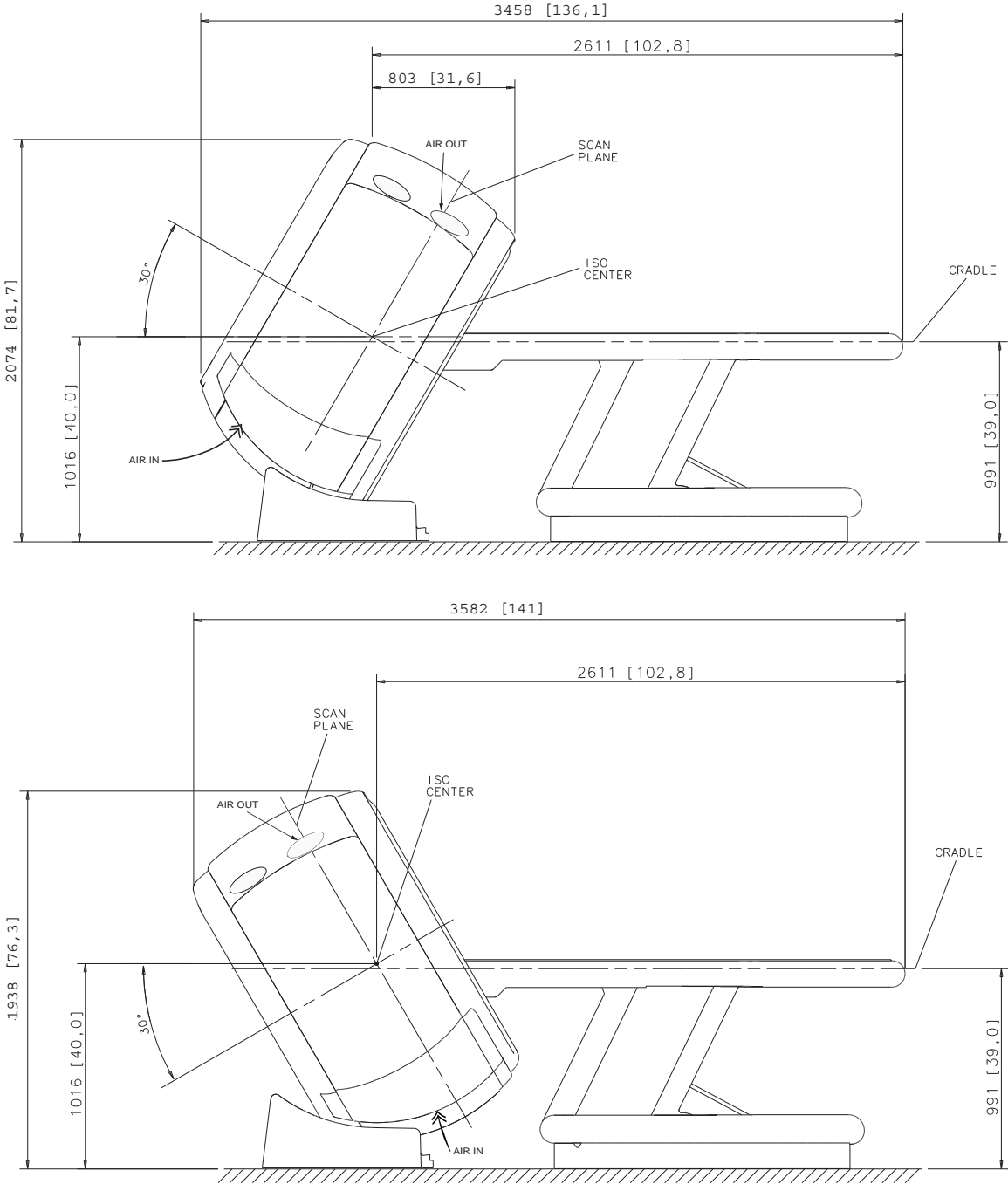


Figure 4-8 Gantry shown tilted +30° (top) and -30° (bottom) for BSD Elite/Edge/Excel with HPower Table

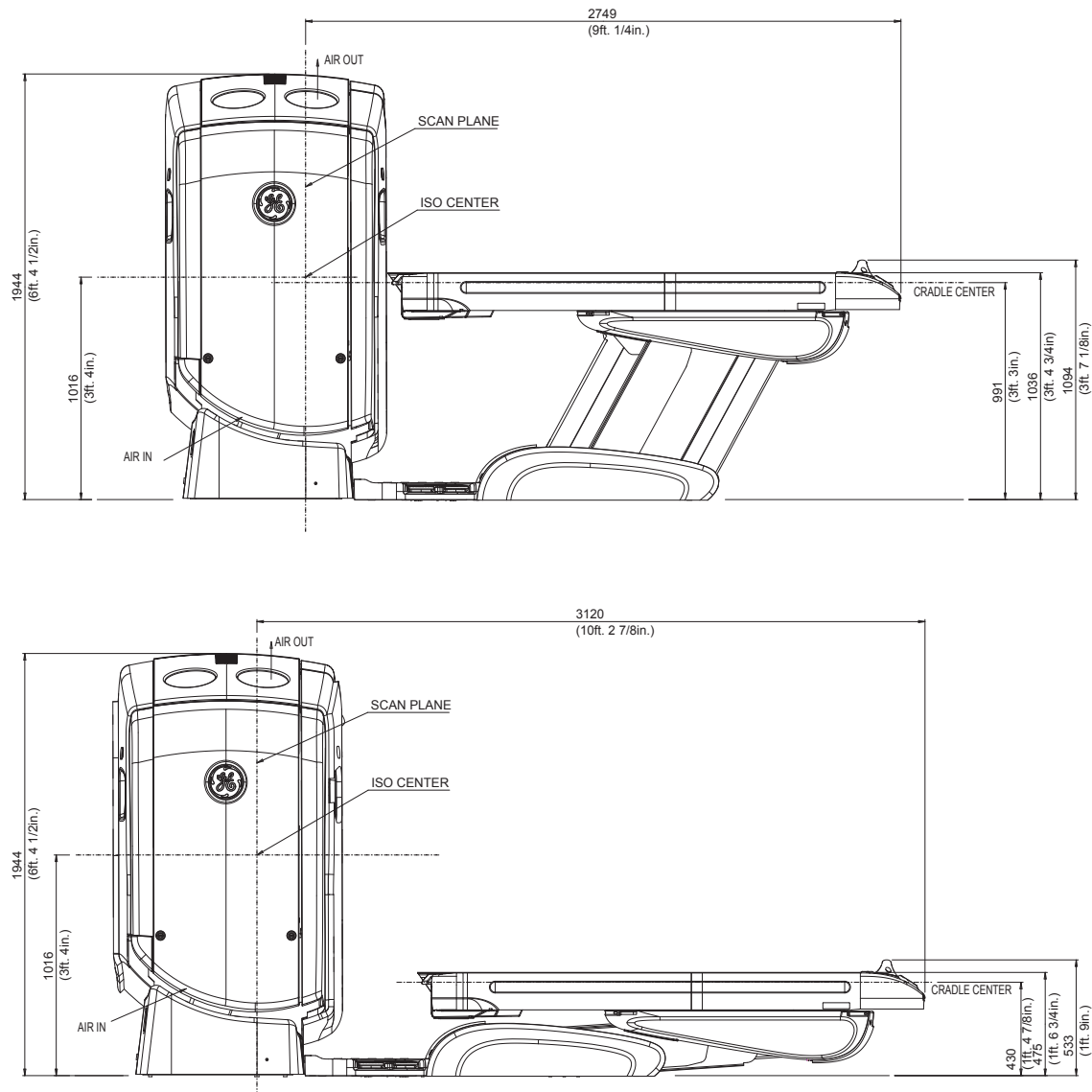


Figure 4-9 Table and Gantry (Side View) for BSD Elite (with GT1700 Table)

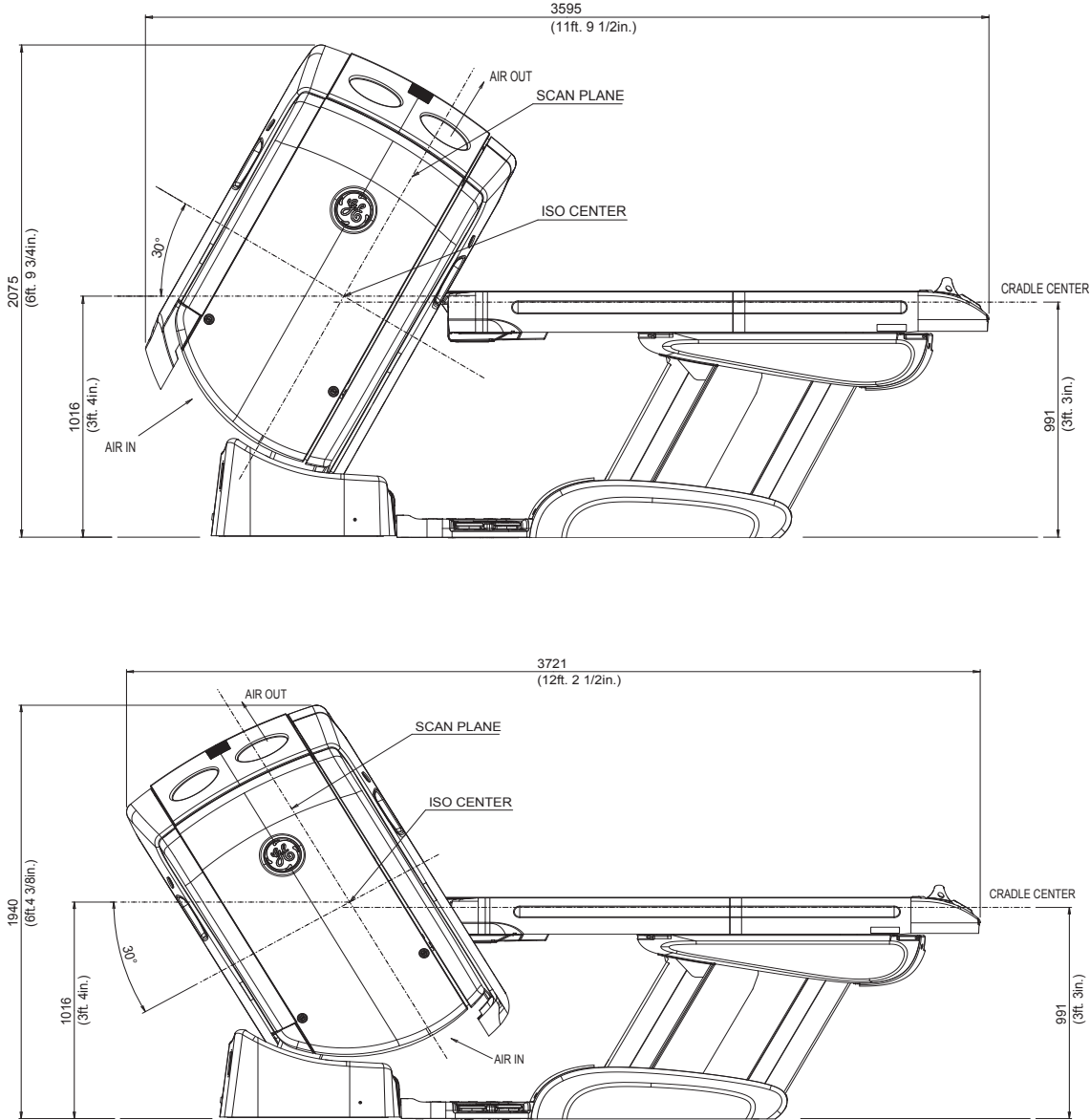


Figure 4-10 Gantry shown tilted +30° (top) and -30° (bottom) for BSD Elite (with GT1700 Table)

6.2 Power Distribution Unit

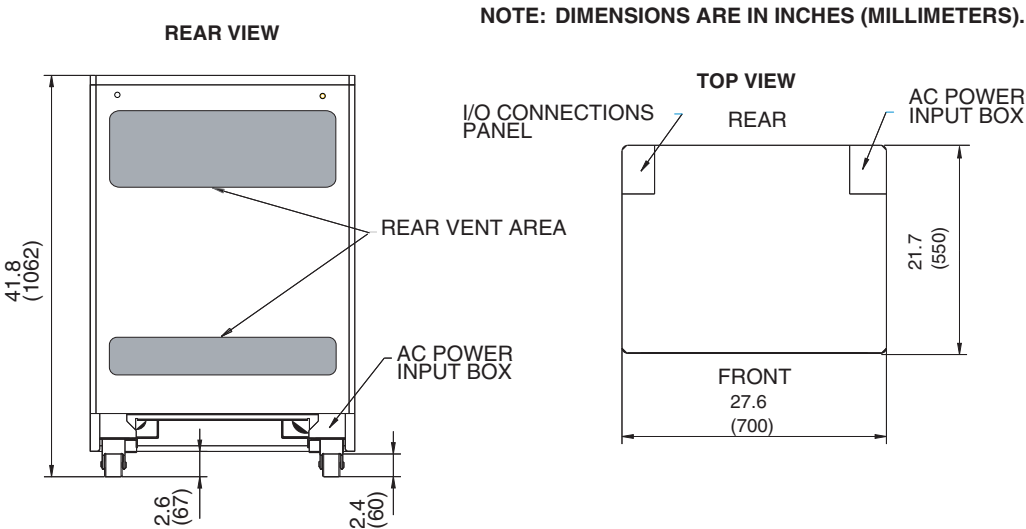
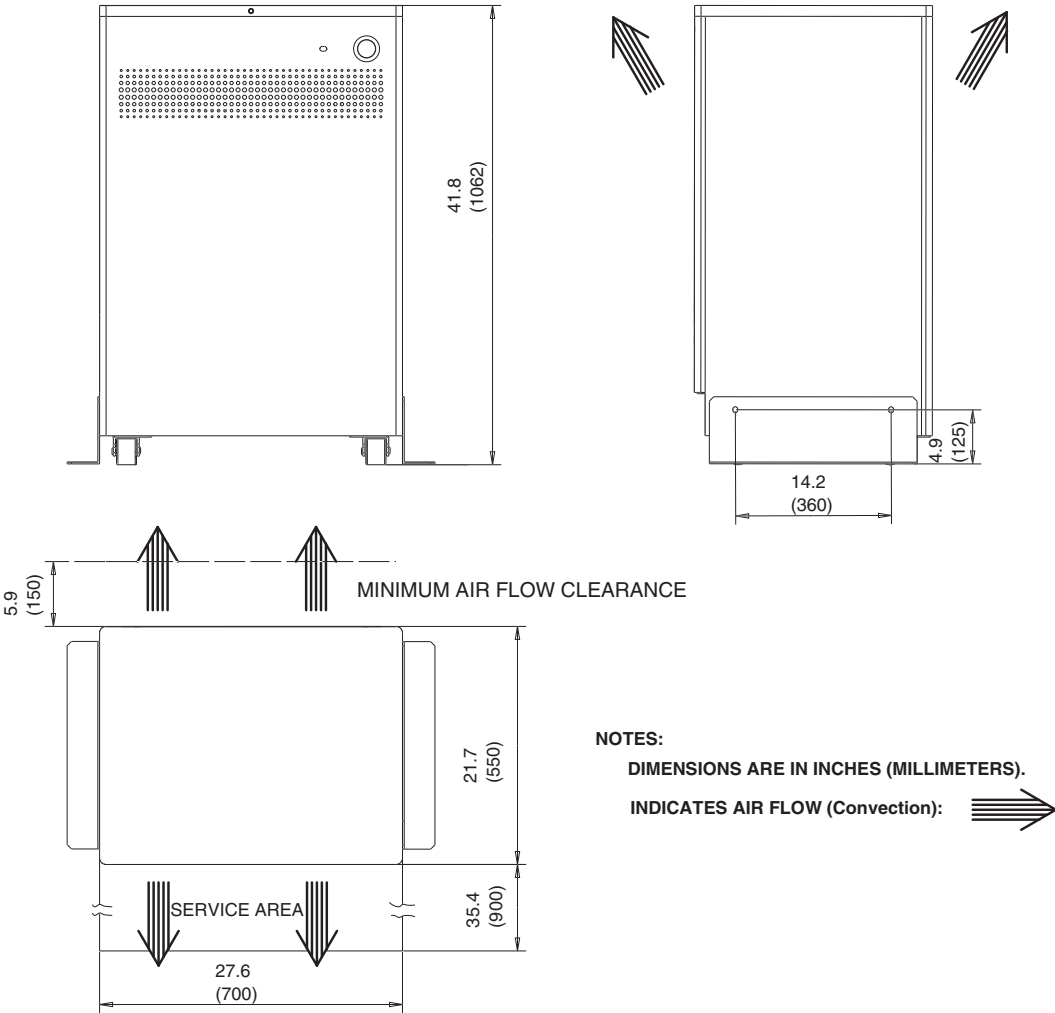


Figure 4-11 Power Distribution Unit (NGPDU)



Power Distribution Unit (NGPDU)

6.3 Operator's Console

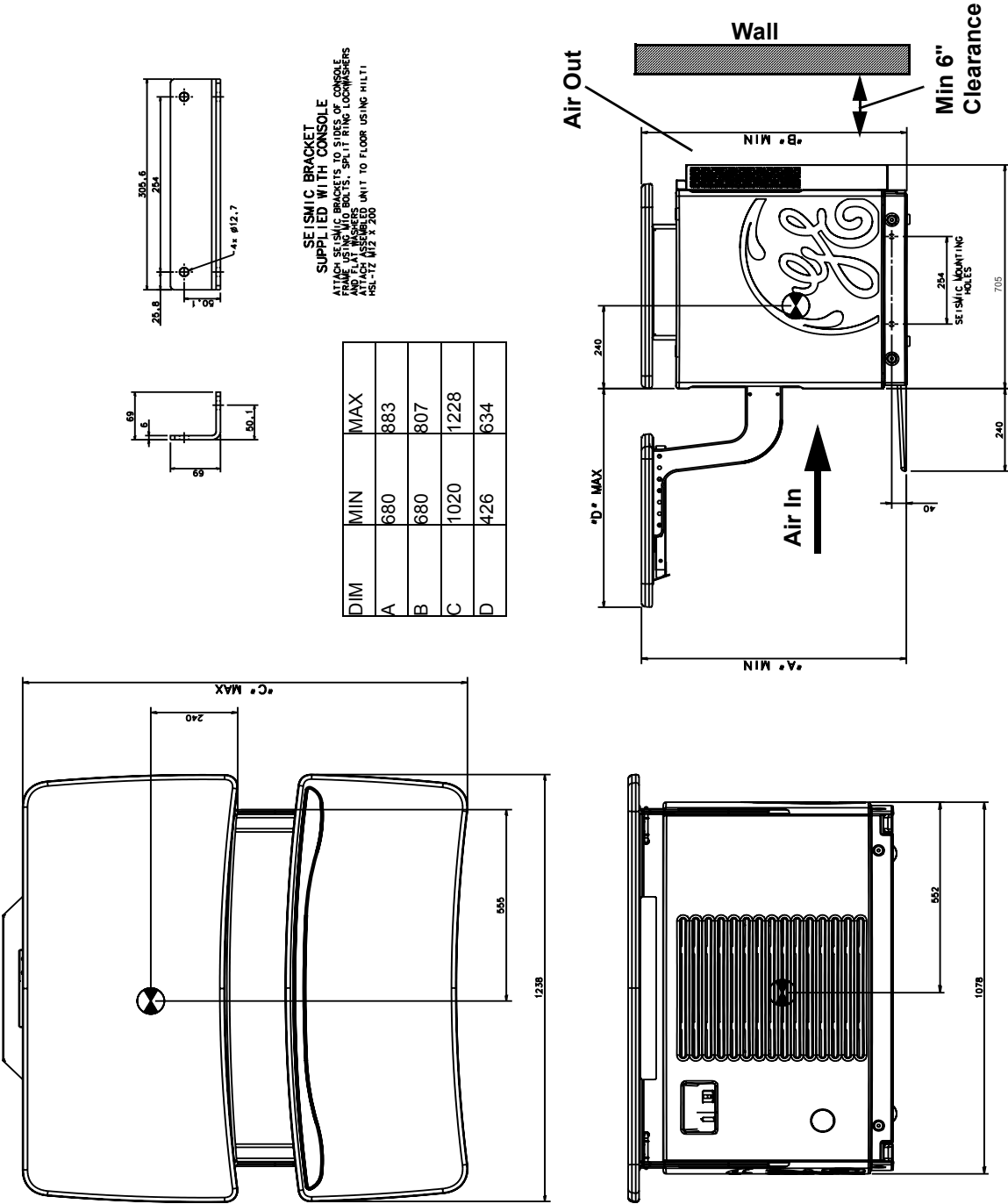


Figure 4-12 Operator's Console with Standard Table

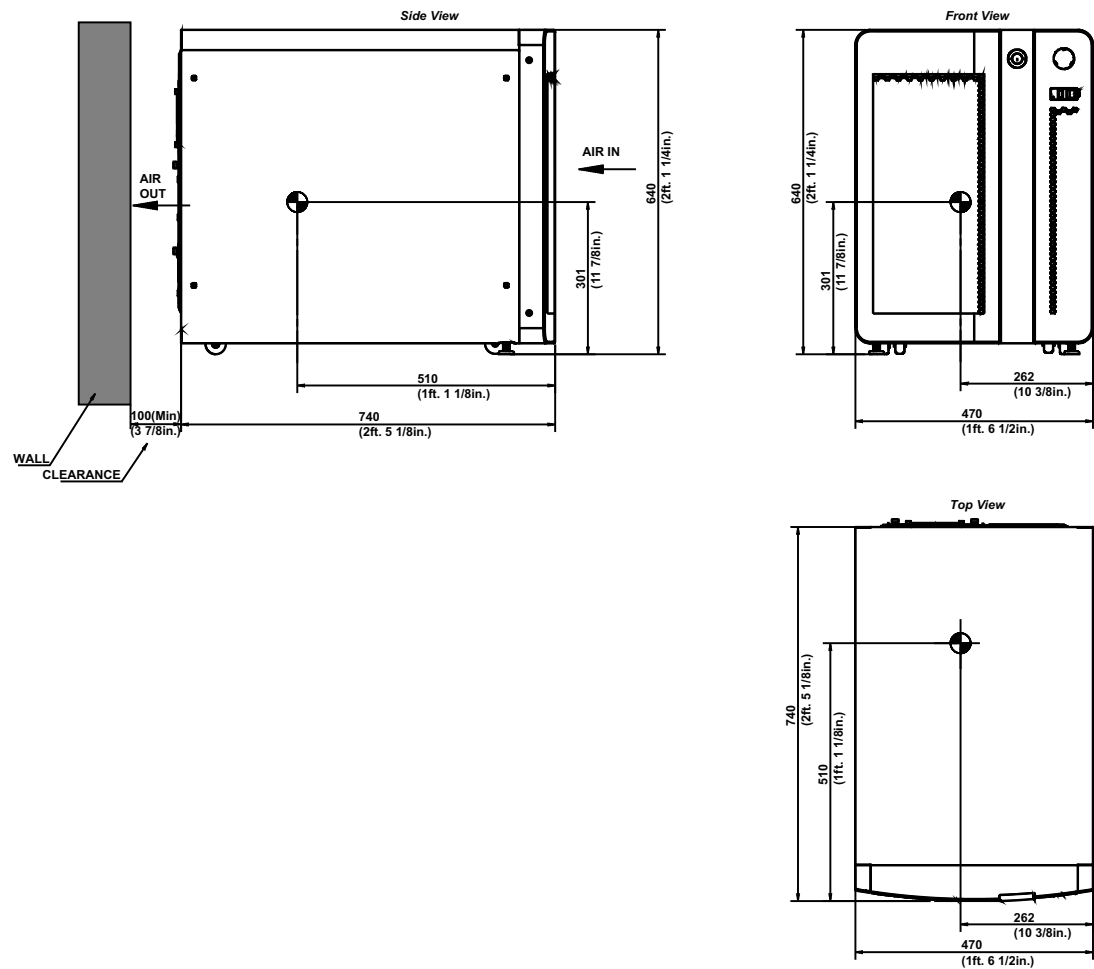


Figure 4-13 TIO Operator's Console

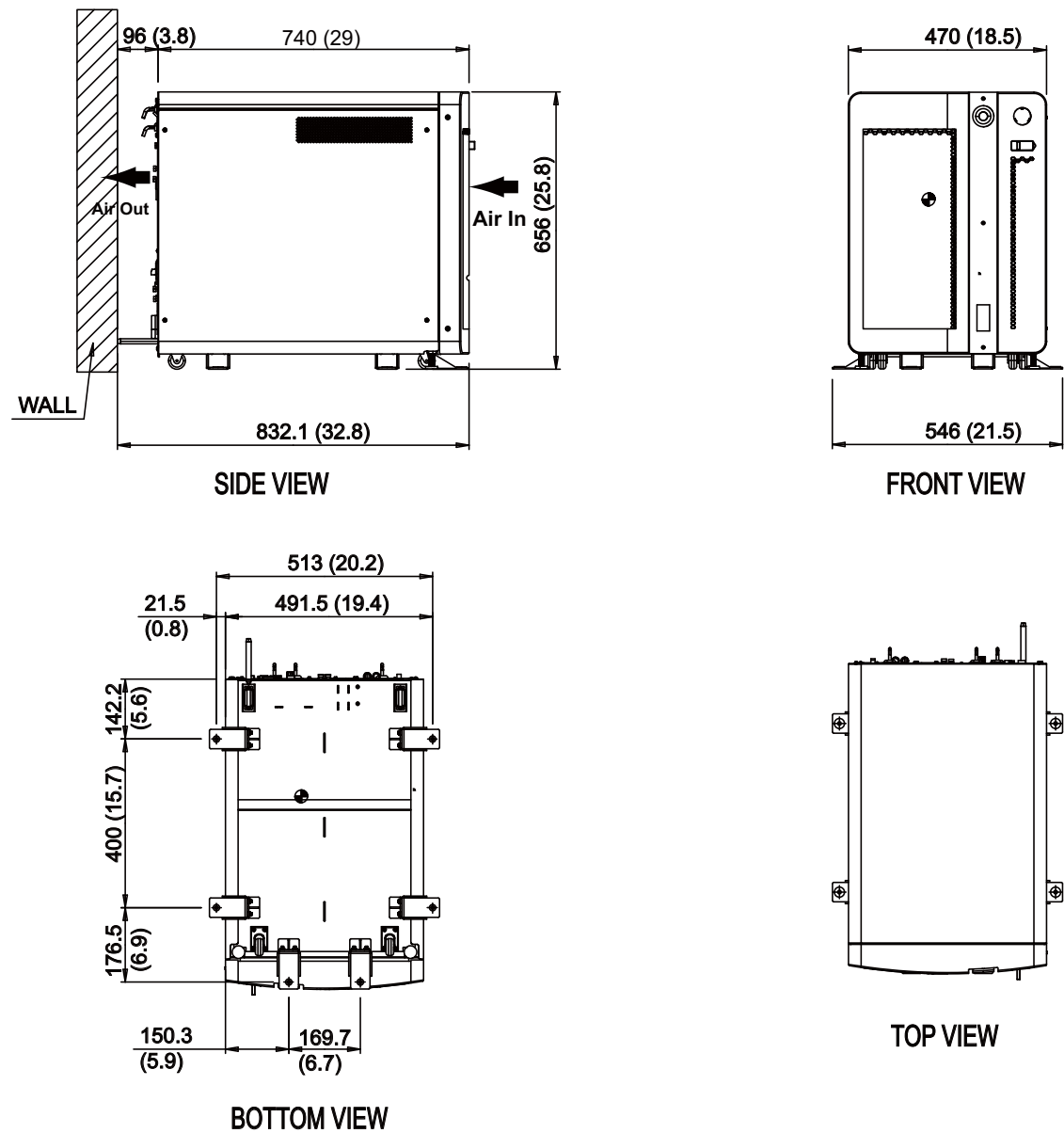


Figure 4-14 NIO16 Operator's Console

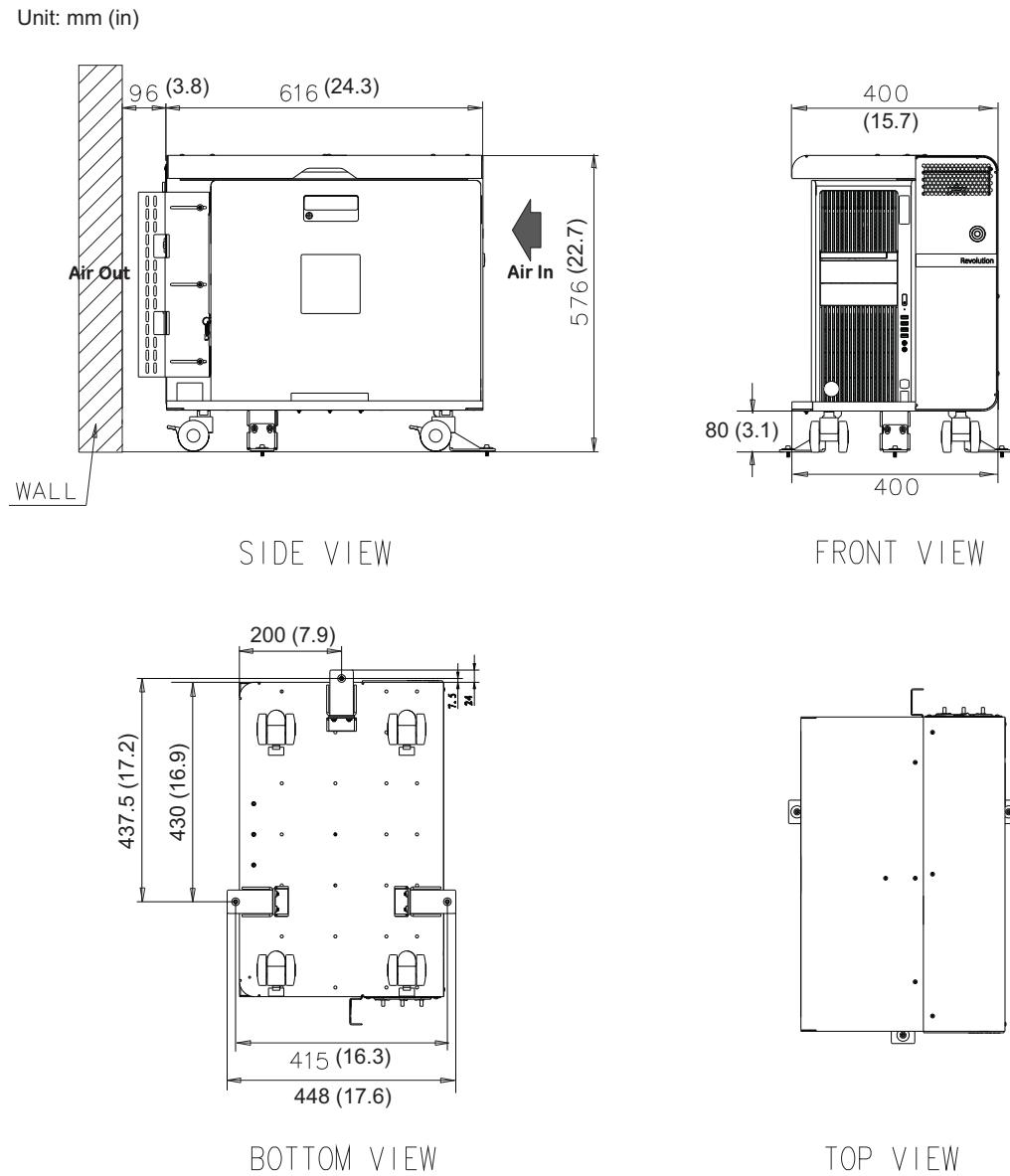


Figure 4-15 OpenOC16 Console

6.4 Freedom Workspace Table

Height of Freedom Workspace is adjustable.

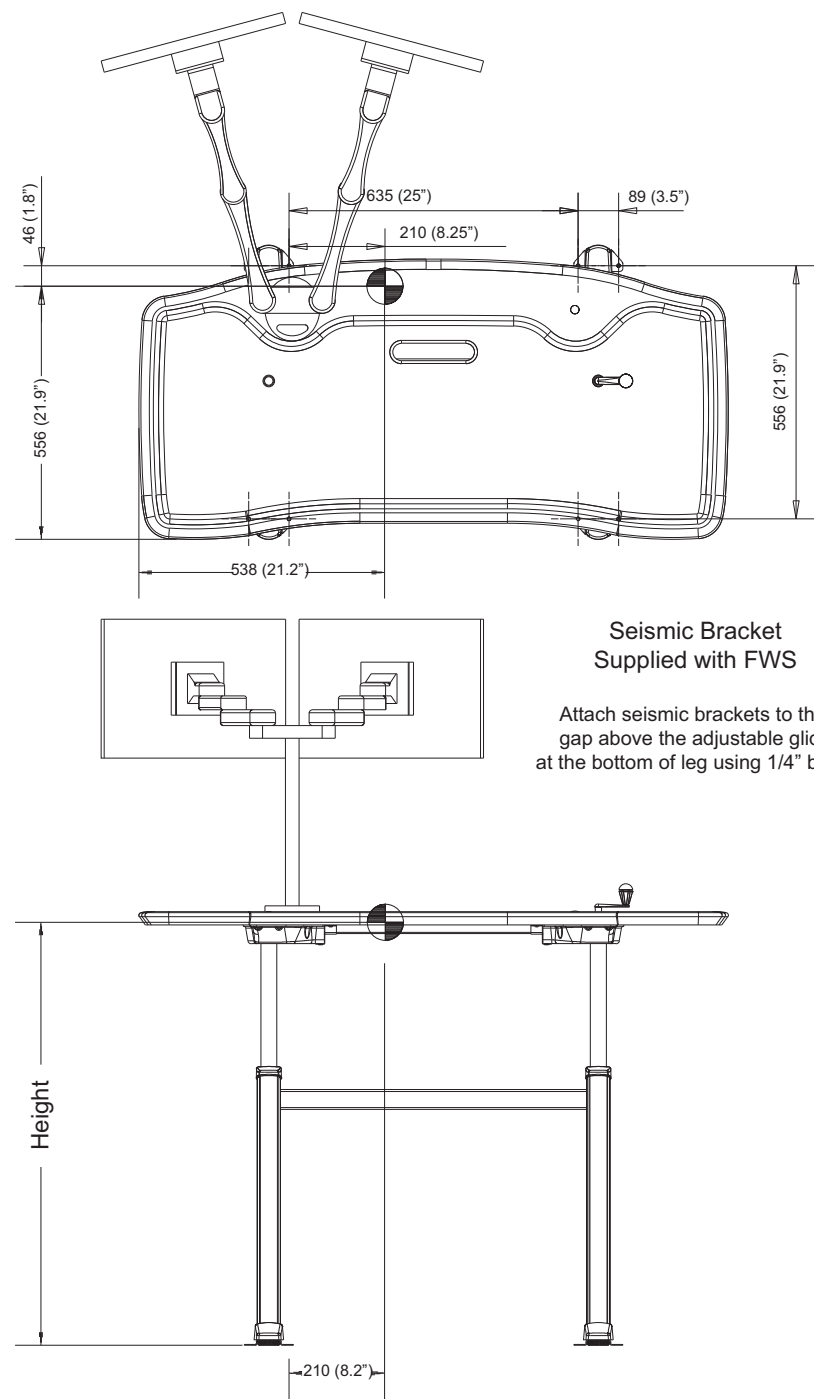


Figure 4-16 Freedom Workspace Table (part 5160735)

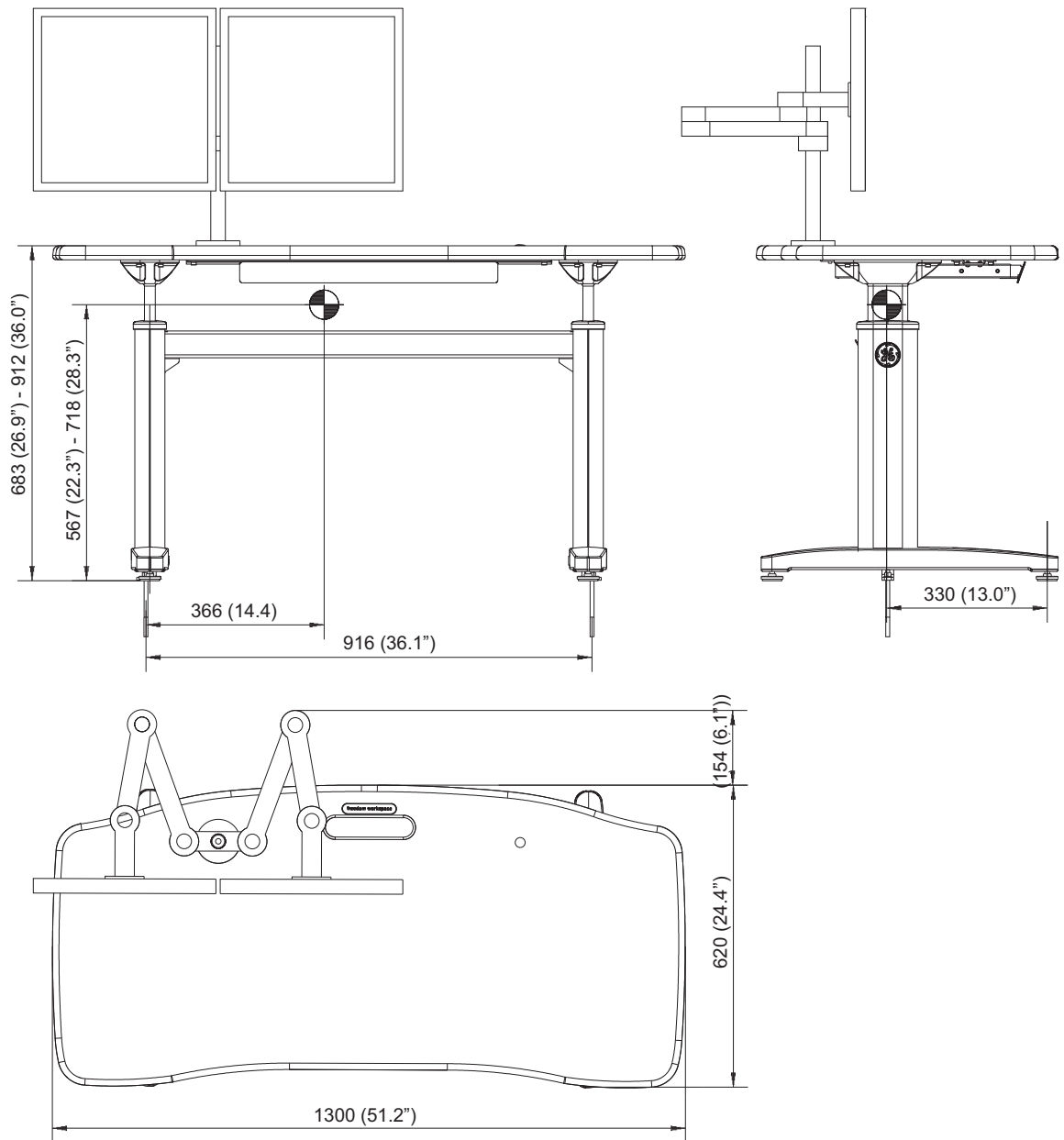


Figure 4-17 Freedom Workspace Table (part 5168666)

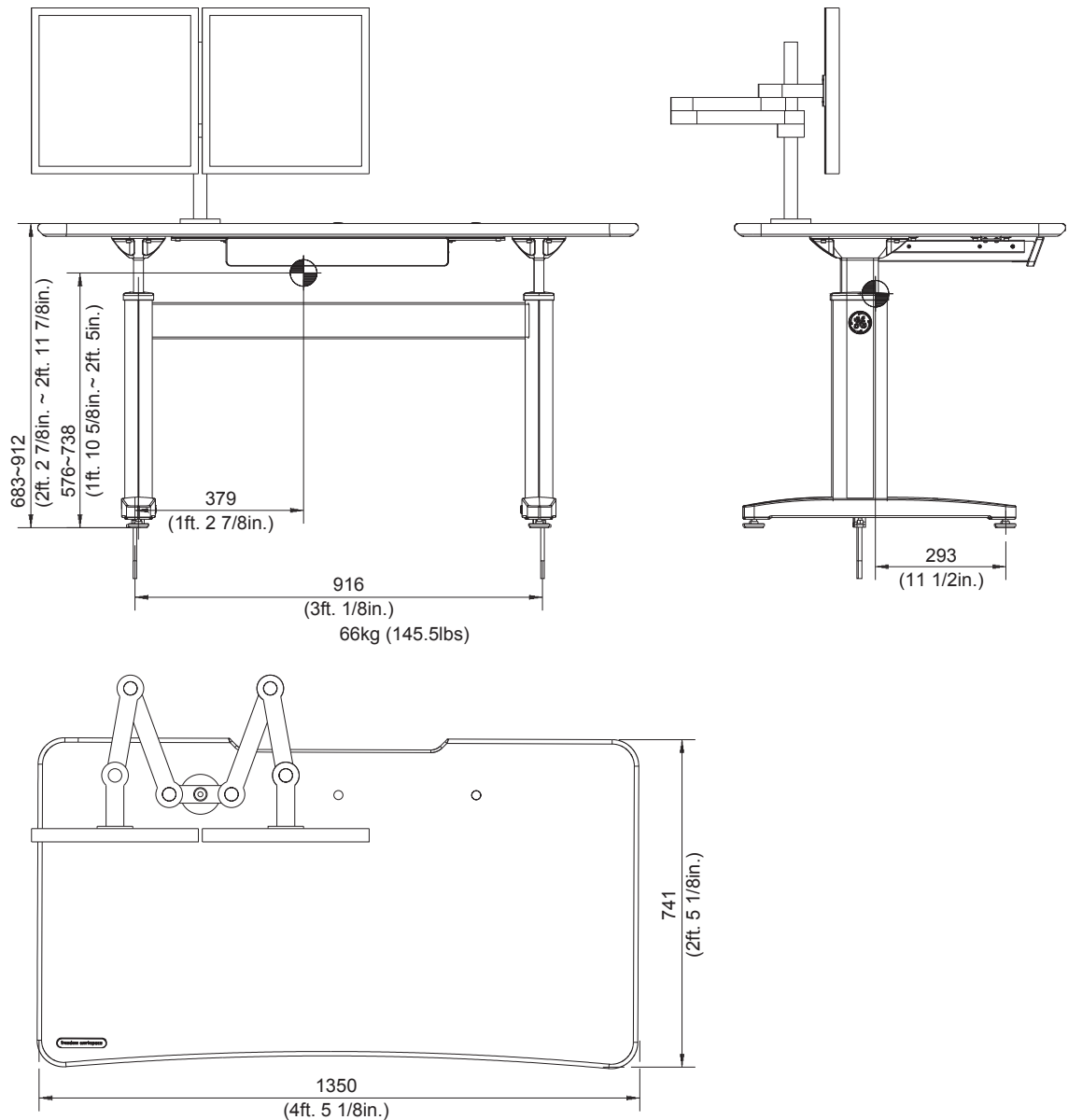


Figure 4-18 Freedom Workspace Table Wide (part 5168666-2)

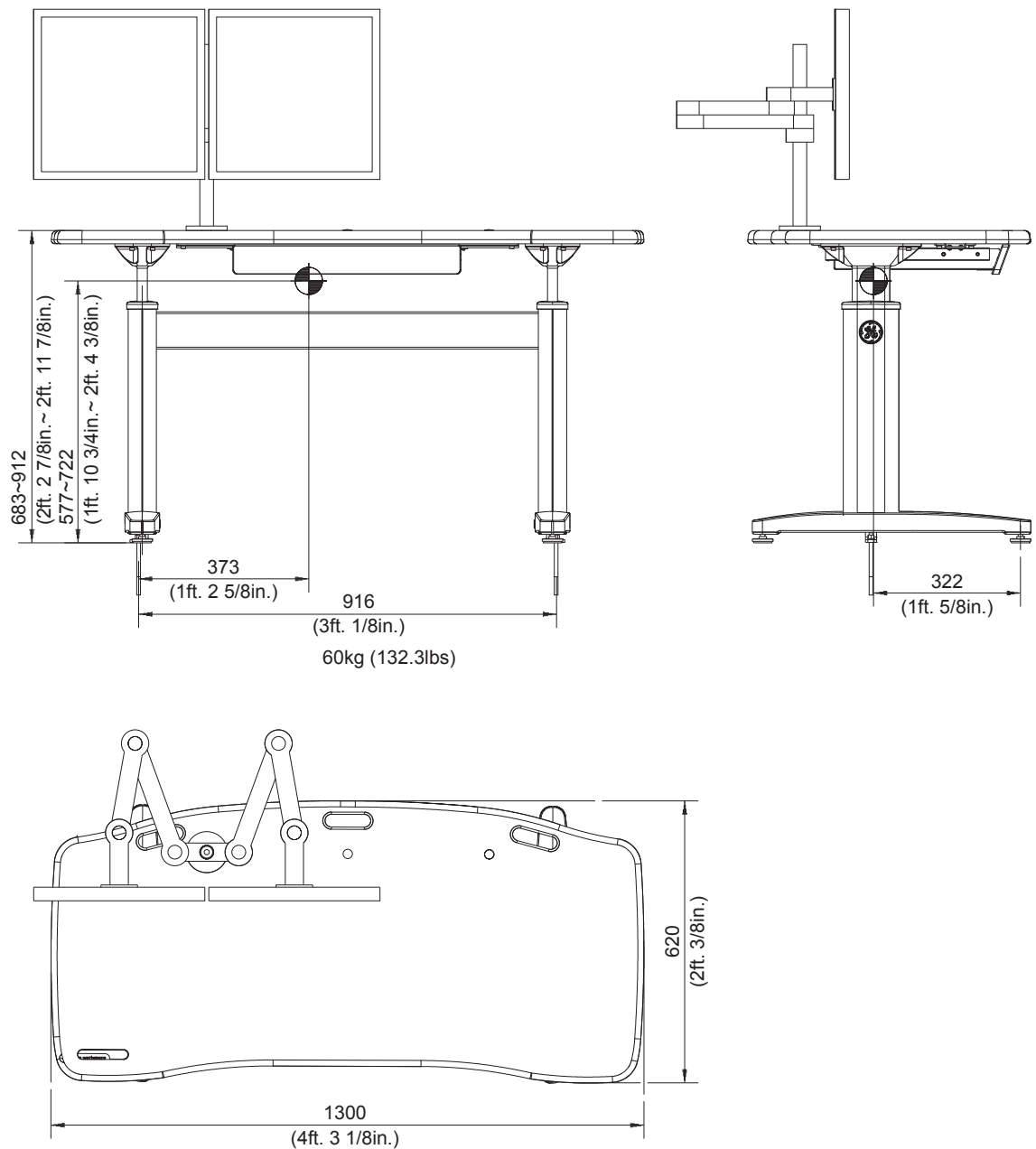


Figure 4-19 Freedom Workspace Table Standard (Narrow) (part 5168666-3)

Section 7.0

Minimum Dimensions and Clearances

7.1 Options

Ceiling Pedestal mount lowest point to floor (Injector or Monitor) 2134.0 mm (84.0 in)

7.2 System Operation

SYSTEM OPERATION	MM	INCHES
Finished ceiling to floor (recommended)	2743.0mm	108.0 in.
Finished ceiling to floor (minimum)	2286.0mm	90.0 in.
HPower Table max extension head end w/extender from Center Line	2030.0mm	80.0 in.
HPower Table extension head end w/extender to obstruction	152.0mm	6.0 in.
HPower Table in lowest pos. w/cradle @home pos. to Center Line	3209.0mm	126.5 in.
GT1700 Table max extension head end w/extender from Center Line	1712.0 mm	67.0 in.
GT1700 Table extension head end w/extender to obstruction	150.0 mm	6.0 in.
GT1700 Table in lowest pos. w/cradle @home pos. to Center Line	3209.0 mm	126.5 in.
GT1700 Table in lowest pos. w/cradle @home pos. to surface of Gantry front cover	2744.0 mm	108.0 in.
Back of GOC4/LCGOC/AIO Console to wall	152.0mm	6.0 in.
Back of TIO/NIO16 Console to wall	96.0mm	4.0 in.
Back of PDU to wall	152.0mm	6.0 in.

7.3 Injector Control

A suitable work area, which is within reach of the operator's console, should be provided for placement of the injector control.

Wall mounted, ceiling mounted and pedestal units need cables to be routed from the gantry area to the console area. Injectors AC power is supplied with Accessory I/F hardware kit.


Note: Injector cables should not be routed with the system cables.

Mounts are available in different configurations and lengths. Refer to Injector documentation for detailed installation instructions.

Section 8.0

Structural Requirements

8.1 Table and Gantry Mounting Requirements

 **WARNING** **POTENTIAL FOR PATIENT INJURY.**
IMPROPERLY SECURED TABLE MAY TIP, DISLODGING PATIENT.
PROPER ANCHORING IS KEY TO MAINTAINING PATIENT SAFETY DURING SYSTEM OPERATION.


 **NOTICE** **It is the purchaser's responsibility to provide an approved support structure and mounting method for all floor types other than those listed. General Electric is not responsible for any failure of the support structure or method of anchoring, including seismic requirements.**
GE is not responsible for methods other than those listed.

Table and gantry mounting dimensions are shown in [Figure 6-3](#), [Figure 6-4](#), [Figure 6-5](#), and [Figure 6-6](#). Refer to [Chapter 6](#) for additional details of floor loadings, component weights, and Gantry and Table installation and anchoring.

Anchor gantry and table to floor by a means that will maintain their relative alignment and meet applicable building and other local codes, including seismic structural mounting requirements.

Floor structure must be capable of withstanding the occupied weight of table and gantry, and the individual contact area loading of these components. Refer to [Section 6.0](#) for each of the three (3) major components of the BrightSpeed system.

Support areas of the patient table and gantry must rest on solid concrete, not resilient tile or carpeting which will slowly yield over a period of time and disturb alignment of table to gantry.

Factors that could cause misalignment between gantry and table due to floor sag should be considered. The cradle can potentially carry a 205 kg (450 lb) (HPower Table) / 227 kg (500 lb) (GT1700 Table) patient. Center of gravity changes as cradle cantilevers.

Take into consideration all other moving weights such as gurneys or personal equipment. Refer to [Chapter 6](#) for gantry and table mounting details.

No part of floor surface within table and gantry, nor the two interface areas between table and gantry, should be higher than the support area for table and gantry.

8.2 Floor Anchors

Provided floor anchors are designed for use ONLY on concrete floors that meet the 102 mm (4 in.) concrete floor requirements. All other anchoring methods (on floor types other than the 102 mm (4 in.) concrete minimum) must be determined to meet the stated GE minimum load requirements, at the customer's expense, by their structural contractor. The customer's contractor is responsible for the installation of all anchors other than those shipped with the system.

8.3 Floor Strength

Concrete floors must have a minimum strength of $f'_c = 2000$ psi (1.4×10^7 Pa) for mounting floor anchors. It is the responsibility of each customer to have appropriate tests performed to determine and measure concrete strength.

Note: If installing the GE BS scanner on a floor type thinner than a 102 mm (4 in.) concrete floor, the purchaser, at their expense, shall provide acceptable anchoring and mounting methods that meet all structural specifications provided in sections 8.1 through 8.5 of this Pre-Installation Manual.

8.4 Floor Levelness

The CT Room floor levelness requirement is important for accurate patient positioning. Floor levelness in the Scan Room must not be greater than 6 mm (0.25 in.) between depression and high spots over any 3048 mm (120 in.) distance within the area of the gantry/table template (see [Figure 2-1, on page 43](#)).

Note: Floor must meet levelness specification to properly align the table gantry. Minimum gantry height at this specification will be 1/2" (15 mm) to prevent cable crushing.

Table level may not be achievable if overall floor levelness is greater than the specification.

Overall floor level must be 0" to use under gantry cable entrance. Minimum gantry height will be 3/4" 20 mm with this option to prevent cable crushing.

The use of floor shims is not suitable to achieve floor levelness. It is recommended that the concrete be leveled to meet this requirement.

8.5 Floor Vibration

The CT equipment may be sensitive to vibration in the frequency range of 0.5 to 20 Hz depending on the amplitude of the vibration. It is the customers responsibility to contract a vibration consultant or qualified engineer to implement design modifications to meet the specific limits, However, it is ultimately the customer/architect/engineer responsibility to design the site solution.

8.5.1 Steady State Vibration

The maximum steady state vibration transmitted through the floor should not exceed 10^{-3} 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).

8.5.2 Transient Vibration

The behavioral characteristics must be such that any measurable transient disturbance must also be minimized to less than 0.01 m/s² peak-to-peak.

8.5.3 Equipment Location

To minimize the interference, the CT equipment should be placed on a solid floor, located as far as possible from the following vibration sources:

- Parking lots
- Trains
- Heliports
- Roadways
- Hallways
- Hospital power plants containing pumps, motors, air handling equipment and air conditioning units
- Subways
- Elevators

8.6 Walls: Scan Window

The recommended patient viewing window dimensions are 1219 mm wide by 1067 mm high (48 in. x 42 in.). The location of the window is dependent on the position of Operator Workspace position. Consult [Section 10.0](#) of this chapter and a **qualified radiological health physicist** for radiation protection requirements of glass (lead content and thickness).

Note: The operator at the Operator Workspace must be able to view the patient during a scan.

8.7 Ceiling Requirement

The weight of "Boom in a room LCD monitor" assy is 50 kg., and ceiling shall have enough strength against the specification.

Section 9.0 Network Connections

Broad-band is the standard network connection and is required for BrightSpeed Series systems. (A dial-up modem is optional.) A 1000 baseT high-speed network is desired, with 100 baseT network service acceptable. Broad-band connections should use one of the following Category 5 patch cables:

CAT Num	GE Part Num	Length
K9000WB	2215028-10	20 m
K9000KP	2215028-5	10 m
K9000JR	2215028-4	5 m
K9000WA	2215028-9	3 m

The CT system is connected to the network through the Console.

- A patch cable (not to exceed 3.05 m (10 ft.) should be provided by the customer, and it is used to connect the console to a wall box. (See Notes on [Figure 9-6](#))
- Some customer-site units may require cable duct-work or conduit to route connecting network cables to the workstation, camera and console.
- The run from the hospital switch to the CT wall outlet must not exceed 88m (290 ft.). Bandwidth performance is degraded when the length reaches 91m (300 ft.) or greater.
- For the optional modem: **Two phone lines should be provided by the facility.** One line is for use with a modem and must be an analog line. The second line is a voice only line.

Hospital Network Advantage Window

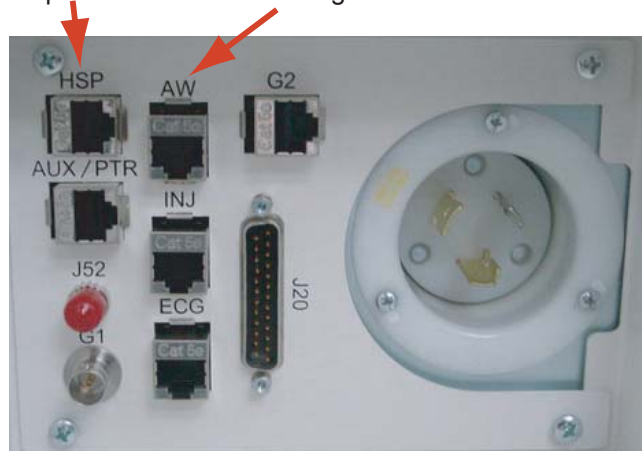


Figure 4-20 LCGOC/GOC4/AIO Console Rear Bulkhead

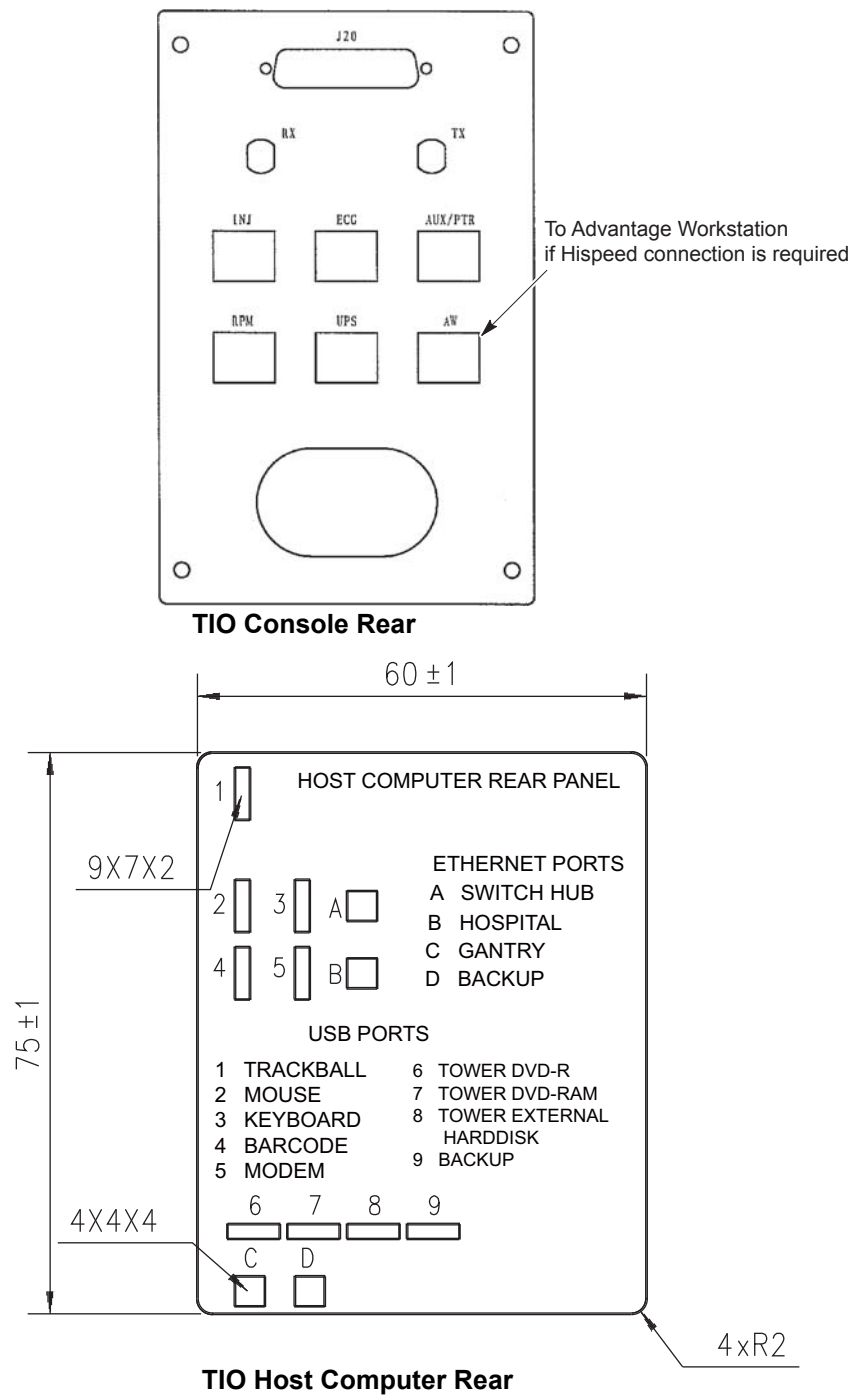


Figure 4-21 TIO Console and Host Computer Rear

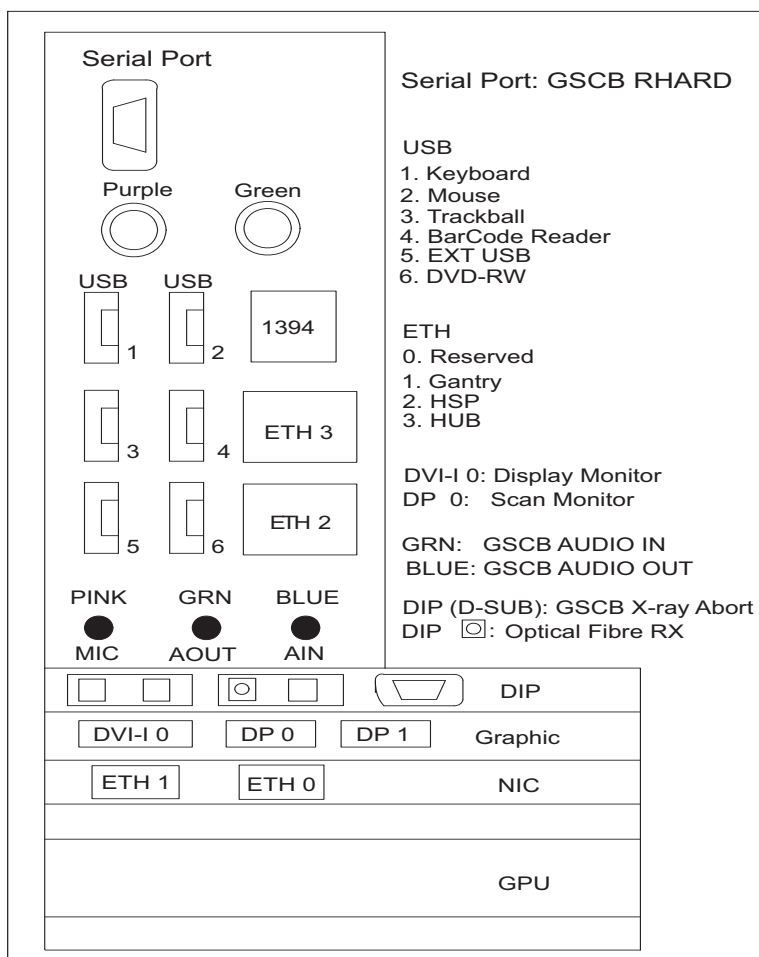


Figure 4-22 NIO16 Console with Z800 Host Computer Rear

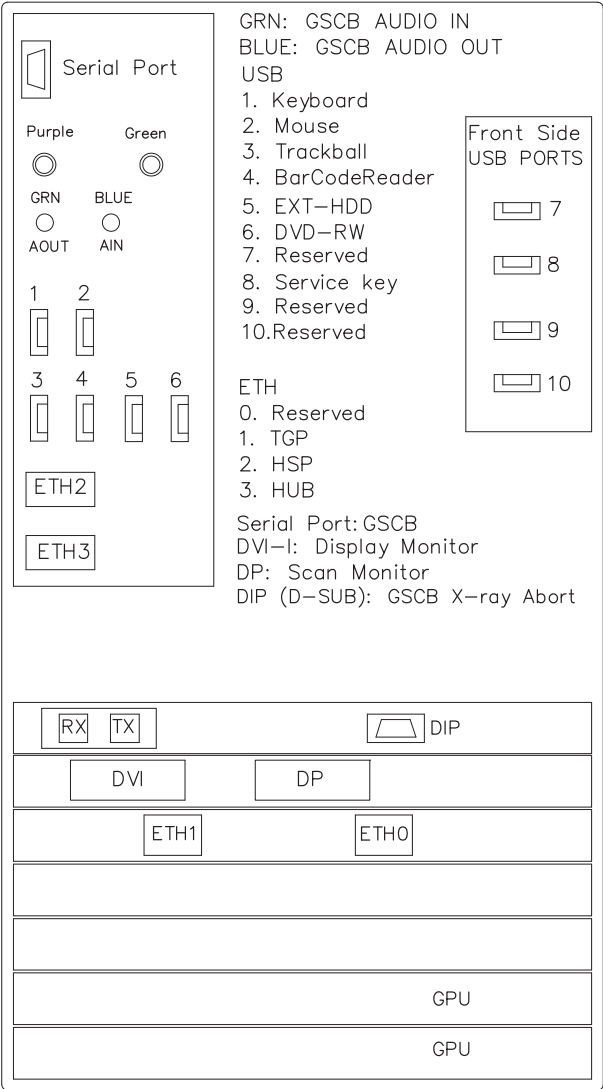


Figure 4-23 OpenOC with Z840 Host Computer Rear

9.1 US Broad Band Process Overview

The United States network connectivity requirement for this product is broad-band. The US process relies on the Project Manager Installation to select a Customer Champion and identify an IT contact for the site. Together, those individuals then complete a site assessment to gauge what tasks are needed to fulfill the connection.

Anyone can contact the GE Connectivity team at 800.321.7937, Option #3, with questions.

9.2 Customer Broad-Band Responsibilities

Provide GE Healthcare Installation Project Manager with an accurate site address, telephone number, contact name, and e-mail address for the:

- Customer Champion
 - Coordinate VPN activities between Radiology/Cardiology and the Information Technology (IT) departments
 - Act as a focal point in assuring site broad-band infrastructure meets GE Healthcare requirements for connection as determined by a mutual assessment with the GE Healthcare Connectivity team.
- IT Contact
 - Complete an equipment assessment with GE Healthcare Connectivity team to determine site readiness for broad-band
- Contact your Installation Project Manager, for the name of the zone Broad-Band Specialist
 - Work with the Customer Champion to complete any identified infrastructure changes
 - Provide IP addresses for new CT equipment
 - Provide a VPN compatible appliance that will support the IPSec tunneling protocol and 3DES data encryption
 - Utilize an Internet Service Provider that supports static routing

Section 10.0 Radiation Protection



NOTICE Scanner-room shielding requirements should be reviewed by a qualified radiological health physicist taking into consideration:

- Scatter radiation levels within the scanning room (see [Figure 4-25](#))
- Equipment placement
- Weekly projected work-loads (# patient/day technique (kvp*ma))
- Materials used for construction of walls, floors, ceiling, doors, and windows
- Access to surrounding scan room areas
- Equipment in surrounding scan room areas (e.g., film developer, film storage)

[Figure 4-24](#) depicts measurable radiation levels within the scanning room while scanning a 32 cm CTDI phantom (body) and a 20 cm water phantom (head) with the technique shown. The mAs, kV and aperture scaling factors shown in [Table 4-11](#) can be used to adjust exposure levels to the scan technique used at the site.

Note: Actual measurements can vary. All measurements have an accuracy of $\pm 20\%$ because of measurement equipment, technique, and system-to-system variation.

Use the correction factors shown in [Table 4-11](#) to adjust exposure levels to the usual scan technique at your site.

CHANGED PARAMETER	MULTIPLICATION FACTOR
mAs	new mAs/100
80 kV	0.21
120 kV	0.71
140 kV	1.0
4 x 3.75mm images	0.82
<u>16 x 0.625 LD</u> <u>8 x 1.25 LD</u> <u>4 X 2.5 LD</u> <u>Fluro 5mm</u>	<u>0.59</u>
4 x 1.25 LD 5mm (1i) Fluro 2.5 mm	0.40
1 x 1.25mm images	0.20
2 x 0.625 LD 1 x 1.25	0.10

Table 4-11 Shielding Requirements Scaling



NOTICE The units of measure used for radiation levels have been changed in this publication, from mR (millirads) to μGy (micrograys). The conversion factor is:

$$1 \text{ mR} = 8.69 \mu\text{Gy}$$

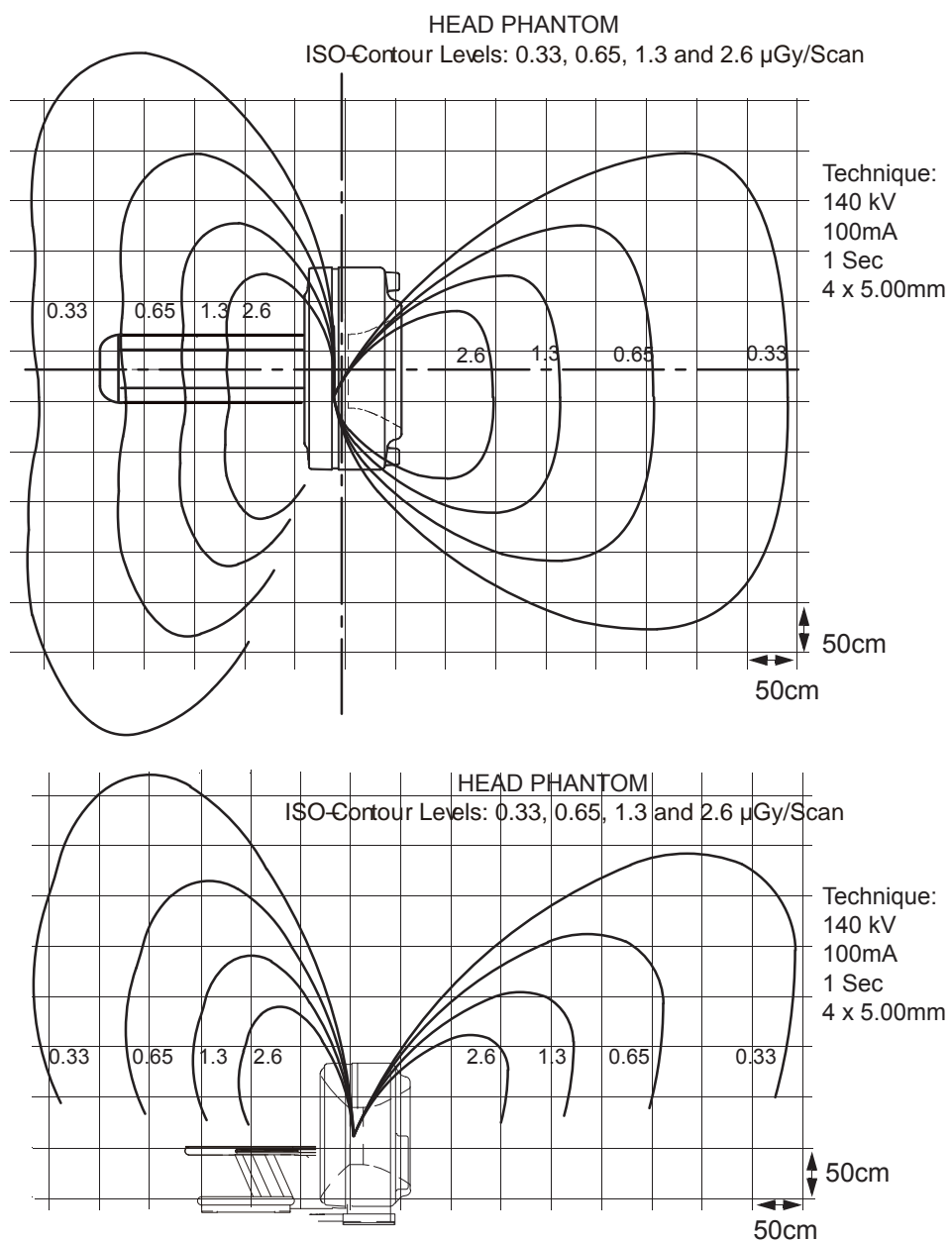


Figure 4-24 Typical Scatter Survey (Head Filter)

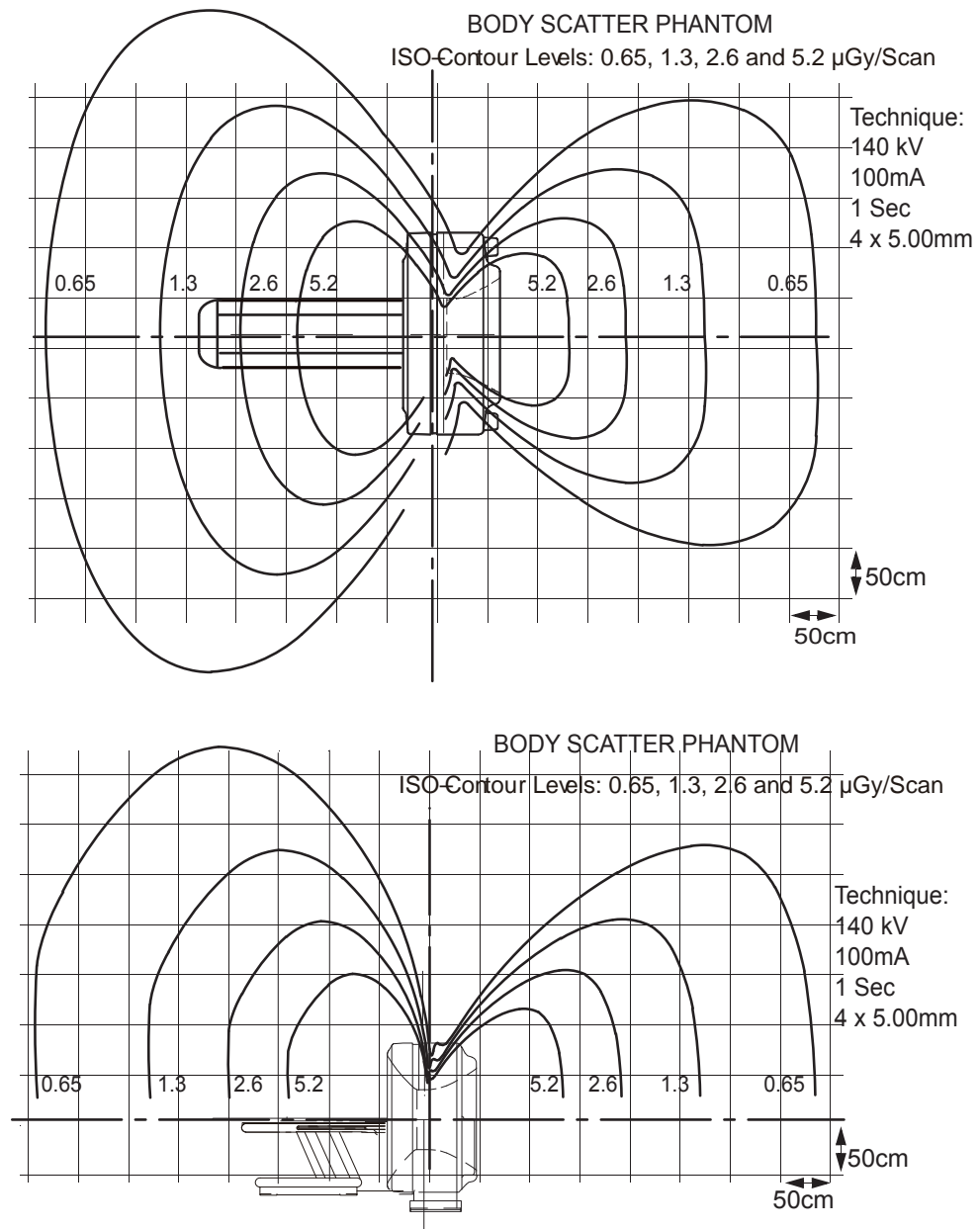


Figure 4-25 Typical Scatter Survey (Body Filter)

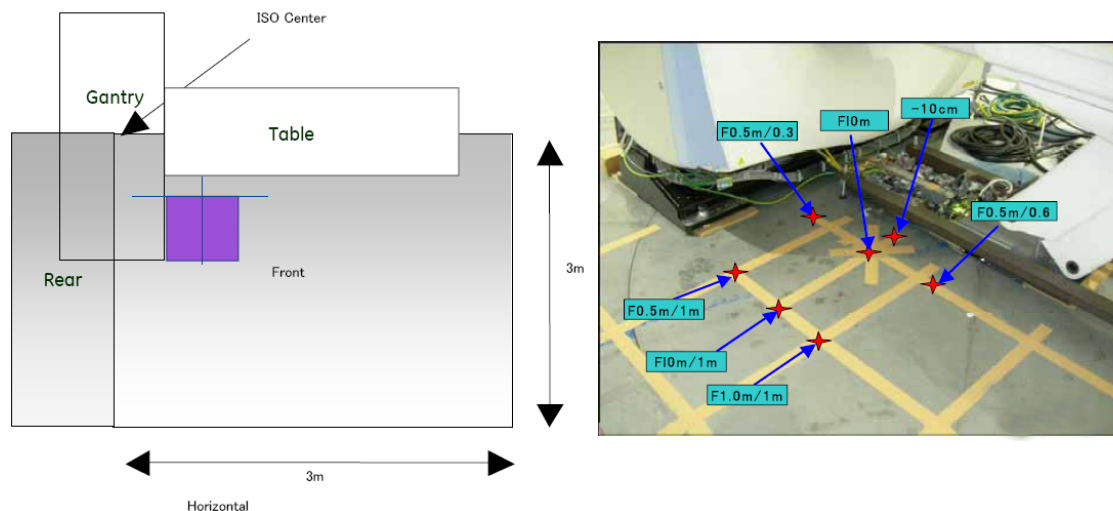


Figure 4-26 Fluoro Stand Position

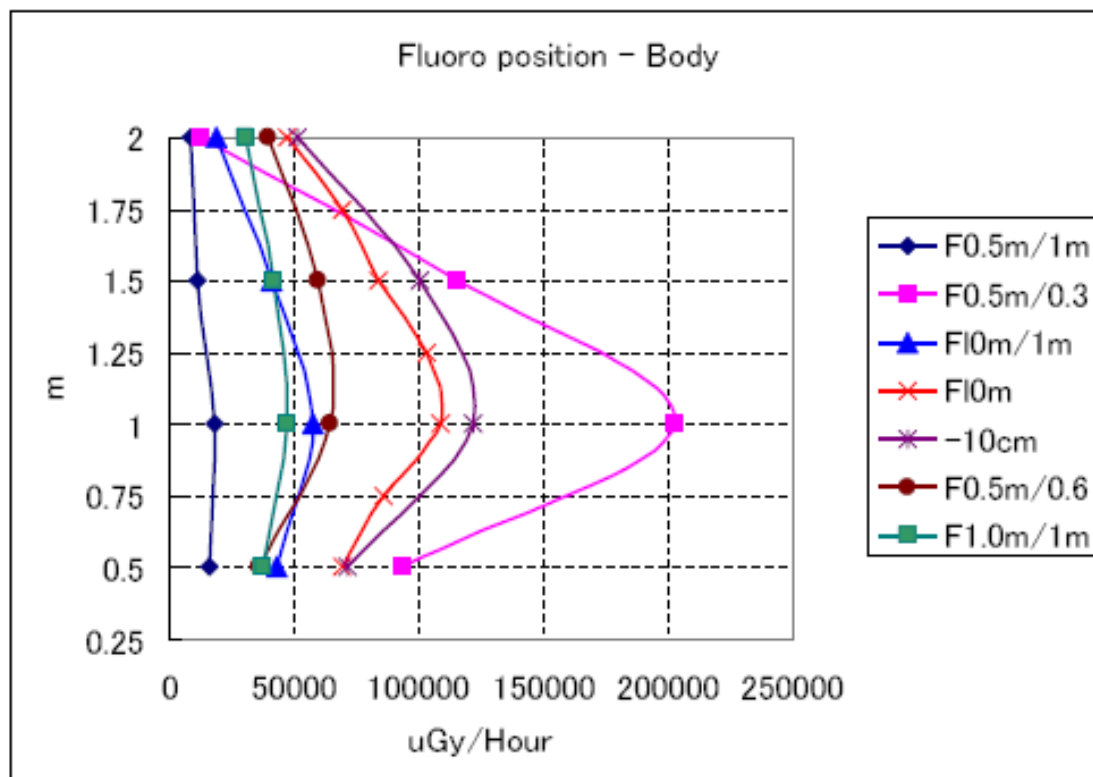


Figure 4-27 Scatter Plot of Fluoro - Body

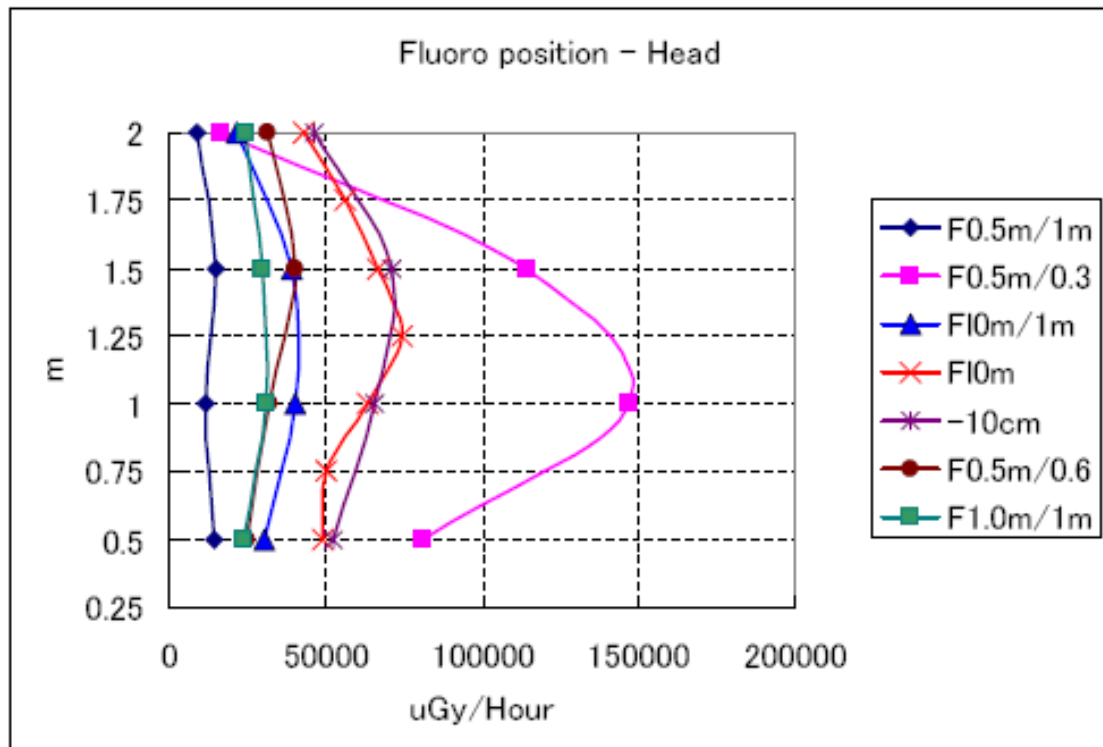
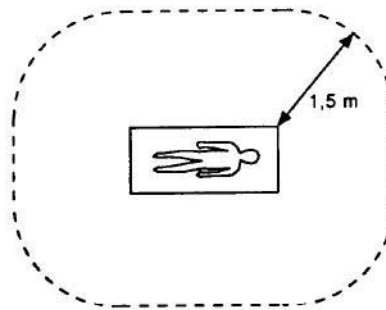
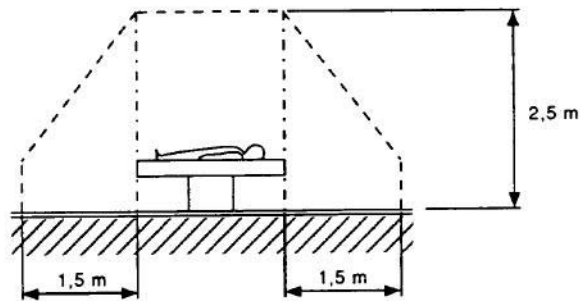


Figure 4-28 Scatter Plot of Fluoro - Head

Section 11.0

Patient Environment

The patient environment is defined as the following picture.



IEC 2513/2000

Only Scanning Gantry, Patient Table components and the following options can be placed in this area.


- Advantage 4D
- In room monitor
- SmartStep
- Extream Injector

Chapter 5

Environmental Conditions

Ratings and duty cycles of CT subsystems apply if site environment meets the standards of this section. Maintain environmental conditions listed below at all times – including, for example, overnight, weekends and holidays. Shut down the CT system if air conditioning is not working.

When system is shut down for major repair, air conditioning may be shut down also.




NOTICE Silver, copper, gold films used in the CT system are especially sensitive to the presence of sulfide, chloride and nitrate contaminates. Sulfur is the most damaging. If high levels of contaminates exist site may want to consider appropriate air filtration systems.

Section 1.0

Temperature and Humidity Specifications

Environmental specifications apply to the table, gantry, power distribution unit, and operating console.



NOTICE System Operation and Image Quality may be affected, if environmental specifications are exceeded.

1.1 Temperature (Scan Room & Control Room)

Maximum allowable ambient room temperature:	26° C (79° F)
Recommended ambient room temperature:	22° C (72° F)
Minimum allowable ambient room temperature:	18° C (64° F)
Maximum allowable ambient room temperature rate of change:	3° C/hr. (5° F/hr.)

Equipment Room: If a separate equipment room is used to house the PDU, the allowable temperature range is 64° - 79° F (18° - 26° C).

1.2 Humidity (Scan Room & Control Room)

Maximum allowable non-condensing relative humidity:	60%
Minimum allowable non-condensing relative humidity:	30%
Maximum allowable relative humidity rate change:	5% per hour

1.3 Other Guidelines

- To help determine the hospital room environmental conditions, a temperature and humidity recorder may be temporarily installed close to where the system will be installed. Note readings before and after installation, to verify the true temperature and humidity in your environment.
- Consider heating, ventilating, air conditioning (HVAC) needs and redundancy. An air conditioner with two compressor units, rather than one, may prevent system downtime. A back-up (redundant) air conditioner permits CT system operation during an extended repair of the primary air conditioner.

Section 2.0 Cooling Requirement

Use [Table 5-1](#) to assist in cooling requirements planning. Over half the cooling used by your scanner is required for gantry operation. Locate a wall air-conditioning vent at floor level beside and behind gantry to meet both gantry cooling needs and provide patient comfort. Do not locate any cooling vents directly above the gantry. Air returns above the gantry are recommended.

SYSTEM COMPONENT	BTU/HR	WATT
1. Gantry recommended (See NOTE 1)	18,766	5,500
2. HPower Table / GT1700 Table	682/1023	200/300
3. Power distribution unit	5,118	1,500
Recommended Scan Room Subtotal (see notes):	24,566/24,907	7,200/7,300
4. Operator's console w/ 1 IG, 2 monitors & SCSI Tower	8,189	2,400
MOD Drive (Option)	682	200
IG Node, each (Option)	1,024	300
Remote Monitor (Option)	222	65
DASM (Option)	290	85
Recommended Control Room Subtotal (w/o option):	8,189	2,400
System Total (Recommended) (See NOTE 1)	32,755/33,096	9,600/9,700
Option: Advantage Windows	256	75
Option: UPS	5,200	1,200
ROOM TOTAL (SEE NOTE 2)		
NOTE 1: With 75 scan rotations per patient: Recommended BTU/hr. provides for up to six patients per hour. It is also needed during calibration of the system. NOTE 2: Cooling requirements do not include cooling for room lighting, personnel or non-CT equipment.		

Table 5-1 Cooling Requirements (Worksheet)

Please refer to [Figure 4-7](#), and [Figure 4-12](#) in [Chapter 4, Section 6.0](#), for component air flow requirements.

Section 3.0 Altitude

The system shall meet all functional and performance specification when placed in a room that is at an elevation of -150 m to 3000 m (-492 ft. to 9842.5 ft) above sea level.

Section 4.0

Electro-Magnetic Interference (EMI)

Note: If power sub-stations exist under or above the scan room, or near the control 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 control room floor.

4.1 Gantry and Table

Locate gantry in ambient static magnetic fields of less than 10^{-4} tesla (1,000 milligauss) to guarantee specified imaging performance. Ambient AC magnetic fields must be below 10^{-6} tesla (10 milligauss) peak.



WARNING REQUISITES FOR ROOM

GANTRY & TABLE ARE ALLOWED TO BE INSTALLED ONLY IN X-RAY PROTECTED ROOMS, WHICH PROVIDE AN ATTENUATION OF AT LEAST 12dB FOR RADIO DISTURBANCES FROM 30 MHz TO 1 GHz.

(The Warning statement above is specified by IEC 60601-1-2, First Edition, 1993)

4.2 Color Monitor

Locate color monitors in ambient static magnetic fields of less than 5×10^{-5} tesla (100 milligauss) to guarantee color purity and display geometry. See [Figure 5-1](#).

4.3 Console / Computer Equipment

Locate computer equipment in ambient static magnetic fields of less than 10^{-3} tesla (10,000 milligauss) to guarantee data integrity. See [Figure 5-1](#).

4.4 Magnetic Media

Locate magnetic media in ambient static magnetic fields of less than 10^{-3} tesla (10,000 milligauss).

4.5 PDU

The PDU produces an electromagnetic field that radiates outward from its cabinet in all directions. Do not place the gantry or patient table within 0.3 meters (12 in.) of the edge of the Power Distribution Unit. Do NOT place other sensitive electronics (e.g. the computer equipment) within 1.0 meters (39 in.) of the edge of the Power Distribution Unit in any direction, including above or below it. See [Figure 5-1](#).

Note: The UPS is not classified as sensitive electronics.

4.6 EMI Reduction

If fields of excessive EMI are known or suspected to be present, consult GE Medical Systems 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 leakage magnetic field 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.

Maintain good screening of cables and cabinets.

4.7 UPS

The Uninterruptable Power Supply (UPS) provides a consistent power supply to various electrical components of the system. Also, it continues to provide electrical power to components during a site-wide power outage so components can be safely shut down. The UPS should be kept at least one meter (1m) away from sensitive electronics (the PDU does not include sensitive electronics).

4.8 Equipment EMI “Envelopes”

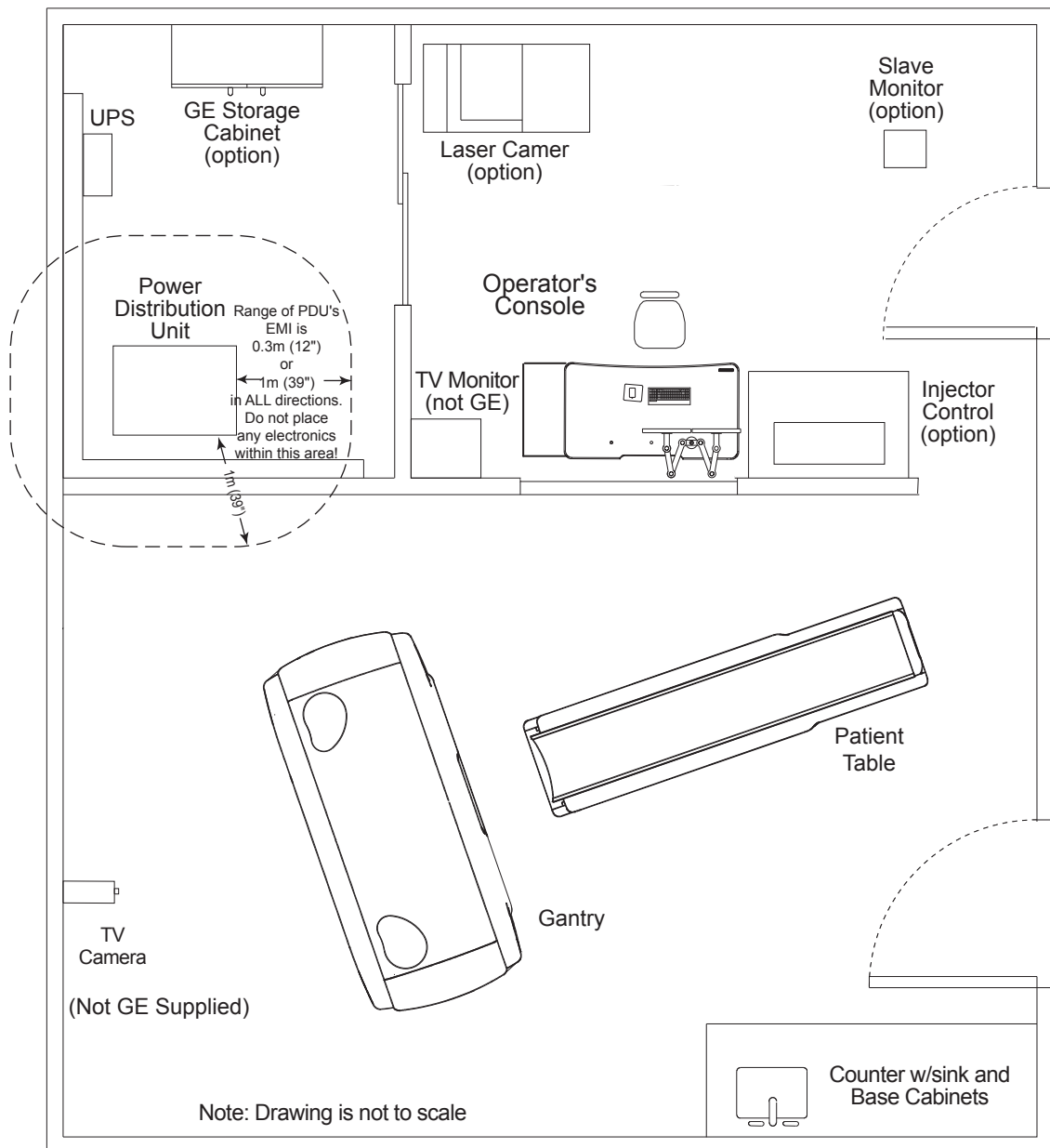


Figure 5-1 Sample Room Layout, showing approximate EMI requirements

Section 5.0 System Component Noise Levels

Maximum Gantry Audible Noise Level The maximum ambient noise levels is produced by the gantry during a CT scan acquisition. It is less than 75 dBA when measured at a distance of one meter from the nearest gantry surface, in any direction.

Maximum OC Audible Noise Level The maximum ambient noise levels is less than or equal to 56dBA when measured 1m up and 1m away from the console at an ambient temperature of 26°C.

Chapter 6

Floor Loading and Weights

Section 1.0 Floor Loading

The BrightSpeed system has a total floor load of approximately 2880 kg (6340 lbs). About 2310 kg (5088 lbs), including patient (205 kg (450 lbs)), is concentrated in the table-gantry assembly.

Table 6-1 lists CT components with weight, size, floor loading and normal mounting requirements.

ITEM	NET WEIGHT LB(KG)	OVERALL W X D INCH (MM)	WEIGHT/AREA LB/SQ. FT. (KG/M ²)	LOAD PATTERN IN. (MM)	NORMAL METHOD OF MOUNTING IN. (MM) (GE SUPPLIED) ¹
Gantry (w/ covers)	~3899 (~1770)	81 x 40.1 (2057 x 1018)	263 (1286)	Rectangular base plate 27.6 X 77.4 (700 X 1966) with four round pads, each 2.5 (63.5) in contact with floor. Individual pad loadings are: 910 lb, 960 lb, 1040 lb, and 1090 lb (see Figure).	Hilti Kwik-Bolt II 1/2in (12.7mm) diameter by 8in (203mm) long per P/N 2106573 at four leveling pads into concrete floor.
Dollies (each)	250 (114)				
Top Cover (each)	15.4 (7)				
Side Cover (each)	11 (5)				
Front Cover	92.5 (42)				
Rear Cover	92.5 (42)				
Patient Table	1201 (545) Includes 450 (205) Patient	24.3 x 94 (616 x 2387)	175 (852)	Rectangular base 17 X 57.5 (432 X 1460) with five round pads, each 2.5 (63.5) in contact with floor. Worst-case cantilever pull on any bolt is 1235 lb (561 kg).	Hilti Kwik-Bolt II 1/2in (12.7mm) diameter by 8in (203mm) long per P/N 2106573 at three leveling pads into concrete floor.
Dolly	215 (98)				
Patient Table:GT 1700V w/227kg patient	980 (445) / 1481 (672)	25.6 x 93.3 (650 x 2370)	493 (2408)	For round 63.5mm pads. Max Anchor Load is 1363lbs (6061N).	Hilti Kwik-Bolt II 1/2in (12.7 mm) diameter by 8in (203mm) long per P/N 2106573 at the leveling pads into concrete floor.
Foot Switch	73 (33)	-	-	-	-
Power Distribution Unit	~770 (~350)	28 x 22 (700 x 550)	185 (909)	Four Casters support area of 28 X 22 (711 X 559).	Casters are for positioning and service. Set on floor. May be anchored to floor using angle brackets ² in seismic zones.
Console w/ single-piece desktop & w/o monitors	Elite: 430 (195) Edge/Excel: 397 (180)	48.8 x 48.6 (1240 x 1235)	Elite: 140 (681) Edge/Excel: 134 (652)	Four Casters or Leveling Feet support area of 46 X 19 (1168 X 483).	Casters are for positioning. Set on floor. Console may be anchored to floor using angle brackets ²

Notes:

- 1.) Use the GE Supplied mounting hardware ONLY IF APPROVED by qualified personnel.
[See statements in 8.1 - Table and Gantry Mounting Requirements, on page 84.]
- 2.) Seismic angle brackets are included and shipped with the PDU..

Table 6-1 BrightSpeed System Floor Loading

ITEM	NET WEIGHT LB(KG)	OVERALL W X D INCH (MM)	WEIGHT/AREA LB/SQ. FT. (KG/M ²)	LOAD PATTERN IN. (MM)	NORMAL METHOD OF MOUNTING IN. (MM) (GE SUPPLIED) ¹
Console w/o single-piece desktop & w/o monitors	Elite: 353 (160) Edge/Excel: 320 (145)	48.8 x 48.6 (1240 x 1235)	Elite: 116(563) Edge/Excel: 110 (533)		
All-In-One Console w/ single-piece desktop & w/o monitors & w/o IG	363 (165)	48.8 x 48.6 (1240 x 1235)	113 (567)		
All-In-One Console w/o single-piece desktop & w/o monitors & w/o IG	286 (130)	48.8 x 27.8 (1240 x 705)	89 (447)		
Console w/ single-piece desktop & w/o monitors & w/ 3 IG (Elite only)	496 (225)	48.8 x 48.6 (1240 x 1235)	163 (789)		
Console w/o single-piece desktop & w/o monitors & w/ 3 IG (Elite only)	419 (190)	48.8 x 48.6 (1240 x 1235)	138(666)		
True-In-One Console w/o monitors	192 (87)	18.5 X 29.2 (470 x 740)	99 (483)		
NIO16 Console	176 (80)	19X29 (470X740)		Four Casters support	
OpenOC16 Console	143.5 (65.1)	15.7X 26.4 (400 x 671)			
Monitor - LCD (each)	20 (9)	16.5 x 9.7 (420 x 247)			
Freedom Workspace (part 5160735)	86 (39)	51 x 26 (1295 x 662)			
Freedom Workspace (part 5168666)	99 (45)	51 x 24 (1300 x 620)			
Freedom Workspace (part 5168666-2)	108 (49)	53 x 29 (1350 x 741)			
Freedom Workspace (part 5168666-3)	97 (44)	51 x 24 (1300 x 620)			
Notes:					
1.) Use the GE Supplied mounting hardware ONLY IF APPROVED by qualified personnel. [See statements in 8.1 - Table and Gantry Mounting Requirements, on page 84.]					
2.) Seismic angle brackets are included and shipped with the PDU..					

Table 6-1 BrightSpeed System Floor Loading

1.1 Floor Loading and Anchoring Guidelines

Follow the floor loading and anchoring guidelines below when preparing a site for system installation:

- The table and gantry require secure anchoring to the scan room floor. The power distribution unit and the console sit on the floor with casters; anchoring of these components to the floor is optional, unless required because of seismic considerations.
- Anchors mount through the table and gantry supports. Use the floor template or its dimensions to locate the table and gantry 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.
- If a loading analysis determines that the gantry and table position should change relative to their position on the GE site print, be sure to take into account the clearance requirements when determining an appropriate location for the system.
- Hospitals and scanning facilities throughout the world may utilize a variety of floor types, and the disposition of different floor types may necessitate additional planning to adequately accommodate the system:
 - Wood floors often require substantial reinforcement. GE does not recommend using wood floors.
 - Temperature variation in blacktop or marble floors may allow anchor movement and pullout. GE does not recommend using these floors.
 - GE recommends using concrete floors with a minimum thickness of 102 mm (4 in.) when using GE-supplied anchoring or any other equivalent anchoring method.

1.1.1 Anchor Edge Distance Definition

The edge distance of Table/Gantry floor anchor must have a minimum tension strength.

- **GT1700 Table/Gantry:** Using Hilti KBIII 0.5inch DIA*7 inch long anchor (P/N: 5487992-2)
The distance from CL of anchor to the edge of concrete basement of table and Gantry should not be less than 178mm, which is necessary to keep anchor full tension strength f_{RN}



NOTICE

Responsibility for providing an approved support structure and mounting method for all floor types other than the GE-recommended floor rests with the purchaser. General Electric accepts no responsibility for any failure of the support structure or anchoring method, including those used for seismic mounting. GE accepts no responsibility for methods other than those listed.

1.2 GE Supplied Anchoring

GE supplies anchors for mounting the table and gantry. The console and power distribution unit do not require anchoring to the floor. It is the responsibility of the customer to have a structural engineer and trained contractor use either the GE-supplied anchoring method or to provide an equivalent anchoring method to mount the table and gantry to the floor.

Consult your architect, structural engineer, contractor, or PMI to resolve any questions.



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.

1.2.1 Specifications of GE-supplied Anchors

Table 6-2 lists the specifications of GE-supplied anchors for the system. There are two types of anchors used in this product depending on manufacturing date. Both anchors can be used for anchoring of Gantry and GT1700V Table. For a detailed view, including dimensions and additional specifications.

PART NUMBER	2106573	5487992-2
Description	Hilti Kwik Bolt 2	Hilti Kwik Bolt 3
Diameter	12.7 mm (0.5 in.)	12.7 mm (0.5 in.)
Length	203 mm (8 in.)	178 mm (7 in.)

Table 6-2 GE-Supplied Anchor Specifications

Section 2.0

Mounting Data, Including Seismic



WARNING

POTENTIAL FOR PATIENT INJURY.

IMPROPERLY SECURED TABLE MAY TIP, DISLODGING PATIENT.

PROPER ANCHORING IS KEY TO MAINTAINING PATIENT SAFETY DURING SYSTEM OPERATION.

The following pages show center-of-gravity information for system components:

- Gantry: [Figure 6-3](#)
- Table: [Figure 6-5](#), [Figure 6-6](#)
- Power Distribution Unit: [Figure 6-7](#)
- Operator's Console/Computer: [Figure 6-9](#), [Figure 6-10](#),
- Freedom Workspace Table. [Figure 4-16](#), [Figure 4-17](#), [Figure 4-18](#), [Figure 4-19](#)

Floor mounting hole locations for components that don't have templates are also in this section.

Customer is responsible for seismic mounting. Refer to all applicable codes in your area.

GE provided floor anchors ([Figure 6-1](#)) are designed to be used ONLY on concrete floors that meet the concrete floor requirement. Supplied floor anchors must be installed by a trained contractor, and shall be set to a minimum depth of 3 inches at each anchor point. Any anchors having more than 1 inch of thread showing above the nut, when torqued to 55 ft.-lbs, shall have a second anchor installed in the closest adjacent hole. the second anchor shall be installed to the standard depth and torque specifications.

MOUNTING REQUIREMENTS	ANCHOR P/N 2106573	ANCHOR P/N 5487992-2
Minimum Floor Thickness:	102 mm (4 in.)	102 mm (4 in.)
Recommended Drilling Depth:	95 mm (3-3/4 in.)	85 mm (3-3/8 in.)
Average Anchor Embedment:	89 mm (3-1/2 in.)	75 mm (3 in.)
Minimum Anchor Embedment:	76 mm (3 in.)	63 mm (2-1/2 in.)
Available Alternate Anchor Locations:	Yes	Yes
Shipped Anchor Size:	203 mm (8 in.)	178 mm (7 in.)
Alternate Anchoring Methods:	Yes (see notes, below)	Yes (see notes, below)
Floor Levelness Requirement:	6 mm (1/4 in.) over 3 m (10 ft.)	6 mm (1/4 in.) over 3 m (10 ft.)

Table 6-3 Gantry and Table Mounting Requirements

Note: If the Installers cannot set all for anchors for the GT1700V table, the installer must inform the customer that the minimum anchoring cannot be met, and structural engineering contractor is strongly recommended to determine the anchoring method and certify that their anchoring meets the stated GE minimum load requirement and torque specifications.

Note: All other anchoring methods on floor types other than the concrete minimum must be determined at the customer's expense by a structural engineering contractor, and anchoring method must be certified to meet the stated GE minimum load requirement and torque specification.

Note: If installing the GE BS scanner on a floor type other than a 102 mm (4 in.) concrete floor, all structural specifications in this document must be reviewed and met.

NOTE:
1) ANCHORS MUST BE EMBEDDED
AT LEAST 125MM [4.9 INCHES]
FROM CONCRETE FLOOR EDGE OR
EXPANSION JOINT
2) TORQUE ANCHOR TO
75 N-M [55 FT-LBF]

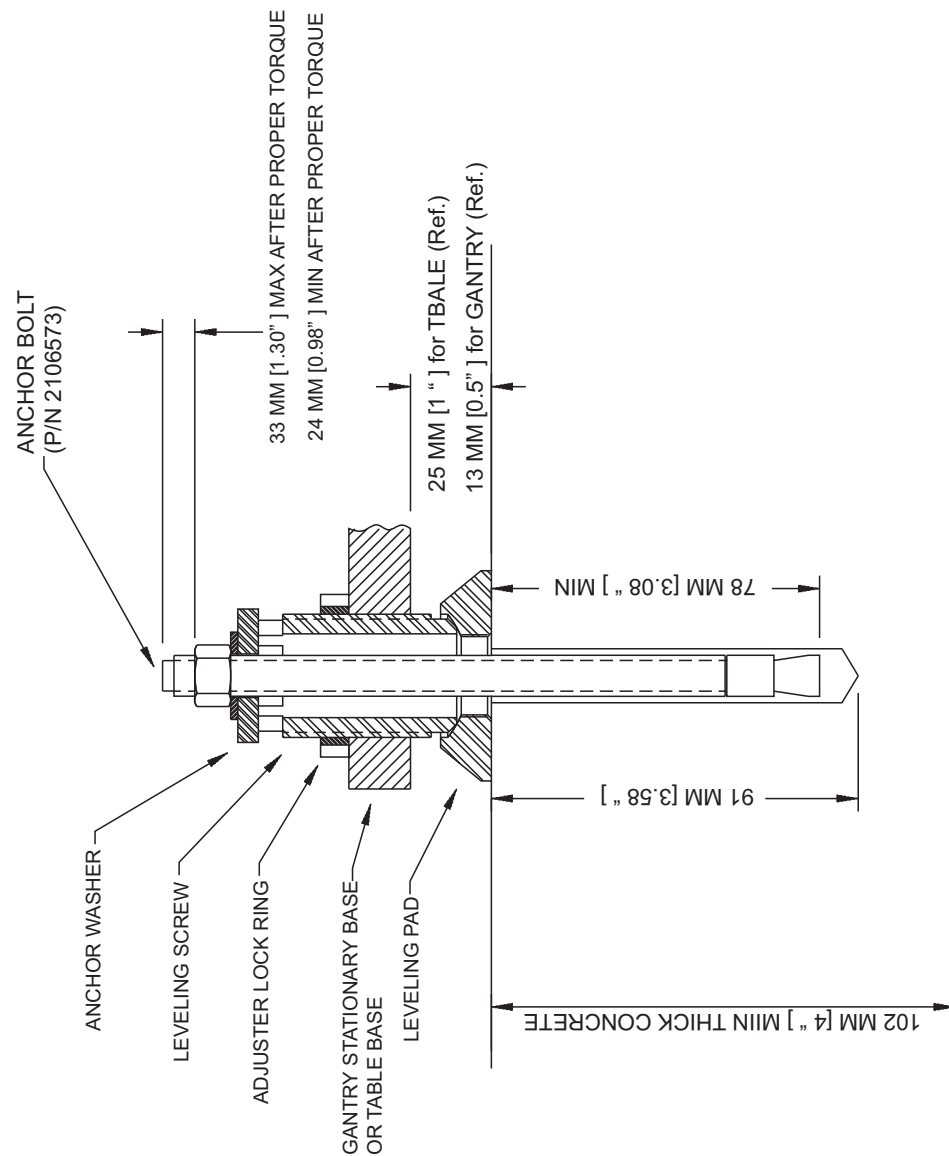


Figure 6-1 Gantry and Table Anchor with 2106573 (8 in.) Anchor Bolt

- NOTE:
- 1) ANCHORS MUST BE EMBEDDED AT LEAST 160MM [6.3 INCHES] FROM CONCRETE FLOOR EDGE OR EXPANSION JOINT
 - 2) TORQUE ANCHOR TO 54 N-M [40 FT-LBF]

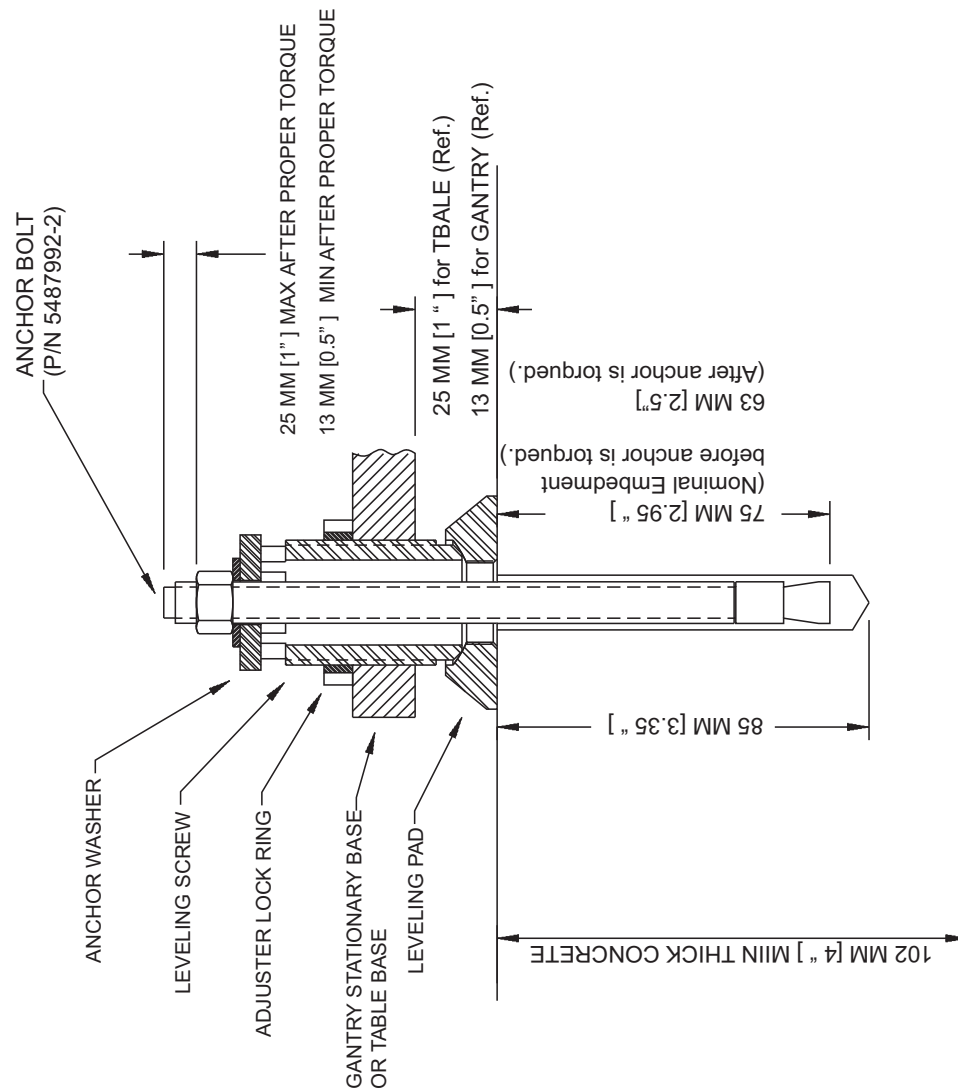


Figure 6-2 Gantry and Table Anchor with 5487992-2 (7 in.) Anchor Bolt

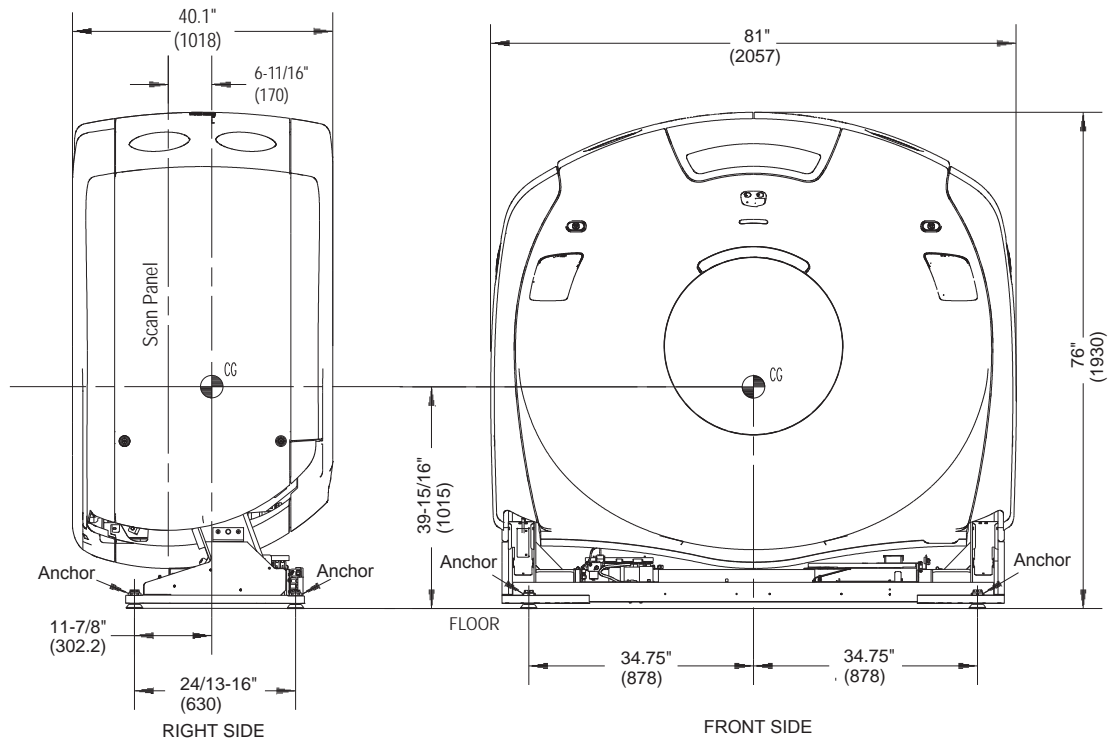
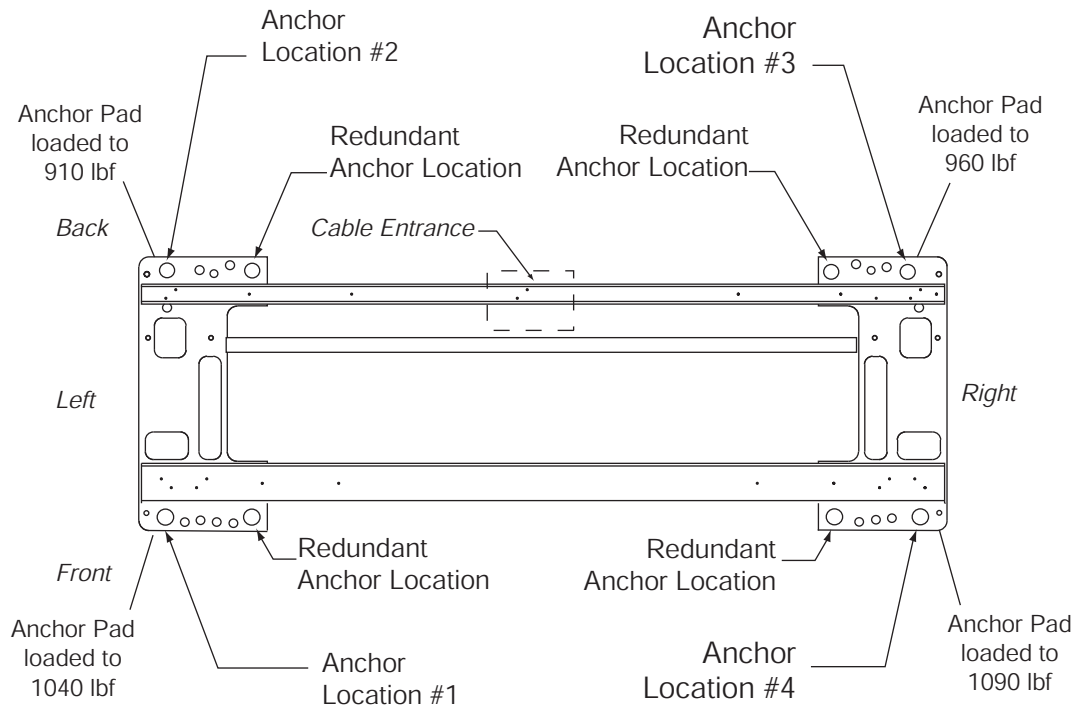


Figure 6-3 Gantry



Note: Adjusters are used at each anchor location. Anchor hole ID is 1" (2.5 cm). Void between adjuster and anchor must be filled according to local building codes for seismic application.

Figure 6-4 Gantry Anchor Location

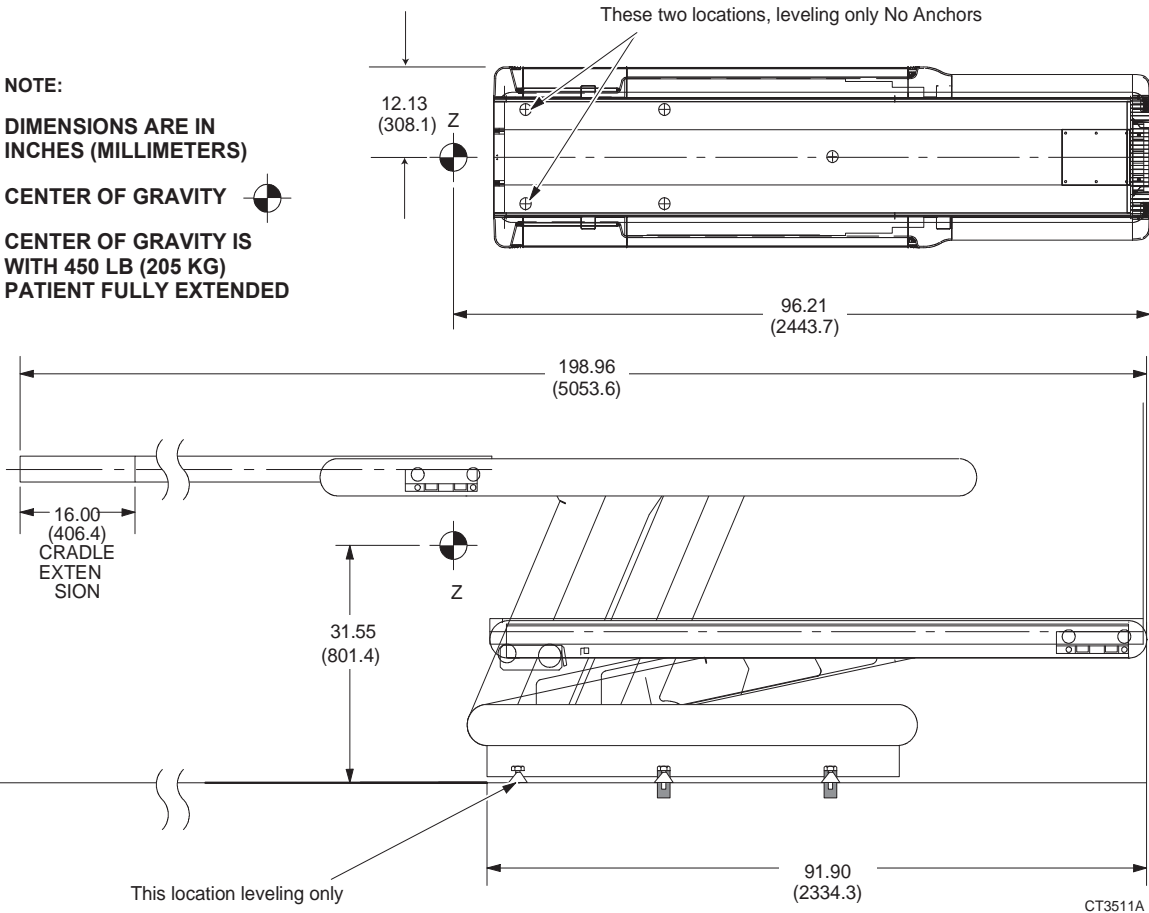


Figure 6-5 Patient Table (H-Power)

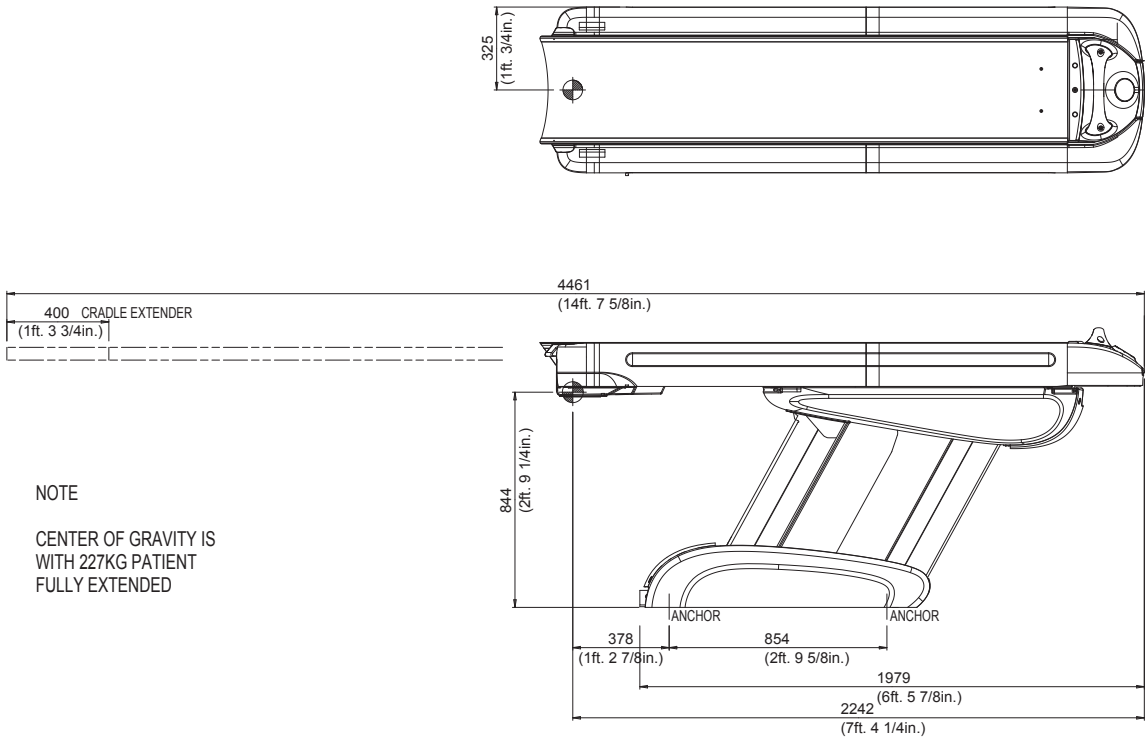


Figure 6-6 Patient Table (GT1700)

Note: See [Figure 4-7](#) for cradle *operational* limits.

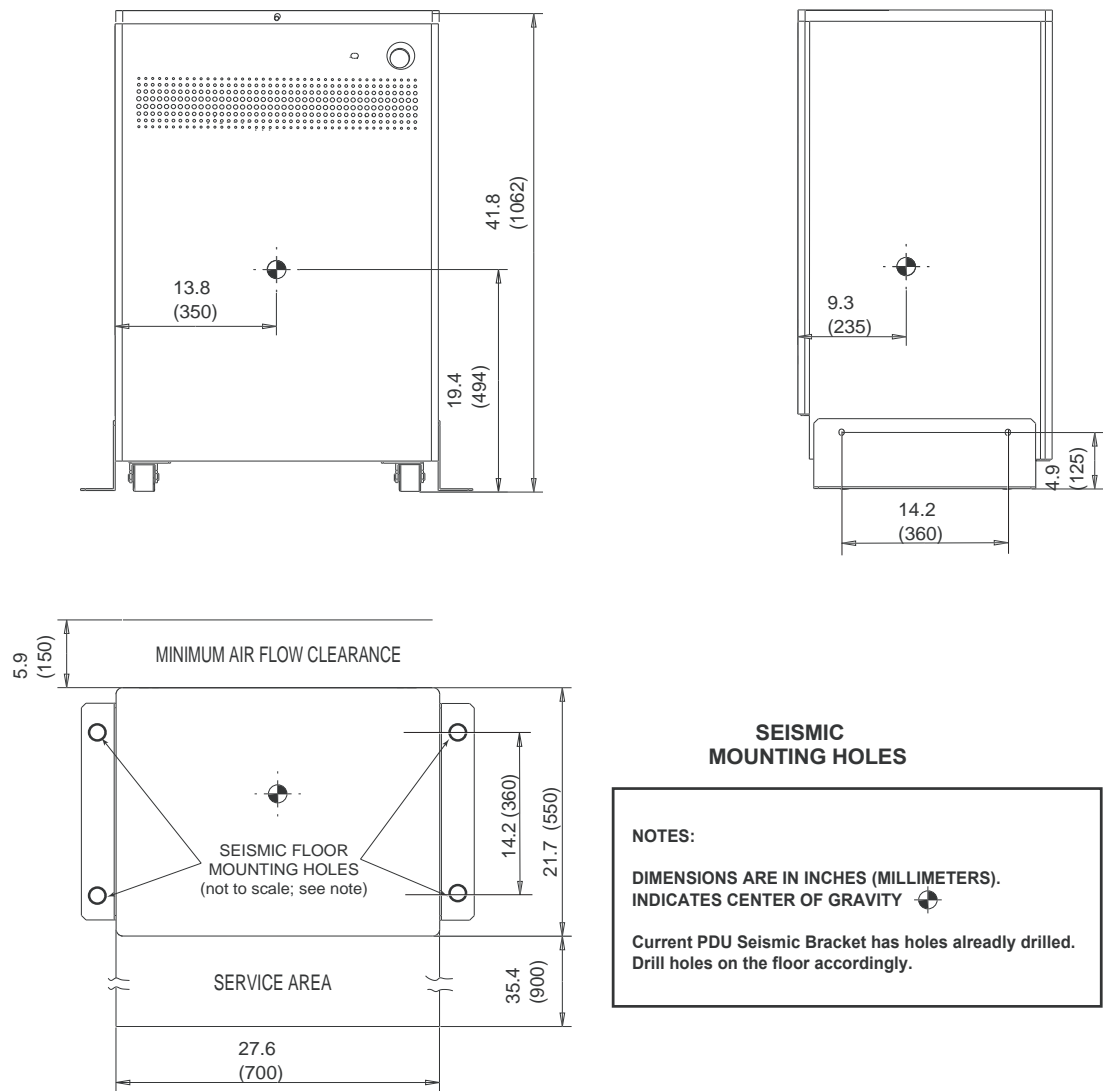


Figure 6-7 Power Distribution Unit (NGPDU)

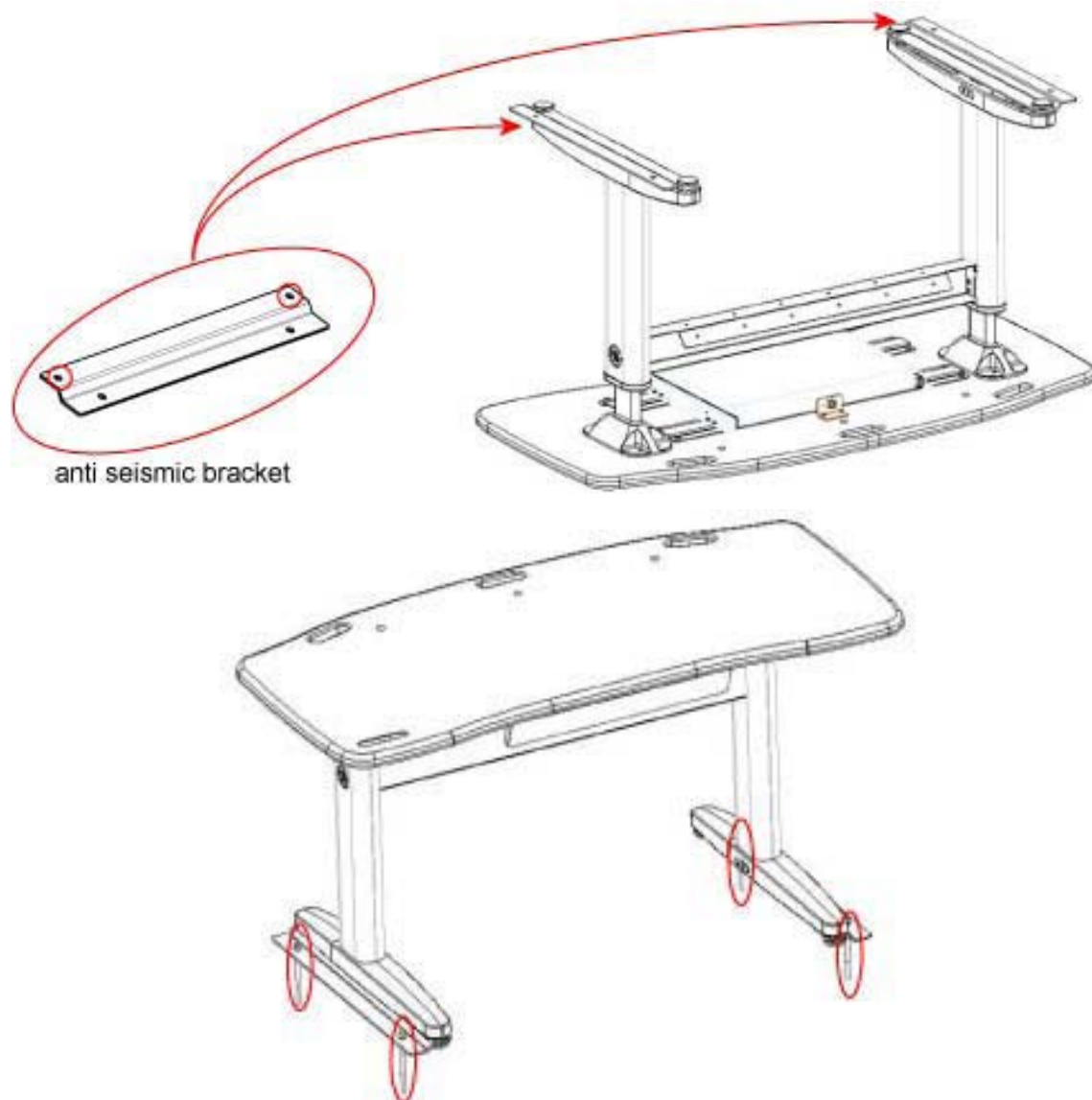


Figure 6-8 FWS Assembly (5168666-3)

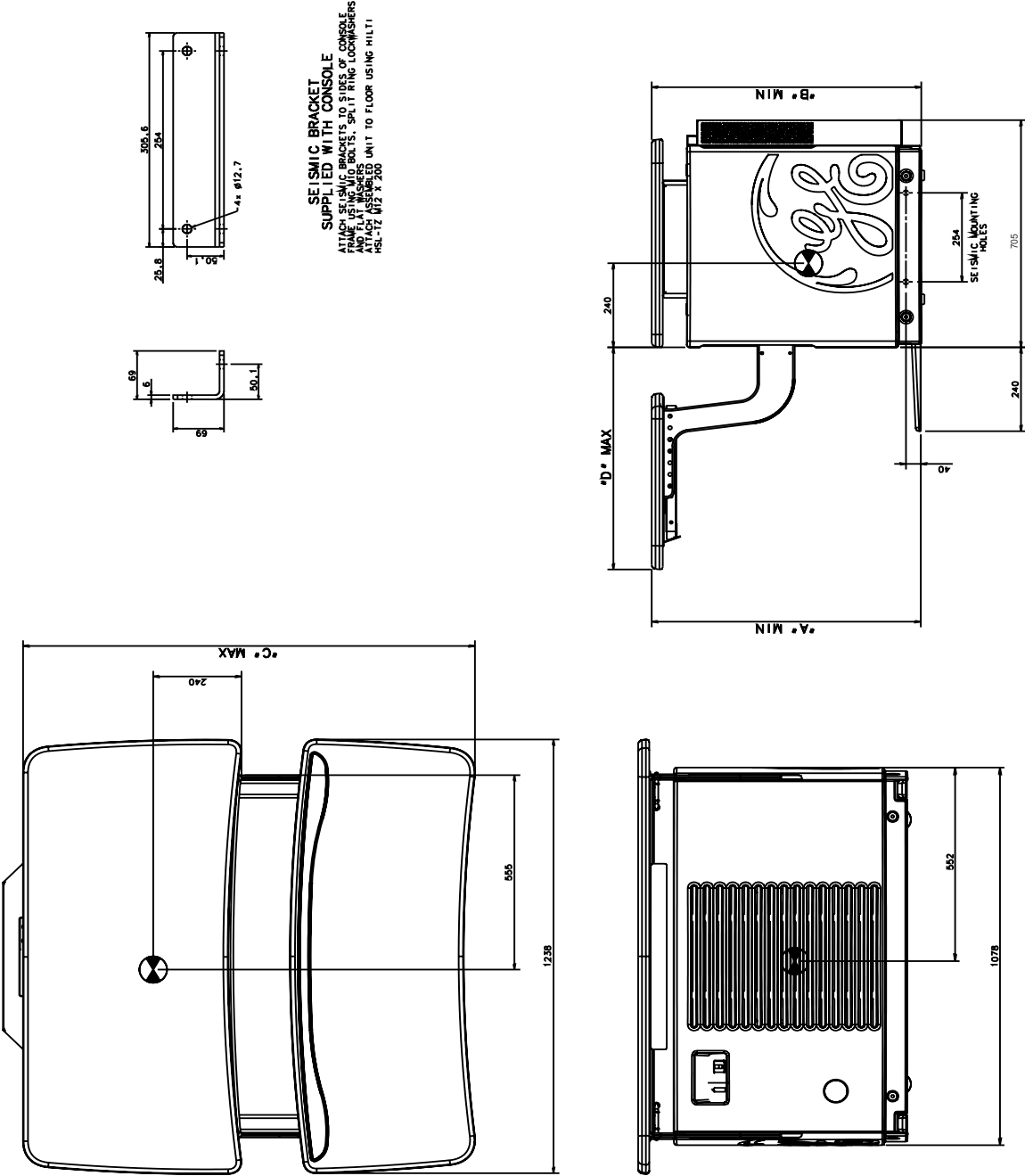


Figure 6-9 GOC4/LCGOC/AIO Operator Console

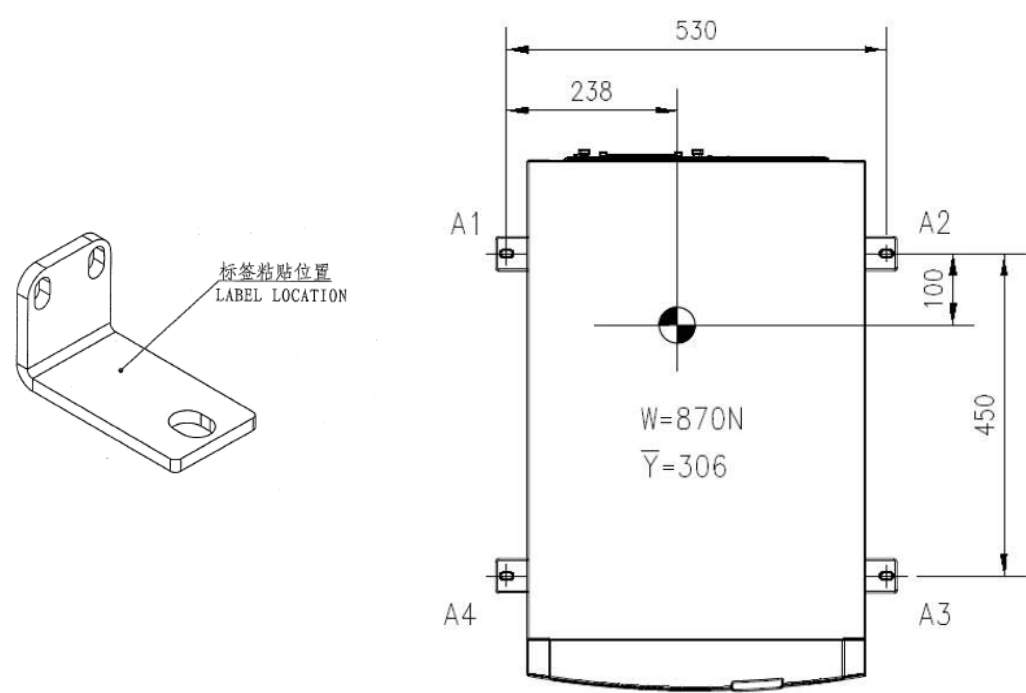


Figure 6-10 TIO and NIO16 Console Seismic Mounting Hole Position

Unit: mm (in)

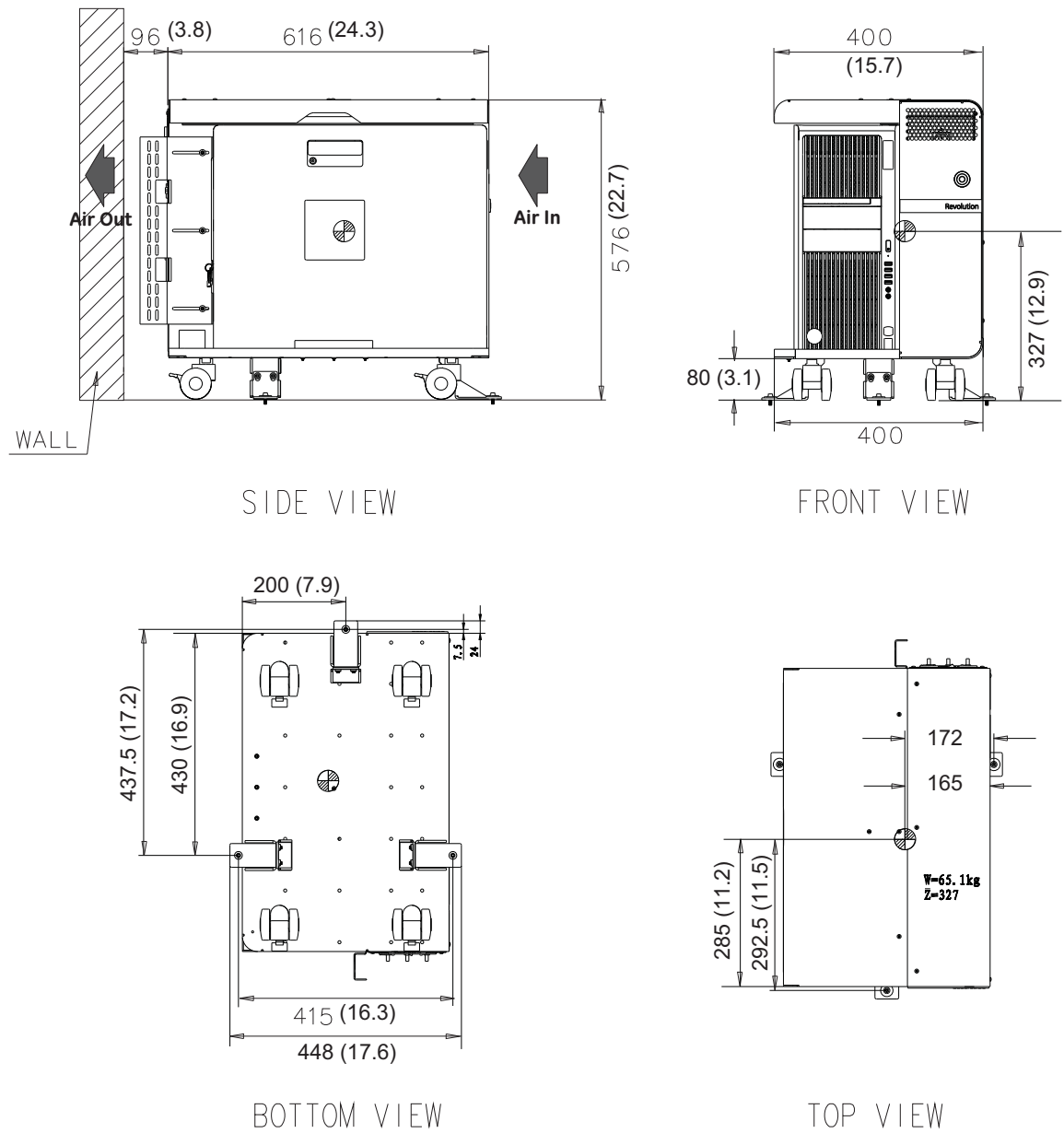


Figure 6-11 OpenOC Center-of-Gravity

Chapter 7

Delivery and Storage Requirements

This chapter provides information necessary for planning a safe and successful delivery of the system from GE Healthcare to the receiving area of the installation site, and from the receiving area of that facility to the scan suite.

Section 1.0

Delivery to the Facility

Your Project Manager of Installation will determine the most appropriate means of transporting the system to your facility. However, the type of receiving area at the facility where the installation will occur determines, to a large extent, the method used to transport the system to that facility. When planning for delivery, facilities fall into two general categories: those with a loading dock, and those without a loading dock.

1.1 Loading Dock Deliveries (Preferred methods)

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 gantry 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.

1.2 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.

1.2.1 Lift-Gate Truck

If a truck equipped with a lift-gate is used, the delivery truck requires a lift gate rated for a 2722.0 kg (3.0 Tons) capacity. When the gantry or table is lowered to ground level they 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 gantry or table level during movement to avoid flipping. Failure to smoothly transition the table and gantry to ground level may cause serious damage to the table, gantry or their transport dollies.

1.2.2 Tilt Bed Truck

If a tilt bed delivery truck is used, a GE representative shall supervise the delivery of the CT scanner to ensure the system is safely delivered without damage. To avoid damaging the table and gantry, the representative shall direct the driver to attach strapping to the lowest point (not the wheels) of each dolly. When the table or gantry is 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 gantry to ground level may cause serious damage to the table, gantry or their transport dollies.

1.2.3 Forklift Truck

A forklift can be used to unload the gantry, provided that the lifting option is ordered and delivered. The system will arrive with a lifting skid attached to the gantry and table. This option cannot be added later as an on-site addition.

1.2.4 Rigging

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



**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 gantry assembly and both gantry transport side dollies must be placed on a lifting platform. GE does not provide a lifting platform.
- 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 so no lifting straps or cables come in contact with any part of

the gantry or table subsystems or its 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.

Section 2.0

Delivery to the Scan Suite

Once at the installation site, conveyance of the system into the scan suite may involve special considerations, such as vertical lifting, or transportation through stairwells, which involves additional planning by the Project Manager of Installation.

2.1 Lifting

Both vertical and horizontal lifting require professional riggers. The PMI should always notify CT engineering before attempting either lifting procedure and should make sure that the order includes the necessary lifting fixtures, as both vertical and horizontal fixtures must appear on the order for them to ship with the system.

If delivery requires vertical lifting, the PMI adds the appropriate identifier to the order. The gantry ships in a vertical lifting crate with lifting instructions for riggers.

If delivery requires horizontal lifting, the PMI adds the corresponding identifier to the order. The gantry ships in a horizontal lifting crate with lifting instructions for riggers.

2.1.1 Stairway Deliveries

Stairways with angles at or less than 45 degrees can accommodate delivery of system components. If the site requires delivery through stairwells, the PMI adds the appropriate identifier to the order to ensure proper packaging of the system, and notifies CT engineering before attempting the procedure. The components ship attached to special lifting skids with lifting instruction for riggers.

2.2 Floor Protection

GE recommends floor protection along the delivery path from the dock/receiving area to scan room.

2.3 Un-Loading and Un-packing the System

Retain the packaging surrounding the following components:

- Console-Shipped on a shock resistant skid. Do not remove the skid.
- UPS-Shipped on a shock resistant skid. Do not remove the skid.

Section 3.0 Dollies

3.1 Installations within the United States

Typically, domestic shipments (shipments within the United States) involve the use of dollies for moving the gantry, table, and console. After completing installation, return the dollies to GE using the shipping document found in Box #1.

3.2 Zero Clearance Dollies

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>.

3.3 Tilting Table Dollies

Deliveries involving small elevators with a depth of at least 2438 mm (96 in.) require tilting table dollies. If storing the system prior to installation, do not order tilt dollies. If you are unable to obtain tilt dollies for delivery, substitute riggers in their place. A limited number of tilt dollies exist for U.S. deliveries. To order tilt dollies, go to <http://www.umi-dollyshop.com>.

3.4 Installation Outside of the United States

Customers may purchase dollies (B7850LD) for shipments outside of the United States. After removing the system from the crates, DO NOT return dollies shipped outside of the US to GE Healthcare in Milwaukee, WI, USA. Instead, forward them to the local GE office or warehouse. Zero Clearance and Tilting Table dollies can be purchased through UMI, To buy tilt dollies, go to: <http://www.umi-dollyshop.com>.

Section 4.0

Gantry Considerations

The gantry is mounted on the pallet. Use dolly elevating casters to lift gantry off its base and roll it into position. See [Figure 7-1](#).



Figure 7-1 Gantry with dollies

Door Openings. Clear door openings for moving equipment into building must be 1067 X 2083 mm (42 X 82 in.) minimum. 2439 mm (8 ft.) corridor width is helpful.

Elevator requirements. To move gantry from receiving location to scanning room, consider elevator capacity and size. By removing side rails and one dolly after gantry is placed in elevator, gantry width/length and elevator depth requirements are reduced. Contact a representative of elevator manufacturer if gantry weight exceeds elevator capacity.

CONFIGURATION	LENGTH CM (IN)	WIDTH CM (IN)	HEIGHT CM (IN)	WEIGHT KG (LB)
Dollies On, Side Rails On	281 (111)	129 (51)	200 (79)	2041 (4496)
Dollies On, Side Rails Removed	281 (111)	100 (39.4)	200 (79)	2013 (4434)
Dollies Off, Covers Off	197 (77)	86 (34)	185 (73)	1662 (3660)

Table 7-1 Size of Gantry & Dollies, with and without Side Rails

Minimum hallway and door size for gantry with covers and dollies attached, but side rails removed, is 101.6 cm (40 in.).

For alternative lifting arrangements and instructions, contact GE Installation Support Services.

Dollies: Dollies can be purchased for international shipments (B7850LD) or US shipments (B7850GD) to be used at the customer site. After the system has been removed from the crates, dollies shipped with international shipments **only** are not to be shipped back to GE in Milwaukee, WI, USA, but to be retained to the local GE office or warehouse.

Gantry shipping dimensions are:
2440mm (96 in.) long, 1370mm (54 in.) wide, 2180mm (86 in.) high

Section 5.0

Table Considerations

5.1 HP-Power Table

The table is shipped with 2 crates. The mainbody of table is put in crate without dollies. Bottom Cover and accessories are shipped in another crate.

For the table shipping dimensions, refer to [Table 7-2](#).

LENGTH		WIDTH		HEIGHT	
MM	IN	MM	IN	MM	IN
2620	103	900	35	1300	51
1700	67	770	30	750	30

Table 7-2 H-Power Table Shipping Dimensions

5.2 GT1700 Table

The table is shipped without side covers installed. Covers are shipped in separate boxes. The table is mounted with two dollies. For the table dimensions with dollies, refer to [Table 7-3](#)

	LENGTH		WIDTH		HEIGHT		WEIGHT	
	MM	IN	MM	IN	MM	IN	KG	LB
GT1700V	2489	98	762	30	1143	45	576	1270

Table 7-3 GT1700 Table Dimensions with dollies

Section 6.0

Console Considerations

LCGOC/GOC4/AIO Console:

The console is shipped without the keyboard table installed. The keyboard table is shipped with the console. See [Figure 7-2](#).

The dimensions of the console alone (as shipped) are 1170mm (46 in.) deep, 1340mm (53 in.) wide, and 1150mm (45 in.) high.



Figure 7-2 Console packing

True-In-One Console:

The console is shipped without the keyboard table installed. The keyboard table is shipped with the console.

The dimensions of the console alone (as shipped) are 740mm (29 in.) deep, 470mm (19 in.) wide, and 640mm (25 in.) high.

NIO16 Console:

The console is shipped without covers installed. The covers are delivered in the Product Grade Collector.

The dimensions of the console alone (as shipped) measure 830 mm (33 in.) deep, 470 mm (19 in.) wide, and 656 mm (26 in.) high.

OpenOC16 Console:

The console is open chassis without covers installed.

The dimensions of the open console alone (as shipped) measure 850 mm (33.5 in.) deep, 550 mm (21.6 in.) wide, and 740 mm (29.1 in.) high.

Section 7.0

PDU Considerations

The PDU is shipped on a skid equipped with ramps for unloading.

PDU shipping dimensions (on the shipping skid) are 720 mm (28 in.) deep, 870 mm (34 in.) wide, and 1320 mm (52 in.) high.

Section 8.0

Storage Requirements

8.1 Short Term Storage (Less than 6 months)

If the CT system is to be stored before installation, store in a temperature and humidity controlled warehouse. Protect from weather, dirt and dust.

Meeting these requirements prevents rust and corrosion from forming on bearing surfaces due to condensation.

- Storage temperature should not exceed 0° to 30° F (32° to 86° C).
- Storage relative humidity up to 70%, non-condensing.
- Maximum relative humidity rate of change is 5%/hr.
- The maximum temperature rate of change is 5° F/hr. (3° C/hr.)
- Air pressure should be between 700hPa and 1060hPa.



NOTICE Between delivery is considered short-term storage.
Van storage must meet the same specifications as above.

8.2 Construction-Site Storage

When storing the CT system at a construction site be sure to adhere to the following storage requirements:

- Do not damage or puncture the shipping crate.
- Do not remove packaging until all construction is completed at the site and all dust created by the construction is removed.
- Maintain a storage temperature within the range of 10° to 32° C (50° to 90° F).

Maintain a relative humidity (non-condensing) between 20% and 70%.

8.3 Long Term Storage (6 months or more)

If the CT system is to be stored before installation, store in a temperature and humidity controlled warehouse. Protect from weather, dirt and dust.

Meeting these requirements prevents rust and corrosion from forming on bearing surfaces due to condensation.



- Storage temperature should not exceed 50° to +90° F (10° to +32° C).
- Maintain relative humidity (non-condensing) between 20% and 70%.

If you are storing a system longer than six (6) months, but less than 12 months, contact CT Engineering for installation start-up instructions. Storage longer than 12 months is not recommended.



Figure 7-3 Package Symbols (Storage)

Section 9.0 Extreme Temperature Transportation and Deliveries

-  **NOTICE** Failure to adhere to Extreme Temperature Transportation and Delivery requirements will likely result in equipment damage.
- Extreme temperatures should be avoided during system transportation and delivery.
- Extreme temperatures consist of temperatures below -18° C (0° F), or above 49° C (120° F), without humidity control.
- When transporting the CT system, prevent extended exposure of the system to temperatures or humidity outside of the following specifications:
- Time: Up to two weeks duration
 - Temperature: -40° to +70° C (-40° to +158° F)
 - Humidity: 10% to 100%
 - Altitude: -1,800ft to 18,000ft
-  **NOTICE** Component Freezing occurs if CT system is exposed to temperatures below -18° C (0° F) for a period longer than two days.
- Allow a minimum of 12 hours for the CT system to adjust to ambient room temperature, prior to installation.

Section 10.0

Site Environmental Considerations

10.1 Dust/Dirt Contamination

The system (consisting of: Console, PDU, Table and Gantry) are highly susceptible to airborne contaminants, especially concrete and drywall dust. Due to the possibility of contamination, these systems should NEVER be installed in a construction site. Any site with unfinished floors, walls or ceilings is considered a construction site, and is not suitable for system installation.



NOTICE The act of installing a GE CT scanner in a construction (i.e., unfinished) site will likely result in the following adverse effects:

- Increased installation time
- Decreased installation quality
- Increased scanner downtime, due to increased service calls

10.2 Chemical Contamination

Wet film processors must never be installed in the same room as the scanner, due to the possibility of chemical contamination of system CT scanner components. Such chemicals can contribute to increased equipment failures, increased system downtime, and decreased reliability. Film processor equipment installation must meet the manufacturer's requirements (e.g. ventilation specifications) and all applicable national and local codes. Also, consideration's should be given to the location of this equipment and chemical fumes relative to human contact as it relates to locating this equipment and chemicals in the control room.

Section 11.0

Handling Requirements

Communicate the information in this chapter to any personnel who will transport, move, or otherwise handle the system components during transportation and delivery of the system.

11.1 Transportation

To avoid dropping the gantry, it is recommended that the system is transported from GE Healthcare to the facility of the installation site, shipping dock-to-dock in a van. However, facilities without a loading dock may transport the system using lift-gate or flatbed trucks, provided that no dropping or mis-handling of the system occurs. These methods involve unloading system components from the truck and then rolling them across SMOOTH sidewalks or other paved surfaces.

11.2 Handling Requirements

The design of the system does not tolerate dropping, shock, vibration, tipping, or hoisting. Be sure to communicate these handling requirements to all parties involved in transporting, moving, and handling system components.

11.2.1 Avoid Dropping

Never drop the gantry, console, table, or PDU. A drop from a height greater than 13 mm (0.5 in.) may cause structural damage to the frame or other major components. Damage resulting from a drop (e.g., bent frame, misalignment) may not become apparent until after the system is installed.

11.2.2 Avoid Shocks and Vibrations

The design of the system, including the gantry, console, table, and PDU, does not tolerate excessive shock or vibration, which may occur during unloading. For example, rolling the console across a "washboard" style ramp may vibrate components, causing loose or broken connections. Damage resulting from shock or vibration (e.g., monitor, CD-ROM, hard-drive, or console failure) may not become evident until after the system is installed.

11.2.3 Avoid Tipping

All system components must remain upright at all times; avoid tipping them. Move the gantry by rolling it on its dollies ONLY, do NOT hoist it. Avoid tipping or lifting the gantry when moving it through hallways, doorways, elevators, etc.



NOTICE Never lift the gantry with a forklift. Lifting the gantry requires engineering approval for each occurrence. Your GE PMI should contact CT Engineering for all special lifting requirements, as unauthorized gantry lifting can cause gantry bearing damage.

11.3 Inclines and Flat-bed Truck Removal

Inclines and Flat-bed Truck Removal wrecker, attach the straps to the LOWEST possible point on the dolly, and lower the gantry at the SLOWEST reasonable rate, (see [Figure 7-4](#)).

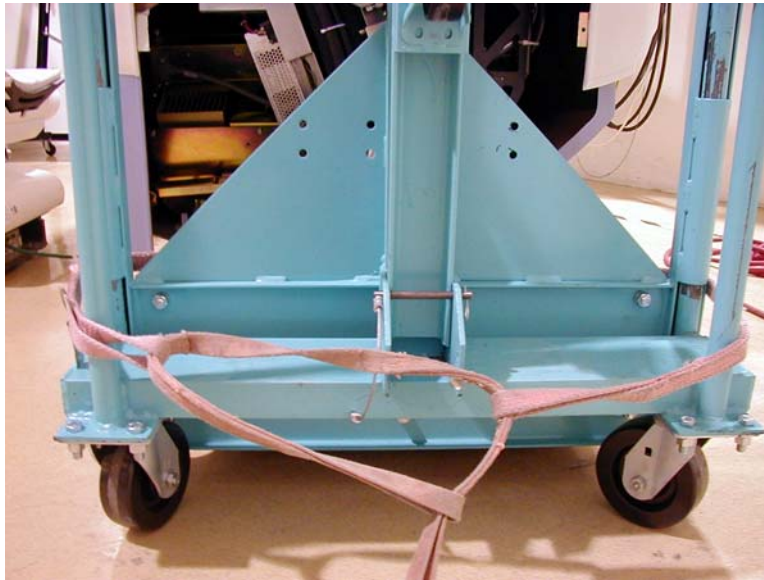


Figure 7-4 Proper Gantry Strap Location



WARNING SOME ASSEMBLIES ARE TOP-HEAVY. BE CAREFUL NOT TO TIP.

Chapter 8

Power Requirements

Section 1.0

Introduction

The power distribution unit (PDU) supplied with the system transforms and distributes power to all system components. The PDU is the only power entry point required to operate system.

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

When routing the power wiring all three phase wires and ground must be run in the same conduit or raceway duct. Power wires should be routed separately from system control and signal cables, using a separate conduit or trough in raceway duct.

Metallic conduit, floor duct or surface raceway may be used for running cables, depending upon local codes and practices. However, cable passageways should be large enough to install any cable with all other cables already installed. Use of non-metallic conduit is not recommended.

Section 2.0

System Input Power

2.1 Power Source Configuration

The BrightSpeed CT Scanner is designed to operate on a three-phase, four-wire wye power source. A solidly grounded wye source is preferred. The neutral wire does not need to be run to the system, i.e., four-wire connection. If a neutral wire is run, then it should be terminated in the PDB or A1 box. A dedicated feeder from the nearest Main Distribution Panel (MDP) should be used to supply power to the scanner. 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 PDU. It must be located within 10 m (32 ft.) of the PDU, dedicate to CT system, visible to PDU service personnel, and must have lockout /tagout provisions.

2.2 Rating

BrightSpeed Elite (16 slice), Edge (8 slice): 90kVA

BrightSpeed Excel (4 slice): 75 kVA is standard rating, 90kVA is an optional rating.

The BrightSpeed system operates on three-phase power meeting the following specifications.

(Note: The value in the brackets is for 75kVA.)

Voltage	200 to 480 VAC
Capacity	90 kVA (75KVA)
Frequency	50 or 60 Hz +/- 3 Hz

- Maximum power demand = 90 kVA (75KVA)@ 0.85 PF at a selected technique of 140 kV, 380 mA (300mA).
- Average (continuous) power demand at maximum duty cycle = 20kVA.

The disconnect device referenced above must provide overcurrent protection for the system. A disconnect utilizing undervoltage release control is preferred over shunt trip devices. The rating of the disconnect device depends on the nominal line voltage at the site. Refer to [Section 3.0 Recommended Power Distribution System](#), for minimum rating requirements and suggested disconnect devices.



NOTICE

The electrical rating is described on the system rating label attached on the gantry; not on the PDU.

WARNING

TO PREVENT POWER LOSS TO OTHER LOADS IN CASE OF AN UNEXPECTED CT OR PET SYSTEM FAULT, THE POWER FEEDER MUST HAVE OVERCURRENT PROTECTION SUCH THAT THE DOWN-STREAM OVERCURRENT PROTECTION DEVICES (E.G. GE A1 PANEL) CLEAR THE FAULT BEFORE ANY UP-STREAM OVERCURRENT PROTECTION DEVICE OPENS.

2.3 Regulation

Total load regulation as measured at the PDU input terminals must not exceed 6%. The capacity of the facility transformer and size & length of feeder wires directly affect the load regulation presented to the system. Refer to [Section 3.0 Recommended Power Distribution System](#), for recommended single-unit installation specifics.

2.4 Phase Imbalance

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

2.5 Sags, Surges & Transients

Sags and surges of the power line must not exceed the absolute range limits shown in Table 8-1. Maximum transient voltages should be limited to 1500V peak.

2.6 Grounding

Metal conduit, raceway or the armor of armored cable used to power the system should be bonded to the PDU cabinet. However, in addition to such mechanical grounding, a dedicated 1/0 (55 mm²) or larger insulated copper ground wire must be run with the phase wires from the main distribution panel to the PDU.

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

The ground wire should be bonded to intermediate distribution panels through which it passes in accordance with local codes. The resistance between the PDU ground and the facility earth ground must not exceed 0.5 ohm. In addition, the total resistance between the PDU ground and earth must not exceed 2 ohms.

Section 3.0

Recommended Power Distribution System

A dedicated feeder run from the facility main isolation transformer is recommended to power the BrightSpeed CT scanner. If the scanner must be powered from an existing distribution transformer and secondary feeder, such as the equipment distribution panel of an X-ray department, installation with other X-Ray equipment that use rapid film changers should be avoided. These changers use a large number of high powered, closely spaced exposures, which may coincide with the CT scan and produce image artifacts.



IF THE POWER FEED FOR THE A1/PDB PANEL IS NOT ON A DEDICATED POWER TRANSFORMER ANY DEVICE THAT SHARES POWER FROM THAT TRANSFORMER MAY BE IMPACTED BY INADVERTENT POWER INTERRUPTION CAUSED BY AN A1/PDB POWER PANEL FAULT. CONVERSLY, THE OPERATION OF OTHER DEVICES SHARING THE POWER TRANSFORMER MAY ALSO IMPACT THE OPERATION OF THE CT/PET SCANNER.

If a dedicated distribution transformer is provided for the scanner, the minimum recommended transformer size is 112.5 kVA, rated 2.4% regulation at unity power factor. For this configuration, the minimum recommended feeder size and overcurrent protection device based on line voltage is shown in [Table 8-2 Minimum Feeder Wire Size](#).

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

SYSTEM CHARACTERISTICS:

Note: [\(xxx\):The value in the brackets is for 75kVA.](#)

- Maximum power demand = 90kVA (75kVA) @ 0.85 PF: at a Selected Technique of 140 kV, 380 mA (300mA).
- Continuous (average) power demand at maximum duty cycle = 20kVA (16.7kVA).
- Maximum allowable total source regulation is 6%.
- Minimum recommended transformer size: 112.5 kVA (93.75kVA), with 2.4% rated regulation at unity power factor. Resultant maximum allowable feeder regulation is 3.4%.

The nominal line voltage must fall within one of the ranges listed below

Nominal Line Voltage	200	220	240	380	400	420	440	460	480
Hi-Line Limit, +10%	220	242	264	418	440	462	484	506	528
Lo-Line Limit, -10%	180	198	216	342	360	378	396	414	432
Continuous Line Current	58	52	48	30	29	27	26	25	24
Momentary Line Current	260	236	217	137	130	124	118	113	108
Maximum Line Current	289	262	241	152	144	137	131	126	120
Minimum Recommended Circuit Protection Rating	150	150	150	110	110	100	100	90	90

Table 8-1 Nominal Line Voltage

FEEDER LENGTH (MDATO A1) FEET (METERS)	MINIMUM FEEDER WIRE SIZE, AWG OR MCM (SQ. MM)/ VAC								
	200 VAC	220 VAC	240 VAC	380 VAC	400 VAC	420 VAC	440 VAC	460 VAC	480 VAC
50 (15)	1 (45)	2 (35)	3 (30)	4 (22)	4 (22)	4 (22)	4 (22)	4 (22)	4 (22)
100 (30)	1/0 (55)	1/0 (55)	1 (45)	4 (22)	4 (22)	4 (22)	4 (22)	4 (22)	4 (22)
150 (46)	3/0 (85)	2/0 (70)	2/0 (70)	4 (22)	4 (22)	4 (22)	4 (22)	4 (22)	4 (22)
200 (61)	4/0 (100)	4/0 (100)	3/0 (85)	2 (35)	3 (30)	3 (30)	4 (22)	4 (22)	4 (22)
250 (76)	5/0 (125)	5/0 (125)	4/0 (100)	2 (35)	2 (35)	2 (35)	3 (30)	3 (30)	4 (22)
300 (91)	6/0 (170)	5/0 (125)	5/0 (125)	1 (45)	1 (45)	2 (35)	2 (35)	2 (35)	3 (30)
350 (107)	7/0 (215)	6/0 (170)	5/0 (125)	1/0 (55)	1/0 (55)	1 (45)	1 (45)	2 (35)	2 (35)
400 (122)	7/0 (215)	7/0 (215)	6/0 (170)	2/0 (70)	1/0 (55)	1/0 (55)	1 (45)	1 (45)	1 (45)

Table 8-2 Minimum Feeder Wire Size

SUB-FEEDER LENGTH (A1 TO PM) FEET (METERS)	MINIMUM SUB-FEEDER WIRE, AWG OR MCM (SQ. MM)								
	200 VAC	220 VAC	240 VAC	380 VAC	400 VAC	420 VAC	440 VAC	460 VAC	480 VAC
32(9.7536)	1/0 (55)	1/0 (55)	1/0 (55)	2 (35)	2 (35)	3 (30)	3 (30)	3 (30)	3 (30)

Table 8-3 Minimum Feeder Wire Size

- 1.) [Table 8-1](#), [Table 8-2](#), and [Table 8-3](#) above are based on the use of copper wire, rated 75 C and run in steel conduit. Ampacity is determined in accordance with the National Electrical Code (NFPA 70), Table 310-16 (2002)
- 2.) The minimum feeder size is determined by the ampacity of the circuit protection device listed above, except where a larger size is necessary to meet total source regulation limits.
- 3.) A 1/0 (55 sq. mm) ground wire is recommended in all cases.

Section 4.0 Ground System

The BrightSpeed CT Scanner has been designed to use an equal potential grounding system. The required ground system is shown in [Figure 8-1](#). There are three primary grounding points:

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

All exposed metal surfaces in the patient vicinity are grounded to the reference ground point.

For additional information, refer to Electrical Safety Equipment, Direction 46-014505.

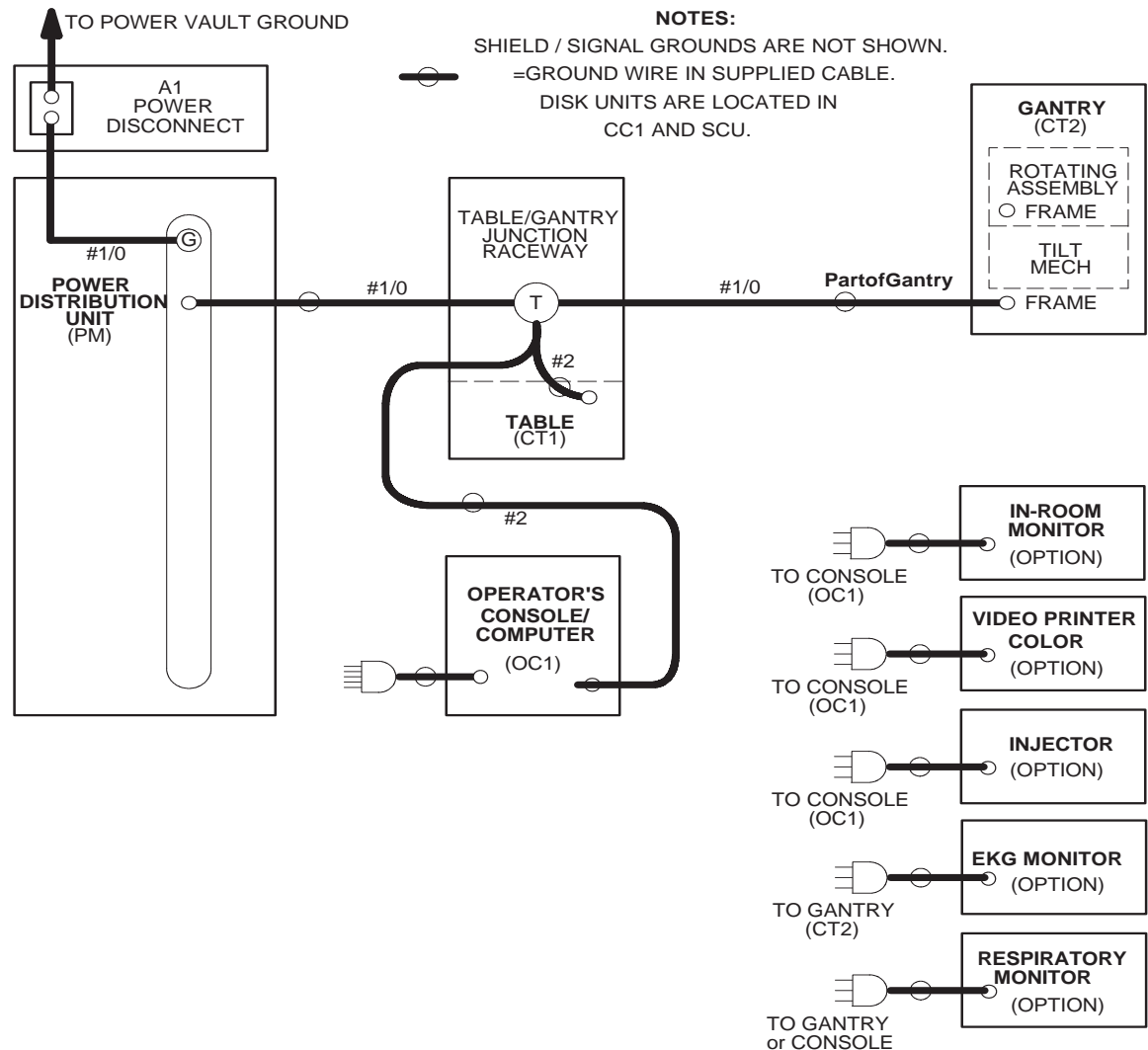


Figure 8-1 System Ground Map

Chapter 9

Interconnection Data

Section 1.0 Introduction

Figure 9-6 shows interconnection runs for a 50/60 Hz system.

Table 9-1 shows component designators for supplied equipment and options and wall power outlets.

Table 9-13 lists customer-installed wiring and supplied cables. Actual length of each run is less than the length of supplied cables to allow for routing inside equipment. Cable diameters and sizes of connectors are provided to aid in sizing conduit and access plates.

Table 9-2 and Table 9-9 list details for connection to BrightSpeed Series equipment, using short length and long length cables, respectively. Details are listed for the following types of runs as appropriate:

- Flush-floor duct
- Computer floor
- Through-wall bushing
- Junction box
- Surface floor duct
- Through-floor duct
- Wall duct
- Conduit

Need for additional junction boxes is minimized by use of either a cable raceway system or a raised computer floor. BrightSpeed Series systems use prefabricated cables with large plugs. Therefore, conduit or pipe is not recommended for cable runs.

Long cable set (B71182CA) and short cable set (B71172CA) are both optional. Order the cable set that is required for your site.

Section 2.0 Component Designators

DESIGNATOR	APPLIES TO	SOURCE
A1	Primary power disconnect	Contractor supplied
CT1	Patient table	System
CT2	Gantry	System
ITL	InSite telephone lines	Contractor supplied
LP	Line printer	Option
OC1	Operator's console/computer	System
PM	Power distribution unit	System
SEO	System emergency off	Contractor supplied
SM	Slave monitor	Option
WL	"X-ray on" warning light	Contractor supplied
DS	Door Interlock Switch	Contractor supplied
XCVR	Ethernet transceiver	System

Table 9-1 Component Designators

Section 3.0 Interconnect Runs, Wiring and Cables

3.1 GEMS Supplied (Optional, Short Run)

RUN #	LENGTH, ACTUAL (USABLE)		PART #	DESCRIPTION	UL CABLE INFORMATION								PULL SIZE MM (INCHES)
	ft	m			UL Style	Flam. Rating	Voltage Rating	Voltage Actual	Temp. Rating (C)	Dia. mm (inch)	# of Cond	Size AWG	
050	28 (20)	8.5 (6.1)	2343529-2	HVDC, PDU to Gantry	2587	FT4	600	+ & - 350VDC	90	19 (.751)	3	(2) 4 (1) 8	22 (0.87) Dia
051	28 (20)	8.5 (6.1)	2343530-2	HVAC, PDU to Gantry	2587	FT4	600	440Y/254	90	15.3 (.604)	4	14	11.2 (0.44) Dia
052	28 (20)	8.5 (6.1)	2343528-2	LVAC, PDU to Gantry	2587	FT4	600	208Y/120	90	13.8 (.542)	5	8	56.4 (2.22) Dia
053	65 (60)	19.8 (18.3)	2343531-2	LVAC, PDU to Console	2587	FT4	600	120VAC	90	12.3 (.483)	3	10	56.4 (2.22) Dia
054			n/a	LVAC, Gantry to Table	1015		600	120VAC			3	14	
055	28 (20)	8.5 (5.97)	2371450-2	Ground, PDU to Raceway	1284	VW-1 (FT-1)	600	0	105	15.5 (.608)	1	1/0	15.8 (0.62) Dia
056	68 (57)	20.8 (17.4)	2371450-4	Ground, Raceway to Console	1283	VW-1 (FT-1)	600	0	105	11.9 (.467)	1	2	12.2 (0.48) Dia
100	32.5 (20)	9.9 (6.1)	5120646-2	Signal, Gantry MSUB to PDU		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (0.68 x 2.30) 19 x 51 (0.75 x 2.01)
101	71 (60)	21.7 (18.3)	5120645-2	Signal, Gantry MSUB to OC		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (0.68 x 2.30) 19 x 51 (0.75 x 2.01)
102	71 (63)	21.7 (19.3)	2373436-3	Signal (LAN), Gantry to OC			1900	<30VDC		5.9 (.234)	8	24	15 (0.59) Dia
103	68 (60)	20.7 (18.3)	2117848-7	Fiber Optic, Gantry to OC			N/A	N/A			1	N/A	10 (0.39) Dia
104			n/a	Signal, Gantry to Table		FT-4	300		80		25	22	

Table 9-2 GEMS Supplied Cables (Optional, Short Run) - UL Information

RUN #	LENGTH, ACTUAL (USABLE)		PART #	DESCRIPTION	UL CABLE INFORMATION								PULL SIZE MM (INCHES)	
	ft	m			UL Style	Flam. Rating	Voltage Rating	Voltage Actual	Temp. Rating (C)	Dia. mm (inch)	# of Cond	Size AWG		
050	28 (20)	8.5 (6.1)	2343529-2	HVDC, PDU to Gantry	2587	FT4	600	+ & - 350VDC	90	19 (.751)	3	(2) 4 (1) 8	22 (0.87) Dia	
051	28 (20)	8.5 (6.1)	2343530-2	HVAC, PDU to Gantry	2587	FT4	600	440Y/254	90	15.3 (.604)	4	14	11 (0.44) Dia	
052	28 (20)	8.5 (6.1)	2343528-2	LVAC, PDU to Gantry	2587	FT4	600	208Y/120	90	13.8 (.542)	5	8	56.4 (2.22) Dia	
053	65 (60)	19.8 (18.3)	2343531-2	LVAC, PDU to Console	2587	FT4	600	120VAC	90	12.3 (.483)	3	10	56.4 (2.22) Dia	
054			n/a	LVAC, Gantry to Table	1015		600	120VAC			3	14		
055	28 (20)	8.5 (5.97)	2371450-2	Ground, PDU to Raceway	1284	VW-1 (FT-1)	600	0	105	15.5 (.608)	1	1/0	15.8 (0.62) Dia	
056	68 (57)	20.8 (17.4)	2371450-4	Ground, Raceway to Console	1283	VW-1 (FT-1)	600	0	105	11.9 (.467)	1	2	12.2 (0.48) Dia	
100	32.5 (20)	9.9 (6.1)	5120646-2	Signal, Gantry MSUB to PDU		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (0.68 x 2.30) 19 x 51 (0.75 x 2.01)	
101	71 (60)	21.7 (18.3)	5120645-2	Signal, Gantry MSUB to OC		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (0.68 x 2.30) 19 x 51 (0.75 x 2.01)	
102	71 (63)	21.7 (19.3)	2373436-3	Signal (LAN), Gantry to OC			1900	<30VDC		5.9 (.234)	8	24	15 (0.59) Dia	
103	68 (60)	20.7 (18.3)	2117848-7	Fiber Optic, Gantry to OC			N/A	N/A			1	N/A	10 (0.39) Dia	
104			2343529-2	Signal, Gantry to Table		FT-4	300		80		25	22		

Table 9-3 GE Healthcare Supplied Cables for GOC or TIO (Standard Run) (2281840-5)- UL Information

RUN #	LENGTH, ACTUAL (USABLE)		PART #	DESCRIPTION	UL CABLE INFORMATION								PULL SIZE MM (INCHES)	
	ft	m			UL Style	Flam. Rating	Voltage Rating	Voltage Actual	Temp. Rating (C)	Dia. mm (inch)	# of Cond	Size AWG		
050	28 (20)	8.5 (6.1)	2343529-2	HVDC, PDU to Gantry	2587	FT4	600	+ & - 350VDC	90	19 (.751)	3	(2) 4 (1) 8	22 (.87) Dia	
051	28 (20)	8.5 (6.1)	2343530-2	HVAC, PDU to Gantry	2587	FT4	600	440Y/254	90	15.3 (.604)	4	14	11.2 (.44) Dia	
052	28 (20)	8.5 (6.1)	2343528-2	LVAC, PDU to Gantry	2587	FT4	600	208Y/120	90	13.8 (.542)	5	8	56.4 (2.22) Dia	
053	65 (60)	19.8 (18.3)	2343531-2	LVAC, PDU to Console	2587	FT4	600	120VAC	90	12.3 (.483)	3	10	56.4 (2.22) Dia	
054			2343596	LVAC, Gantry to Table	1015		600	120VAC			3	14		
055	28 (20)	8.5 (6.0)	2371450-2	Ground, PDU to Raceway	1284	VW-1 (FT-1)	600	0	105	15.5 (.608)	1	1/0	15.8 (.62) Dia	
056	68 (57)	20.8 (17.4)	2371450-4	Ground, Raceway to Console	1283	VW-1 (FT-1)	600	0	105	11.9 (.467)	1	2	12.2 (.48) Dia	
100	32.5 (20)	9.9 (6.1)	5120646-2	Signal, Gantry MSUB or TGPU to PDU		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (.68 x 2.30) 19 x 51 (.75 x 2.01)	
101	71 (60)	21.7 (18.3)	5419981-2	Signal, Gantry MSUB or TGPU to OC		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (.68 x 2.30) 19 x 51 (.75 x 2.01)	
102	71 (63)	21.7 (19.3)	2373436-3	Signal (LAN), Gantry to OC			1900	<30VDC		5.9 (.234)	8	24	15 (.59) Dia	
103	68 (60)	20.7 (18.3)	5432019	Fiber Optic, Gantry to OC			N/A	N/A			1	N/A	10 (.39) Dia	
104			2333151	Signal, Gantry to Table		FT-4	300		80		25	22		

Table 9-4 GE Healthcare Supplied Cables for NIO16 Console (Standard Run) (2281840-14)- UL Information

Note: For short cable kits GEHW Cat# is B71022RT, WSO Cat# is B7580JY

3.2 GEMS Supplied (Freedom Workspace Table Extended Cables Kit)

Extended Cables Kit (5160577) is used for FWS:

DESCRIPTION	QUANTITY	CONNECT TO	PART NUMBER	LENGTH	
				IN	MM
DVI-A HD15 Video Cable	1	Monitor	5160573	181.10+/-3.94	4600+/-100
DVI-A HD15 Video Cable	1	Monitor	5160573-2	181.10+/-3.94	4600+/-100
USB Extension Cable	1	Trackball	5160574	118.11+/-3.94	3000+/-100
PS_2 Extension Cable	1	Keyboard	5160575	118.11+/-3.94	3000+/-100
PS_2 Extension Cable	1	Mouse	5160575-2	118.11+/-3.94	3000+/-100
SCIM CABLE	1	SCIM	5160576	251.97+/-3.94	6400+/-100
Power Cord	2	Monitor	5162253	216.54+/-3.94	5500+/-100

Table 9-5 Extended Cables

Note: Freedom Workspace Table is only used for BrightSpeed and BrightSpeed Select series Systems.

PART #	DESCRIPTION	CONNECT TO	QUANTITY	LENGTH	
				MM	INCHES
5160575-2	PS_2 EXTENSION CABLE	Mouse	1	3000+/-100	118.11+/-3.94
5160574	USB_EXTENSION CABLE	Keyboard	1	3000+/-100	118.11+/-3.94
5332107-2	CABLE, DVI to D-SUB VIDEO CABLE	Monitor	2	3000+/-20	118.11+/-0.79
5332093-2	CABLE, SCIM HD50-HD50	SCIM	1	3250+/-25	127.95+/-0.98
5315370	CABLE, USB TYPE A-B	PMT Tower	3	2000	78.74
5332100-2	Power Cord 3.5meter	PMT Tower/LCD Monitors	4	3500+/-30	137.80+/-1.18

Table 9-6 TIO Console Extended Cables

PART #	DESCRIPTION	CONNECT TO	QUANTITY	LENGTH	
				MM	INCHES
5366514-2	USB EXTENSION CABLE	Keyboard	1	3560 ± 30	140.16 ± 1.18
5450275	PS2 EXTENSION CABLE	Mouse	1	3000 ± 30	118.11 ± 1.18
5332107-2	CABLE, DVI to D-SUB VIDEO CABLE	Monitor	1	3000 ± 20	118.11 ± 0.79
5315370	CABLE, USB TYPE A-B	PMT media Tower, DVD-RW/USB external HDD	2	2000	78.74
5408703	DP to DVI cable, 3 meter	Monitor	1	3000 ± 50	118.11 ± 1.97
5432953-2	Power Cable, Peripheral Tower to NIO AC Box, IEC C14 to C13 Connectors	PMT media Tower	1	3050 ± 50	120 ± 1.97
5432953-3	Power Cable, Display monitor to NIO AC Box, IEC C14 to C13 Connectors	Monitor	1	3050 ± 50	120 ± 1.97
5432953-4	Power Cable, Scan monitor to NIO AC Box, IEC C14 to C13 Connectors	Monitor	1	3050 ± 50	120 ± 1.97

Table 9-7 GE Healthcare Supplied NIO16 Console with Z800 Cables

PART #	DESCRIPTION	CONNECT TO	QUANTITY	LENGTH	
				MM	INCHES
5431909	Cable, USB_Extend	Keyboard	1	3500 ± 50	137.8 ± 1.97
5458346	USB EXTENSION CABLE	Mouse	1	3500 ± 50	137.8 ± 1.97
5315370	CABLE, USB TYPE A-B	PMT media Tower, DVD-RW/USB external HDD	2	2000	78.74
5408703-2	DP to DVI cable, 3 meter	Monitor	1	3000 ± 50	118.11 ± 1.97
5366259	DV-I to VGA cable, 3 meter	Monitor	1	3000 ± 20	118.11 ± 0.79
5432953-6	Power Cable, Peripheral Tower to OpenOC J5	PMT media Tower	1	3050 ± 50	120 ± 1.97
5478299-6	Power Cable, Display monitor to OpenOC	Display Monitor	1	3050 ± 50	120 ± 1.97
5478299-5	Power Cable, Scan monitor to OpenOC	Scan Monitor	1	3050 ± 50	120 ± 1.97

Table 9-8 GE Healthcare Supplied OpenOC16 Console with Z840 Cables

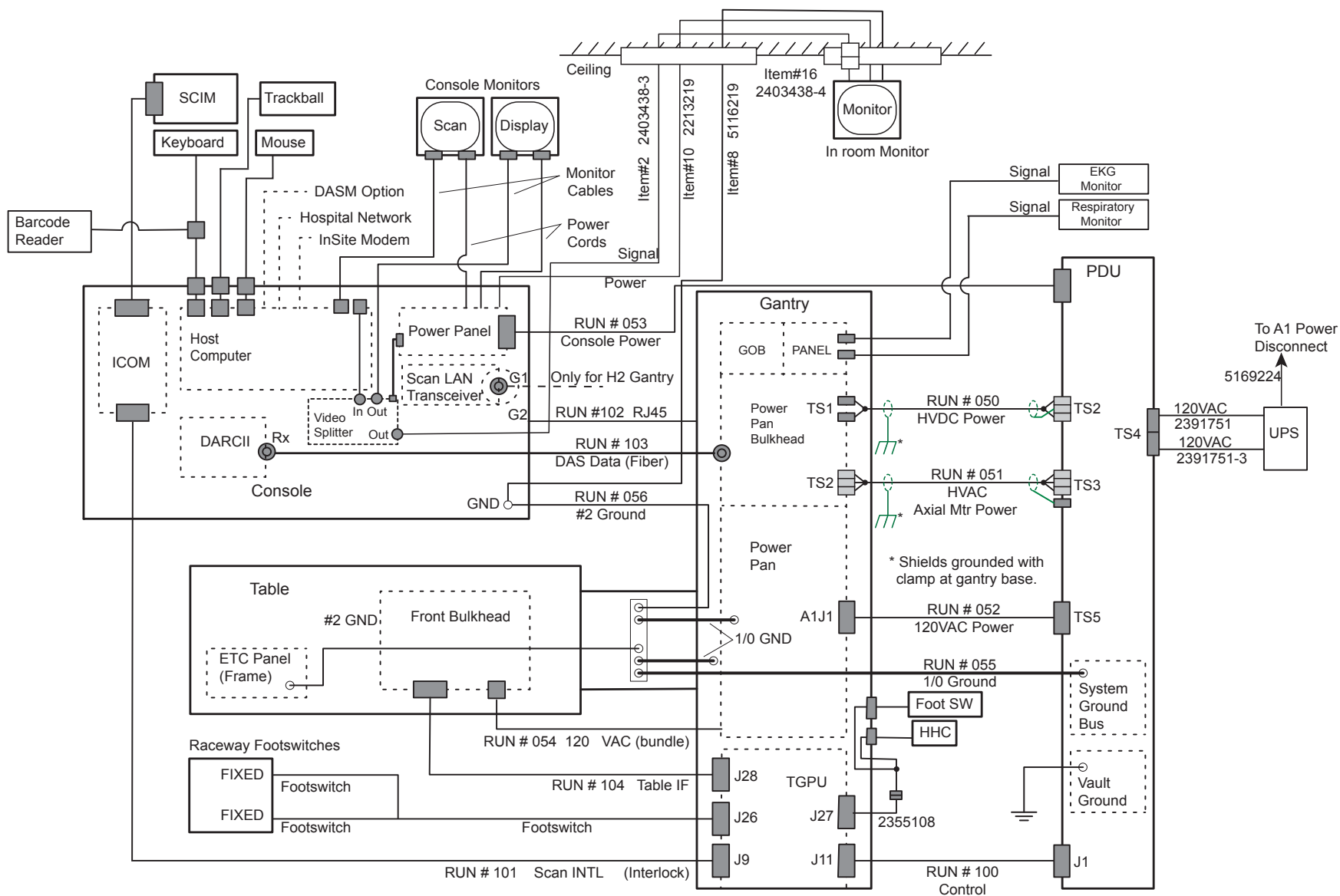


Figure 9-1 System Interconnect Diagram (With GOC4/LCGOC Console and GOB Board)

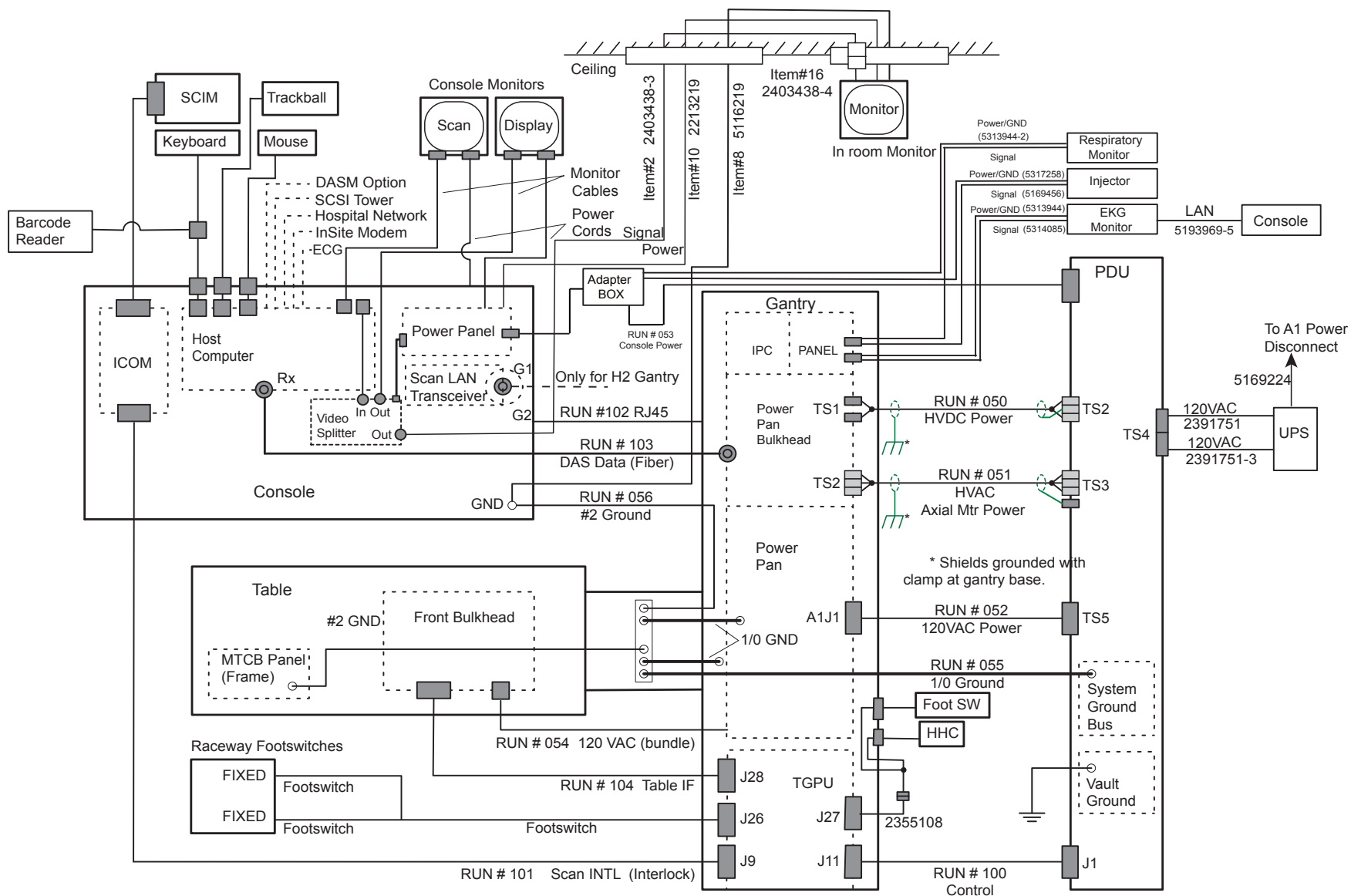


Figure 9-2 System Interconnect Diagram (With All-In-One Console and IPC Board)

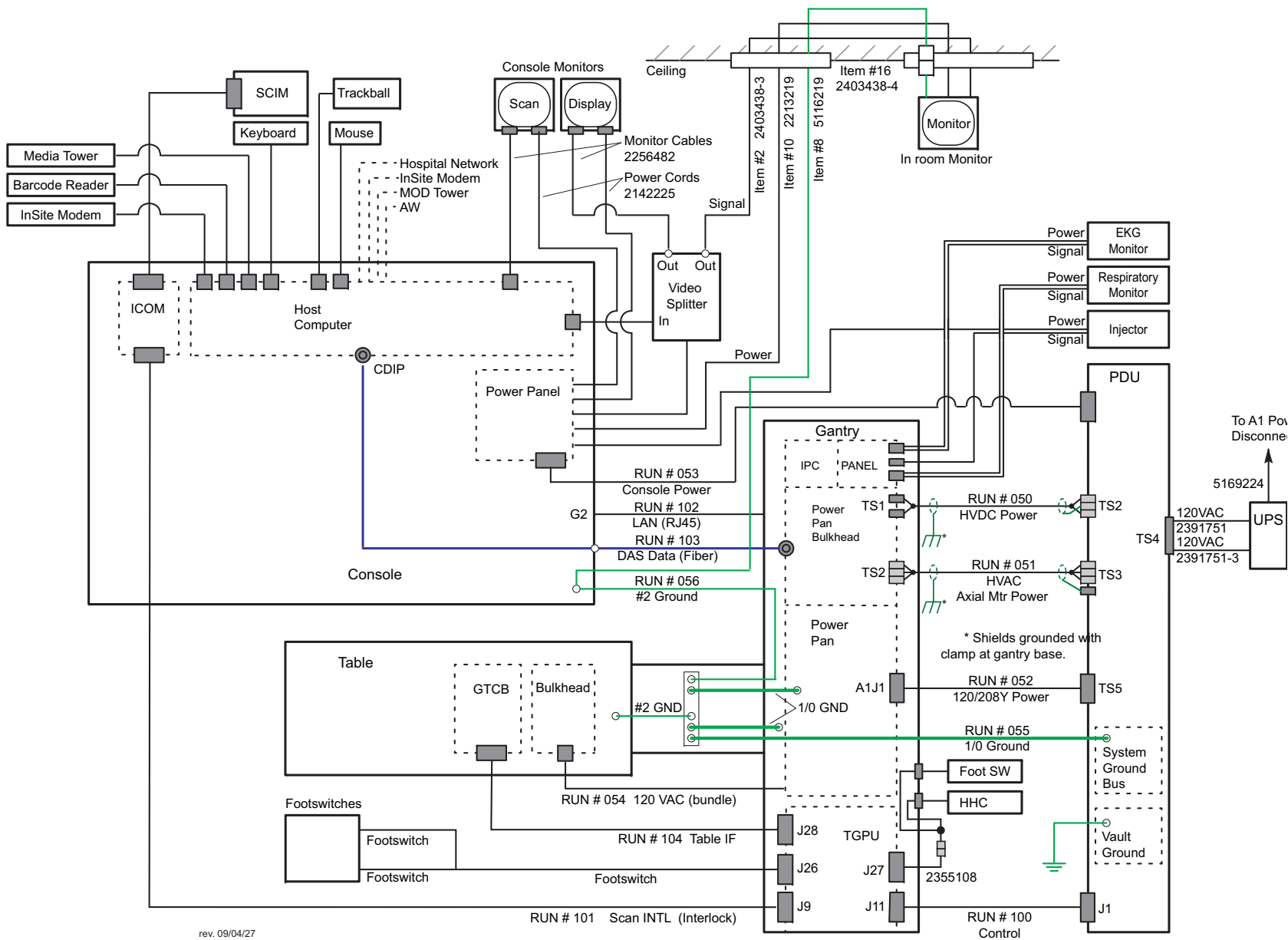


Figure 9-3 System Interconnect Diagram (With TIO Console and IPC Board)

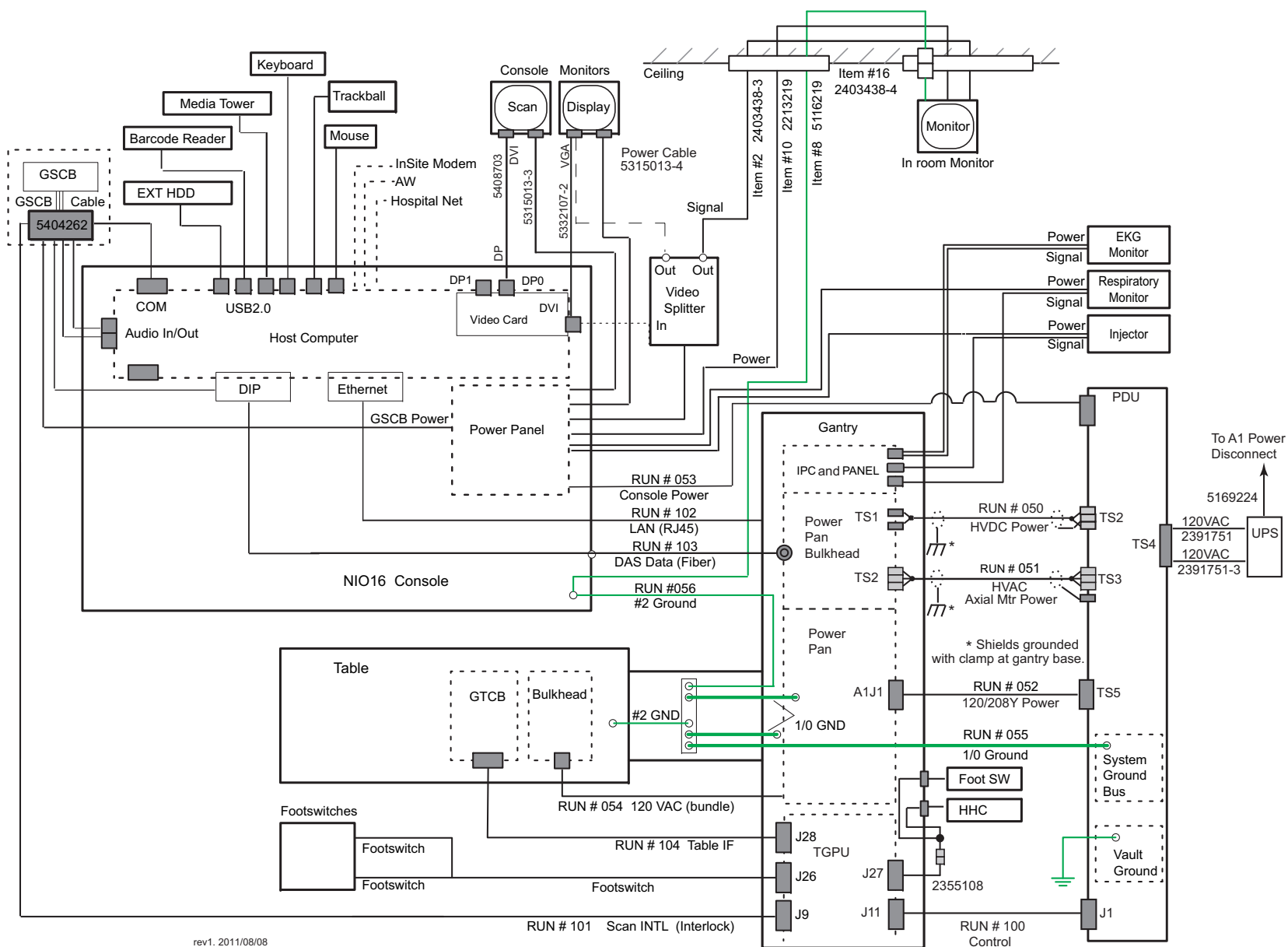
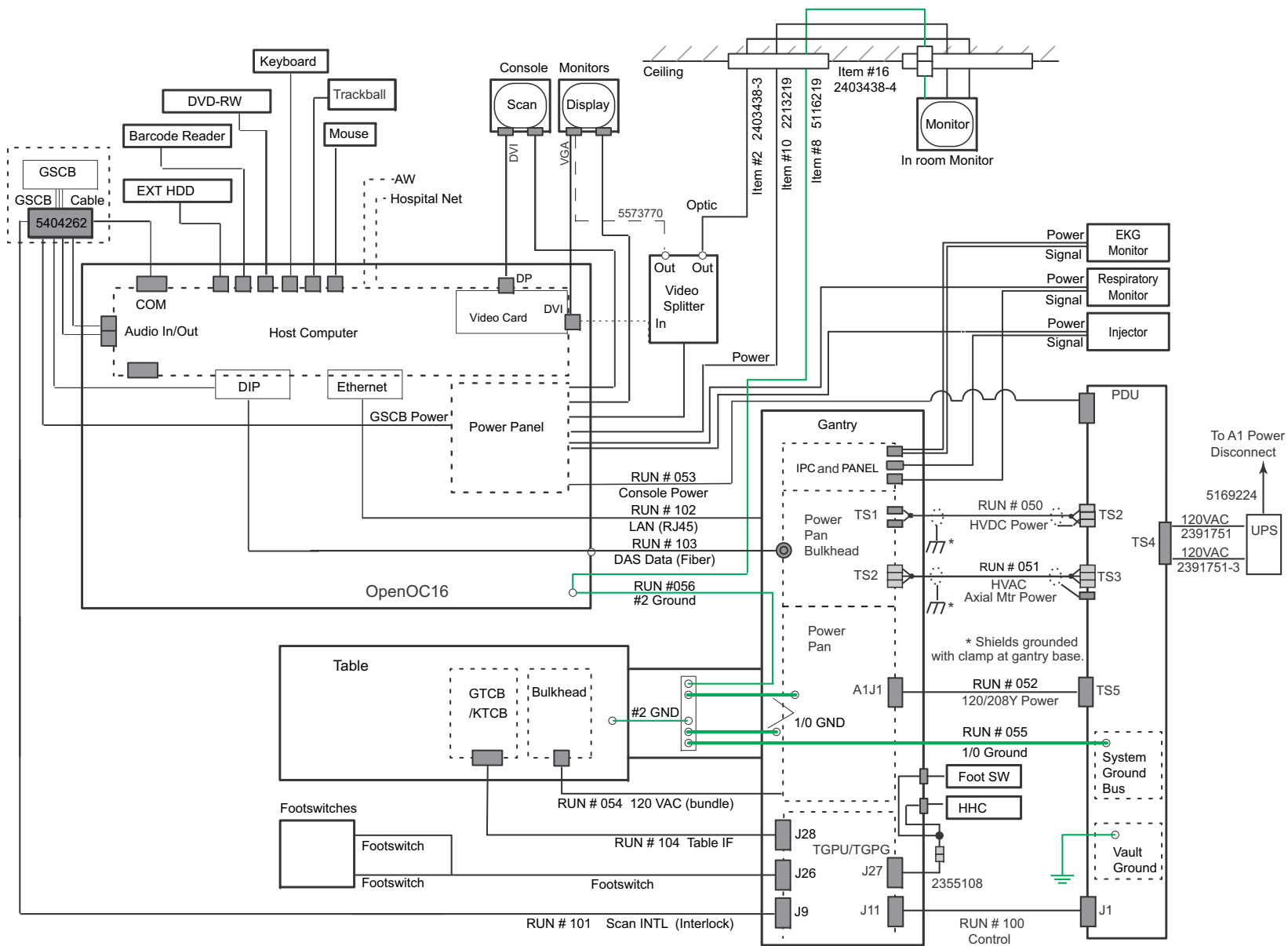


Figure 9-4 System Interconnect Diagram (NIO16 Console with Z800 Host PC)



3.3 GEMS Supplied (Optional, Long Run)

RUN #	LENGTH, ACTUAL (USABLE)		PART #	DESCRIPTION	UL CABLE INFORMATION								PULL SIZE MM (INCHES)
	ft	m			UL Style	Flam. Rating	Voltage Rating	Voltage Actual	Temp. Rating (C)	Dia. mm (inch)	# of Cond	Size AWG	
050	63 (55)	19.3 (16.76)	2343529	HVDC, PDU to Gantry	2587	FT4	600	+ & - 350VDC	90	19 (.751)	3	(2) 4 (1) 8	22 (0.87) Dia
051	62.5 (55)	19 (16.76)	2343530	HVAC, PDU to Gantry	2587	FT4	600	440Y/254	90	15.3 (.604)	4	14	11.2 (0.44) Dia
052	63 (57)	19.3 (17.56)	2343528	LVAC, PDU to Gantry	2587	FT4	600	208Y/120	90	13.8 (.542)	5	8	56.4 (2.22) Dia
053	80 (75)	24.5 (22.86)	2343531	LVAC, PDU to Console	2587	FT4	600	120VAC	90	12.3 (.483)	3	10	56.4 (2.22) Dia
055	63 (55)	19.3 (16.76)	2371450	Ground, PDU to Raceway	1284	VW-1 (FT-1)	600	0	105	15.5 (.608)	1	1/0	15.8 0(.62) Dia
056	83 (75)	25.5 (22.86)	2371450-3	Ground, Raceway to Console	1283	VW-1 (FT-1)	600	0	105	11.9 (.467)	1	2	12.2 (0.48) Dia
100	70 (62)	21.4 (18.86)	5120646	Signal, Gantry MSUB to PDU		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (0.68 x 2.30) 19 x 51 (0.75 x 2.01)
101	86 (78)	26.35 (23.71)	5120645	Signal, Gantry MSUB to OC		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (0.68 x 2.30) 19 x 51 (0.75 x 2.01)
102	86 (81)	26.3 (24.86)	2373436-2	Signal (LAN), Gantry to OC			1900	<30VDC		5.9 (.234)	8	24	15 (0.59) Dia
103	80 (75)	24.3 (22.86)	2117848-2	Fiber Optic, Gantry to OC			N/A	N/A			1	N/A	10 (0.39) Dia

Table 9-9 GEMS Supplied Cables (Optional, Long Run) - UL Information

RUN #	LENGTH, ACTUAL (USABLE)		PART #	DESCRIPTION	UL CABLE INFORMATION								PULL SIZE MM (INCHES)
	ft	m			UL Style	Flam. Rating	Voltage Rating	Voltage Actual	Temp. Rating (C)	Dia. mm (inch)	# of Cond	Size AWG	
050	63 (55)	19.3 (16.76)	2343529	HVDC, PDU to Gantry	2587	FT4	600	+ & - 350VDC	90	19 (0.751)	3	(2) 4 (1) 8	22 (0.87) Dia
051	62.5 (55)	19.3 (16.76)	2343530	HVAC, PDU to Gantry	2587	FT4	600	440Y/254	90	15.3 (.604)	4	14	11.2 (0.44) Dia
052	63 (57)	19.3 (16.76)	2343528	LVAC, PDU to Gantry	2587	FT4	600	208Y/120	90	13.8 (.542)	5	8	56.4 (2.22) Dia
053	80 (75)	24.5 (22.86)	2343531	LVAC, PDU to Console	2587	FT4	600	120VAC	90	12.3 (.483)	3	10	56.4 (2.22) Dia
055	63 (55)	19.3 (16.76)	2371450	Ground, PDU to Raceway	1284	VW-1 (FT-1)	600	0	105	15.5 (.608)	1	1/0	15.8 (0.62) Dia
056	83 (75)	25.5 (22.86)	2371450-3	Ground, Raceway to Console	1283	VW-1 (FT-1)	600	0	105	11.9 (.467)	1	2	12.2 (0.48) Dia
100	70 (62)	21.4 (18.86)	5120646	Signal, Gantry MSUB to PDU		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (0.68 x 2.30) 19 x 51 (0.75 x 2.01)
101	86 (78)	26.35 (23.71)	5120645	Signal, Gantry MSUB to OC		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (0.68 x 2.30) 19 x 51 (0.75 x 2.01)
102	86 (81)	26.3 (24.86)	2373436-2	Signal (LAN), Gantry to OC			1900	<30VDC		5.9 (.234)	8	24	15 (0.59) Dia
103	80 (75)	24.3 (22.86)	2117848-2	Fiber Optic, Gantry to OC			N/A	N/A			1	N/A	10 (0.39) Dia

Table 9-10 GE Healthcare Supplied Cables for GOC or TIO (Optional, Long Run) (2281840-4)- UL Information

RUN #	LENGTH, ACTUAL (USABLE)		PART #	DESCRIPTION	UL CABLE INFORMATION								PULL SIZE MM (INCHES)
	ft	m			UL Style	Flam. Rating	Voltage Rating	Voltage Actual	Temp. Rating (C)	Dia. mm (inch)	# of Cond	Size AWG	
050	63 (55)	19.3 (16.76)	2343529	HVDC, PDU to Gantry	2587	FT4	600	+ & - 350VDC	90	19 (.751)	3	(2) 4 (1) 8	22 (.87) Dia
051	62.5 (55)	19 (16.76)	2343530	HVAC, PDU to Gantry	2587	FT4	600	440Y/254	90	15.3 (.604)	4	14	11.2 (.44) Dia
052	63 (58)	19.3 (17.56)	2343528	LVAC, PDU to Gantry	2587	FT4	600	208Y/120	90	13.8 (.542)	5	8	56.4 (2.22) Dia
053	80 (75)	24.5 (22.86)	2343531	LVAC, PDU to Console	2587	FT4	600	120VAC	90	12.3 (.483)	3	10	56.4 (2.22) Dia
055	63 (55)	19.3 (16.76)	2371450	Ground, PDU to Raceway	1284	VW-1 (FT-1)	600	0	105	15.5 (.608)	1	1/0	15.8 (.62) Dia
056	83 (75)	25.5 (22.86)	2371450-3	Ground, Raceway to Console	1283	VW-1 (FT-1)	600	0	105	11.9 (.467)	1	2	12.2 (.48) Dia
100	70 (62)	21.4 (18.86)	5120646	Signal, Gantry MSUB or TGPU to PDU		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (.68 x 2.30) 19 x 51 (.75 x 2.01)
101	86 (78)	26.35 (23.71)	5419981	Signal, Gantry MSUB or TGPU to OC		FT-4	300	<30VDC	80	11.2 (.440)	25	22	17 x 58 (.68 x 2.30) 19 x 51 (.75 x 2.01)
102	86 (81)	26.3 (24.84)	2373436-2	Signal (LAN), Gantry to OC			1900	<30VDC		5.9 (.234)	8	24	15 (.59) Dia
103	80 (75)	24.3 (22.86)	5432019	Fiber Optic, Gantry to OC			N/A	N/A			1	N/A	10 (.39) Dia

Table 9-11 GE Healthcare Supplied Cables for NIO16 Console (Optional, Long Run) (2281840-13)- UL Information

Note: For long cable kits GEHW Cat# is B70992RT, WSO Cat# is B7580JZ

3.4 GEMS Supplied (Cables of Options)

OPTION	LENGTH, ACTUAL (USABLE)		PART #	DESCRIPTION	UL CABLE INFORMATION								PULL SIZE MM (INCHES)
	ft	m			UL Style	Flam. Rating	Voltage Rating	Voltage Actual	Temp. Rating (C)	Dia. mm (inch)	# of Cond	Size AWG	
Fluoro	75	22.9	2403438-3	5 BNC MALE TO HD 15 MALE 75 FEET		FT4		1Vp-p	75	9.1 (0.358)	5	26	
	70	21.2	2213219	POWER CABLE FOR LCD-CONSOLE TO LCD		FT1	120	120VAC	105	9.3 (0.366)	3	14	
	71	21.5	5116219	Grounding Cable For LCD Console To LCD	1015	VW-1	600	0V	105		1	8	
	15	4.6	2403438-4	HD 15 FEMALE TO HD 15 MALE 15 FEET				1Vp-p	60	8.0 (0.315)	5	26	
	1.3	0.4	2355108	JUMPER CABLE FOR ADAPTING 2286150 TO WORK WITH H-POWER MSUB							8	22	
UPS	15	4.6	2391751	POWER CABLE, NGPDU TO UPS	2587	FT4	600	208VAC	90	5.8 (0.228)	5	8	
	15	4.6	2391751-3	POWER CABLE, UPS DISCONNECT PANEL TO NGPDU	2587	FT4	600	208VAC	90	5.8 (0.228)	4	8	
	45	13.6	5169224	UPS CONTROL CABLE	2587	FT4	600	120VAC	90	10.3 (0.406)	5	18	
Injector	100	30.5	5169456	GANTRY TO INJECTOR	1007	VW-1	300	<30VDC	80	1.57 (0.062)	3	22	45(1.78) Dia
	8.2	2.5	5317258	POWER CABLE INJECTOR TO CONSOLE	62	FT2	300	120VAC	60	9.4 (0.37)	3	14	36(1.41) Dia
Cardiac	30	9.1	5198566	GANTRY TO EKG MONITOR	2919	UL1685 UL loading	30	<30VDC	80	6.45 (0.254)	6	24	37(1.45) Dia

Table 9-12 GEMS Supplied Cables for Options - UL Information

OPTION	LENGTH, ACTUAL (USABLE)		PART #	DESCRIPTION	UL CABLE INFORMATION								PULL SIZE MM (INCHES)
	ft	m			UL Style	Flam. Rating	Voltage Rating	Voltage Actual	Temp. Rating (C)	Dia. mm (inch)	# of Cond	Size AWG	
Adv 4D Resp	100	30.5	5199717	GANTRY TO RPM UNIT	2464	FT4	300	<30VDC	80	6.6 (0.26)	4	22	37(1.45) Dia

Table 9-12 GEMS Supplied Cables for Options - UL Information

3.5 Contractor (Customer) Supplied

CUSTOMER INSTALLED WIRING		DESCRIPTION	CABLES SUPPLIED			PLUG PULLING DIMENSIONS		WIRE & CABLE PIGTAILS FT. (M.)	
QTY	SIZE AWG (MM ²)		PART NO	LENGTH FT. (M.)	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						3 (1)	3(1)
1	1/0 (50)	GROUND						3 (1)	3 (1)
RUN NO. 2 FROM FACILITY DISCONNECT TO POWER MODULE (A1 - PM) MAXIMUM RUN LENGTH *									
3	*	POWER						3 (1)	3(1)
1	1/0 (50)	GROUND						3 (1)	3 (1)
1	*	NEUTRAL (Not Required)						3 (1)	3 (1)
RUN NO. 3 FROM FACILITY DISCONNECT TO SYSTEM EMERGENCY OFF (A1 - SEO)									
2	14 (2)	POWER						6 (2)	6 (2)
1	14 (2)	GROUND						6 (2)	6 (2)
RUN NO. 4 POWER MODULE TO WARNING LIGHT CONTROL (PM - WL)									
2	14 (2)	WARNING LIGHT 24 VOLT CONTROL A3J2-1,2,3,4							
RUN NO. 5 POWER MODULE TO SCAN ROOM DOOR INTERLOCK (PM - DOOR SWITCH)									
2	14 (2)	SCAN ROOM DOOR INTER LOCK A3J6-1,2							
*	REFER TO Table 8-3 on page 137 FOR AWG (MM2) WIRE SIZES.								

Table 9-13 Runs 1, 2, 3, 4 and 5 Connections

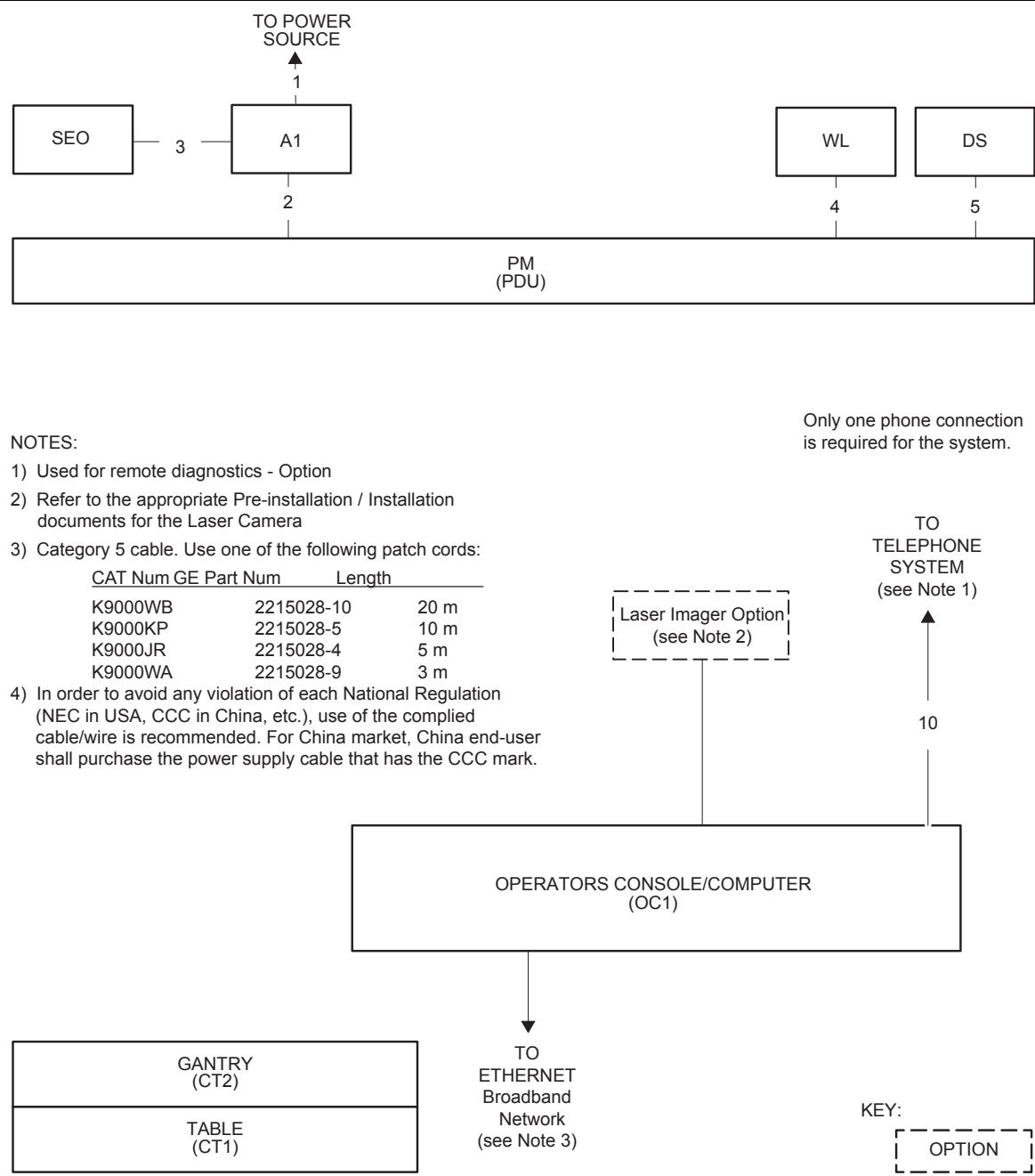


Figure 9-6 Interconnection Runs

Section 4.0

Contractor Supplied Components

REFERENCE	ASSOCIATED EQUIPMENT	MATERIAL/LABOR SUPPLIED BY CUSTOMER CONTRACTOR	USA VENDOR / CAT NO. GE CATALOG
A1 380 - 480V 50/60 Hz	Fusible Disconnect and Magnetic Contactor	3 Pole, 380V - 480V, Combination breaker with magnetic contactor. Includes control transformer, optional UPS interface, On/Off controls and auto-restart feature	Recommended:* • E4502AC (110A) • E4502AB (90A)
ITL	In-suite Telephone Lines	Supply 2 voice-grade telephone lines. One line must be a direct number from outside the facility – do not route this line through a telephone switchboard. Telephone line operating charges are paid by customer.	
BBNC (required)	Broad-Band Network Connection	Broad-Band network connection wall jack, located within 1m (39inches) of console location, for internal hospital networking and InSite Broad-Band connectivity.	
	System Components	Reference the system installation drawings supplied by Installation Support Services within your geographic area.	

*Refer to [Table 9-17 on page 160](#).

Table 9-14 Contractor-Supplied Components

Section 5.0

Fuse

ITEM	NUMBER	QTY	FRU CODE	DESCRIPTION/NAME
1	2351493	1.0	Yes	100A FUSE
2	2364059	1.0	Yes	GLASS FUSE
3	46-170021P50	1.0	Yes	FUSE 12 AMPS 250 VOLTS BUSSMAN MDA12 DUAL ELEMENT.
4	46-170021P15	1.0	Yes	Time Lag FUSE 8 AMPS 250 VOLTS (REVIEWED TK, 7/91).
5	2336517-2	1.0	Yes	FUSE 25 AMPS 700 VOLTS 2.5M SECONDS
6	46-170021P52	5.0	Yes	FUSE 3 AMPS 250 VOLTS (REVIEWED TK, 7/91).
7	46-170021P10	2.0	Yes	006.000A 0250V 3AG FAST UL/C (REVIEWED TK, 7/91).
8	46-170021P101	1.0	Yes	FUSE 20 AMPS 700 VOLTS 2~ LONG X 9/16~ DIA FAST BLOW
9	46-170021P106	1.0	Yes	FUSE 8 AMPS 250 VOLTS BUSSMANN ONLY
10	46-170021P31	2.0	Yes	1/2A, 250V SLO-BLO FUSE. TYPE 3AG, 1.25~ X 0.25~ GLASS BODY. (REVIEWED TK, 7/91).
11	2106993-5	2.0	Yes	FUSE 20 AMPS 500 VOLTS .3 SECONDS
12	46-327160P1	1.0	Yes	12.0A, 125VAC, DUAL ELEMENT TIME DLY FNM-12, 0.406 X 1.5 LG, FIBER BODY
13	2379651	1.0	Yes	FUSE - 700 V, 200 A, FAST SEMI
15	2238207-3	1.0	Yes	FUS FF 14X51 2A 700VDC C 50KA ULR
16	99183979	1.0	Yes	SLOW BLOW FUSE HCP 6X32 10A 250V UL

Table 9-15 FUSE KIT BS 90KVA (2385412-2 BOM, rev 2)

ITEM	NUMBER	QTY	FRU CODE	DESCRIPTION/NAME
17	U8009FF	2.0	Yes	FUSE 3.2A
18	U8008FF	1.0	Yes	FUSE 2.0A
19	U8006FF	2.0	Yes	FUSE 1.0A

Table 9-15 FUSE KIT BS 90KVA (2385412-2 BOM, rev 2) (Continued)

ITEM	NUMBER	QTY	FRU CODE	DESCRIPTION/NAME
1	2351493	1	Yes	100A 690V Semiconductor Fuse
2	2364059	1	Yes	GLASS FUSE
3	46-170021P50	1	Yes	FUSE, TIME DELAY, 6.3X32MM, 12A, 250V, 400A INTERRUPT AT 250VAC, CERAMIC, UL
4	46-170021P15	1	Yes	FUSE, TIME DELAY, 6.3X32MM, 8A, 250V, 400A INTERRUPT AT 250VAC, CERAMIC, UL
5	2336517-2	1	Yes	FUSE 25 AMPS 700 VOLTS 2.5M SECONDS
6	46-170021P52	5	Yes	FUSE 3 AMPS 250 VOLTS (REVIEWED TK, 7-91).
7	46-170021P10	2	Yes	006.000A 0250V 3AG FAST UL/C (REVIEWED TK, 7/91).
8	46-170021P101	1	Yes	FUSE 20 AMPS 700 VOLTS 2~ LONG X 9/16~ DIA FAST BLOW
9	46-170021P106	1	Yes	FUSE 8 AMPS 250 VOLTS BUSSMANN ONLY
10	46-170021P31	2	Yes	One-HalfA, 250V SLO-BLO FUSE. TYPE 3AG, 1.25aprox. X 0.25aprox. GLASS BODY. REVIEWED TK, 7-91
11	5329469	2	Yes	FUSE 20 AMPS 500 VOLTS .3 SECONDS--RoHS
12	46-327160P1	1	Yes	12.0A, 125VAC, DUAL ELEMENT TIME DLY FNM-12, 0.406 X 1.5 LG, FIBER BODY
13	2379651	1	Yes	FUSE - 700 V, 200 A, FAST SEMI
15	2238207-3	1	Yes	FUS FF 14X51 2A 700VDC C 50KA ULR
16	99183979	1	Yes	SLOW BLOW FUSE HCP 6X32 10A 250V UL
17	U8006FF	2	Yes	FUSE 1.0A
18	5118644	1	Yes	FAST ACTION 15 AMPS 250 VOLTS 0.01 SECONDS U0028FF
19	5327449	2	Yes	PROTECTION FUSE, 3.2A, NA, FAST ACTION, 250V, HM FUSE
20	5327448-2	1	Yes	PROTECTION FUSE, 2A, NA, FAST ACTION, 250V, HM FUSE, Not Preferred Part
21	2374694	2	Yes	8A TIME DELAY FUSES
22	5368105	1	Yes	1A Time_Delay fuse,10_4X38_1CLIP
23	5306477-3	1	Yes	PROTECTION FUSE, 15A, TIME DELAY, 300VDC, 600VAC, CARTRIDGE

Table 9-16 FUSE KIT for BSD Meri (2385412-4 BOM, rev 2)

Section 6.0

UPS Interconnect

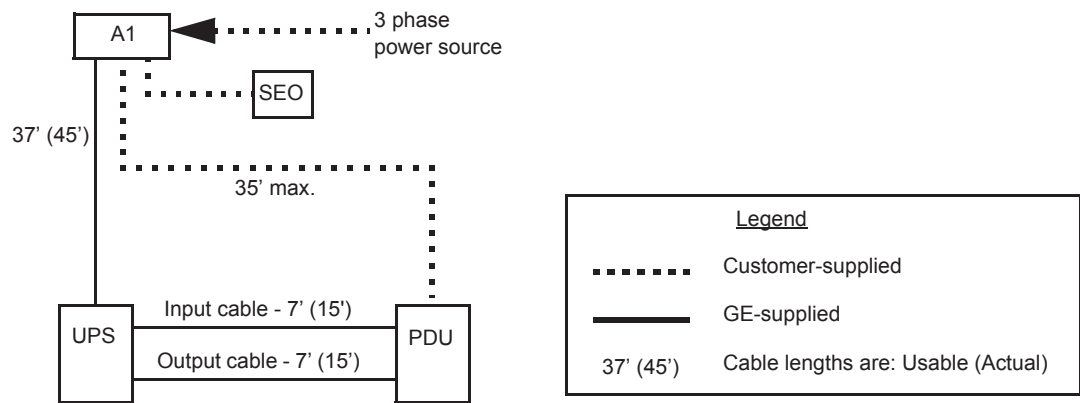


Figure 9-7 Typical UPS Interconnect

NOTICE **UPS Kit B7999ZA REQUIRES** installation of one of the A1 Panels listed below.

PDU Type & Model #	Max. Mom. kVA Rating	Recommended Main Disconnect (A1) Cat #			Optional Partial UPS Kit Cat #
		America	EMEA	Asia	
NGPDU-3 2326492-3	90kVA	E4502AB (90A) or E4502AC (110A) (incl. Auto Restart & Integrated UPS Control)	E46001AC (incl. Auto Restart & Integrated UPS Control)	E4502AC (110A) (incl. Auto Restart & Integrated UPS Control)	B7999ZA alt. E4502KY (includes 5169128 9155-10GE model 10KVA, 2ph UPS & hardware kit) REQUIRES one of the A1 Panels shown at left

Table 9-17 BrightSpeed Series Partial UPS Back-up Options

- Note: Conduit is required between:
- A1 and UPS
 - UPS and PDU
 - PDU and A1

Section 7.0

Typical Customer Supplied Wiring

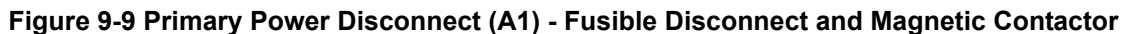
7.1 Primary Power Disconnect

Requires LOTO compatible disconnect to install this system.

If a UPS is required, a GE Disconnect is strongly recommended for safe operation. The GE disconnect and UPS are designed to work together.



Figure 9-8 Primary Power Disconnect (A1)



7.2 Scan Room Warning Light & Door Interlock

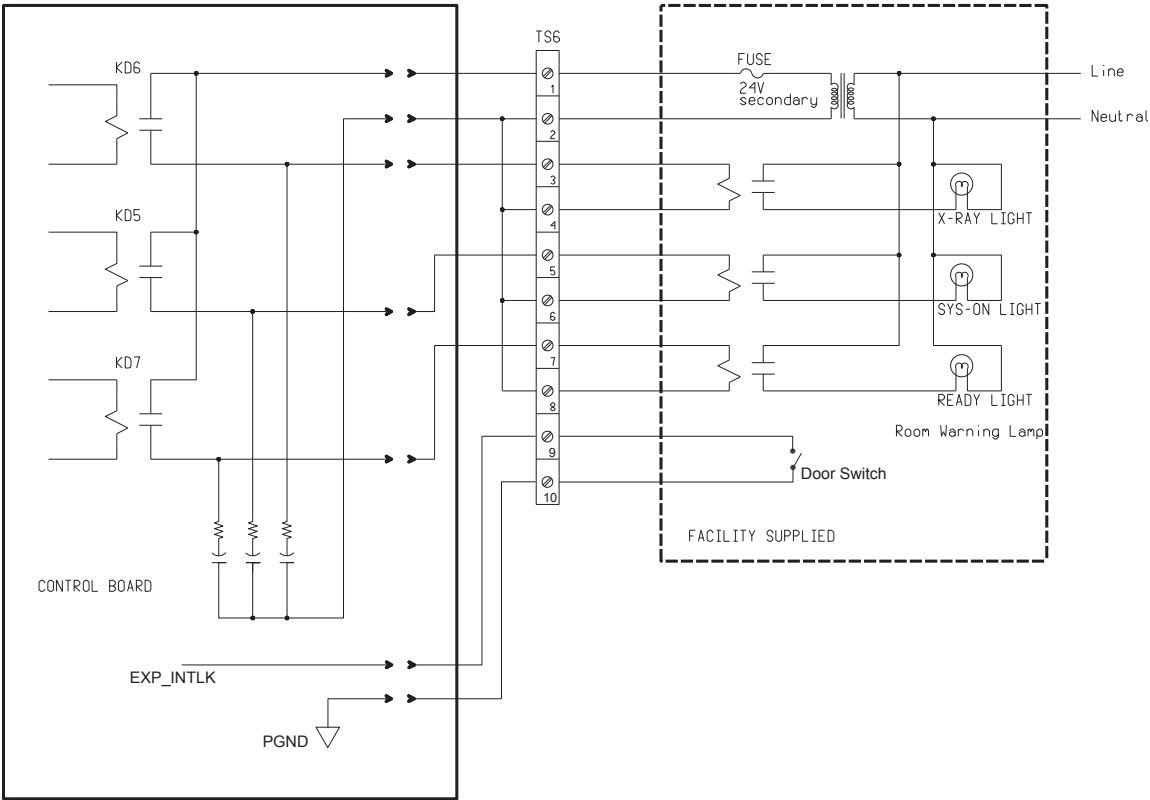


Figure 9-10 Typical TS6 Warning Light & Door Interlock Connections

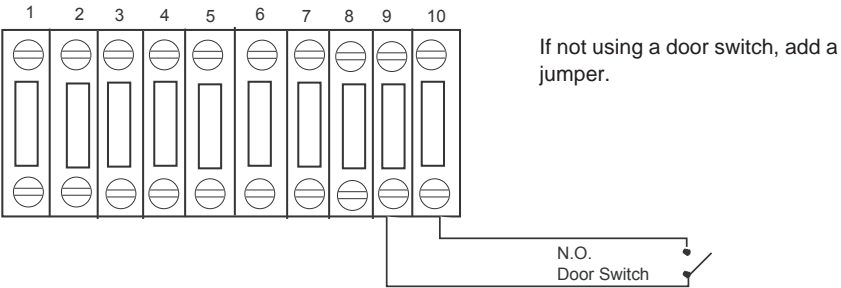


Figure 9-11 TS6 Room Door Interlock Connections - With a Door Interlock

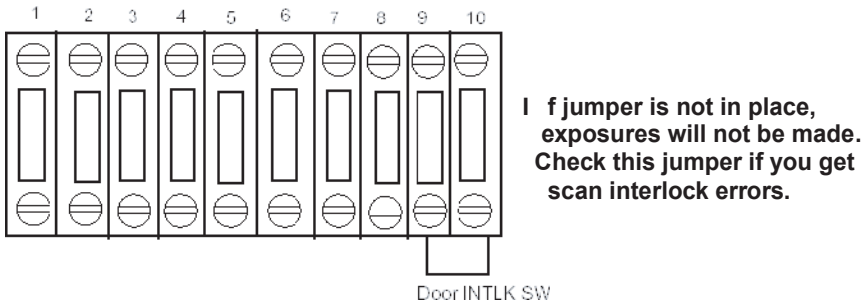


Figure 9-12 TS6 Room Door Interlock Connections - Without a Door Interlock

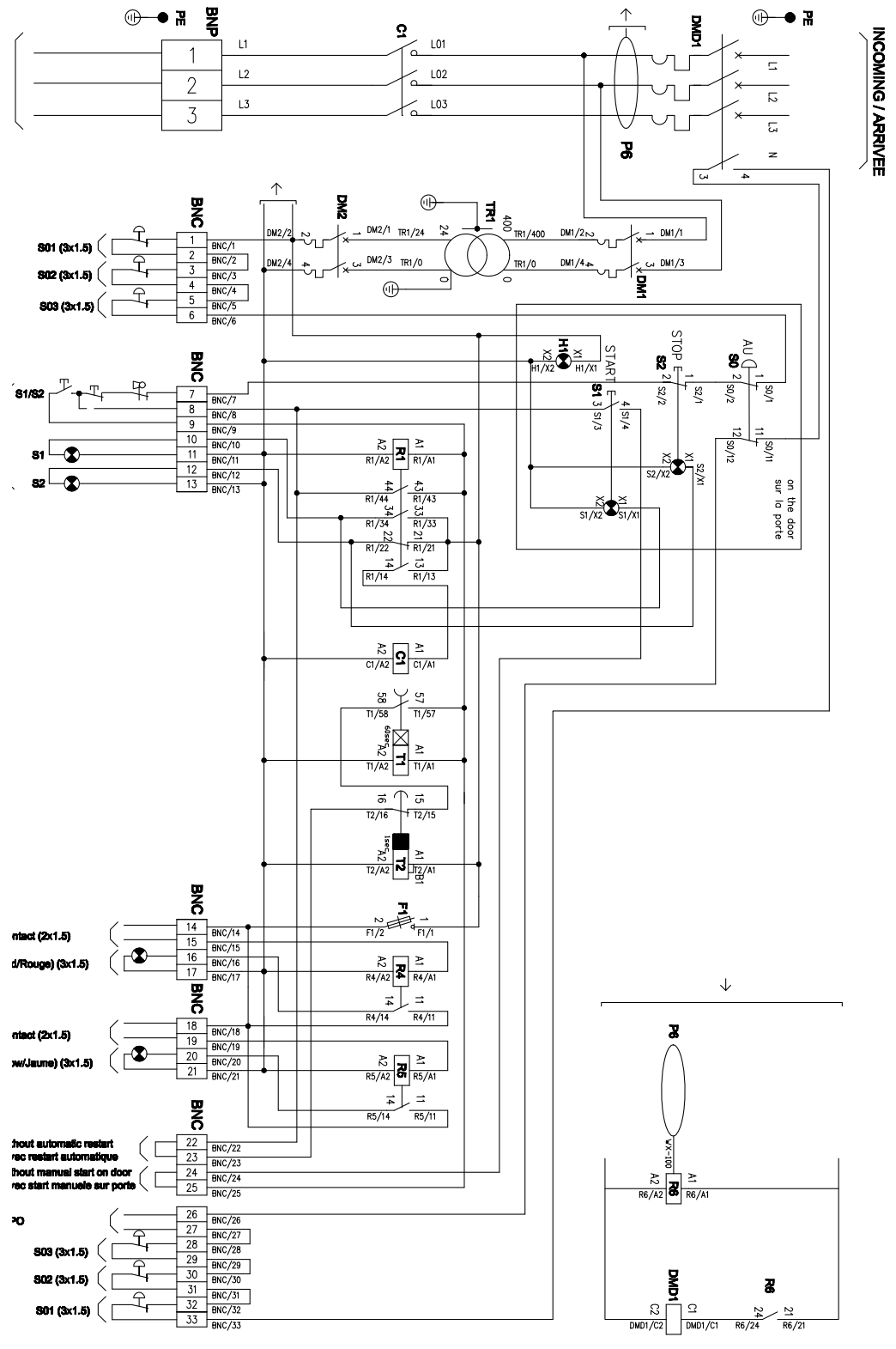


Figure 9-14 Power Distribution Interconnect Box (for Europe) 2/2

Appendix A

Alternate Cover Removal Options

Section 1.0

Alternate Cover Removal Options

1.1 Overview

The room dimensions and clearance dimensions shown in this manual assume a room configuration in which the front and rear gantry covers are removed and stored straight back/forward from the gantry. However, not all room configurations are the same, meaning covers can be stored in other available spaces. For example, some rooms are long and skinny, while other rooms are short and wide. Some rooms may have a support column in the way, while other rooms have an adjacent room to store the gantry covers. For this reason, some alternative cover removal options for different room configurations are presented in this appendix.

1.2 Front Cover Removal

Rather than storing the front cover straight forward from the gantry at the foot of the table, the cover can be moved and stored on the right or left side of the table if there is space available while still maintaining service access to the table. Additionally, the cover can be moved out of the scan room to a temporary storage location.

The standard procedure for removing the front cover is with the table all the way down. A second method for front cover removal is with the table partially raised and the cradle moved into the bore of the gantry. Under this method, the minimum length of the room can be reduced by 508 mm (20 in.)

NOTICE



A room size that utilizes the table-up cover removal method has severe limitations in space for patient care and work flow. The map and dimensions shown in this manual depict the required clearances for proper equipment operation and service only. The customer/purchaser is responsible for federal, state and/or local codes regarding facility egress and related facility requirements.

1.3 Rear Cover Removal

Rather than storing the rear cover straight back from the gantry, the cover can be moved and stored on the right or left side or angled if there is space available while still maintaining service access to the gantry. Additionally, the cover can be moved to the side of the table or out of the scan room to a temporary storage location.

For rooms with a surface floor duct (without ramps) behind the gantry, the rear cover cannot be moved to the side of the gantry. Due to the weight of the gantry cover, lifting it over a surface floor duct without ramps is prohibited.

1.4 Condition References

There are three possible minimum service space requirements based on the construction of the wall directly adjacent to the side of the gantry. The following three conditions determine the minimum space requirement that would apply to the room based on the special conditions of the wall:

- **Condition 1**
If the side of the system being serviced is directly facing an ungrounded surface or wall without live voltage panels and without surface mounted ducts or conduits the minimum space requirement is 914 mm (36 in).
- **Condition 2**
If side of the system being serviced is directly facing a grounded surface or wall the minimum space requirement 1067 mm (42 in).
- **Condition 3**
If side of the system being serviced is directly facing a surface or wall with live voltage panels, surface mounted ducts, or conduits the minimum space requirement is 1219 mm (48 in).

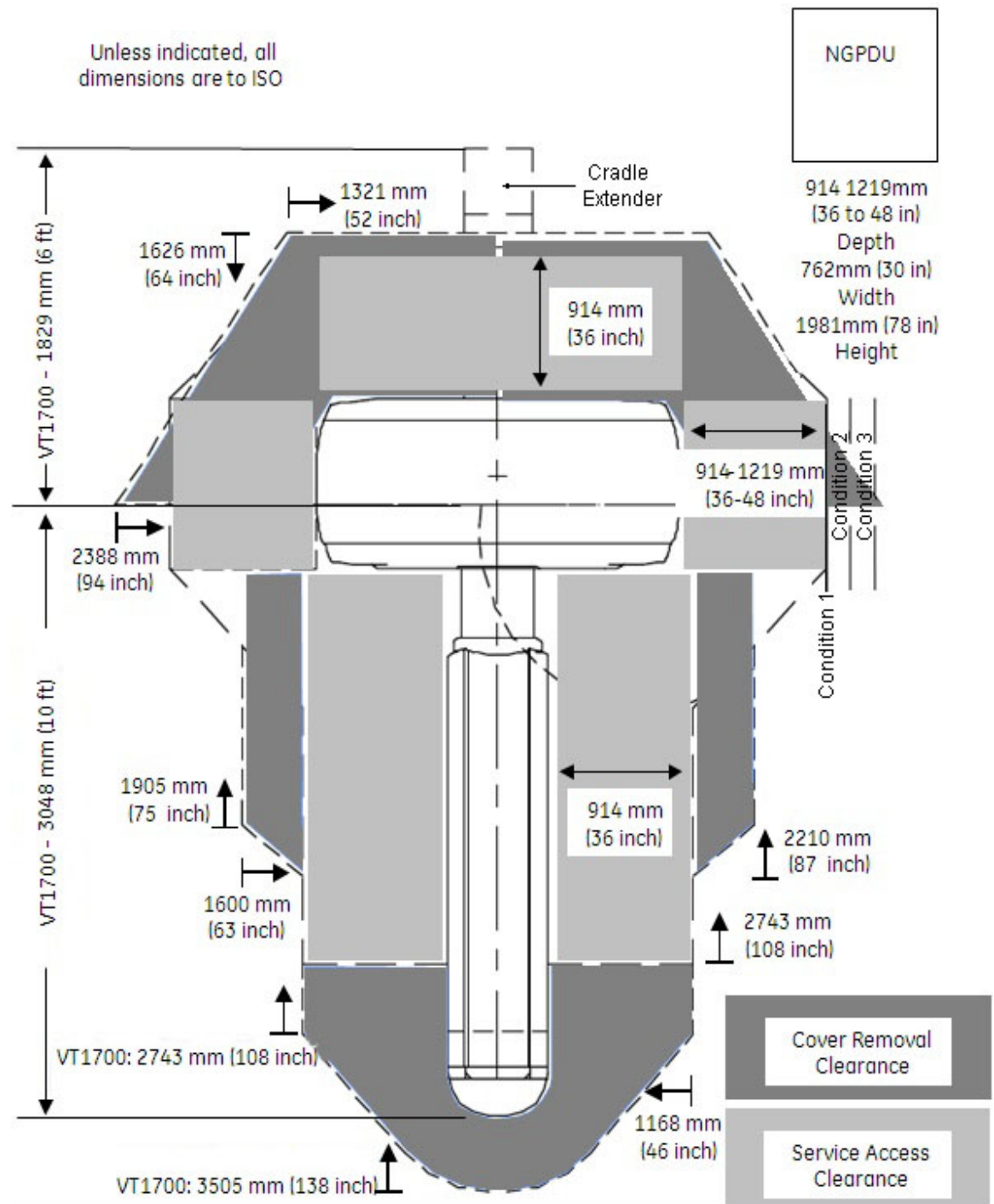


Figure A-1 Standard Service Access

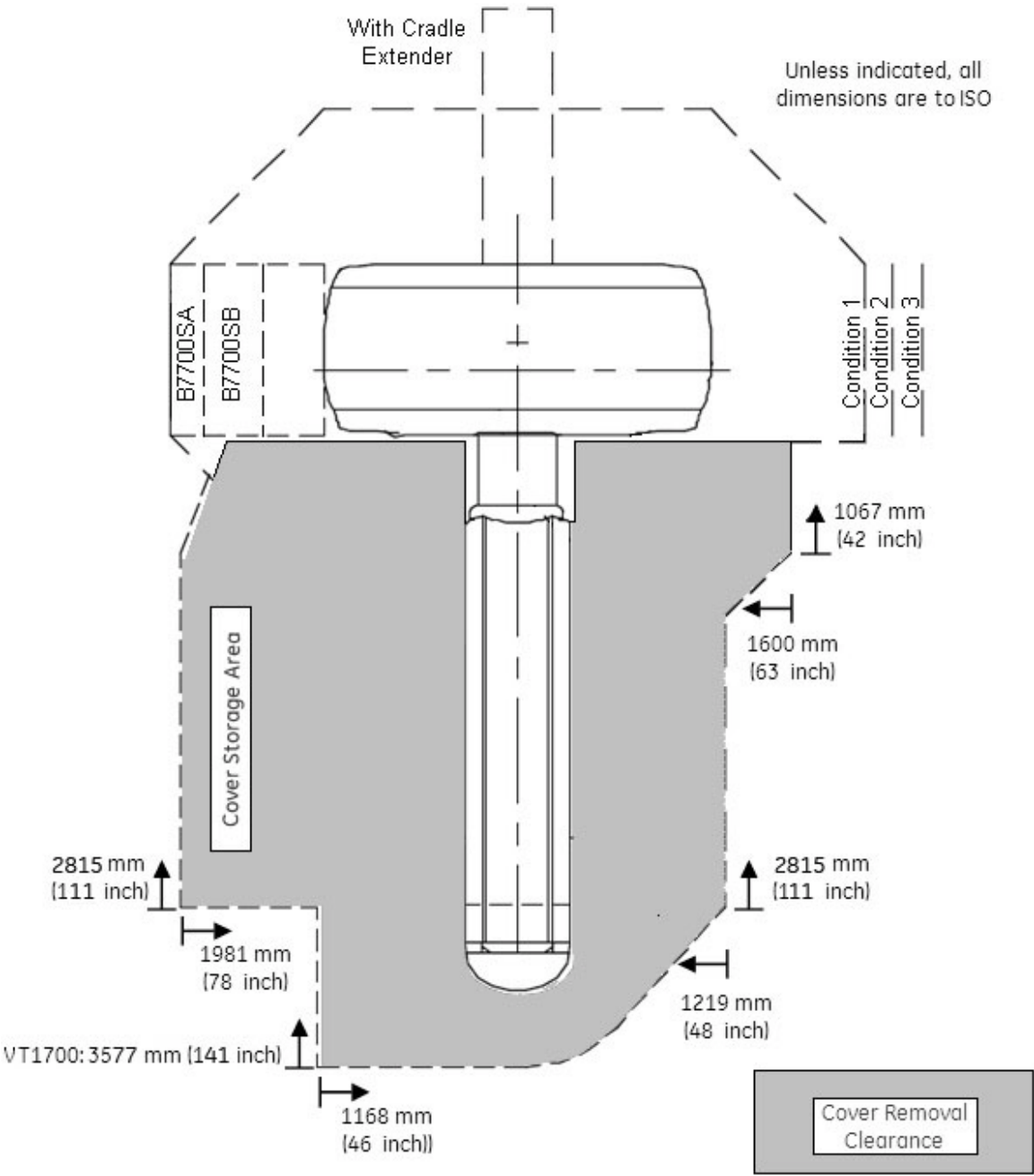


Figure A-2 Front Cover Removal and Storage to Left Side

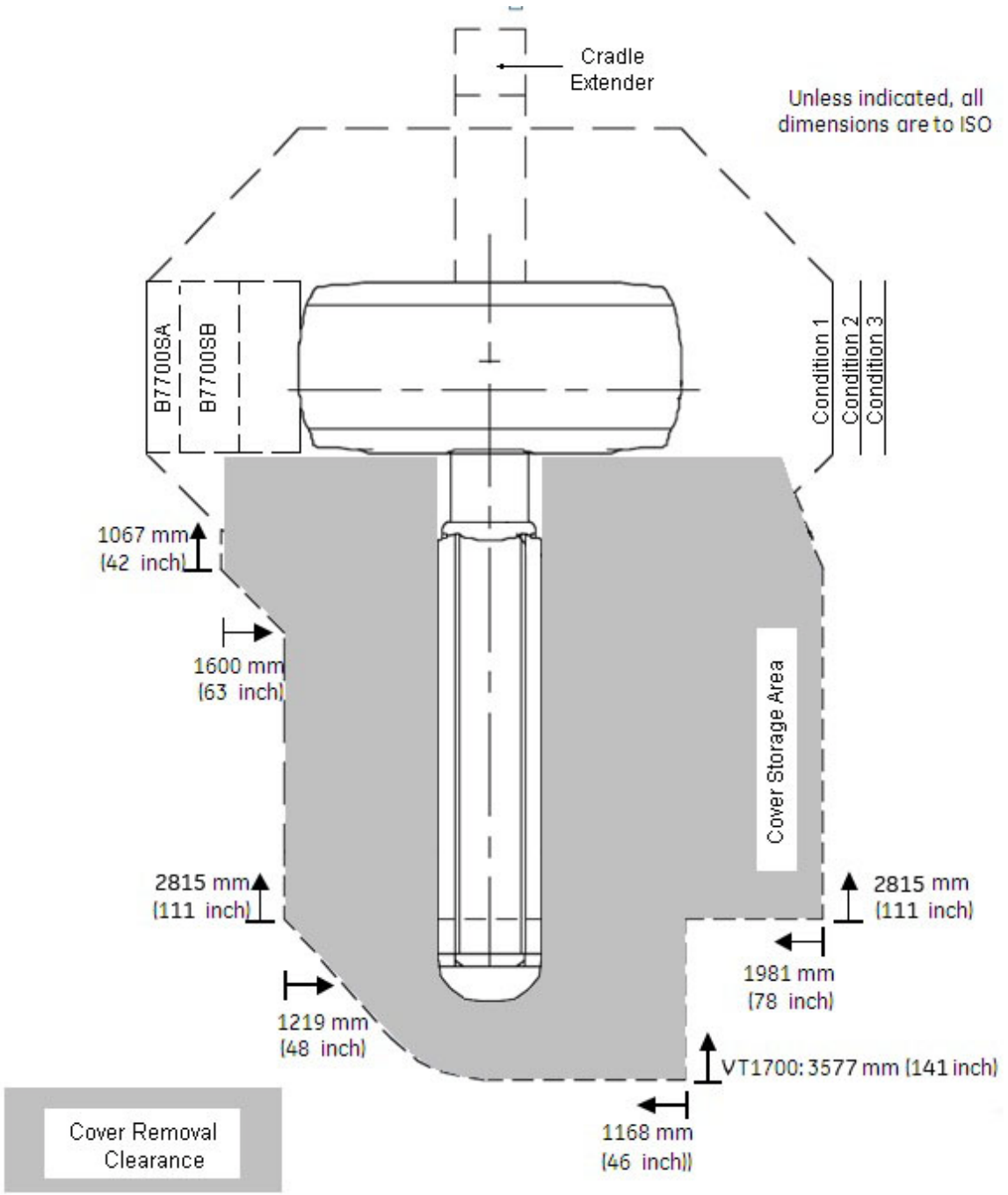


Figure A-3 Front Cover Removal and Storage to Right Side

A - Covers

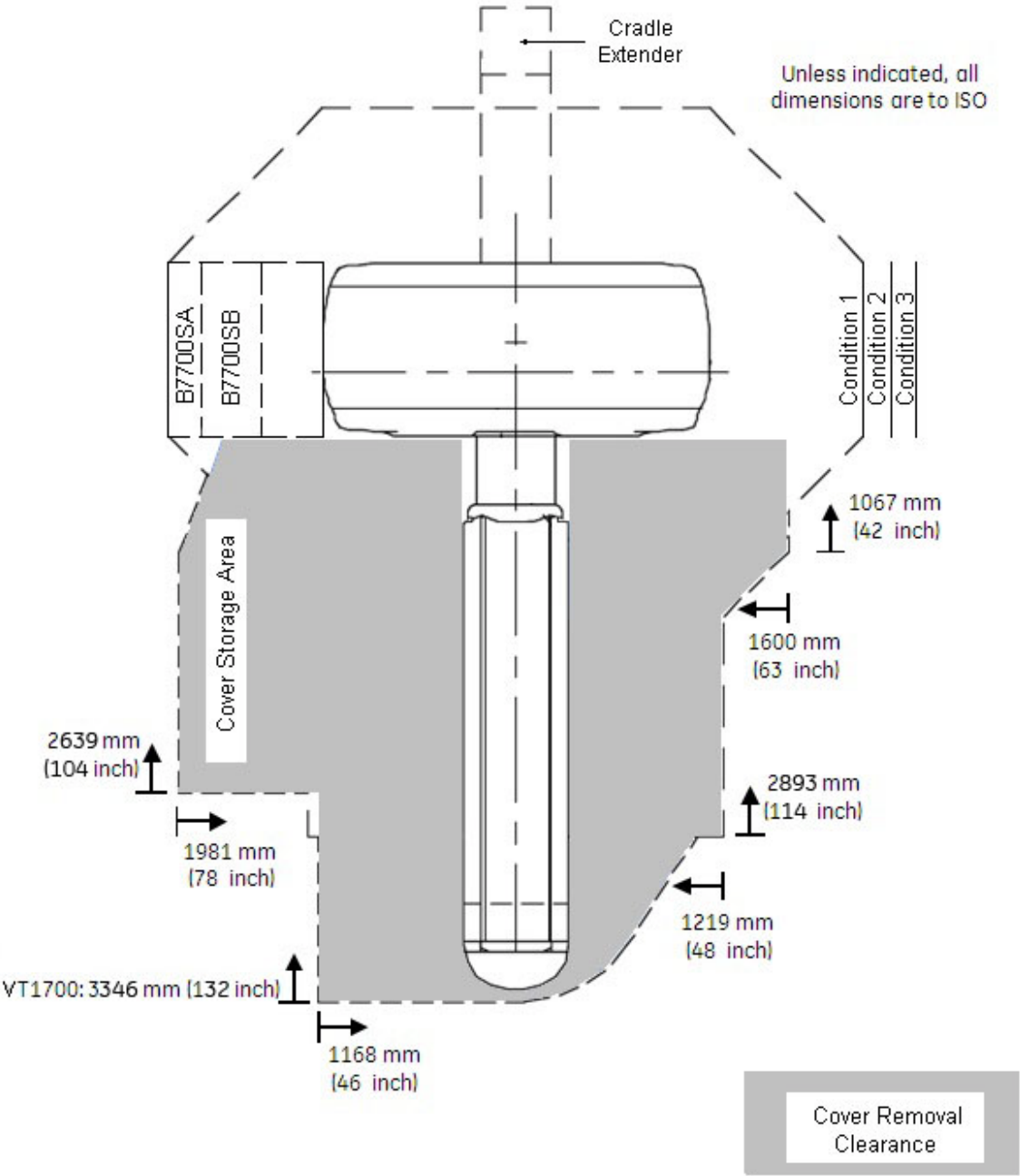
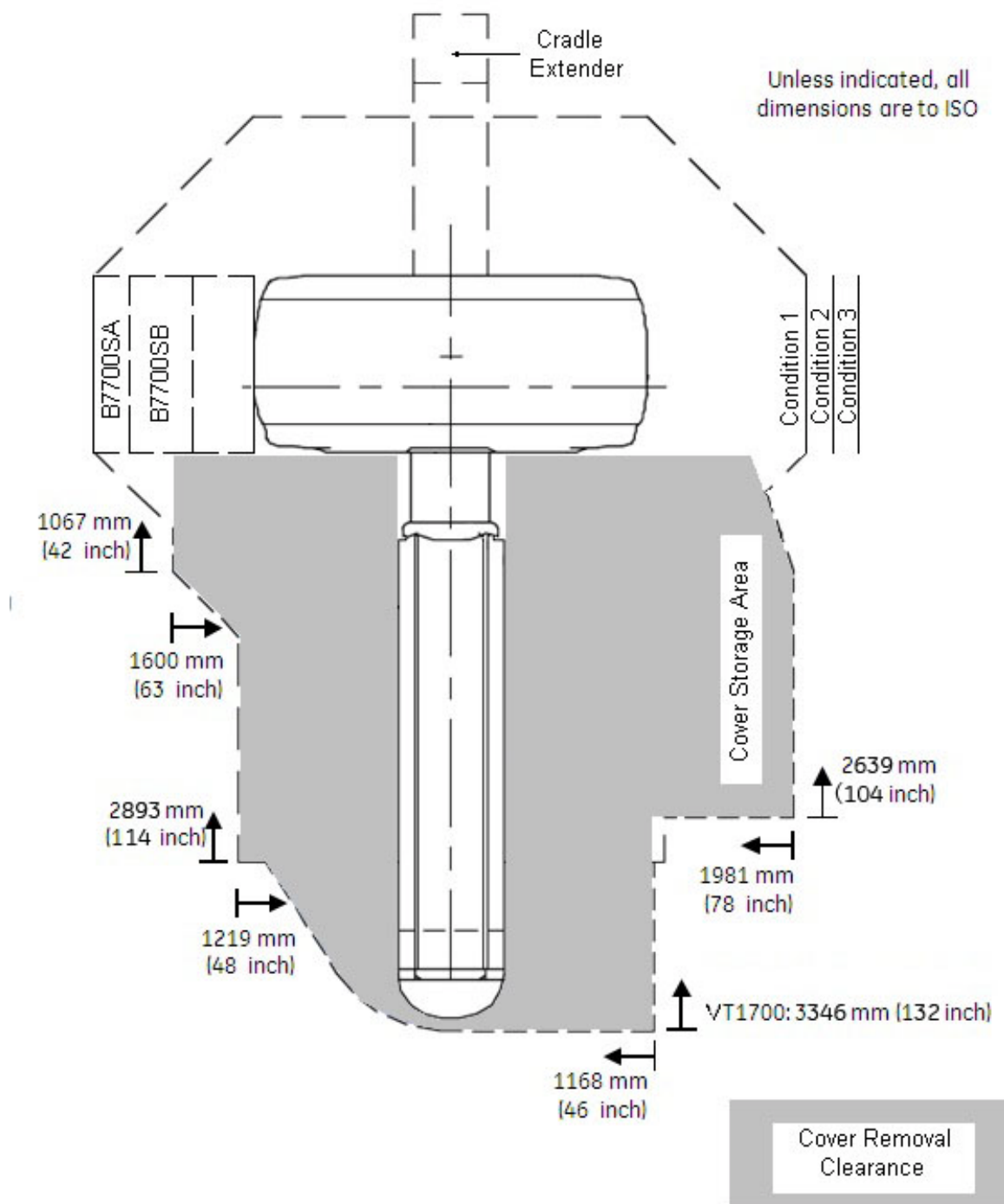


Figure A-4 Front Cover Removal with Table Up, Storage to Left Side



A - Covers

Figure A-5 Front Cover Removal with Table Up, Storage to Right Side

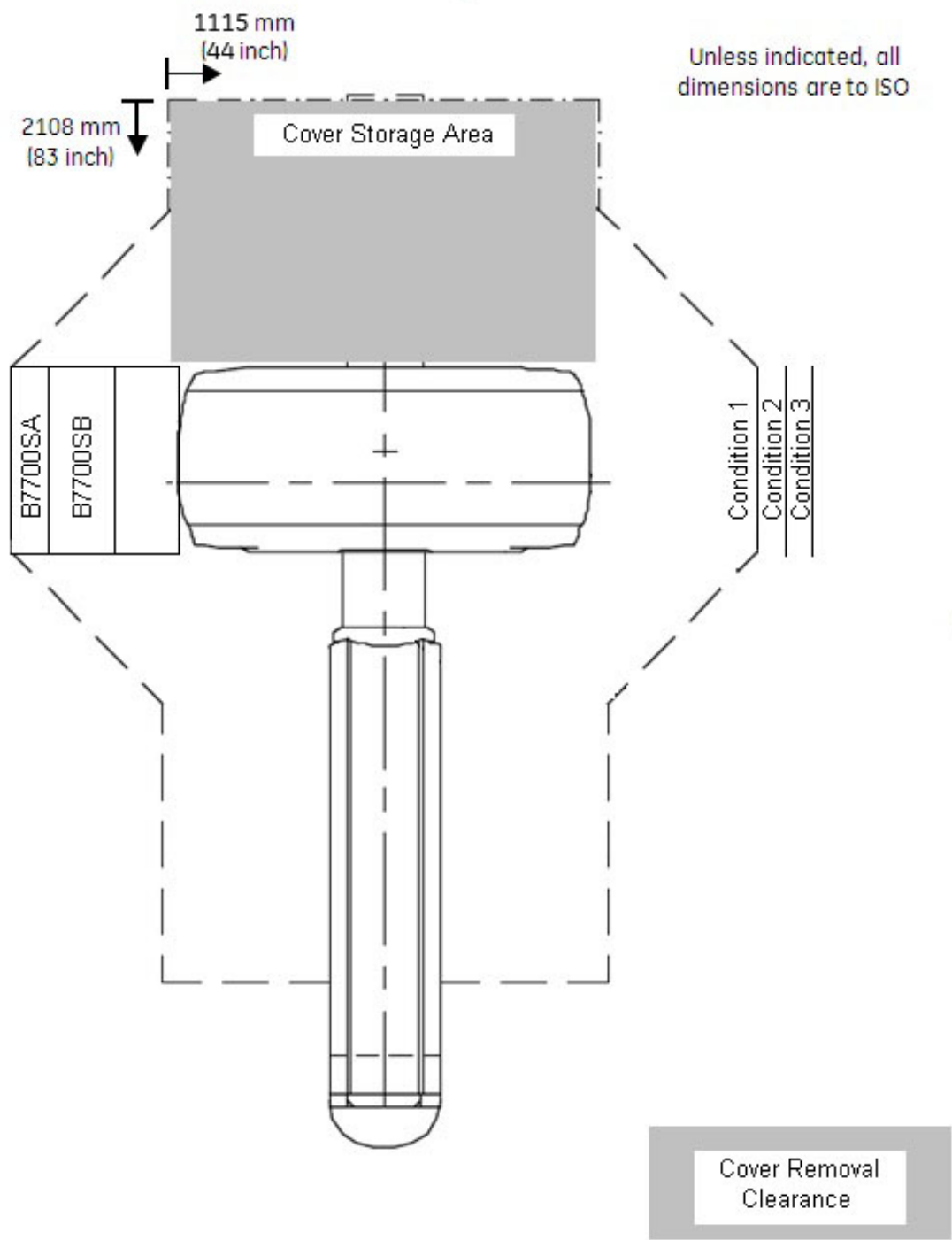


Figure A-6 Rear Cover Removal and Storage Straight Back

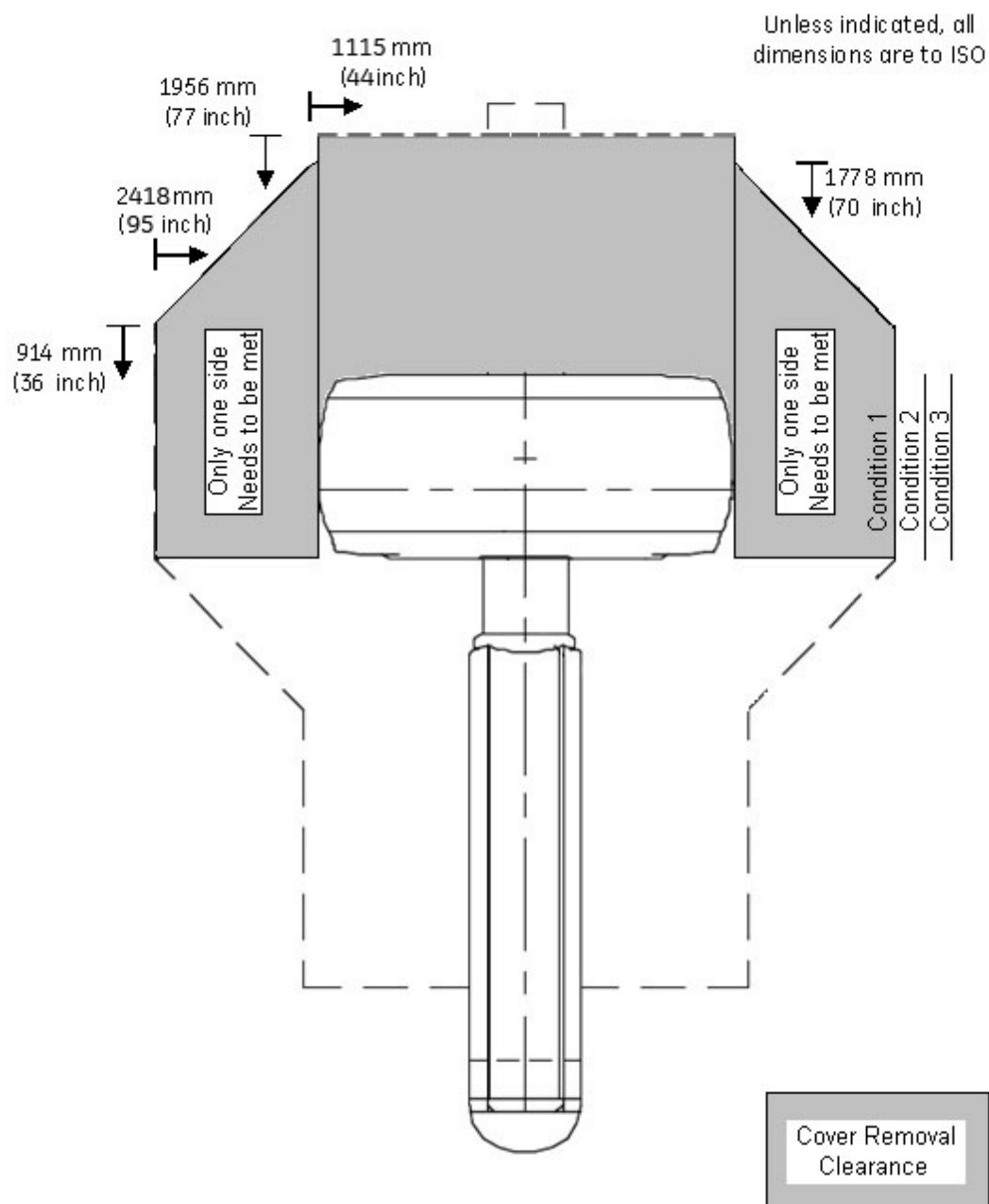


Figure A-7 Rear Cover Removal and Storage to Left or Right Side

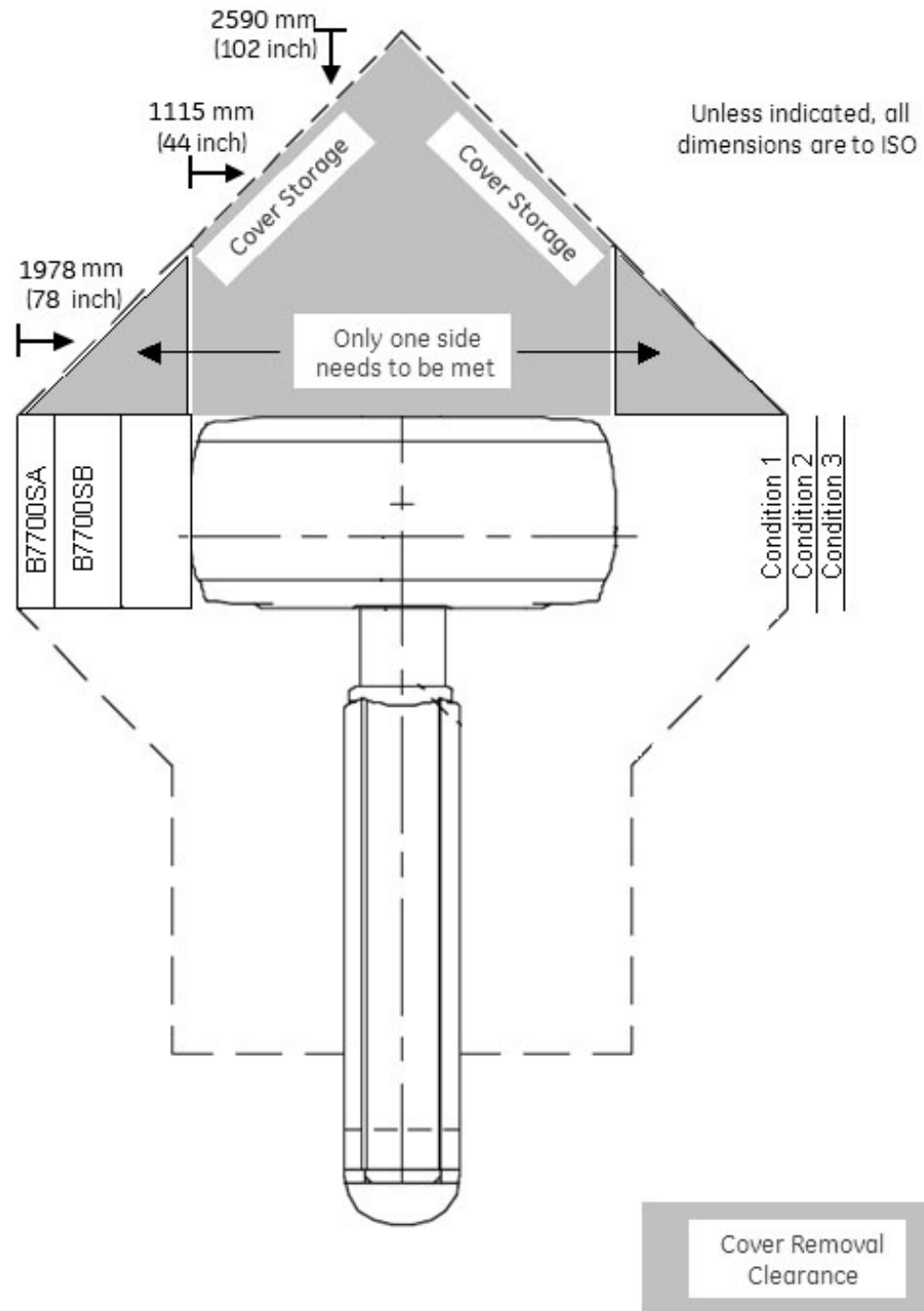


Figure A-8 Rear Cover, Gantry Angled, Storage in Corner

www.gehealthcare.com

