

GE Healthcare

Innova 2100-IQ, 3100/3100-IQ, 4100/4100-IQ Cardiovascular Imaging System Pre-Installation Manual



OPERATING DOCUMENTATION

5160944-13-1EN
Revision 2

ATTENTION

LES APPAREILS A RAYONS X SONT DANGEREUX A LA FOIS POUR LE PATIENT ET POUR LE MANIPULATEUR SI LES MESURES DE PROTECTION NE SONT PAS STRICTEMENT APPLIQUEES

Bien que cet appareil soit construit selon les normes de sécurité les plus sévères, la source de rayonnement X représente un danger lorsque le manipulateur est non qualifié ou non averti.

Une exposition excessive au rayonnement X entraîne des dommages à l'organisme.

Par conséquent, toutes les précautions doivent être prises pour éviter que les personnes non autorisées ou non qualifiées utilisent cet appareil créant ainsi un danger pour les autres et pour elles-mêmes.

Avant chaque manipulation, les personnes qualifiées et autorisées à se servir de cet appareil doivent se renseigner sur les mesures de protection établies par la Commission Internationale de la Protection Radiologique, Annales 26 : Recommandations de la Commission Internationale sur la Protection Radiologique et les normes nationales en vigueur.

WARNING

X-RAY EQUIPMENT IS DANGEROUS TO BOTH PATIENT AND OPERATOR UNLESS MEASURES OF PROTECTION ARE STRICTLY OBSERVED

Though this equipment is built to the highest standards of electrical and mechanical safety, the useful x-ray beam becomes a source of danger in the hands of the unauthorized or unqualified operator.

Excessive exposure to x-radiation causes damage to human tissue.

Therefore, adequate precautions must be taken to prevent unauthorized or unqualified persons from operating this equipment or exposing themselves or others to its radiation.

Before operation, persons qualified and authorized to operate this equipment should be familiar with the Recommendations of the International Commission on Radiological Protection, contained in Annals Number 26 of the ICRP, and with applicable national standards.

ATENCION

LOS APARATOS DE RAYOS X SON PELIGROSOS PARA EL PACIENTE Y EL MANIPULADOR CUANDO LAS NORMAS DE PROTECCION NO ESTAN OBSERVADAS

Aunque este aparato está construido según las normas de seguridad más estrictas, la radiación X constituye un peligro al ser manipulado por personas no autorizadas o incompetentes. Una exposición excesiva a la radiación X puede causar daños al organismo.

Por consiguiente, se deberán tomar todas las precauciones necesarias para evitar que las personas incompetentes o no autorizadas utilicen este aparato, lo que sería un peligro para los demás y para sí mismas.

Antes de efectuar las manipulaciones, las personas habilitadas y competentes en el uso de este aparato, deberán informarse sobre las normas de protección fijadas por la Comisión Internacional de la Protección Radiológica, Anales No 26: Recomendaciones de la Comisión Internacional sobre la Protección Radiológica y normas nacionales.

ACHTUNG

RÖNTGENAPPARATE SIND EINE GEFAHR FÜR PATIENTEN SOWIE BEDIENUNGSPERSONAL, WENN DIE GELTENDEN SICHERHEITSVORKEHRUNGEN NICHT GENAU BEACHTET WERDEN

Dieser Apparat entspricht in seiner Bauweise strengsten elektrischen und mechanischen Sicherheitsnormen, doch in den Händen unbefugter oder unqualifizierter Personen wird er zu einer Gefahrenquelle.

Übermäßige Röntgenbestrahlung ist für den menschlichen Organismus schädlich.

Deswegen sind hinreichende Vorsichtsmaßnahmen erforderlich, um zu verhindern, daß unbefugte oder unqualifizierte Personen solche Geräte bedienen oder sich selbst und andere Personen deren Bestrahlung aussetzen können.

Vor Inbetriebnahme dieses Apparats sollte sich das qualifizierte und befugte Bedienungspersonal mit den geltenden Kriterien für den gefahrlosen Strahleneinsatz durch sorgfältiges Studium des Hefts Nr. 26 der Internationalen Kommission für Strahlenschutz (ICRP) vertraut machen: Empfehlungen der Internationalen Kommission für Strahlenschutz und anderer nationaler Normenbehörden.

Important Information

LANGUAGE

ПРЕДУПРЕЖДЕНИЕ

(BG)

Това упътване за работа е налично само на английски език с изключението на случаите, когато се изисква изрично по друг начин от местното законодателство, или от споразумение на местно ниво.

- 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，除非当地法律或本地供应协议另有明确要求。

- 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触电、机械伤害或其他形式的伤害。

VÝSTRAHA

(CS)

Tento provozní návod existuje pouze v anglickém jazyce, pokud není jinak výslovně vyžadováno místními zákony nebo odsouhlaseno na místní úrovni.

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

ADVARSEL

(DA)

Denne servicemanual findes kun på engelsk, medmindre andet kræves i henhold til lokal lovgivning eller lokal aftale.

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

WAARSCHUWING

(NL)

Deze onderhoudshandleiding is enkel in het Engels verkrijgbaar, tenzij expliciet vereist door plaatselijke regelgeving of overeengekomen op lokaal niveau.

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

WARNING

(EN)

This service manual is available in english only except as otherwise expressly required by local law or agreed to at a local level.

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

HOIATUS

(ET)

See teenindusjuhend on saadaval ainult inglise keeles, kui kohalikud seadused ei ütle teisiti või kui kohalikes õigusaktides ei ole otseselt teisiti ette nähtud.

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

VAROITUS

(FI)

Tämä huolto-ohje on saatavilla vain englanniksi, ellei paikallinen laki nimenomaan toisin vaadi tai jos toisin on sovittu paikallisella tasolla.

- 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)

Sauf exigence contraire des lois locales ou accord contraire au niveau local, ce manuel d'installation et de maintenance n'est disponible qu'en anglais.

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

WARNUNG

(DE)

Diese Serviceanleitung existiert nur in englischer Sprache, sofern nichts anderes gesetzlich vorgeschrieben oder auf lokaler Ebene vereinbart wurde.

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

ΠΡΟΕΙΔΟΠΟΙΗΣΗ

(EL)

Το παρόν εγχειρίδιο σέρβις διατίθεται μόνο στα αγγλικά, εκτός αν η τοπική νομοθεσία απαιτεί κάτι άλλο ή υπάρχει διαφορετική συμφωνία σε τοπικό επίπεδο.

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

FIGYELMEZTETÉS

(HU)

Ezen karbantartási kézikönyv kizárólag angol nyelven érhető el, kivéve ha a helyi rendelkezések ezt kifejezetten elő nem írják, illetve ha helyi szinten erről külön megállapodás nem születik.

- 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.

AÐVÖRUN

(IS)

Þessi þjónustuhandbók er eingöngu fánleg á ensku, nema annað sé sérstaklega krafist, löglega eða samþykkt á landsgrundvelli.

- 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.

AVVERTENZA

(IT)

Il presente manuale di manutenzione è disponibile soltanto in inglese, eccetto quando espressamente richiesto dalle normative locali o convenuto a livello locale.

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

警告

(JA)

このサービスマニュアルには英語版しかありません。ただし使用国の法令に別異の定めがある、あるいは現地で別段の合意がある場合を除きます。

- 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)

현지 법률에 따라 명시적으로 요구하거나 현지 수준에서 합의한 경우를 제외하고 본 서비스 매뉴얼은 영어로만 이용하실 수 있습니다.

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

BRĪDINĀJUMS
(LV)

Šī apkalpes rokasgrāmata ir pieejama tikai angļu valodā, izņemot gadījumus, kad vietējie likumi nepārprotami nosaka citādi vai panākta vienošanās vietējā līmenī.

- Ja klienta apkalpes sniedzējam nepieciešama informācija citā valodā, nevis angļu, klienta pienākums ir nodrošināt tulkošanu.
- Neveiciet aprīkojuma apkalpi bez apkalpes rokasgrāmatas izlasīšanas un saprašanas.
- Šī brīdinājuma neievērošana var radīt elektriskās strāvas trieciena, mehānisku vai citu risku izraisītu traumu apkalpes sniedzējam, operatoram vai pacientam.

ĮSPĖJIMAS
(LT)

Šis eksploatavimo vadovas yra tik anglų kalba, išskyrus tuos atvejus, kai vietiniai įstatymai tiesiogiai numato kitokius reikalavimus arba vietiniu lygiu sutarta kitaip.

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

ADVARSEL

(NO)

Denne servicehåndboken finnes bare på engelsk, bortsett fra dersom det motsatte uttrykkelig er fastsatt av lokal lovgivning eller det er inngått annen avtale lokalt.

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

OSTRZEŻENIE

(PL)

Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim, chyba że lokalne przepisy lub umowy wyraźnie stanowią inaczej.

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

ATENȚIE

(RO)

Acest manual de service este disponibil numai în limba engleză, cu excepția cazului în care este o cerință obligatorie stipulată de legislația națională sau convenită la nivel local.

- 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! Данное руководство по техническому обслуживанию предлагается только на английском языке, за исключением тех случаев, когда наличие руководства на национальном языке является требованием местного законодательства или когда выпуск такого руководства согласован с местным представительством.

(RU)

- 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.

UPOZORNENIE Tento návod na obsluhu je k dispozícii len v angličtine, okrem prípadov, kedy tak výslovne vyžadujú miestne zákony alebo je dohodnuté na miestnej úrovni.

(SK)

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

ATENCION Este manual de servicio sólo existe en inglés, salvo que la legislación local exija de forma expresa lo contrario, o así se haya acordado a nivel local.

(ES)

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

VARNING

(SV)

Den här servicehandboken finns bara tillgänglig på engelska om inte annat uttryckligen krävs av lokal lag eller har överenskommit på lokal nivå.

- 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.

DİKKAT

(TR)

Aksi, yerel bir yasa tarafından açıkça gerekli görülmediği veya yerel bir seviyede kabul edilmediği takdirde, bu servis kılavuzunun sadece İngilizcesi mevcuttur.

- Eğer müşteri teknisyeni bu kılavuzu İngilizce 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.

AVISO

(PT-BR)

Este manual de assistência técnica encontra-se disponível unicamente em inglês, salvo disposições em contrário previstas pela legislação local ou acordadas no âmbito local.

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

ATENÇÃO (PT-PT)

Este manual de assistência técnica só se encontra disponível em inglês, salvo requisição expressa pela legislação local ou acordo efectuado a nível local.

- Se qualquer outro serviço de assistência técnica solicitar este manual noutra língua, 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.

UPOZORENJE (SR)

Ovo servisno uputstvo je dostupno samo na engleskom jeziku, sem ako lokalni zakon to izričito zahteva ili je dogovoreno na lokalnom nivou.

- 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, rukovoca ili pacijenta usled strujnog udara ili mehaničkih i drugih opasnosti.

UPOZORENJE (HR)

Ovaj servisni priručnik dostupan je na engleskom jeziku.

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

警告 (ZH-TW)

本維修手冊僅有英文版。

- 若客戶的維修廠商需要英文版以外的語言，應由客戶自行提供翻譯服務。
- 請勿試圖維修本設備，除非您已查閱並瞭解本維修手冊。
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Chapter 1 Introduction

1 Object and Scope of this manual

This document is intended as a guide and information resource to properly plan and prepare a site for the installation of an Innova system.

In addition, this document provides references to the pre-installation documents of the various product included with an Innova System.

These documents are intended to assist the Installation Specialist and the Site Planner in properly preparing a site for the installation of this system.

It provides pre-installation data, such as site preparation prior to the delivery of the Innova System, environmental and electrical requirements and some additional planning aids.



MAKE SURE THE ROOM PREPARATION COMPLIES WITH LOCAL REGULATIONS AS THE PIM IS NOT INTENDED TO REFLECT ALL OF THEM

2 Responsibilities of the Purchaser/Customer

To ensure that the installation of an Innova System meets the purchaser or customer expectations, it is important to determine who will take responsibility for the various items during the system installation process. To help you in determining these responsibilities, review the following checklists with the customer and assign responsibilities as appropriate:

- Tool and Test Equipment ([Chapter 7, Section 2, Tools and Test Equipment](#))
- Pre-Installation Checklist ([Chapter 7, Section 5, Pre-Installation Checklist](#))

Contract Changes:

Be sure to inform the customer that the cost of any alteration or modification not specified in the sales contract are liable to the customer.

The following GE-supplied equipment must be installed by the Hospital's Contractors, per room drawings:

- PDB (Electrical Power Distribution Box or Main Disconnect Panel)
- LC Gantry & Table baseplate hole drilling (Per supplied template)
- LCD Monitor suspension stationary rails
- LC Gantry baseplate grout
- LC Gantry baseplate
- Omega/Innova^{IQ} Table common baseplate (if applicable)

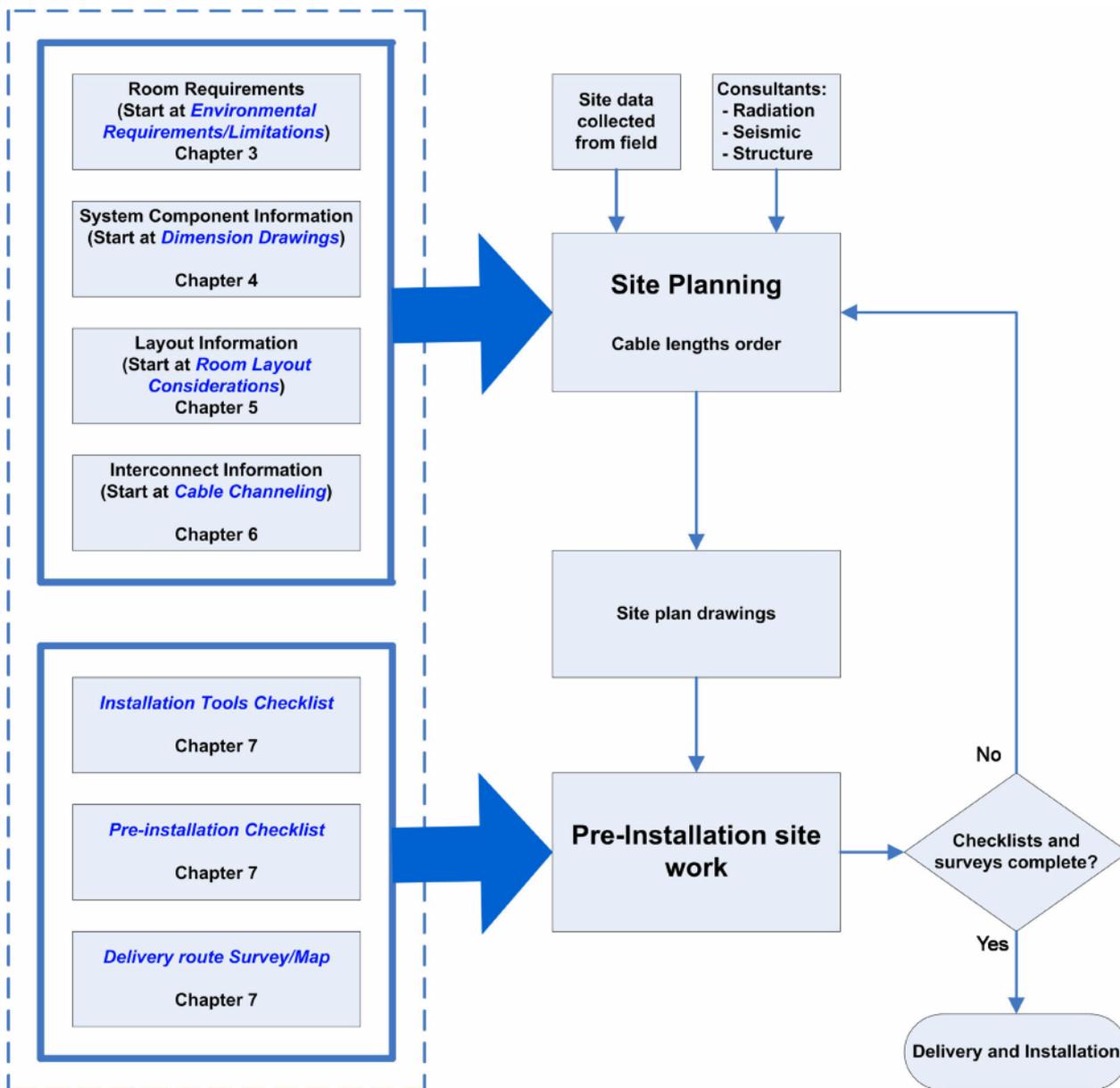
NOTE: In case of Innova^{IQ} Table upgrade, it is critical to have the table baseplate flushed in the concrete.

3 Pre-Installation Process

Complete the checklists in *ROOM LAYOUTS*, *ELECTRICAL CONNECTIONS*, and *ADDITIONAL PLANNING AIDS* of this manual. They represent an important part of the pre–installation process. The checklists summarize the required preparations and allow to verify the proper completion of the pre–installation procedures.

You will find hereafter a chart of the information flow in the pre–installation process.

Illustration 1-1:



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Chapter 2 Innova Systems

1 Description of Innova System

1.1 Description of the Innova LC positioner

A complete Innova LC positioner comprises only three parts.

- Innova C2 cabinet
- Innova positioner including an X-ray tube housing with a collimator and a Revolution Digital Detector.
- TSSC, Smart Box or Smart handle (options for remote installation) .

1.2 Description of the Innova Patient table

1.2.1 Innova 2100-IQ Case

Innova 2100-IQ System can be supplied with an OMEGA IV Compact patient table, an OMEGA V long patient table, which includes a table side control with Contour Filter, or a Innova^{IQ} patient Table.

1.2.2 Innova 3100/3100-IQ and 4100/4100-IQ Case

Innova 3100/4100 Systems can be supplied with an OMEGA V Long patient table or Innova^{IQ} patient Table, which includes a table side control with Contour Filter.

Illustration 2-1: Omega patient table (with TSSC)



Illustration 2-2: Innova^{IQ} Patient Table



1.3 Description of the X-Ray generator

The Innova System uses an Innova High Voltage System with component parts as follows according to the power requested (100 kW):

- Jedi – C1 cabinet,
- Ingrid H.V. tank mounted on the Performix 160A X-Ray tube housing.

1.4 Description of the X-Ray head

The Innova System uses a Performix 160A X-Ray tube housing:

- X-Ray tube
- collimator
- Ingrid HV tank
- oil/water exchanger
- contour filter
- tube chiller

NOTE: An external recirculating chiller is mandatory.

It is mandatory to place the Chiller in the Technical Room.

1.5 Description of the Innova Imaging System

An Innova System is managed and controlled by a System including (does not list all components):

- C1 cabinet, inside which the main components are the RTAC, the DL, the modem, the Firewall, the HUB, the KVM, the 4 KVA PDU and the Jedi generator,

- C2 cabinet positioner control,
- Fluoro UPS interface box near C1 cabinet (Fluoro UPS option),
- VCIM console,
- Revolution Digital Detector mounted on Innova LC positioner:
- An external Digital Detector chiller is mandatory.

- 53 cm (21") Hi-Brite monitor,
- 43 cm (17") Hi-Brite monitor (optional).
- LCD NEC 19" 1990 SXi Color Monitor.
- LCD 18" EIZO GmbH (formerly Siemens) SMD 18101G or 18102G B & W Monitor.
- LCD 19" EIZO GmbH SMD 19100G Color Monitor.
- LCD 19" GmbH SMD 19100G B & W Monitor.

1.6 Description of the image monitors suspensions

The common type of this suspension is an XT inboard monitor bridge.

A monitor frame support receiving 3 monitors (1 life monitor, 1 reference monitor, 1 Advantage Windows monitor).

A monitor frame support receiving 4 monitors (1 life monitor, 1 reference monitor, 1 Advantage Windows monitor (optional for Innova 2100-IQ), 1 ECG monitor).

A monitor frame support receiving 3, 4, or 6 LCD monitors (fixed monitor suspension).

Only for Control Area a Gyro TV® wall mount can supports the 2 Hi-Brite monitors 53 cm or 43 cm (21" or 17").

1.7 Description of the DL and associated devices

An Innova System uses the DL Digital Imaging system.

- The C1 Cabinet contains:
 1. DL Computer,
 2. Modem (option)
 3. Firewall
 4. Ethernet switch
 5. KVM-local
 6. Video Splitter
- The user area is made of:
 1. I/R Receiver / Emitter
 2. DL color LCD monitor (19")
 3. Keyboard,
 4. Mouse

5. Keypads for user dialogue
6. Video station:
 - Hi-Brite monitor in a user area
 - VCR in option

1.8 AW workstation

2 monitors 19" flat panel and 1 monitor (flat panel) fixed on suspension (option) and 1 video switcher. Check power input for switcher.

1.9 TV monitors

As basic configuration, two 21" (53 cm) (Hi-Brite) monitor are mounted on a TV monitor frame support. In this case, the frame is fastened to a boom.

As an option 3 monitors, dual 21" (Hi-Brite) monitors and an additional monitoring screen are supplied mounted on the TV frame support with tray. The frame is fastened to a boom.

Another option, in case of four 21" (Hi-Brite) monitors, is a fixed suspension. It's the precabled four monitor frame support.

For monitors, see [Section 1.6](#)

1.10 CENTRICITY CA1000 option

Refer to : *Centricity Cardiology CA 1000 V2.0 Preinstallation Guide* in the OEMs of the Innova 2100-IQ, 3100/3100-IQ, 4100/4100-IQ service manual.

1.11 Injectors

The recommended injectors are:

- LF Angiomat Illumina (pedestal only)
- Medrad Mark V + Provis (Table/rack mount or pedestal)
NOTE: Only the Medrad Mark V injector rack mounted version is authorized to be used on Innova^{IQ} Table
- ACIST CVI (table rail mounted or Standard/cart)
- Medrad Avanta (Pedestal only)

1.12 Fluoro UPS option

The Innova LC system can be protected with an optional Fluoro UPS.

There are two types of Fluoro UPS:

- UL for North America and other 480V – 60Hz countries.
- CE for Asia and Europe



WARNING

DO NOT CONNECT THE UPS BATTERIES PRIOR THE COMMISSIONING OF THE UPS (INITIAL POWER UP).



NOTICE

General safety instructions

- Move the UPS in an upright position in its original package to the final destination room.
To lift the cabinets, use a forklift or lifting belts with spreader bars.
- Check for sufficient floor and elevator loading capacity.
- Check the integrity of the UPS equipment carefully.
- If you notice visible damage, do not install or start the UPS. Contact the nearest Service Center immediately.
WARNING! RISK OF ELECTRICAL SHOCK: Do not remove covers; there are no user serviceable parts inside.
- All installation, maintenance and service work should be performed by qualified service personnel.
The UPS contains its own energy source (battery).
- The field-wiring terminals may be electrically live, even when the UPS is disconnected from the utility.
- Dangerous voltages may be present during battery operation. The battery must be disconnected during maintenance or service work.
- This UPS contains potentially hazardous voltages.
- Be aware that the inverter can restart automatically after the utility voltage is restored.



NOTICE

Installation safety instructions:

- Contractor responsibility:
 - Electrical contractor is responsible for providing and connecting the cables and configuring the PDB in by-pass mode.
 - GEHC is responsible for powering on the system with the UPS in by-pass mode.
 - GEDE is responsible for UPS commissioning.
- After removing the sidewalls of the UPS, make sure that all earth connections when reassembling, are correctly reattached.
- This UPS is intended for use in a controlled indoor environment free of conductive contaminants and protected against animals intrusion.
- **HIGH GROUND LEAKAGE CURRENT:** Ground connection is essential before connecting to AC input!
For Europe only, if a differential breaker is placed on the hospital main supply, upstream the PDB, the differential shall be set to 300 mA.
- Switching OFF the unit does not isolate the UPS from the utility.
- Do not install the UPS in an excessively humid environment or near water.
- Avoid spilling liquids on or dropping any foreign object into the UPS.
- The unit must be placed in a sufficiently ventilated area; the ambient temperature should not exceed 104°F (40°C).
- Optimal battery life time is obtained if the ambient temperature does not exceed 77°F (25°C).
- It is important that air can move freely around and through the unit. Do not block the air vents.
- Avoid locations in direct sunlight or near heat sources.
- Check local regulations for UPS installation.



NOTICE

Storage safety instructions:

- Store the UPS in a dry location; storage temperature must be within -13°F (-25°C) to 131°F (55°C).
- If the unit is stored for a period exceeding 3 months, the battery must be recharged periodically (time depending on storage temperature).



NOTICE

Battery safety instructions:

- The battery–voltage is dangerous for person’s safety.
- Never dispose of battery in a fire: They may explode.
- Do not open or mutilate battery: Their contents (electrolyte) may be extremely toxic.
If exposed to electrolyte, wash immediately with plenty of water.
- Avoid charging in a sealed container.

1.13 Intravascular Ultrasound (IVUS) Option

1.13.1 Purpose

Volcano is a manufacturer of intravascular ultrasound systems, which are used in the cath lab. GE has a strategic agreement with Volcano. GE will be selling and servicing some of the Volcano products.

1.13.2 Product Description

The Volcano IVUS s5i and s5i/GE systems are dedicated equipments for IntraVascular UltraSound imaging, designed as add on equipment to Vascular Imaging systems. The IVUS s5i/GE equipment is also capable of receiving patient data from the Innova system.

The Volcano IVUS rev 1 Hardware configuration consists of:

- A computer (IVUS CPU) connected to a monitor (IVUS Monitor), both located in the Control Room,
- A Patient Interface Module (IVUS PIM) located in the Procedures Room
- Various user interface units to control the system
 - IVUS Control Station,
 - IVUS Joystick,
 - IVUS Keyboard & mouse pad installed in the Control Room,
- Optional Image Printer, located in the Control Room is available for the IVUS system

The IVUS integration to Innova, involves further components :

- Innova Central (Touchscreen) as optional control station,
- Video Signal Switch to route Workstation and IVUS video signals,
- Procedures Room monitor shared by Workstation (AW or Ca1000) and IVUS operations,
- Network cable (IVUS to Innova system),
- Grounding cable (IVUS CPU to Patient Table ground bar),

The s5i/GE rev 1 is used with phased array catheter provided by Volcano (Eagle Eye Gold catheter).

The s5i/GE rev 2 includes a new PIM for rotational catheter and another one for FFR capabilities.

The s5i/GE rev 2 release is based on

- S5x platform
- 3.0.2 software release

The new s5x platform introduces 2 new components:

- A new IVUS catheter type (rotational catheter) in addition to the current one (phased array catheter):
The same Graphical User Interface and application will be used for both catheter types, the user only needs to plug the desired Patient Interface Module and insert a corresponding catheter type to be able to start imaging.
- A new application (FFR):
It is a new diagnostic method, the so-called FFRTM (Fractional Flow Reserve) mode which serves as a blood pressure measurement device in the vascular veins. In this mode the Volcano s5x device can measure the difference between the patient's aortic and distal pressure, which result serves as a good decision-helper for the type of treatment.

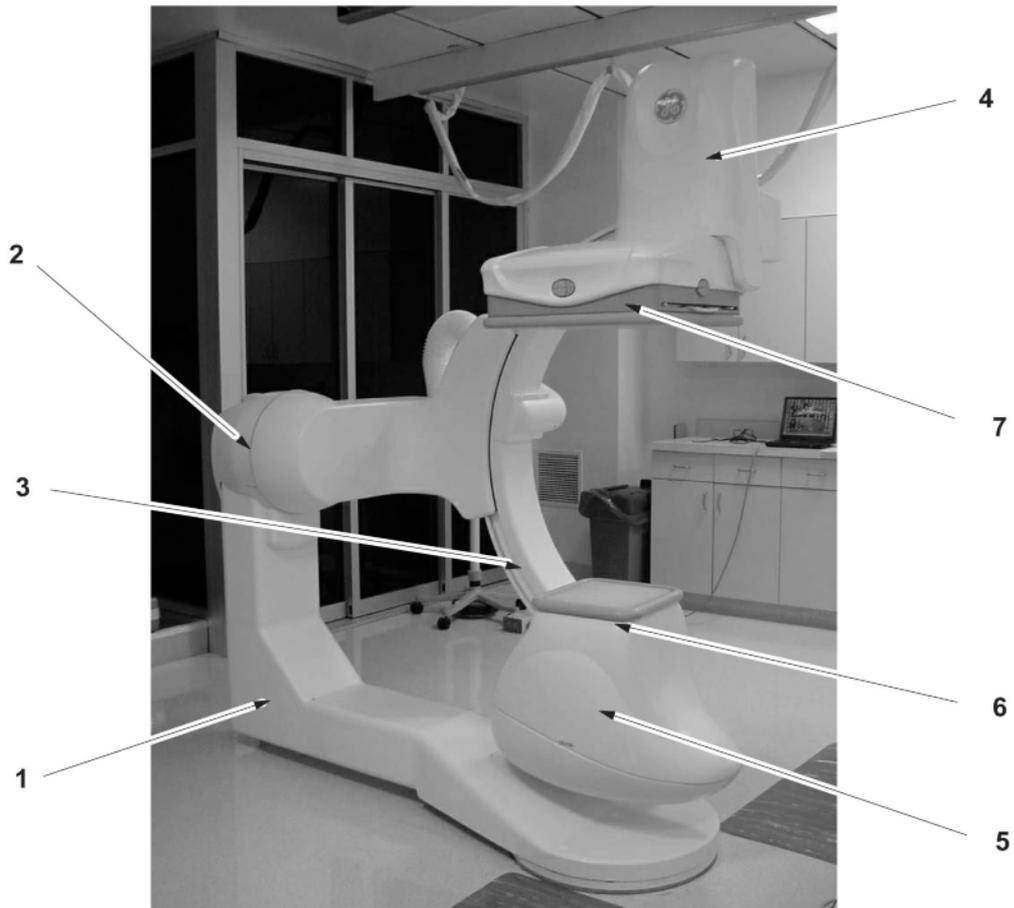
It also answers some user enhancement requests:

- Introduction of a sealable Patient Interface Module to prevent oxidation of the catheter connector.
- Introduction of a set of cable clamps and a Patient Interface Module's rail hanger with cable strain relief to decrease cable damage.
- Introduction of a new monitor cable type to increase the system reliability.
- Introduction of a new tableside-based TouchPad device to provide an enhanced user interface, focusing mainly on characterization of the vessel wall on the IVUS image.

2 Innova Product Identification

2.1 Innova LC Basic Product

Illustration 2-3:



Innova LC positioner including:

- L-arm (Item 1),
- Pivot (Item 2),
- C-arc (Item 3),
- Motorized elevator (Item 4) for the Revolution Digital Detector,
- X-ray tube (Item 5),
- Siemens collimator (Item 6),
- 21 cm Revolution Digital Detector for Innova 2100-IQ (Item 7).
- 31 cm Revolution Digital Detector for Innova 3100 (Item 7).
- 41 cm Revolution Digital Detector for Innova 4100 (Item 7).

2.2 C1 Cabinet

Illustration 2-4:



2.3 C2 Cabinet

Illustration 2-5:



2.4 Omega Patient Table

Illustration 2-6:



OMEGA PATIENT TABLE

2.5 InnovalQ Patient Table

Illustration 2-7:



TILT PATIENT TABLE

2.6 User Interfaces

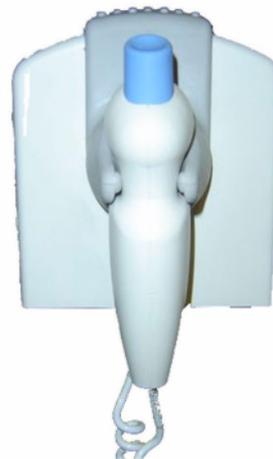
Illustration 2-8: User interfaces with Omega table



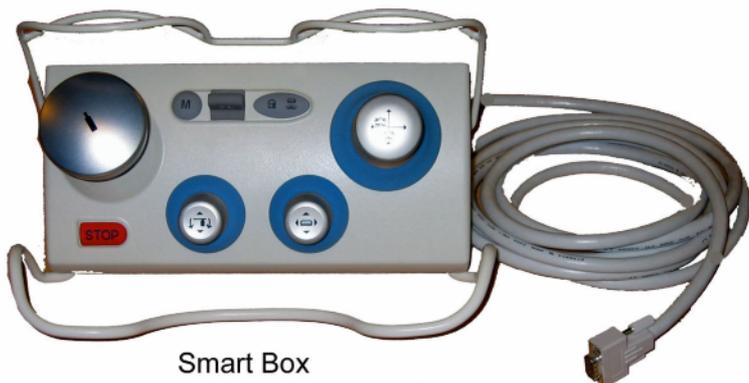
Illustration 2-9: User interfaces with Innova^{IQ} Table



Table Side Control (TSSC) with contour filtering



Bolus Handle (option)



Smart Box



Table Panning Device (TPD)



3D Mouse (option)



Table Footswitch



Intelligent TouchScreen Unit (ITU) (option)

2.7 Fluoro UPS

Illustration 2-10:



NOTE: Refer to the UPS vendor Service manual Installation Guide SG Serie 10, 20, 30 & 40 kVA for more details

2.8 UPS IF Box

Illustration 2-11:



UPS IF BOX

2.9 X-Ray Tube Chiller

Illustration 2-12:



Lytron

2.10 Digital Detector Chillers

Illustration 2-13:



Thermo-Tek
(with Innova 3100/4100)



Thermo-Con
(with Innova 2100-IQ)

2.11 Innova User Area

Illustration 2-14:



Remote control



Keypad



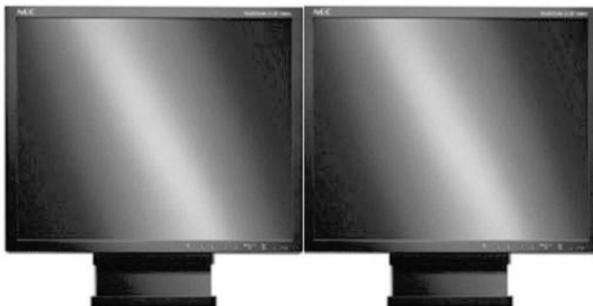
Innova VCIM with DL keyboard console



DL color LCD monitor



Post processing color LCD monitors
(Options)



Repeater B&W LCD monitors (Options)



Advantage
windows
monitor



Centricity
CA1000
monitor

2.12 IVUS Option

Illustration 2-15: IVUS Rev 1 components



IVUS Safety Isolation Transformer



IVUS CPU



IVUS Patient Interface module



IVUS Control Console



IVUS Video Switch



IVUS printer



IVUS Joystick

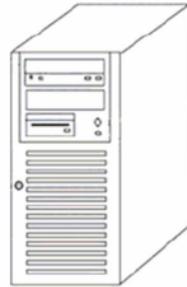


IVUS Control Room Monitor

Illustration 2-16: IVUS Rev 2 components



IVUS Safety Isolation Transformer



IVUS CPU



IVUS Patient Interface module



IVUS Control Console



IVUS Video Switch



IVUS printer



IVUS Joystick



IVUS Control Room Monitor



IVUS Touchpad Control



IVUS PIMr



IVUS Pimette

3 Basic Innova System Compatibility

3.1 System Compatibility Cross-Reference – Innova LC Positioner

| PRODUCT NAME | MODEL NUMBER | PRE-INSTALLATION DOCUMENT NUMBER | NOTES |
|----------------------|---------------------|----------------------------------|---|
| LC ANGIO POSITIONER | 2341727 | This document | HV cable 24 m |
| LC COMBO POSITIONER | 2396420 | This document | |
| LC CARDIO POSITIONER | 5126671 | This document | |
| C2 CABINET | 2335139-2/2335139-4 | This document | |
| SMART HANDLE+ SP | 2237456-3/5127605 | This document | Optional: Second MAC : For Omega table only |
| SMART BOX+ SP | 2237457-3/5127604 | This document | Optional: Second MAC : For Omega table only |
| SMART BOX | 5231984 | This document | For Innova ^{IQ} Table only |
| BOLUS HANDLE | 2111431 | This document | Optional |

3.2 System Compatibilities Cross-Reference – Tables Sub-System

| PRODUCT NAME | MODEL NUMBER | PRE-INSTALLATION DOCUMENT NUMBER | NOTES |
|----------------------------------|-----------------|----------------------------------|---|
| INNOVA ^{IQ} TABLE | 5142213 | This document | |
| OMEGA IV TABLE | 2320221-3 | This document | Includes tabletop |
| OMEGA V LONG TABLE | 2320045-5 | This document | Includes tabletop |
| OMEGA V NON MOTORIZED LONG TABLE | 2320045-6 | This document | Includes tabletop |
| TSSC+ W/ CF | 2347973/5127602 | This document | Optional: Second MAC : For Omega table only |
| TSSC | 5231985 | This document | For Innova ^{IQ} Table only |
| TABLE PANNING DEVICE | 2214620 | NA | |

Note 1: w/CF means with Contour Filter and w/o CF means without Contour Filter.

3.3 System Compatibilities Cross-Reference – Jedi X-Ray Generator

| PRODUCT NAME | MODEL NUMBER | PRE-INSTALLATION DOCUMENT NUMBER | NOTES |
|---------------|--------------|----------------------------------|---------------------|
| JEDI 100 VASC | 2326480 | NA | Includes C1 cabinet |

3.4 System Compatibility Cross-Reference – X-Ray Head

| PRODUCT NAME | MODEL NUMBER | PRE-INSTALLATION DOCUMENT NUMBER | NOTES |
|----------------------------|--------------------|----------------------------------|-------|
| Performix 160 A X-Ray tube | D2801A | Not applicable | |
| Cardio collimator | 5127609 | Not applicable | |
| Angio collimator | 2317741 or 5245319 | Not applicable | |
| COOLIX 4000 Chiller | 5115497 | 2358897-100 | |

3.5 System Compatibility Cross-Reference – Innova LC Imaging And X-Ray Control

| PRODUCT NAME | MODEL NUMBER | PRE-INSTALLATION DOCUMENT NUMBER | NOTES |
|---|--------------|----------------------------------|-------|
| VCIM | 2340519 | NA | |
| DL Liberty user interface | 2345576 | This document | |
| C1 cabinet | 2335129 | This document | |
| Innova 2100-IQ, 21 cm Revolution Digital detector | 5127984 | This document | |
| Innova 3100, 31 cm Revolution Digital detector | 2359035 | This document | |
| Innova 4100, 41 cm Revolution Digital detector | 2329766 | This document | |
| Detector Chiller Thermo-Tek (with Innova 2100-IQ) | 2387548 | This document | |
| Detector Chiller Thermo-Con (with Innova 3100/4100) | 5131740 | This document | |

3.6 System Compatibility Cross-Reference – Monitor Support & Suspension

| PRODUCT NAME | MODEL NUMBER | PRE-INSTALLATION DOCUMENT NUMBER | CATALOG NUMBER |
|---|--|----------------------------------|--|
| PRECABLED 3 MONITOR COUNTERBALANCED SUSPENSION: <ul style="list-style-type: none"> • 3 FFD and ECG (2) monitor frame support • 9 ft 6 in (2.9 m) Inboard Monitor Bridge • or 7 ft 9 in (2.4 m) Inboard Monitor Bridge | <ul style="list-style-type: none"> • 2353620 • 46-182884G2 • or 46-193992G2 | 2248370-100 | <ul style="list-style-type: none"> • B2057AE • B2057AG |
| PRECABLED 4 MONITOR FIXED HEIGHT SUSPENSION: <ul style="list-style-type: none"> • 4 FFD monitor frame support (1) • 9 ft 6 in (2.9 m) Inboard Monitor Bridge • or 7 ft 9 in (2.4 m) Inboard Monitor Bridge | <ul style="list-style-type: none"> • 2353621 • 46-182884G2 • or 46-193992G2 | 2208876-100 | <ul style="list-style-type: none"> • B2057AE • B2057AG |
| Note (1): With power strip for Innova | | | |
| PRECABLED LCD 3 MONITOR SUSPENSION: <ul style="list-style-type: none"> • CABLE HARNESS 24 m • or CABLE HARNESS 36 m | 5126893 <ul style="list-style-type: none"> • 2378538 • or 2378540 | 2393190-100 | |
| PRECABLED LCD 4 MONITOR SUSPENSION: <ul style="list-style-type: none"> • CABLE HARNESS 24 m • or CABLE HARNESS 36 m | 5126894 <ul style="list-style-type: none"> • 2378538 • or 2378540 | 2393190-100 | |
| PRECABLED LCD 6 MONITOR SUSPENSION: <ul style="list-style-type: none"> • CABLE HARNESS 24 m • or CABLE HARNESS 36 m | 5126896 <ul style="list-style-type: none"> • 2378538 • or 2378540 | 2393190-100 | |

3.7 System Compatibilities Cross-Reference – 21” (53 CM), 17” (43 CM), 18” & 19” Monitors

| PRODUCT NAME | MODEL NUMBER | PRE-INSTALLATION DOCUMENT NUMBER | CATALOG NUMBER |
|--|--------------|----------------------------------|----------------|
| 17"- (43 cm) Flicker Free Extra Bright Monitor | 2223415 | sm 2224863-100 | |
| 21"- (53 cm) Flicker Free Extra Bright Monitor | 2305765-3 | sm 2224863-100 | |
| LCD NEC 19" - 1990 SXi Color Monitor | 5172850-2 | | |
| LCD 18" - EIZO GmbH (formerly Siemens) SMD18101G B& W Mon-SMD18101G B& W Monitor | 2403949-2 | sm 2408074-100 | |
| | 2403949-3 | | |
| LCD 19" – Eizo SMD19100G B& W with Stand | 5148721-2 | sm 5219983-100 | |
| LCD 19" – Eizo SMD19100G B& W without Stand | 5148721-3 | | |
| LCD 19" – Eizo SMD19100G Color with Stand | 5148720-2 | | |
| LCD 19" – Eizo SMD19100G Color without Stand | 5148720-3 | | |

4 Optional Innova System Components

4.1 System Compatibilities Cross-Reference – Omega Table Sub-System

| PRODUCT NAME | MODEL NUMBER | PRE-INSTALLATION DOCUMENT NUMBER | CATALOG NUMBER |
|----------------|-------------------|----------------------------------|----------------|
| SMART HANDLE | 2237456-3/5127605 | This document | |
| SMART BOX | 2237457-3/5127604 | This document | |
| TSSC+ SP W/ CF | 2347973/5127602 | This document | |

Note 1: w/CF means with Contour Filter and w/o CF means without Contour Filter.

4.2 System Compatibilities Cross-Reference – InnovalQ Table Sub-System

| PRODUCT NAME | MODEL NUMBER | PRE-INSTALLATION DOCUMENT NUMBER | CATALOG NUMBER |
|--------------|--------------|----------------------------------|----------------|
| SMART BOX | 5231984 | This document | |
| TSSC | 5231985 | This document | |

4.3 System Compatibilities Cross-Reference – Wall Mount Monitor

| PRODUCT NAME | MODEL NUMBER | PRE-INSTALLATION DOCUMENT NUMBER | CATALOG NUMBER |
|--|--------------|----------------------------------|----------------|
| Wall Mount for 17 or 21" (43 or 53 cm) | 2305202 | 2129003-100 | |

Note: The wall mount monitor is for Control Room only.

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Chapter 3 Physical Requirements of Room

1 Presentation of the 3 Rooms

1.1 Examination room

- Innova LC Positioner
- Omega / Innova^{IQ} Patient Table
- Performix X-Ray Tube Assembly
- Collimator
- Innova Digital Detector



WARNING

THE ELECTRONIC CABINETS (C1, C2, COOLIX 4000 CHILLER, DETECTOR CONDITIONER AND FLURO UPS WHEN INSTALLED) INCLUDE FANS THAT ARE CREATING AIR-CIRCULATION OF PULSED-AIR. WHEN THIS PULSED AIR IS IN AN ENVIRONMENT THAT MAY CONTAIN AIRBORNE PATHOGENS LIKE AN EXAM ROOM/CONTROL ROOM, THERE IS A RISK OF TRANSMISSION OF THESE AIRBORNE PATHOGENS FROM PATIENTS TO OTHER PATIENTS OR CLINICAL PERSONNEL (NOSOCOMIAL DISEASES). TO REDUCE THIS RISK, THE ELECTRONIC CABINETS MUST BE INSTALLED IN A ROOM SEPARATED FROM EXAM ROOM/CONTROL ROOM, I.E., TECHNICAL ROOM.

1.2 Technical room

- C2 Cabinet
- C1 Cabinet
- Coolix 4000 Chiller
- Detector Conditioner HEAT DRY 1
- Fluoro UPS (option) (1 Cabinet)
- Fluoro UPS IF box (option)

1.3 Control room

- VCIM
- DL Flat Panel
- DL Keyboard
- Monitors

2 Environmental Requirements/Limitations

2.1 Room Climate



NOTICE

Avoid extremes in temperatures

Innova system room climate requirements – relative humidity and temperature (individual products or components are classed by their installation area)

Table 3-1:

| INSTALLATION ROOM OF PRODUCT OR COMPONENT | RELATIVE HUMIDITY (NON- CONDENSING) | | | | TEMPERATURE | | | | | |
|---|-------------------------------------|-----|---------|-----|-----------------------|----------------|---|----------------|---------------------|-----------------|
| | IN-USE | | STORAGE | | IN-USE (See Note (3)) | | RECOMMENDED (See Note (3)) | | STORAGE / TRANSPORT | |
| | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| Examination room | 30% | 70% | 10% | 70% | +15°C +59°F | +32°C +90°F | Design for Patient/ Operator Comfort | | -10°C +14°F | +50°C +122°F |
| Technical room (See Note (1)) | 30% | 75% | 10% | 70% | +10°C +50°F | +35°C +95°F | +13°C +55°F | +25°C +77°F | -14°C +8°F | +50°C +122°F |
| Technical room with Fluoro UPS optional | 30% | 75% | 10% | 70% | +20°C +68 °F | +25°C +77°F | +20°C +68 °F | +25°C +77°F | -5°C +23°F | +50°C +122°F |
| Control room | 30% | 75% | 10% | 70% | +10°C +50°F | +35°C +95°F | +20°C +68°F | +25°C +77°F | -10°C +14°F | +50°C +122°F |
| Innova Digital Detector | See Note (2) | | | | | | | | | |

NOTE: (1): The target temperature (best recommended) is 18°C (64°F).

NOTE: (2): The detector should be stored at 10 to 40 °C (50 to 104 °F) and less than or equal to 90% RH in the plastic wrapped shipping box. (This should include two bags of desiccant as well). The lowest temperature (e.g. 10 °C (50 °F)) and humidity is preferable. If they are to be stored outside of their shipping box or in the inner shipping box without plastic wrapping they should be stored at 20 °C (68 °F) or less and 30% RH or less. In terms of transportation, do not expose to temperatures below –20 °C (–4 °F) **in its shipping box** for more than 15 hours. The detector will reach the ambient temperature after 20 to 25 hours. The detector should not be allowed to reach temperatures less than –10 °C (14 °F) or irreparable damage to the detectors scintillator will occur. Care must be taken when removing a detector from a shipping box. If the detector has been subject to cold temperatures for an extended period the detector in the box should be allowed to sit in the plastic wrapped box to reach room temperature. This will prevent condensation from occurring. Condensation on the detector can cause irreparable damage to the electronics. Storage 10 to 40 °C (50 to 104 °F); 10 to 90 % RH, 250 day storage transportation –20 to +60 °C (–4 to 140 °F) and 10 to 80% RH. The Detector chiller HEAT DRY 1 is shipped within GEMS packaging.

NOTE: (3): **In use temperature limits** specify the range where the system shall work. Operating outside these limits could occur severe performance and reliability issues.

Recommended temperature limits specify the range where it is recommended to adjust air conditioning control in order to warranty current operations inside the in use range.

Relative Humidity and Temperature: Refer to [Table 3-1](#). To obtain relative humidity and temperature requirements for components not specified in [Table 3-1](#), refer to the appropriate component Pre-Installation Manual listed in [Chapter 2, Section 3, Basic Innova System Compatibility](#).

Altitude and Atmospheric Pressure: Refer to [Table 3-2](#). To obtain altitude and atmospheric pressure requirements for components not specified in [Table 3-2](#), refer to the appropriate component Pre-Installation Manual listed in [Chapter 2, Section 3, Basic Innova System Compatibility](#).

Table 3-2:

| INSTALLATION ROOM OF PRODUCT OR COMPONENT | ALTITUDE (meters) | | | | ATMOSPHERIC PRESSURE (kPa) | | | |
|---|-------------------|------|---------------------|------|----------------------------|-----|---------------------|-----|
| | IN-USE | | STORAGE / TRANSPORT | | IN-USE | | STORAGE / TRANSPORT | |
| | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| Examination room | 0 | 3000 | -30 | 3000 | 70 | 106 | 70 | 106 |
| Technical room (See Notice below) | 0 | 3000 | -30 | 3000 | 70 | 106 | 50 | 106 |
| Control room | 0 | 3000 | 0 | 3000 | N/A | N/A | N/A | N/A |



NOTICE

The chiller is able to dissipate maximum continuously power at 3000 meters in an ambient temperature up to 20°C, for this altitude the technical room temperature shall not exceed 20°C.



NOTICE

In some cases condensation occurs and water drops from outlets and pipes of the air conditioner in the technical room.

Therefore, it is critical to install the cabinets where there is no risk of flood from the air conditioner.



NOTICE

Ensure the air outlet positions in the exam room is not in area closed to monitor suspension carriage/rail.

2.2 Equipment Heat Output (Dissipation)

2.2.1 Equipment Heat Output tables

Refer to [Table 3-3](#). To obtain heat output information for components not specified in [Table 3-3](#), refer to the appropriate component Pre-Installation Manual listed in [Chapter 2, Section 3, Basic Innova System Compatibility](#).

Table 3-3:

| | | HEAT OUTPUT | | | | | | | | | |
|--|-----------------------------------|-----------------|--------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-----------------|--|
| | | Stand by | | Moderate Use (4) | | Typical Use (4) | | Maximum Use (4) | | | |
| Room | Core System | kW | BTU/hr | kW | BTU/hr | kW | BTU/hr | kW | BTU/hr | | |
| Exam Room | Innova LC positioner and table | 0.41 | 1394 | 0.55 | 1858 | 0.89 | 3020 | 1.62 | 5517 | | |
| Ctrl Room | DL user area with 1 TFT monitor | 0.16 | 546 | 0.16 | 546 | 0.16 | 546 | 0.16 | 546 | | |
| | 2 B&W flat monitors | 0.17 | 573 | 0.17 | 573 | 0.17 | 573 | 0.17 | 573 | | |
| Tech Room | C1 Cabinet | 0.41 | 1398 | 0.69 | 2366 | 0.99 | 3389 | 1.29 | 4412 | | |
| | C2 Cabinet | 0.29 | 989 | 0.33 | 1125 | 0.54 | 1828 | 0.87 | 2966 | | |
| | Coolix X-Ray tube chiller (1) (2) | 2.53 | 8619 | 4.49 | 15309 | 5.49 | 18725 | 6.93 | 23625 | | |
| | Detector conditioner | 0.21 | 709 | 0.21 | 709 | 0.21 | 709 | 0.21 | 709 | | |
| | Main disconnect panel - PDB | 0.4 | 1534 | 0.45 | 1534 | 0.45 | 1534 | 0.45 | 1534 | | |
| Total for core system | | 4.6 | 15762 | 7.0 | 24020 | 8.9 | 30324 | 11.7 | 39881 | | |
| Room | | Options (3 & 5) | | Stand by | | Moderate Use (4) | | Typical Use (4) | | Maximum Use (4) | |
| Exam Room | 3 in room B&W TFT monitors | 0.25 | 859 | Same values as Stand by | Same values as Stand by | Same values as Stand by | Same values as Stand by | Same values as Stand by | Same values as Stand by | | |
| | In room AW TFT monitor | 0.12 | 409 | | | | | | | | |
| | Typical injector | 0.09 | 320 | | | | | | | | |
| Ctrl Room | AW work station | 0.35 | 1201 | | | | | | | | |
| | 2 AW TFT monitors | 0.24 | 818 | | | | | | | | |
| | Printer | 0.31 | 1054 | | | | | | | | |
| Typical configuration without fluoro UPS | | 5.9 | 20424 | 8.4 | 28682 | 10.3 | 34985 | 13.1 | 44543 | | |

NOTE: (1) Air flow requirements 1200 m³/h (706 CFM)

NOTE: (2) For more details, consult appropriate pre-installation manual

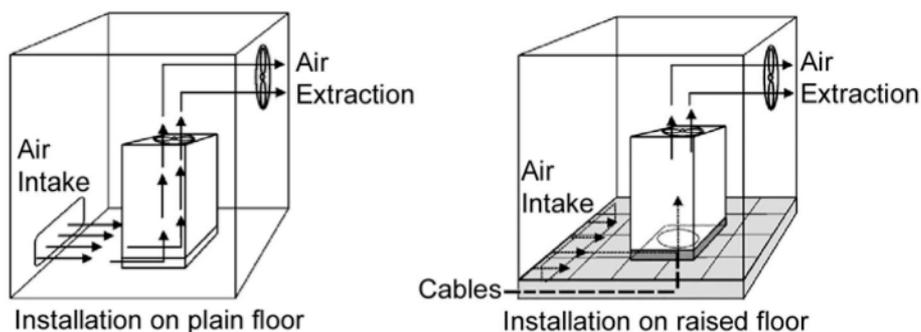
NOTE: (3) For UPS 20 kVA option refer to [Section 2.2.2](#)

NOTE: (4) **Moderate use:** 8 cases / 10 hours, **typical use:** 11 cases / 10 hours, **maximum use:** during case.

NOTE: (5) For IVUS environmental limitations and heat output, refer to [Section 2.2.3](#)

2.2.2 Fluoro UPS Option

Illustration 3-1:



NOTICE

The Fluoro UPS batteries require a cooling system to keep ambient temperature below 25 °C (77 °F).

The heat produced by the UPS is transferred to the environment by its ventilation. Cooling air enters the cabinets through the air inlet (grids) located at the bottom and exhausted through the outlet on the roof. A suitable ventilation or cooling system must be installed to extract the heat from the UPS room.



CAUTION

Make sure there is a ventilation air flow, preferably ensured by natural air flow, otherwise by enforced ventilation, so that hydrogen concentration is below 1% (according to Standard IEC 62040-1-2).



NOTICE

Do not put anything on the top of the cabinet.

If the UPS is placed on a raised floor, the airflow for UPS cooling should enter from underneath the UPS, through the appropriate aperture on the raised floor.

If the UPS runs in a dusty environment, we recommend strongly to install filters on the air inlet of the UPS room. In this case it should be considered that these filters can cause reduced speed at the air inlet.

The size of the air inlet has therefore to be dimensioned accordingly.

Contact your Local Distributor or one of the Service Centre, which will help you to find valuable solutions.

The tables below indicate the heat dissipation at full load at **PF = 0.8 lag** and charged battery, up to 1000 m (3280 ft) altitude, for cooling air 25°C (77°F) to 30°C (86°F).

- VFI (Voltage Frequency Independent) UPS system where the load is continuously supplied by the inverter through the rectifier.
- SEM (Super Eco Mode) permitting the maximum energy saving.

Table 3-4: Fluoro UPS CE

| Losses | | Cooling air flow | |
|---------|---------|-----------------------|-----------------------|
| VFI | SEM | VFI | SEM |
| 2.14 kW | 0.64 kW | 625 m ³ /h | 190 m ³ /h |

Table 3-5: Fluoro UPS UL

| Losses | | Cooling air flow | |
|----------|------|------------------|-------------------|
| BTU / hr | kW | CFM | m ³ /h |
| 6751 | 1.98 | 301 | 512 |



NOTICE

If installed in the technical room, the UPS may impact on it's layout. It may also be installed in a separate room. This depends on hospital constraints, local regulations or EHS rules. Clearance, weight of UPS, airflow and cooling system should be adapted for the UPS.



WARNING

ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND CONNECTING THE CABLES FROM THE PDB TO THE UPS AND CONFIGURING THE PDB IN BYPASS MODE. GEHC IS RESPONSIBLE FOR POWERING ON THE SYSTEM WITH THE UPS IN BYPASS MODE. GEDE IS RESPONSIBLE FOR UPS COMMISSIONING.



CAUTION

The Fluoro UPS can be installed either in an Electrical Local with restricted access or in the innova technical room as per local regulations.



NOTICE

Make sure that local regulations have been applied for the installation of the Fluoro UPS (dedicated room/fire detection etc.)

NOTE: Refer to the UPS vendor Service manual Installation Guide SG Serie 10, 20, 30 & 40 kVA for more details

2.2.3 IVUS Option

2.2.3.1 Environmental Limitations in Use (room climate)

Table 3-6: IVUS Rev 1

| | | |
|--|------------|----------------|
| Humidity (non condensing) : | 30 - 80 % | |
| Temperature (at 20% Relative Humidity) : | 15 - 32 C | (60 - 90 F) |
| Altitude (Relative to sea level) : | max 3048 m | (max 10000 ft) |

Table 3-7: IVUS Rev 2

| | | |
|--|------------|----------------|
| Humidity (non condensing) : | 30 - 80 % | |
| Temperature (at 20% Relative Humidity) : | 5 - 35 C | (41 - 95 F) |
| Altitude (Relative to sea level) : | max 3048 m | (max 10000 ft) |

2.2.3.2 Heat Output

| Device | Location | Heat output |
|---------|--------------|------------------------|
| PC | Control room | 335W – 1206 BTU/h |
| Monitor | Control room | 125W – 427 BTU/h |
| Printer | Control room | 67W – 229 BTU/h (idle) |



TAKE ANY STEPS NECESSARY TO PROVIDE CORRECT TEMPERATURE AND DUST FREE ENVIRONMENT FOR CORRECT OPERATION OF PC IN THE CONTROL ROOM.

2.3 Equipment Classifications

The following equipment classifications are applicable to the product:

Table 3-8:

| Classification category | Equipment classification |
|---|--|
| Protection against electric shock | Class I |
| Degree of protection against electric shock | Type B |
| Degree of protection against harmful ingress of water. | Ordinary equipment (enclosed equipment without protection against ingress of water); except footswitch which is a watertight device (protected against the effects of submersion, IPX7). |
| Method(s) of sterilization or disinfection recommended by the manufacturer. | Sterilization: not applicable Disinfection: refer to operator manual (Chapter Safety and Regulatory section Disinfection), recommended disinfecting agents. |
| Degree of safety of application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide. | Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide |
| Mode of operation | Continuous operation with intermittent loading |

2.4 IEC60601–1–2 Electromagnetic Standard Compliance & Documentation

The information contained in this section is also found in the Innova system Operator Manual.

2.4.1 General Scope

This equipment complies with IEC60601–1–2 Edition 2 EMC standard for medical devices

The Innova system is suitable to be used in the electromagnetic environment, as per the limits & recommendations described in the tables here after:

- Emission Compliance level & limits ([Table 3-9](#)).
- Immunity Compliance level & recommendations to maintain equipment clinical utility (see [Table 3-10](#), [Table 3-11](#) and [Table 3-12](#)).

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 cables interconnect diagrams.

2.4.2 Electromagnetic Emission

The Innova system is suitable for use in the specified electromagnetic environment. The purchaser or user of the Innova system should assure that it is used in an electromagnetic environment as described below:

Table 3-9:

| Emissions | Test Compliance | Electromagnetic Environment |
|---|-----------------------|--|
| Radio–Frequency Emissions CISPR11 | Group1 Class A limits | The Innova system is suitable for use in all establishments other than domestic and those directly connected to the low voltage power supply network that supplies buildings used for domestic purposes. |
| | Group1 Class A limits | The Innova system uses RF energy only for its internal function. Therefore, the RF emission is very low and not likely to cause any interference in nearby electronic equipment. |
| Harmonic emissions IEC 61000–3–2 | Not applicable | The Innova system is suitable for use only in establishments not directly connected to a public low voltage power supply network. |
| Voltage fluctuations/ flicker emissions IEC 61000–3–3 | Not applicable | The Innova system is suitable for use only in establishments not directly connected to a public low voltage power supply network. |

2.4.3 Electromagnetic Immunity

2.4.3.1 Electromagnetic Immunity

The Innova system is suitable for use in the specified electromagnetic environment. The purchaser or user of the Innova system should assure that it is used in an electromagnetic environment as described below:

Table 3-10:

| Immunity Test | IEC 60601-1-2 Test Level | Compliance Level | Electromagnetic Environment |
|--|--|--|--|
| Electrostatic discharge (ESD) IEC 61000-4-2 | 6 kV contact 8 kV air | 6 kV contact 8 kV air | Floors are wood, concrete, or ceramic tile, or floors are covered with synthetic material and the relative humidity is at least 30 percent. |
| 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 is that of a typical commercial and/or hospital environment |
| Surge IEC 61000-4-5 | 1 kV line(s) to lines(s) 2 kV line(s) to earth | 1 kV line(s) to lines(s) 2 kV line(s) to earth | Mains power quality is that of a typical commercial and/or hospital environment. |
| Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11 | 0 % U_n for 5 sec | 0 % U_n for 5 sec | Mains power quality is that of a typical commercial and/or hospital environment. If the user of the Innova system requires continued operation during power mains interruptions, it is recommended that the Innova system be powered from an uninterruptible power supply or a battery. |
| Power frequency (50/60 Hz) magnetic field IEC 61000-4-8 | 3 A/m | 3 A/m 1A/m | Power frequency magnetic fields are at levels characteristic of a typical location in a typical commercial and/or hospital environment. At that disturbance amplitude level the monitor image might present some slight flicker. For image quality improvement, the monitor might be removed from the low frequency magnetic field source vicinity. At that disturbance amplitude level the system is fully operational. |
| Note: These are guidelines. Actual conditions may vary. | | | |

2.4.3.2 Electromagnetic Immunity IEC 60601–1–2

The Innova system is suitable for use in the specified electromagnetic environment. The purchaser or user of the Innova system should assure that it is used in an electromagnetic environment as described below:

Table 3-11:

| Immunity Test | IEC 60601-1-2 Test Level | Compliance Level | Electromagnetic Environment |
|----------------------------|--------------------------|----------------------------|--|
| Conducted RF IEC 61000-4-6 | 3 V, 150 kHz to 80 MHz | [V ₁ =] 0.3 V | Portable and mobile RF communications equipment are used no closer to any part of the Innova system, including cables, than the recommended separation distance calculated from the equation appropriate for the frequency of the transmitter. At that disturbance amplitude the monitor image might present some slight flicker. For image quality improvement, the monitor might be removed from the electric field source vicinity. |
| | | [V ₂ =] 0.3 V | At that disturbance amplitude the system is fully operational. |
| Radiated RF IEC 61000-4-3 | 3 V/m, 80 kHz to 800 MHz | [E ₁ =] 0.3 V/m | At that disturbance amplitude the monitor image might present some slight flicker. For image quality improvement, the monitor might be removed from the electric field source vicinity. |
| | | [E ₂ =] 0.3 V/m | At that disturbance amplitude the system is fully operational. |
| | | 3 V/m, 800 MHz to 2.5 GHz | At that disturbance amplitude the monitor image might present some slight flicker. For image quality improvement, the monitor might be removed from the electric field source vicinity. |
| | | [E ₃ =] 0.3 V/m | At that disturbance amplitude level the system is fully operational. |
| | | [E ₄ =] 0.3 V/m | Note: P is the power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,* are less than the compliance level in each frequency range.** Interference may occur in the vicinity of equipment marked |
| | | |  with the following symbol: |

NOTE: * Field strengths from fixed transmitters, such as base stations for cellular telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast cannot be estimated accurately. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be performed. If the measured field strength exceeds the RF compliance level above, observe the Innova system to verify normal operation in each use location. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Innova system

** Over the frequency range 150 kHz to 80 MHz, field strengths are less than [V₂] V/m.

The Recommended Separation Distances are listed in [Table 3-12](#).

These are guidelines. Actual conditions may vary.

2.4.3.3 Recommended Separation Distances for Portable and Mobile RF Communications Equipment IEC 60601-1-2

Table 3-12:

| Frequency of Transmitter | 150 KHz to 26 MHz | 26 MHz to 80 MHz | 80 MHz to 800 MHz | 800 MHz to 2.5 GHz |
|------------------------------------|---------------------------------|---------------------------------|----------------------------|----------------------------|
| Equation | $d = [3.5 / \sqrt{2}] \sqrt{P}$ | $d = [3.5 / \sqrt{2}] \sqrt{P}$ | $d = [3.5 / E_2] \sqrt{P}$ | $d = [3.5 / E_4] \sqrt{P}$ |
| Rated Power of Transmitter (watts) | Distance (meters) | Distance (meters) | Distance (meters) | Distance (meters) |
| 10 mW | 1.2 | 1.2 | 1.2 | 2.3 |
| 100 mW | 3.8 | 3.8 | 3.8 | 7.3 |
| 1 | 12 | 12 | 12 | 23 (*) |
| 10 | 38 | 38 | 38 | 73 |
| 100 | 120 | 120 | 120 | 230 |

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

NOTE: These are guidelines. Actual conditions may vary.

2.4.4 Limitations Management

Adhering to the distance separation recommended in [Table 3-12](#), between 150 KHz & 2.5 GHz, 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 (800 MHz to 2.5 GHz carrier frequency) shall be put 23 meters (see (*) [Table 3-12](#)) apart from the Innova system (in order to avoid images interferences risks).

2.4.5 Use Limitation

The use of accessories, transducers, and cables other than those specified may result in degraded ELECTROMAGNETIC COMPATIBILITY of the Innova system

2.4.6 Installations Requirements & Environment Control



NOTICE

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

- **Cables 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.
- **Separated Power supply distribution panel & separated power line:**
 - This product complies with the radiated emission limits as per the CISPR11 Group1 ClassA standard.
 - The Innova system is predominantly intended for use (e.g. in hospitals) with a dedicated supply system, and with an X-ray shielded room.
 - In case of using in a domestic environment (e.g. doctors' offices), in order to avoid interferences, it is recommended to use a separated AC power distribution panel & separated power line, and an X-ray shielded room.
- **Subsystem & accessories Power supply distribution:**
All components, accessories subsystems, systems which are electrically connected to the Innova system, have to be all AC power supplied by the same power distribution panel & line.

NOTE: In order to avoid interferences, the same AC power distribution panel should supply all components, accessories, the Innova system (& subsystems as the Advantage Workstation). The separated AC power line should supply the panel.
- **Stacked components & equipment:**
The Innova system should not be used adjacent to or stacked with other equipment; if adjacent or stacked use is necessary, the Innova system should be observed to verify normal operation in the configuration in which it will be used.
- **Low frequency magnetic field:**
In case of an Innova system, the Gantry (digital detector) shall be apart 1 meter from the generator cabinet, and 1 meter apart from the analog (CRT) monitors. These distances specifications shall minimize the low frequency magnetic field interference risk.
- **Static magnetic field limits:**
 - In order to avoid interference on the Innova 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.
 - Static field is specified less than <3 Gauss in the Technical Room.
- **Electrostatic discharges 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.



NOTICE

Route separately EMI filter incoming power lines and outgoing power lines (refer to *Electrical Connections*).

NOTE: The maximum distance between the EMI filter and the PDB is 3 m.

NOTE: The Fluoro UPS option requires an EMI filter placed upstream the PDB. The EMI filter will be delivered with the Fluoro UPS. According to the country, filter enclosure and additional protective device can be supplied either by GE Power Control and by GE Industrial System. For further information on the EMI filter, see *Typical EMI Filter Enclosure* in [Chapter 6, Section 2, Recommended Power Distribution System](#)

2.5 Radiation Protection

Because x-ray equipment produces radiation, special precautions may be needed or special site modifications may be required. The General Electric Company does not make recommendations regarding radiation protection. It is the purchasers' responsibility to consult a radiation physicist for advise on radiation protection in x-ray rooms.

2.6 Audible noise

- Less than 50 dB (A) at 1 meter for an Innova LC Positioner.
- Limited to 50 dB (A) at 1 meter for Omega IV, Omega V tables.
- Limited to 58 dB (A) at 1 meter for Innova^{IQ} Table.
- Limited to 55 dB (A) at 1 meter for C2 Cabinet.
- Limited to 60 dB (A) at 1 meter for the COOLIX 4000.
- Limited to 65 dB (A) at 1 meter for C1 Cabinet.
- Limited to 60 dB (A) at 1 meter for Digital Detector Chiller Thermo-Tek.
- Limited to 52 dB (A) (background of 35 dB (A)) at 1 meter for Digital Detector Chiller Thermo-Con.
- Less than 50 dB (A) at 1 meter for a DL LCD monitor.
- Less than 60 dB (A) at 1 meter for the Fluoro UPS.

NOTE: Both cabinets C1 and C2 generate 70 dB noise altogether. Noise can be reduced if cabinets are slightly separated, and as far as possible from Exam room.

2.7 Windows and curtains

When the examination room has a window with an aperture outside of the controlled light area (day light, other...) a curtain has to maintain the light intensity under a limit fixed to 150 lux.

3 Structural Requirements

3.1 Room Size

For Room size dimensions, refer to [Chapter 4, Section 2, Room Layout Drawings](#).

For additional details, refer to [Chapter 4, Section 1, Room Layout Considerations](#).

3.2 Door Size Requirements

Minimum door sizes also apply to hallways and elevators. For additional details, refer to [Chapter 7, Section 1, Shipping Information](#).

3.2.1 Door Height

The minimum door height (to accommodate Innova positioner on its dolly) is **1.980 m (78 in)**. If the height is limited to 2 m (79 in), you will need a fall over cabinet.

3.2.2 Door Width

The minimum door width needed (to accommodate the Innova LC shipping dolly) is:

- 1.165 m (46 in) with protective side rail,
- 1.096 m (43 in) with one protective side rail removed on site.

NOTE: Door widths are based on a *straight-in* approach requiring a 2.44 m (96 in) wide corridor. Calculations need to be made for accommodation of equipment through narrower corridors.

3.3 Floor

3.3.1 General Vascular GEMS Policy

GEMS's Customer is responsible for the structural analysis and mounting of the base plates. If GEMS is forced to mount the base plate, the LCT must hire a structural engineer to design and approve the mounting method and provide GEMS with an engineering report.

The floor level cannot exceed a general levelness of 5 mm (0.2 in) for any 2 meters (79 in).



NOTICE

The floor slabs on which the equipment is to be installed must have a levelness of 1 mm (0.04 in) per meter (40 in). Position of baseplates and table basement depends on the type of installation. The two types of installation are given in [Illustration 3-2](#).

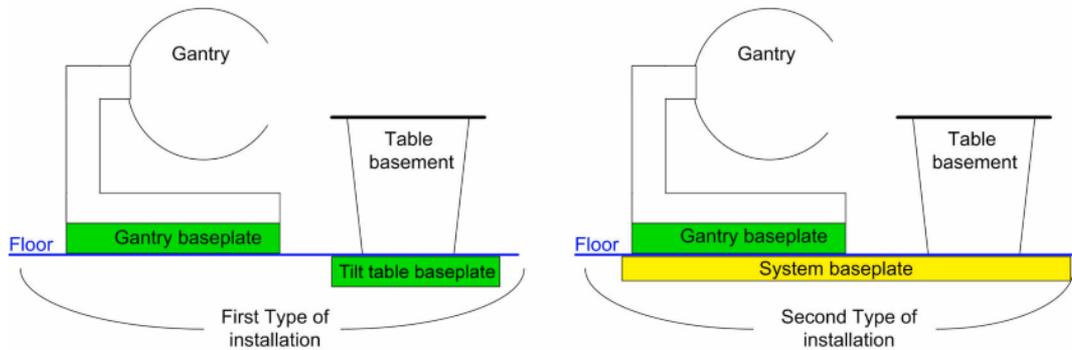


NOTICE

The Table baseplate or the System baseplate are mandatory to install the table (patient support).

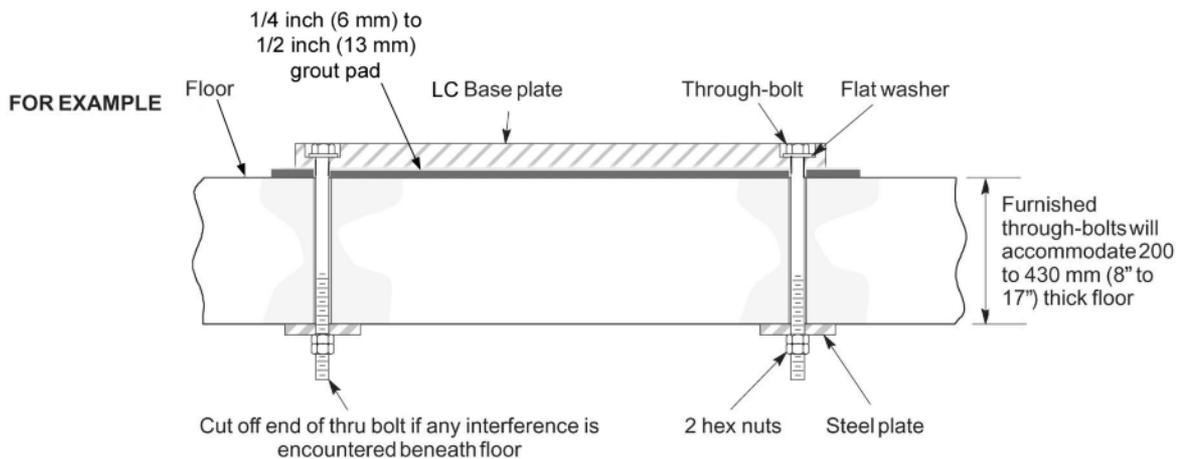
The Table must never be installed on grade.

Illustration 3-2:



The preferred installation method for the Innova LC Positioner or the Omega tables is through-bolting. The through-bolting method can be used in all seismic zones. If through-bolting cannot be used, use provided floor anchors instead.

Illustration 3-3: Through-Bolt Supplied (Slab Type Floor Construction)



3.3.2 Floor requirements when using provided floor anchors

The maximum pullout force per provided anchor was calculated assuming:

- A concrete compression strength of **17.24 MPa** at 28 days (which is the minimum required compression strength).
- Anchors installed to the required hole depth of **165.1 mm** minimum, and

- Center of anchor hole to concrete edge distance **79.4 mm**.

Make sure to obtain data on compression strength of the concrete before using floor anchors.

3.3.3 Pan Type Floor Construction Requirement

For Pan type floor construction, steel channels must be designed by a local structural engineer to span floor joists. See [Illustration 3-4](#).

NOTE: For specific floor preparation procedures, refer to PIM Innova 2000/2100-IQ/3100/4100 Cardiovascular Imaging System Pre-Installation Kit Installation Procedures.

Illustration 3-4: Through-Bolt Supplied (Pan Type Floor Construction)

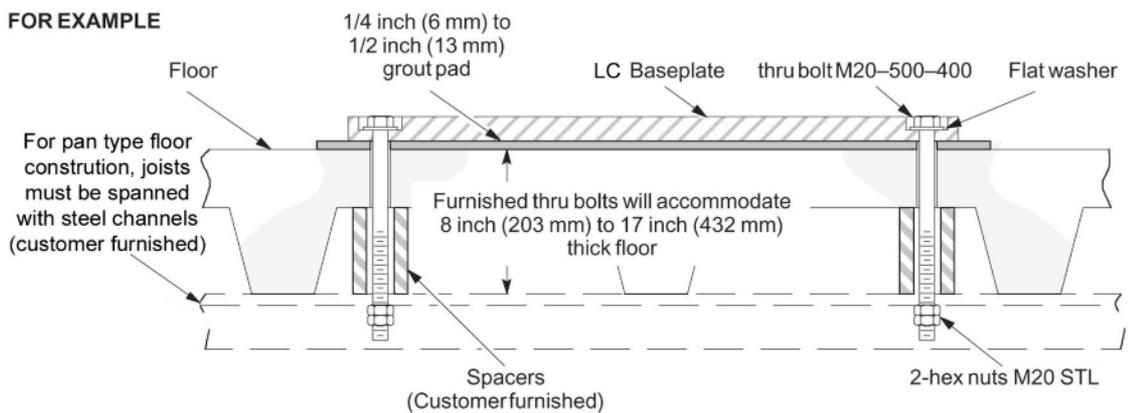
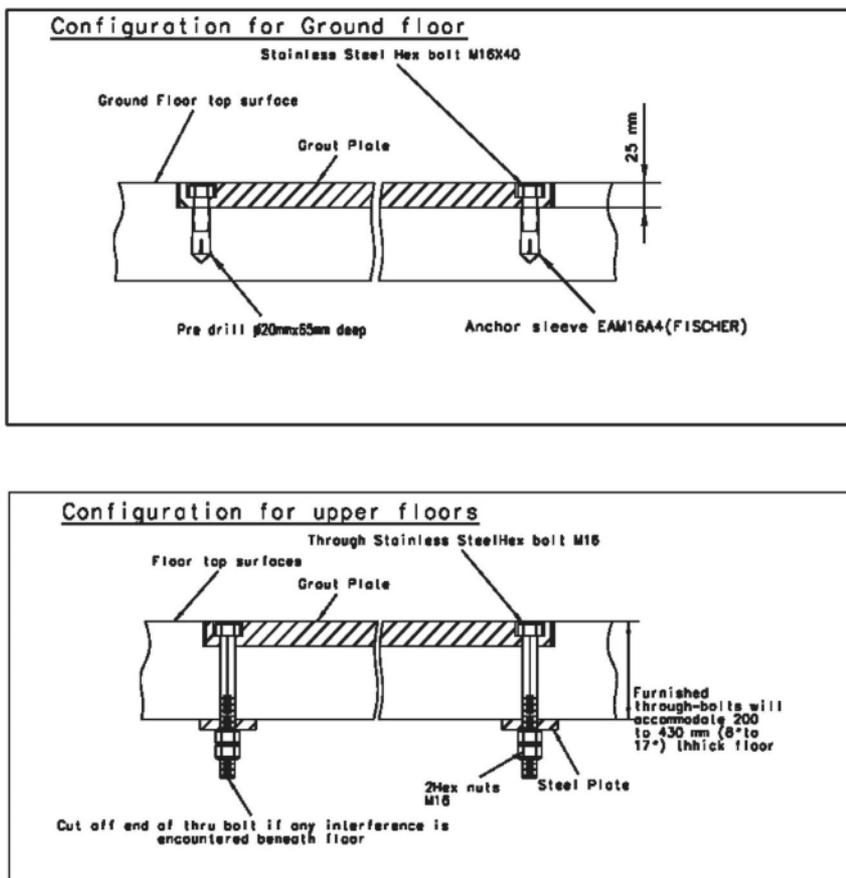


Illustration 3-5: Table floor mounting layout



NOTICE

Prepare the floor such that the Innova^{IQ} Table base plate will be flush with the floor finish surface, taking into account the thickness of the floor finish material.

For alternative table bolts or seismic area, refer to template drawing shown in Illustration *Innova LC Positioner And Table Floor Mounting Template* contained in [Chapter 5, Section 2, Mounting Requirements](#).

3.3.4 Hole dimension and preferred location in concrete floor

In the examination room, the Innova LC Positioner is not placed on a computer floor but directly put on concrete floor, the location of the cable access needs to be carefully planned.

Otherwise, if the cable run is located under the concrete floor, the cables will have to come through the floor and in this case you will need two holes, one for the LC Positioner and the other for the patient table.

The diameter of both holes must be the same 225 mm or 9 in.

Illustration 3-6: Hole location in concrete floor

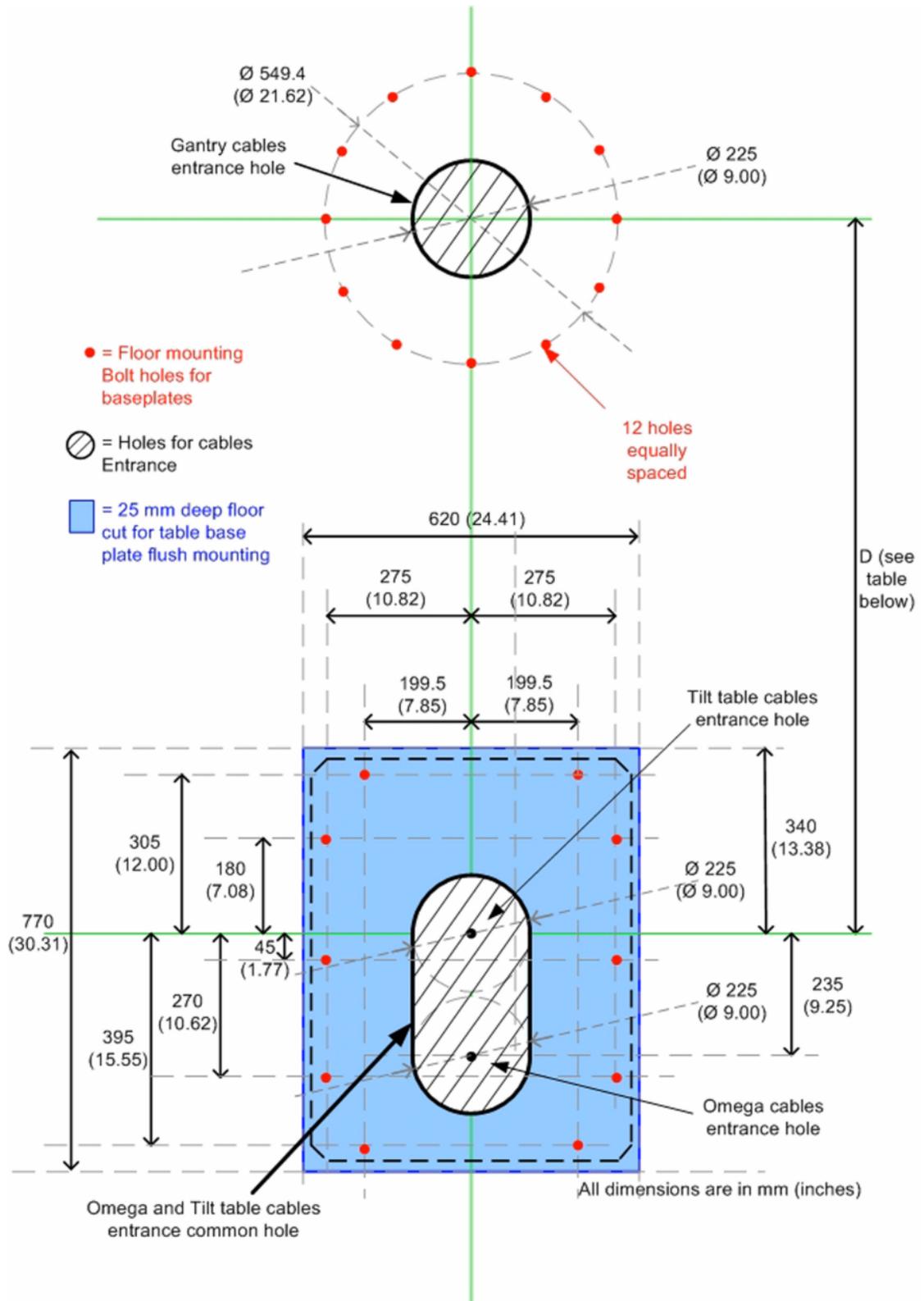


Table 3-13: D distance

| | ANGIO | CARDIO | NEURO |
|----------------------------|-------------------|-------------------|--------------------|
| Omega IV Compact | NA | 1395 mm (54.9 in) | NA |
| Omega V Long | 1278 mm (50.3 in) | NA | 1395 mm (54,9 in) |
| Omega V non motorized Long | 1278 mm (50.3 in) | NA | 1395 mm (54,9 in) |
| Innova ^{IQ} Table | 1278 mm (50.3 in) | NA | 1395 mm (54,9 in)* |

NOTE: * in case of a Innova^{IQ} Table upgrade, there is the possibility of a distance of 1595 mm (62.8 in).



NOTICE

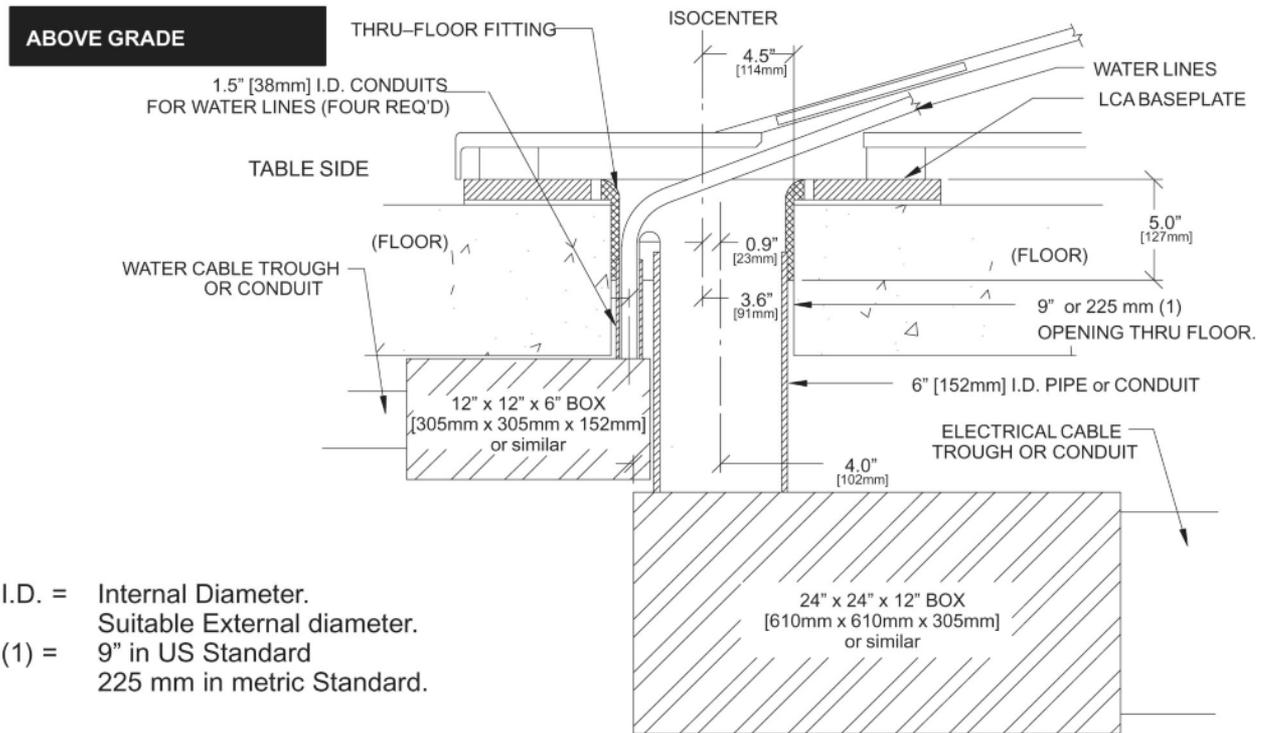
Due to the plastic bushing used in the USA to protect cables from the sharp edges of conduits it is necessary to place the cable conduit inside the table cable access opening but the height of the outcoming conduit plus bushing is limited to 1/2 in (12.7 mm).

NOTE: Refer to table *Chemical anchors Pull out efforts and recommendations* in [Chapter 5, Section 2, Mounting Requirements](#) for pull out effort on each fixation bolts.

3.3.5 Water Pipe Requirements

- An Innova LC System uses a Performix 160 A X-Ray tube with a recirculating chiller.
- Two water hoses are supplied to allow water circulation between Innova LC Positioner and chiller.
- In some countries, it is forbidden to run electrical cables and water pipes in the same conduit. In this case, two separate conduits are required. But then a problem arises at the level of the Innova LC Positioner entrance.
- Depending on the method used, one of the two options shown hereafter (Illustrations [Illustration 3-7](#) and [Illustration 3-8](#)) must be used.

Illustration 3-7: Water Conduit location



I.D. = Internal Diameter.
 Suitable External diameter.
 (1) = 9" in US Standard
 225 mm in metric Standard.

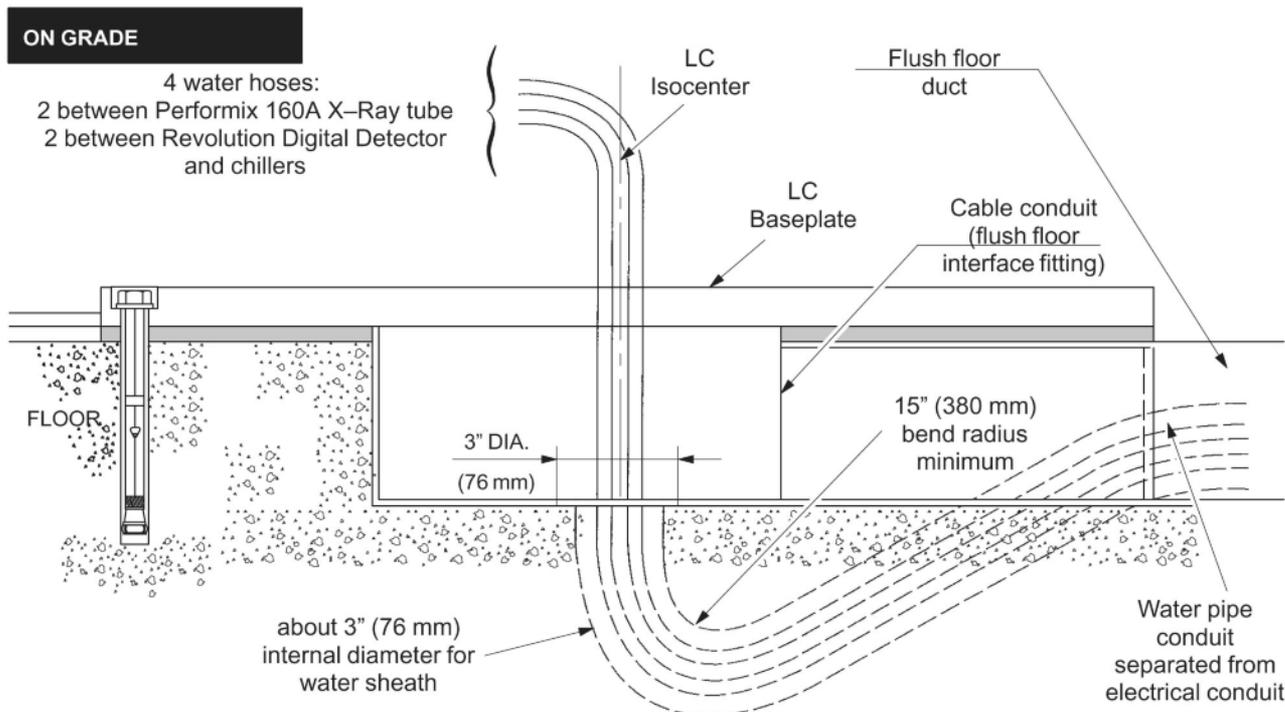
Note: Pipe, junction box and duct or conduit are to be supplied and installed by Customer or customer's Contractor.



NOTICE

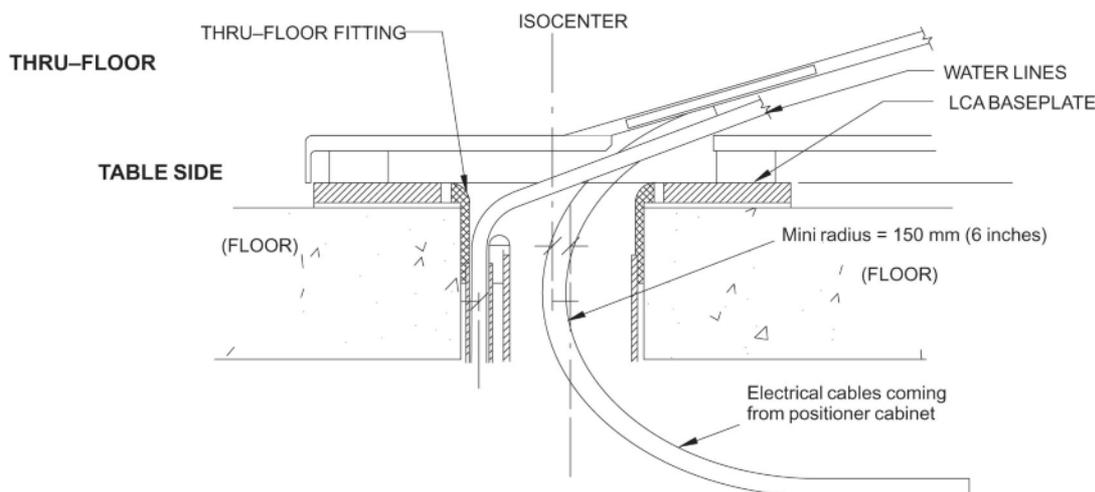
In some countries, depending on local regulations, it may be forbidden to run electrical cables and water pipes in the same conduit. In this case, two separate conduits are required.

Illustration 3-8: Water Conduit location



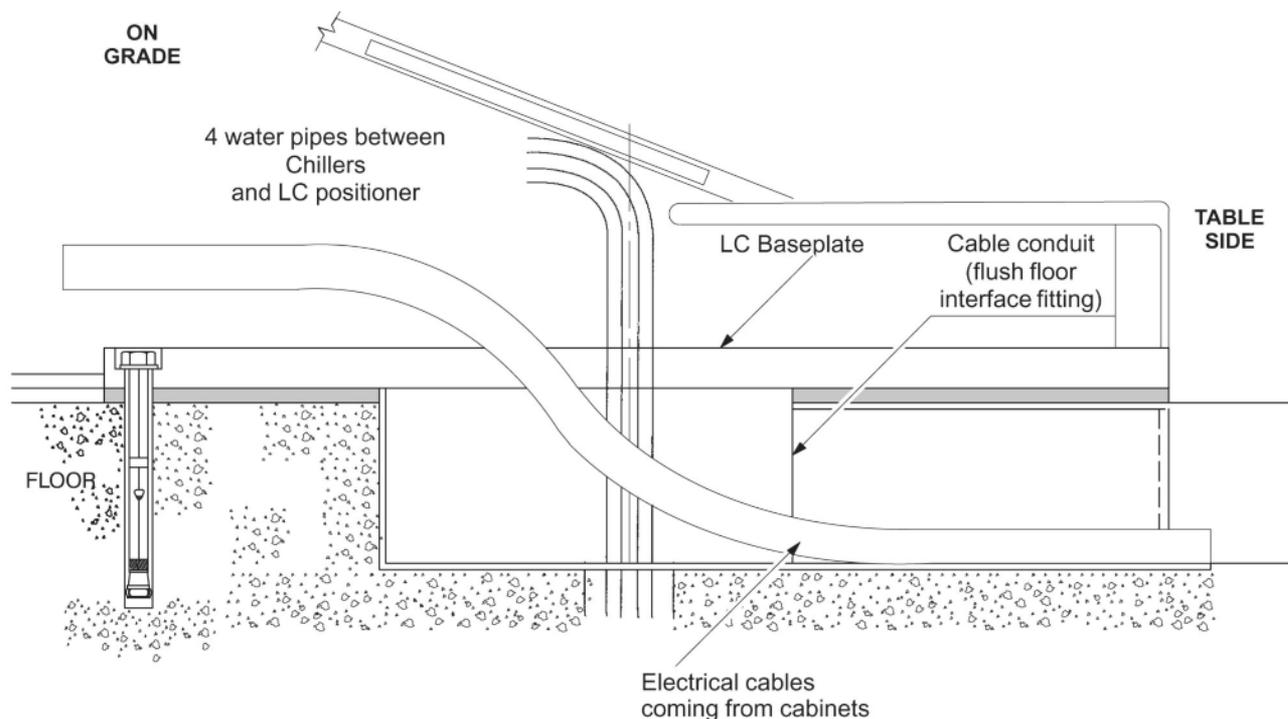
Note: Flush floor interface fitting is part of GEMS installation kit 2286398 and is installed by Customer or customer's Contractor.

Illustration 3-9: Cable Curvature



Note: In case of thru-floor cabling, if the electrical cables are coming from the head side, they will need to have a minimum curvature with a minimum radius of 150 mm (6").
In any other cases (i.e. flush floor) no such curvature is allowed.

Illustration 3-10: Cable Curvature



NOTE: In case of on grade cabling, because of the minimum curvature constraint of 150 mm (6”), the cable will have to come from the side between Innova LC Positioner and patient table.

3.3.6 Seismic areas

Chiller: The seismic kit for Lytron is included with the chiller when shipped.

In Seismic areas all cabinets must be anchored to the floor. See [Chapter 2, Section 3, Basic Innova System Compatibility](#) for referential documents. C1 & C2 Cabinets: Wall support 2285242.

Every sub-system is delivered on site with its proper seismic kit.

- Monitor Flat Panel Seismic Kit: 2353317
- VCIM seismic kit: 2365510.

Anti-seismic means be installed before opening the system for normal use.

Refer to [Chapter 9, Section 2, Calculations](#) for Seismic Anchoring Information.

3.4 Ceiling

Aluminum rails support the In-Room Monitor bridge used in Innova system X-ray rooms.

Reference:

For additional details on ceiling requirements for stationary rails, refer to: - Direction 46-019639, *Advantx (VHLA) XT Stationary Rails Installation and Adjustment*.

When evaluating ceiling you must take into account the following mounting information:

3.4.1 Rail Mounting

Attach stationary rails to structural steel with through-bolts in concrete ceilings. Do not use screw anchors in direct tension.

Mount stationary rails directly to the ceiling slab or to flush-mounted unistrut or halfen structure. In higher rooms with false ceiling, mount stationary rails to rigid vertical members hung from ceiling slab.

Securing a supplementary channel to the bottom of the vertical members and mounting the stationary rails to this channel can greatly reduce the number of vertical members.

The stationary rail support structure must be leveled before installation can begin. Do not assume that any support structure is level within specified tolerances, particularly after removing suspensions from an existing room.

3.4.2 Bolt Specifications

- The maximum load per bolt will not exceed **1557 N**.
- Each bolt must not “pull out” or otherwise fail under a vertically downward *dead* load of **6227 N**.

3.4.3 Select Rails

All XT Stationary rails are with a select length process. Detail of available length is illustrated in [Chapter 7, Section 4, European Process Order Select](#).

3.4.4 Boom Mounted for Monitor Suspension

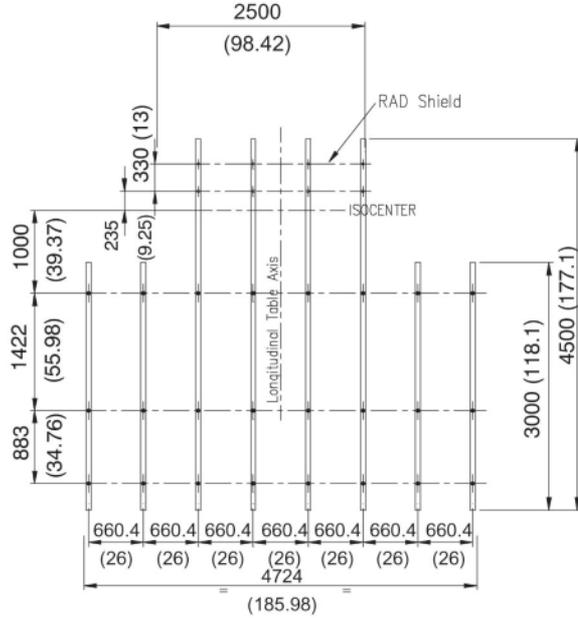
One type of boom mounted is supplied as counterpoised monitor suspension not adjusted on site as follows:

- for 2 x 21” (53 cm) EIZO GmbH (formerly Siemens) flat panel 21” (Hi-bright) and additional AW NEC monitor.

Illustration 3-11: Recommended locations for 3 monitor suspension

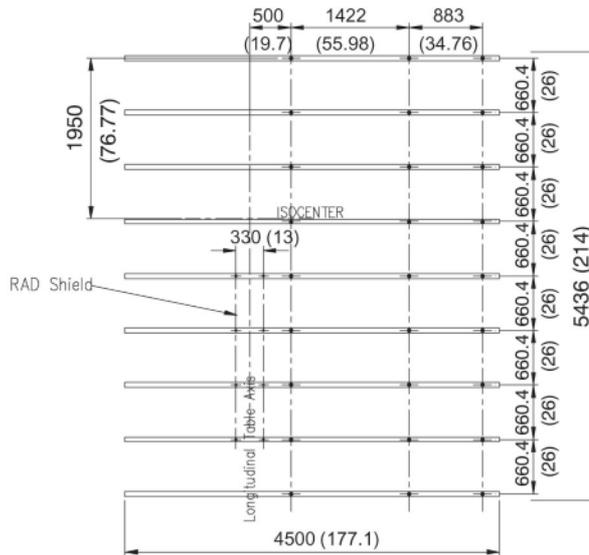
Solution 1: Stationary rails perpendicular to Patient Table
 Stationary rails item # B0186JA, long or short bridge

Typical additional ceiling structure (HALFEN or UNISTRUT)



Solution 2 : Stationary rails parall to Patient Table
 Stationary rails item # B0214JA, short bridge

Typical additional ceiling structure (HALFEN or UNISTRUT)



All dimensions are in mm (inches)



NOTICE

A recommended location for 3 monitor suspension is defined to avoid a risk of obstruction to operators.

3.4.5 Cable Support for Monitor Cables

A cable support (cable drape) is provided with an Innova LC System.

The cable support kit contains:

- 1 B2054 EK (Drape with 3 M Bridge, on suspensions for X-Ray tubes and monitors, contains 8 FT 6 inch track, three carriers, and mounting hardware)
- 1 B2055 ED (stationary rail parts)

NOTE: In Americas the Cable Support Kit must be provided locally by the Customer (e.g. CPGE55 from Unistrut).

3.5 Walls

3.5.1 General requirement

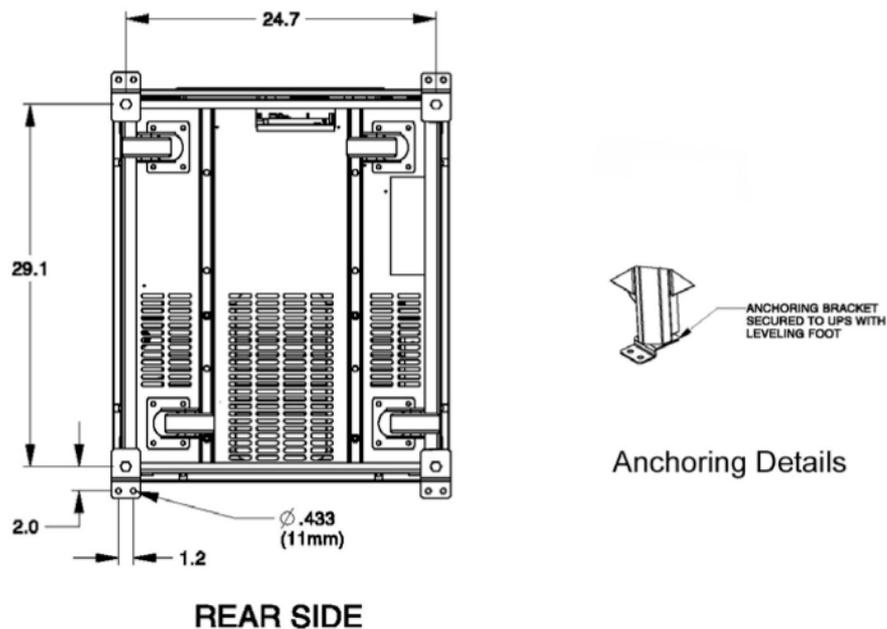
The C1 Cabinet, the C2 Cabinet, and the PDB Cabinet must be securely fastened to the wall to prevent them from tipping.

3.5.2 Seismic Areas

NOTE: For Fluoro UPS option (US version only), the Fluoro UPS supplier will deliver anchoring brackets (see [Illustration 3-12](#)). The bolts will be provided by the customer.

Consider local seismic codes when planning cabinet mounting. Consult seismic expert to determine which mounting method is appropriate for the seismic region. Certain seismic regions require additional reinforcement in walls. See [Chapter 2, Section 3, Basic Innova System Compatibility](#) for referential documents.

Illustration 3-12:



Refer to [Chapter 9, Section 2, Calculations](#) for Seismic Anchoring Information.

4 Functional Requirements

4.1 Electrical Requirements

Innova System require two specific power lines, two three phase for C1 cabinet (see Illustration *AC Interconnect without Fluoro UPS* in [Chapter 6, Section 1, Power Distribution](#)).

Connect the main power demand to the X-Ray generator – Jedi (C1 cabinet).

X-Ray generator is feed by a 126 kVA three phase power line.

For Generator Power Supply Features, see ref 60601.1 IEC.

NOTE: In CE configuration, C2 cabinet is fed by C1 cabinet.

Table 3-14: ELECTRICAL REQUIREMENTS: System line voltage without Fluoro UPS

| Peak Max Power input (kVA) | Frequency (Hz) | Mains Voltage (V) | Max. Line Impedance (ohms) | Peak Current (A) | Average Current (A) | Mains Wire |
|----------------------------|----------------|--------------------------|----------------------------|-------------------|---------------------|-----------------------|
| 150 | 50 or 60 | 380 to 480 (3 ph, ± 10%) | 0.09 to 0.12 | 228 to 180 for C1 | 16 to 13 | 4 wires (3 ph + GND). |

Table 3-15: ELECTRICAL REQUIREMENTS: System line voltage with Fluoro UPS UL

| Peak Max Power input (kVA) | Frequency (Hz) | Mains Voltage (V) | Max. Line Impedance (ohms) | Peak Current (A) | Average Current (A) | Mains Wire |
|----------------------------|----------------|----------------------|----------------------------|------------------|---------------------|--------------------------|
| 150 | 60 | 480 (3 ph + N, ±10%) | 0.09 to 0.12 | 180 for C1 | 13 | 5 wires (3 ph + N + GND) |

Table 3-16: ELECTRICAL REQUIREMENTS: System line voltage with Fluoro UPS CE

| Peak Max Power input (kVA) | Frequency (Hz) | Mains Voltage (V) | Max. Line Impedance (ohms) | Peak Current (A) | Average Current (A) | Mains Wire |
|----------------------------|----------------|------------------------------|----------------------------|------------------|---------------------|--------------------------|
| 150 | 50 or 60 | 380/400/415 (3 ph + N, ±10%) | 0.09 to 0.12 | 228 for C1 | 16 | 5 wires (3 ph + N + GND) |

NOTE: PDB (CE) maximum rating is equal to 57 kVA.

PDB (UL) maximum rating is equal to 124 kVA.



NOTICE

Line impedance should be compliant with IEC 601.2.7 Refer to the table *Max Line Impedance for feeder line between Generator cabinet and Hospital* in [Chapter 6, Section 4, Power and Grounding Requirements](#).



NOTICE

When a Fluoro UPS is or will be installed, a Neutral line is mandatory. An IT or Delta configuration power input requires the installation of an isolation transformer (see transformer specification below)..

For **C2 Cabinet** there are two positions for the shunts:

- First position if input AC supply is between 323 VAC and 420 VAC.
- Second position if input AC supply is between 420 VAC and 528 VAC.

For **Chiller** the voltage range is:

- 342 VAC (323 VAC for less than 3 seconds*) to 418 VAC*, 50 Hz if the switch is on 50 Hz.
- 432 VAC (408 VAC for less than 3 seconds*) to 528 VAC*, 60 Hz if the switch is on 60 Hz.

NOTE: * A voltage drop may occasionally occur at startup and during operation.



NOTICE

If the main power supply is outside this range, a 6 KVA autotransformer must be used to supply the Chiller.

Examples:

- With a main power supply at 480 VAC/50 Hz, use an autotransformer to supply the Chiller at 380 VAC/50 Hz,
- With a main power supply at 360 VAC/60 Hz, use an autotransformer to supply the Chiller at 480 VAC/60 Hz.

For **PDU : C1 Cabinet** the voltage range is:

- 380 VAC (+10 % to – 20 %) – PDU setting 342 – 394 VAC.
- 410 VAC (+10 % to – 20 %) – PDU setting 394 – 444 VAC.
- 480 VAC (+10 % to – 20 %) – PDU setting 444 – 528 VAC.



NOTICE

(For US only)

A purchasable option I-sense (catalog number E4504B) allows to monitor the hospital main power line. It is recommended to install this option everywhere RMS and waveform variation events can impact the standard behaviour of the system.

The I-Sense power monitor can be installed at the imaging equipment sub-panel (between the hospital transformer and the PDB) or the main distribution panel in the facility. Placement will depend on the monitoring needs of the facility.

I-sense is connected to each phase conductor and the ground. An analog telephone line also needs to be connected to the I-Sense unit. It is recommended to dedicate one telephone line to I-sense.

4.2 Room Speaker

If the VCIM tone cannot be heard from the exam room, a remote loud-speaker must be installed in that room; the loud-speaker, which must be purchased locally, has to be compliant with the local legal requirements (if any; e.g. CE Marking for EEC).

The loud-speaker is to be connected to the handswitch support which provide a type 3.5 mm Jack plug for connecting external audio device.

4.3 Room Lighting

See Illustration Room Lighting for Innova System in [Chapter 4, Section 2, Room Layout Drawings](#), for a recommended room lighting layout for an Innova LC system.

Requirements for lighting

Requirement for lighting concern the following, general, light-technique characteristics:

- Illuminator level.
- Lighting distribution.
- Preventing the operator from being dazzled by the light (by direct light sources or by reflection on bright objects).

The Illumination level must be compliant with established lighting technical rules and be as constant as possible.

5 Emergency

During an examination, any operator can encounter two main cases of failures.

5.1 Main power supply cut

In this case, refer to [Chapter 6, Section 17, Physical Runs](#).

5.2 System failure

When the system fall into failure with a patient on table during an examination, the operator can require a help with a Surgical Imaging mobile unit to finish the examination.

In this case a wall outlet single phase + ground is required to feed the mobile. It is also requires a free space around the patient table to proceed with the mobile instead of Innova LC Positioner. The table has to rotate to 90°.

Refer to illustration *Room Layout for Innova System (Digital Mobile Imaging System 9800)* contained in [Chapter 4, Section 2, Room Layout Drawings](#) for a surgical imaging mobile use.

6 Insite/Network Connection

The preferred Insite connection uses a broadband modem. This connection requires a dedicated Ethernet Jack (RJ45) that must be located less than 1 meter (3 feet) from the C1 cabinet

For complete descriptions of these connectivity solutions, please refer to the Broadband Solutions catalogue available through your local GEHC sales and service representative.

Connectivity Process and pre-installations checklists are available in the Broadband Connectivity PIM available through your local GEHC sales and service representative

Optionally, the analog modem is also fitted inside the C1 cabinet. A dedicated phone line with a local socket used only for a connection to a modem will preferably be located close to the cabinet. The phone outlet must be located less than 1 meter (3 feet) from the C1 cabinet

A modem compliant to each country is supplied with the Innova System.

InSite requires an Internet Address connecting it to the Innova System. This address must be available before installing the system. A request form has been defined. For more information, please refer to [Chapter 8, Section 1, IP Addressing Process](#) or contact your GEMS OLC representative.

For network requirements for IVUS option, see the section *Ethernet Network Requirement* in [Chapter 4, Section 3, IVUS Option](#).



NOTICE

The C1 cabinet comes equipped with a Firewall unit. The hospital network must be capable of connecting to this firewall. In the case that it cannot be, please contact GE Healthcare to discuss alternatives.

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Chapter 4 Room Layouts

1 Room Layout Considerations

1.1 Radiation Protection

Because X-Ray equipment produces radiation, you may need to take special precautions or make special site modifications. The General Electric Company does not make recommendations regarding radiation protection. It is the purchasers' responsibility to consult a radiation physicist for advise on radiation protection in x-ray rooms.

1.2 Service Access

Allow appropriate space for service access of equipment. Consult component pre-installation directions for clearance information.

1.3 Clinical Access

Make sure that you plan the room with the following clinical access requirements:

- Provide easy access to the patient table. Stretchers and other mobile hospital equipment must reach the table quickly.
- The layout of the table in the room (PIM) shall make a provision so that the clearance between the maximum table position (head side) on system axis and any object in the room (e.g.: wall, device) be greater than 50 cm (19.7 in) or 65 mm (25.6 in) if the Header Extender is used), taking into account the fact that the Innova^{IQ}Table can rotate 180°.
- Provide sufficient space around the patient table for the unimpeded conduct of CPR (Cardiac Pulmonary Resuscitation). With the table in this position, the table must be capable of rotating +/- 45°
- Clinicians at the patient table must be able to communicate with assistants in the control area.
- There must be an unrestricted view of the video monitors and physiological monitoring equipment from the vascular table.
- Operators in the control area must have easy access to the control console. However, position the controls (including handswitches) so that the operator cannot take exposures while looking around or standing outside the control booth's lead glass window.
- Operators in the control area must have easy access to video recorders and injector programmers, film and video storage cabinets, and service and operating manuals.
- Consult customer on the number and location of nonelectrical lines (air, oxygen, vacuum, water, etc.) in the vascular room.

1.4 Peripheral Equipment

Consult hospital personnel regarding additional space requirements for the following types of hospital equipment:

- Storage cabinets.
- Sinks.
- Oxygen stations.

- IV apparatus.
- Injectors.
- Heart monitoring equipment.
- Crash cart.

1.5 Emergency Stop

Protect the Emergency Stop from accidental actuation.

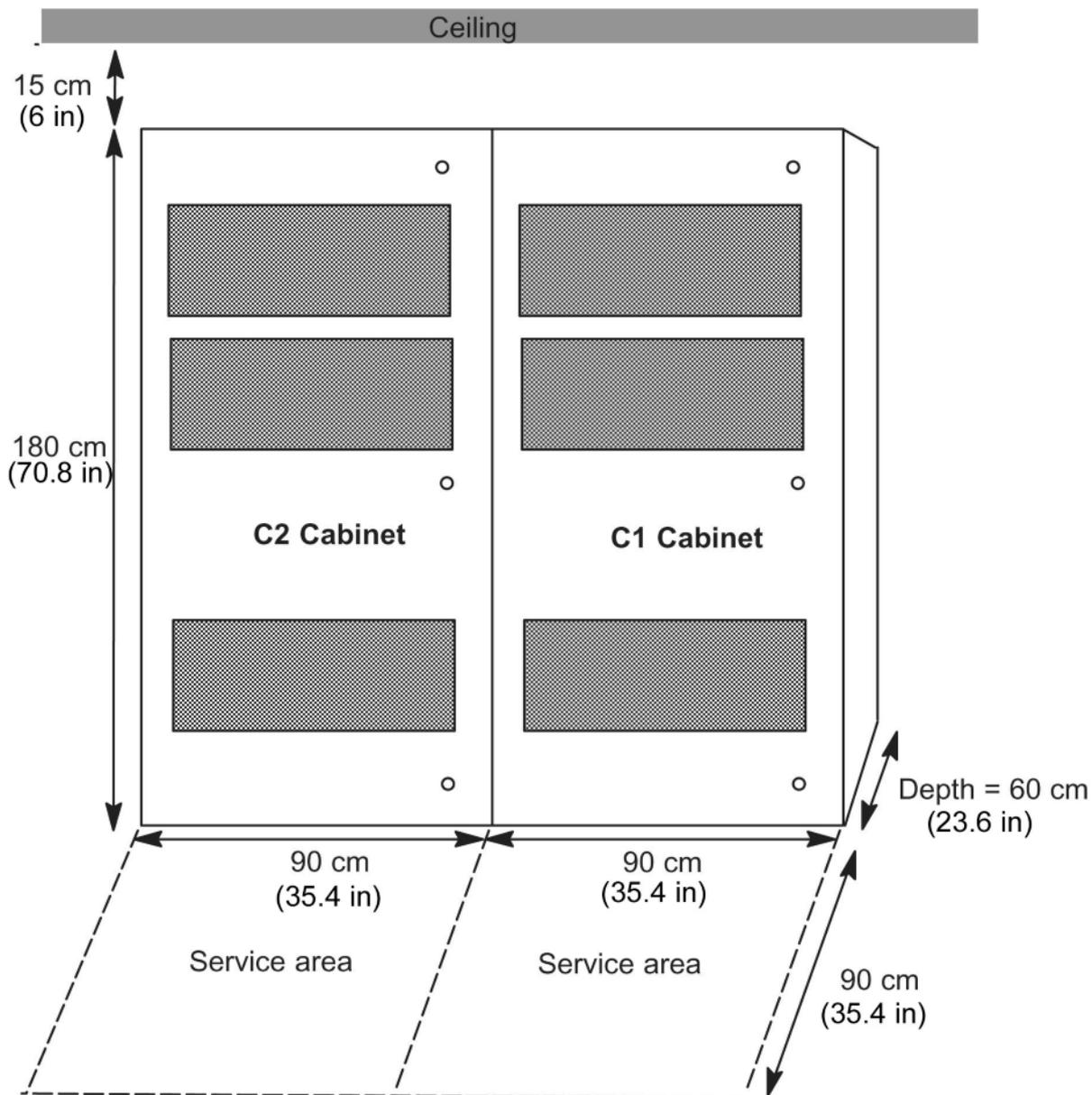
1.6 Patient Environment Equipment

The components that may be installed within patient vicinity need to be medical equipment ("patient vicinity is defined in the standardization as a space within the room 1.83 m (70.7 in) beyond the perimeter of the examination table and extending vertically 2.29 m (90.2 in) above the floor."). For the Innova System, the equipment are:

- Table
- C-arm
- Monitors
- Injector

1.7 Preference Cabinet locations

Illustration 4-1:



C2 cabinet weight = 258 kg C1 cabinet weight = 452.5 kg



CAUTION

The service area dimensions shown above are just an example. Service areas must comply with local regulations.

1.8 Layout Constraints



NOTICE

The X-Ray tube Chiller elevation cannot exceed 3 meters (9.84 feet) in height.



NOTICE

Minimum distance between Digital Detector and UPS is 3 m (118 inches) (Fluoro UPS option).



NOTICE

The distance of the Detector chiller cannot exceed 3 m (1 floor) in height below the detector.

2 Room Layout Drawings



WARNING

LOCATION IN TECHNICAL ROOM FOR ELECTRICAL CABINETS IS MANDATORY.

THE ELECTRONIC CABINETS (C1, C2, COOLIX 4000 CHILLER, DETECTOR CHILLER AND FLURO UPS WHEN INSTALLED) INCLUDE FANS THAT ARE CREATING AIR-CIRCULATION OF PULSED-AIR. WHEN THIS PULSED AIR IS IN AN ENVIRONMENT THAT MAY CONTAIN AIRBORNE PATHOGENS LIKE AN EXAM ROOM/CONTROL ROOM, THERE IS A RISK OF TRANSMISSION OF THESE AIRBORNE PATHOGENS FROM PATIENTS TO OTHER PATIENTS OR CLINICAL PERSONNEL (NOSOCOMIAL DISEASES).

TO REDUCE THIS RISK, THE ELECTRONIC CABINETS MUST BE INSTALLED IN A ROOM SEPARATED FROM EXAM ROOM/CONTROL ROOM, I.E., TECHNICAL ROOM.

For exam and control rooms, several configurations are recommended.

NOTE: Motion controls installed in remote location from the table shall be installed at a location where all the positioner axis are visible by the operator.

In case the system has a tilting table, the remote motion controls shall not be installed on the longitudinal axis of the Table (to avoid any operator visual dead angle due to tilted table top hiding the patient).

Refer to [Section 2.2](#) to [Section 2.6](#) to see recommended exam / control rooms layouts.

2.1 Room layout and room min length

Table 4-1: Exam Room dimensions

| | Length | Width | Ceiling Height |
|--|---|----------------------|---------------------|
| Recommended: | 32 ft 0 in (9.75m) | 20 ft 0 in (6.00 m) | 10 ft 0 in (3.05 m) |
| Minimum: | For minimum exam room lengths, see different table configurations in Illustration 4-2 , Illustration 4-3 and Illustration 4-4 | 14 ft 5 in (4.40 m) | 9 ft 0 in (2.74 m) |
| Note (1): With a 3 monitor frame suspension, take care with the ceiling height not more 3.05 m (10 ft) | | | |

Illustration 4-2: Omega V or Innova^{IQ} Table (Angio, Cardio, Neuro) with header extender

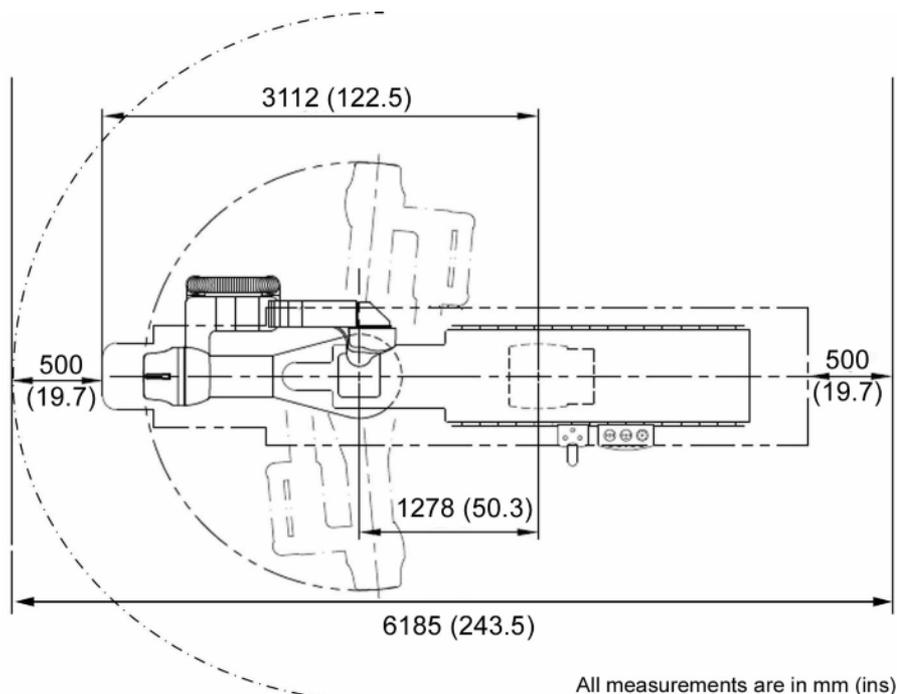


Illustration 4-3: Omega V or Innova^{IQ} Table (Angio, Cardio, Neuro) without header extender (requirement = 500 mm)

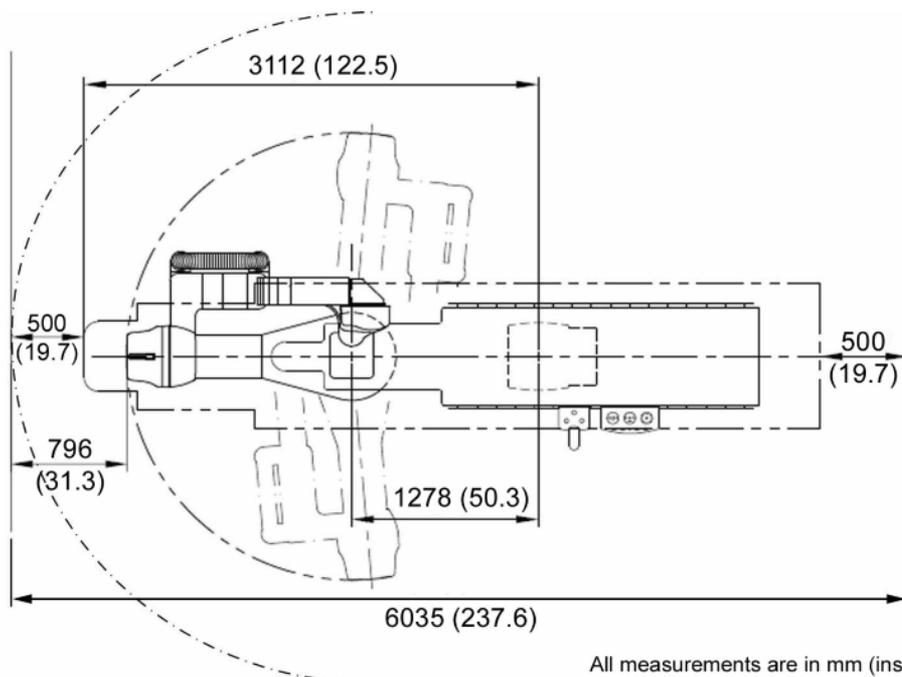
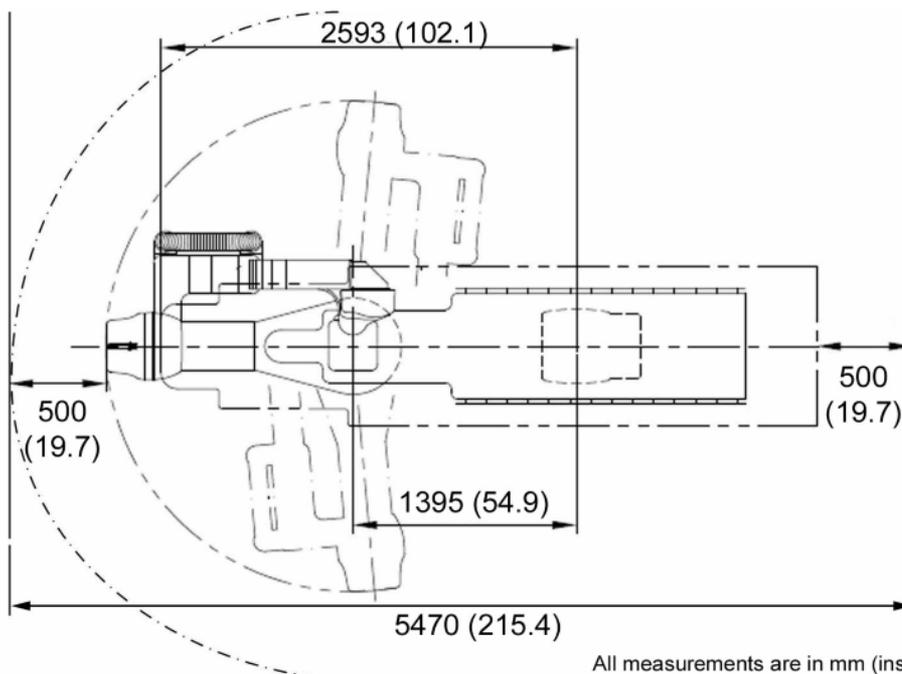


Illustration 4-4: Omega IV or Innova^{IQ} Table (with or without header extender) in cardio/neuro configuration



2.2 Room Layout for Innova System (example 1 & 2- Suspension rails parallel to table)

Illustration 4-5: Example 1 - suspension rails adjacent to patient table

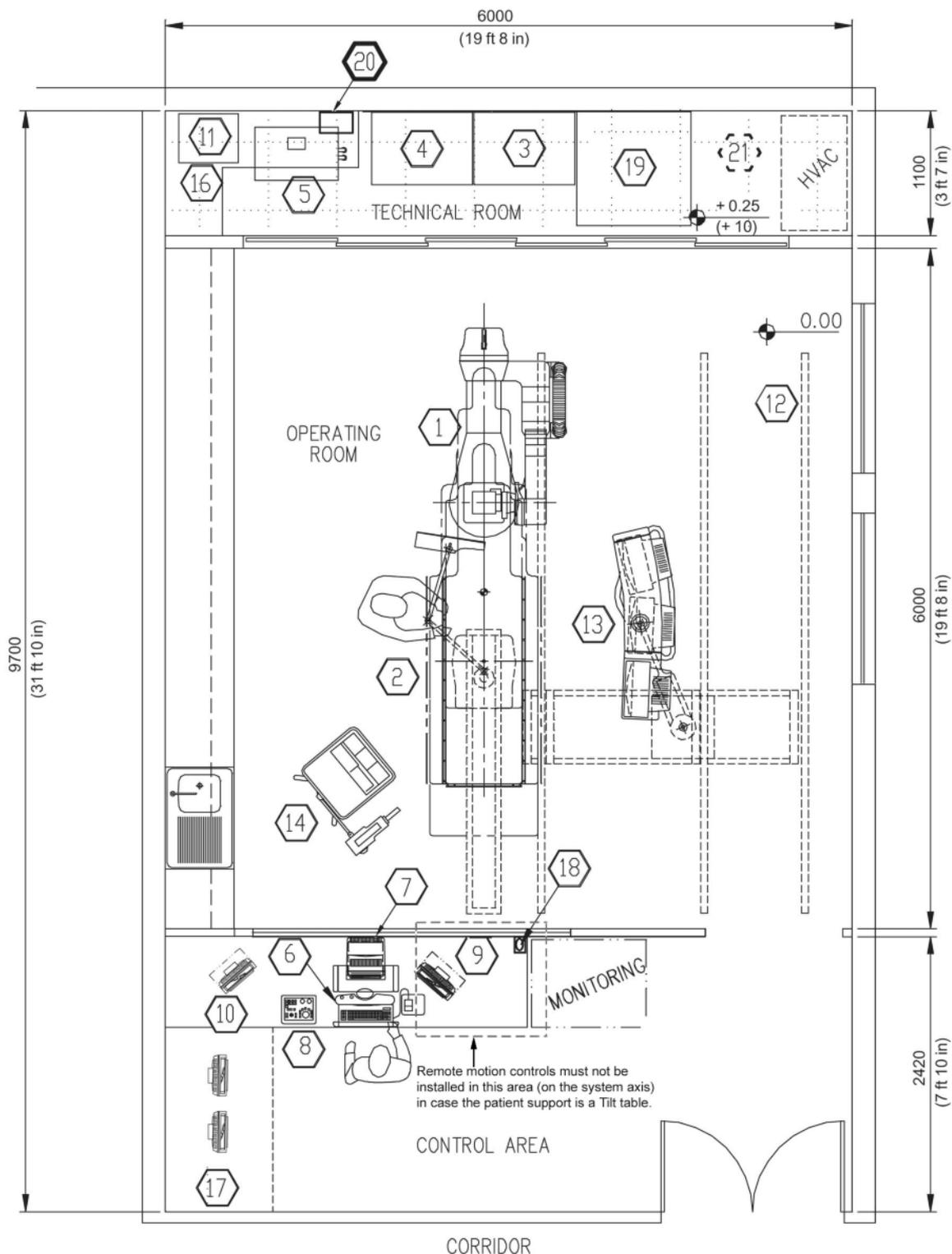
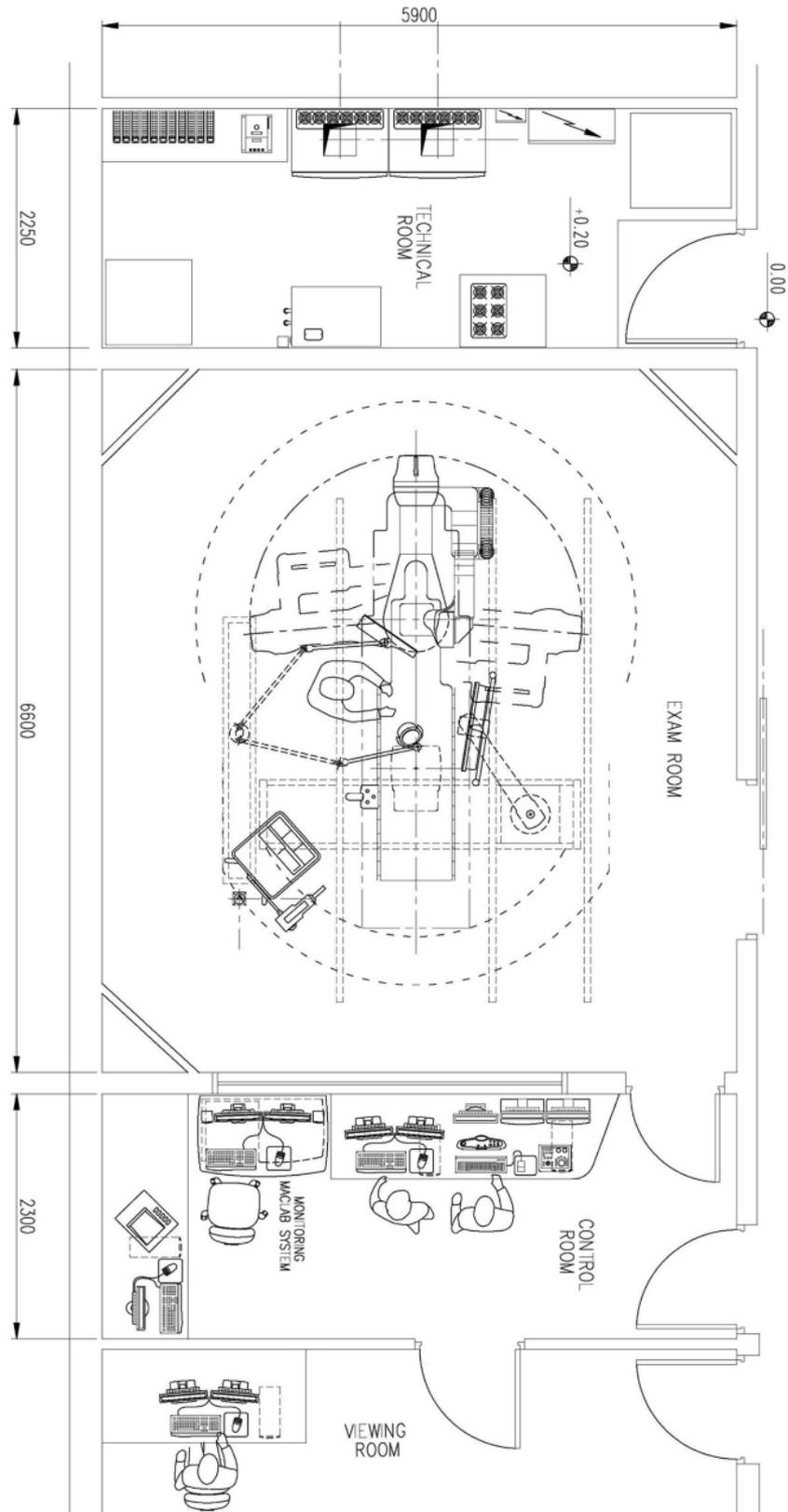


Illustration 4-6: Example 2 - suspension rails either side of patient table





WARNING

LOCATION IN TECHNICAL ROOM FOR ELECTRICAL CABINETS IS MANDATORY.

THE ELECTRONIC CABINETS (C1, C2, COOLIX 4000 CHILLER, DETECTOR CHILLER AND FLUORO UPS WHEN INSTALLED) INCLUDE FANS THAT ARE CREATING AIR-CIRCULATION OF PULSED-AIR. WHEN THIS PULSED AIR IS IN AN ENVIRONMENT THAT MAY CONTAIN AIRBORNE PATHOGENS LIKE AN EXAM ROOM/CONTROL ROOM, THERE IS A RISK OF TRANSMISSION OF THESE AIRBORNE PATHOGENS FROM PATIENTS TO OTHER PATIENTS OR CLINICAL PERSONNEL (NOSOCOMIAL DISEASES).

TO REDUCE THIS RISK, THE ELECTRONIC CABINETS MUST BE INSTALLED IN A ROOM SEPARATED FROM EXAM ROOM/CONTROL ROOM, I.E., TECHNICAL ROOM.

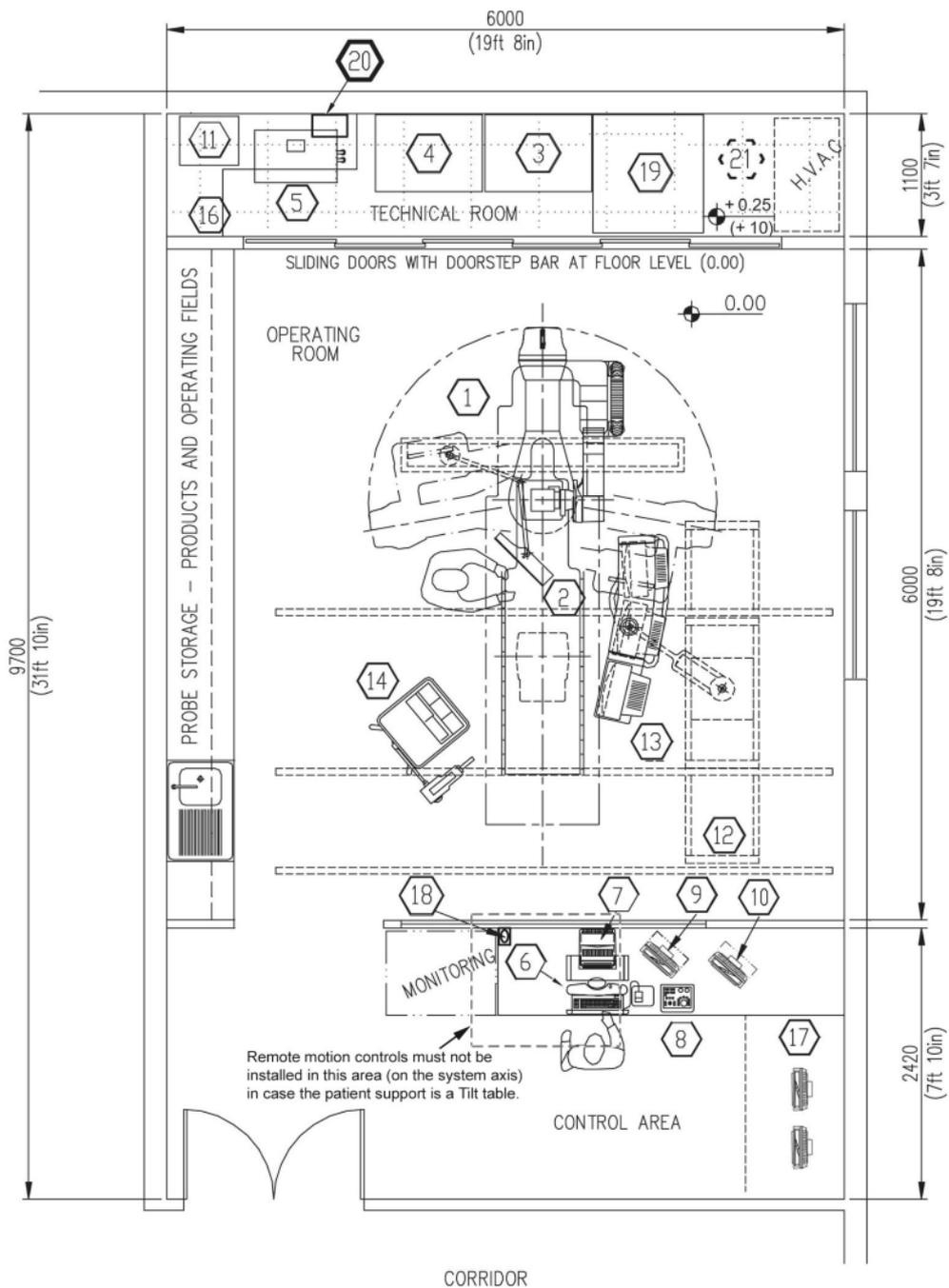
Legend of [Illustration 4-5](#)

1. Innova LC positioner
2. Patient table
3. C1 Cabinet
4. C2 Cabinet
5. Chiller Coolix 4000 (X-Ray tube housing)
6. VCIM Console and DL keyboard
7. DL Image monitor
8. DL Keypad
9. Flat panel monitor for Live Images
10. Flat Panel monitor for Roadmap Images
11. Chiller Innova Detector
12. XT monitor suspension
13. 21" (53 cm) FFD Monitors put on frame with monitoring screen
14. Injector on Pedestal
15. - NA -
16. Bookcase or bookshelves required for Technical Publications and special parts and tools
17. AW Station and flat panel monitor (x2)
18. Bolus handle (optional)
19. Fluoro UPS (optional)
20. Fluoro UPS I/F box (optional)
21. EMI Filter Enclosure (optional)

NOTE: The phone outlet must be located less than 1 meter (3 feet) from the C1 Cabinet (3).

2.3 Room Layout for Innova System (example 3)

Illustration 4-7: Example 3 - suspension perpendicular to patient table



NOTICE

Monitor suspension shown on this illustration is not finalized location yet.



WARNING

LOCATION IN TECHNICAL ROOM FOR ELECTRICAL CABINETS IS MANDATORY.

THE ELECTRONIC CABINETS (C1, C2, COOLIX 4000 CHILLER, DETECTOR CHILLER AND FLURO UPS WHEN INSTALLED) INCLUDE FANS THAT ARE CREATING AIR-CIRCULATION OF PULSED-AIR. WHEN THIS PULSED AIR IS IN AN ENVIRONMENT THAT MAY CONTAIN AIRBORNE PATHOGENS LIKE AN EXAM ROOM/CONTROL ROOM, THERE IS A RISK OF TRANSMISSION OF THESE AIRBORNE PATHOGENS FROM PATIENTS TO OTHER PATIENTS OR CLINICAL PERSONNEL (NOSOCOMIAL DISEASES).

TO REDUCE THIS RISK, THE ELECTRONIC CABINETS MUST BE INSTALLED IN A ROOM SEPARATED FROM EXAM ROOM/CONTROL ROOM, I.E., TECHNICAL ROOM.

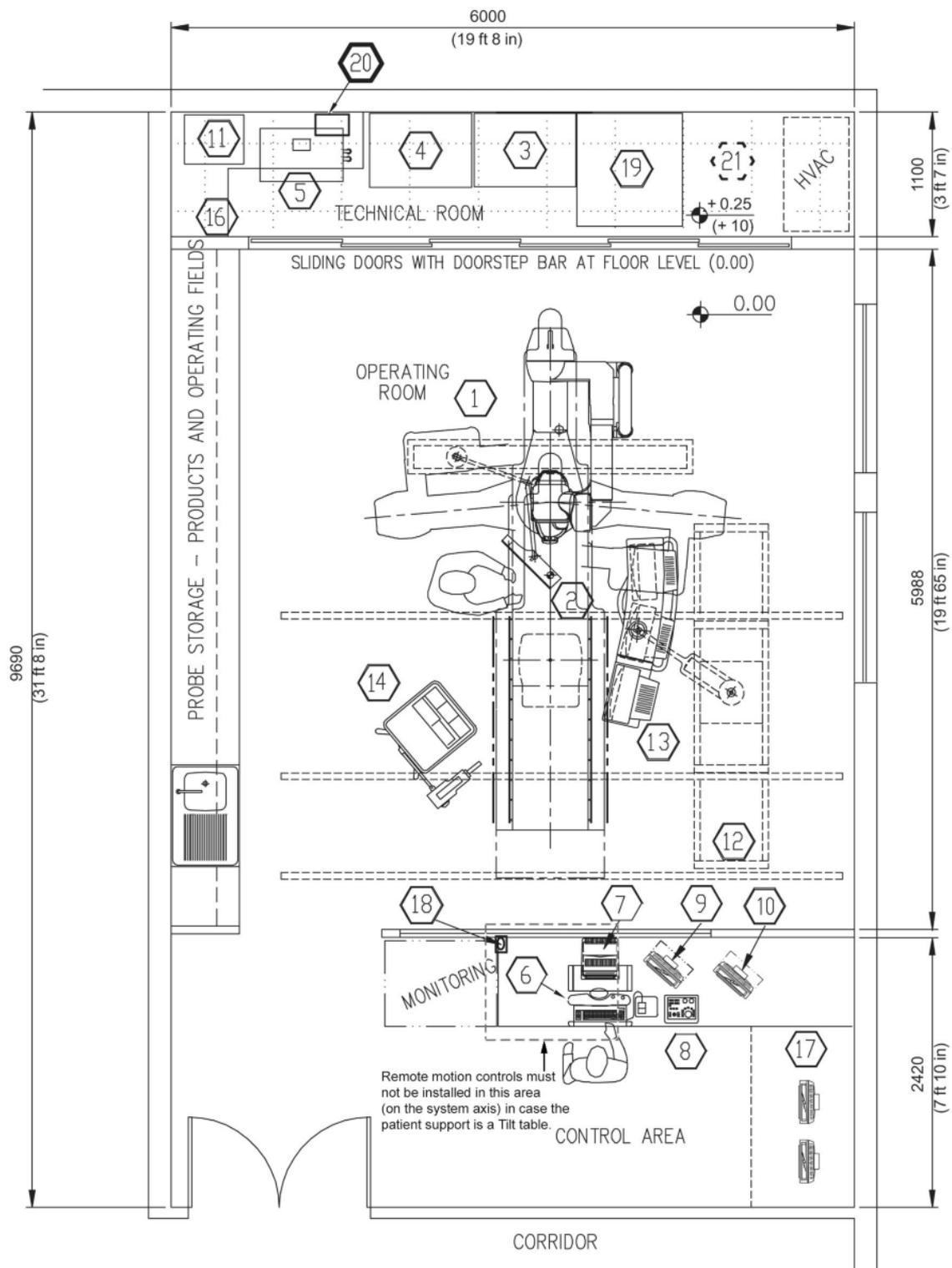
Legend of [Illustration 4-7](#)

1. Innova LC positioner
2. Patient table
3. C1 Cabinet
4. C2 Cabinet
5. Chiller Coolix 4000 (X-Ray tube housing)
6. VCIM Console and DL keyboard
7. DL Image monitor
8. DL Keypad
9. Flat panel monitor for Live Images
10. Flat Panel monitor for Roadmap Images
11. Chiller Innova Detector
12. XT monitor suspension
13. 21" (53 cm) FFD Monitors put on frame with monitoring screen
14. Injector on Pedestal
15. - NA -
16. Bookcase or bookshelves required for Technical Publications and special parts and tools
17. AW Station and flat panel monitor (x2)
18. Bolus handle (optional)
19. Fluoro UPS (optional)
20. Fluoro UPS I/F box (optional)
21. EMI Filter Enclosure (optional)

NOTE: The phone outlet must be located less than 1 meter (3 feet) from the C1 Cabinet (3).

2.4 Room Layout for Innova System (example 4)

Illustration 4-8: Example 4 - suspension perpendicular to patient table





WARNING

LOCATION IN TECHNICAL ROOM FOR ELECTRICAL CABINETS IS MANDATORY.

THE ELECTRONIC CABINETS (C1, C2, COOLIX 4000 CHILLER, DETECTOR CHILLER AND FLUORO UPS WHEN INSTALLED) INCLUDE FANS THAT ARE CREATING AIR-CIRCULATION OF PULSED-AIR. WHEN THIS PULSED AIR IS IN AN ENVIRONMENT THAT MAY CONTAIN AIRBORNE PATHOGENS LIKE AN EXAM ROOM/CONTROL ROOM, THERE IS A RISK OF TRANSMISSION OF THESE AIRBORNE PATHOGENS FROM PATIENTS TO OTHER PATIENTS OR CLINICAL PERSONNEL (NOSOCOMIAL DISEASES).

TO REDUCE THIS RISK, THE ELECTRONIC CABINETS MUST BE INSTALLED IN A ROOM SEPARATED FROM EXAM ROOM/CONTROL ROOM, I.E., TECHNICAL ROOM.

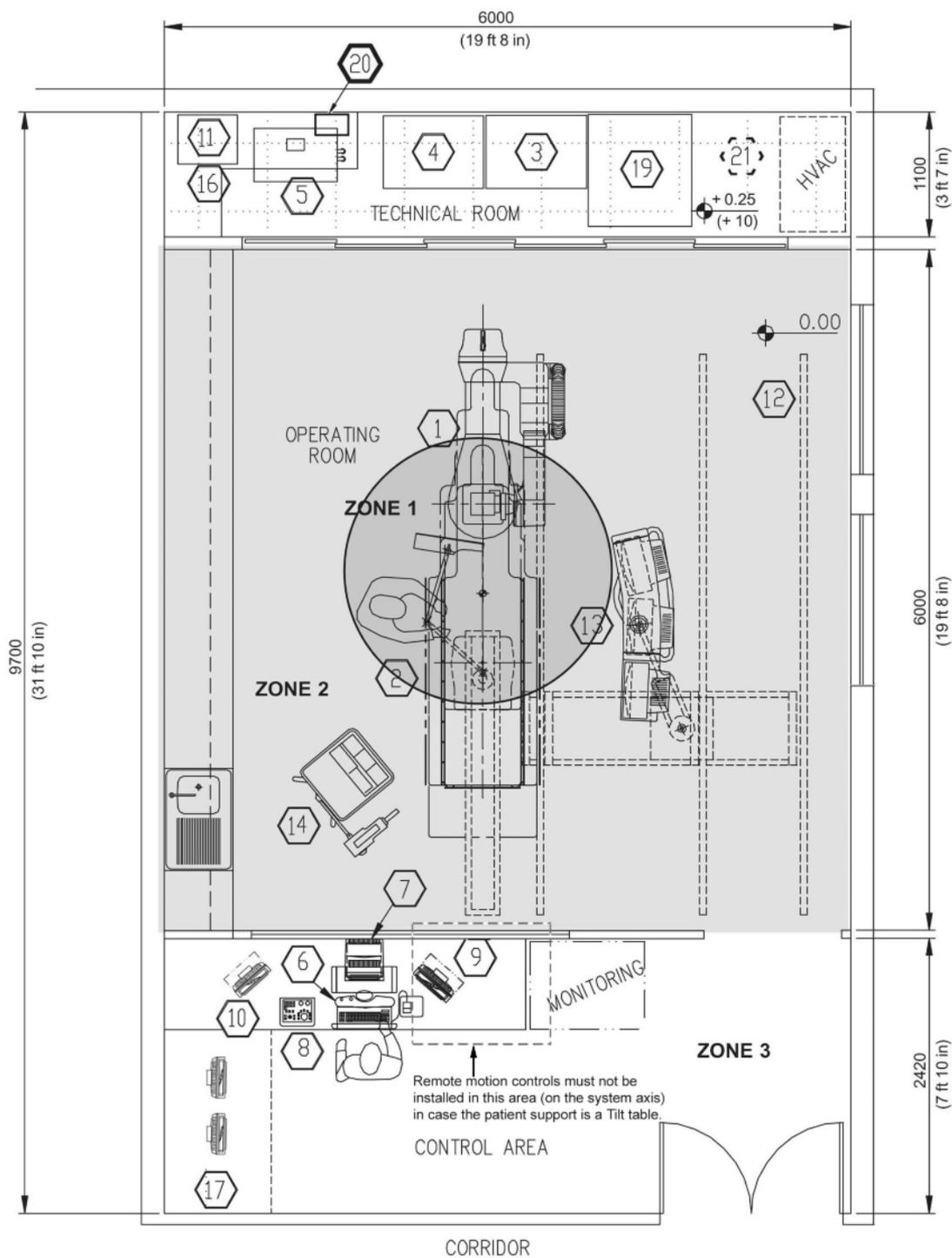
Legend of [Illustration 4-8](#)

1. Innova LC positioner
2. Patient table
3. C1 Cabinet
4. C2 Cabinet
5. Chiller Coolix 4000 (X-Ray tube housing)
6. VCIM Console and DL keyboard
7. DL Image monitor
8. DL Keypad
9. Flat panel monitor for Live Images
10. Flat Panel monitor for Roadmap Images
11. Chiller Innova Detector
12. XT monitor suspension
13. 21" (53 cm) FFD Monitors put on frame with monitoring screen
14. Injector on Pedestal
15. - NA -
16. Bookcase or bookshelves required for Technical Publications and special parts and tools
17. AW Station and flat panel monitor (x2)
18. Bolus handle (optional)
19. Fluoro UPS (optional)
20. Fluoro UPS I/F box (optional)
21. EMI Filter Enclosure (optional)

NOTE: The phone outlet must be located less than 1 meter (3 feet) from the C1 Cabinet (3).

2.5 Room Lighting for Innova System

Illustration 4-9: Room Lighting for Innova System





WARNING

LOCATION IN TECHNICAL ROOM FOR ELECTRICAL CABINETS IS MANDATORY.

THE ELECTRONIC CABINETS (C1, C2, COOLIX 4000 CHILLER, DETECTOR CHILLER AND FLURO UPS WHEN INSTALLED) INCLUDE FANS THAT ARE CREATING AIR-CIRCULATION OF PULSED-AIR. WHEN THIS PULSED AIR IS IN AN ENVIRONMENT THAT MAY CONTAIN AIRBORNE PATHOGENS LIKE AN EXAM ROOM/CONTROL ROOM, THERE IS A RISK OF TRANSMISSION OF THESE AIRBORNE PATHOGENS FROM PATIENTS TO OTHER PATIENTS OR CLINICAL PERSONNEL (NOSOCOMIAL DISEASES).

TO REDUCE THIS RISK, THE ELECTRONIC CABINETS MUST BE INSTALLED IN A ROOM SEPARATED FROM EXAM ROOM/CONTROL ROOM, I.E., TECHNICAL ROOM.

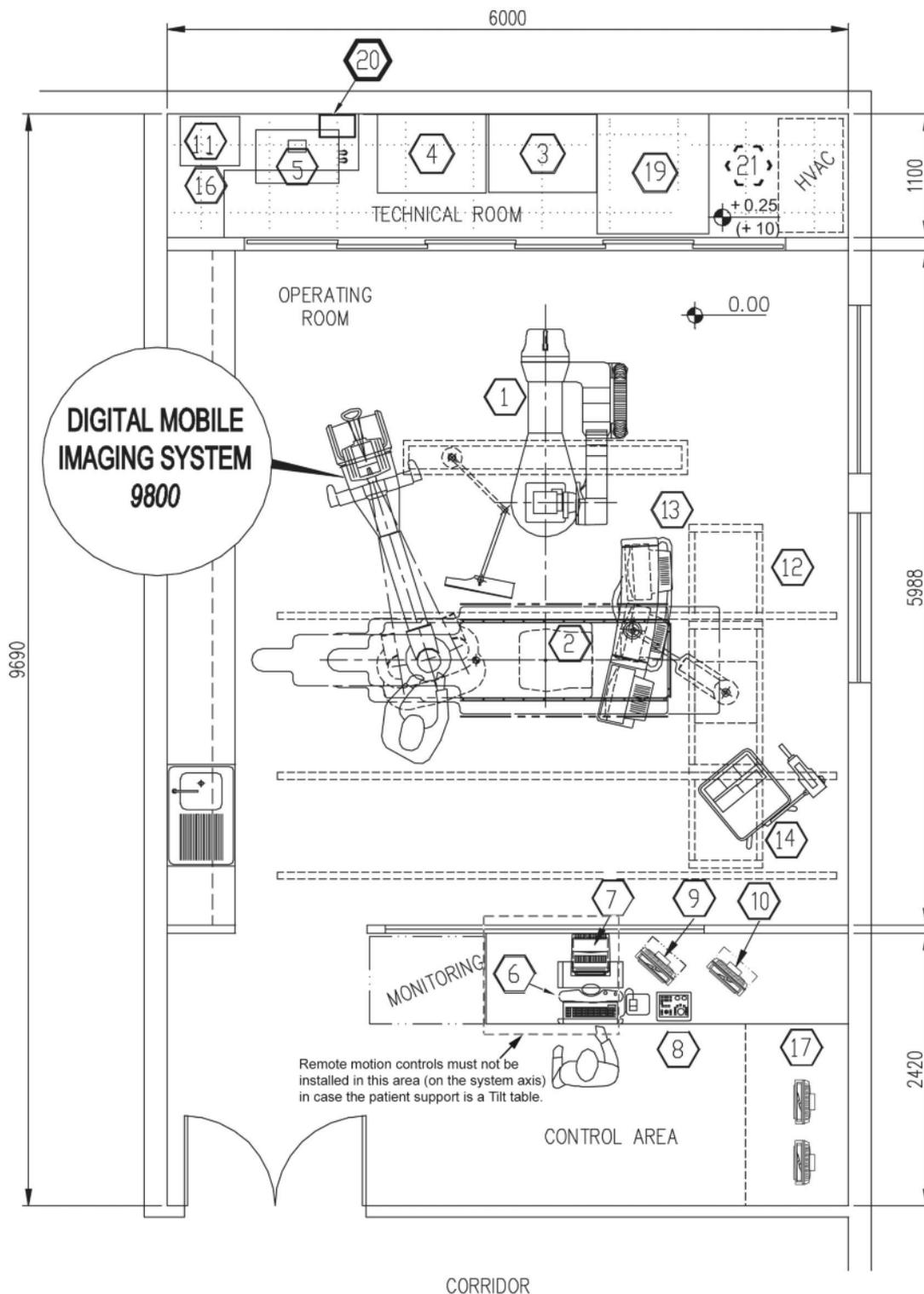
Legend of [Illustration 4-9](#)

1. Innova LC positioner
2. Patient table
3. C1 Cabinet
4. C2 Cabinet
5. Chiller Coolix 4000 (X-Ray tube housing)
6. VCIM Console and DL keyboard
7. DL Image monitor
8. DL Keypad
9. Flat panel monitor for Live Images
10. Flat Panel monitor for Roadmap Images
11. Chiller Innova Detector
12. XT monitor suspension
13. 21" (53 cm) FFD Monitors put on frame with monitoring screen
14. Injector on Pedestal
15. - NA -
16. Bookcase or bookshelves required for Technical Publications and special parts and tools
17. AW Station and flat panel monitor (x2)
18. Bolus handle (optional)
19. Fluoro UPS (optional)
20. Fluoro UPS I/F box (optional)
21. EMI Filter Enclosure (optional)

NOTE: The phone outlet must be located less than 1 meter (3 feet) from the C1 Cabinet (3).

2.6 Room Layout for Innova System (example with Mobile system 9800)

Illustration 4-10: Room Layout for Innova System





WARNING

LOCATION IN TECHNICAL ROOM FOR ELECTRICAL CABINETS IS MANDATORY.

THE ELECTRONIC CABINETS (C1, C2, COOLIX 4000 CHILLER, DETECTOR CHILLER AND FLUORO UPS WHEN INSTALLED) INCLUDE FANS THAT ARE CREATING AIR-CIRCULATION OF PULSED-AIR. WHEN THIS PULSED AIR IS IN AN ENVIRONMENT THAT MAY CONTAIN AIRBORNE PATHOGENS LIKE AN EXAM ROOM/CONTROL ROOM, THERE IS A RISK OF TRANSMISSION OF THESE AIRBORNE PATHOGENS FROM PATIENTS TO OTHER PATIENTS OR CLINICAL PERSONNEL (NOSOCOMIAL DISEASES).

TO REDUCE THIS RISK, THE ELECTRONIC CABINETS MUST BE INSTALLED IN A ROOM SEPARATED FROM EXAM ROOM/CONTROL ROOM, I.E., TECHNICAL ROOM.

Legend of [Illustration 4-10](#)

1. Innova LC positioner
2. Patient table
3. C1 Cabinet
4. C2 Cabinet
5. Chiller Coolix 4000 (X-Ray tube housing)
6. VCIM Console and DL keyboard
7. DL Image monitor
8. DL Keypad
9. Flat panel monitor for Live Images
10. Flat Panel monitor for Roadmap Images
11. Chiller Innova Detector
12. XT monitor suspension
13. 21" (53 cm) FFD Monitors put on frame with monitoring screen
14. Injector on Pedestal
15. - NA -
16. Bookcase or bookshelves required for Technical Publications and special parts and tools
17. AW Station and flat panel monitor (x2)
18. Bolus handle (optional)
19. Fluoro UPS (optional)
20. Fluoro UPS I/F box (optional)
21. EMI Filter Enclosure (optional)

NOTE: The phone outlet must be located less than 1 meter (3 feet) from the C1 Cabinet (3).

3 IVUS Option

3.1 Functional Diagram

Illustration 4-11: IVUS Rev 1

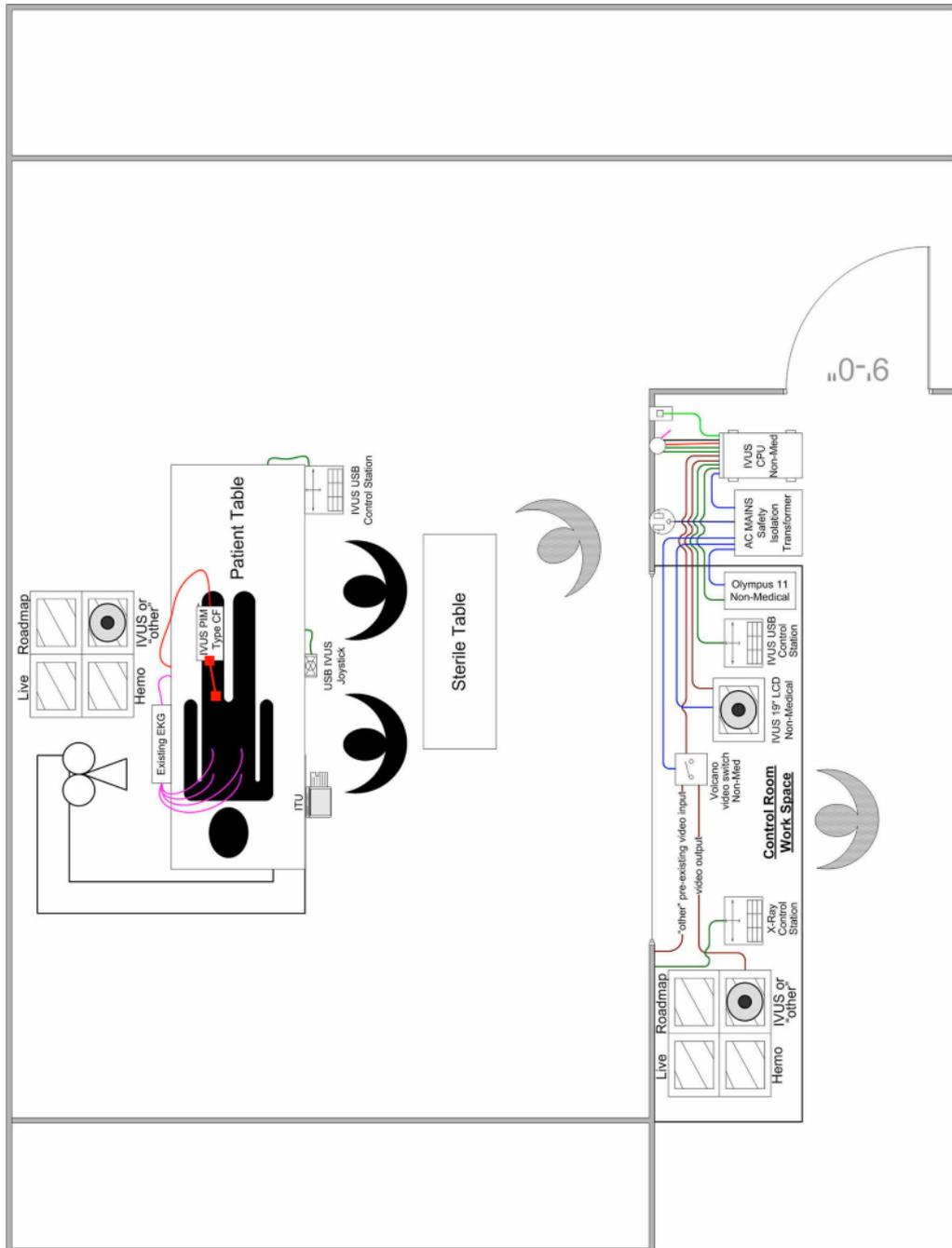
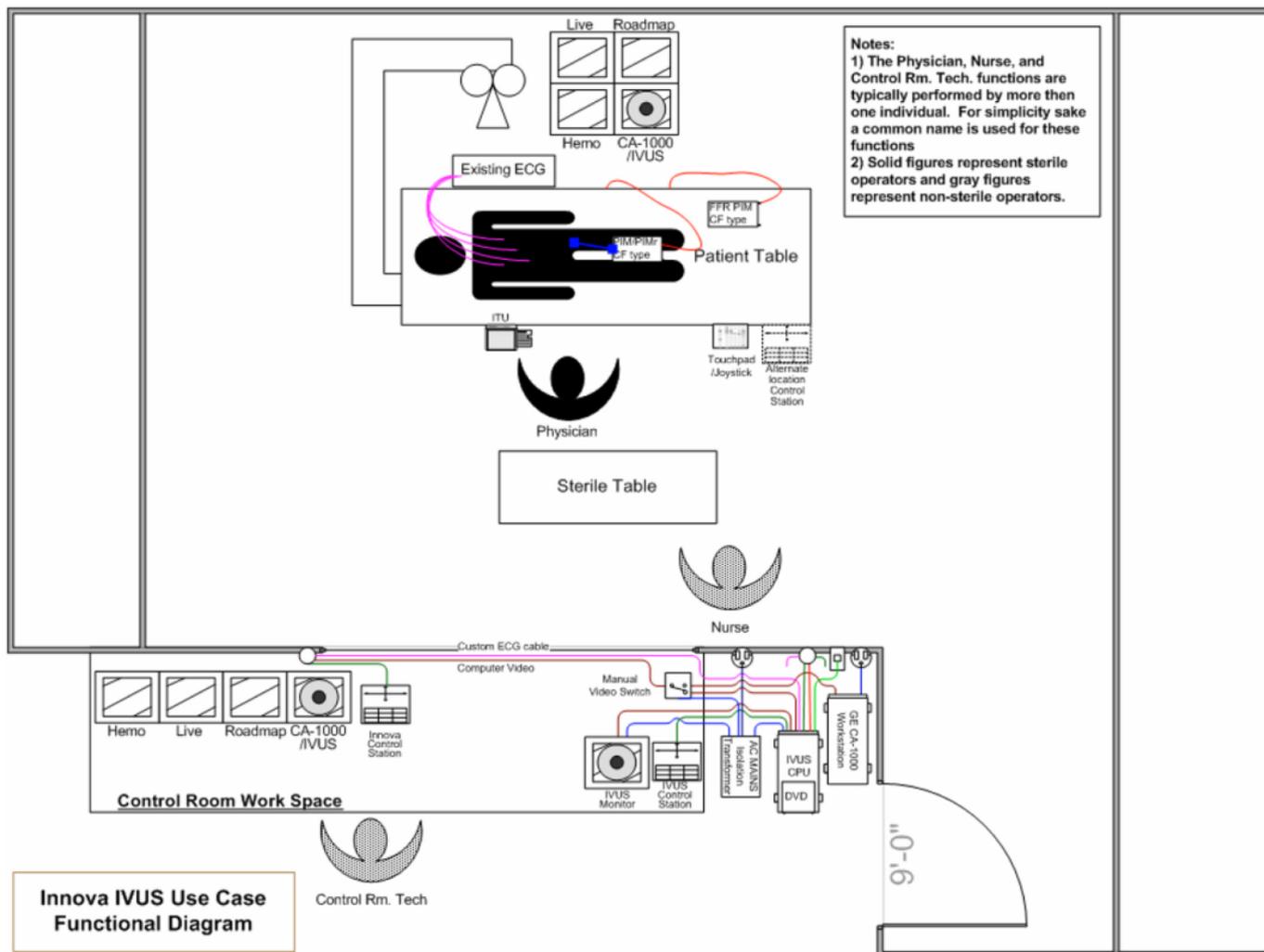


Illustration 4-12: IVUS Rev 2



Innova IVUS Use Case Functional Diagram

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Chapter 5 Physical Characteristics

1 Dimension Drawings

Refer to this section for the dimensional drawings of the components of the Innova LC Positioner and Omega Tables sub-systems. These components include:

Innova LC Positioner, Omega Patient Tables, Innova^{IQ} Patient Table, C2 Cabinet, C1 Cabinet, and Chillers.

In addition, refer to this section for Positioner/table relative position drawings.

Table 5-1:

| TITLE | ILLUSTRATION |
|---|-----------------------------------|
| Innova LC Positioner Dimensions: - Side View | Illustration 5-1 |
| - Top View | Illustration 5-2 |
| - Front View | Illustration 5-3 |
| Omega IV Compact Patient Table Dimensions | Illustration 5-4 |
| Omega V Long Patient Table Dimensions | Illustration 5-5 |
| Innova ^{IQ} Patient Table Dimensions | Illustration 5-6 |
| Omega IV Table Interference Regions (Innova 2100-IQ) | Illustration 5-7 |
| Omega V Long Patient Table Interference Regions | Illustration 5-8 |
| Innova ^{IQ} Patient Table Interference Regions | Illustration 5-9 |
| Omega Table side clearance (CPR access) | Illustration 5-10 |
| Innova LC Positioner and Omega IV Compact Patient Table Relative Positions (Innova 2100-IQ) | Illustration 5-11 |
| Innova LC Positioner and Omega V Long Patient Relative Positions | Illustration 5-12 |
| C2 Cabinet Dimensions | Illustration 5-13 |
| C1 Cabinet Dimensions | Illustration 5-14 |
| Floor Space Diagram for Lytron Chiller | Illustration 5-15 |
| Detector Chiller Thermo-Tek Dimensions | Illustration 5-16 |
| Detector Chiller Thermo-Con Dimensions | Illustration 5-17 |
| Detector Chiller Thermo-Tek - Configuration & Orientation | Illustration 5-18 |
| Detector Chiller Thermo-Con - Orientation | Illustration 5-19 |
| Fluoro UPS UL Layout (Optional) | Illustration 5-20 |
| Fluoro UPS CE Layout (Optional) | Illustration 5-21 |
| UPS IF Box (Optional) | Illustration 5-22 |
| Gas box outlets Omega IV | Illustration 5-23 |
| Gas box outlets Omega V | Illustration 5-24 |
| DL Keypad Dimensions | Illustration 5-25 |
| DL Image Monitor Dimensions | Illustration 5-26 |
| VCR Mounting Holes Location | Illustration 5-27 |

Illustration 5-1: Innova LC Positioner Dimensions: - Side View

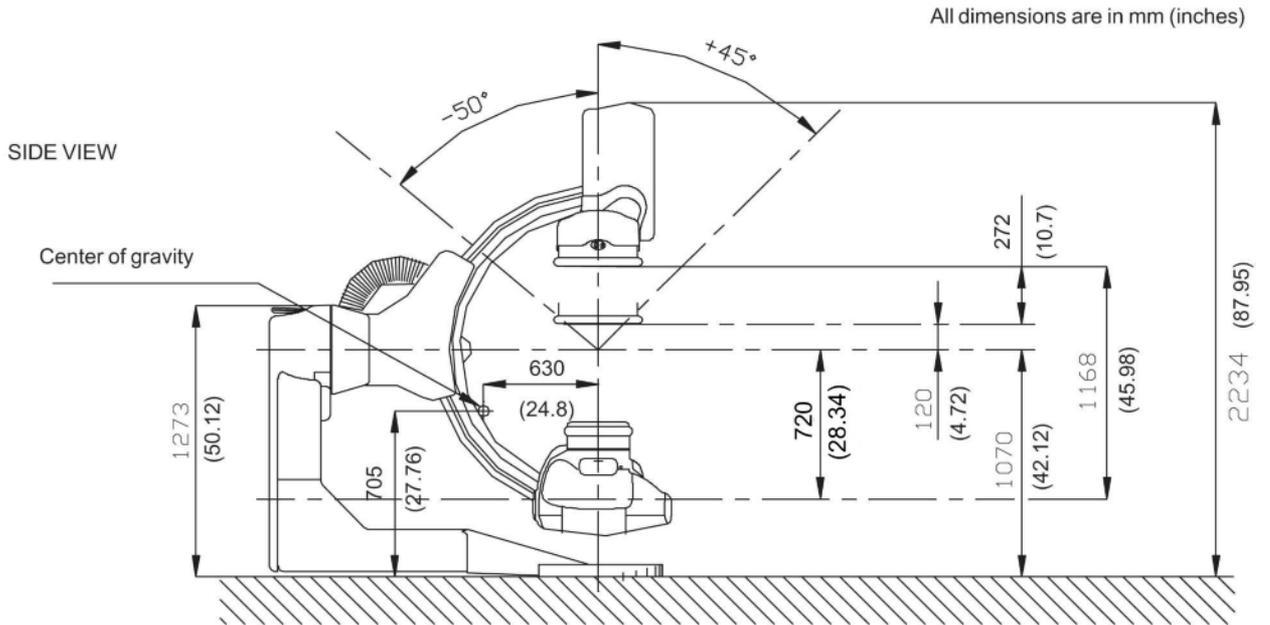


Illustration 5-2: Innova LC Positioner Dimensions: - Top view

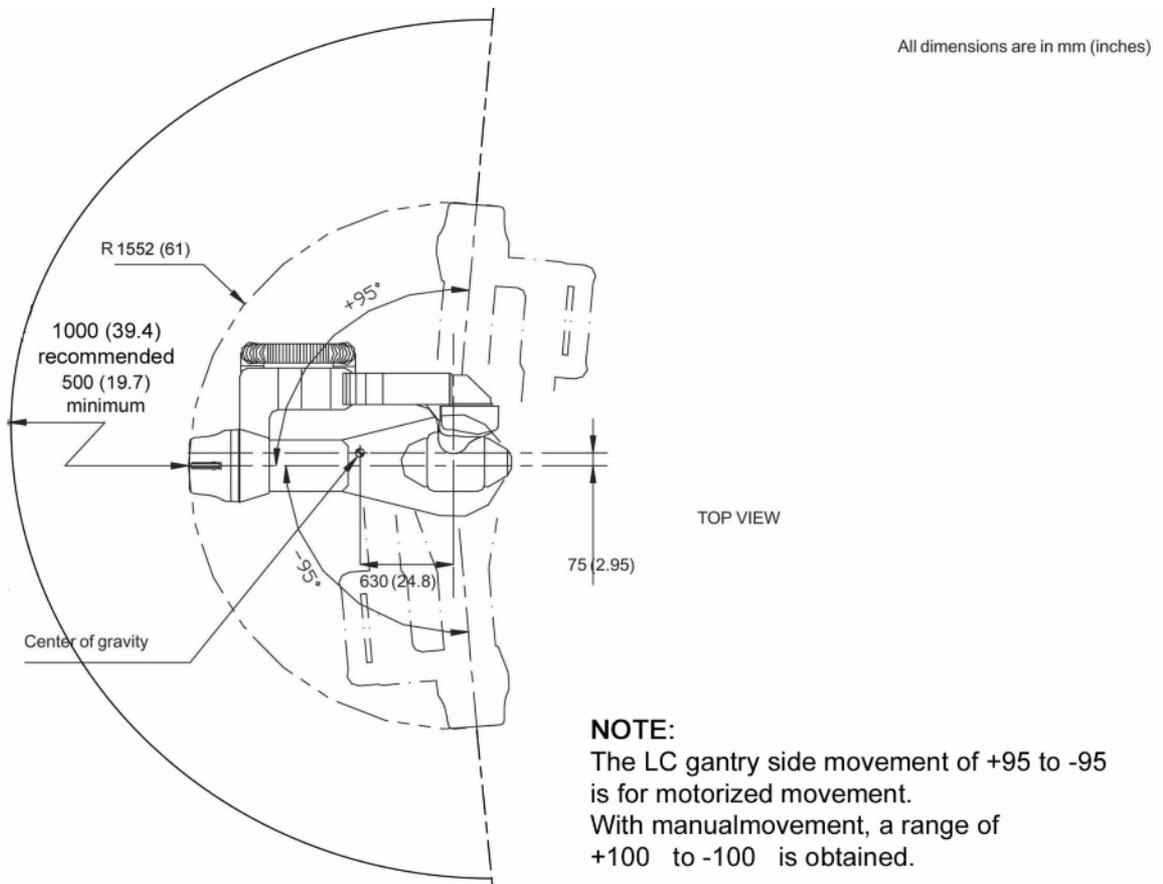


Illustration 5-3: Innova LC Positioner Dimensions: - Top view

All dimensions are in mm (inches)

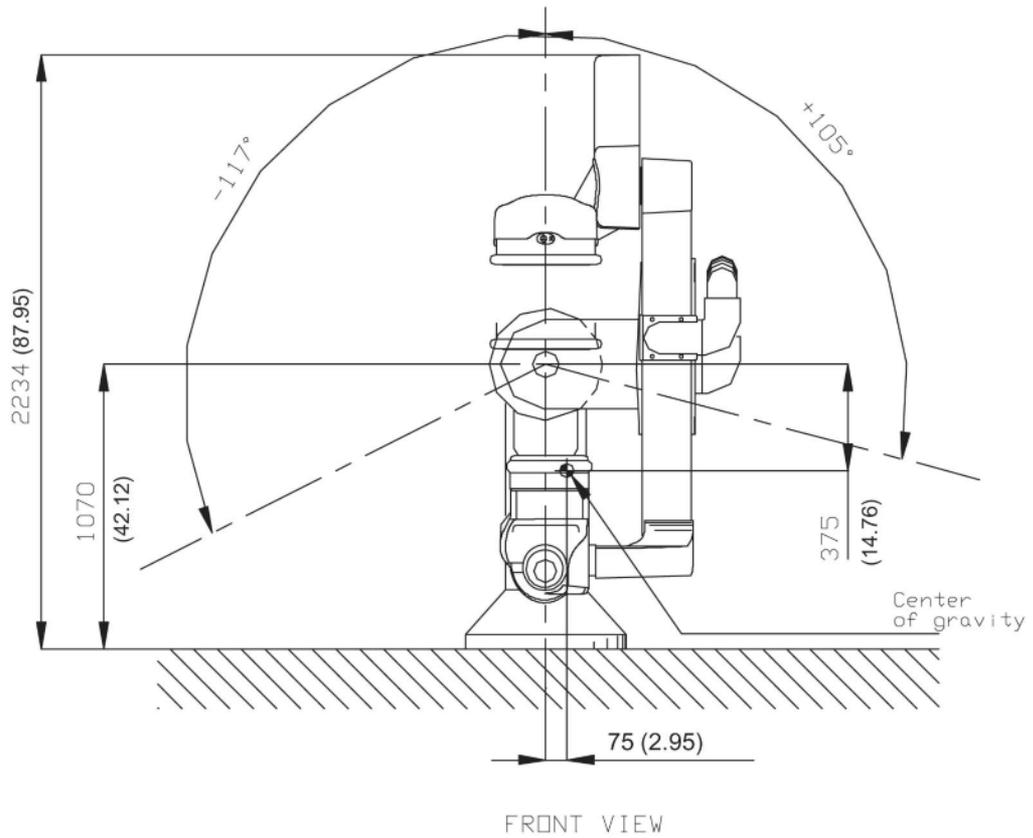


Illustration 5-4: Omega IV Compact Patient Table Dimensions

All dimensions are in mm (inches)

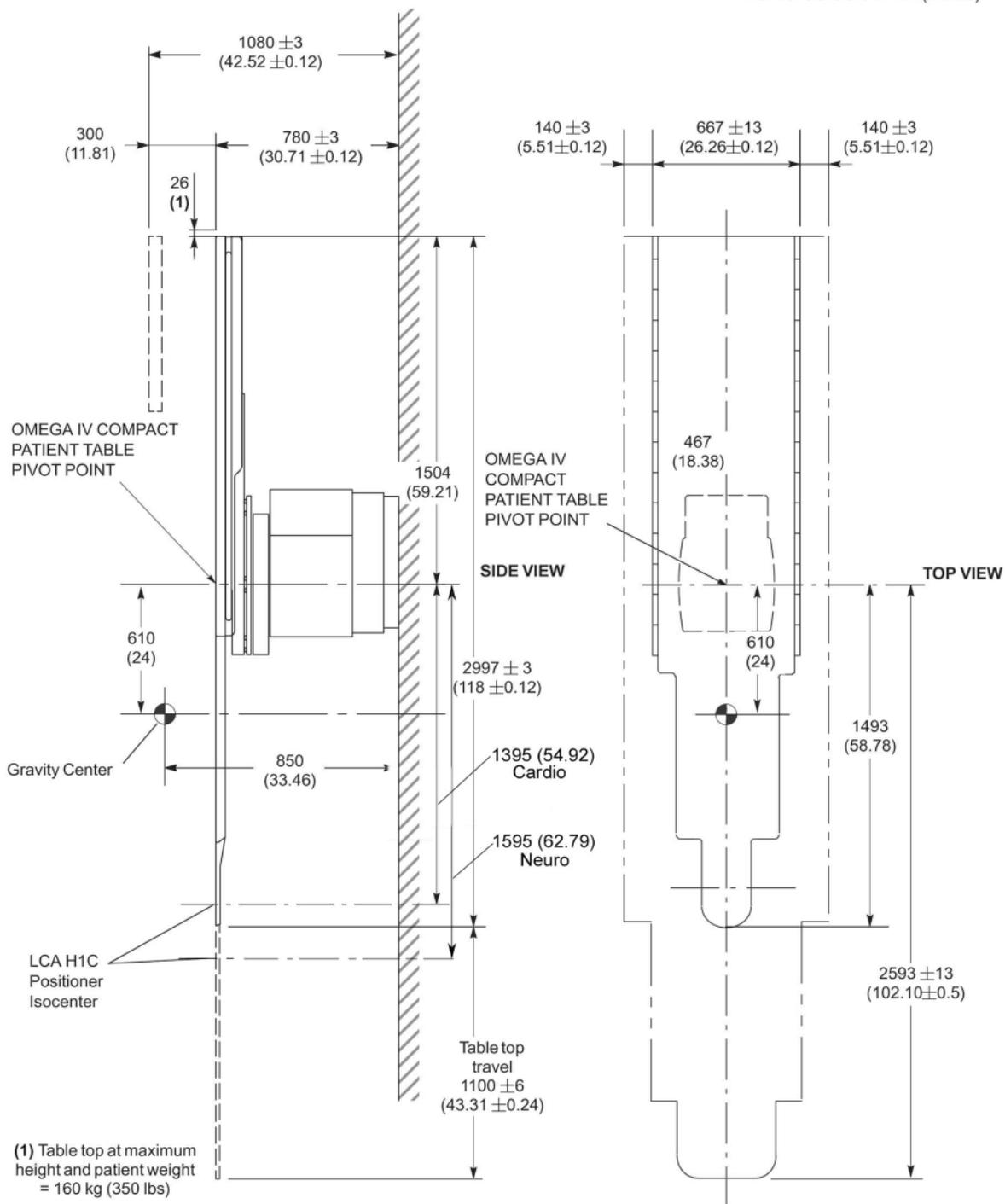
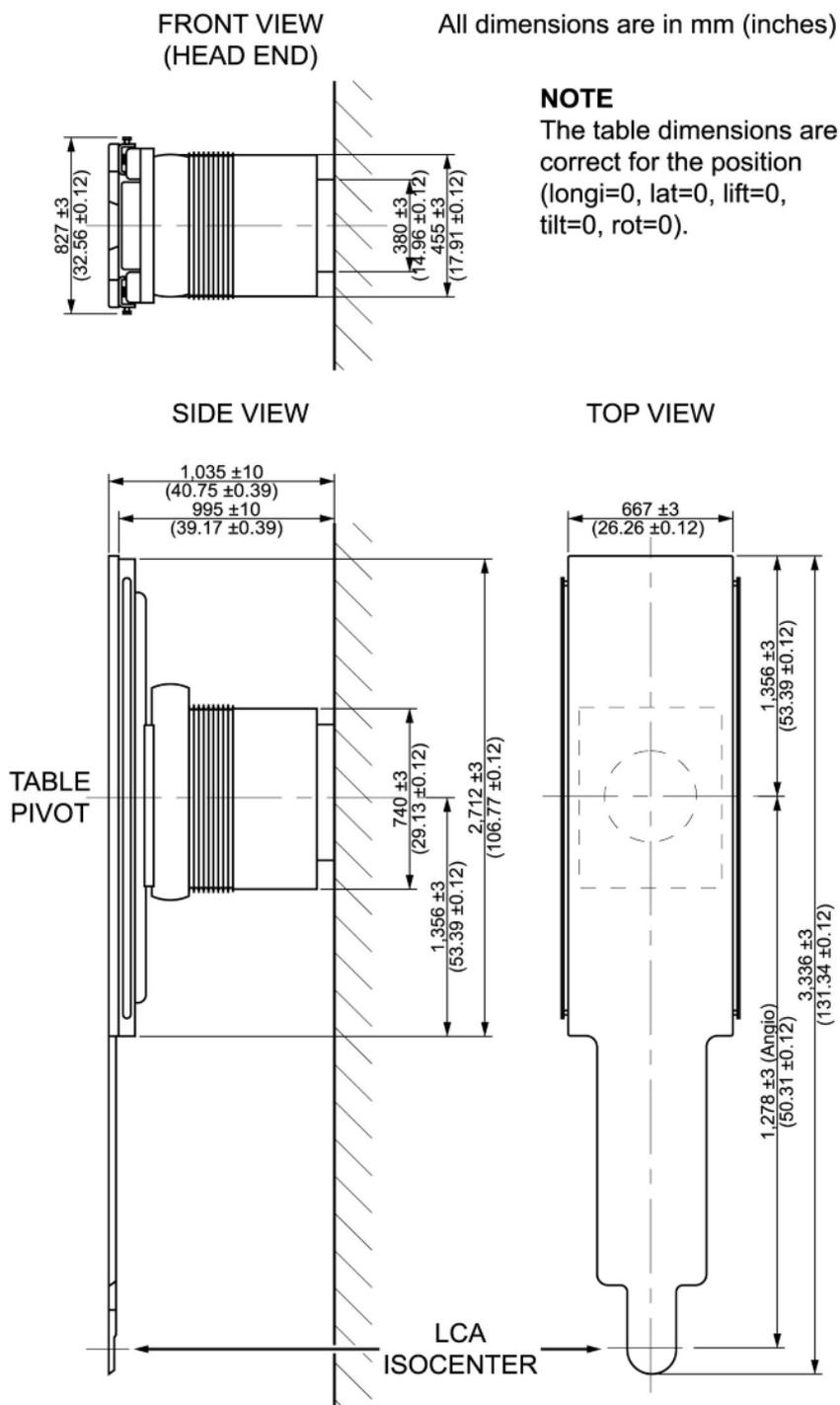


Illustration 5-6: Innova^{IQ} Patient Table Dimensions



NOTE: With a Innova^{IQ} Table, the minimum distance from table pivot to the medical Gas Box is 600 mm and the maximum dimensions of the medical Gas Box are :

- height = 305 mm
- width = 250 mm
- length = 500 mm

Illustration 5-7: Omega IV Compact Patient Table Interference Regions (Innova 2100-IQ)

All dimensions are in mm (inches)

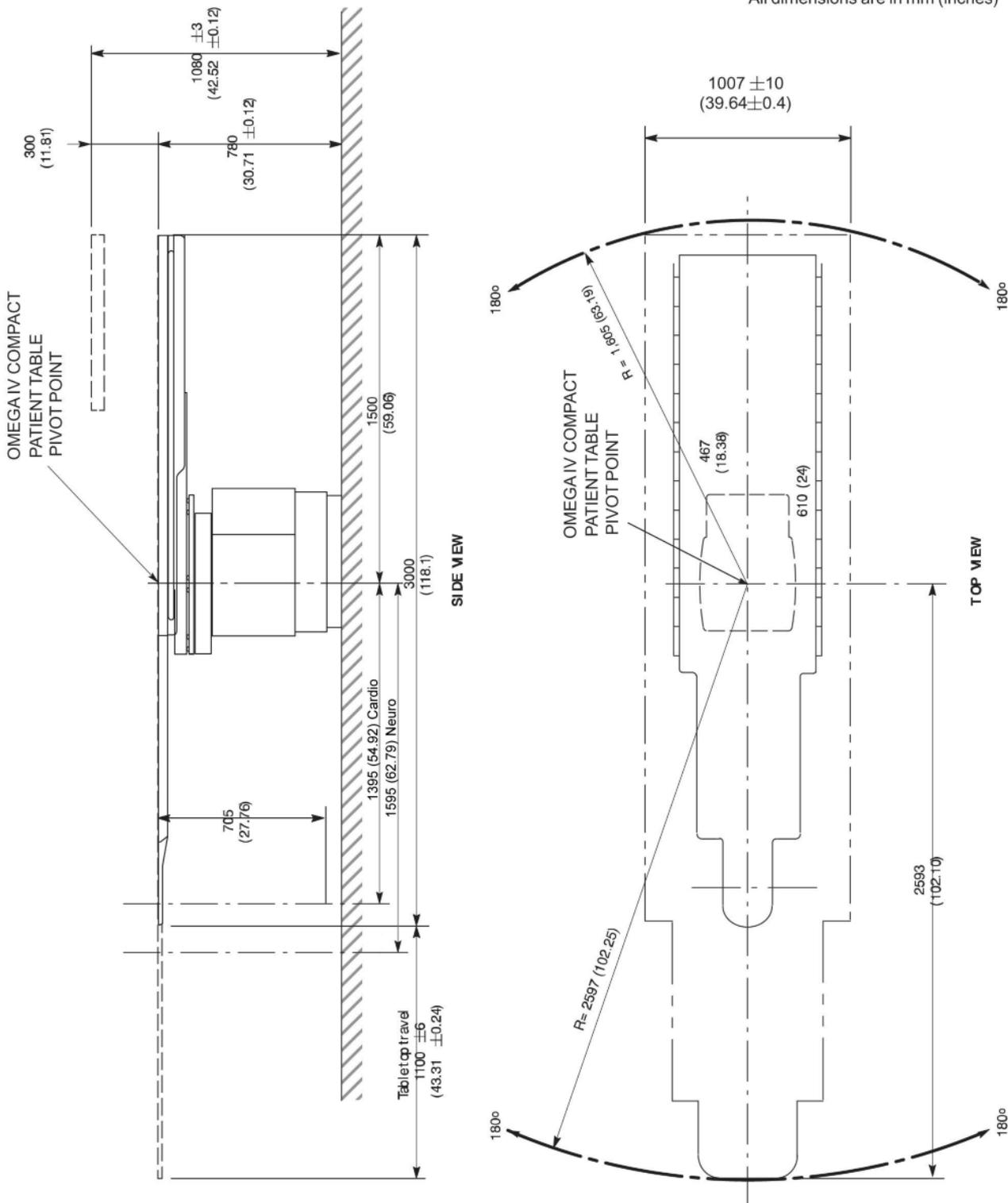
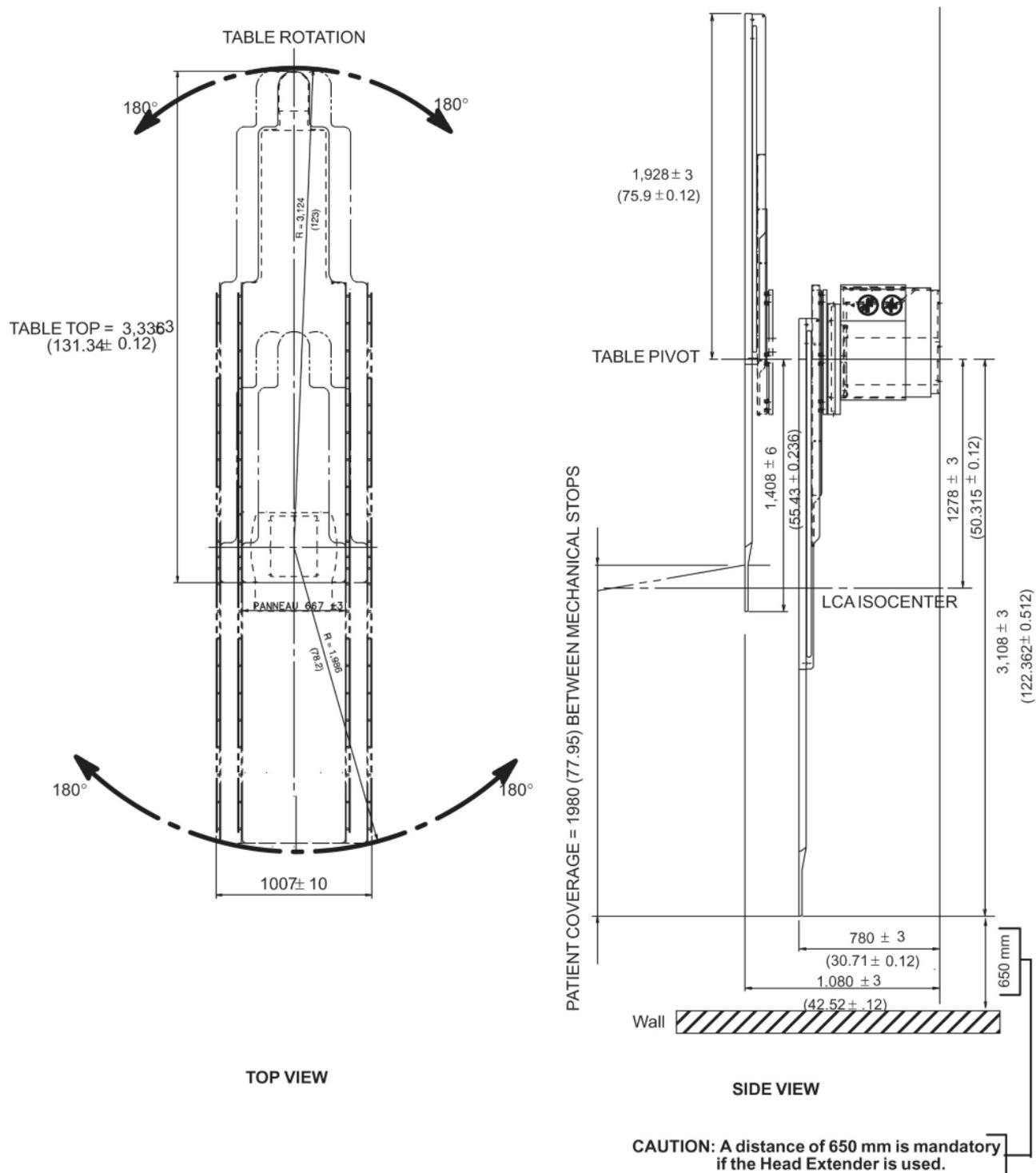


Illustration 5-8: Omega V Long Patient Table Interference Regions



All dimensions are in mm (inches)

Illustration 5-9: Innova^{IQ} Patient Table Interference Regions

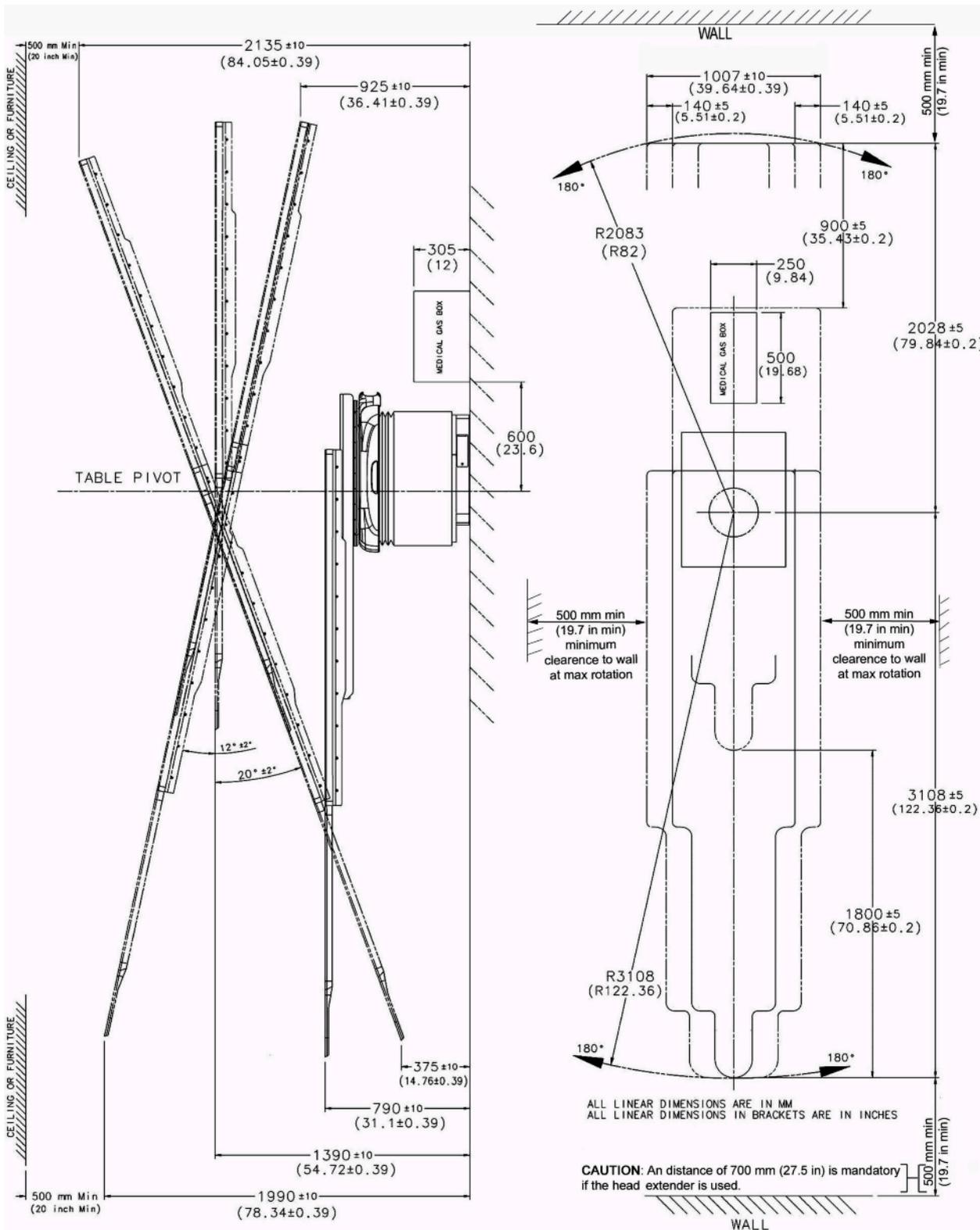


Illustration 5-10: Omega Table side clearance (CPR access)

All dimensions are in mm (inches)

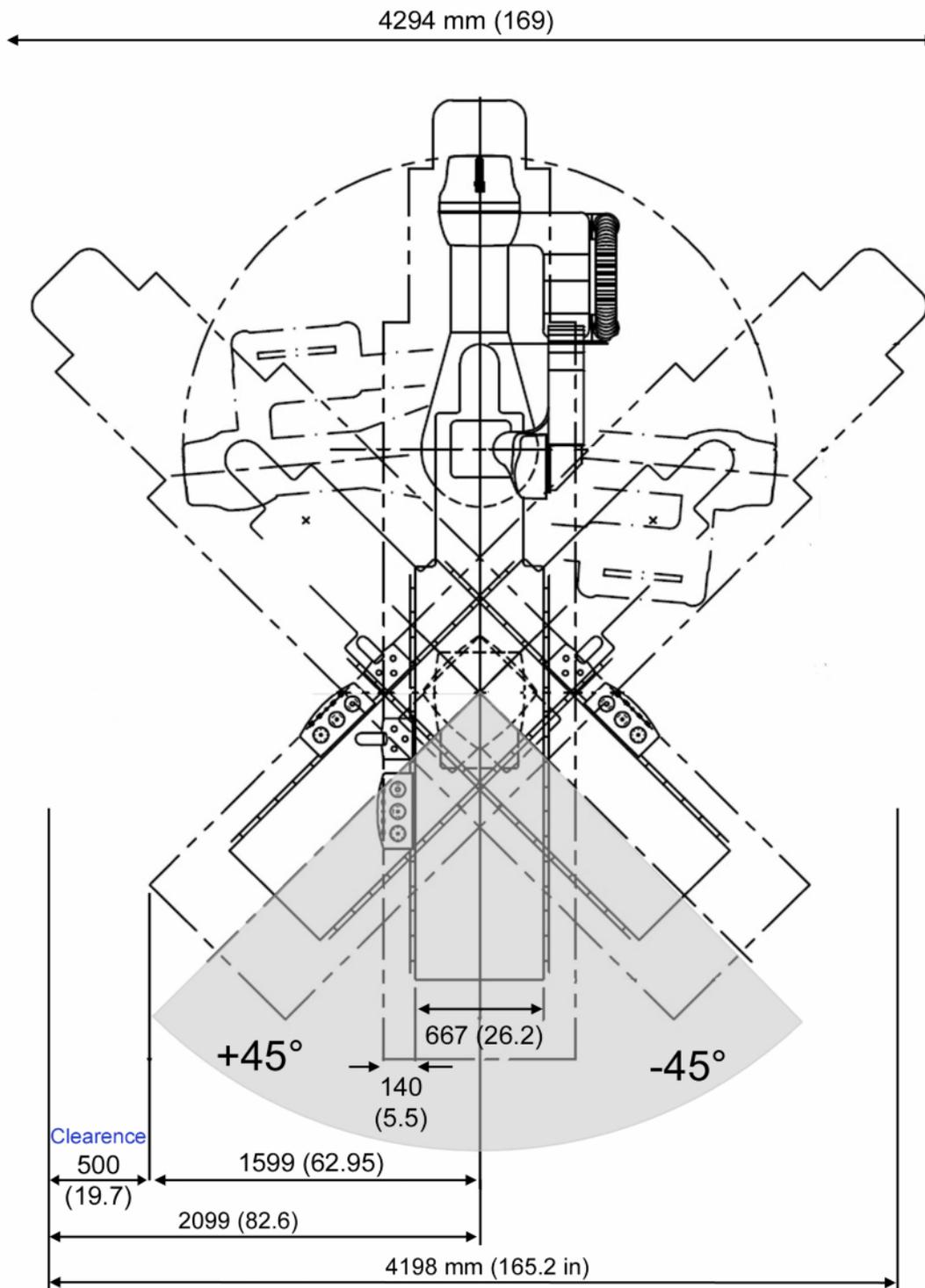
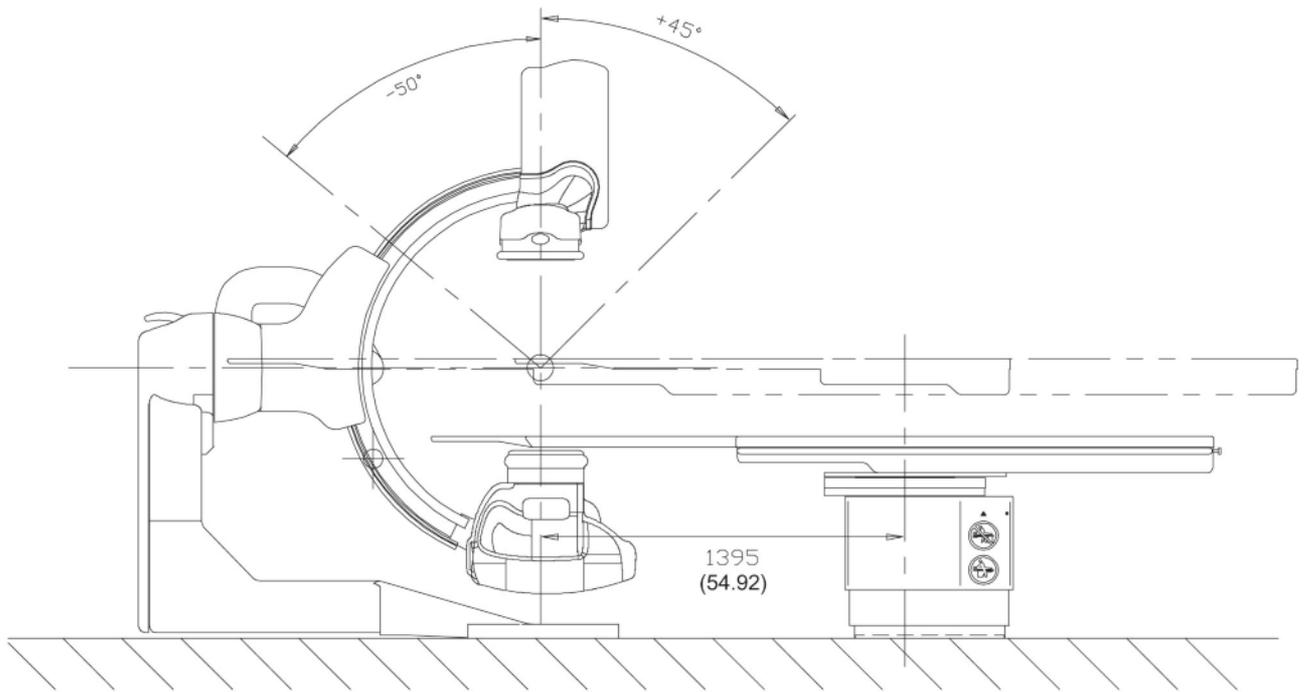


Illustration 5-11: Innova LC Positioner and Omega IV Compact Patient Table Relative Positions (Innova 2100-IQ) - side view

All dimensions are in mm (inches)



SIDE VIEW

Illustration 5-12: Innova LC Positioner and Omega V Long Patient Table Relative Positions - side view

All dimensions are in mm (inches)

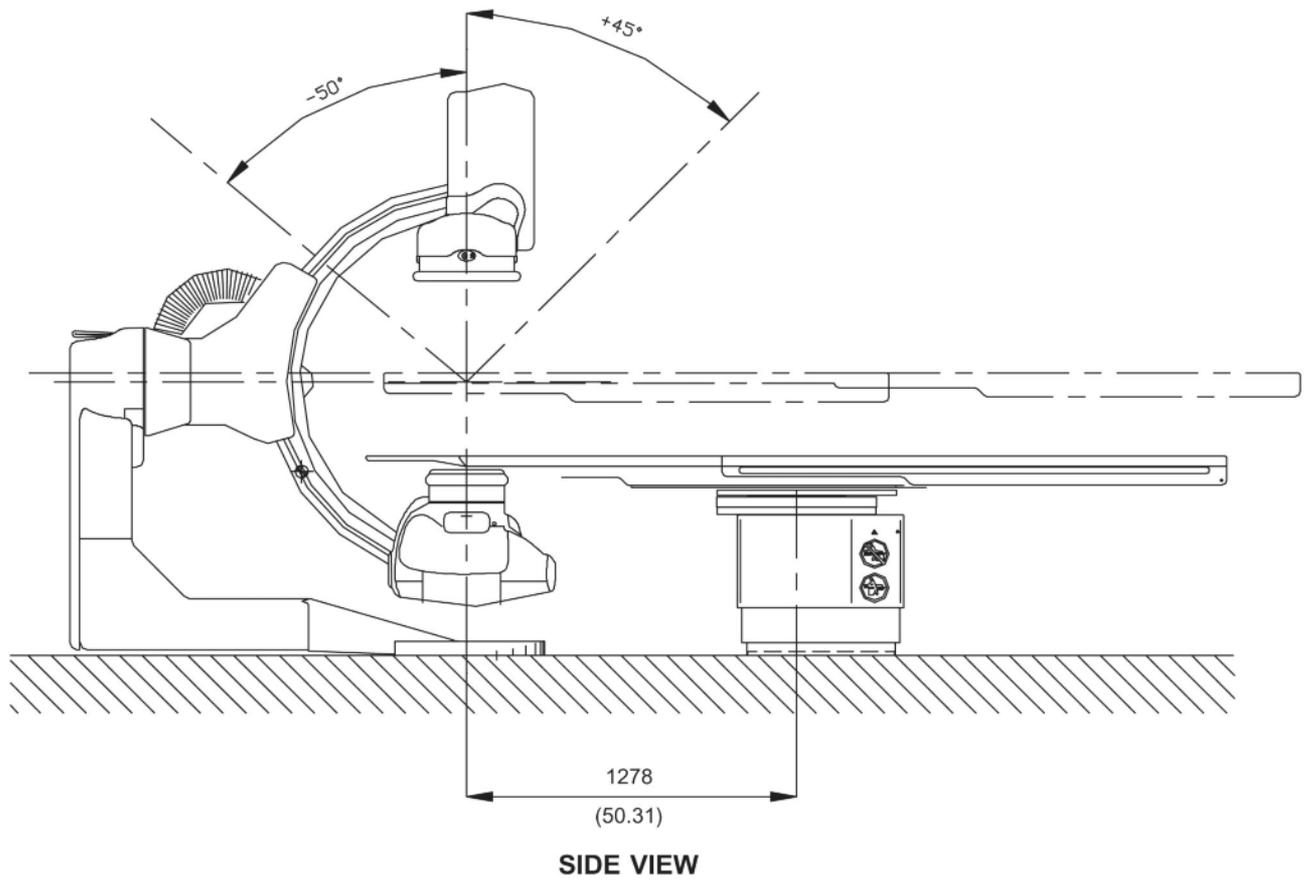
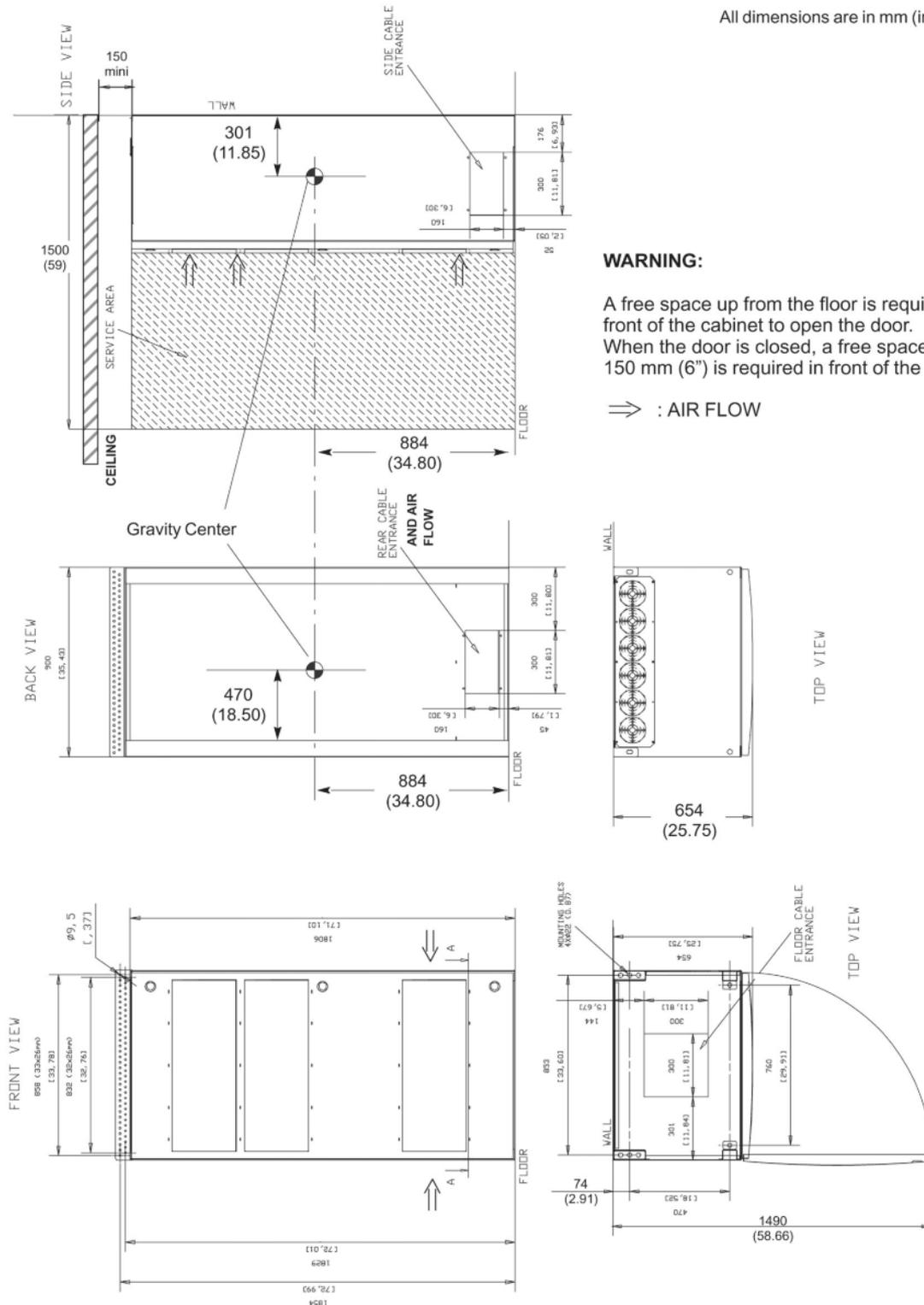


Illustration 5-13: C2 Cabinet Dimensions

All dimensions are in mm (inches)



WARNING:

A free space up from the floor is required in front of the cabinet to open the door.
 When the door is closed, a free space about 150 mm (6") is required in front of the door.

⇒ : AIR FLOW

Illustration 5-14: C1 Cabinet Dimensions

All dimensions are in mm (inches)

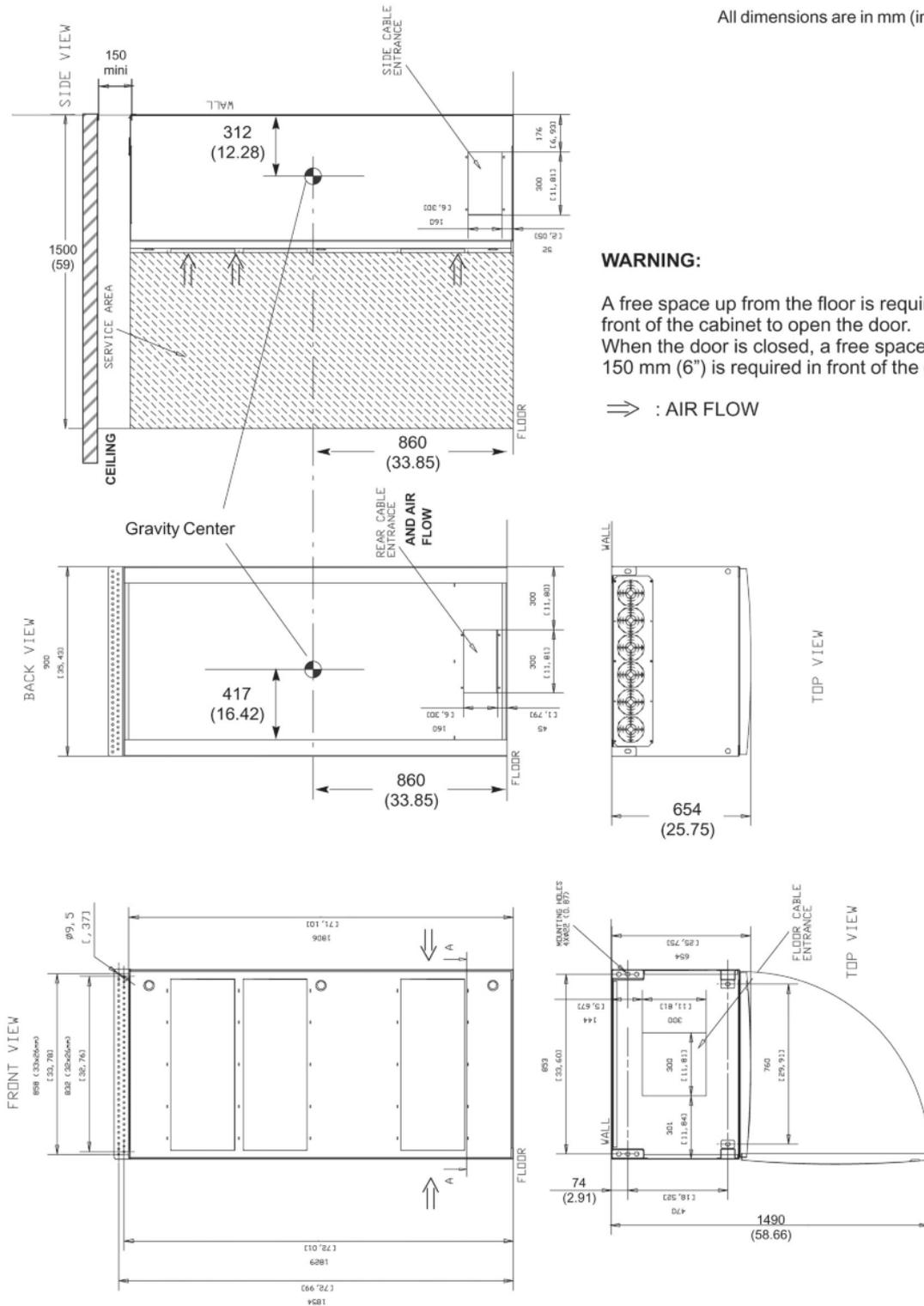
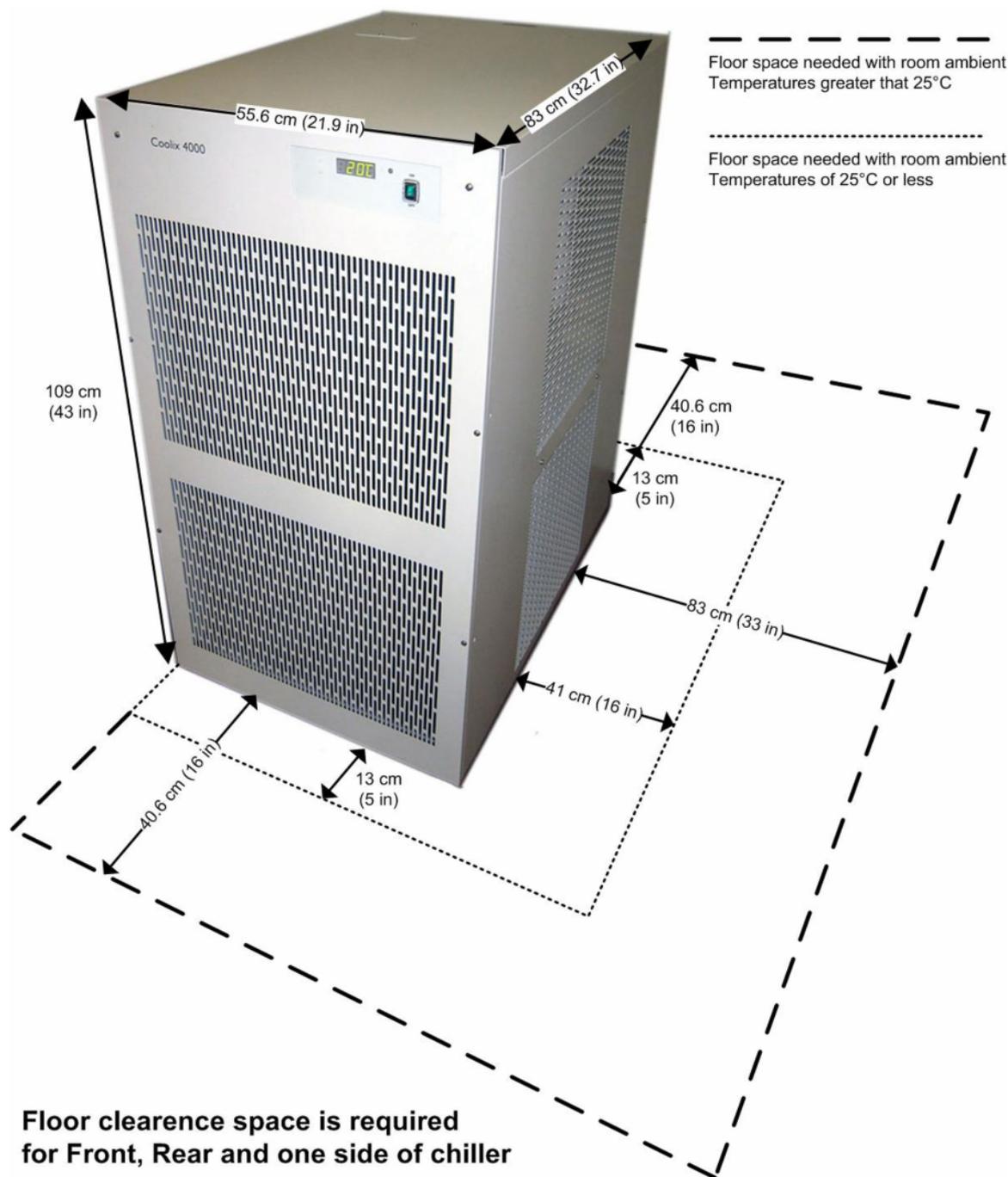


Illustration 5-15: Floor Space Diagram for Lytron Chiller

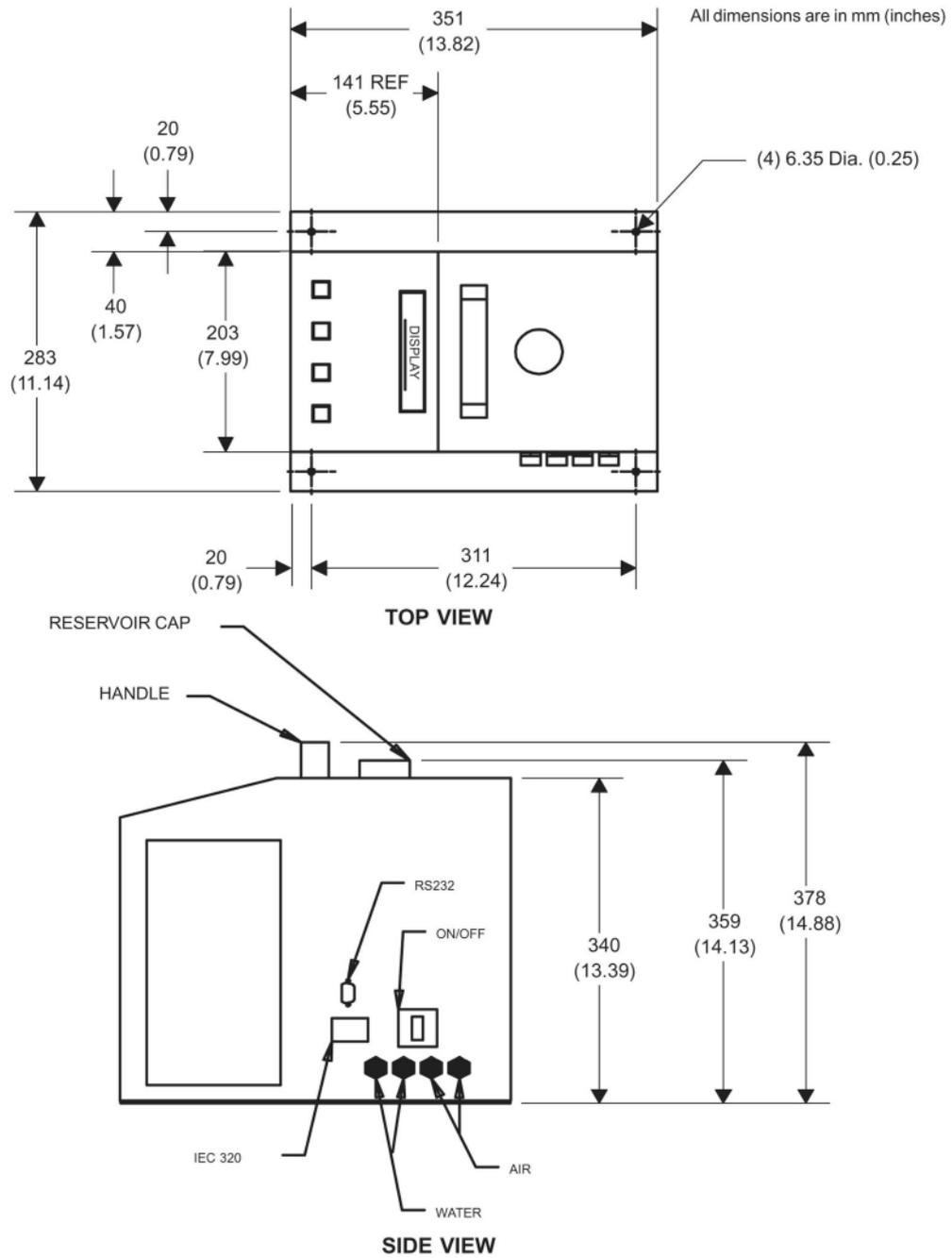


NOTICE

The maximum elevation difference between X-Ray Tube Housing and Chiller is around 3 meters (10 ft).

Exact dimensions of the Coolix 4000 chiller depend on model type. Required floor space depends on ambient room temperatures. When in doubt, allow for maximum floor space.

Illustration 5-16: Detector Chiller Thermo-Tek Dimensions



NOTICE

The chiller cannot be located more than 3 m (10 ft) below the detector

Illustration 5-17: Detector Chiller Thermo-Con Dimensions

All dimensions are in mm (inches)

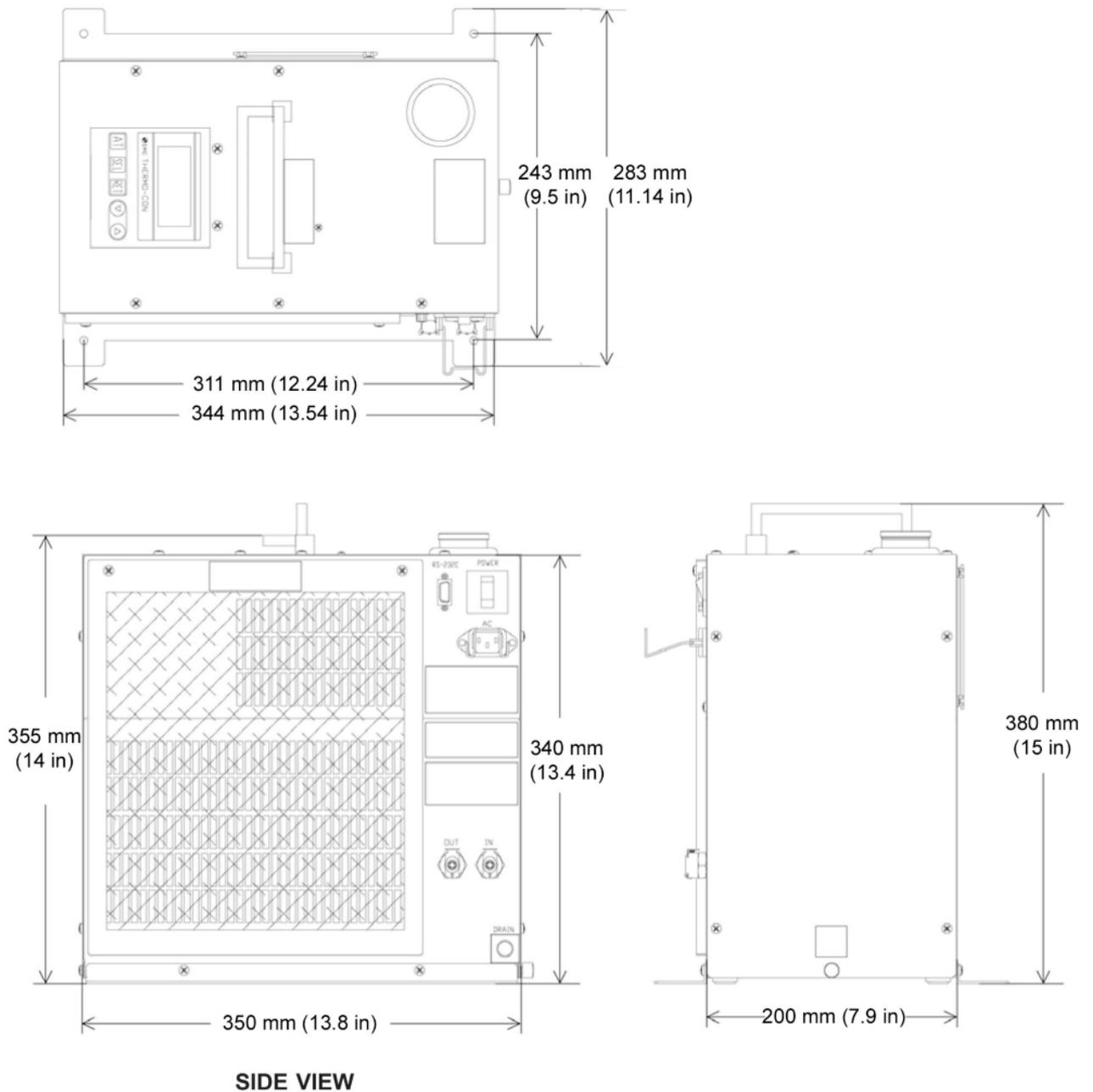


Illustration 5-18: Detector Chiller Thermo-Tek - Configuration & Orientation

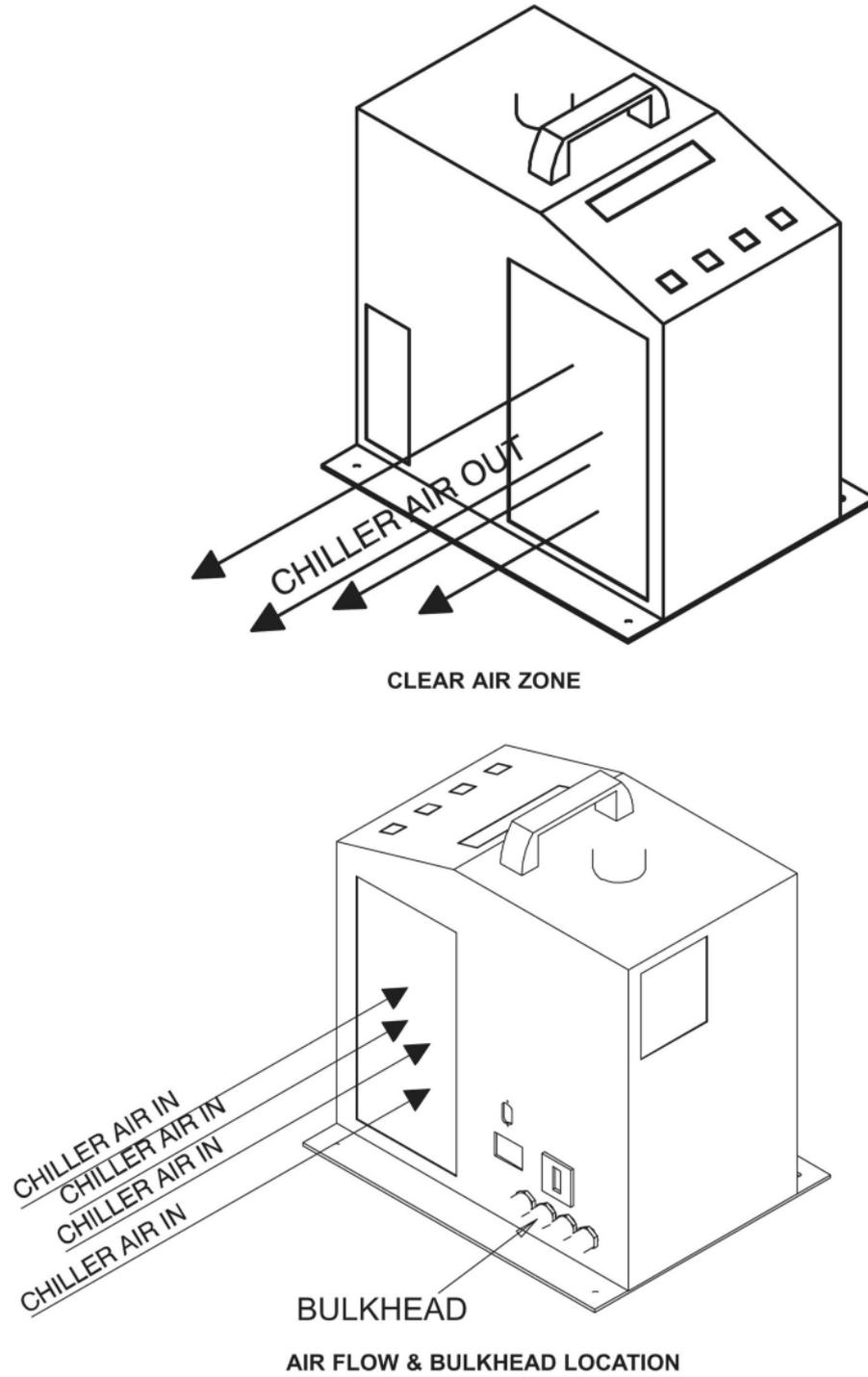


Illustration 5-19: Detector Chiller Thermo-Con - Orientation

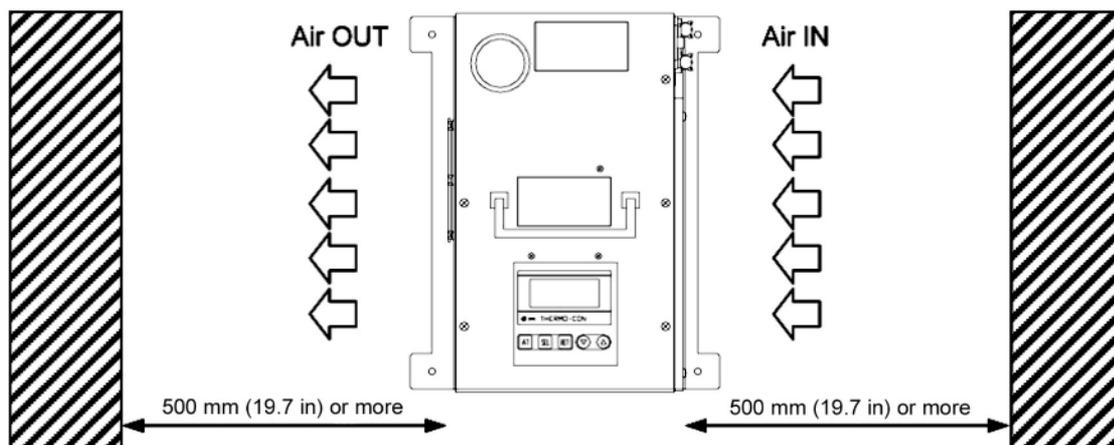
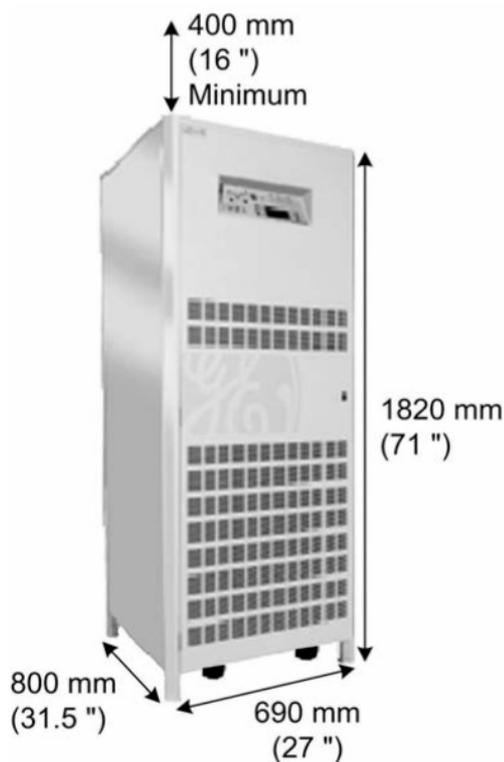


Illustration 5-20: Fluoro UPS UL Layout (Optional)



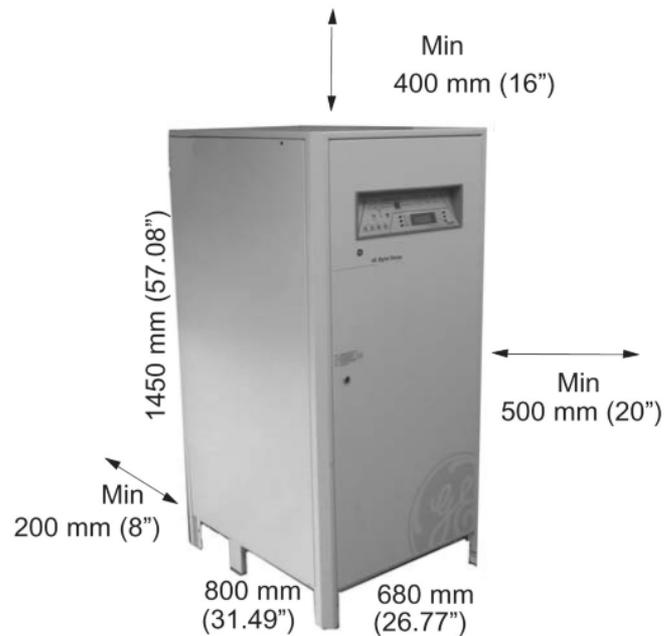
The left, right or back side of the UPS cabinet can be positioned against the wall.

The front side of the UPS cabinet must be accessible for maintenance operation.

Clearance around the front should be sufficient to enable free passage of personnel with the door fully opened.

Recommended minimum clearance between ceiling and top of the UPS should be 400 mm (16") for proper cooling air exhaust.

Illustration 5-21: Fluoro UPS CE Layout (Optional)



The UPS cabinet can be positioned against the wall but, in order to improve the ventilation and to make easier the maintenance operations for UPS and battery, we recommend a minimum distance of 200 mm (8") from the wall.

The right side of the UPS cabinet must be accessible for maintenance operation.

Clearance around the front should be sufficient to enable free passage of personnel with the door fully opened.

Recommended minimum clearance between ceiling and top of the UPS should be 400 mm (16") for proper cooling air exhaust.

Illustration 5-22: UPS IF Box (Optional)

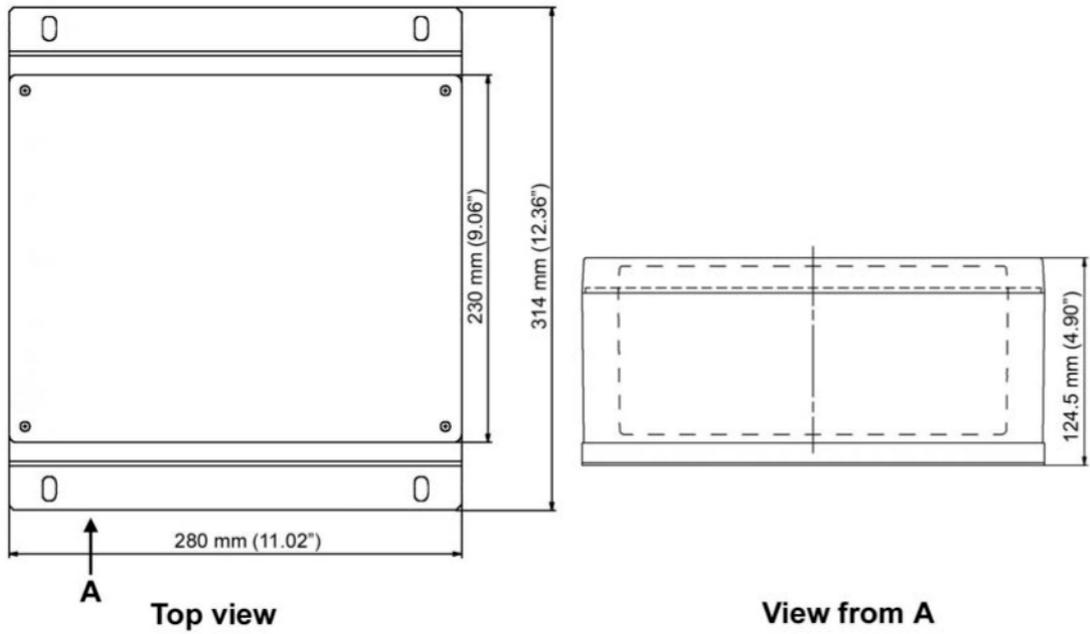
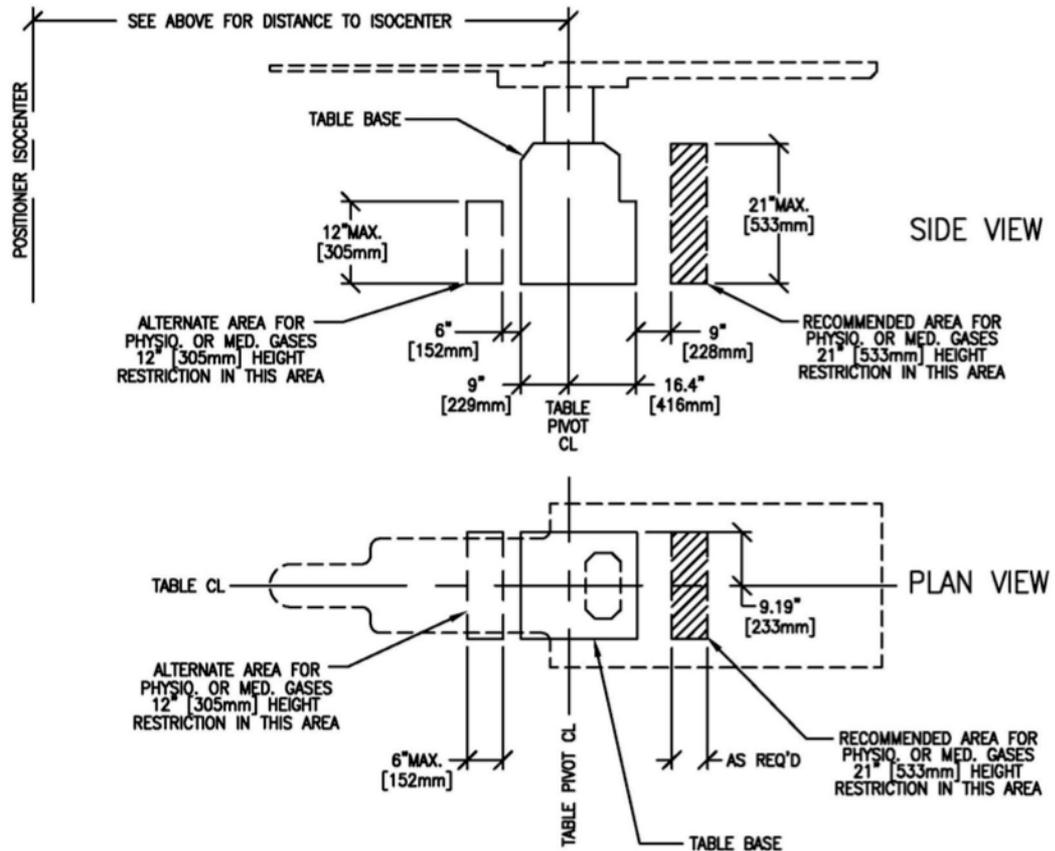


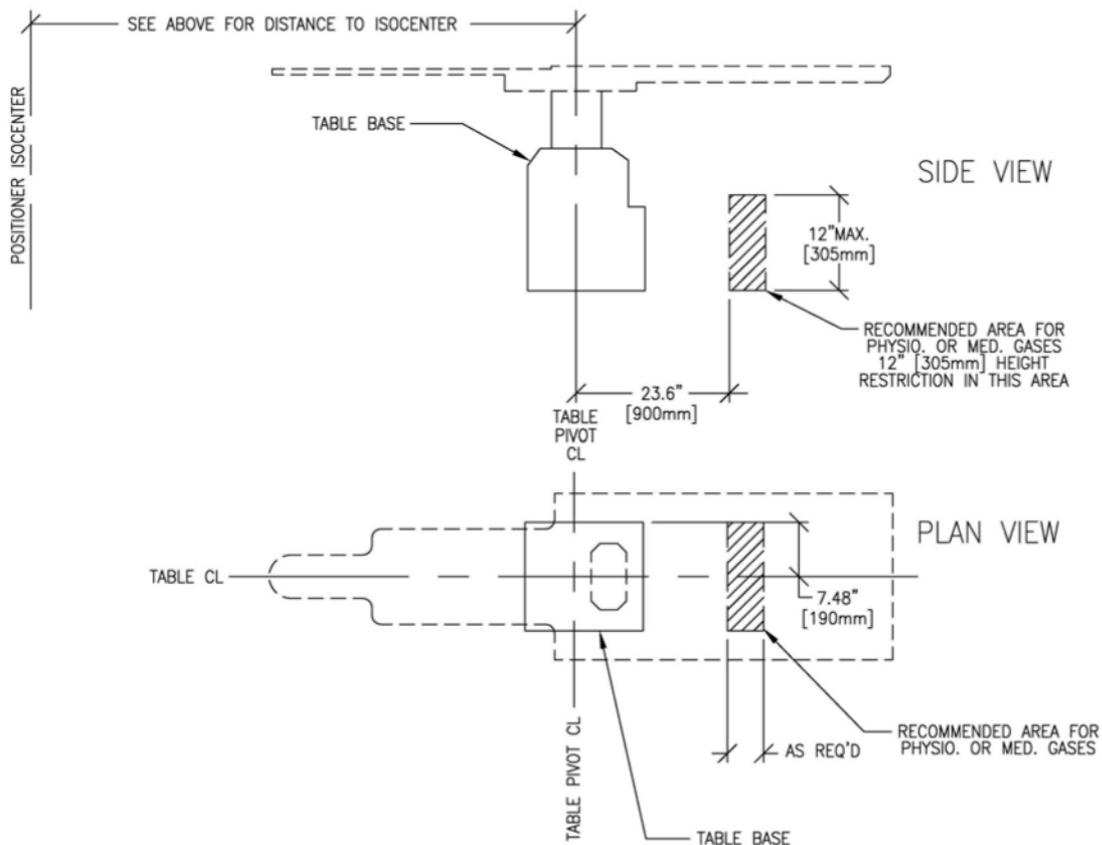
Illustration 5-23: Gas box outlets Omega IV



NOTE: With a Innova^{IQ} Table, the minimum distance from table pivot to the medical Gas Box is 600 mm and the maximum dimensions of the medical Gas Box are :

- height = 305 mm
- width = 250 mm
- length = 500 mm

Illustration 5-24: Gas box outlets Omega V



NOTE: With a Innova^{IQ} Table, the minimum distance from table pivot to the medical Gas Box is 600 mm and the maximum dimensions of the medical Gas Box are :

- height = 305 mm
- width = 250 mm
- length = 500 mm

Illustration 5-25: DL Keypad Dimensions

ALL DIMENSIONS ARE IN MM (INCHES)

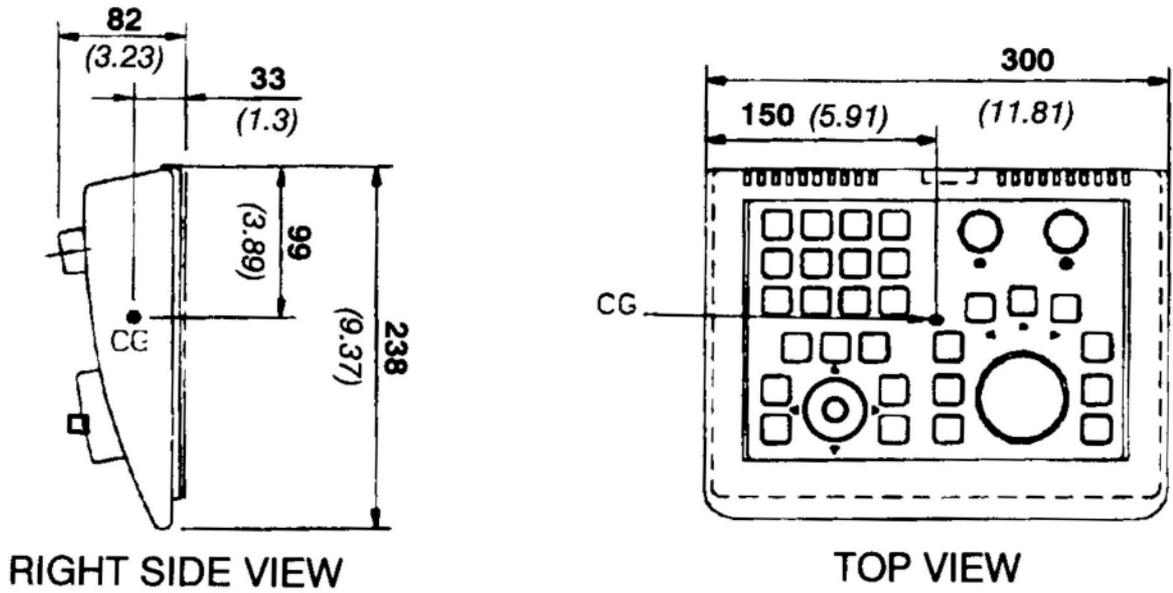
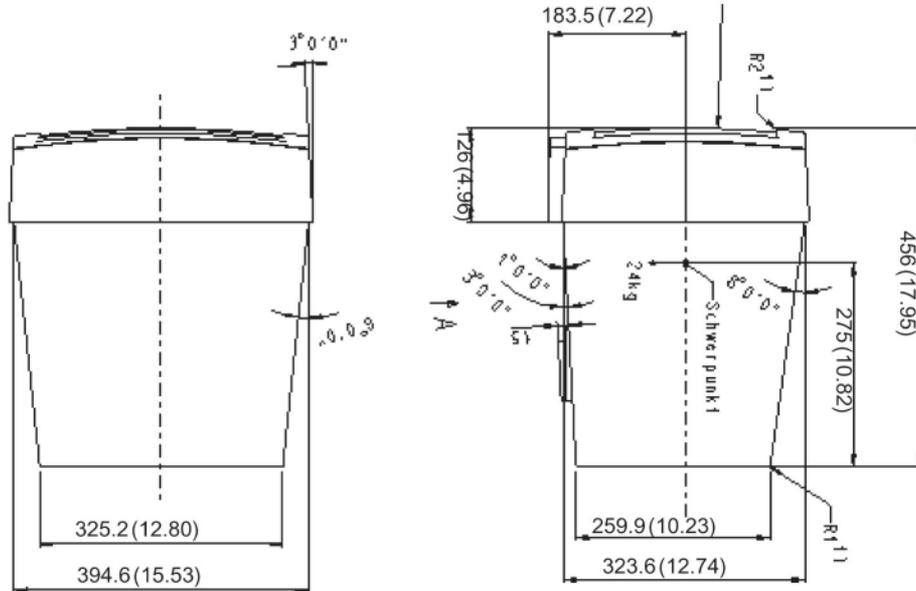


Illustration 5-26: DL Image Monitor Dimensions

All dimensions are in mm (inches)

Siemens monitors



NEC 19" Flat panel

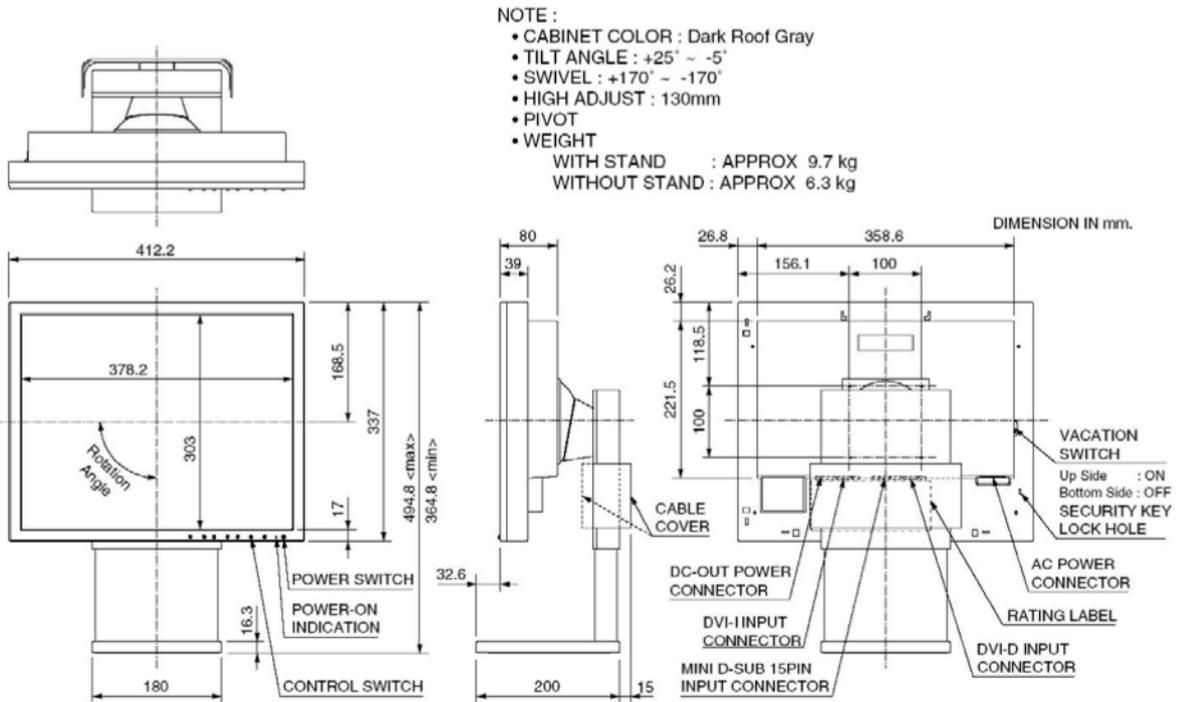
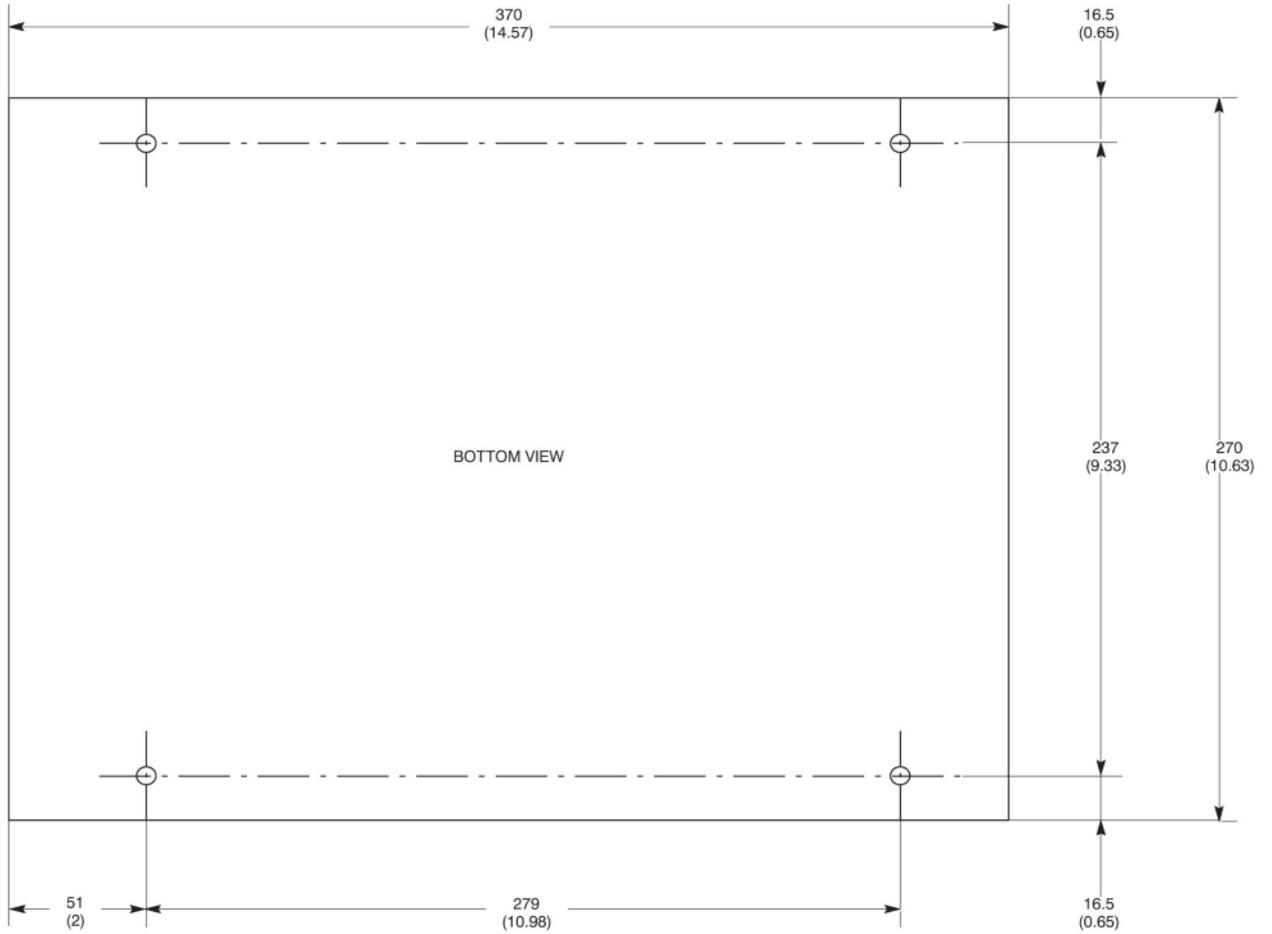


Illustration 5-27: VCR Mounting Holes Location

All dimensions are in mm (inches)



NOTE: Unscrew the four *feet* on the bottom. Use these four holes to fix the VCR. The mounting holes accommodate M3 x 10 mm screws. The holes are 0.4 inches (10 mm) deep.

2 Mounting Requirements

2.1 Floor Loading and Recommended Mounting Methods

See [Table 5-2](#). To obtain floor loading and recommended mounting methods for components not specified in [Table 5-2](#), refer to the appropriate component Pre-Installation Manual listed in [Chapter 2, Basic Innova LC System Compatibility](#).

Table 5-2:

| PRODUCT OR COMPONENT | NET WEIGHT KG (LBS) | DIMENSIONS MM (INCHES) | | | LOAD BEARING AREA MM (INCHES) | WEIGHT/ OCCUPIED AREA | MOUNTING METHOD |
|---|-----------------------|---|-----------------------|----------------------|-------------------------------|--|--|
| | | WIDTH | DEPTH | HEIGHT | | | |
| Liberty LC Positioner | 750 (1655) | See Illustrations <i>INNOVA LC POSITIONER DIMENSIONS</i> : <ul style="list-style-type: none"> Side view Top view Front view in Dimension Drawings | | | Circle diameter 600 (23.62) | | Recommended: <ul style="list-style-type: none"> Through-Bolts (12) Alternates: • On Grade 5/8 in, Anchors (12) Above Grade 3/4 in, Anchors (12) See Illustration 5-28 , Illustration 5-29 and Illustration 5-30 |
| Table | 590 (1300) See note 1 | See illustrations in Dimension Drawings <ul style="list-style-type: none"> Omega IV Omega V | | | 571.5x429 (22.5x16.9) | 2410 kg/m ² (492.3 lb/ft ²) | Same as Innova LC Positioner See IMPORTANT NOTICE below. |
| | 785 (1731) | Innova IQ | | | 750x600 (30x24) | 2000 kg/m ² (409 lb/ft ²) | |
| IMPORTANT NOTICE | | | | | | | |
| The Table baseplate or the System baseplate are mandatory to install the table (patient support). The Table must never be installed on grade. | | | | | | | |
| C2 Cabinet | 299 (659) | See Illustration <i>C2 Cabinet Dimensions</i> in Dimension Drawings | | | 600x900 (23.63x35.44) | 478 kg/m ² (98 lb/ft ²) | |
| C1 Cabinet | 506 (1115.5) | See Illustration <i>C1 Cabinet Dimensions</i> in Dimension Drawings | | | 600x900 (23.63x35.44) | 838 kg/m ² (172 lb/ft ²) | |
| COOLIX 4000 | 204 (450) See note 3 | 556 (21.9) See note 2/3 | 830 (32.7) See note 3 | 1090 (43) See note 3 | Four casters | Not applicable | |
| Detector Chiller Thermo-Tek | 13.6 (30) | See Illustration <i>Detector Chiller Thermo-Tek Dimensions</i> in Dimension Drawings | | | 283x351 (11.14x13.82) | | |
| Detector Chiller Thermo-Con | 14.6 (32.2) | See Illustration <i>Detector Chiller Thermo-Con Dimensions</i> in Dimension Drawings | | | 13.5x11.14 (344x283) | | |
| Fluoro UPS UL (optional) | 530 (1169) | 690 (27.0) | 800 (31.5) | 1820 (70.1) | | 975 kg/m ² (200 lb/ft ²) | Ground -mounted |
| Fluoro UPS CE (optional) | 480 (1059) | 680 (26.7) | 800 (31.5) | 1450 (57.1) | | 883 kg/m ² (181 lb/ft ²) | Ground -mounted |
| Fluoro UPS IF box (optional) | 4 (9) | 280 (11.02) | 314 (12.36) | 124.5 (4.9) | | | Wall-mounted |
| PDB US (4) | 148 (326) | 685 (27) | 225 (9) | 1850 (73) | | | Wall-mounted |
| PDB CE (4) | 110 (242) | 800 | 300 | 1200 | | | Wall-mounted |

| PRODUCT OR COMPONENT | NET WEIGHT KG (LBS) | DIMENSIONS MM (INCHES) | | | LOAD BEARING AREA MM (INCHES) | WEIGHT/ OCCUPIED AREA | MOUNTING METHOD |
|--|------------------------|------------------------|-------------|------------|----------------------------------|-----------------------|-----------------|
| | | WIDTH | DEPTH | HEIGHT | | | |
| EMI Filter enclosure US (4) | 31 (68) | 406 (16) | 180 (7) | 965 (38) | | | Wall-mounted |
| EMI Filter enclosure CE (4) | <40 | 300 | 210 | 950 | | | Wall-mounted |
| DL keypad | 1.4 (3) | 283 (11.55) | 300 (11.8) | 82 (3.25) | | | |
| DL LCD monitor | 8.2 (18) | 179 (7) | 387 (15.2) | 504 (19.8) | | | |
| VCIM | 0.95 (2.09) | 450 (17.7) | 150 (5.9) | 50 (2) | | | |
| Videostation VCR | 12 (26.5) | 370 (14.57) | 270 (10.63) | 144 (5.67) | | | |
| Components common to IVUS Rev 1 & Rev 2 Option | | | | | | | |
| PIM (Ultrasound probe) | 2 (4.4) | 38 | 96 | 177 | | | |
| Control Station | 4 (8.8) | 120 | 360 | 240 | | | |
| Joystick | 1 (2.2) | 90 | 76 | 102 | | | |
| Isolation transformer | 7 (15.4) | 97 | 267 | 171 | | | |
| IVUS CPU | 15 (33.1) | 396 | 162 | 510 | | | |
| IVUS Keyb. & mouse pad | 1 (2.2) | NA | NA | NA | | | |
| IVUS monitor | 15 (33.1) | 420 | 432 | 240 | | | |
| Image printer | 6 (13.2) | 158 | 184 | 18 | | | |
| 4-way Video Switch | 1 (2.2) | 44 | 222 | 241 | | | |
| Components specific to IVUS Rev 2 Option | | | | | | | |
| PIMr | 1,5 (3,2) | 356 | 102 | 102 | | | |
| Pimette | 1 (2,2) | 142 | 76 | 18 | | | |
| Touchpad controller | 1 (2,2) | 211 | 180 | 76 | | | |
| Printer HP | 1,3 (2,8) | 227 | 138 | 117 | | | |

NOTE: (1) including patient weight.

NOTE: (2) Depth.

NOTE: (3) Maximum dimensions given. Exact dimensions depend on chiller manufacturer type.

NOTE: (4) Recommended supplier.

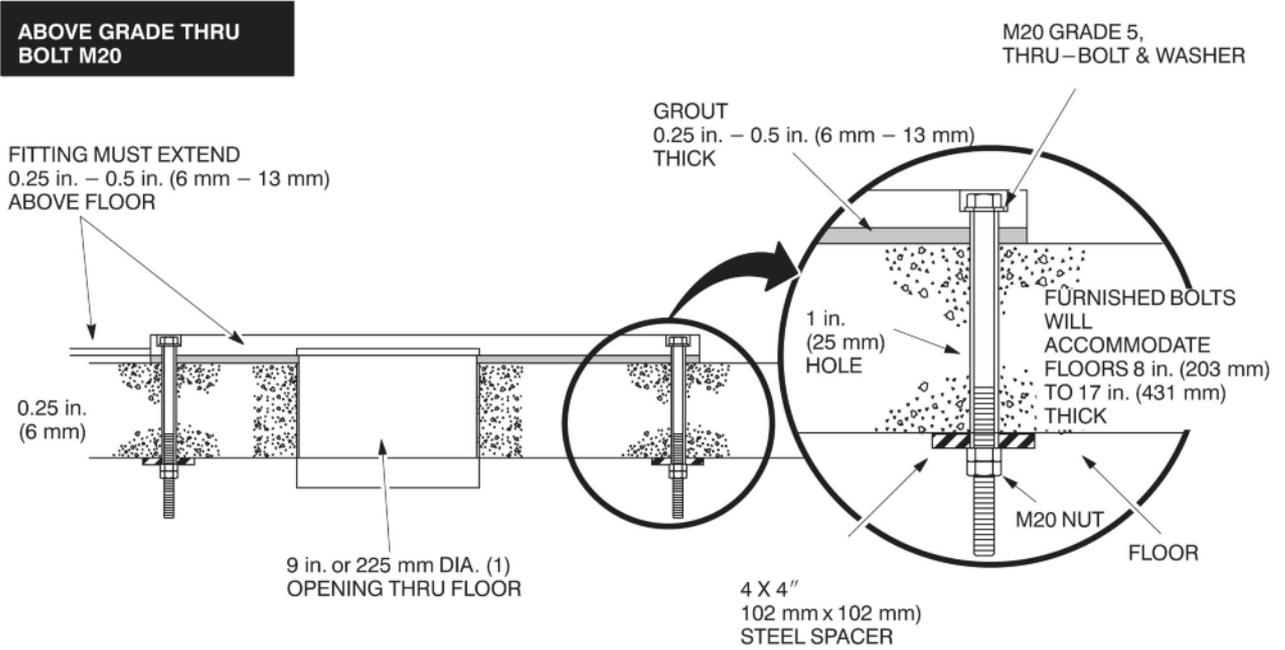
2.2 Positioner and Table Floor Mounting

The distances between the Innova LC Positioner and the Tables are critical for a proper clinical usage. For this reason, GEMS provides two floor mounting templates to ensure these components are properly placed in relation to one another.

Table 5-3:

| Title | Illustration |
|---|--|
| Innova LC Positioner Floor Mounting Methods | Illustration 5-28 and Illustration 5-29 |
| Cable Conduit For On-Grade Floor Anchor Kit | |
| Inner Base Plate For Above Grade Floor Anchor Kit | Illustration 5-31 |
| Innova LC Positioner And Innova ^{IQ} Table Floor Mounting Template | Illustration 5-33 and Holes location in concrete floor illustration in Chapter 3, Structural requirements. |
| Fixing Bolt Overview | Illustration 5-32 |

Illustration 5-28:



(1) The US or the METRIC standard for base plate inner

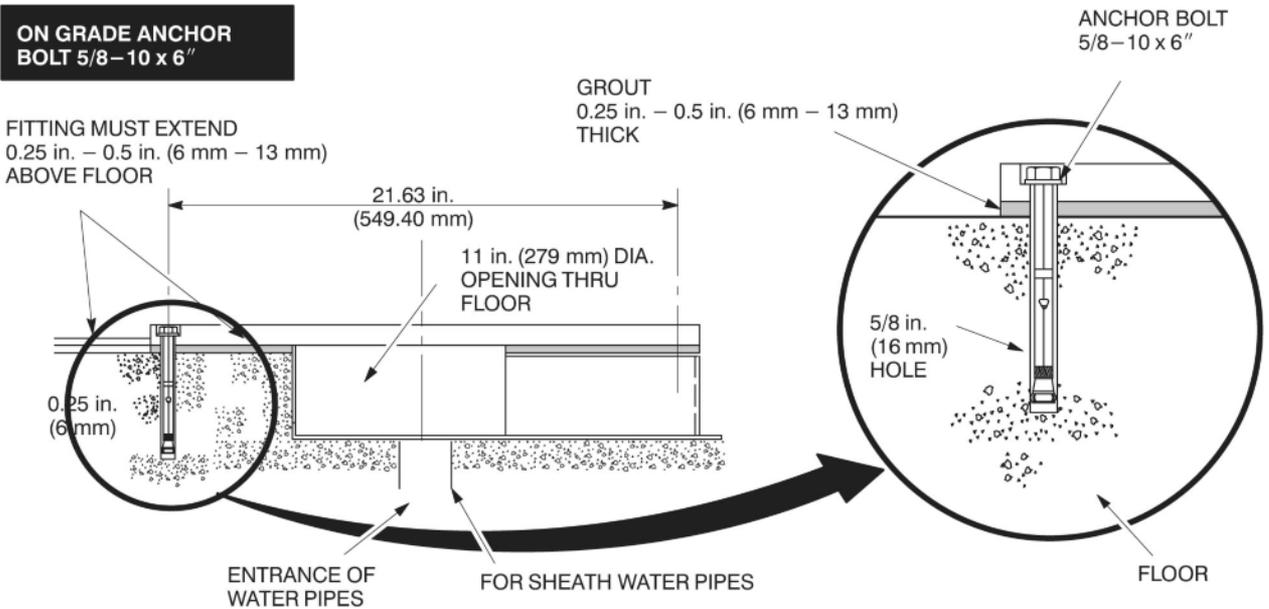
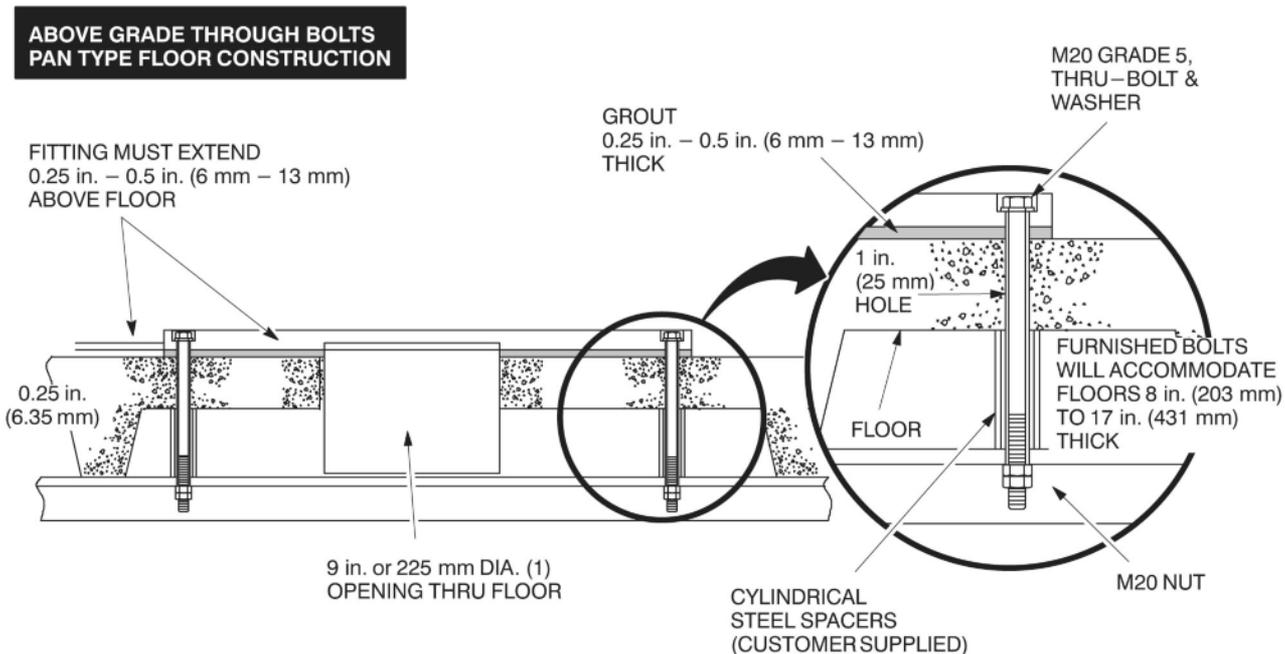
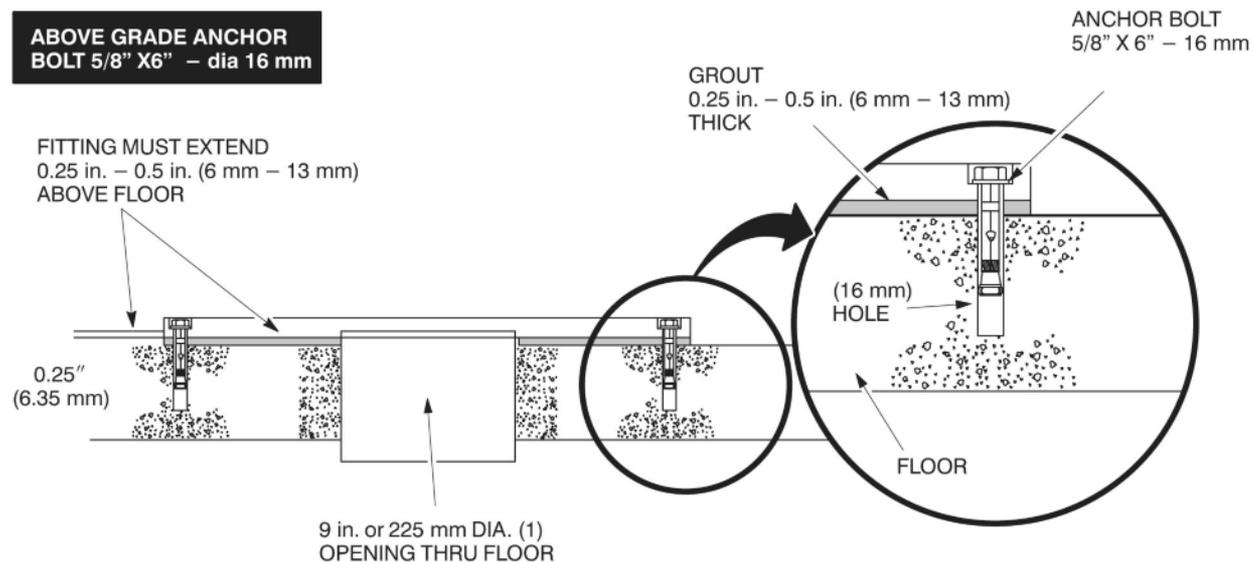


Illustration 5-29:



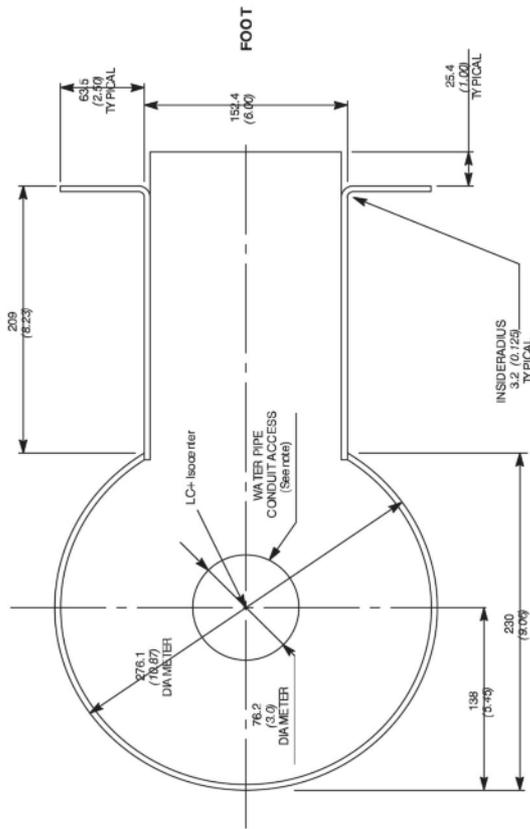
(1) The US or the METRIC standard for base plate inner



(1) The US or the METRIC standard for base plate inner

Illustration 5-30:

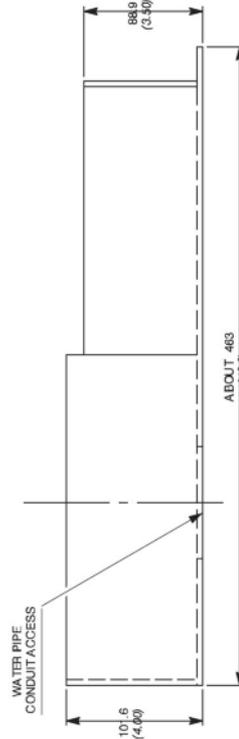
All dimensions are in mm (inches)



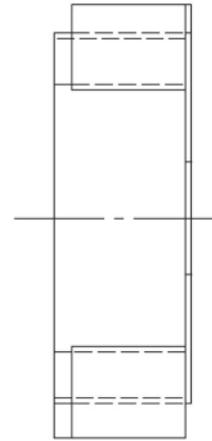
Note:

- The key hole has been redesigned to permit a 60 mm (2.5 in.) water conduit for a separate access for water pipes used with a MAXIRAY 150. Push 76 (3.0) hole in center. Reinsert slug and tack weld in one spot hole is for 63.5 (2.5) internal diameter conduit tack well from bottom if possible.

FRONT VIEW



SIDE VIEW



STEEL PLATE (0.12) OR 3mm THICKNESS
 FINISH: F50E0K01

FRONT VIEW (FOOT END)

Illustration 5-31:

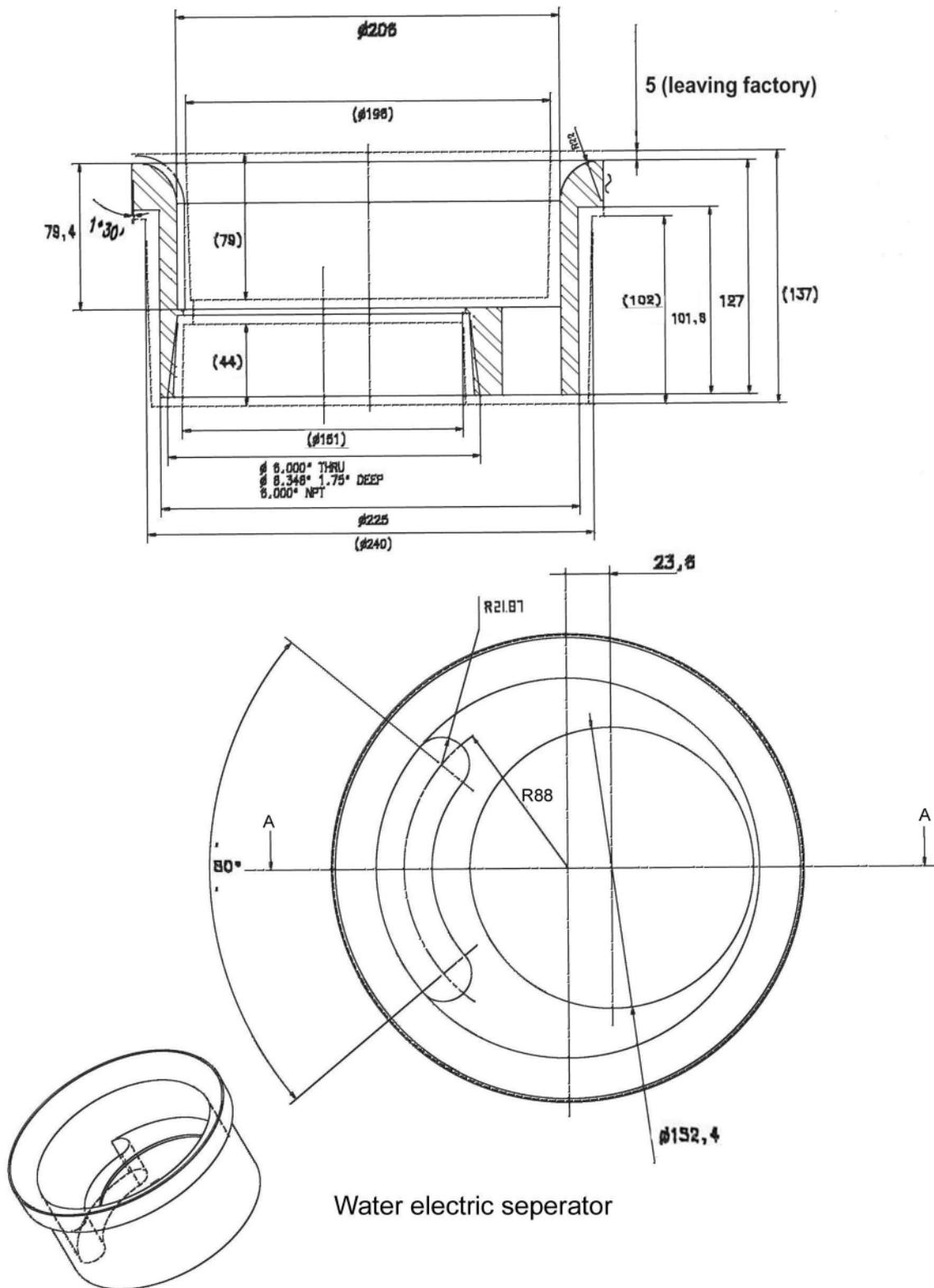
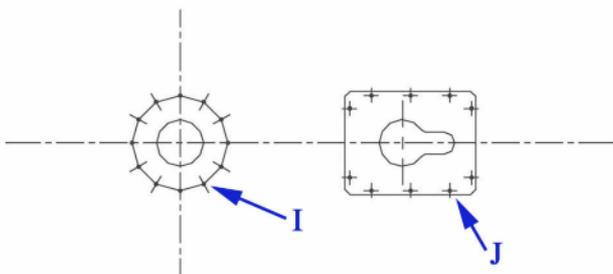
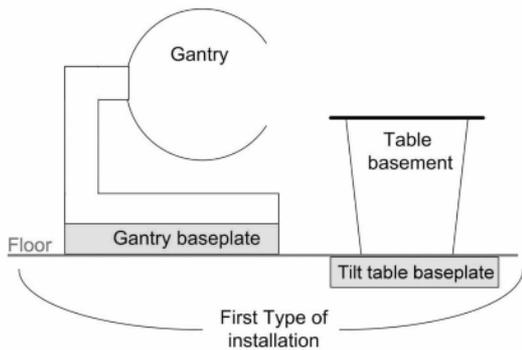
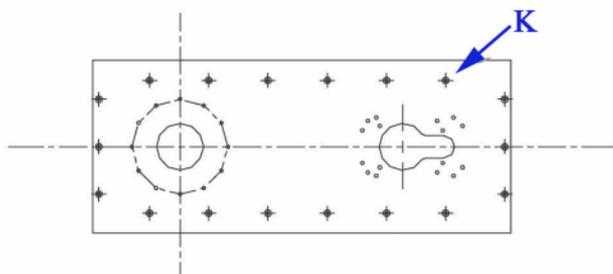
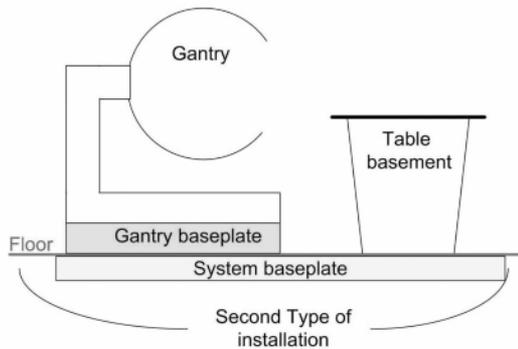


Illustration 5-32:

OMEGA/TILT BASEPLATE



FLOOR PLATE





NOTICE

The Table baseplate or the System baseplate are mandatory to install the table (patient support).

The Table must never be installed on grade.

NOTE: For more details on Floor plate or Baseplates, refer to [Illustration 5-33](#) and illustration Holes location in concrete floor in [Chapter 3, Structural Requirements](#).

NOTE: With any kind of fixation methods (Bolts M20, Mechanical anchors or Chemical anchors), the number of holes used mandatory is:

- Gantry baseplate : 12 max and 8 min holes used are acceptable
- Table baseplate : 10 max and 8 min holes used are acceptable
- Floor baseplate : 24 max and 12 min holes used are acceptable

we can have only 2 consecutive holes omitted.

NOTE: In case of floor plate configuration, the gantry baseplate shall be mounted onto the floor plate, but the table baseplate shall not be mounted on the floor plate.

Pull out efforts and recommendations about chemical anchors not provided by GE.

The following table provides the recommended chemical anchors for Omega/LC baseplates and for the floor plate ordered locally that they could be used instead of bolts provided by GE.

Table 5-4: Chemical anchors Pull out efforts and recommendations

| | Gantry baseplate | Table baseplate Omega | Table Omega | Floor plate (to be ordered locally) |
|--|---|--|---|--|
| Mark | I on Illustration 5-32 | J on Illustration 5-32 | A on Illustration 5-33 | K on Illustration 5-32 |
| Pull out effort | 736 daN per bolt if 12 used and 1992 daN per bolt if 8 used | 1120 daN per bolt if 10 used and 2000 daN per bolt if 8 used | 4432 daN per bolt with 4 bolts | 272 daN per bolt if 24 used and 2008 daN per bolt if 12 used |
| Number of holes in the plate | 12 max (8 min mandatory) | 10 max (8 min mandatory) | 4 mandatory | 24 max (12 min mandatory) |
| Recommended chemical anchors example 1 | Supplier HILTIHVU adhesive capsule + HAS Anchor rod | Supplier HILTIHVU adhesive capsule + HAS Anchor rod | Supplier HILTIHVU adhesive capsule + HAS Anchor rod | Supplier HILTIHVU adhesive capsule + HAS Anchor rod |
| Threaded rod | M16 A4-70 / 333 131 5/8 | M20 A4-70 / 333 135 3/4 | M20 A4-70 / 333 135 3/4 | M16 A4-70 / 333 131 5/8 |
| Hole diameter in the floor | 18 mm (11/16 in) | 24 mm (7/8 in) | 24 mm (7/8 in) | 18 mm (11/16) in |
| Hole depth in the floor | 125 mm (5 in) | 170 mm (6-5/8 in) | 170 mm (6-5/8 in) | 125 mm (5 in) |
| Minimum floor thickness | 180 mm (7 in) | 220 mm (8-1/2 in) | 220 mm (8-1/2 in) | 180 mm (7 in) |
| Max Tightening Torque | 80 N.m (59 ft-lb) | 150 N.m (110 ft-lb) | 150 N.m (110 ft-lb) | 80 N.m (59 ft-lb) |

NOTE: The floor plate ordered locally needs to be in steel.

Refer to supplier technical documents for all specification and installation data about chemical anchors.

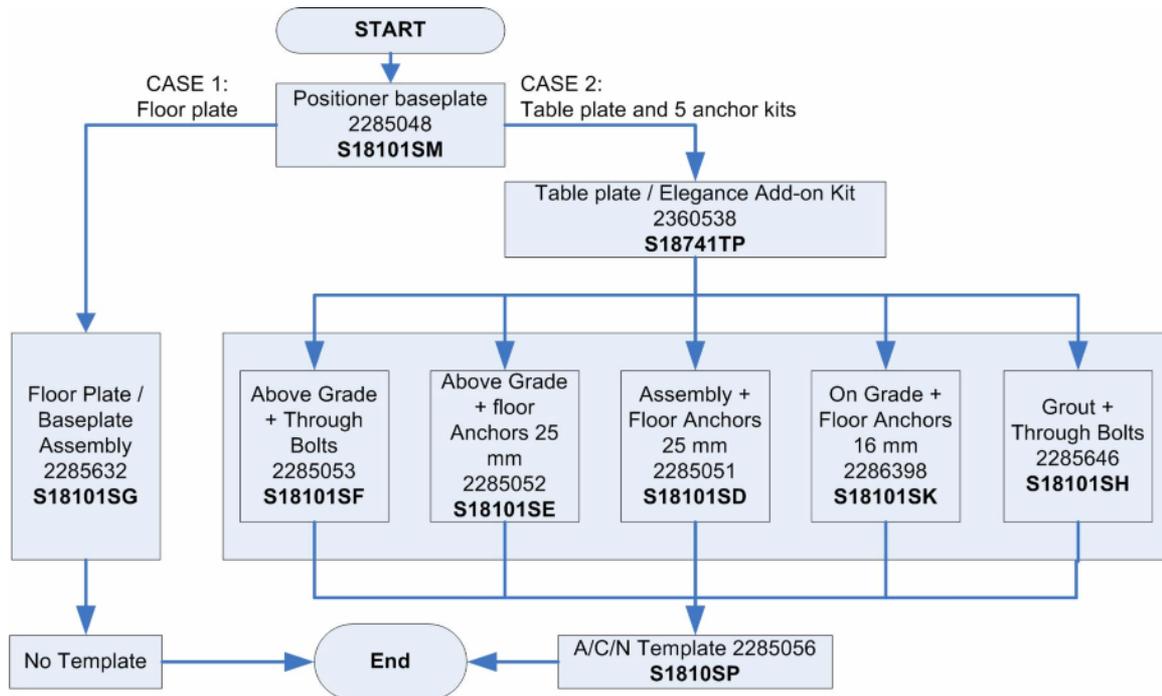
Table 5-5: D distance

| | ANGIO | CARDIO | NEURO |
|----------------------------|-------------------|-------------------|--------------------|
| Omega IV Compact | NA | 1395 mm (54.9 in) | NA |
| Omega V Long | 1278 mm (50.3 in) | NA | 1395 mm (54,9 in) |
| Omega V non motorized Long | 1278 mm (50.3 in) | NA | 1395 mm (54,9 in) |
| Innova ^{IQ} Table | 1278 mm (50.3 in) | NA | 1395 mm (54,9 in)* |

NOTE: * in case of a Innova^{IQ} Table upgrade, there is the possibility of a distance of 1595 mm (62.8 in).

2.3 Innova LC Positioner and Omega/InnovaIQ Table Floor Preparation Kits (GEMS supplied)

Illustration 5-34:



All GE supplied vascular system floor preparation are contained in catalog. There are some additional gantry/table mounting kits based on each mounting method: through bolts or floor anchors.



NOTICE

The Table baseplate or the System baseplate are mandatory to install the table (patient support).

The Table must never be installed on grade.

The Omega/Innova^{IQ} Table baseplate is recommended if a future Omega to Innova^{IQ} Table upgrade is to be considered.

- Base plate assembly (mandatory) 2285048 – Refer to [Table 5-6](#)
- Innova^{IQ} Table Add-On Kit 2360538 (Innova 2100-IQ/3100/4100 only) – (refer to [Table 5-7](#)) (Floor base plate assembly 2285632 shall be ordered).
- If there is no integrated baseplate plan (2359194) delivered with S18101SG, please refer to drawings 2359194 (Angio configuration [Illustration 5-35](#)) or 2359194 (Cardio configuration [Illustration 5-36](#)) Please order locally the integrated base plate based on this plan.
- Assembly and separation (Select kit) 2285050 – Refer to tables,
 - Above grade, Floor anchors without insert – 2285051.
 - Through bolts without insert – 2285646.

- On grade, Floor anchors – 2286398.
- Above grade, Floor anchors and insert – 2285052.
- Through bolts and insert – 2285053.
- Floor plate / Base plate Assembly – 2285632.
- Templates (select kit) – 2285054 – Refer to
Angio/Cardio/Neuro templates – 2285056 (containing 2185979, 2127792 and 2360133 Innova
2000 and Innova 2100–IQ/3100/4100 templates).

2.3.1 2285048 - Base Plate Assembly

Table 5-6:

| Item | Name | Part # | Description | Quan. | Notes |
|---|----------------|---------------|---|-------|-------|
| | Baseplate | 2285059 | 12 Hole Floor Baseplate | 1 pc | |
| | Lift Plate | 2290939 | Lifting Straps | 2 pc | |
|  | Hex Head Screw | 5166535 | Hex Head Screw 1/2"-13UNC L1 1/2" 12.9 Black | 2 pc | |
| | Grease | 2295599 | Lithium grease lubricant 100g | 2 pc | |
| | Doc | 2230112-1-100 | Vascular Gantry Baseplate and Table | 1 pc | |
| | Doc | 2229297-100 | LCA/LCV+/LC+ System Baseplate and Omega IV/V/EP Table Floor Preparation | 1 pc | |
| | Doc | 2290880-2-100 | Innova Pre-Installation Kit Install Procedure | 1 pc | |

NOTE: The 12 LC baseplate mounting screws are delivered with the system's LC Gantry. These screws are:

- cap screws 5166774; Screw Socket Head Cap 1/2"-20 UNF L1 1/2" 12.9 Black (used when installing new system on old baseplate (US threads))
- cap screws 2300939; Hex Head Cap screw; M12 40/40 Class 12.9 Black ; used to attach L-brackets on table shipping pallet to positioner dolly for table positioning (used when the new baseplate is metric threads)

2.3.2 2360538 – InnovalQ Table Add-On Kit

Table 5-7:

| Item | Name | Part # | Description | Quan. | Notes |
|---|-------------------------------------|-------------|--|-------|---------------------------|
| | Omega / InnovalQ Table common Plate | 2361993 | Plate to be anchored under the table | 1 pc | |
|  | Hex Screws | 5120708 | Screw M16x40x40 Inox A4-70 Pass | 10 pc | 4 only are used for Omega |
|  | Washer, Flat | 99125091 | Washer Plain - Large 17 mm/40 mm | 10 pc | |
|  | Floor Anchor | 46-302265P1 | 5/8 diameter 6" floor anchor bolts | 6 pc | |
|  | Dowel | 2290937-2 | Wood Dowel; 16 mm diameter | 6 pc | |
|  | Bolt, Hex | 2296892 | Through bolt M20-500-400 | 6 pc | |
|  | Washer, Flat | 99142204 | Washer plain 21 mm/40 mm for Through Bolts; one for each bolt | 6 pc | |
|  | Plate | 2290941 | Special Steel Spacer Plate; 4 in. x 4 in. (102 mm x 102 mm); one for each bolt | 6 pc | |
|  | Nut, Hex | 99141607 | Hex Nut M20 STL galvanized, two for each bolt | 12 pc | |
|  | Dowel | 2290937 | Wood Dowel; 24 mm diameter | 6 pc | |
|  | Cap | 5130979 | Plastic Cap | 10 pc | |
|  | M16 Plug | 5130982 | Plastic Plug | 6 pc | see note * |

NOTE: * M16 plug is needed only when Omega V table is replaced by InnovalQ Table. Therefore, these plugs have to be kept (bag let inside the table base) until InnovalQ Table is installed (no need to fit them with Omega table).

2.3.3 2285050 – Assembly and separation select kit

2.3.3.1 2285051 – Above grade, Floor Anchors without insert

Table 5-8:

| Item | Name | Part # | Description | Quan. | Notes |
|---|--------------|-------------|---|-------|--|
|  | Floor Anchor | 46-302265P1 | Floor Anchor Bolt; 5/8 - 10x6" - (16 mm) drilling. (16 mm) drilling. 12 anchors for LC Positioner and 4 anchors for Table | 16 pc | Above Grade anchor mounting method hardware |
|  | Grout assy | 2285055 | - 10 kg Powdered Mortar Ardex K-15 - RTV Silicon Rubber Adhesive - 18 mm making tape adhesive - Open cell foam | 1 kit | Used in constructing LC Positioner grout dam |
|  | Dowel | 2290937-2 | Wood Dowel; (16 mm) diameter | 12 pc | |

2.3.3.2 2285646 – Through bolts without insert

Table 5-9:

| Item | Name | Part # | Description | Quan. | Notes |
|---|--------------|----------|--|-------|---|
|  | Bolt, Hex | 2296892 | Through Bolt; M20 - 500-400 12 bolts for LC Positioner and 4 bolts for Table | 16 pc | Through Bolt mounting method hardware |
|  | Washer, Flat | 99142204 | Special Flat Washer for Through Bolts; one for each bolt | 16 pc | same as above |
|  | Plate | 2290941 | Special Steel Spacer Plate; 4 in. x 4 in. (102 mm x 102 mm); one for each bolt | 16 pc | same as above |
|  | Nut, Hex | 99141607 | Hex Nut M20 STL galvanized two for each bolt | 32 pc | same as above |
|  | Grout assy | 2285055 | - 10 kg Powdered Mortar Ardex K-15 - RTV Silicon Rubber Adhesive - 18 mm making tape adhesive - Open cell foam | 1 kit | Used in constructing LC Po- sitioner grout dam |
|  | Dowel | 2290937 | Wood Dowel; 24 mm diameter | 12 pc | |

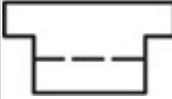
2.3.3.3 2286398 – On grade, Floor anchor

Table 5-10:

| Item | Name | Part # | Description | Quan. | Notes |
|---|---------------|-------------|---|-------|--|
|  | Floor Anchor | 46-302265P1 | Floor Anchor Bolt; 5/8-10 x 6 in. 12 anchors for LC Positioner and 4 anchors for Table | 16 pc | On Grade anchor mounting method hardware |
|  | Grout assy | 2285055 | - 10 kg Powdered Mortar Ardex K-15 - RTV Silicon Rubber Adhesive - 18 mm making tape adhesive - Open cell foam | 1 kit | Used in constructing LC Positioner grout dam |
|  | Dowel | 2290937-2 | Wood Dowel; 16 mm diameter | 12 pc | |
| | Cable Conduit | 2285057 | Cable conduit - sheet metal part | 1 pc | |
| | Vinyl Trim | 2296890 | Gripping Range; 1.5 to 3 mm THK | 1 m | |
| | Vinyl Trim | 2296891 | Vinyl trim with segmented metal core 12 mm | 1 m | |

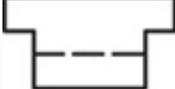
2.3.3.4 2285052 – Above grade, Floor anchor with insert

Table 5-11:

| Item | Name | Part # | Description | Quan. | Notes |
|---|--------------------------|-------------|---|-------|--|
|  | Floor Anchor | 46-302265P1 | Floor Anchor Bolt; 5/8-10 x 6 in. drilling 12 anchors for LC Positioner and 4 anchors for Table | 16 pc | Above Grade anchor mounting method hardware |
|  | Grout assy | 2285055 | - 10 kg Powdered Mortar Ardex K-15 - RTV Silicon Rubber Adhesive - 18 mm making tape adhesive - Open cell foam | 1 kit | Used in constructing LC Positioner grout dam |
|  | Dowel | 2290937-2 | Wood Dowel; 16 mm diameter | 12 pc | |
|  | Water Electric Separator | 2268647 | Manufactured part introduced in Positioner key hole to fit 1 electrical conduit of 6". | 1 pc | Electrical and water conduits separated inch size. |

2.3.3.5 2285053 – Through bolts with insert

Table 5-12:

| Item | Name | Part # | Description | Quan. | Notes |
|---|--------------------------|----------|---|-------|--|
|  | Bolt, Hex | 2296892 | Through Bolt; M20 - 500-400 12 bolts for LC Positioner and 4 bolts for Table | 16 pc | Through Bolt mounting method hardware |
|  | Washer, Flat | 99142204 | Special Flat Washer for Through Bolts; one for each bolt | 16 pc | same as above |
|  | Plate | 2290941 | Special Steel Spacer Plate; 4 in. x 4 in. (102 mm x 102 mm); one for each bolt | 16 pc | same as above |
|  | Nut, Hex | 99141607 | Hex Nut M20 STL galvanized two for each bolt | 32 pc | same as above |
|  | Grout assy | 2285055 | - 10 kg Powdered Mortar Ardex K-15 - RTV Silicon Rubber Adhesive - 18 mm making tape adhesive - Open cell foam | 1 kit | Used in constructing LC Positioner grout dam |
|  | Dowel | 2290937 | Wood Dowel; 24 mm diameter | 12 pc | |
|  | Water Electric Separator | 2268647 | Manufactured part introduced in Positioner key hole to fit 1 electrical conduit of 6". | 1 pc | Electrical and water conduits separated inch size. |

2.3.3.6 2285632 – Floor plate / Base plate assembly

Table 5-13:

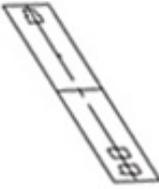
| Item | Name | Part # | Description | Quan. | Notes |
|---|-------------|---------------|---------------------------------|--------------|--|
|  | Hex Screws | 2360523 | Screw M16x30x30 Inox A4-80 Pass | 12 pc | For floor plate / Base plate assembly |
|  | Washer | 99125091 | Washer P 17 mm/40 mm | 34 pc | 24 are used for the positioner integration |
|  | Hex Screws | 99133570 | Screw M16x40x40 Inox A4-80 Pass | 10 pc | 4 only are used for Omega |

NOTE: The kit 2285632 Floor plate / Baseplate assembly is needed when the floor plate is installed. This part isn't GE part. It's ordered locally.

2.3.4 2285054 – Templates

2.3.4.1 2285056 - A/C/N Templates

Table 5-14:

| Item | Name | Part # | Description | Quan. | Notes |
|---|-----------------|---------|---|-------|---|
|  | A/C/N Templates | 2185979 | LC Positioner and Omega C/N Patient Table floor mounting template | 1 pc | See Illustration 5-33 |
| | | 2127792 | LCV+ Gantry and Omega A Patient Table floor mounting template | 1 pc | |
| | | 2360133 | Innova 4100 Template | 1 pc | Specific for Innova 4100 Innova ^{IQ} table template |

2.3.4.2 2186109 – EP Template

Table 5-15:

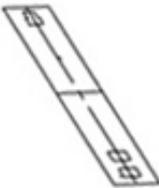
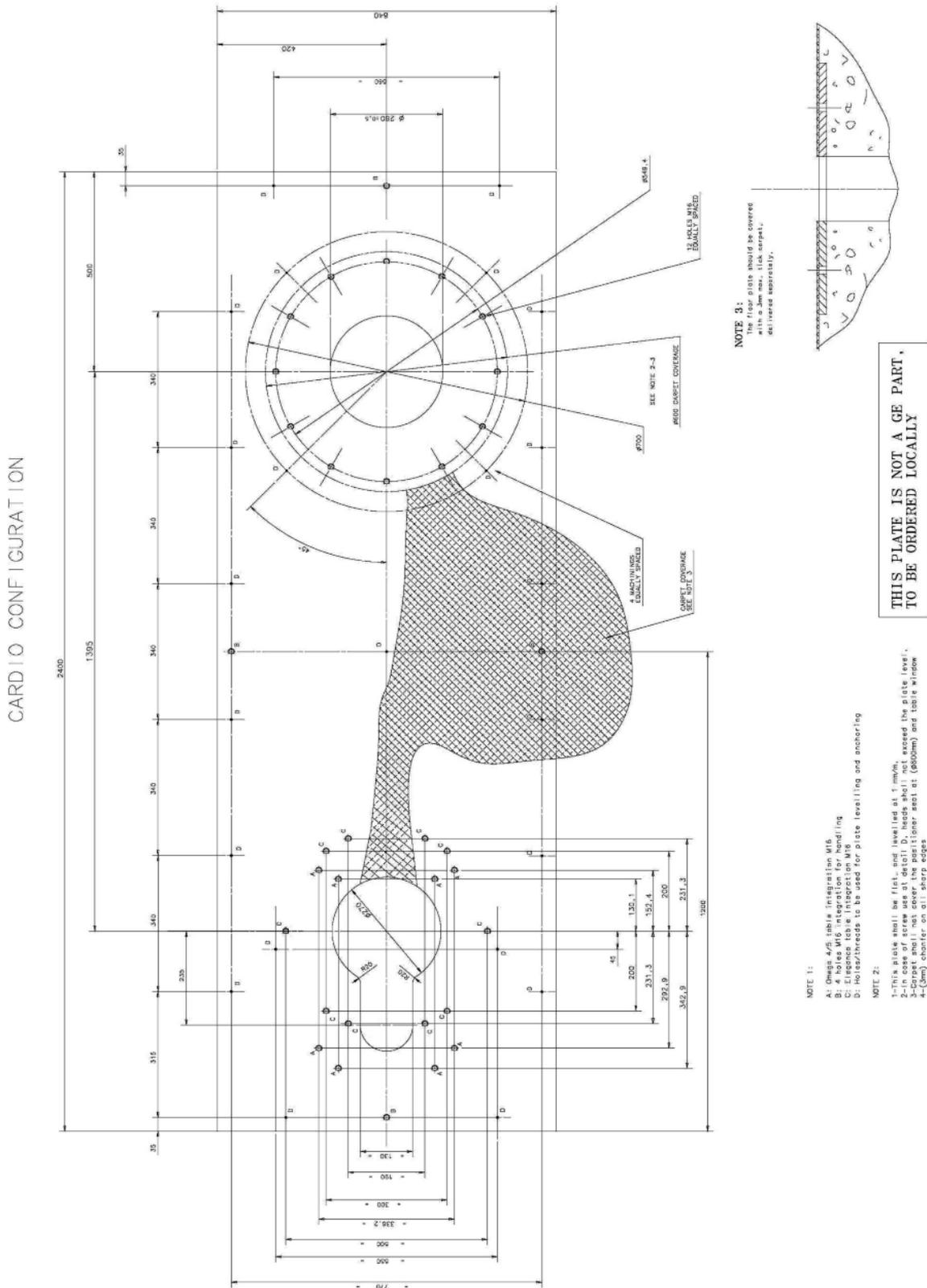
| Item | Name | Part # | Description | Quan. | Notes |
|--|-------------|---------|--|-------|-------|
|  | EP Template | 2186109 | LCV+ Gantry and EP Patient Table floor mounting template | 1 pc | |

Illustration 5-36: Baseplate plan 2359194 - Cardio configuration



2.4 Injector Mounting Requirements



Table accessory rail load consideration:

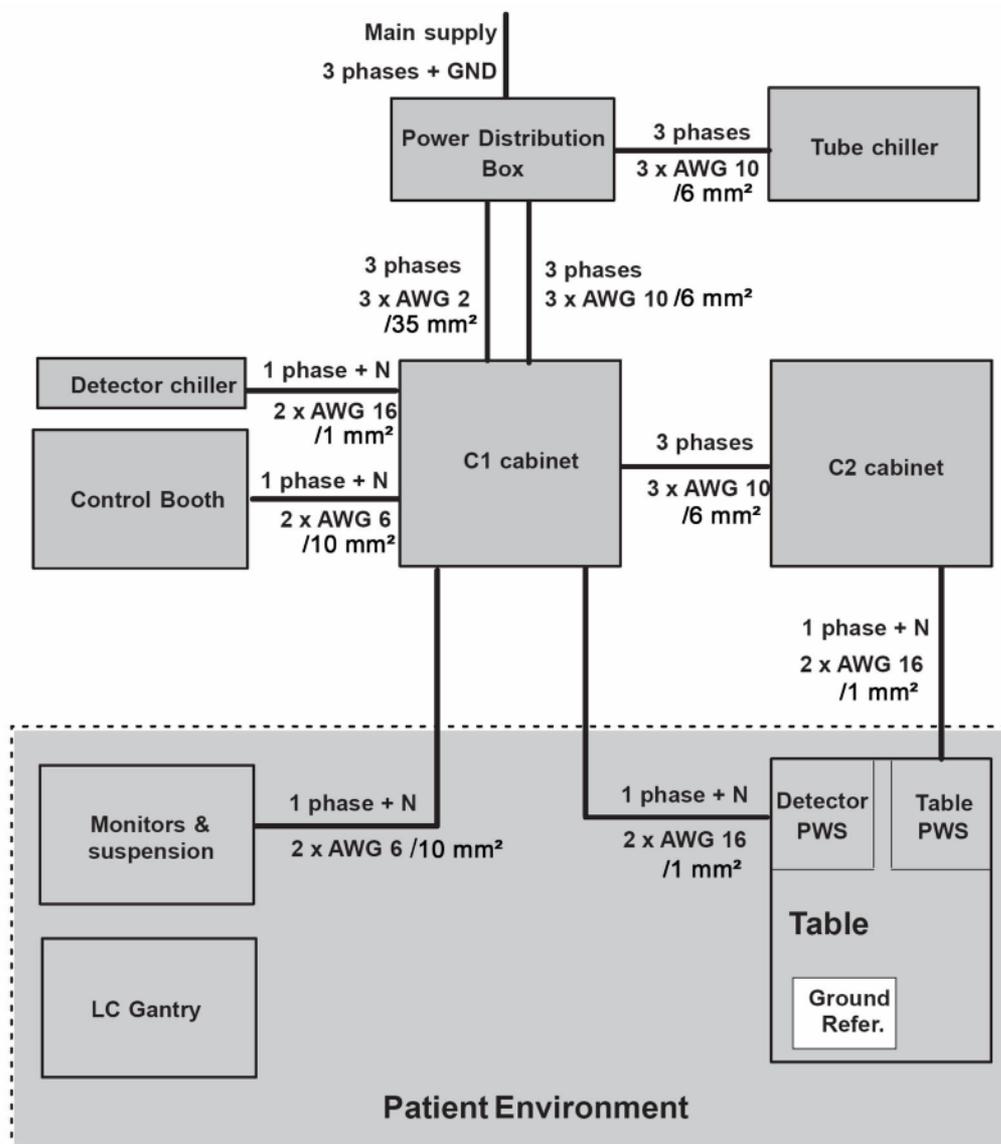
The maximum load per table accessory rail is 40 kg (88 lbs) at 150 mm (0.49 ft) (60 N.m or 44.25 ft/lbs). Therefore:

- Only light extra load not exceeding 5 kg (11 lbs) at 100 mm (0.33 ft) (i.e IV pole with its accessories, pressure head...) is authorized on the same table accessory rail as the injector.
- Never install injector and radiation protection on the same table accessory rail.
- Typical installation on the front table accessory rail is Smart handle or Smart box, Table Side System Control (TSSC), InnovaCentral/Touchscreen, Table panning device and cables support.
- If needed an optional rail can be installed at table foot end of the Omega V table for other options.

Chapter 6 Electrical Connections

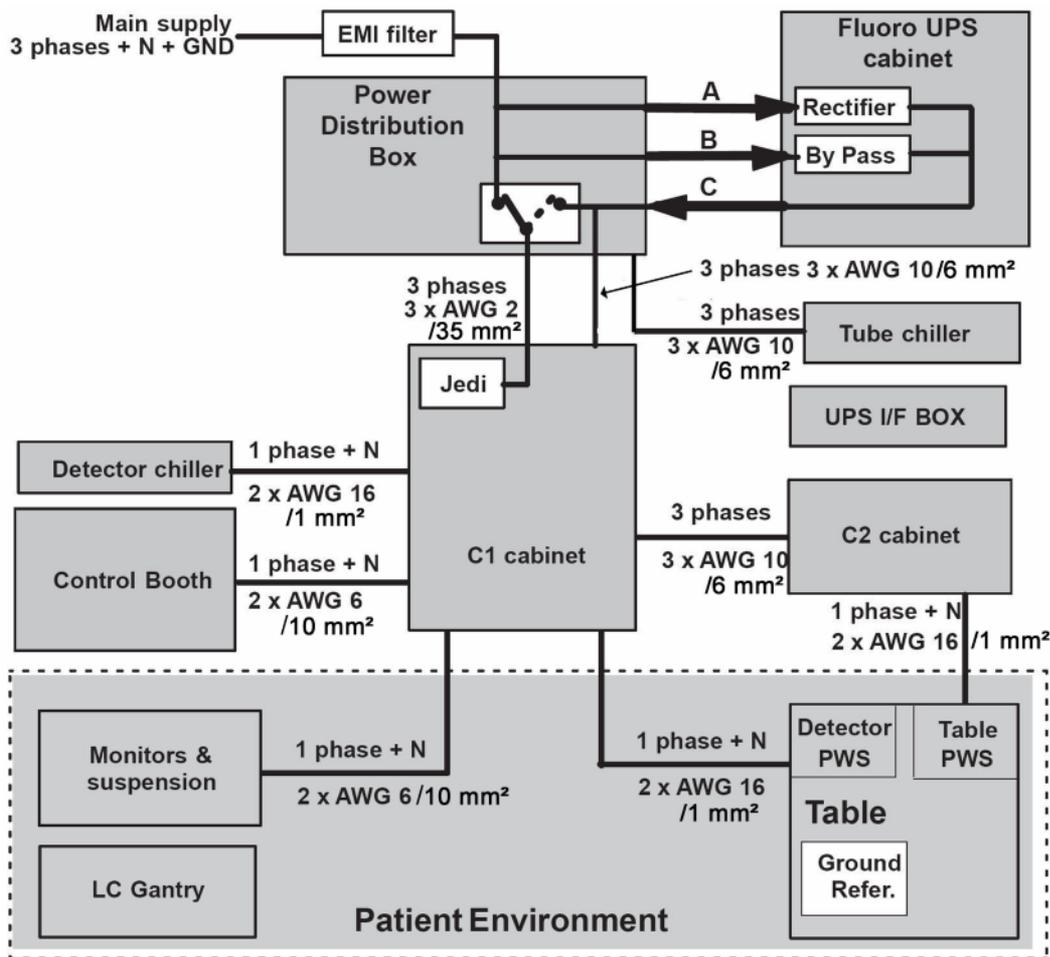
1 Power Distribution

Illustration 6-1: AC Interconnect without Fluoro UPS



NOTE: All short AC power cable less than 3 meters, between peripherals and respective power strip, are not shown. All have a single phase line, a neutral line and a ground wire.

Illustration 6-2: AC Interconnect with Fluoro UPS



NOTE: Contractor responsibility:

1. Electrical contractor is responsible for providing and connecting cables from the PDB to the UPS (see table below) and configuring the PDB in bypass mode.
2. GEHC is responsible for powering on the system with the UPS in bypass mode.
3. GEDE is responsible for UPS commissioning.

Table 6-1: A, B and C cables specification

| Cable | UPS CE version | | UPS UL version | | |
|-------|------------------------|---------------|----------------|------------------------|---------------|
| | Recommended (Note (1)) | | Max | Recommended (Note (2)) | |
| A | 5 X 10 mm ² | 3 ph + N + PE | 5 X 3 AWG | 5 X 6 AWG | 3 ph + N + PE |
| B | 4 X 6 mm ² | 3 ph + PE | 3 X 3 AWG | 3 X 8 AWG | 3 ph |
| C | 5 X 10 mm ² | 3 ph + N + PE | 5 X 3 AWG | 5 X 8 AWG | 3 ph + N + PE |

Note: (1) According to local requirement.
 Note: (2) According to local requirement and cable type.

NOTE: The PDB shall include the switch allowing the commutation of generator supply to the UPS. Neutral shall be fed by the hospital. The customer provides the cables A, B and C.

NOTE: Refer to the UPS vendor Service manual Installation Guide SG Serie 10, 20, 30 & 40 kVA for more details

2 Recommended Power Distribution System



WARNING

ANY SAFETY LABELS AFFIXED ON THE PDB AND ON THE EMI FILTER ENCLOSURE WOULD HAVE TO FULFILL THE LEGAL REQUIREMENT OF THE COUNTRY CONCERNING THE LANGUAGE TO BE USED FOR INFORMATION FOR SAFETY ON PROFESSIONAL EQUIPMENT.



CAUTION

To prevent risk of cable overheating or fire.
Local regulations concerning cable tightening inside the PDB must be respected.



NOTICE

The drawing hereafter is a guide to illustrate all functions included inside the main disconnect room device.

It should be compliant with the specific country rules.

NOTE: According to the country, the PDB/MDP can be ordered from GEHC.

One configuration 480 V, 60 Hz is certified to UL 508 and CSA C22.2 N°14: North America. Second configuration (380/400/415 V, 50/60 Hz) is certified to EN 60439-1 and is CE marked (not certified for Japan and China). Please check your country local regulations for the applicable configuration or refer to your local GE representative.

2.1 Main functions

Lock-out/Tag-out by S1 (Europe) or CB1 handle (US),

Main disconnect device by DMD1 (Europe) or CB1 handle (US),

Low voltage created by TR1 applied on remote, L1 and L2,

Separated injection circuit by TR2/CPT2 and BR,

L is mandatory for French standards,

Protect the Room Emergency Off (AU1, AU2) from accidental activation



WARNING

MANDATORY FOR FLUORO UPS OPTION THE PDB FRONT PANEL MUST WARN THE OPERATOR WITH AN ELECTRICAL HAZARD LABEL.



NOTICE

L1 is mandatory in several countries. By the same L1 circuit one or many other(s) light indicator(s) have to be mounted inside the examination room and have to be visible from anywhere by operators.



NOTICE

It is recommended to separate the two power supply cables from the other cables.

2.2 Typical PDB (Europe CE)

Typical PDB (Europe CE) - model number XR_765_3

Illustration 6-3:

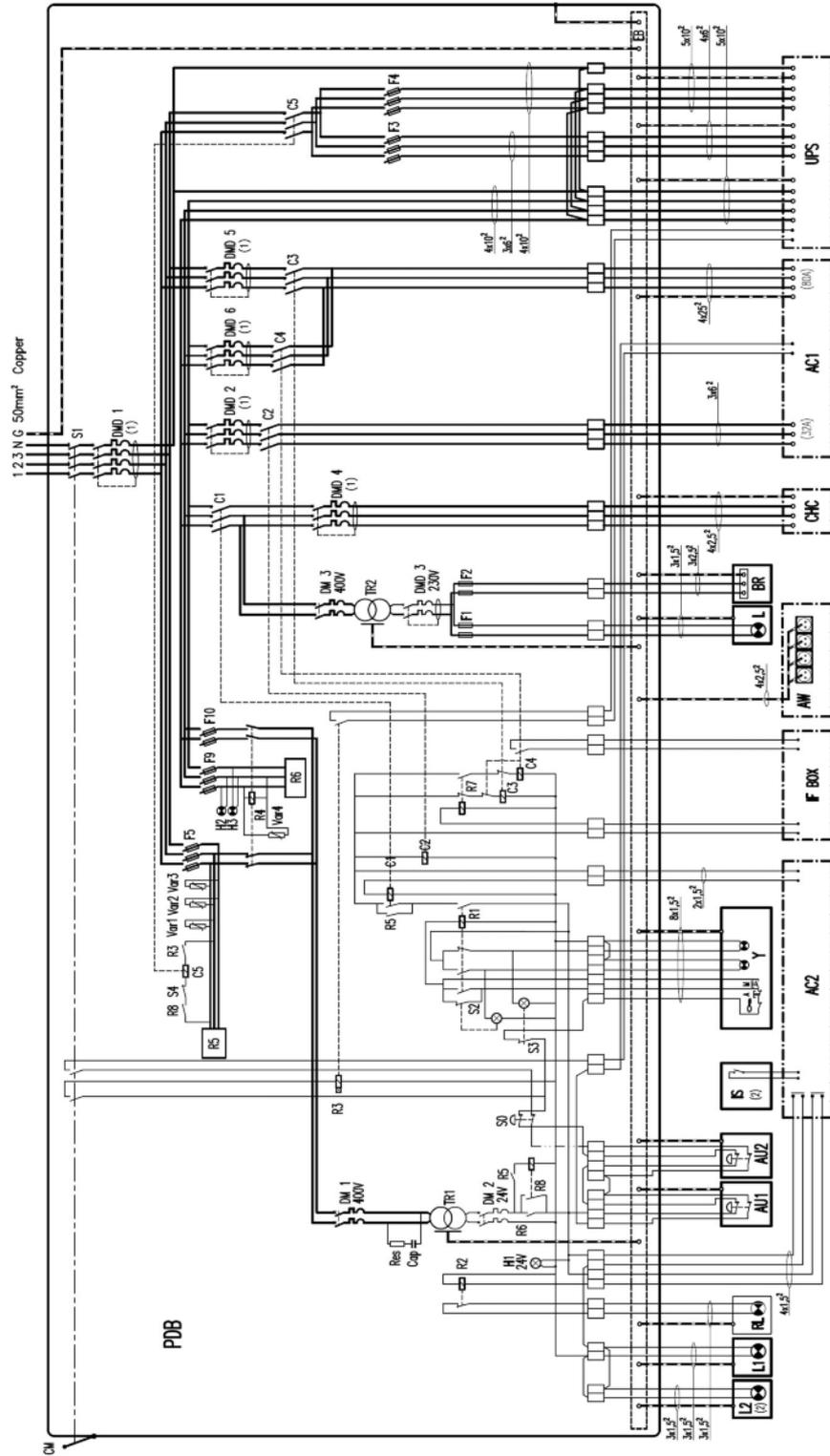


Illustration 6-4: Legend for Typical PDB (Europe CE)

- PDB POWER DISTRIBUTION BOX ONLY FOR RADIOLOGICAL EQUIPMENTS IN THE ROOM
(NOT SUPPLIED BY GEMS, CAN BE ORDERED AS AN OPTION)
- S1 DISCONNECTOR WITH AUXILIARY CONTACT
- CM LOCK OUT / TAG OUT DEVICE
- DMD1 THERMALMAGNETIC CIRCUIT BREAKER In= 80A. Imag= 12In±20% DIFFERENTIAL 30mA. (1) 300mA(1)(3)
- DMD2 THERMALMAGNETIC CIRCUIT BREAKER In= 32A. Imag= 12In±20%. DIFFERENTIAL 30mA. (1)
- DMD3 THERMALMAGNETIC CIRCUIT BREAKER In= 16A. Imag= 12In±20%. DIFFERENTIAL 30mA. (1)
- DMD4 THERMALMAGNETIC CIRCUIT BREAKER In= 16A. Imag= 12In±20%. DIFFERENTIAL 30mA. (1)
- DMD5 THERMALMAGNETIC CIRCUIT BREAKER In= 80A. Imag= 12In±20%. DIFFERENTIAL 30mA. (1)
- DMD6 THERMALMAGNETIC CIRCUIT BREAKER In= 32A. Imag= 12In±20%. DIFFERENTIAL 30mA. (1)
- DM1 THERMALMAGNETIC CIRCUIT BREAKER In= 4A. Imag= 12In±20%.
- DM2 THERMALMAGNETIC CIRCUIT BREAKER In= 16A. Imag= 7In±20%.
- DM3 THERMALMAGNETIC CIRCUIT BREAKER In= 10A. Imag= 12In±20%.
- TR1 400V/24V SAFETY TRANSFORMER. P=400VA
- TR2 400V/230V TRANSFORMER. P= 1600VA
- R1 24V RELAY. 10A CONTACT FOR LIGHTING ROOM
- R2-7-8 24V PILOT RELAYS.
- R3 24V ON TIME DELAY RELAY
- R4 400V PILOT RELAY
- R5-6 PHASE DETECTOR RELAYS.
- F1 2A FUSE (230V) F2 : 10A FUSE (230V) F3 : 32A FUSE (400V) F4 : 50A FUSE (400V)
- F5-10 10A FUSES (400V) F9 : 2A FUSE (400V)
- C1-2-4-5 REMOTE CONTACTORS 40A , COIL 24V
- C3 REMOTE CONTACTOR 80A , COIL 24V
- S0 EMERGENCY STOP BUTTON WITH DOUBLE CONTACTS. S2 : START BUTTON WITH GREEN LAMP 24V.
- S3 STOP BUTTON WITH RED LAMP 24V. S4 : SERVICE TEST BUTTON.
- Res RESISTOR 2 Ohms 500V 50W.
- Cap CAPACITOR 30 µF 550V AC.
- Var1-2-3-4 VARISTOR 460V 200J.
- H1 24V TELLTALE LAMP
- H2-3 POWER ON LAMP.
- EB EQUIPOTENTIAL BAR LINKING ALL CONDUCTEURS IN ROOMS WHERE SYSTEM COMPONENTS ARE LOCATED
- AU1-2 'BREAK THE GLASS' TYPE EMERGENCY STOP, 1.50m ABOVE FLOOR NEAR ACCES DOORS WITH DOUBLE CONTACTS FOR TWO INDEPENDENT CIRCUITS. SECOND CIRCUIT SIZED FOR 5A.
- Y SYSTEM REMOTE-CONTROL LOCKED WHEN POWERED OFF. ON & OFF IMPULSE BUTTONS WITH INDICATOR LAMPS RED=ON / GREEN=OFF LOCATED AT 1.50m ABOVE FLOOR
- CHC WATER CHILLER: CABLES INLET ON THE FLOOR WITH 2.00m EXTRA LENGTH
- AC1 ATLAS C1 CABINET: CABLES INLET ON THE FLOOR WITH 2.00m EXTRA LENGTH
- AC2 ATLAS C2 CABINET: CABLES INLET ON THE FLOOR WITH 2.00m EXTRA LENGTH
- (2) IS DOOR INTERLOCK SWITCH
- (1) L RED 230V LIGHT INDICATOR, CONTINUOUS OR FLASHING, LOCATED ABOVE THE MAIN ENTRANCE DOORS
L LIGHTS UP WHEN LOW VOLTAGE IS SUPPLIED TO THE X-RAY GENERATOR.
- L1 YELLOW 24V LIGHT LOCATED INSIDE EXAM ROOM, INDICATES X-RAY GENERATION
- (2) L2 YELLOW 24V LIGHT LOCATED NEAR TO L, INDICATES X-RAY GENERATION
- RL ROOM LIGHT CIRCUIT, INACTIVE DURING X-RAY RADIATIONS, CABLES INLET TO PDB WITH 1m EXTRA LENGTH
- BR INJECTOR WALL OUTLET 10/16A+G, LOCATED 1.50m ABOVE THE FLOOR LABELLED "ONLY FOR INJECTOR".
- AW 4 WALL OUTLETS 10/16A 2 PLUGS LINK TO THE HOSPITAL UPS OR A DEDICATED UPS OF 1.5kVA SINGLE PHASE.
- UPS FLUORO UPS OPTION. CABLES INLET ON THE FLOOR WITH 2.00m EXTRA LENGTH.
- IF BOX FLUORO UPS OPTION.

Illustration 6-5: System Power (Block Diagram)

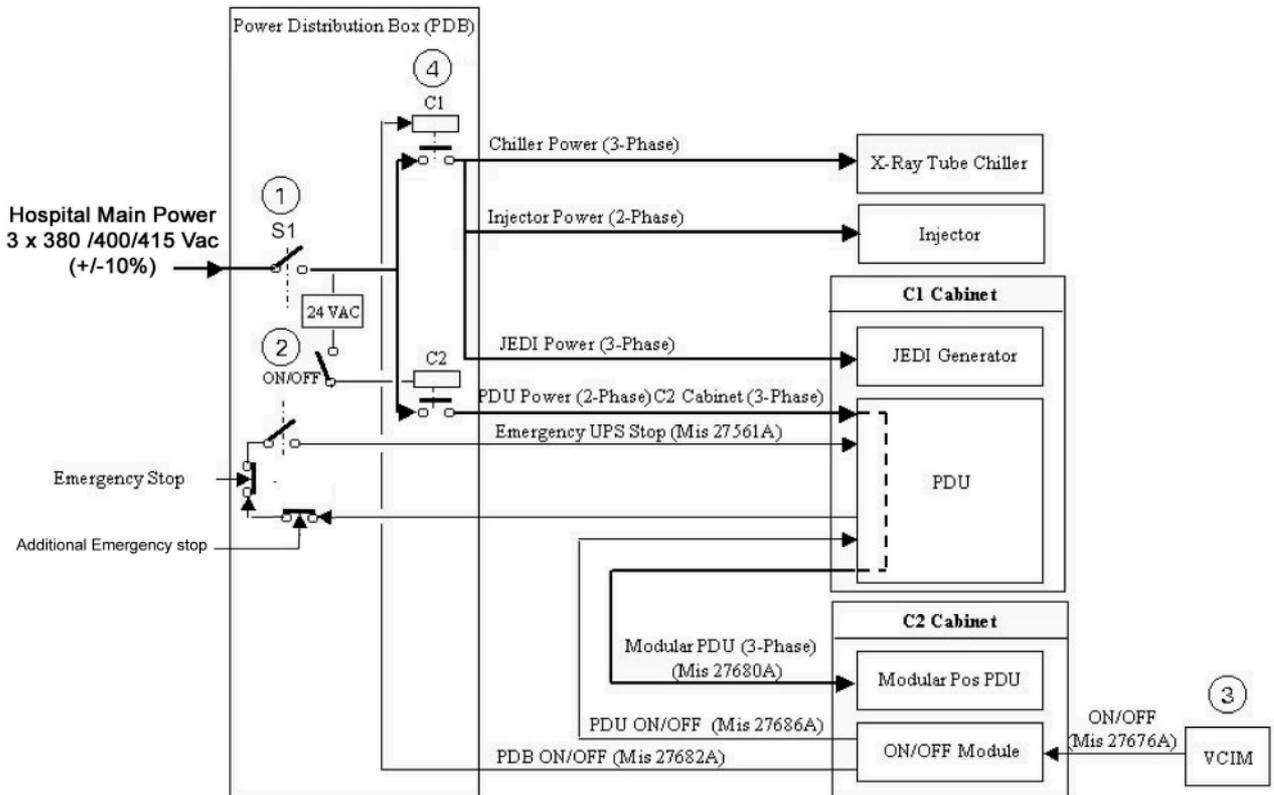
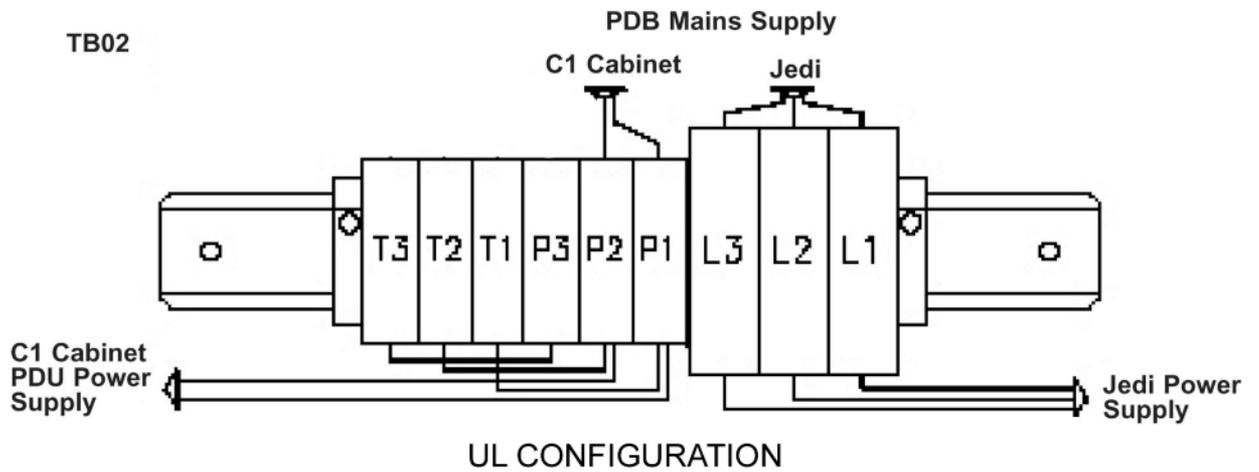
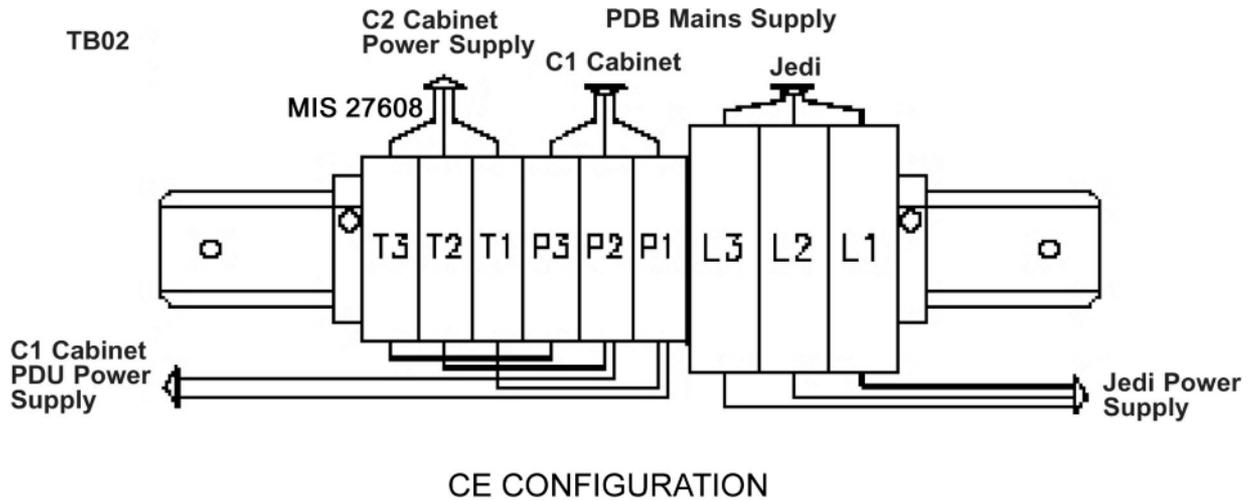
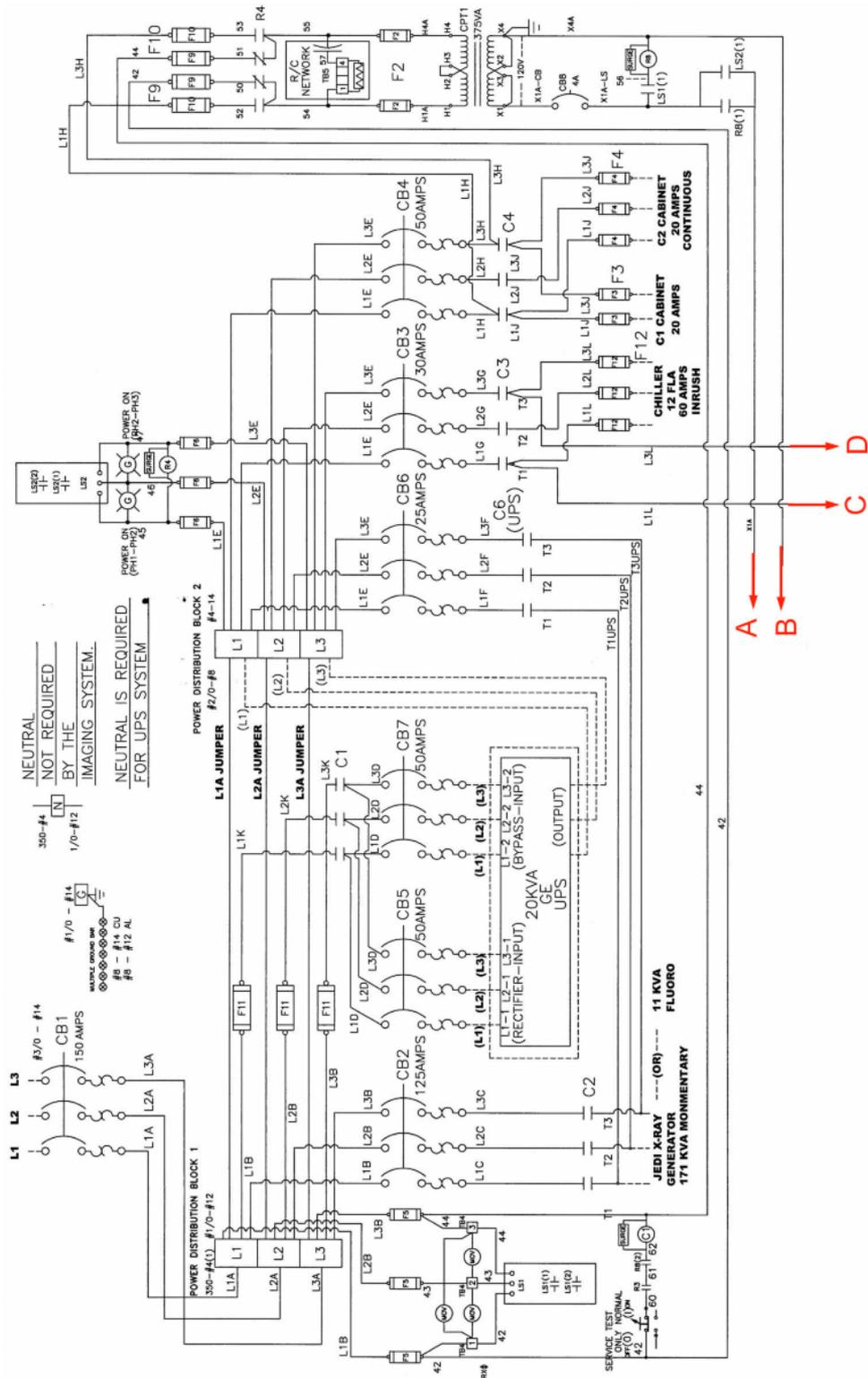


Illustration 6-6: Detail Of General Power Supply – C1 Power Terminal Connection



2.3 Typical US PDB

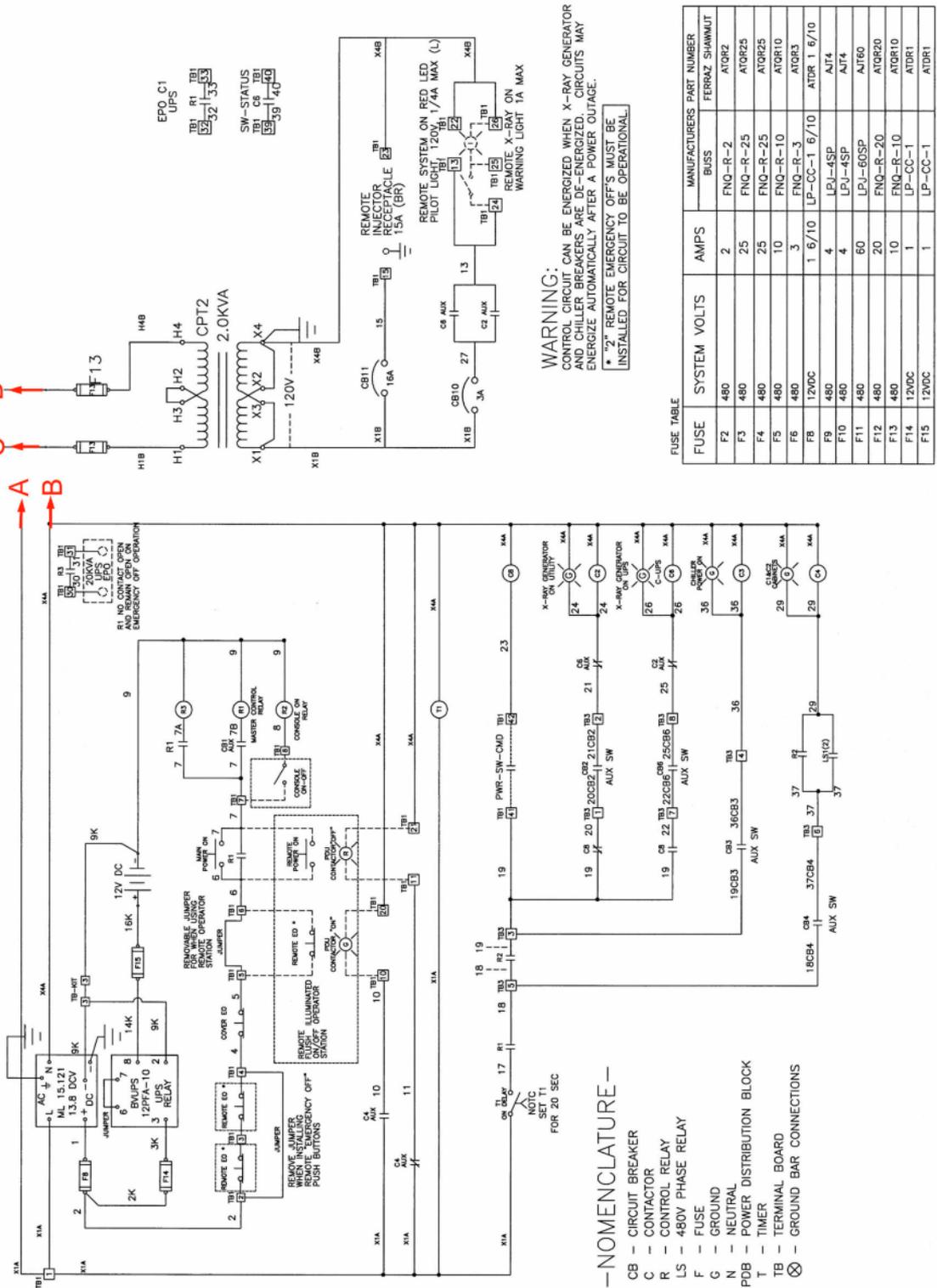
Illustration 6-7: Typical US PDB (1/2)



To A, B, C and D on next illustration

Illustration 6-8: Typical US PDB (2/2)

To A, B, C and D on previous illustration



NOTE: The UL PDB Schematics are updated after integration of FMI12109.

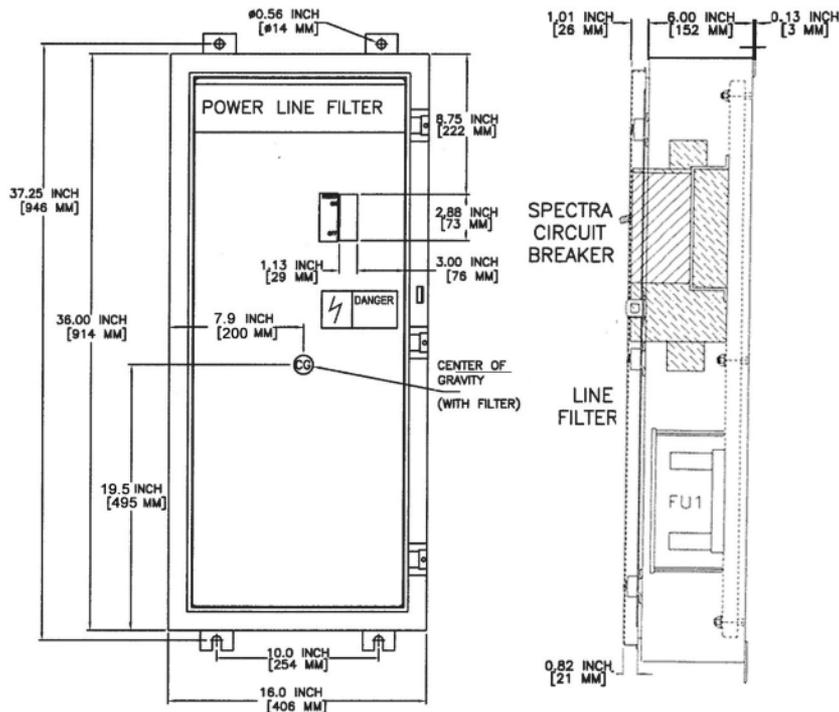
2.4 Typical EMI Filter Enclosure

The EMI filter shall be installed on the sites with fluoro UPS. The filter itself will be delivered with the UPS as part of the product.

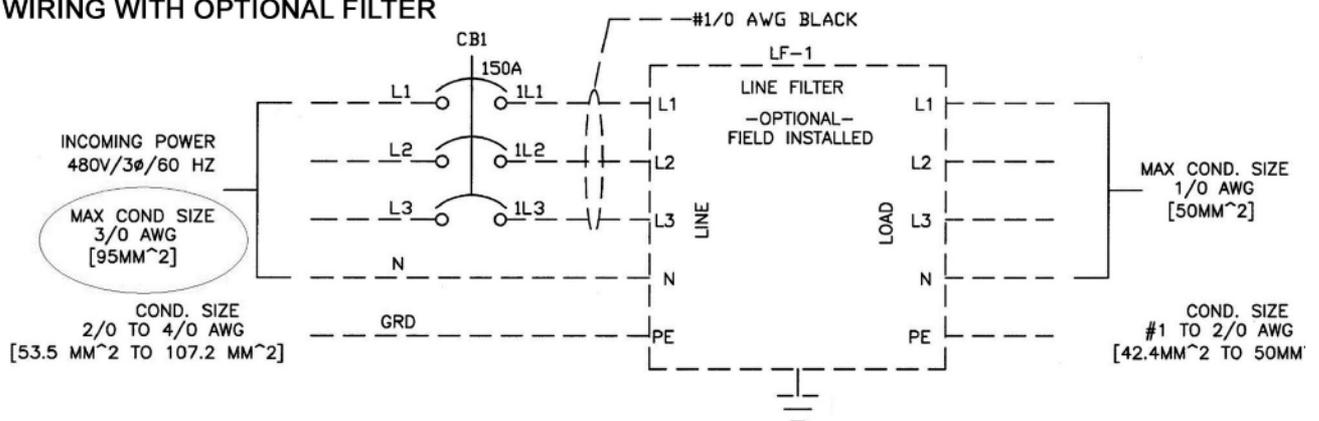
The filter enclosure will be delivered with the PDB supplied by GE Consumer as part of the PDB.

If a supplier other than GE Consumer provides the PDB, it is a local responsibility to provide the filter enclosure as well on the sites where a fluoro UPS will be installed.

Illustration 6-9: Filter enclosure for USA



WIRING WITH OPTIONAL FILTER

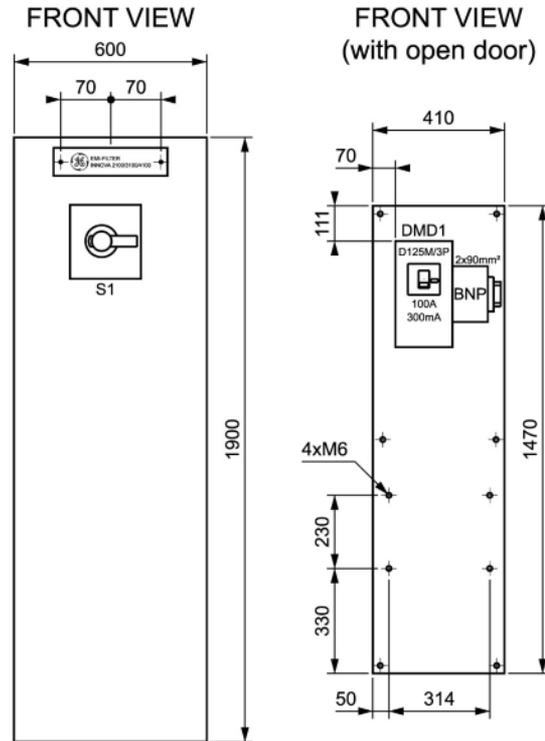




NOTICE

The Power Line Filter accepts wires up to 3/0. If feeder is 4/0 or bigger, a reduction box shall be installed before Filter Enclosure.

Illustration 6-10: Filter enclosure for Europe



All dimensions are in mm

3 Grounding

A vascular lab is a critical care area and requires a special grounding system for patient safety. An equipotential grounding system is recommended for meeting patient safety requirements.

Reference: For general system grounding requirements and information on establishing an equipotential grounding system, refer to: *Grounding Continuity* – Job card in the Installation manual.



NOTICE

All shielded cables shall have a connection to ground at each extremity without regard to the grounding to the scheme below.



NOTICE

Metallic covers on cable connectors shall be tested to ground.

Illustration 6-11: Grounding Interconnect Without Fluoro UPS

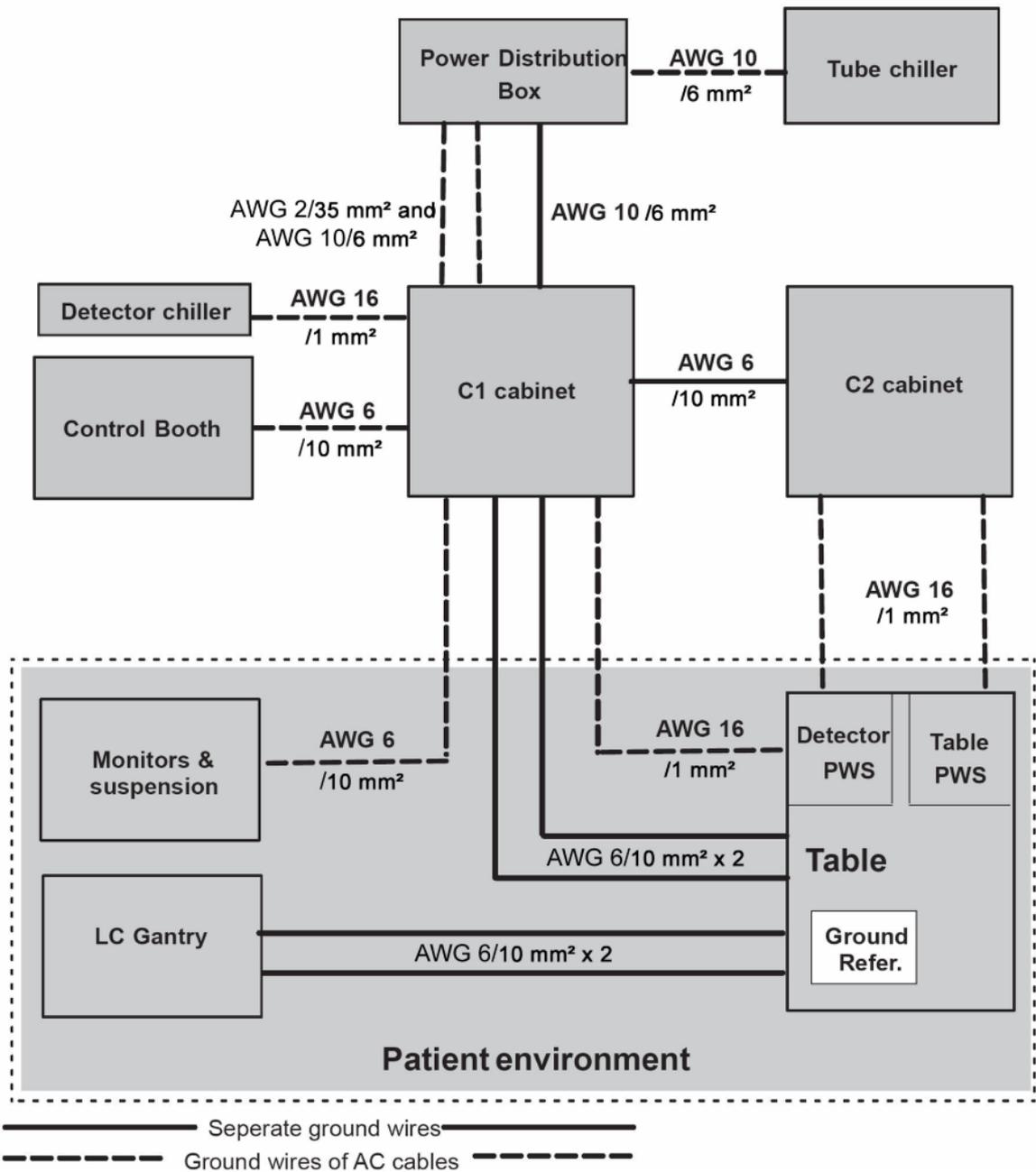
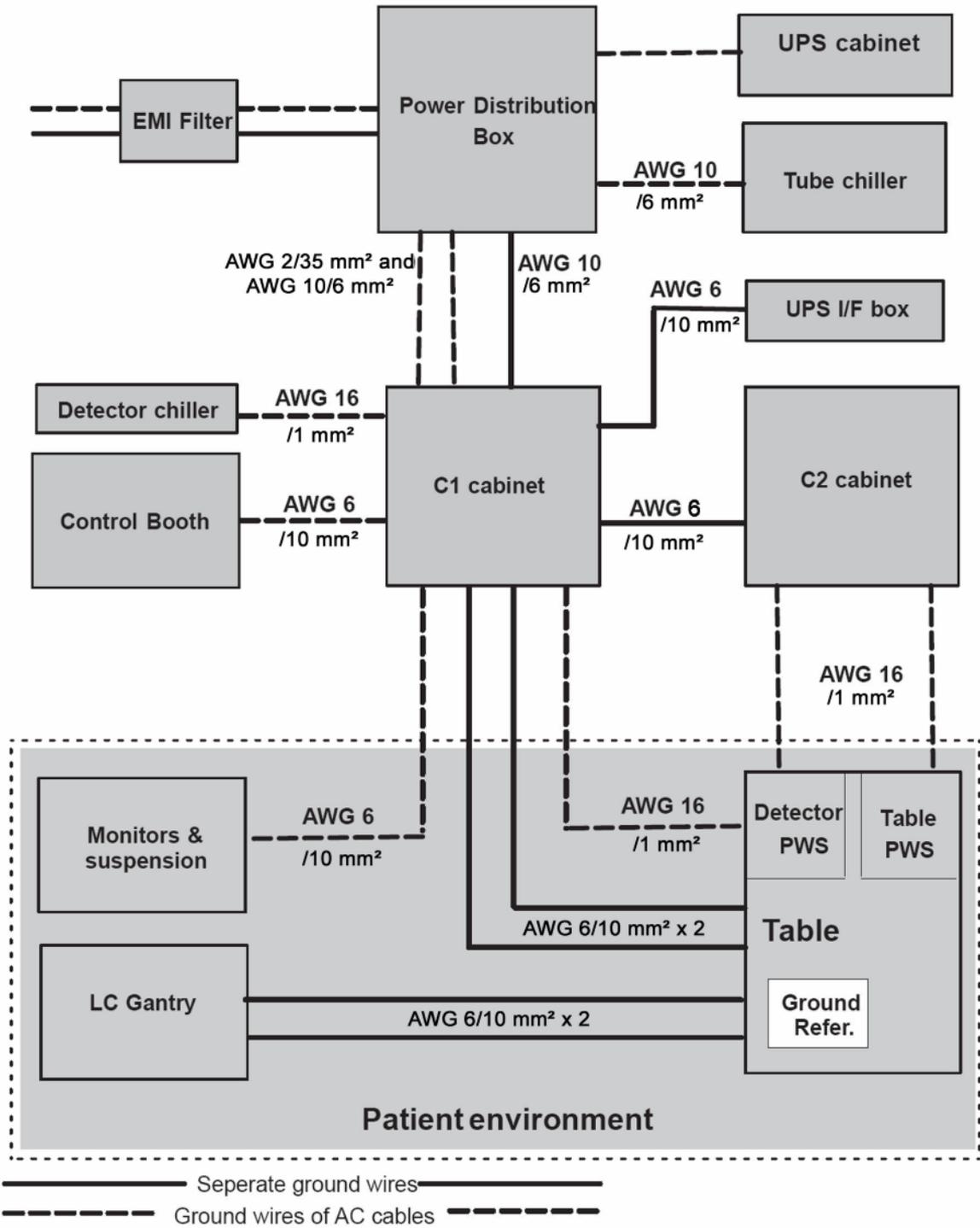


Illustration 6-12: Grounding Interconnect With Fluoro UPS



4 Power and Grounding Requirements

4.1 Requirements for ground cables provided by the customer

- A wall circuit breaker or equivalent device with LOTO capability must be installed on the Main Power. This device must be compatible with the power input specifications of the system. Procurement, delivery and installation of this breaker is customer responsibility.
- The customer shall provide the ground wire between the EMI filter (for Fluoro UPS CE option only), PDB (Power Distribution Box) and earth. Impedance of the ground wire to earth shall be lower than 2 ohms (refer to direction 46–019668 for method of measurement).
- The ground wire to earth shall be a minimum of AWG 2/0 (UL) or 35 mm² (CE) or the same size (100%) as feeder wires, which ever is larger.
- The shield of any shielded cable coming from the distribution cannot replace the ground wire.

4.2 Requirements for power supply cables provided by the customer

The customer shall provide the power supply cables between the main transformer and the system:

- between the transformer and the PDB (Power Distribution Box),
- between the transformer and the EMI filter (for Fluoro UPS CE option only),
- between the EMI filter and the PDB (Power Distribution Box) (for Fluoro UPS option only) (max length = 3 m),
- between the PDB and the Jedi (max length = 24 m),
- between the PDB and the C1 cabinet (max length = 24 m),
- between the PDB and the tube chiller (max length = 24 m),
- between the PDB and the Fluoro UPS (Fluoro UPS option).(max length = 24 m),
- between C1 and C2 cabinets (max length = 6 m)

The power supply cable between the main transformer and the PDB (Power Distribution Box) and between the PDB and the Jedi shall be sized to insure proper voltage drop.

Table 6-2:

| Max Line Impedance for feeder line between Generator cabinet and Hospital | | | | | | |
|---|------|-------|-------|-------|-------|------|
| V | 380 | 400 | 420 | 440 | 460 | 480 |
| Ω | 0.09 | 0.096 | 0.102 | 0.108 | 0.114 | 0.12 |

The power supply cables provided by the customer shall be sized according to the Illustrations *AC Interconnect without Fluoro UPS* and *AC Interconnect with Fluoro UPS* in [Section 1, Power Distribution](#).

4.3 Requirements for all power supply and ground cables provided by the customer

- Power supply and ground cables shall be dedicated to the system. They must not be used to supply other systems.
- Power supply and ground cables shall be kept separated from room system cables.
- Power supply and ground cables must be connected to the same distribution panel. They must run near one to the other.

- Power supply and ground cables provided by the customer shall be compliant with local regulations (UL, CSA, IEC, CCC).
- Power supply and ground cables must be CCC certified and labeled for installation in China.

Reference: For specific Vascular system grounding maps and connection details, refer to the MisMap and mis chart listed in [Section 15, MIS \(Master Interconnect System\)](#).

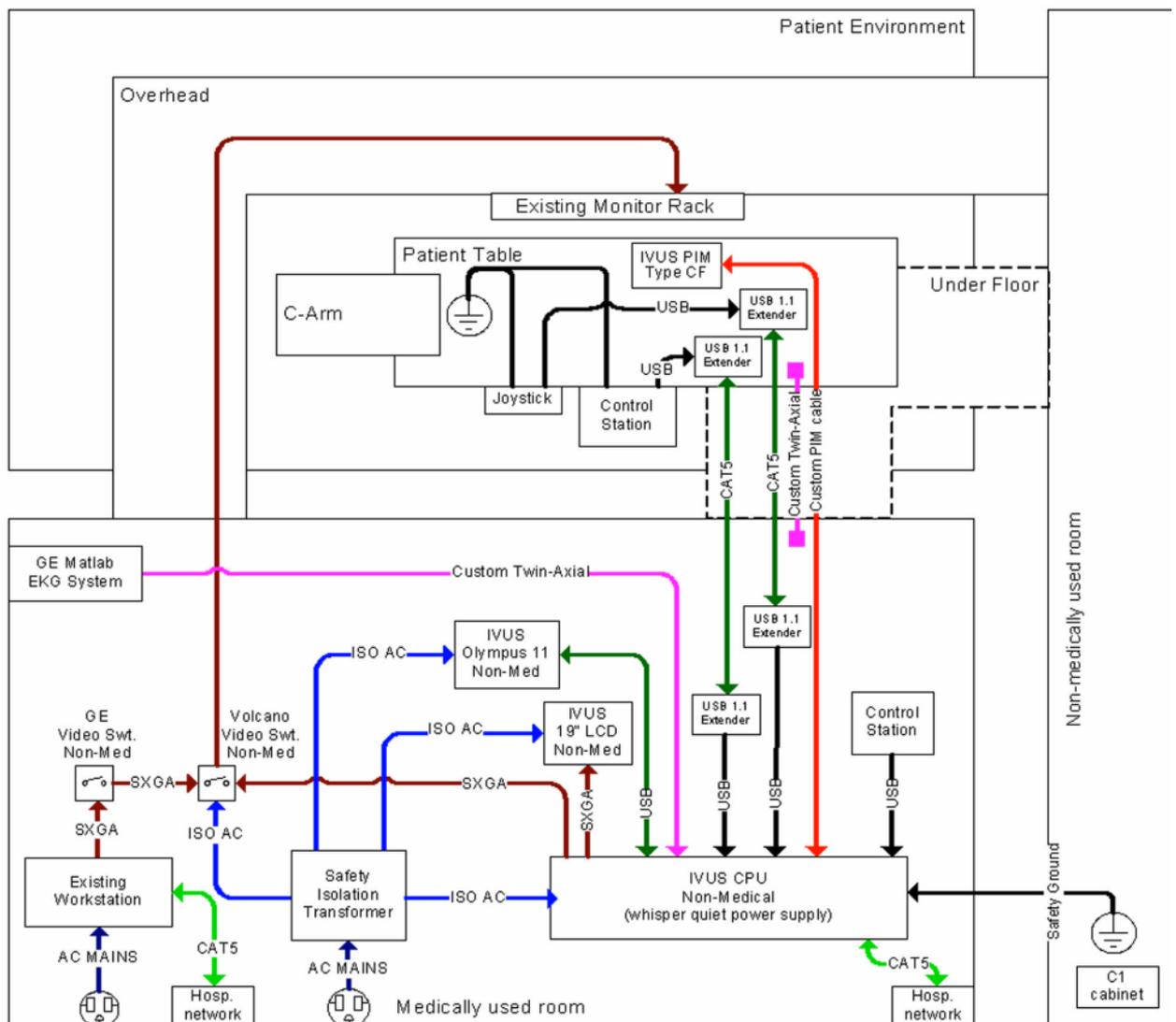
5 IVUS Rev 1 Option

5.1 Wiring Diagram

The connection cables between the IVUS Control Room and Procedures Room components run in a dedicated under floor conduit (see [Section 5.2](#)).

A GND wire between the C1 cabinet and the IVUS CPU runs in the underfloor conduit prepared for the Control Booth cables between Equipment Room and Control Room.

Illustration 6-13:



5.2 IVUS Floor Conduits

A 3 inches and max. 25 m long conduit between Control and Patient Rooms shall be prepared below the floor for the IVUS Innova interconnection cables.

- Locate the position of the IVUS components in the Control Room, according to the workflow requirement of the operators.
- Establish a 76 mm (3") conduit below floor from the IVUS CPU location in the Control Room, to the foot end area of the Patient Table in the Procedures Room:
 - Locate the Procedures Room exit of the conduit close to the centerline of the Patient Table
 - Locate it as close to the Patient Table base as possible, considering :
 - Room for access to the table for service purposes
 - Limitation from other cables connected to the table
 - Location of the table plate
 - Location of Mac-Lab conduit
 - Location of Physio or Med Gases connections
 - The IVUS cables are moving cables, they have to allow the Patient Table motions (Panning, Lifting and Rotating)
- Use similar solutions (i.e. protection against cleaning fluids, etc.) as it is used for the Mac-Lab conduit
- See also guidance on Typical Layout drawing 4-58f sheets E1 and S2, showing Mac-Lab and P/M Gas location recommendations.

5.3 Run Interconnection cables through the Conduit

Use the IVUS PIM (#806365003) as reference to the procedures below.

- Unpack , and check the completeness of the Preinstallation kit :
 - 1pcs - Custom PIM cable 30 m (98 ft, 5 in) - Volcano ID :806452001
 - 2pcs - CAT5 cable 30 m (98 ft, 5 in) - Volcano ID :803391001
 - 1pcs - Custom Twin axial cable - Volcano ID :806380001
 - 1pcs – Ground Cable, 30 m (98 ft, 5 in) s5i – Volcano ID :806889001
 - 1pcs - IVUS preinstallation Manual - Volcano ID :806365003
- Install 806889001 Ground Cable through the Control Booth conduit (see note)
- Install the cables through the IVUS conduit from the Control Room end :
 - 806452001 Room - PIM cable, round shaped connector end to the Procedures
 - 803391001 - Ethernet cable (1pcs)
- Install the optional cables through the IVUS conduit from the Control Room end :
 - 803391001 - Ethernet cable if 2 IVUS remote control items will be installed 1 IVUS Control Station and 1 IVUS Joystick)
 - 806380001 - ECG cable in case, if NON Mac-Lab ECG will be installed

NOTE: For the ground cable, see the IVUS service manual for special instructions concerning cable running and cutting .

NOTE: If the installation has the **MaC-Lab ECG** in the configuration, the ECG cable shall not be run through the conduit, it will be used in the Control Room to **connect Mac-Lab and IVUS PCs.**

NOTE: You should consider running the ECG cable through the conduit in case, the customer requires interconnecting to a **NON Mac-Lab ECG** at the table base.

In this case you **shall hide the unconnected cable in the conduit** for future expansion options.

NOTE: Same applies to the 2nd Ethernet cable, if a later extension of the IVUS remote controls expected.

- **Ensure sufficient cable length on the Procedures Room end of the cables according to the table below**

| Cable | Free length from the conduit exit |
|-----------------------|-----------------------------------|
| PIM cable | 2.4 m (8 ') |
| Control Station cable | 2.1 m (7 ') |
| Joystick cable | 2.7 m (9 ') |
| ECG cable | Depends on the ECG location |

NOTE: The incorrect cable length might cause reliability issues during the operation !

Make sure, that the out of conduit parts of the cables with the connectors are properly protected during the rest of the installation

5.4 Electrical Requirements

The power for the IVUS hardware components delivered with the product (PC, monitor, Video Switch and printer) is supplied through the IVUS Safety Isolation Transformer .

The customer is in charge to provide a wall outlet to supply the Safety Isolation Transformer. This outlet shall be located in the control room suitable to the IVUS components positioning. The maximum rated power of the Safety Isolation Transformer is 600 VA, the maximum continuous system power consumption for s5i and s5iGE IVUS systems is 400 VA.

The s5i and s5iGE IVUS systems can be configured to work on 100, 120, or 230 VAC. The difference between the supported configurations is limited switching the fuse values. See table below :

| Line Voltage | Fuse value |
|--------------|------------|
| 100 VAC | 8 A |
| 120 VAC | 6.3 A |
| 230 VAC | 3.15 A |

Frequency: 50/60 Hertz

The country specific power cords are pre-selectable in the GTC.



NOTICE

The IVUS will be connected to a standard hospital outlet. There is no grounding requirement specified at site preparation.

5.5 Ethernet Network Requirement

The IVUS CPU located in the control room shall be connected to the hospital Ethernet network. A wall Ethernet outlet shall be available in the control room to connect the device.

DICOM Image Storage:

Saving patient cases to DVD: The archived images are stored in DICOM format with Volcano s5i system acting as a File Set Creator (FSC), following the guidelines in the 2004 DICOM 3.0 specification.

Sending patient cases to DICOM server: The Volcano s5i supports the ultrasound multi-frame image storage SOP class as an SCU (service class user).

For more information, see the Volcano s5 DICOM Conformance Statement located on line at :

http://www.volcanocorp.com/pages/products/s5/productinfo/s5_DCS.pdf

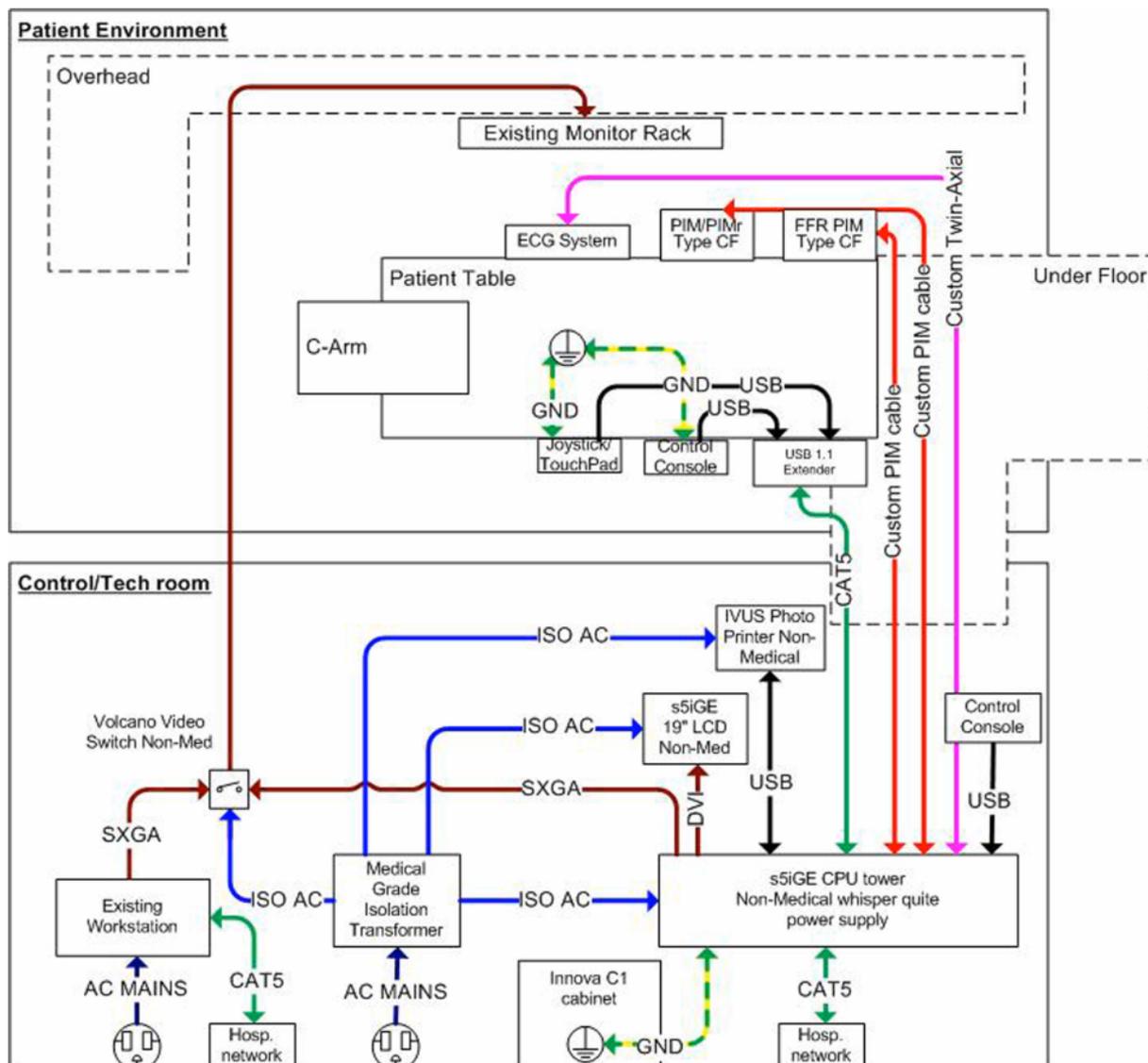
6 IVUS Rev 2 Option

6.1 Wiring Diagram

The connection cables between the IVUS Control Room and Procedures Room components run in a dedicated under floor conduit (see [Section 6.2](#)).

A GND wire between the C1 cabinet and the IVUS Rev 2 CPU runs in the underfloor conduit prepared for the Control Booth cables between Equipment Room and Control Room.

Illustration 6-14:



6.2 IVUS Floor Conduits

A 3 inches and max. 25 m long conduit between Control and Patient Rooms shall be prepared below the floor for the IVUS Innova interconnection cables.

- Locate the position of the IVUS components in the Control Room, according to the workflow requirement of the operators.
- Establish a 76 mm (3") conduit below floor from the IVUS CPU location in the Control Room, to the foot end area of the Patient Table in the Procedures Room:
 - Locate the Procedures Room exit of the conduit close to the centerline of the Patient Table
 - Locate it as close to the Patient Table base as possible, considering :
 - Room for access to the table for service purposes
 - Limitation from other cables connected to the table
 - Location of the table plate
 - Location of Mac-Lab conduit
 - Location of Physio or Med Gases connections
 - The IVUS cables are moving cables, they have to allow the Patient Table motions (Panning, Lifting and Rotating)
- Use similar solutions (i.e. protection against cleaning fluids, etc.) as it is used for the Mac-Lab conduit
- See also guidance on Typical Layout drawing 4-58f sheets E1 and S2, showing Mac-Lab and P/M Gas location recommendations.

6.3 Run Interconnection cables through the Conduit

Use the IVUS Rev 2 PIM (#806365002) as reference to the procedures below.

- Unpack , and check the completeness of the Preinstallation kit :
 - 1 pcs - Custom PIM cable 30 m (98 ft, 5 in) - Volcano ID :806452001
 - 1 pcs - CAT5 cable 30 m (98 ft, 5 in) - Volcano ID :807055001
 - 1 pcs - Custom Twin axial cable - Volcano ID :806380001
 - 1 pcs - Ground Cable, 30 m (98 ft, 5 in) s5i – Volcano ID :806889001
 - 1 pcs - IVUS Rev 2 Preinstallation Manual - Volcano ID :806365002
- Install 806889001 Ground Cable through the Control Booth conduit (see note)
- Install the cables through the IVUS conduit from the Control Room end :
 - 806452001 PIM cable, round shaped connector end to the Procedures Room
 - 807055001 - Ethernet cable (1 pcs)
- Install the optional cables through the IVUS conduit from the Control Room end :
 - 806380001 - ECG cable in case, if NON Mac-Lab ECG will be installed
 - 808631002 – FFR cable option - 15m
 - 808632002 – FFR cable option - 27m

NOTE: For the ground cable, see the IVUS Rev 2 service manual for special instructions concerning cable running and cutting .

NOTE: If the installation has the **MaC-Lab ECG** in the configuration, the ECG cable shall not be run through the conduit, it will be used in the Control Room to **connect Mac-Lab and IVUS PCs.**

NOTE: You should consider running the ECG cable through the conduit in case, the customer requires interconnecting to a **NON Mac-Lab ECG** at the table base.

In this case you **shall hide the unconnected cable in the conduit** for future expansion options.

NOTE: Same applies to the 2nd Ethernet cable, if a later extension of the IVUS remote controls expected.

- **Ensure sufficient cable length on the Procedures Room end of the cables according to the table below**

| Cable | Free length from the conduit exit |
|---------------------------|-----------------------------------|
| IVUS PIM cable * | 2.4 m (8') |
| FFR cables for Pimette ** | 0m (0') |
| Control Station cable | 2.1 m (7') |
| Joystick cable | 2.7 m (9') |
| ECG cable | Depends on the ECG location |

* Consider the 12' length of the PIMr cable, if PIMr exists.

** Pimette has 3 m cable.

NOTE: The incorrect cable length might cause reliability issues during the operation !

Make sure, that the out of conduit parts of the cables with the connectors are properly protected during the rest of the installation

6.4 Electrical Requirements

The power for the IVUS hardware components delivered with the product (PC, monitor, Video Switch and printer) is supplied through the IVUS Safety Isolation Transformer.

The customer is in charge to provide a wall outlet to supply the Safety Isolation Transformer. This outlet shall be located in the control room suitable to the IVUS components positioning. The maximum rated power of the Safety Isolation Transformer is 600 VA, the maximum continuous system power consumption for s5i and s5iGE IVUS systems is 400 VA.

The s5i and s5iGE IVUS systems can be configured to work on 100, 120, or 230 VAC. The difference between the supported configurations is limited switching the fuse values. See table below :

| Line Voltage | Fuse value |
|--------------|------------|
| 100 VAC | 8 A |
| 120 VAC | 6.3 A |
| 230 VAC | 3.15 A |

Frequency: 50/60 Hertz

The country specific power cords are pre-selectable in the GTC.



NOTICE

The IVUS Isolation Transformer will be connected to a standard hospital outlet. There is no grounding requirement specified at site preparation.

6.5 Ethernet Network Requirement

The IVUS CPU located in the control room shall be connected to the hospital Ethernet network. A wall Ethernet outlet shall be available in the control room to connect the device.

DICOM Image Storage:

Saving patient cases to DVD: The archived images are stored in DICOM format with Volcano s5i system acting as a File Set Creator (FSC), following the guidelines in the 2004 DICOM 3.0 specification.

Sending patient cases to DICOM server: The Volcano s5i supports the ultrasound multi-frame image storage SOP class as an SCU (service class user).

NOTE: All this applies to the IVUS mode of the s5i/GE, not for the FFR mode.

For more information, see the Volcano s5 DICOM Conformance Statement located in the 806365-005 Volcano Service Manual.

7 X-Ray Lamp Room Distribution

The fitter shall install a lamp in:

- Exam room,
- Control room.

So that they are connected to the equipment through connexion terminals.

Innova LC provides a room distribution from C2 cabinet as follows:

- X-ray-on-line (red) drive by low voltage relay 24 V. Acting during X-Ray exposures in Control Room.
- X-ray-on-line (red) drive by low voltage relay 24 V.
In the Exam Room, visible from any place in the room.
Acting during X-ray exposures.
- room light (limited to 24 Vac maxi, wires sized to 10 Amps maxi), controls an external relay which applies power to the room lamp.



CAUTION

THE X-RAY ON LAMP MUST BE INSTALLED IN THE EXAM ROOM TO CONFORM TO INTERVENTIONAL STANDARD IEC/EN 60601-2-43. SIGNAL INDICATING THE X-RAY ON SHALL BE PERCEPTIBLE BY THE OPERATOR IN ALL THE LOCATIONS DEFINED FOR THE PERSONNEL WHO MAY RECEIVE SCATTERED RADIATION

In the control room, an additional X-Ray on light must be installed if the console (VCIM) indicator cannot be perceived by all the persons in the control room.

8 Room Light Distribution

Innova 2100-IQ, 3100/3100-IQ and 4100/4100-IQ has the ability to control an external relay that applies power to the room light (dry contacts).

The relay is to be provided by the hospital or contractor.

The wire size to connect to the C2 cabinet is 1.5 mm² (AWG 14).

Relay rating is max 600 VAC

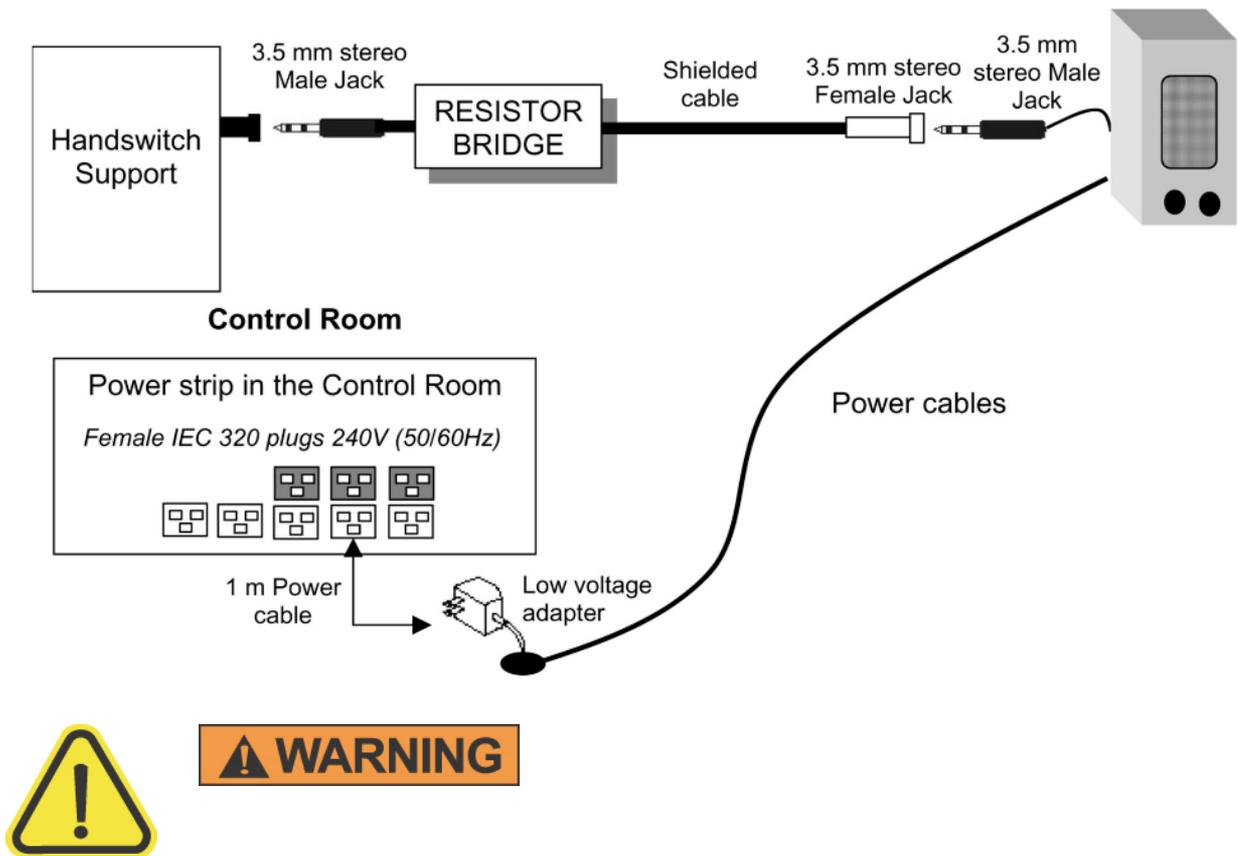
The room light distribution is wired between the C2 cabinet and the PDB.

9 Room Speaker

The remote speaker provides the operator in the exam room, the indication of record exposure sequence (same level information as provided by the control room control panel).

The speaker must be installed in the exam room out of the patient vicinity to give easy access to the FE for maintenance operations and to medical staff to adjust the tone signal level and to be able to see the power LED indicator.

Illustration 6-15:



WARNING

THE REMOTE SPEAKER KIT SHALL NOT BE INSTALLED IN THE PATIENT VICINITY.

Patient Vicinity Definition : see *Patient Environment Equipment* in [Chapter 4, Section 1, Room Layout Considerations](#)

10 Door Interlocks



CAUTION

IEC 60601-2-43 requires not to install door interlocks. It is the responsibility of the field service to check that this requirement is not in contradiction with local regulation. In case of conflict, follow local regulation. No other measures employed for radiation protection should cause the interruption of irradiation and any other disturbance of a procedure in progress.

The door interlocks is wired to the C2 cabinet.

11 Emergency

11.1 Partial UPS Fluoro (option)

A Fluoro UPS (20 kVA) has been designed for the Innova system. This partial UPS lets the customer complete an exam in fluoro mode in case of a power failure. The autonomy provided by this UPS is 5 minutes of fluoro every 24 hours.

11.2 Full UPS Record (option)

An UPS sized for 150 kVA is required to supply the system in record mode. Such an UPS will provide to the customer about 10 minutes of autonomy. Contact your local GEMS representative for more information and/or public power distribution analysis.

NOTE: An UPS is inserted inside C1 Cabinet and the DL is not affected by microcuts with a duration of less than 10 μ s.

C1 UPS accepts a power cut without a hardware risk.

The UPS inserted inside C1 Cabinet is a part of the system and it is not permitted to replace it by another locally supplied unit.

UPS autonomy is 1 minute before shutdown. Time before shut down is 1 minute without risk of losing stored image.

Time to completely charge the battery of UPS is 48 hours.

12 Injectors

The injector is provided with an additional ground cable (P/N #2135737) to meet equipotentiality requirement at patient vicinity.

12.1 Remote Injector (rack mount)

A power cord is supplied with the injector.

If the voltage is 110 VAC, the cord should be connected inside the bulkhead positioner cabinet, but it is highly recommended to connect it to a wall outlet fed by the main disconnect room device.

12.2 Pedestal Injector

A power cord is supplied with the injector.

In all cases (110 VAC or 230 VAC), it will be connected to a wall outlet near the operator location, fed by the main disconnect room device.

12.3 Injector L.F. ILLUMINA

As a result of power demand availability for all functions of this new injector, in any cases it will be connected to a wall outlet sized to 1500 W, 110 VAC or 230 VAC as nominal voltage. The wall outlet is fed by the main disconnect room device.

13 Advantage Windows

A power cord is supplied with Advantage Windows. It is connected to outlet fed by the main disconnect room device.

Verify that the ground between AW, AW splitter and monitors ground are equipotential (0.1 ohm equipotentiality between room ground point (busbar) and wall outlets).



NOTICE

To power the AW splitter, use the appropriate cable out of lot P/N 2385173.

14 MAC-LAB System EX

The best location for a MAC-LAB Acquisition Unit Floor mount kit 408431-001 isn't defined yet.

For MAC-LAB System EX, refer to: Marquette document P/N 2000465-001 Preinstallation Guide.

15 MIS (Master Interconnect System)

Innova system interconnect cables are described in MIS (Master Interconnect System) documents. These documents specify all interconnections between components within the system.

Reference: For specific Vascular system interconnect maps and connection details, refer to the following

- *Innova 2100-IQ, 3100/3100-IQ, 4100/4100-IQ MIS Map*
- *Innova 2100-IQ, 3100/3100-IQ, 4100/4100-IQ MIS Charts*

General Guidelines

Innova System introduce a new system interconnect with a star distribution for all cables from the technical area. The cables are shipped on spools to create cable groups. Cable group 1 for Exam room and cable group 2 for control room. The cable group shall be put in place during the same action. The cables are routed in the same duct.

The HV cables could be pulled separately.

16 Cable Channeling

16.1 General

High voltage and power cables must be separated from other cables. Use a separate trough in the duct system, or use a separate conduit. Minimize cable length between the line disconnect and the System Cabinet power unit to reduce voltage regulation problems and wiring costs.

For information about the cables supplied with your system, please refer to [Section 17, Physical Runs](#).

16.2 Conduit

Separate conduits must be used for power and signal wires. These wires must be kept separated from each other.

Using conduit imposes some important considerations when used with this system. Of primary concern, the majority of cables used are pre-terminated. Pre-termination greatly simplifies interconnection but makes cable-pulling difficult because of the added dimensions of the connectors.

Conduit must be large enough to pass the cable and connector through with all other cables already in the conduit. Also, the size of conduit chosen must allow for future growth. There is the possibility of additional cables being added later as the system is developed and options are added.

The use of conduit is recommended for cables running overhead between rooms, especially when a diagonal run provides the shortest cable path

Separate conduits must be used for Hospital and Fluoro UPS power wires. These wires must be kept separated from each other (at least 30 cm).

16.3 Electrical Ducts

It's important that electrical ducts have separate compartments for power and signal wires. These wires must be kept separated from each other for proper system operation.

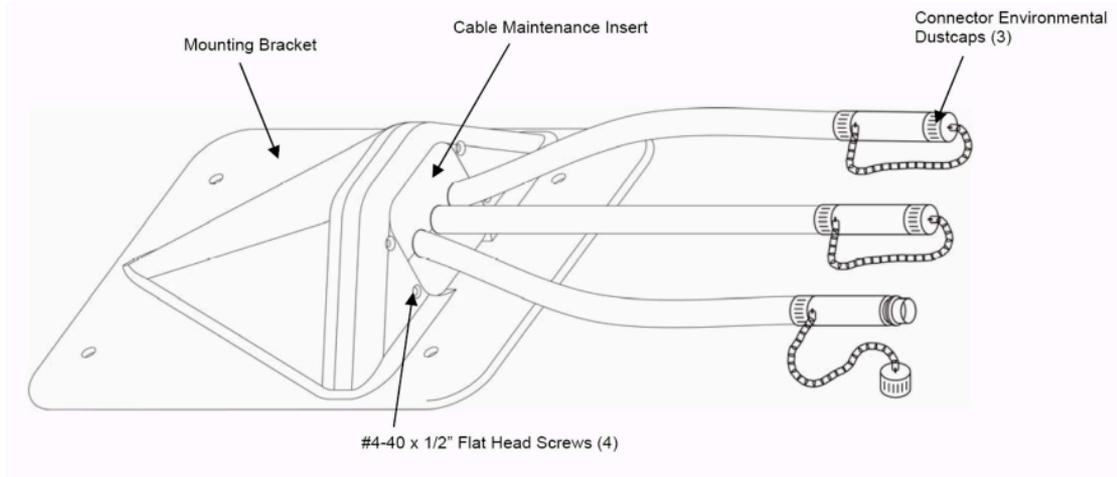
Electrical ducts have advantages, when used with a single room or two adjacent rooms. Electrical ducts combine cabling in a neat and functional appearance, with accessibility and room for expansion.

NOTE: Medrad AVANTA, IVUS and Mac-lab cables exit behind the table in the patient room.

It is the responsibility of the site planner to provide the appropriate solution to the table exit (e.g gas box, Clab II, Tram module, connection interface box)

NOTE: **MEDRAD Avanta Table mount:** A 76.2 mm (3 in) and max 25 m (984 in) length conduit between technical room and patient room shall be prepared below the floor for the three injector cables. It is recommended to use the MEDRAD Avanta floor mounting bracket to cover the duct hole in the patient room if there is no gases box.

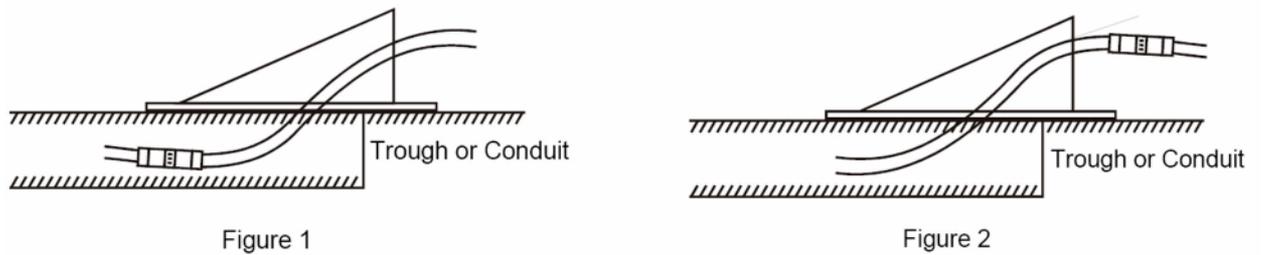
Illustration 6-16: MEDRAD Avanta mounting bracket



Floor mount installation can be accomplished one of two ways:

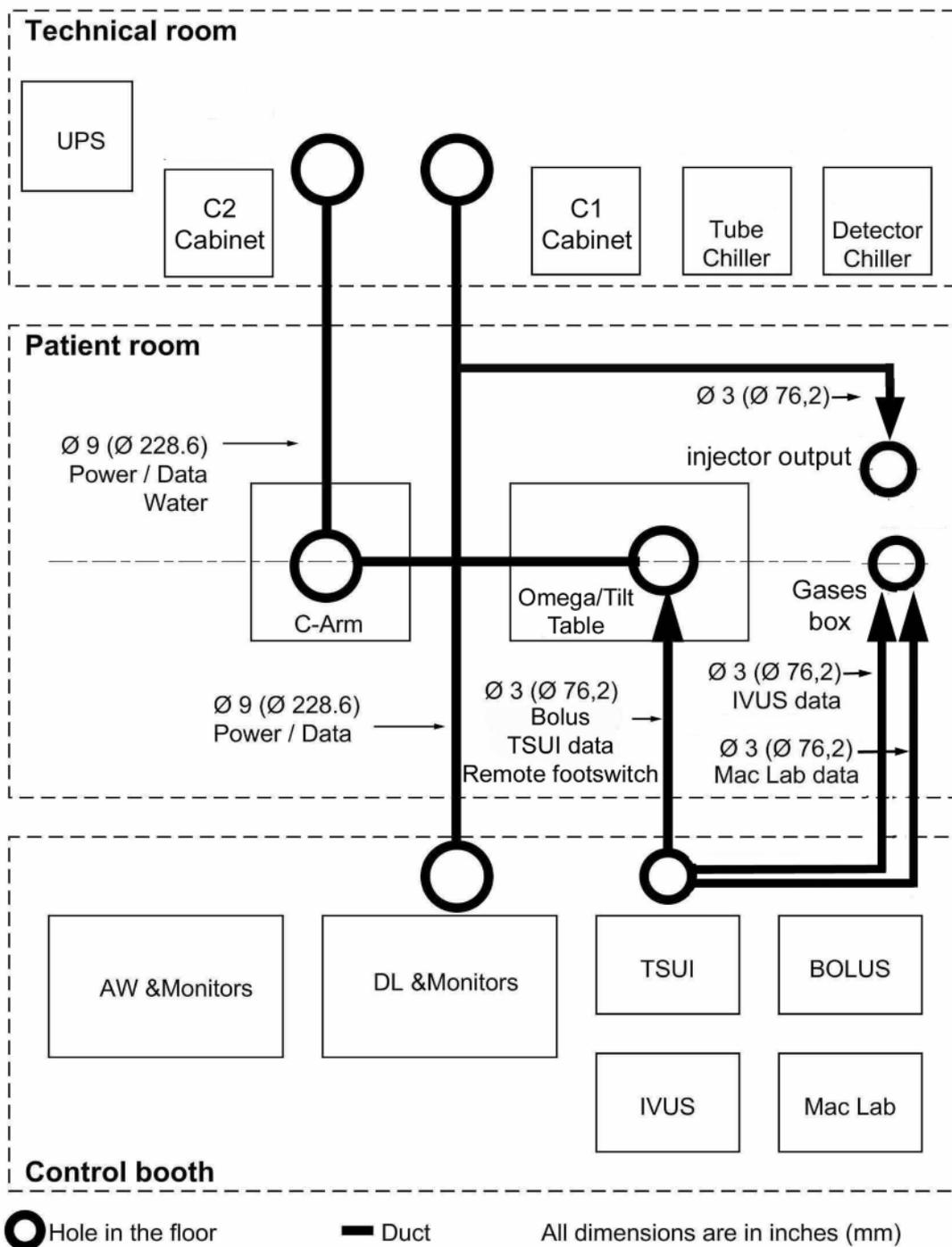
- Connectors mounted in trough under mounting bracket (Figure 1)
- Connectors mounted above mounting bracket (Figure 2)

Illustration 6-17: MEDRAD Avanta floor mounting methods



For further MEDRAD Avanta floor mounting, see the Installation guide MEDRAD Avanta Floor Mounting Bracket.

Illustration 6-18: Cable Channeling Layout

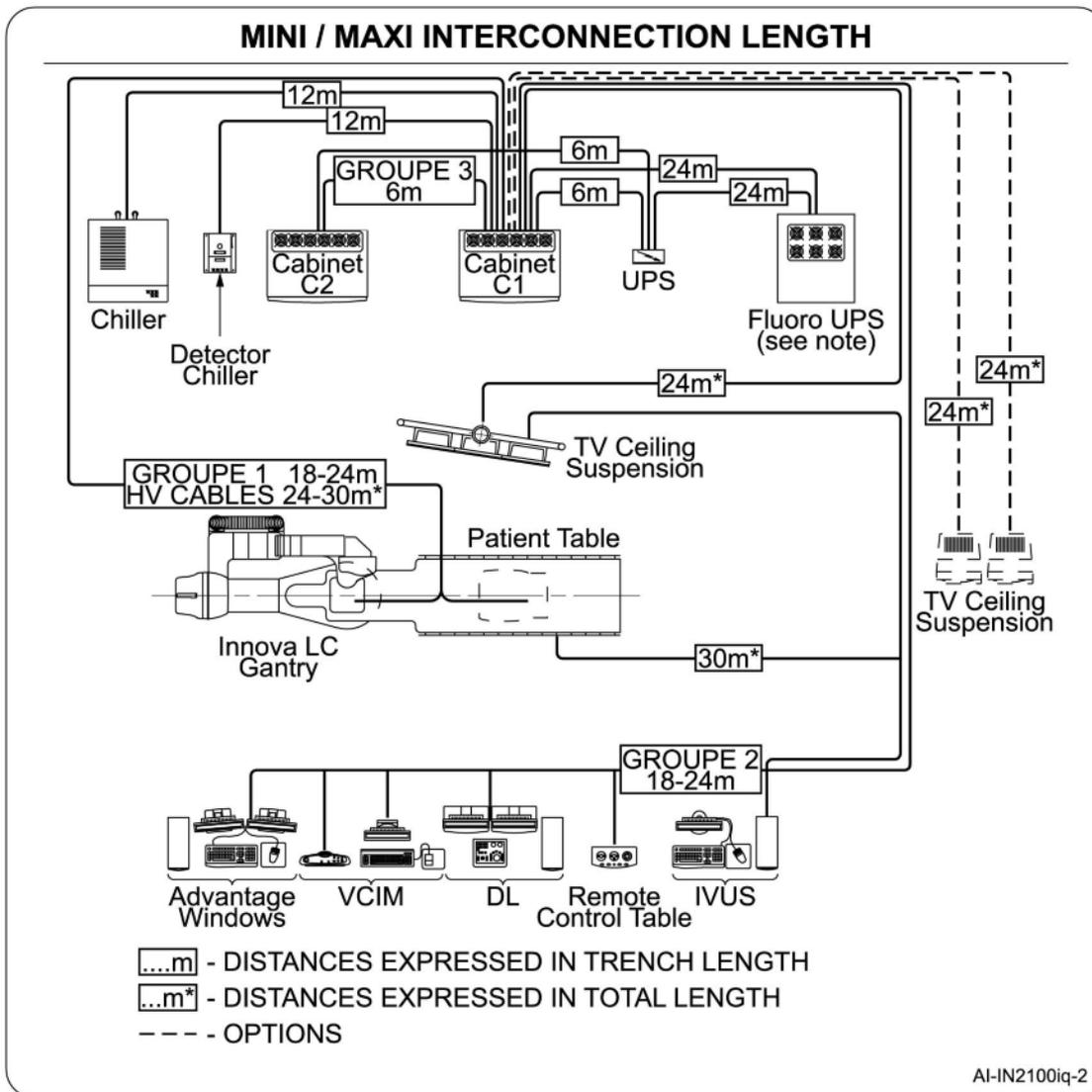


NOTE: 18 meters (59 ft) is the only cable length available for the Remote TSUI box data cable connecting remote TSUIs in the control booth and the patient table.

17 Physical Runs

17.1 Physical Run Synoptic

Illustration 6-19:



17.2 System Core Matrix



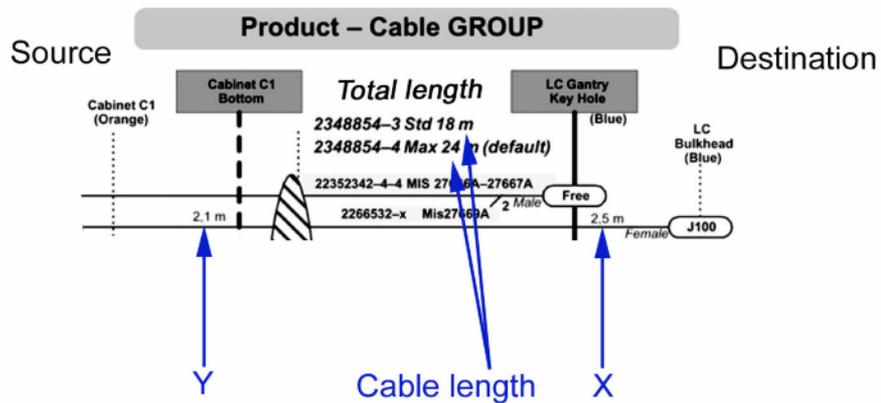
NOTICE

All lengths of cable are:

- in useable meter when you look at group level, or
- in meters (connector to connector) when you look at the cable level.

For a description of how to use the following cable group schematics, see below:

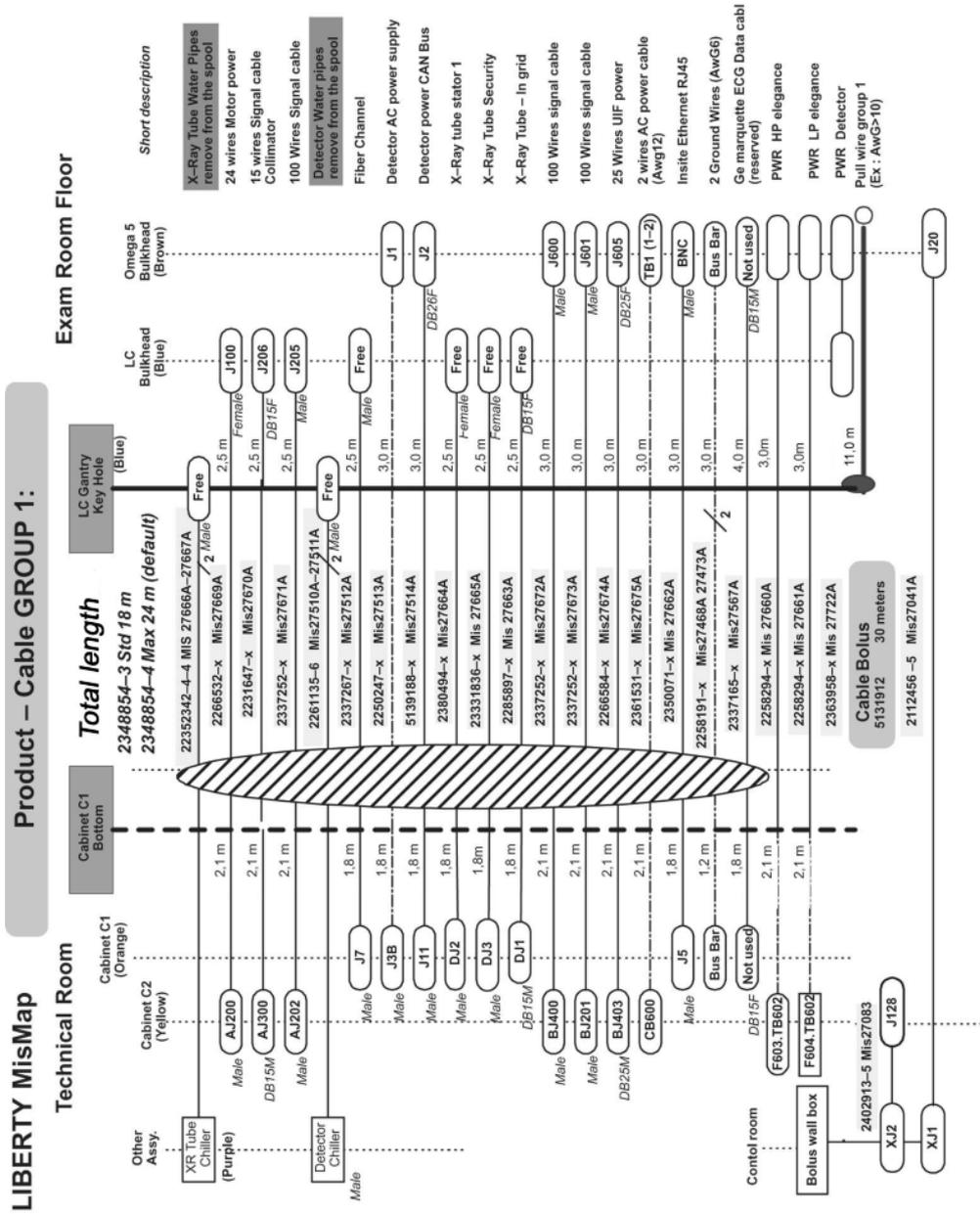
Illustration 6-20:



Cable length data is as follows:

- **Cable Length** = the total cable length, connector to connector (example above is 18/24 meters).
- **X + Y** = used length for connection within system (example above is 4.6 meters).
- **Cable Length - (X + Y)** = available length for conduit run (example above is 13.4 or 19.4 meters).

Illustration 6-21: Cable Group 1 – From Technical Area To Exam Room



NOTE – CABLES MIS 27083 & 27041: DO NOT CONNECT J128. J20 FOR BOLUS APPLICATION USE ONLY

Illustration 6-22: Cable Group 2 – From Technical Area to Control Room

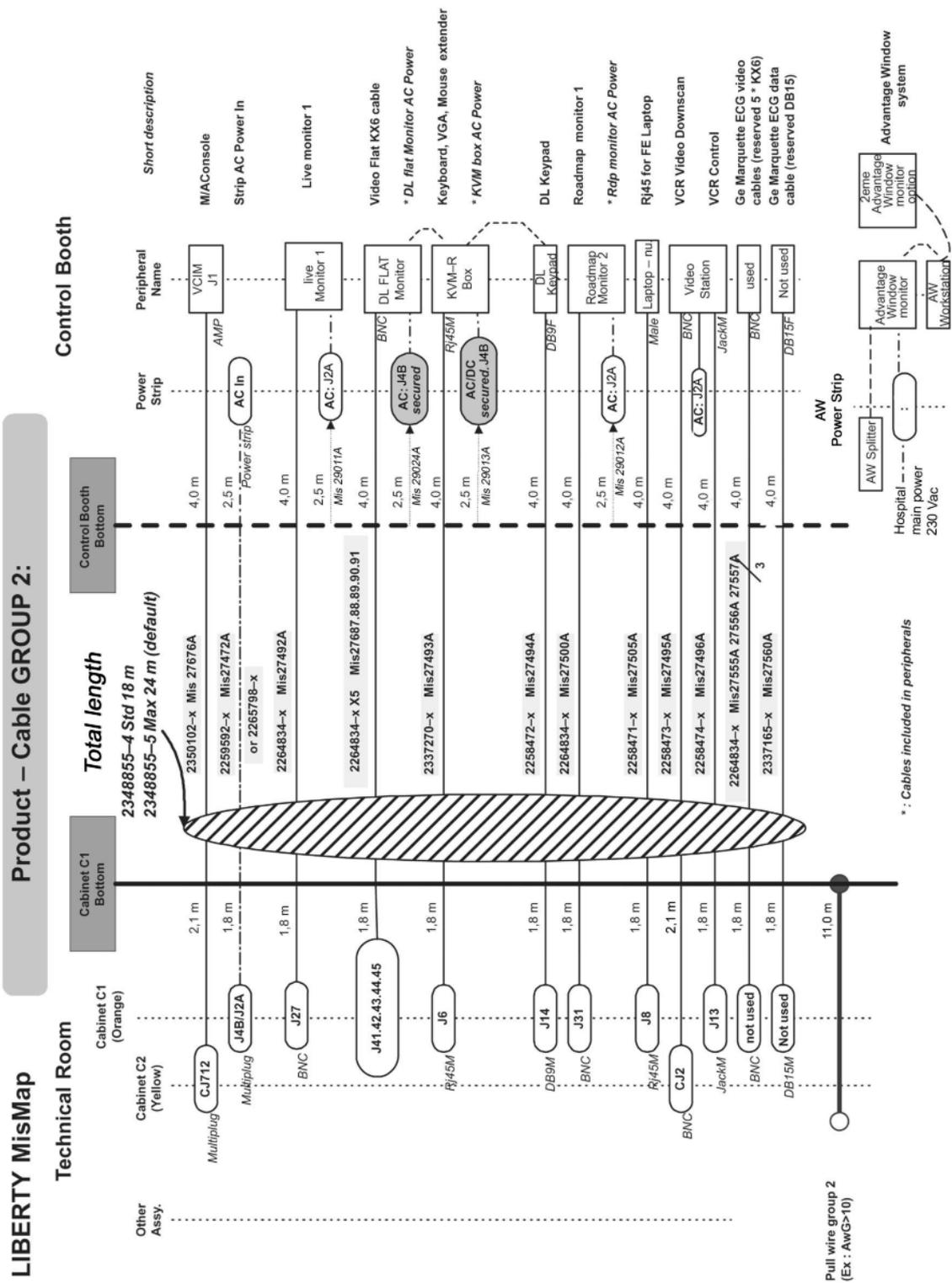


Illustration 6-23: Cable Group 3 – From Technical Area to Technical Area C1 To C2

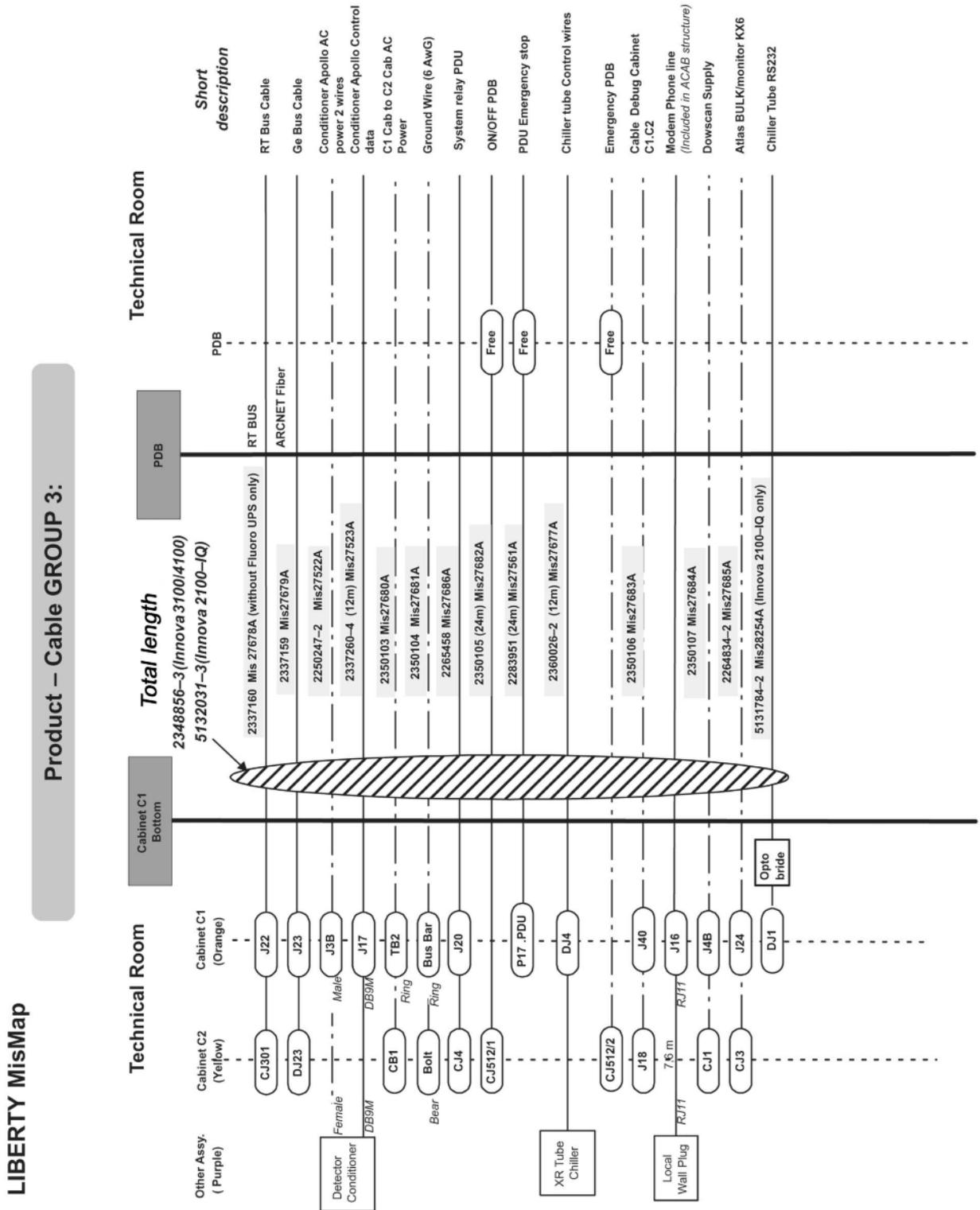
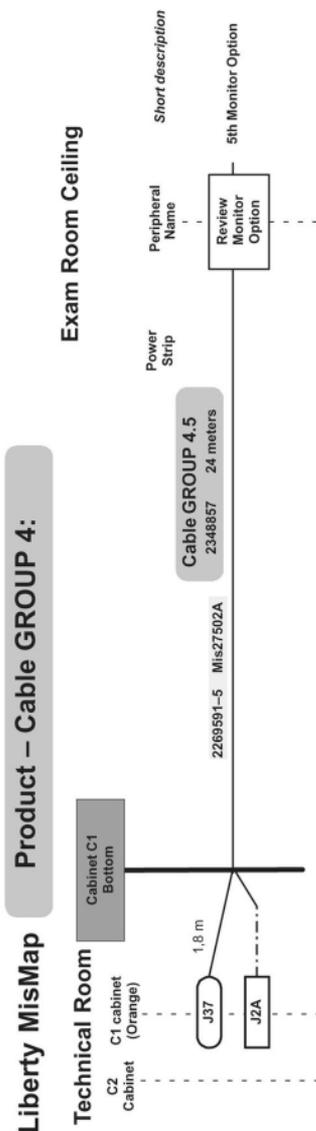


Illustration 6-24: Cable Group 4



Suspension are always pre-cabled with 24 meter cables of connector to connector Monitor options includes their 24 meters length for cabling. Extension cables (6 or 12 meters) are available for the suspension or optional monitors.

Illustration 6-25: Cable Group 4 with LCD Suspension

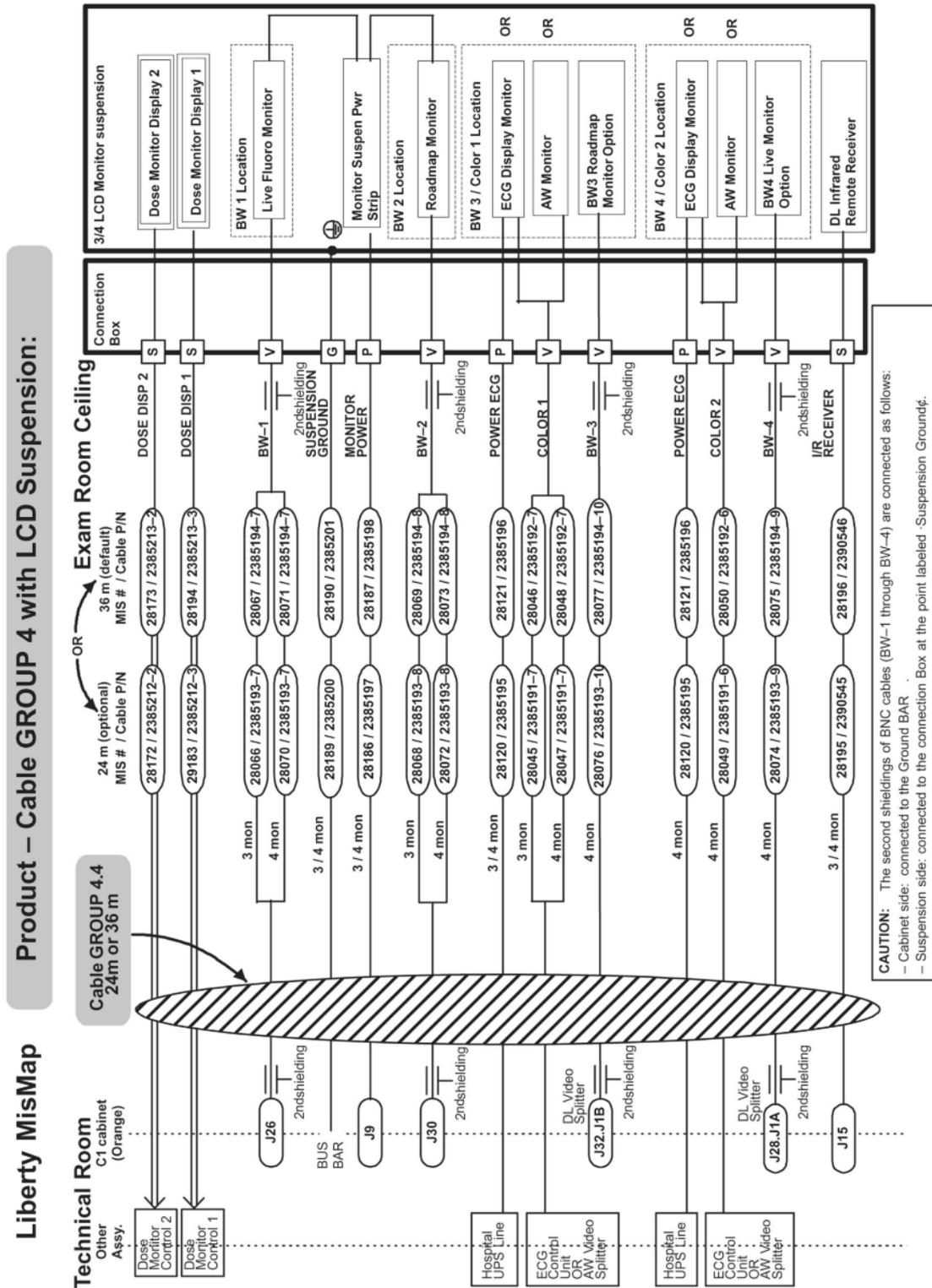
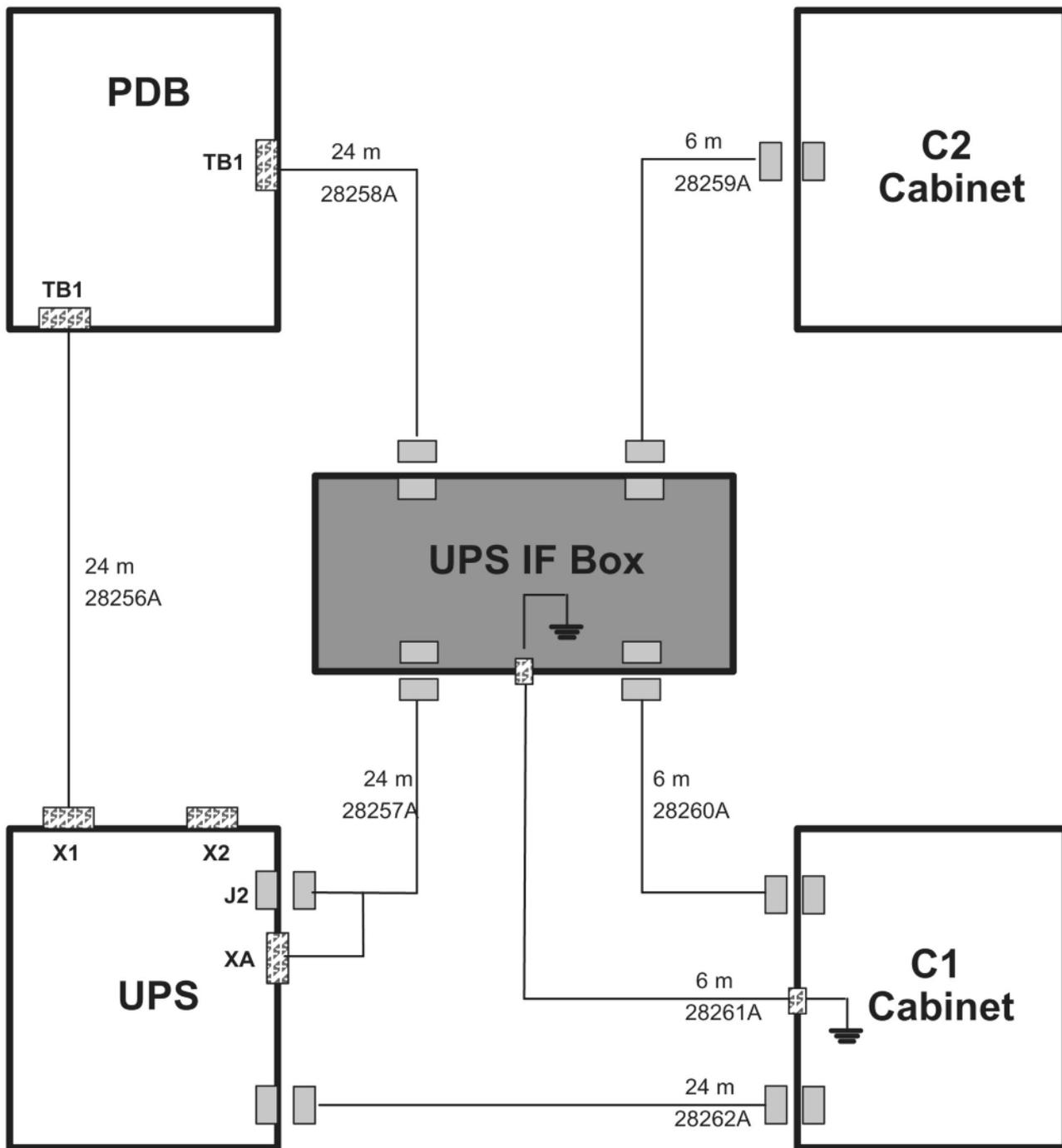


Illustration 6-26: UPS Option Cable Set



17.3 PHYSICAL RUN – SYSTEM CORE DETAIL

Table 6-3:

| MIS number | Cable Assembly | UL Style | Voltage rating (V) | Max Voltage carried (V) | Cable diameter (mm) | Connector type | Bigger Plug size (mm) |
|---|----------------|-------------------------|--------------------|-------------------------|---------------------|---|-----------------------|
| Group n°1 (From C1 / C2 cabinets to LC positioner / Table) | | | | | | | |
| 27663A | 2285897 | 2789 | 600 | | 13.8 | DB 11 pin | 34.4 |
| 27664A | 2380494 | 2463 | 600 | | 8.3 | Metrimate 6 pin | 29 |
| 27665A | 2331836 | 2463 | 300 | | 9.2 | Metrimate 6 pin | 29 |
| 27666A | 2352342 | WATER HOSE | | | | | |
| 27667A | 2252342 | WATER HOSE | | | | | |
| 27468A | 2258191 | 1019 | 600 | | 9.1 | Pre-stripping, ring terminal | 12 |
| 27473A | 2258191 | 1019 | 600 | | 9.1 | Pre-stripping, ring terminal | 12 |
| 27670A | 2231647 | 2789 | 300 | | | HES 15 pin | |
| 27510A | 2261135 | WATER HOSE | | | | | |
| 27511A | 2261135 | WATER HOSE | | | | | |
| 27512A | 2337267 | FIBER OPTIC | | | | | |
| 27513A | 2250247 | 2464 | 300 | | 7 | CEI 320 - HBL4570C plug | 38.6 |
| 27514A | 5139188 | 2789 | 30 | | 7.3 | DB 26 pin | 41.2 |
| 27675A | 2361531 | Type CL2 | 150 | | 8.2 | Pre-stripping | 8.2 |
| 27567A | 2337165 | 2464 | 300 | | 9.9 | DB 15 pin | 41.9 |
| 27660A | 2258294 | | 600 | | 6.5 | Pre-stripping | |
| 27661A | 2258294 | | 600 | | 6.5 | Pre-stripping | |
| 27662A | 2350071 | | 30 | | 7 | AMP 8 pin RJ45 | |
| 27669A | 2266532 | 2464 | 300 | | 16.2 | Circular connector | 47.8 |
| 27671A | 2337252 | 2789 | 30 | | 10.9 | Amplimite 100 pin | 84.6 |
| 27673A | 2337252 | 2789 | 30 | | 10.9 | Amplimite 100 pin | 84.6 |
| 27672A | 2337252 | 2789 | 30 | | 10.9 | Amplimite 100 pin | 84.6 |
| 27674A | 2266584 | 2464 | 300 | | 10.6 | DB 25 pin | 56.6 |
| Following cables are part of component | | | | | | | |
| 27586A | 2260420 | | | | | | |
| 27722A | 2363958 | | 300 | | 15 | AMP 25 pin | 55 |
| 27589A | 2258207 | Locaflex spec. 1311418A | | | 11.7 | HV plug | 72 |
| 27590A | 2115483 | Locaflex spec. 1311418A | | | 11.7 | HV plug | 72 |
| Group no.2 (From C1 / C2 cabinets to Control Booth) | | | | | | | |
| 27676A | 2350102 | | 300 | | 8.3 | SCSI.50 | 60 |
| 27472A | 2259592 | 4299 | 300 | 250 | | 8 plug power strip CEI320 - (HBL4570C plug - ring terminal) | 39 |
| 27492A | 2264834 | 1354 | | | | | |
| 27493A | 2337270 | Category 5 | 150 | | 5.5 | RJ45 | 14.1 |
| 27494A | 2258472 | 2464 | 300 | | 6 | DB 9 pin | 30.9 |

| MIS number | Cable Assembly | UL Style | Voltage rating (V) | Max Voltage carried (V) | Cable diameter (mm) | Connector type | Bigger Plug size (mm) |
|--|----------------|------------|--------------------|-------------------------|---------------------|--------------------------------|-----------------------|
| 27495A | 2258473 | 1354 | 30 | | 7 | BNC 75 ohms | 14.3 |
| 27496A | 2258474 | 2095 | 300 | | 4.1 | Jack plug | 25 |
| 27500A | 2264834 | 1354 | 30 | | 6 | BNC 75 ohms | 14.4 |
| 27505A | 2258471 | Category 5 | 150 | | 5.5 | RJ45 | 14.1 |
| 27555A | 2264834 | 1354 | 30 | | 6 | BNC 75 ohms | 14.4 |
| 27556A | 2264834 | 1354 | 30 | | 6 | BNC 75 ohms | 14.4 |
| 27557A | 2264834 | 1354 | 30 | | 6 | BNC 75 ohms | 14.4 |
| 27558A | 2264834 | 1354 | 30 | | 6 | BNC 75 ohms | 14.4 |
| 27559A | 2264834 | 1354 | 30 | | 6 | BNC 75 ohms | 14.4 |
| 27560A | 2337165 | 2464 | 300 | | 9.9 | DB 15 pin | 41.9 |
| 27686A | 2265458 | 2464 | 300 | | 8.1 | DB 9 pin | 34.4 |
| 27687A | 2264834 | 1354 | 30 | | 6 | BNC 75 ohms | 14.4 |
| 27688A | 2264834 | 1354 | 30 | | 6 | BNC 75 ohms | 14.4 |
| 27689A | 2264834 | 1354 | 30 | | 6 | BNC 75 ohms | 14.4 |
| 27690A | 2264834 | 1354 | 30 | | 6 | BNC 75 ohms | 14.4 |
| 27691A | 2264834 | 1354 | 30 | | 6 | BNC 75 ohms | 14.4 |
| 27041A | 2112456 | 2464 | 300 | | 7.7 | DB 9 pin | 30.9 |
| 27083A | 2126755 | 2464 | 300 | | 7.7 | DN 9 pin | 30.9 |
| 29010A | 5305995 | 2464 | 300 | | | IEC Power Connectors | |
| 29011A | 5305995 | 2464 | 300 | | | IEC Power Connectors | |
| 29012A | 5305995 | 2464 | 300 | | | IEC Power Connectors | |
| 29013A | 5305997 | 2464 | 300 | | | IEC Power Connectors | |
| 29024A | 5305995 | 2464 | 300 | | | IEC Power Connectors | |
| Group no.3 (From C1 to C2 cabinets) | | | | | | | |
| 27677A | 2360026 | 2463 | 600 | | 8.3 | Metrimate 6 pin | 29.8 |
| | | 2463 | 600 | | 13.1 | Terminal ends - ring terminals | 13.1 |
| 27678A | 2337160 | Type CL2 | Low Volt-age SCSI | | 10 | SCSI 50C | 77 |
| 27679A | 2337159 | | | | | Fiber Optic | |
| 27522A | 2250247 | 2464 | 300 | | 7 | CEI 320 - HBL4570C plug | 38.6 |
| 27523A | 2337260 | | | | | | |
| 27680A | 2350103 | | | 600 | | | |
| 27681A | 2350104 | | | | | | |
| 27682A | 2350105 | | | | | | |
| 27683A | 2350106 | | | | | | |
| 27684A | 2350107 | | | | | | |
| 27685A | 2264834 | | | | | | |
| 28254A | 5131784-2 | | | | | | |
| Following cables are part of component | | | | | | | |

| MIS number | Cable Assembly | UL Style | Voltage rating (V) | Max Voltage carried (V) | Cable diameter (mm) | Connector type | Bigger Plug size (mm) |
|---|----------------|----------|--------------------|-------------------------|---------------------|---|-----------------------|
| 27587A | | | | | | | |
| 27561A | 2283951 | | | | | | |
| Group no.4-3 (From C1 / C2 cabinets to Monitors - Standard Suspension) | | | | | | | |
| 27502A | 2269591-5 | 2343 | 300 | | 16 | (CEE22 - ring terminal - BNC50) - (BNC50 - ring terminal - HBL4570C plug) | 38.6 |
| Group no. 4-4 (From C1 / C2 cabinets to Connection Box - LCD Suspension) | | | | | | | |
| 28045 | 2385191-7 | | 30V | | | VGA | |
| 28046 | 2385192-7 | | 30V | | | VGA | |
| 28047 | 2385191-7 | | 30V | | | VGA | |
| 28048 | 2385192-7 | | 30V | | | VGA | |
| 28049 | 2385191-6 | | 30V | | | VGA | |
| 28050 | 2385192-6 | | 30V | | | VGA | |
| 28066 | 2385193-7 | 1354 | 30V | | | BNC | 14.4 |
| 28067 | 2385194-7 | 1354 | 30V | | | BNC | 14.4 |
| 28068 | 2385193-8 | 1354 | 30V | | | BNC | 14.4 |
| 28069 | 2385194-8 | 1354 | 30V | | | BNC | 14.4 |
| 28070 | 2385193-7 | 1354 | 30V | | | BNC | 14.4 |
| 28071 | 2385194-7 | 1354 | 30V | | | BNC | 14.4 |
| 28072 | 2385193-8 | 1354 | 30V | | | BNC | 14.4 |
| 28073 | 2385194-8 | 1354 | 30V | | | BNC | 14.4 |
| 28074 | 2385193-9 | 1354 | 30V | | | BNC | 14.4 |
| 28075 | 2385194-9 | 1354 | 30V | | | BNC | 14.4 |
| 28076 | 2385193-10 | 1354 | 30V | | | BNC | 14.4 |
| 28077 | 2385194-10 | 1354 | 30V | | | BNC | 14.4 |
| 28120 | 2385195 | | 300 | | | Power | |
| 28121 | 2385196 | | 300 | | | Power | |
| 28172 | 2385212-2 | 2789 | 30 | | | DB-9pin | |
| 28173 | 2385213-2 | 2789 | 30 | | | DB-9pin | |
| 28186 | 2385197 | | 300 | | | Power | |
| 28187 | 2385198 | | 300 | | | Power | |
| 28189 | 2385200 | | | | | G/Y | |
| 28190 | 2385201 | | | | | G/Y | |
| 28194 | 2385213-3 | 2560 | 30 | | 6.6 | | |
| 28195 | 2390545 | 2789 | 300 | | | DB-9pin | |
| 28196 | 2390546 | 2789 | 300 | | | DB-9pin | |
| 29183 | 2385212-3 | 2560 | 30 | | 6.6 | | |

18 PIST0017 - System Cable Routing

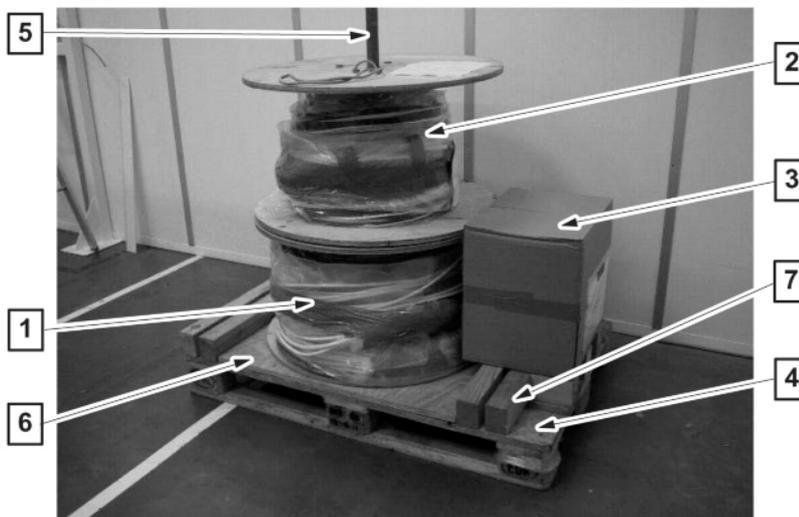
18.1 Personnel Requirements

| Personnel Requirements | Preliminary Reqs | Procedure | Finalization |
|------------------------|------------------|-----------|----------------|
| 1 | 0 min | 9 hours | Not Applicable |

18.2 Overview

The cables sets are delivered on a pallet, lengths were defined during ordering process, with the cable select process. The pallet includes group 1 **1** under group 2 **2** on two independent spools, the group 3 **3** is delivered in a separate box. The pallet could be used as a tool, to unspool the cables sets. This tool **4** includes the axis **5**, the two wooden forms **6** and the support **7**.

Illustration 6-27:



18.3 Preliminary Requirements

18.3.1 Tools and Test Equipment

| Item | Qty | Effectivity | Part# | Manufacturer |
|------------------------------|-----|-------------|-------|--------------|
| Standard engineer's toolkit. | 1 | - | - | - |

18.3.2 Safety



NOTICE

Follow the procedure to unpack the spool.

18.3.3 Required Conditions

| Condition | Reference | Effectivity |
|---|-----------|-------------|
| Gulleys, raceways in place. | - | - |
| Different subsystems shall be color coded to check the cable distribution in real time: Yellow for C2 cabinet, Orange for C1 cabinet., Blue for Gantry and Brown for Table. | - | - |

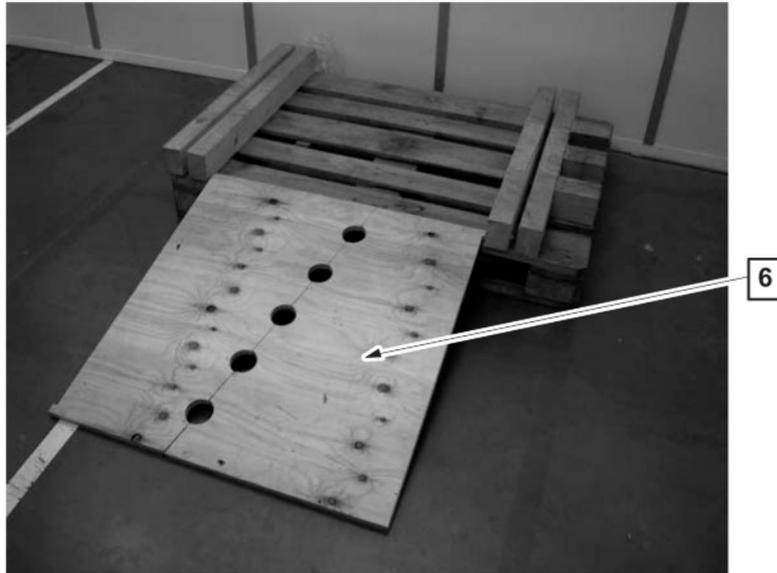
18.4 Procedure

18.4.1 Unpack the spools

1. Extract the axis (5, [Illustration 6-27](#)) from the spools.
2. Put in an other area the group 3 (6, [Illustration 6-27](#)) box.
3. Slide down by hands (avoid lifting the full load) the upper spool.
4. Slide down by hands (avoid lifting the full load) the lower spool.
5. Remove the water cables from the spool and pack in plastic bag.

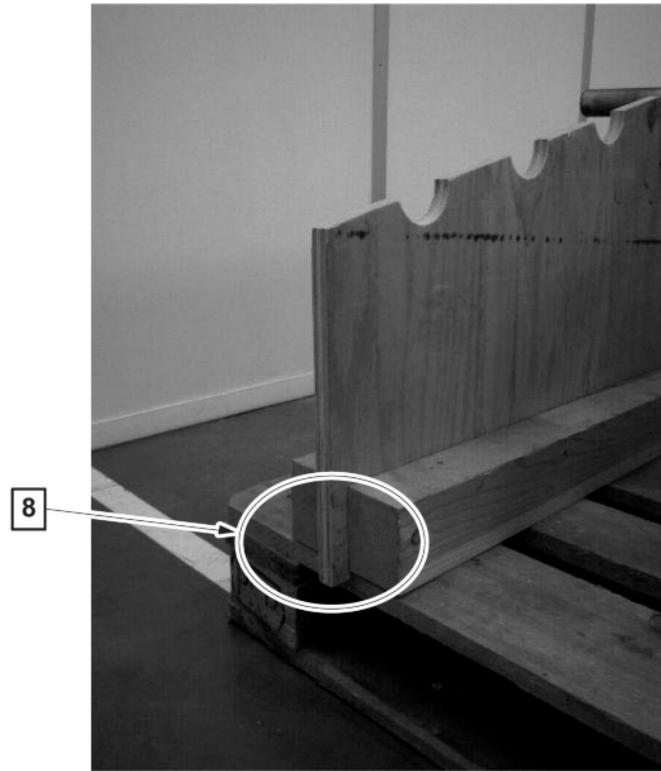
6. Use the two wooden forms as a slope to run the spool on the pallet 6. The cable set will be pulled from the bottom side of the spool.

Illustration 6-28:



7. Put in place the two forms to build side support with anchor 8.

Illustration 6-29:



8. Put the axis in the spool and raise the spool to avoid contact with the pallet.
9. Spool is ready to extract the cable sets.

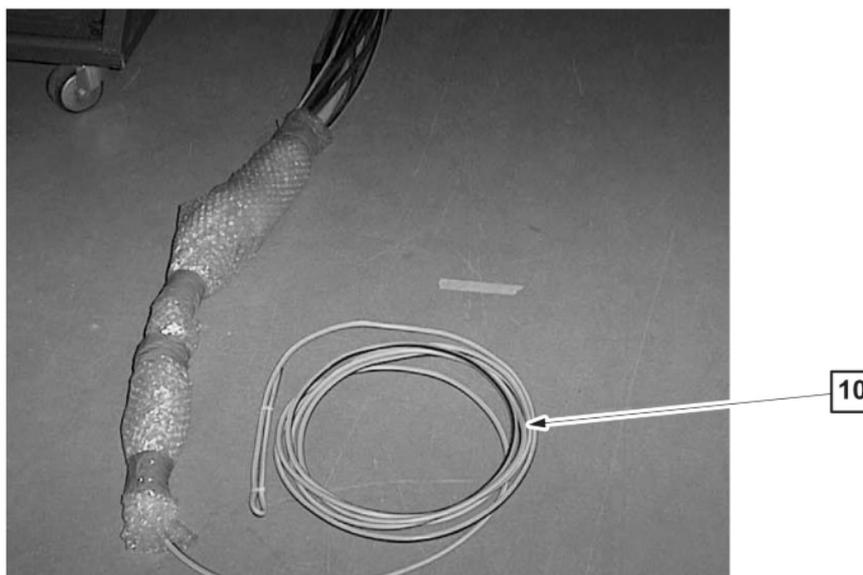
10. Cables are included in a long plastic bag 9 to limit the cables crossed. This plastic bag can be kept on site in the gullet, depending on local regulations.

Illustration 6-30:



11. Pull out the cable set from the spool. A specific pull wire 10 is attached to the opposite side of the cable set. This pull wire could be used to pull the full cable set inside the raceway, gullets or other to facilitate the run in hospital.

Illustration 6-31:



18.4.2 Run the cable Set Group 1

1. Unroll the cable set from the spool and lie it down between gantry and technical area (power cables are not linked to the cable set).
2. Unpack carefully and lie down the free cables of group 1 (optical fiber, water pipes).
3. Add a *pulling wire* to the cable or cable set to be placed in the duct.
4. Pull an other *pulling wire* through the duct between technical area and gantry.
5. Link the cable or cable set to the *pulling wire*.
6. Pull the *pulling wire* out of the appropriate duct sliding the cable set through the duct.
7. Adjust cable position at gantry and table level.
8. Unlink cable set and *pulling wire*.

NOTE: Depending on local regulations, it can be required to put water pipes and power cables in dedicated ducts.

NOTE: The power cable detector between Omega V and LC (mischart 27722A) is not part of spool but part of group 1.

18.4.3 Run the cable Set Group 2

1. Unroll the cable set from the spool and lie it down between control booth and technical area (power cables are not linked to the cable set).
2. Add a *pulling wire* to the cable or cable set to be placed in the duct.
3. Pull an other *pulling wire* through the duct between technical area and control booth.
4. Link to the *pulling wire* the cable or cable set to be placed in the duct.
5. Pull the *pulling wire* out of the appropriate duct sliding the cable set through the duct.
6. Adjust cable position in the control booth.
7. Unlink cable set and *pulling wire*.
8. Power strip and KVM support have to be attached on the wall.
9. The power strip delivers two powers:
 - UPS type: Flat panel, KVM, one free.
 - Non UPS type: External CD, Live monitor, roadmap monitor, two free.

NOTE: Depending on local regulations, it can be required to put power cables in dedicated ducts.

18.4.4 Run the cable Set Group 4

18.4.4.1 If no extended cables required (24 meters standard length)

1. Lay down the cable set of the 3-Monitor or 4-Monitor suspension.
2. Place a *pulling wire* in the duct between monitor suspension and technical area.
3. Link the *pulling wire* to the cable set, pull the cable set through the duct.
4. Adjust the cable length at suspension level in order and check that the suspension bridge is free to move.
5. Unlink the *pulling wire*.

NOTE: Depending on local regulations, it can be required to put power cables in dedicated ducts.

18.4.4.2 If cable extension required (24 meters standard too short)

1. Fix the connection box to the wall as shown on the reservation plan.
2. Lay down the cable set of the 3-Monitor or 4-Monitor suspension.
3. Place a *pulling wire* in the duct between monitor suspension and connection box.
4. Link the *pulling wire* to the cable set, pull the cable set through the duct.
5. Adjust the cable length at suspension level in order and check that the suspension bridge is free to move.
6. Unlink the *pulling wire* and connect the cables to the connection box.
7. Plug the extended cables **1** to the connection box and place cables in the duct between connection box and technical area.

NOTE: It can be required to put power cables in dedicated ducts.

Illustration 6-32:



18.4.5 Run the cables for extra monitors

NOTE: Depending on local regulations, it can be required to put power cables in dedicated ducts.

1. Extra monitors located in patient room are delivered with three cables: video cable, ground cable and power cable. These cables are 24 meters standard length. The cables can be extended using same option as monitor suspension uses.

18.4.6 Run the cable Set Group 3

Group 3 links the components of the technical room.

NOTE: Depending on local regulations, it can be required to put power cables in dedicated ducts.

1. The cable set is delivered in the box, each cable is individual:
 - C1 cabinet and C2 cabinet shall be close to each other, length reference is C1 entrance.
 - Chiller and conditioner shall be at 12 meters maximum from their control subsystem.
 - Use the cable rings to run the different cables on subsystems in conformity with the subsystem color coded (See this procedures *Required Conditions*).
 - Set of cables includes:
 - 2 cables between Jedi and Chiller.
 - 3 cables between C1 and C2 cabinets.
 - 6 cables between C2 and C1 cabinets.
 - 2 cables between C1 cabinet and conditioner.
 - 2 cables between C1 cabinet and Phone plug / PDB.

18.4.7 Routing of the Acquisition cable for Mac/lab

1. The Mac/lab acquisition cable #417335-003 is delivered as part of the pre installation kit of Innova.
2. This 70 foot cable shall be routed in the cable channel between the control room and the table foot.

18.5 Finalization

No finalization steps.

19 PIST0018 - System Facility Power

19.1 Personnel Requirements

| Personnel Requirements | Preliminary Reqs | Procedure | Finalization |
|------------------------|------------------|-----------|----------------|
| 1 | Not Applicable | 15 mins | Not Applicable |

19.2 Overview

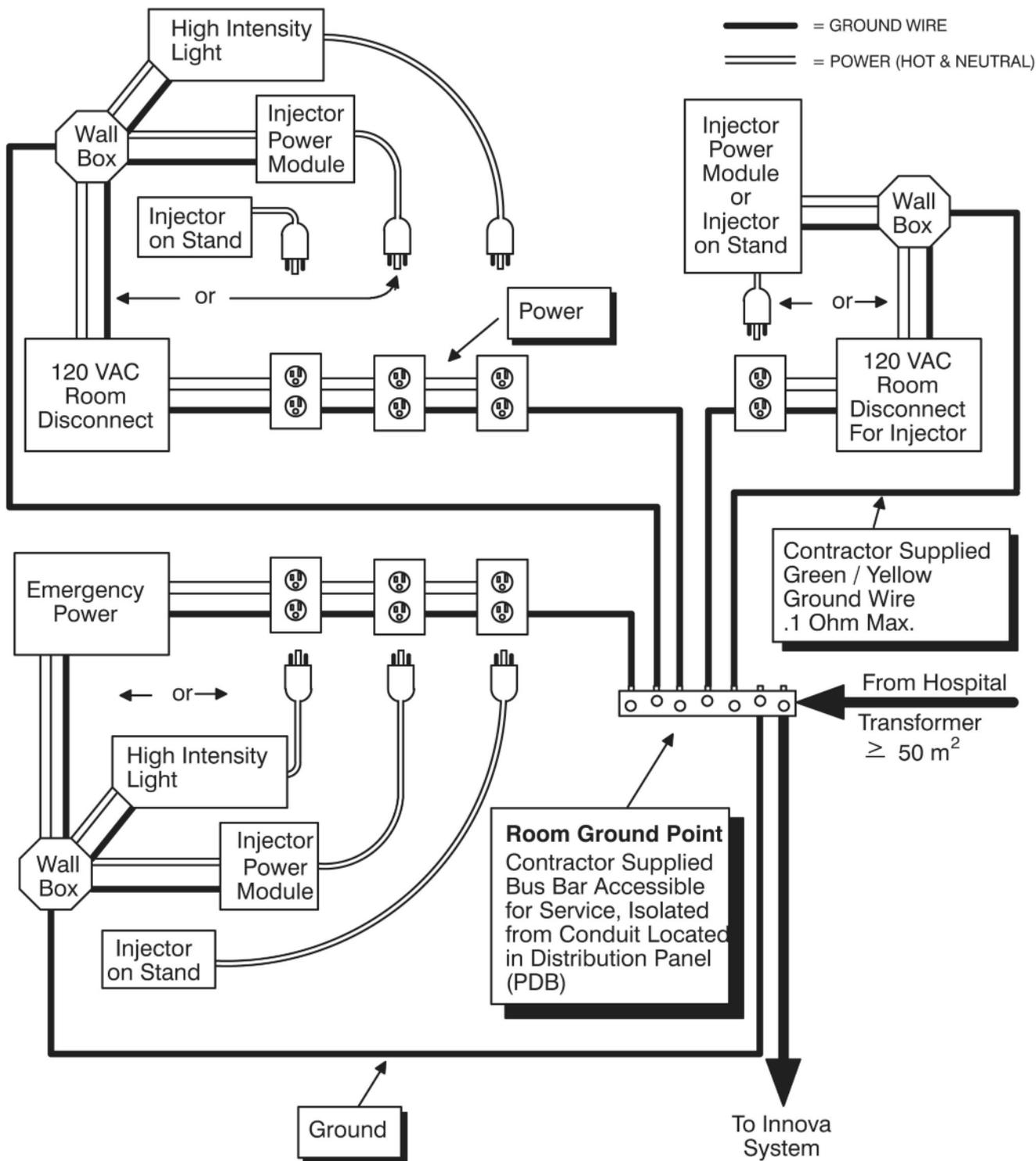
Invasive procedure room shall have all exposed metal parts that *are likely to become energized*, grounded to an approved grounding bus called room ground point. The room ground point is located:

- in the distribution panel (PDB) for Innova system and for any other medical devices powered in the examination room (refer to [Illustration 6-35](#)).
- in the C1 Cabinet for Innova subsystems.

NOTE: All room outlets and emergency power sources in the room shall isolated ground receptacles with the primary grounding coming from the power source and a secondary ground bonded to the room ground point. For the receptacle or electrical box which powers the injectors power module there must be one ground wire back to the room ground point even if the power module is in a separate room.

All ground wire impedances shall be less than 0.1 Ω when measured to the room ground point.

Illustration 6-33: Room ground point description



19.3 Procedure

1. NOTE: The facility shall provide to the GE installation specialist a written statement that the grounding and power supply meets General Electric's specifications including the 2 ohms to earth before the system installation begins.
2. The local service or installation specialist, to be determined by local service, shall do a physical walk through to the facility to insure that the following are correct:
 - a. The ground wires are the same size as the power feeder or AWG 1/0 whichever is larger.
 - b. The grounds at junction points are connected in an approved grounding bus.
 - c. Grounds within an enclosure must be tied together with copper wire or approved buss bar (i.e., separate buss bars within an enclosure must be tied together with copper wire of appropriate size).
 - d. The ground originates at the power sources, i.e., transformer or entrance panel in facility.
 - e. When more than one ground terminal is mounted on the ground screw, the incoming terminal shall always be mounted first and removed last.

Illustration 6-34:

Customer's Confirmation

Signature below confirms that all customer/contractor supplied equipment (see definition in NEC article 100) and wiring conductors required have been installed will provide power as specified in GE Medical System preinstallation drawings and meets requirements set forth in GE Medical System direction 2290880-10 Innova 2000/3100/4100 Cardiovascular Imaging System Pre-Installation K Installation Procedures.

GROUND IMPEDANCE WAS MEASURED TO BE _____ OHMS.

DATE: _____

CUSTOMER'S NAME: _____

SIGNATURE: _____

Illustration 6-35: Ground connection at distribution panel without Fluoro UPS option

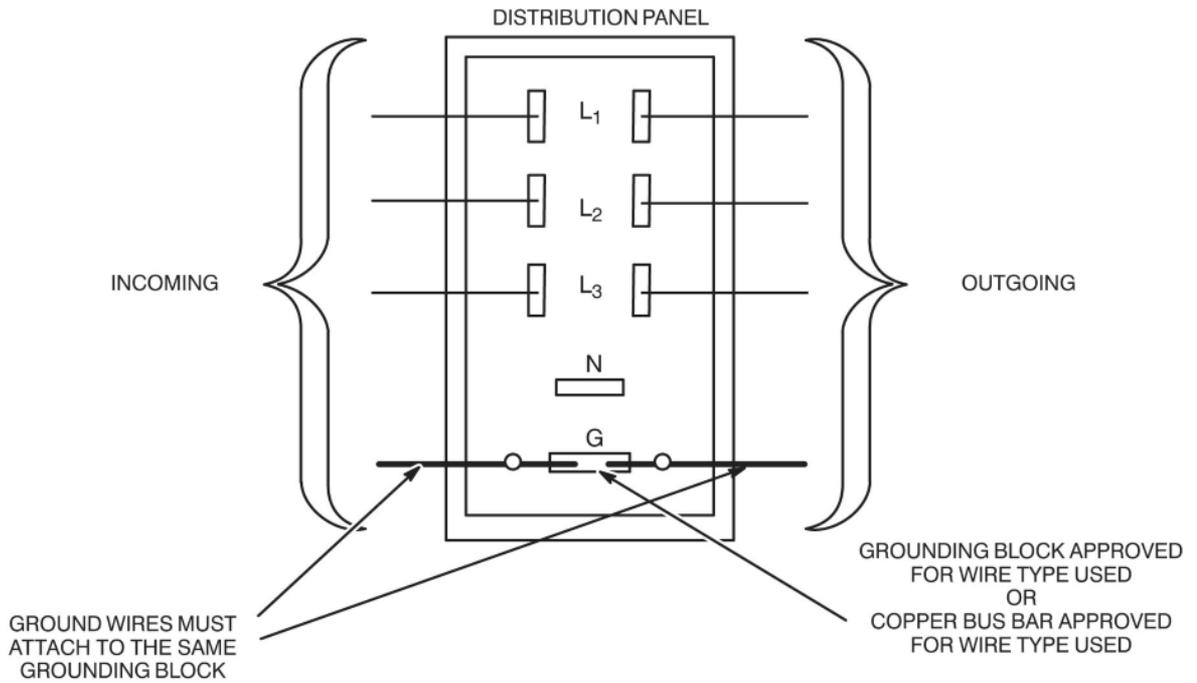


Illustration 6-36: Ground connection at distribution panel with Fluoro UPS option

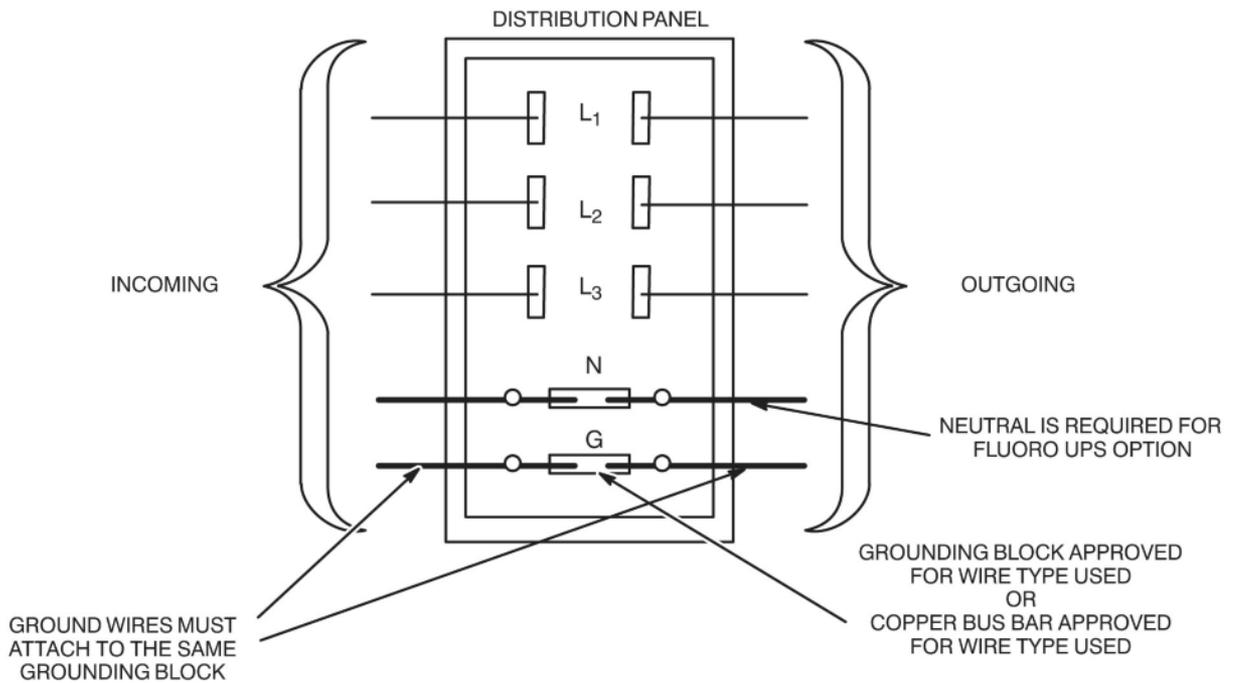


Illustration 6-37: Wire impedance test

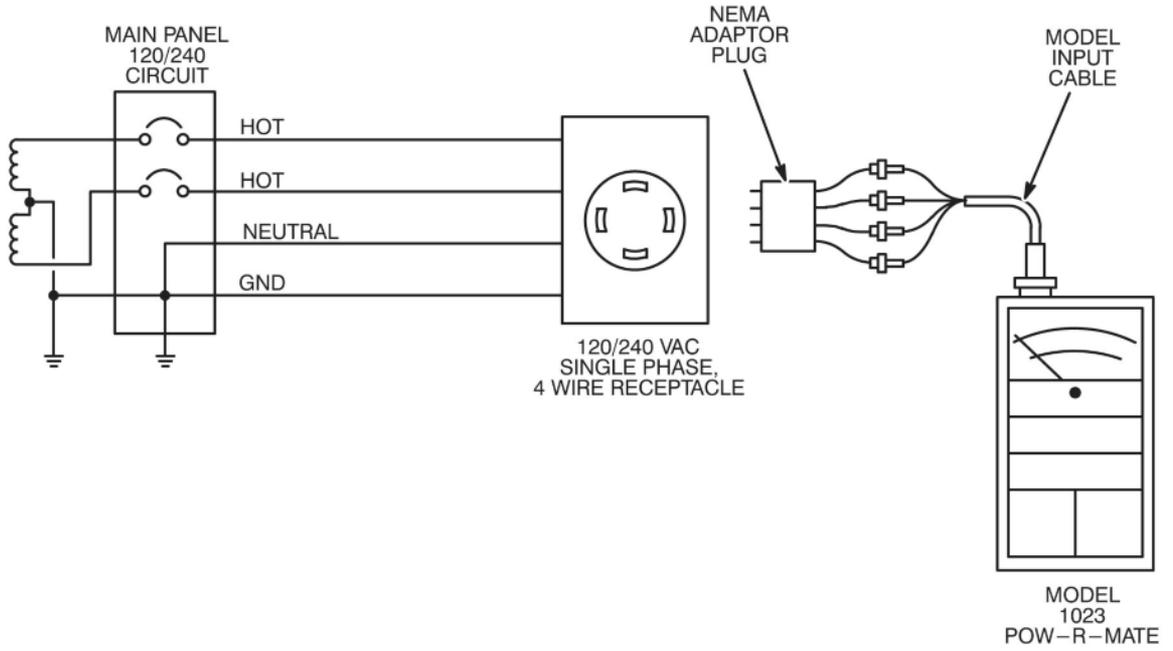
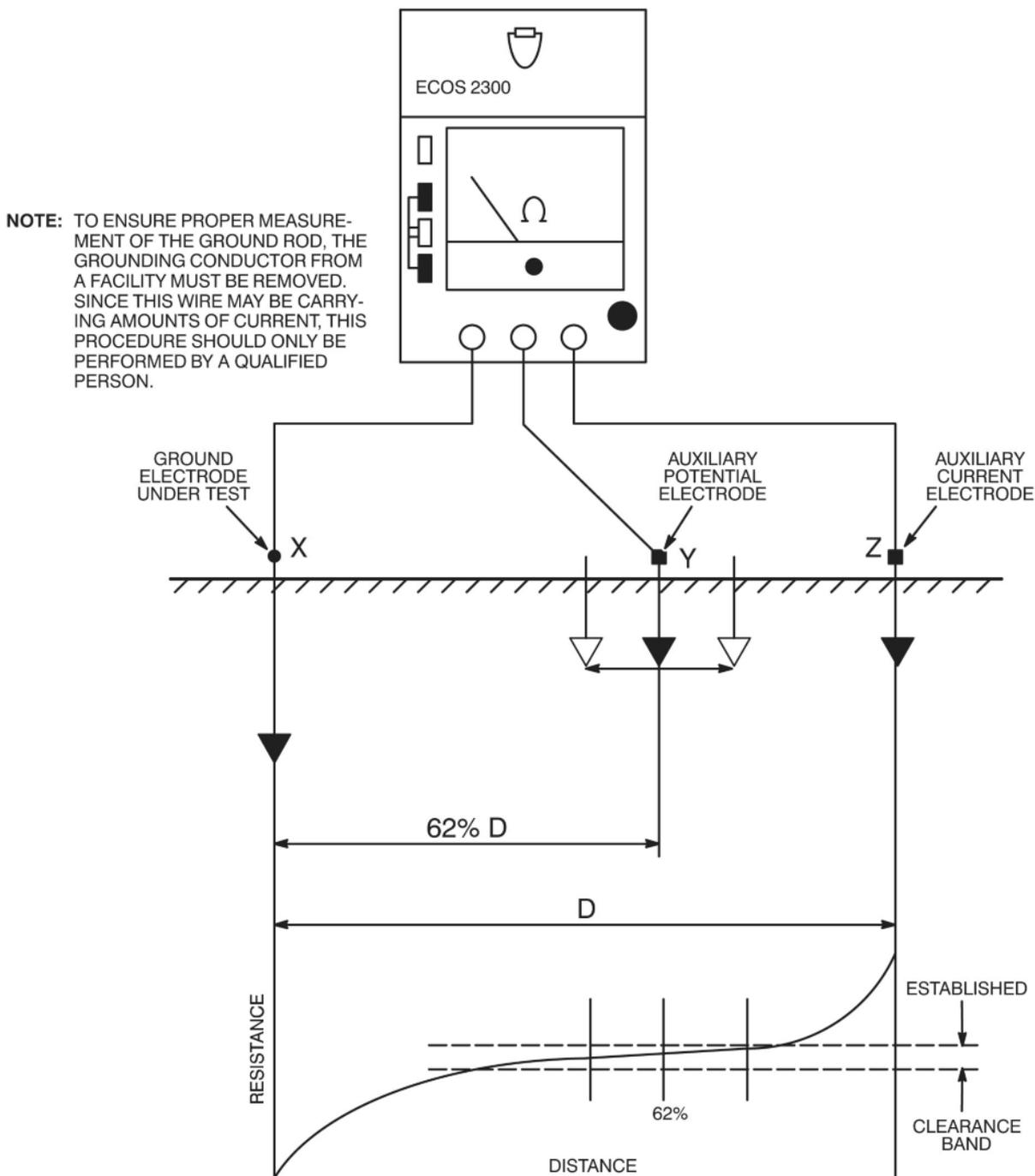


Illustration 6-38: Ground rod impedance test



3.

19.4 Finalization

No finalization steps.

20 PIST0021 - US Fluoro UPS and PDB connection

20.1 Personnel Requirements

| Personnel Requirements | Preliminary Reqs | Procedure | Finalization |
|------------------------|------------------|-----------|----------------|
| 1 | Not Applicable | 1 hour | Not Applicable |

20.2 Preliminary Requirements

20.2.1 Tools and Test Equipment

| Item | Qty | Effectivity | Part# | Manufacturer |
|-------------------------------------|-----|-------------|-------|--------------|
| Standard Service Engineer's toolkit | 1 | - | - | - |

20.2.2 Required Conditions

| Condition | Reference | Effectivity |
|---|-----------|-------------|
| The PDB is already installed | - | - |
| Power cables are as follows: (1) From PDB to UPS rectifier input = 4x6 AWG recommended (4x3 AWG max) (3ph + PE). (2) Bypass = 5x8 AWG recommended (5x3 AWG max)(3ph + N+PE). (3) From UPS output to PDB = 5x8 AWG recommended (5x3 AWG max)(3ph + N+PE).. | - | - |
| Cable sizing shall follow local requirements. | - | - |
| Power cable Mechanical Terminals Torque Specification: < 3 Nm / < 27 lb.in for 20 AWG to 3 AWG. | - | - |
| Check the UPS shipping date marked on the packaging label. Commissioning of the UPS must be performed within 3 months after that date. | - | - |

20.3 Procedure

20.3.1 Connection of the Power Distribution Box

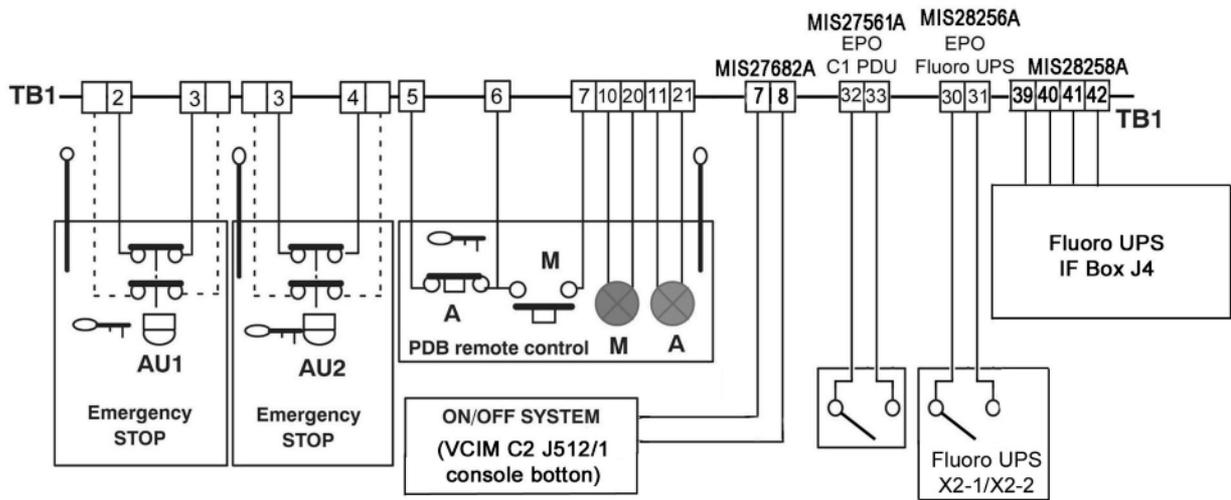


NOTICE

Hospital main power must enter from the Top. Correct phase sequence during installation is very important. Phase failure relays are provided to monitor voltages less than 85%, loss of a phase, or incorrect phase sequence. Corrections to the phase sequence must be corrected only at the line side of the main circuit breaker CB1.

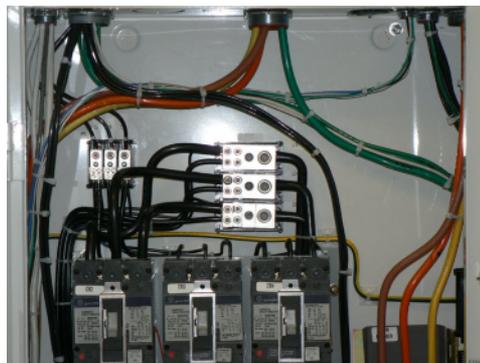
1. Connect the ON/OFF, Remote control and Emergency Power Off devices.

Illustration 6-39:



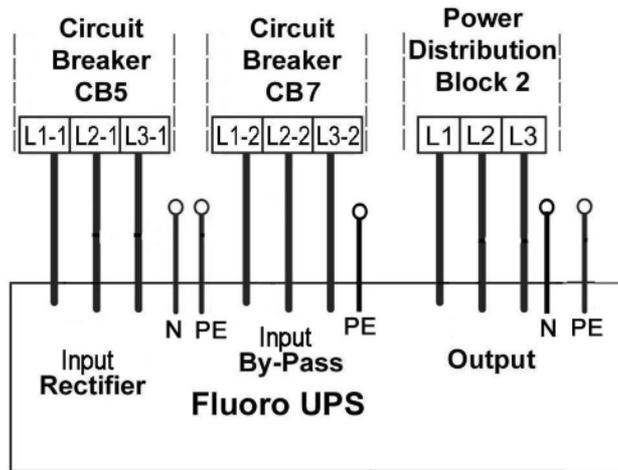
2. If the Fluoro UPS option is installed, remove the L1A, L2A and L3A jumpers linking the Power Distribution Block 1 and the Power Distribution Block 2.

Illustration 6-40:



3. Connect the Power distribution cables.

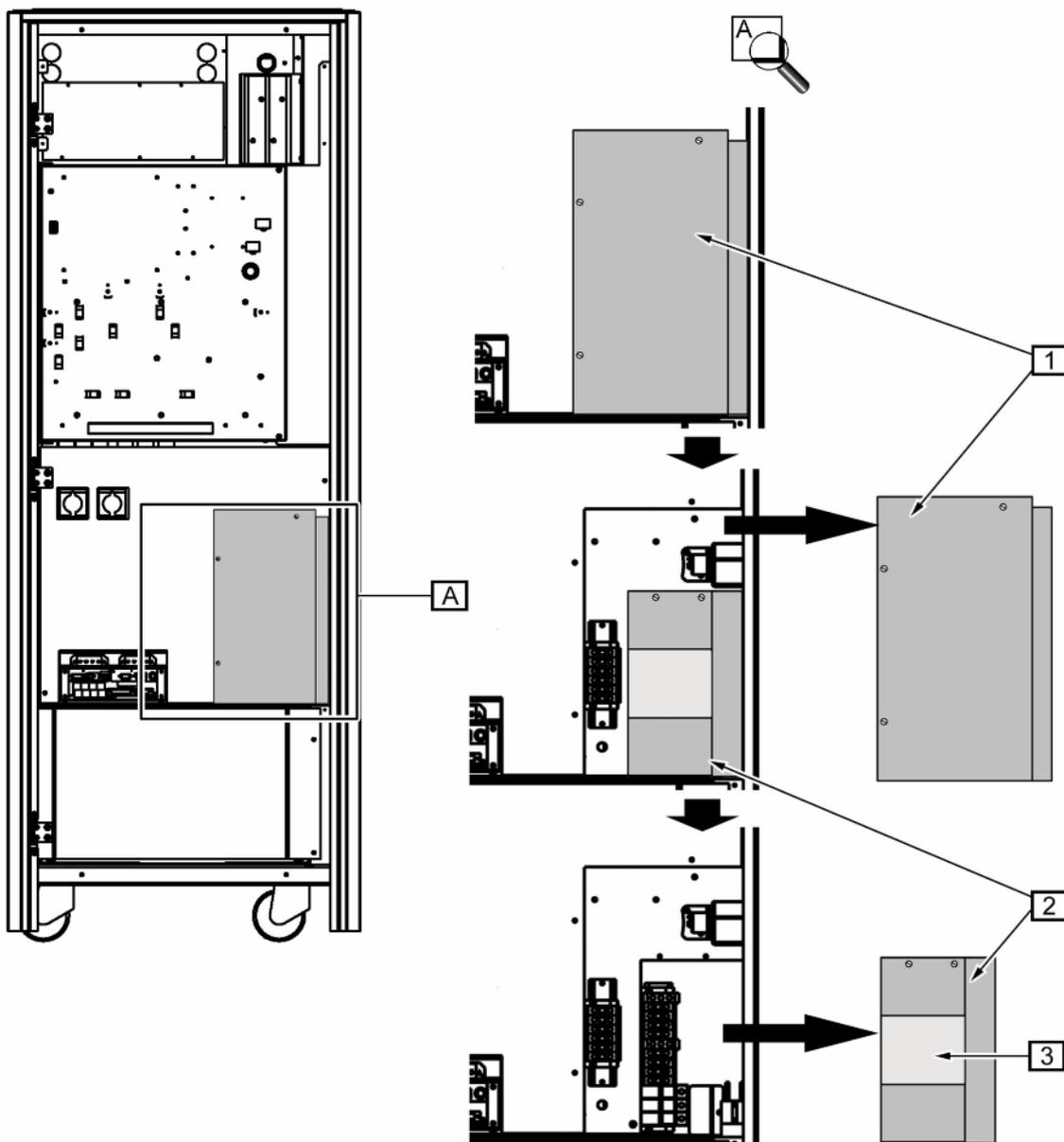
Illustration 6-41:



20.3.2 Connection of the Fluoro UPS Option Cables

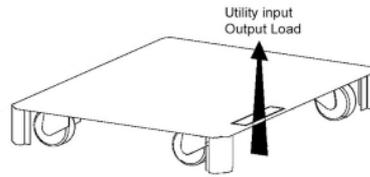
1. Connect the Fluoro UPS power cables.
 - a. Remove the protection panel 1.

Illustration 6-42:



- b. Remove the protection panel (2, Illustration 6-42).
- c. Remove the metallic window (3) from the protection panel (2) (Illustration 6-42).
- d. The power cable shall enter the UPS by the bottom right hand side entry:
 - i. Remove RHS UPS cover (remove two top screws make two bottom screws loose),
 - ii. Remove bottom cover plate.

Illustration 6-43:



- iii. Drill a hole in the bottom cover plate for cable access.



WARNING

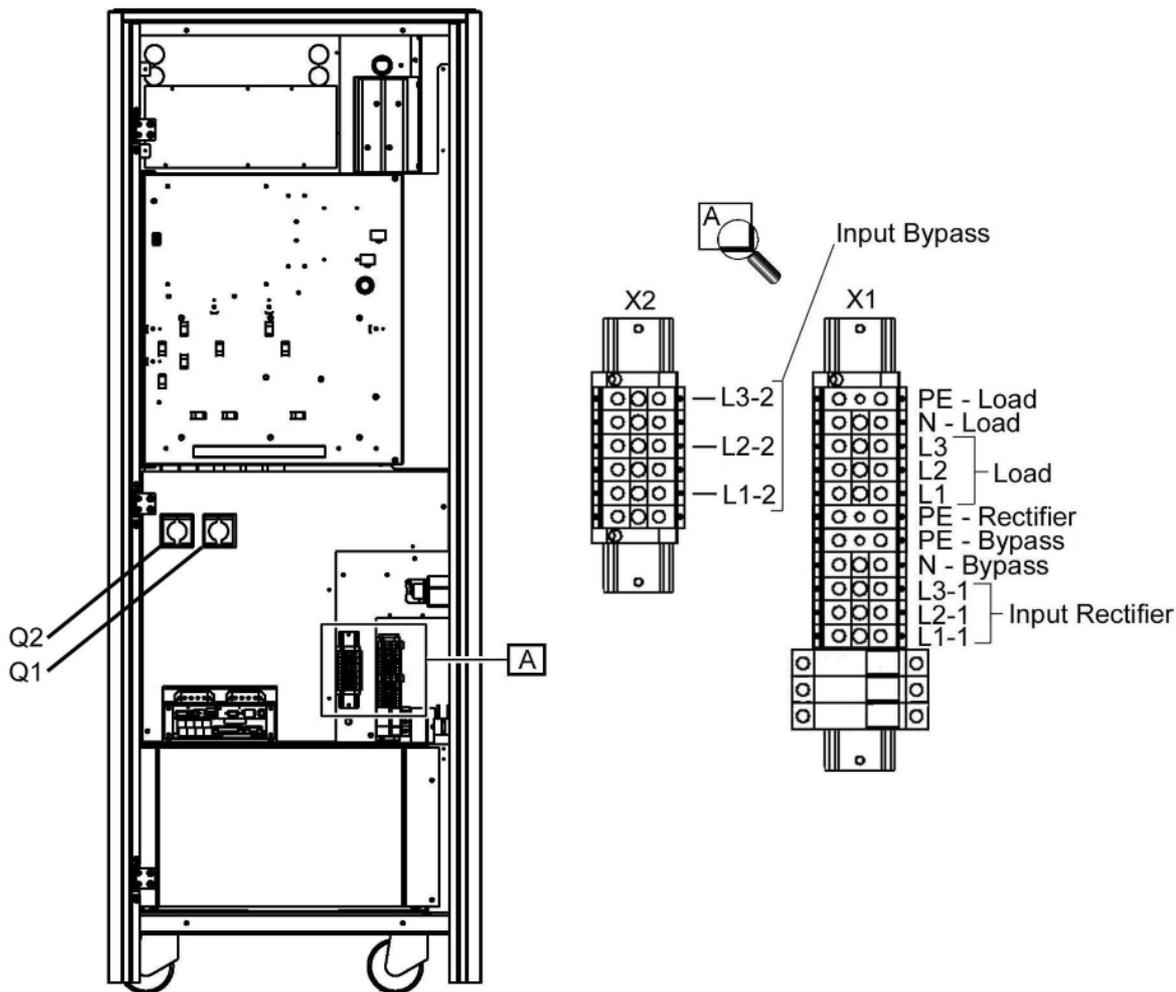
**RISK OF ELECTRIC SHOCK
HIGH VOLTAGE PRESENT**

THE FLUORO UPS REQUIRES COMMO

N POWER INPUT FOR RECTIFIER AND BYPASS . JUMPERS SHALL BE KEPT.

- e. Check the jumpers linking the terminals L1-2, L2-2 and L3-2, are properly installed.

Illustration 6-44:



- f. Connect the Fluoro UPS rectifier input cable from PDB CB5 as follows (Illustration 6-44):
- Rectifier input phase 1 to X1-L1-1 terminal,
 - Rectifier input phase 2 to X1-L2-1 terminal,
 - Rectifier input phase 3 to X1-L3-1 terminal,
 - Rectifier ground to X1-PE-rectifier terminal.
- g. Connect the Fluoro UPS by-pass input cable from PDB CB7 as follows (Illustration 6-44):
- By-pass input phase 1 to X2-L1-2 terminal,
 - By-pass input phase 2 to X2-L2-2 terminal,
 - By-pass input phase 3 to X2-L3-2 terminal
 - By-pass neutral input to X1-N-Bypass terminal.
 - By-pass ground to X1-PE-Bypass terminal.

- h. Connect the Fluoro UPS output cable from PDB power block 2 as follows ([Illustration 6-44](#)):
- Output load 1 to X1- L1 terminal,
 - Output load 2 to X1-L2 terminal,
 - Output load 3 to X1-L3 terminal,
 - Output load neutral to X1-N-Load terminal.
 - Ground to X1-PE-Load terminal.

2. Tie the power cables to the UPS and place the protection plates back on the UPS.

20.4 Finalization

No finalization steps.

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Chapter 7 Additional Planning Aids

1 Shipping Information

1.1 Product Shipping Information

Refer to the table below. To obtain shipping information for components not specified in the table, refer to the appropriate component Pre-Installation Manual listed in [Chapter 2, Section 3, Basic Innova System Compatibility](#).

Table 7-1:

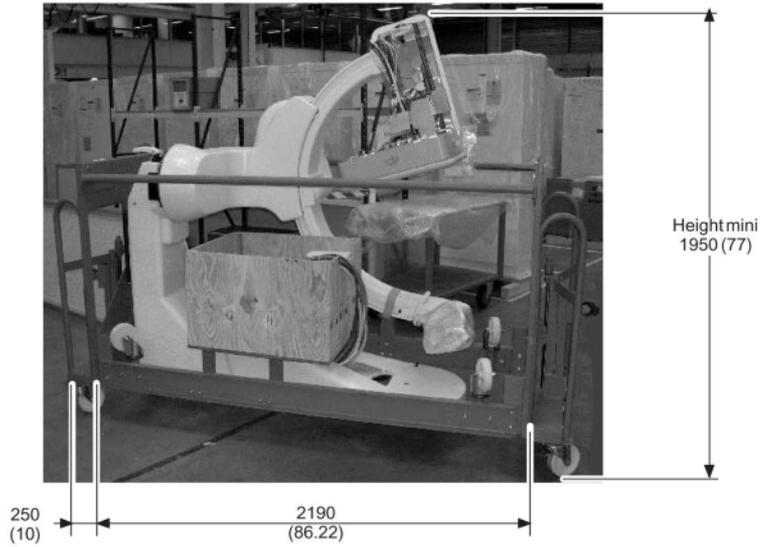
| PRODUCT OR COMPONENT | DIMENSIONS INCHES (METERS) | | | WEIGHT POUNDS (KILOGRAMS) | METHOD OF SHIPMENT |
|--|----------------------------|-------------|--------------|---------------------------|--|
| | Height | Width | Depth | | |
| Innova LC Positioner | 77 (1.95) | 110 (2.79) | 45.5 (1.16) | 2,340 (1060) | Shipping Dolly. See Illustration 7-1 |
| | 90.5 (2.30) | 54.5 (1.38) | 114 (2.90) | 2,645 (1200) | Air shipment. See Illustration 7-2 |
| C2 Cabinet | 70.8 (1.80) | 35.4 (0.90) | 25.6 (0.65) | 769.4 (349) | On pallet. See Illustration 7-3 |
| Omega Table Base Assembly | 49 (1.24) | 38 (0.96) | 84.2 (2.14) | 1,290 (585) | On pallet. See Illustration 7-4 |
| Omega Table Top Assembly | 9 (0.22) | 137 (3.47) | 33 (0.84) | 155 (70) | On pallet. See Illustration 7-4 |
| Innova ^{IQ} Table Base Assembly | 45.7 (1.16) | 39.4 (1) | 84.6 (2.15) | 1653 (750) | On pallet. See Illustration 7-6 |
| C1 Cabinet | 70.8 (1.80) | 35.4 (0.90) | 25.6 (0.65) | 1226 (556) | On pallet. See Illustration 7-3 |
| DL User parts | 41 (1.04) | 33.9 (0.86) | 26.8 (0.68) | 220 (100) | On pallet |
| Videostation VCR | 11.5 (0.29) | 21.3 (0.54) | 16.2 (0.41) | 210 (95) | On pallet |
| X-Ray tube housing | 37.7 (0.96) | 30.3 (0.77) | 28 (0.71) | 250 (113) | On pallet |
| Chiller | 53 (1.35) | 34.8 (0.87) | 41 (1.04) | 670 (304) | On pallet |
| Innova LC Requisites | | | | | On pallet |
| Cables | | | | | On pallet |
| TV monitor susp. bridge | 25.2 (0.64) | 38.6 (0.98) | 120.5 (3.06) | 445 (210) | On pallet |
| TV monitor susp. rails | 15 (0.38) | 12 (0.30) | 235 (5.96) | 355 (160) | On pallet |
| Fluoro UPS UL (*) | 82.7 (2.1) | 35 (0.89) | 39.4 (1) | 1235 (561) | On pallet |
| Fluoro UPS CE (*) | 68.9 (1.75) | 35 (0.89) | 39.4 (1) | 1287 (585) | On pallet |

(*) Estimated values

1.2 Detail Of Innova Shipping Information

1.2.1 Innova LC Positioner Gantry On Shipping Dolly

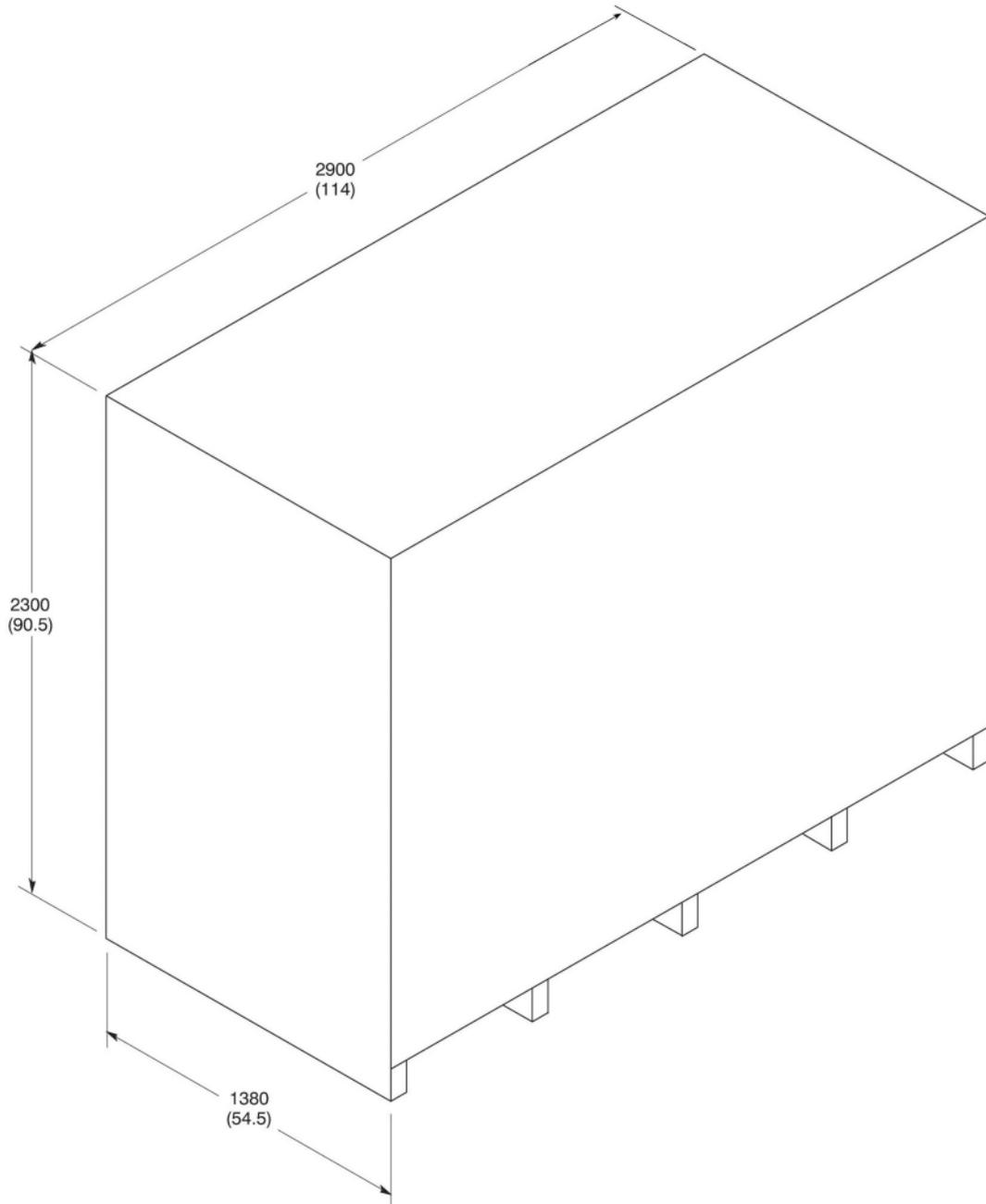
Illustration 7-1:



All dimensions are in mm (in inches)

1.2.2 Innova LC Positioner Air Shipment

Illustration 7-2:

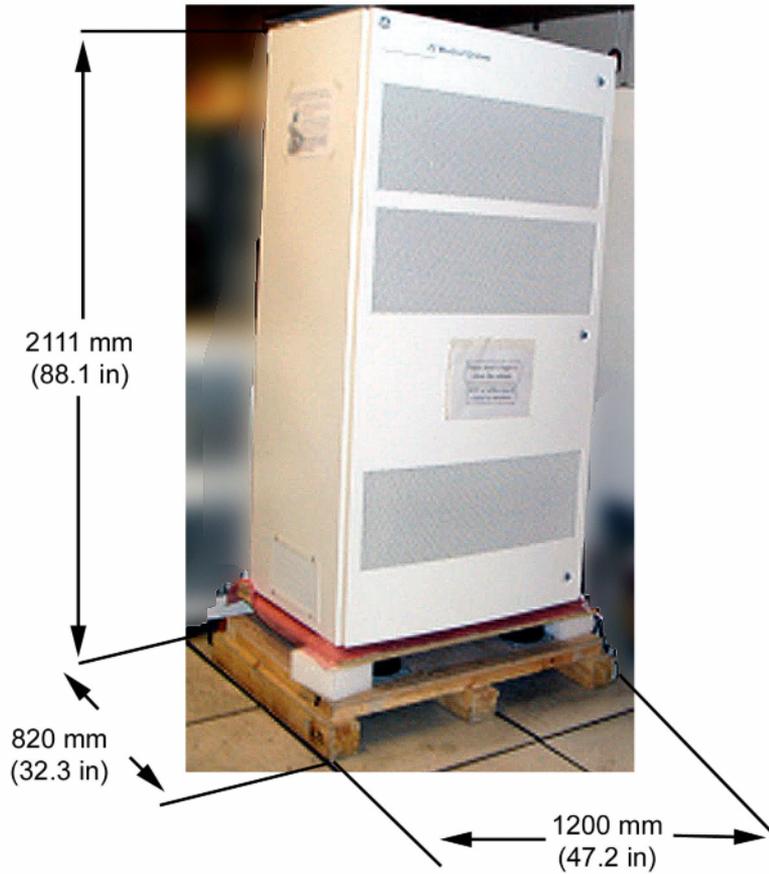


DIMENSIONS IN MM (INCHES)

NOT TO SCALE

1.2.3 Innova C1 and C2 Cabinet on pallet

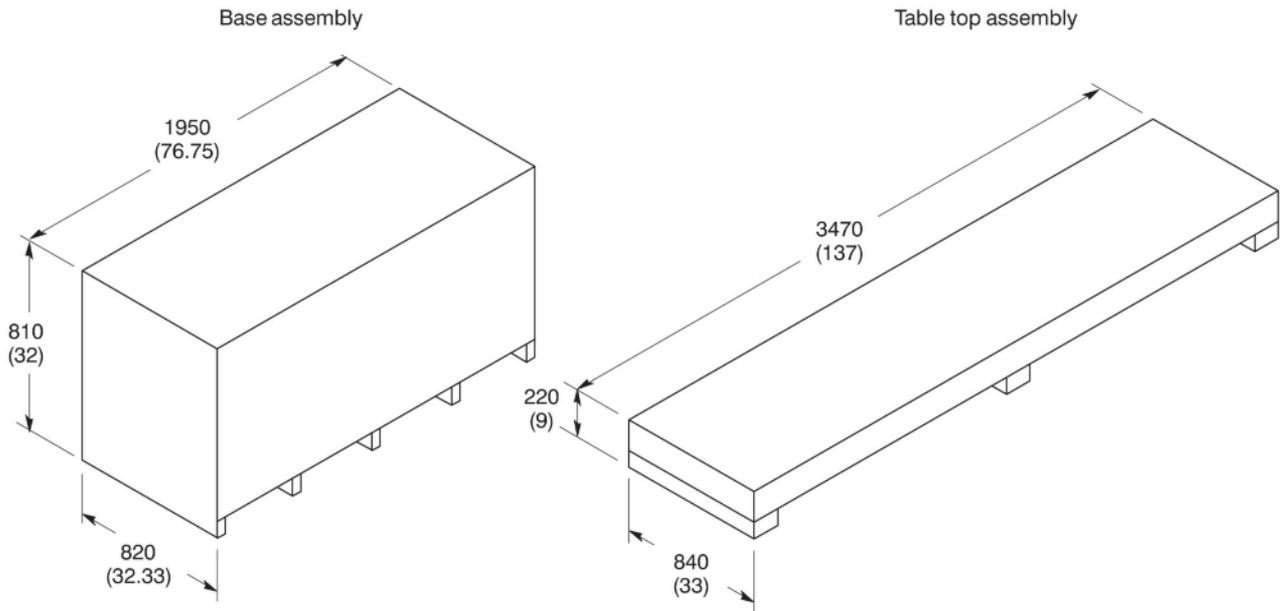
Illustration 7-3:



The shipping weight is of about 81 lbs..

1.2.4 Omega Shipment

Illustration 7-4:

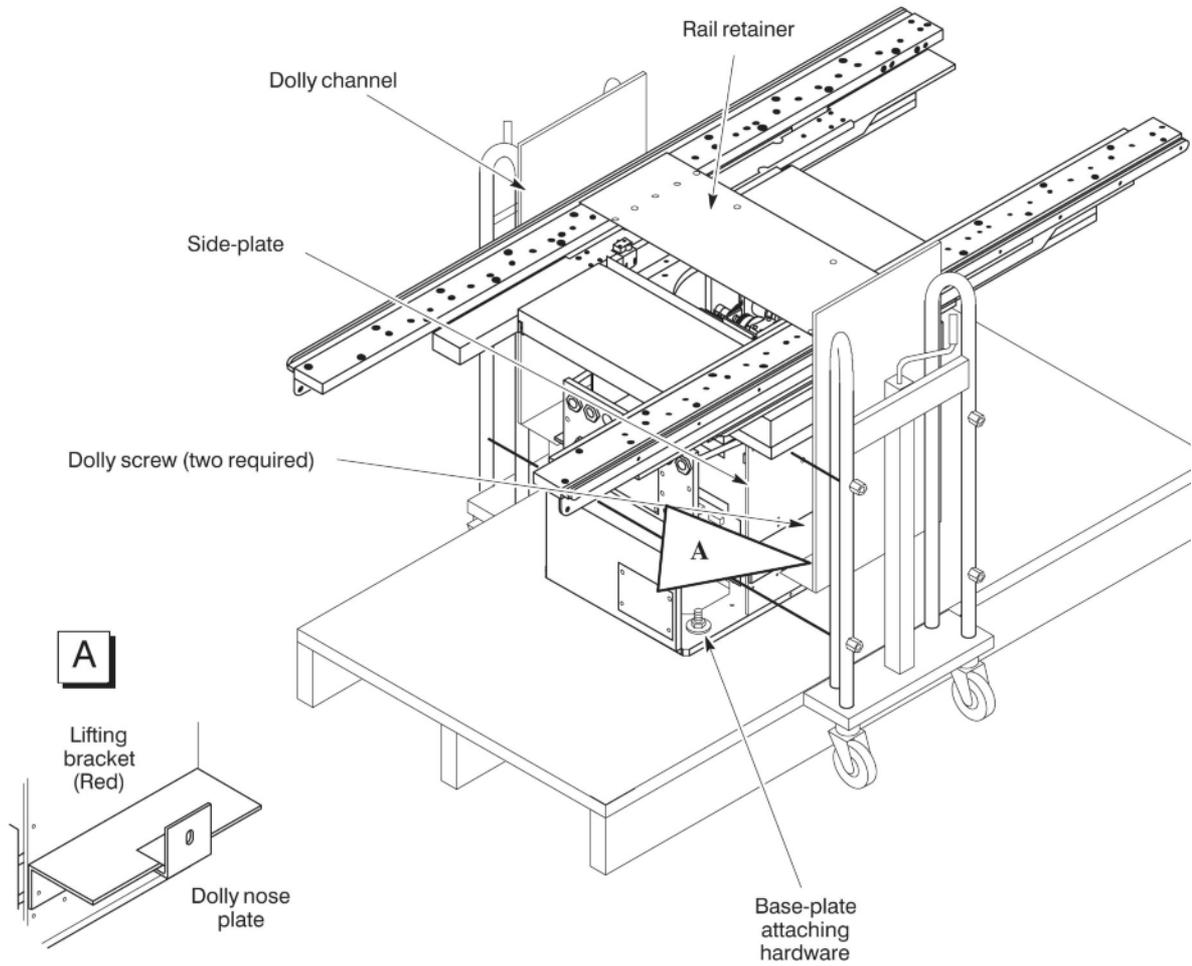


DIMENSIONS IN MM (INCHES)

NOT TO SCALE

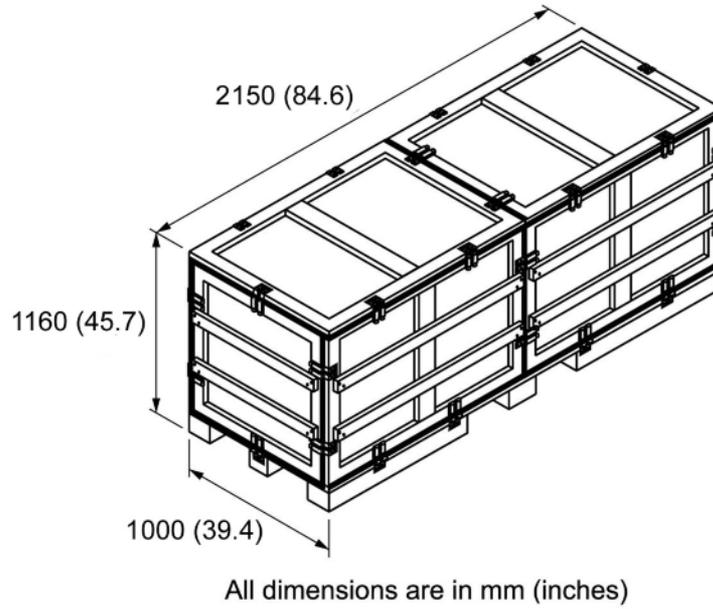
1.2.5 Omega Using Positioner Dollies

Illustration 7-5:



1.2.6 InnovalQ Table Shipment

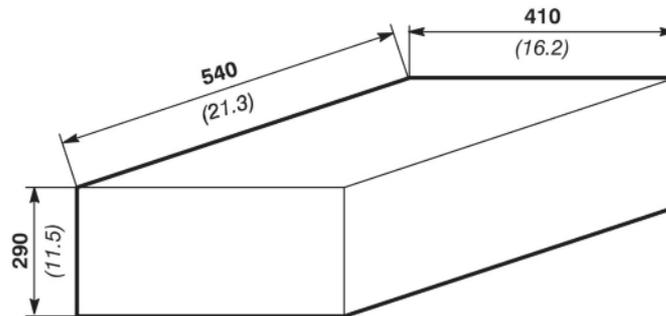
Illustration 7-6:



1.2.7 Other Elements Package

NOTE: All OEM parts are shipped inside their original boxes grouped as needed on pallets.

Illustration 7-7:



2 Tools and Test Equipment

Refer to [Table 7-2](#). To obtain a list of tools and test equipment for components not specified in [Table 7-2](#), refer to the appropriate component Pre-Installation Manual listed in [Chapter 2, Section 3, Basic Innova System Compatibility](#).

Table 7-2:

| PRODUCT OR COMPONENT | TOOL OR TEST EQUIPMENT | USED FOR | SOURCE | RECEIVED (DATE) |
|----------------------------------|---|---|--------|--------------------------|
| Innova LC Positioner | Service Engineer's Tool Case | General Use | | <input type="checkbox"/> |
| | Level, Protractor Type | Positioner Checks | | <input type="checkbox"/> |
| | Plumb Line included in 46-216640G1 | Positioner Checks | | <input type="checkbox"/> |
| | Torque Wrench 2 to 20 daN.m (15 ft. lbs. to 150 ft. lbs.) | Positioner Checks | | <input type="checkbox"/> |
| | 1/2 inch Ratchet Wrench (2) | Raise and Lower Positioner shipping dolly | | <input type="checkbox"/> |
| | Wrench, Spanner (46-176584P1) | High Voltage Cable Installation | | <input type="checkbox"/> |
| | Laptop Computer (MS-DOS Windows) | Positioner Configuration and Calibration | | <input type="checkbox"/> |
| Status Display | Same as for Innova LC (Service Engineer's Tool Case) | | | |
| Omega/Innova ^{IQ} Table | Same as for Innova LC (Service Engineer's Tool Case) Fill in any additional tools or test equipment as required | | | |
| | Installation dolly (PN 5265134) | Replacing Omega with Innova ^{IQ} Table | | <input type="checkbox"/> |
| | | | | <input type="checkbox"/> |
| C2 Cabinet | Same as for Innova LC (Service Engineer's Tool Case) Fill in any additional tools or test equipment as required | | | |
| | | | | <input type="checkbox"/> |
| | | | | <input type="checkbox"/> |
| X-Ray Head | Same as for Innova LC (Service Engineer's Tool Case) Fill in any additional tools or test equipment as required | | | |
| | | | | <input type="checkbox"/> |
| | | | | <input type="checkbox"/> |
| C1 Cabinet | Same as for Innova LC (Service Engineer's Tool Case) Fill in any additional tools or test equipment as required | | | |
| | | | | <input type="checkbox"/> |
| | | | | <input type="checkbox"/> |
| | Same as for Innova LC (Service Engineer's Tool Case) Fill in any additional tools or test equipment as required | | | |
| | Ethernet adaptation kit for laptop 2128794 | General use (to be ordered before delivery of system) | | <input type="checkbox"/> |
| DL User parts | | | | <input type="checkbox"/> |
| | | | | <input type="checkbox"/> |
| | | | | <input type="checkbox"/> |

| PRODUCT OR COMPONENT | TOOL OR TEST EQUIPMENT | USED FOR | SOURCE | RECEIVED (DATE) |
|----------------------|--|----------|--------|--------------------------|
| Monitor Suspension | | | | |
| | | | | <input type="checkbox"/> |
| | | | | <input type="checkbox"/> |
| Chiller | Phillips/Flathead screwdriver. Open chiller. Install wiring and hoses. | | | |
| | | | | <input type="checkbox"/> |
| | | | | <input type="checkbox"/> |

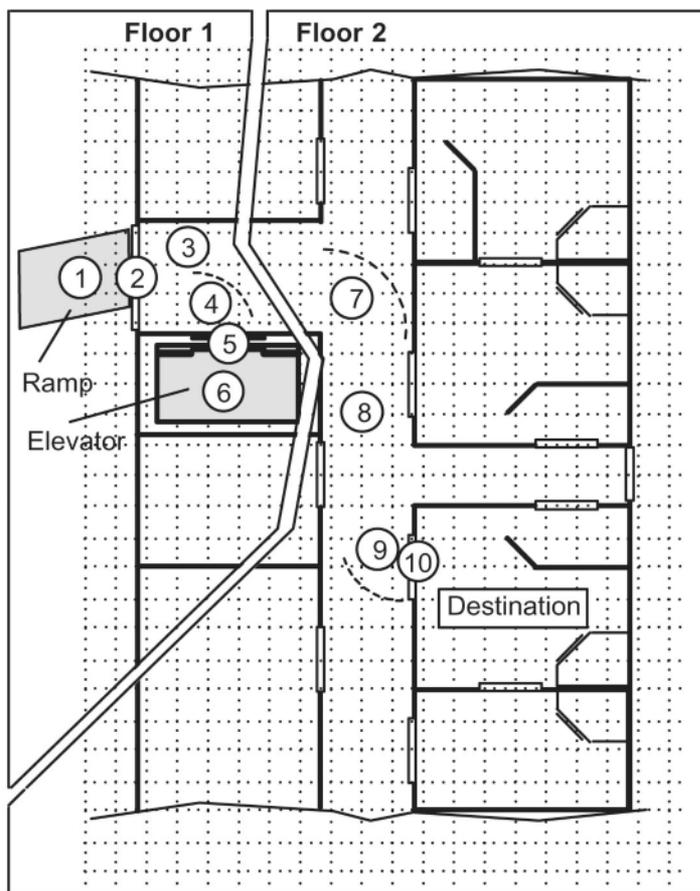
3 Route Survey

3.1 Step One — Sketch

Start preparing Route Survey by sketching a floor plan of the hospital or clinic which will receive the equipment. Include all areas on the delivery route from outside the building to destination. See [Illustration 7-8](#).

Reference Numbers: Numbers in circles refer to Route Survey data. The Route Survey is a form on which site data are listed (see [Section 3.2](#)).

Illustration 7-8:



3.2 Step Two — Survey

Data concerning the intended delivery route are recorded on the Route Survey in the following pages. Record all loading capacities, corridor widths, door openings, turning radii, flooring materials, elevator sizes, obstructions and so on.

4 European Process Order Select

Several components like cables, stationary rails, etc. are length selectable. This selection should reflect the particularities encountered by an Installation Specialist on Site.

All cable and component selections must be sent at least 6 weeks before RSDD to your PMC. The selection tool is available on the website: http://gein.euro.med.ge.com/european_installations/

5 Pre-Installation Checklist

| GE Healthcare Site Readiness Checklist | | | | | | | |
|--|--|-------------------------|---------------------|---------------------|--------------------------------------|--|---|
| GEHC Global Order # : | | | | Customer: | | | |
| GEHC On-site Representative : | | | | MI Supplier: | | | |
| Name of customer reviewed with : | | | | Lead Installer: | | | |
| GEHC PMI : | | | | Phone Number: | | | |
| Target Site Prep Completion Date: | | | | Helper: | | | |
| The customer is responsible for proper site preparation and site readiness regardless of any GEHC inspections/assessments. | | | | | | | |
| For MR Magnet Delivery: Ensure cryogen vents, power for the cooling system and exhaust fan system are installed and operational (0.7T, 1.5T & 3T) and chilled water supply is available 24x7 that meets system cooling equipment requirements. | | | | | | | |
| Inspection Date: | | | | | | | |
| Item # | GEHC Minimum Requirements | Storage: Is item ready? | Predict (Pre-ship) | | Verify (Delivery): Is item ready? | Validate (Mech Install): Is item ready? | Comments If "N", please enter in comments or action plan |
| | | | Is this item ready? | Will item be ready? | | | |
| 1 | Equipment installation drawings must match actual room size and must meet clearance requirements. Deviations that meet installation requirements may be red-lined, if red-lining is allowed by local code. Seismic requirements are identified on construction drawings. | X | | | | | |
| 2 | Delivery route to installation or storage area meets requirements and has been discussed and scheduled with the customer. Ensure floor protection is discussed, requirements identified, and will be available at time of delivery and installation. | | | | | X | |
| 3 | Rooms that will contain equipment, including storage areas, are dust free. Room security to prevent unauthorized access and theft has been discussed with customer. The customer is aware of these security issues, implications and responsibility. | | | | | | |
| 4 | In room HVAC ductwork and units (in room) must be mechanically installed and dust free. Installation rooms appear to meet environmental conditions (see Further Definitions) and observed issues have been communicated to the customer. If being stored, storage area must meet PIM storage criteria. | | | | | | |
| 5 | Ceiling grid is installed, Unistrut is located per the installation drawings, and permanent lighting is installed and operational. | X | | | | | |
| 6 | Floor is clean and prepared for final floor covering. Customer has verified floor leveling meets the equipment installation drawings and PIM specs and no visible defects are observed. Gantry and table baseplate are installed prior to delivery (if applicable) | X | | | | | |
| 7 | Access to a working phone at the facility for emergency use, including MR magnet delivery. | X | | | | | |

| | | | | | | | |
|----------------------------|---|--|---|---|---|--|--|
| 8 | All walls primed (final coat not needed on Day 1), and counter tops that will support equipment must be installed. No dust-producing cabinetry work in installation areas. | X | | | | | |
| 9 | Mechanical supplier has been provided with a set of equipment installation drawings for reference. For California, permitted construction drawings or PMI-specified installation drawings are required. | X | X | X | X | | |
| 10 | Conduit/electrical cable ducting/dividers/access flooring installed, with the exception of surface-mounted floor ducting. Wiring to the main disconnect panel is installed and compliant with equipment installation drawings or pre-installation manual. | X | X | X | X | | |
| Issued Date: 7/9/07 Rev 11 | | GEHC Only: COE # (888) 799.7266 Option 5 (PMI Support) | | | | | |

6 Configuration Checks Before Innova IQ Table Upgrade

1. Check that the Omega table is installed on a base plate. If not, order a base plate for the Innova^{IQ} Table and plan flushing it in the concrete as part of the upgrade.
2. Check that the Omega base plate is flushed in the concrete. If not, plan flushing it in the concrete as part of the upgrade. If not possible contact engineering.
3. Check if the base plate is drilled for Innova^{IQ} Table anchorage. If not, plan to rework the base plate as part of the upgrade.
4. Check that it is possible to pull the cables connected to the table (1 meter) out of the cable channel. If it is not possible, order a new cable set of appropriate length and install this new cable set as part of the upgrade.
5. Check that the system software configuration is Unity SP3.2 or higher (DL application revision is DL_Unity_4.18.9 or higher). If not, plan to upgrade the site with the relevant upgrade and / or FMI
6. Check that clearance with floor, walls and ceiling will comply with room layout and physical characteristics.
7. If the customer uses a Smart Handle with the Omega, check that he/she has been notified that the Smart Handle will be replaced by a Smart Box (there is no Smart Handle with the Innova^{IQ} Table).
8. One TSSC and one Smart Box are supplied with the Upgrade Kit. If the site configuration requires more, check that the customer order contains a remote box (P/N 5184336) and the correct number of extra TSUI (TSSC and Smart Box).
9. If the customer uses an injector head table mounted or an entire injector rail mounted, check that he/she has been notified that this injector head cannot be mountable on the Innova^{IQ} Table and that an alternate solution has been implemented (using a pedestal, for instance).
10. If the customer uses a table top rear support with the Omega, check that he/she has been notified that this accessory cannot be used with the Innova^{IQ} Table.
11. Write down the DL Name which will be needed later on during software installation. To find it, right click on the icon *My Computer*, select [Properties] and go to the *Network identification* tab. The DL name is displayed in the *Full computer name* field.
12. Innova^{IQ} Table does not support the connectivity for IVUS and MacLab. Ensure that IVUS and MacLab cables are routed through a dedicated conduit.
13. Case of CA1000: the Innova^{IQ} Table is not compatible with CA1000 workstations version prior to SPa07. If the site is using a CA1000, check the current version and upgrade it to SPa07 or higher before installing the upgrade.

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Chapter 8 IP Addressing Process

1 IP Addressing Process

To obtain an IP address, contact the following for your pole:

- **GEMSAM:**
Contact: OnLine Center–Americas, Network Products and Services (NP&S)
Telephone: 1–800–321–7937

NOTE: Press [1] for the Online Center. Follow the phone tree instructions to select X–Ray modality. When prompted, select the option for obtaining an IP address.
- **GEMSE:**
Use the new mail form called *INSFORM.xls* or *INSFORM.txt* for obtaining an IP Address. If you have questions or need clarification regarding the use of this form, do not hesitate to ask the Operation support OnLine.
Contact: OnLine Center–Europe
Telephone: +33 (0)1 30 83 13 00
FAX: +33 (0)1 30 70 99 70

NOTE: The INSITE FORM is on the formatted sheet (.xls) or text sheet (.txt) that can be found on the Service CD–Rom.
- **GEMSA:**
Contact: OnLine Center–Asia
Network Products and Services (NP&S)
Telephone: (81) 426 56 0033
FAX: (81) 426 56 0053

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Chapter 9 Seismic Calculations

1 Overview

Seismic requirements are determined and specified by the hospital architect of record and may require approval by the specific state or country agency.

Seismic attachment hardware shown on seismic calculations may differ from hardware supplied with system. Any additional hardware that is required will be the responsibility of the institution and/or their contractor. Contact your Installation Specialist with any related questions.

Seismic calculations included in this chapter are per California Building Code.

2 Calculations

Seismic calculations are included for the following:

- C1 Cabinet - Slab on Grade / Upper Floor, [Section 2.1](#)
- C2 Cabinet - Slab on Grade / Upper Floor, [Section 2.2](#)
- Coolix 4000 Chiller – Slab on grade, [Section 2.3](#)
- Coolix 4000 Chiller – Upper Floor, [Section 2.4](#)
- INNOVA 2100IQ MDC Filter Enclosure (PDB) - E4502KS, [Section 2.5](#)
- Fluoro UPS UL Cabinet – Slab on grade, [Section 2.6](#)
- Fluoro UPS UL Cabinet – Upper Floor, [Section 2.7](#)
- Fluoro UPS CE Cabinet – Slab on grade, [Section 2.8](#)
- Fluoro UPS CE Cabinet – Upper Floor, [Section 2.9](#)
- LC positioner – Slab on grade, [Section 2.10](#)
- LC positioner – Upper Floor, [Section 2.11](#)
- Omega IV Table – Slab on grade, [Section 2.12](#)
- Omega IV Table – Upper Floor, [Section 2.13](#)
- Omega V Long Table w/Baseplate – Slab on grade, [Section 2.14](#)
- Omega V Long Table w/Baseplate – Upper Floor, [Section 2.15](#)
- Omega V Long Table – Slab on grade, [Section 2.16](#)
- Omega V Long Table – Upper Floor, [Section 2.17](#)
- Overhead Flat Panel Suspension – Ceiling mounted, [Section 2.18](#)
- Innova^{IQ} Table w/Baseplate – Slab on grade, [Section 2.19](#)
- Innova^{IQ} Table w/Baseplate – Upper Floor, [Section 2.20](#)

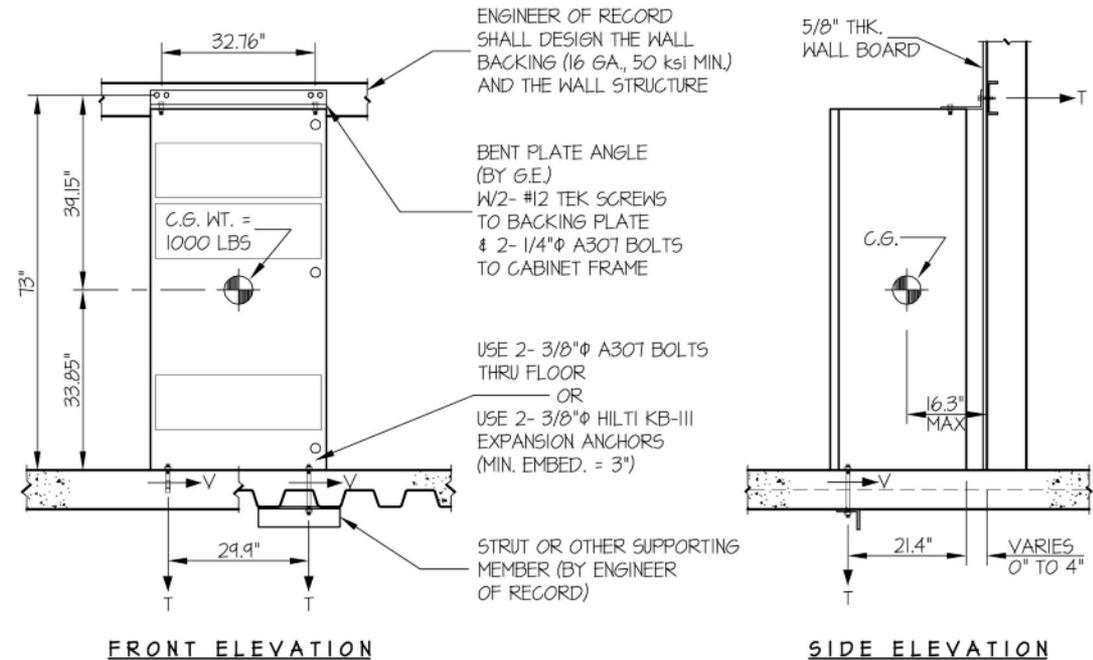
2.1 C1 Cabinet - Slab on Grade / Upper Floor

Illustration 9-1:

| | | |
|---|------------------------|-------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - C1 Cabinet | JOB NO. 12-0516 | OF 1 SHEET |
| | DATE 7/2/07 | |

SEISMIC ANCHORAGE CALCULATION

SLAB ON GRADE/UPPER FLOOR



LOADS: PER 2001 CALIFORNIA BUILDING CODE SECTION 1632A (WORKING LOADS, NOT ULTIMATE)

WEIGHT = 1000 LBS
 HORIZONTAL FORCE (V_H) = $0.71W = 710$ LBS
 VERTICAL FORCE (V_V) = $0.35W = 350$ LBS

BOLT FORCES:

#12 TEK SCREWS
 IN 16 GA., 50 KSI STEEL
 $T_{ALLOW} = 225$ LBS
 $V_{ALLOW} = 570$ LBS

TENSION (T) @ WALL

$$T_{PARALLEL} = \frac{710 \#(33.85") \times (16.3")}{2 \text{ SCREWS } (73") \times (32.76")} = 82 \text{ LBS}$$

$$T_{PERP.} = \frac{710 \#(33.85")}{4 \text{ SCREWS } (73")} = 82 \text{ LBS}$$

$$T_{MAX} = \sqrt{82^2 + 82^2} = 116 \text{ LBS/SCREW (MAX)}$$

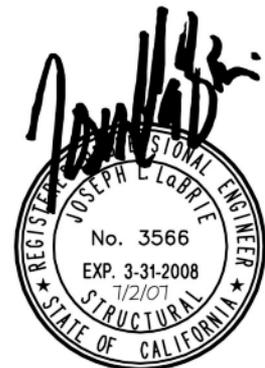
SHEAR (V)

$$V_{WALL} = \frac{710 \#(33.85")}{4 \text{ SCREWS } (73")} = 82 \text{ LBS/SCREW (MAX)}$$

$$V_{FLOOR} = \frac{710 \#(39.15")}{2 \text{ SCREWS } (73")} = 190 \text{ LBS/BOLT (MAX)}$$

NOTE:

PROVIDE FLOOR AND WALL STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN.
 (BY ENGINEER OF RECORD FOR THE BUILDING)

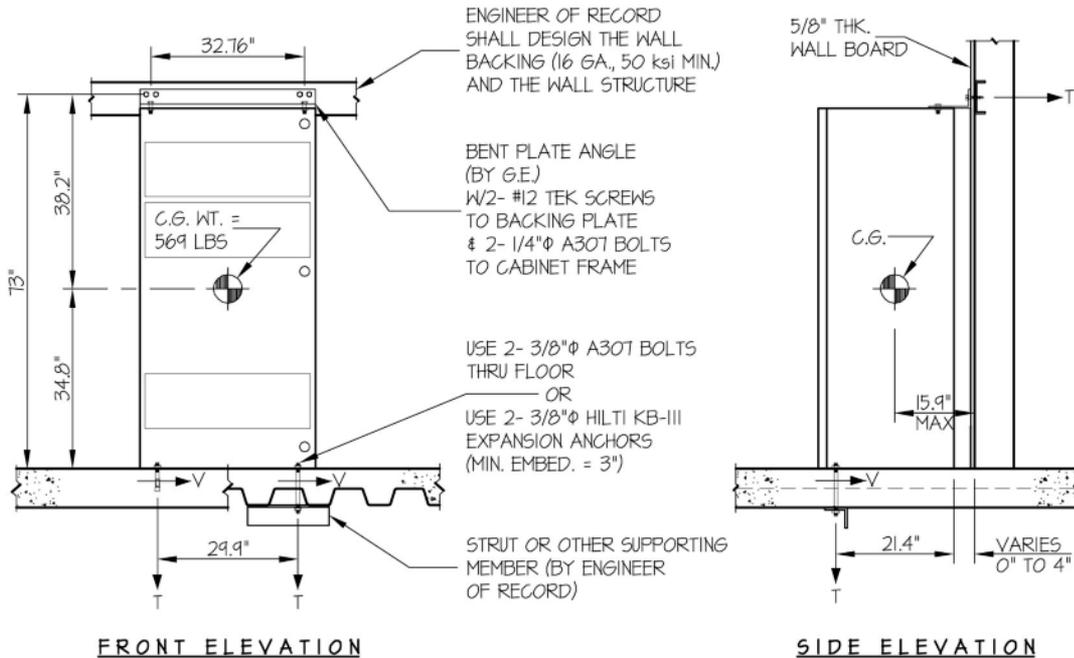


2.2 C2 Cabinet - Slab on Grade / Upper Floor

Illustration 9-2:

| | | |
|---|------------------------|-------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - C2 Cabinet | JOB NO. 12-0516 | OF 1 SHEET |
| | DATE 7/2/07 | |

SEISMIC ANCHORAGE CALCULATIONSLAB ON GRADE/UPPER FLOOR



LOADS: PER 2001 CALIFORNIA BUILDING CODE SECTION 1632A (WORKING LOADS, NOT ULTIMATE)

WEIGHT = 569 LBS

HORIZONTAL FORCE (V_H) = $0.71W$ = 404 LBS

VERTICAL FORCE (V_V) = $0.35W$ = 199 LBS

BOLT FORCES:

#12 TEK SCREWS

IN 16 GA, 50 KSI STEEL

T_{ALLOW} = 225 LBS

V_{ALLOW} = 570 LBS

TENSION (T) @ WALL

$$T_{PARALLEL} = \frac{404 \#(34.8" \times 15.9")}{2 \text{ SCREWS } (7.3" \times 32.76")} = 47 \text{ LBS}$$

$$T_{PERP.} = \frac{404 \#(34.8")}{4 \text{ SCREWS } (7.3")} = 48 \text{ LBS}$$

$$T_{MAX} = \sqrt{47^2 + 48^2} = 67 \text{ LBS/SCREW (MAX)}$$

SHEAR (V)

$$V_{WALL} = \frac{404 \#(34.8")}{4 \text{ SCREWS } (7.3")} = 48 \text{ LBS/SCREW (MAX)}$$

$$V_{FLOOR} = \frac{404 \#(38.2")}{2 \text{ SCREWS } (7.3")} = 106 \text{ LBS/BOLT (MAX)}$$

NOTE:

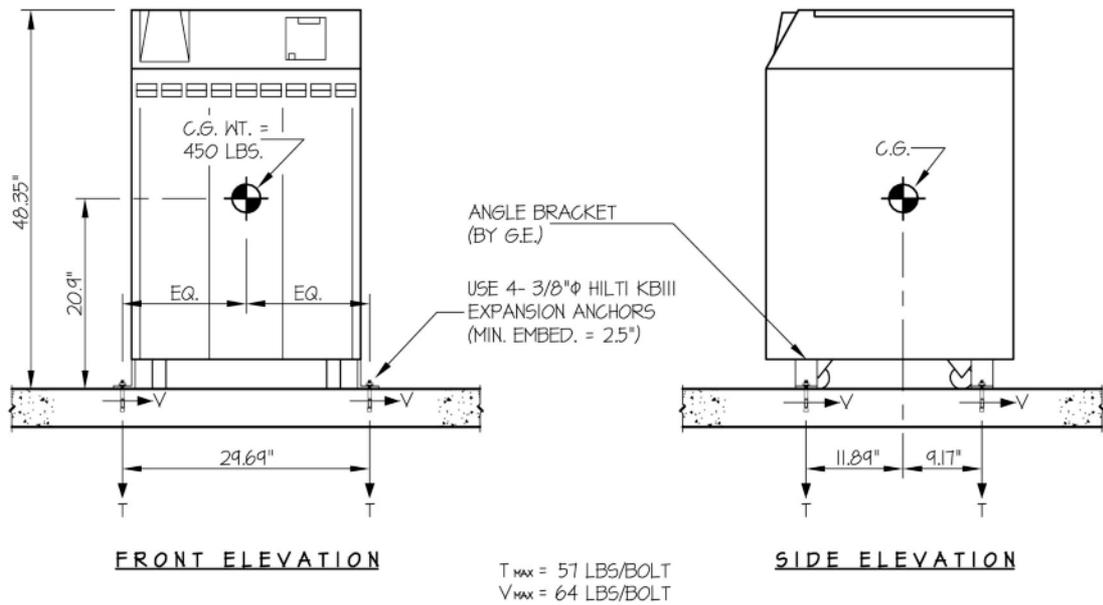
PROVIDE FLOOR AND WALL STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN. (BY ENGINEER OF RECORD FOR THE BUILDING)



2.3 Coolix 4000 Chiller - Slab on Grade

Illustration 9-3:

| | | |
|---|------------------------|----------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - Coolix 4000 Chiller | JOB NO. 12-0516 | OF 1 SHEET |
| | DATE 7/2/07 | |
| <u>SEISMIC ANCHORAGE CALCULATION</u> | | <u>SLAB ON GRADE</u> |



LOADS: PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A (WORKING LOADS, NOT ULTIMATE)

WEIGHT = 450 LBS
 HORIZONTAL FORCE (V_H) = $0.50W$ = 225 LBS
 VERTICAL FORCE (V_V) = $0.33(V_H)$ = 75 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \frac{225\#(20.9")}{2 \text{ BOLTS } (2106") + \left[\frac{225\#(20.9")(1189")}{29.69"(2106")} \right] \times (0.3) - \frac{(450\# - 75\#)9.17"}{2 \text{ BOLTS } (2106")} = 57 \text{ LBS/BOLT (MAX)}$$

(HORIZ - FRONT TO BACK) (HORIZ - SIDE TO SIDE) (WEIGHT - V_V)

SHEAR (V)

$$V = \frac{225\#(1189")}{2 \text{ BOLTS } (2106")} = 64 \text{ LBS/BOLT (MAX)}$$

NOTE:

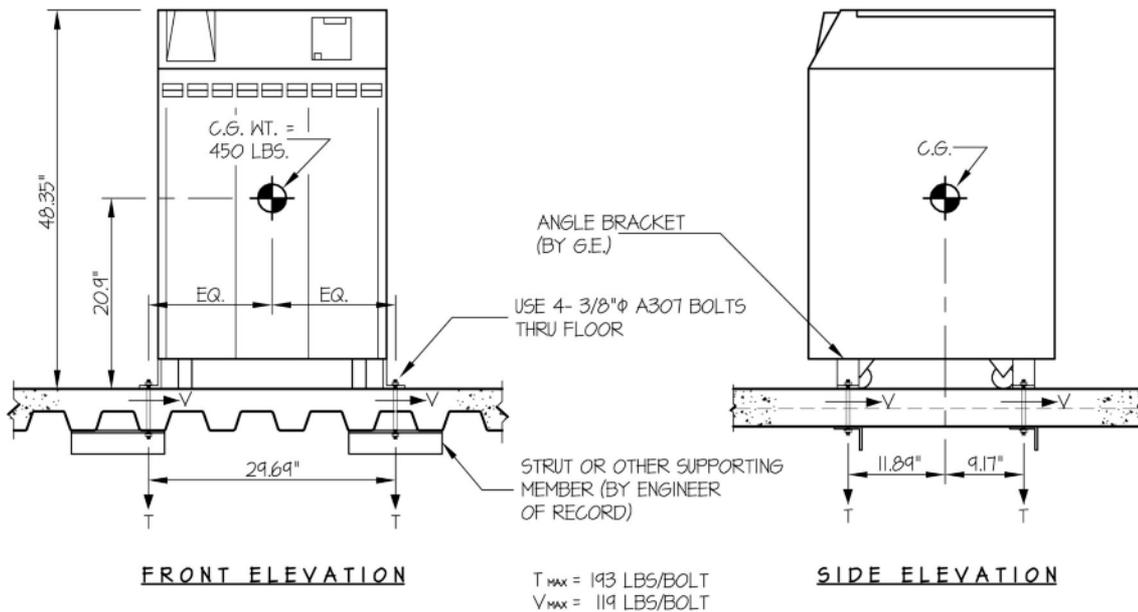
ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



2.4 Coolix 4000 Chiller - Upper Floor

Illustration 9-4:

| | | |
|---|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - Coolix 4000 Chiller | JOB NO. 12-0516 | OF 1 SHEET |
| | DATE 7/2/07 | |
| <u>SEISMIC ANCHORAGE CALCULATION</u> | | <u>UPPER FLOOR</u> |



LOADS: PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A (WORKING LOADS, NOT ULTIMATE)

WEIGHT = 450 LBS

HORIZONTAL FORCE (V_H) = $0.94W$ = 423 LBS

VERTICAL FORCE (V_V) = $0.33(V_H)$ = 141 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \frac{423\#(20.9')}{2 \text{ BOLTS } (21.06')} + \left[\frac{423\#(20.9')(11.89')}{29.69'(21.06')} \right] \times (0.3) - \frac{(450\# - 141\#)9.17'}{2 \text{ BOLTS } (21.06')} = 193 \text{ LBS/BOLT (MAX)}$$

(HORIZ - FRONT TO BACK) (HORIZ - SIDE TO SIDE) (WEIGHT - V_V)

SHEAR (V)

$$V = \frac{423\#(11.89')}{2 \text{ BOLTS } (21.06')} = 119 \text{ LBS/BOLT (MAX)}$$

NOTE:

ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.

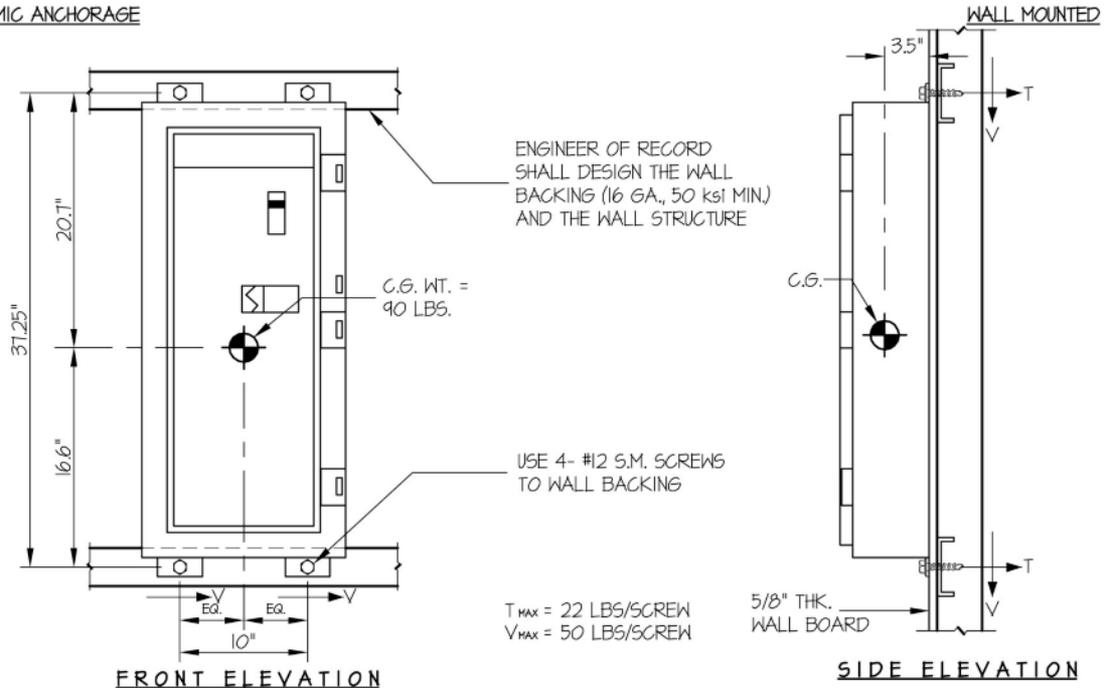


2.5 INNOVA 2100IQ MDC Filter Enclosure (PDB) - E4502KS

Illustration 9-5:

| | | |
|---|------------------------|-------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| INNOVA 2100IQ MDC Filter Enclosure (PDB) - E4502KS | JOB NO. 12-0780 | OF 1 SHEET |
| | DATE 9/18/07 | |

SEISMIC ANCHORAGE



LOADS: PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A (WORKING LOADS, NOT ULTIMATE)

WEIGHT = 90 LBS

HORIZONTAL FORCE (V_H) = 0.71W = 70 LBS

VERTICAL FORCE (V_V) = 0.35W = 32 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{VERTICAL}} = \frac{(90\# + 32\#)(3.5")}{2\text{SCREWS}(70.3")} = 3 \text{ LBS}$$

$$T_{\text{PARALLEL}} = \frac{70\#(3.5")(16.6")}{(10")(37.25")} = 11 \text{ LBS}$$

$$T_{\text{PERP.}} = \frac{70\#(16.6")}{2\text{SCREWS}(37.25")} = 16 \text{ LBS}$$

$$T_{\text{MAX}} = 3\# + \sqrt{11^2 + 16^2} = 22 \text{ LBS/SCREW (MAX)}$$

SHEAR (V)

$$V_{\text{MAX}} = \frac{90\# + 32\#}{4\text{SCREWS}} + \frac{70\#(20.7")}{2\text{SCREWS}(37.25")} = 50 \text{ LBS/SCREW (MAX)}$$

NOTE:

ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.

#12 S.M. SCREWS

IN 16 GA, 50 KSI STEEL

T_{ALLOW.} = 225 LBS

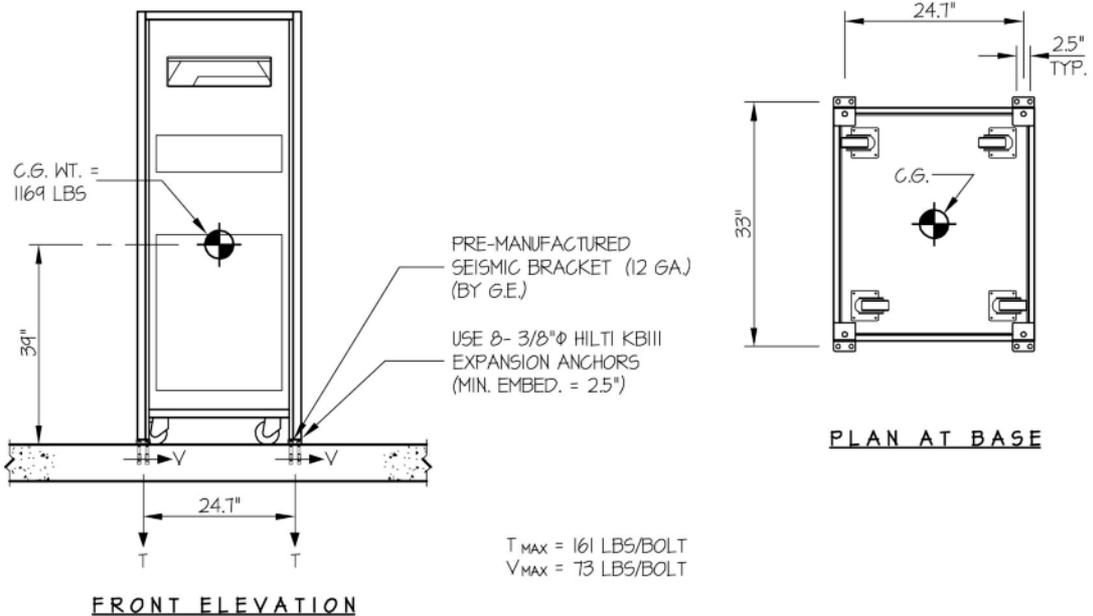
V_{ALLOW.} = 570 LBS



2.6 Fluoro UPS UL Cabinet - Slab on Grade

Illustration 9-6:

| | | |
|---|------------------------|------------------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - Fluoro UPS UL Cabinet | JOB NO. 12-0516 | OF 1 SHEET |
| | DATE 7/2/07 | |
| <small>SEISMIC ANCHORAGE CALCULATION</small> | | <small>SLAB ON GRADE</small> |



LOADS: PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A (WORKING LOADS, NOT ULTIMATE)

WEIGHT = 1169 LBS

HORIZONTAL FORCE (V_H) = $0.50W$ = 585 LBS

VERTICAL FORCE (V_V) = $0.33(V_H)$ = 195 LBS

BOLT FORCES:

TENSION (T)

$$T_{MAXIMUM} = \frac{585\#(39")}{4 \text{ BOLTS } (24.7")} + \left[\frac{585\#(39")}{4 \text{ BOLTS } (33")} \times (0.3) \right] - \frac{1169\# - 195\#}{8 \text{ BOLTS}} = 161 \text{ LBS/BOLT (MAX)}$$

(HORZ - SIDE TO SIDE)
(HORZ - FRONT TO BACK)
(WEIGHT - V_V)

SHEAR (V)

$$V = \frac{585\#}{8 \text{ BOLTS}} = 73 \text{ LBS/BOLT (MAX)}$$

NOTE:

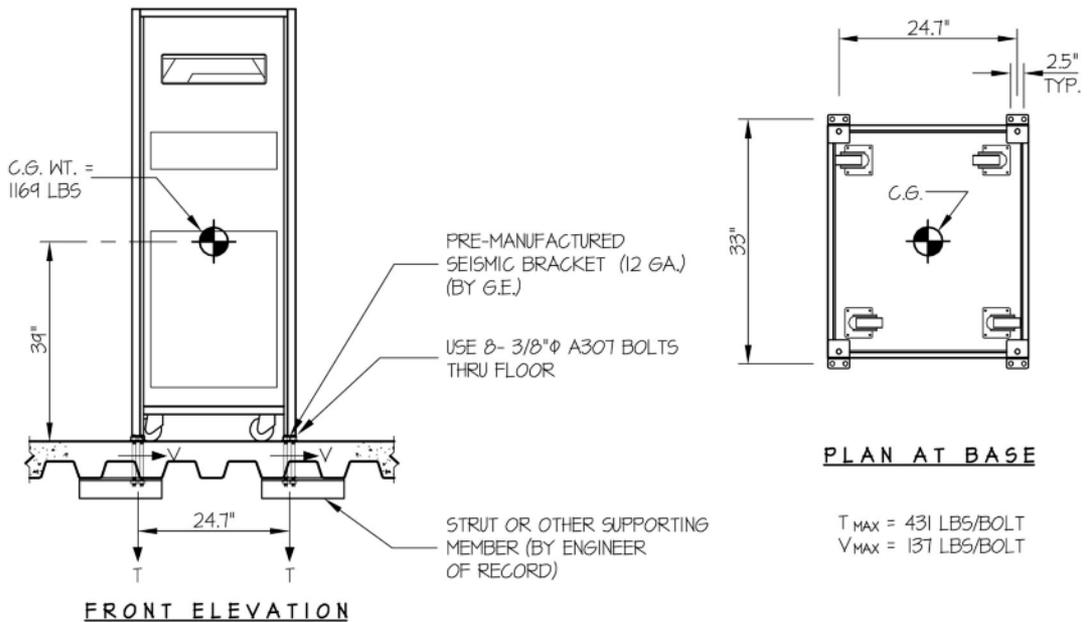
ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



2.7 Fluoro UPS UL Cabinet - Upper Floor

Illustration 9-7:

| | | |
|---|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - Fluoro UPS UL Cabinet | JOB NO. 12-0516 | OF 1 SHEET |
| | DATE 7/2/07 | |
| <u>SEISMIC ANCHORAGE CALCULATION</u> | | <u>UPPER FLOOR</u> |



LOADS: PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A (WORKING LOADS, NOT ULTIMATE)
 WEIGHT = 1169 LBS
 HORIZONTAL FORCE (V_H) = $0.94W$ = 1099 LBS
 VERTICAL FORCE (V_V) = $0.33(V_H)$ = 366 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \frac{1099\#(39\#)}{4 \text{ BOLTS } (24.7\#)} + \left[\frac{1099\#(39\#)}{4 \text{ BOLTS } (33\#)} \times (0.3) \right] - \frac{1169\# - 366\#}{8 \text{ BOLTS}} = 431 \text{ LBS/BOLT (MAX)}$$

(HORIZ - SIDE TO SIDE) (HORIZ - FRONT TO BACK) (WEIGHT - V_V)

SHEAR (V)

$$V = \frac{1099\#}{8 \text{ BOLTS}} = 137 \text{ LBS/BOLT (MAX)}$$

NOTE:

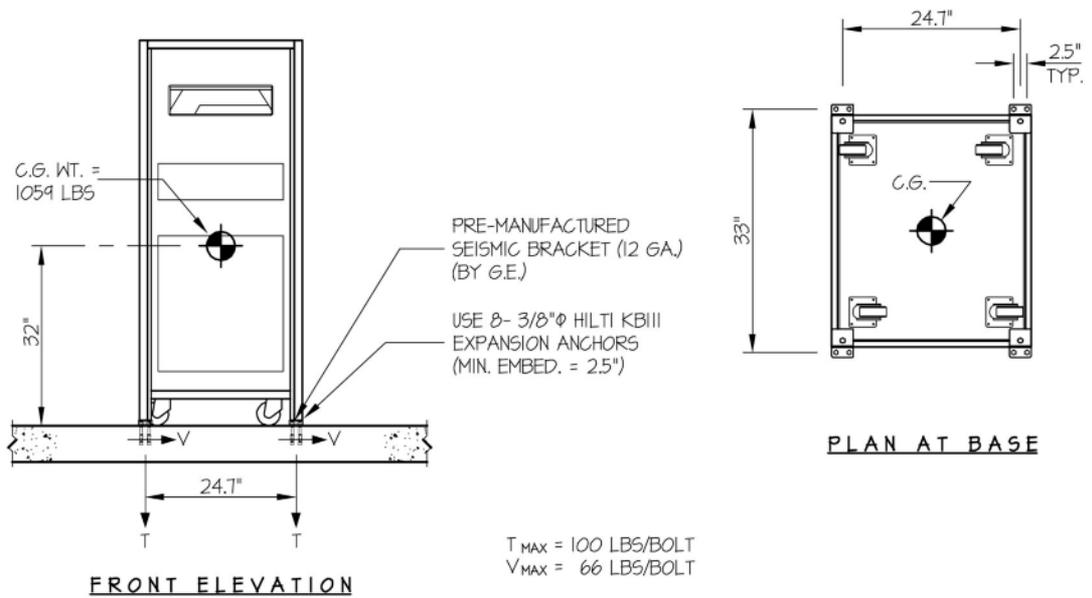
ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



2.8 Fluoro UPS CE Cabinet - Slab on Grade

Illustration 9-8:

| | | |
|--|------------------------|----------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - Fluoro UPS CE Cabinet | JOB NO. 12-0516 | OF 1 SHEET |
| DATE 7/2/07 | | |
| <u>SEISMIC ANCHORAGE CALCULATION</u> | | <u>SLAB ON GRADE</u> |



LOADS: PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A (WORKING LOADS, NOT ULTIMATE)
 WEIGHT = 1059 LBS
 HORIZONTAL FORCE (V_H) = 0.50W = 530 LBS
 VERTICAL FORCE (V_V) = 0.33(V_H) = 177 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \frac{530\#(32'')}{4 \text{ BOLTS } (24.7'')} + \left[\frac{530\#(32'')}{4 \text{ BOLTS } (33'')} \times (0.3) \right] - \frac{1059\# - 177\#}{8 \text{ BOLTS}} = 100 \text{ LBS/BOLT (MAX)}$$

(HORIZ - SIDE TO SIDE) (HORIZ - FRONT TO BACK) (WEIGHT - V_V)

SHEAR (V)

$$V = \frac{530\#}{8 \text{ BOLTS}} = 66 \text{ LBS/BOLT (MAX)}$$

NOTE:

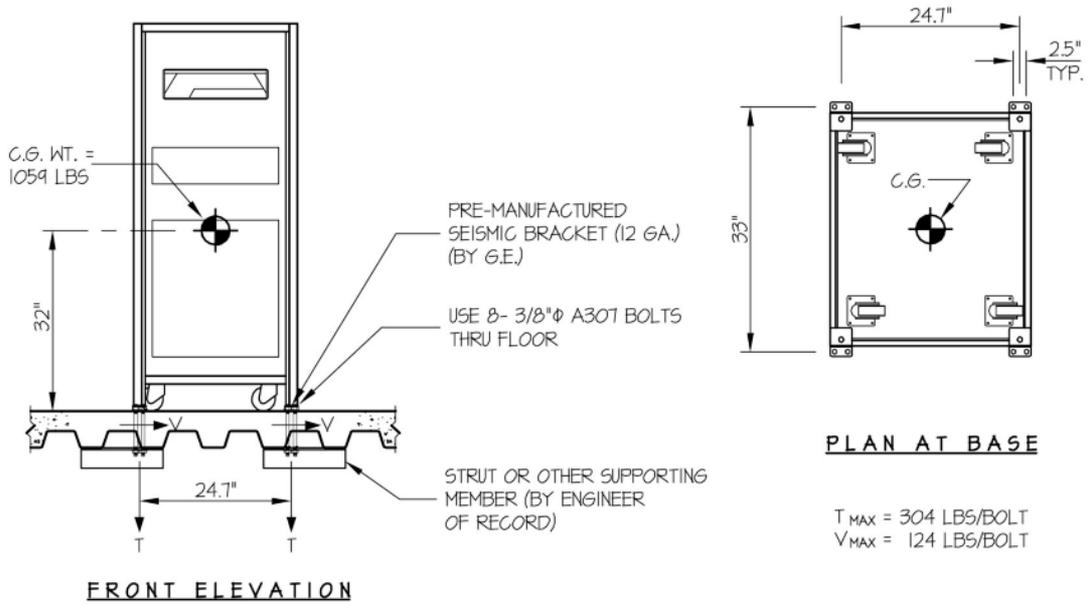
ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



2.9 Fluoro UPS CE Cabinet - Upper Floor

Illustration 9-9:

| | | |
|---|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - Fluoro UPS CE Cabinet | JOB NO. 12-0516 | OF 1 SHEET |
| | DATE 7/2/07 | |
| <u>SEISMIC ANCHORAGE CALCULATION</u> | | <u>UPPER FLOOR</u> |



LOADS: PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A (WORKING LOADS, NOT ULTIMATE)

WEIGHT = 1059 LBS

HORIZONTAL FORCE (V_H) = 0.94W = 995 LBS

VERTICAL FORCE (V_V) = 0.33(V_H) = 332 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \frac{995\#(32'')}{4 \text{ BOLTS } (24.7'')} + \left[\frac{995\#(32'')}{4 \text{ BOLTS } (33'')} \times (0.3) \right] - \frac{1059\# - 332\#}{8 \text{ BOLTS}} = 304 \text{ LBS/BOLT (MAX)}$$

(HORIZ - SIDE TO SIDE) (HORIZ - FRONT TO BACK) (WEIGHT - V_V)

SHEAR (V)

$$V = \frac{995\#}{8 \text{ BOLTS}} = 124 \text{ LBS/BOLT (MAX)}$$

NOTE:

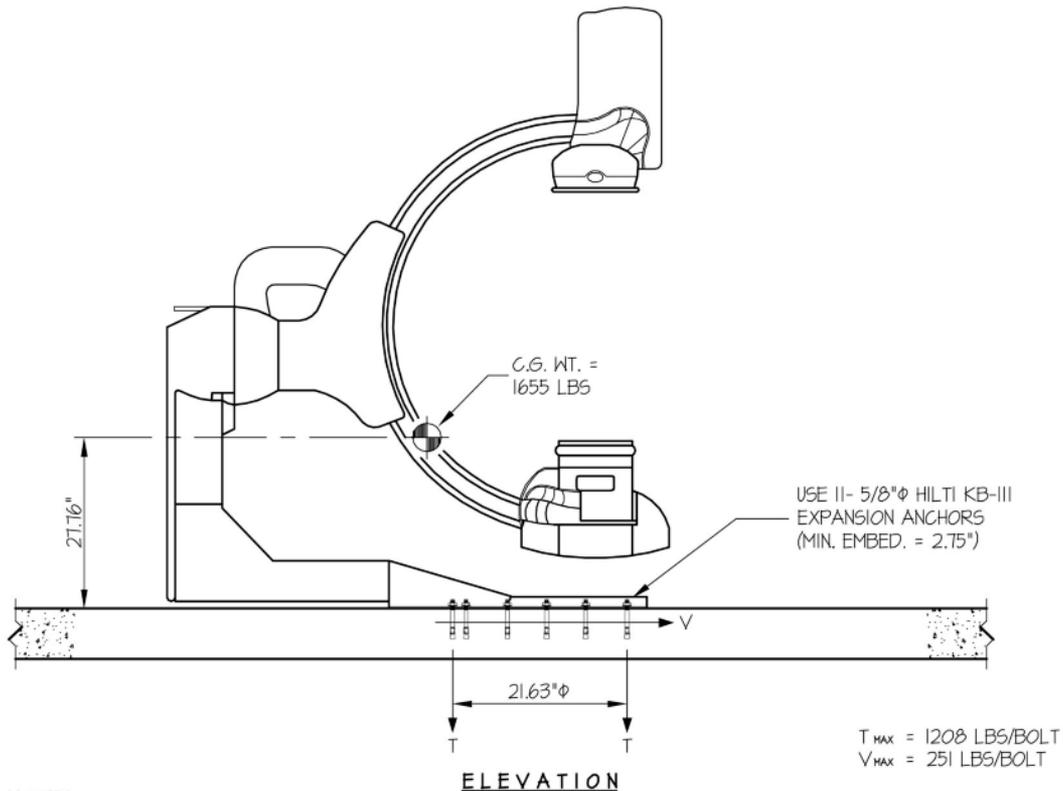
ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



2.10 LC Positioner - Slab on Grade

Illustration 9-10:

| | | |
|---|------------------------|------------------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - LC Positioner | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |
| <small>SEISMIC ANCHORAGE CALCULATION</small> | | <small>SLAB ON GRADE</small> |



NOTES:

1. FORCES ARE DETERMINED PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.
 HORIZONTAL FORCE (V_H) = $0.50W$ ($C_a = .66, a_p = 1.0, I_p = 1.5, R_p = 1.5$)
 VERTICAL FORCE (V_V) = $0.35W$
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.

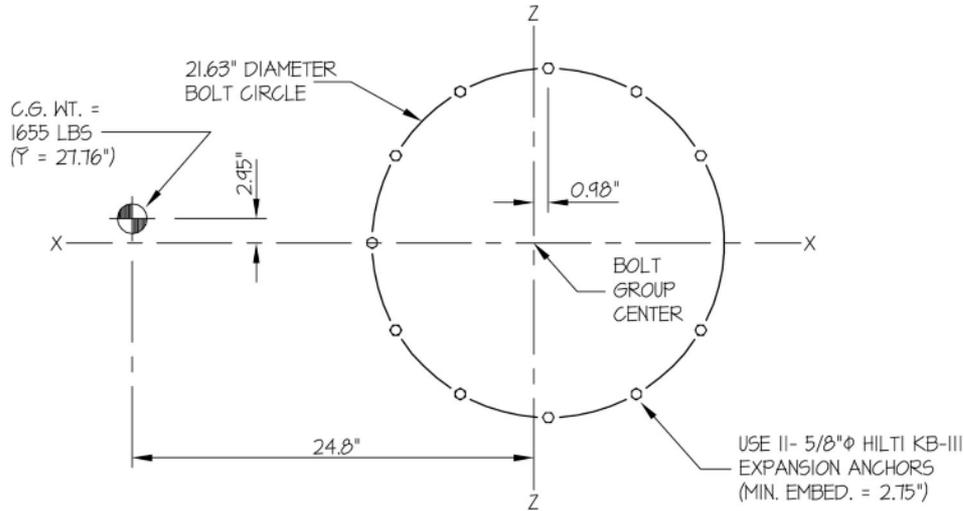


Illustration 9-11:

| | | |
|---|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 2 |
| - Innova 2100-IQ/3100/4100 - LC Positioner | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |

SEISMIC ANCHORAGE CALCULATION

SLAB ON GRADE



PLAN AT BASE

LOADS:

WEIGHT = 1655 LBS
 HORIZONTAL FORCE (V_H) = 828 LBS
 VERTICAL FORCE (V_V) = 579 LBS

BOLT GROUP PROPERTIES:

I_{X-X} = 702 in.⁴
 I_{Z-Z} = 575 in.⁴
 I_{Y-Y} = 1277 in.⁴

MOMENTS:

M_{XX} = 828#(21.76") + (1655# + 579#)2.95" = 29,576"#
 M_{ZZ} = 828#(21.76") + (1655# + 579#)24.8" = 78,388"#
 M_{YY} = 828#(25") = 20,700"#

BOLT FORCES:

TENSION (T)

$$T = \frac{78388\#(10.35")}{575} - \frac{1655\# + 579\#}{11 \text{ BOLTS}} = 1208 \text{ LBS/BOLT (MAX)}$$

SHEAR (V)

$$V = \frac{828\#}{11 \text{ BOLTS}} + \frac{20700\#(10.82")}{1277} = 251 \text{ LBS/BOLT (MAX)}$$

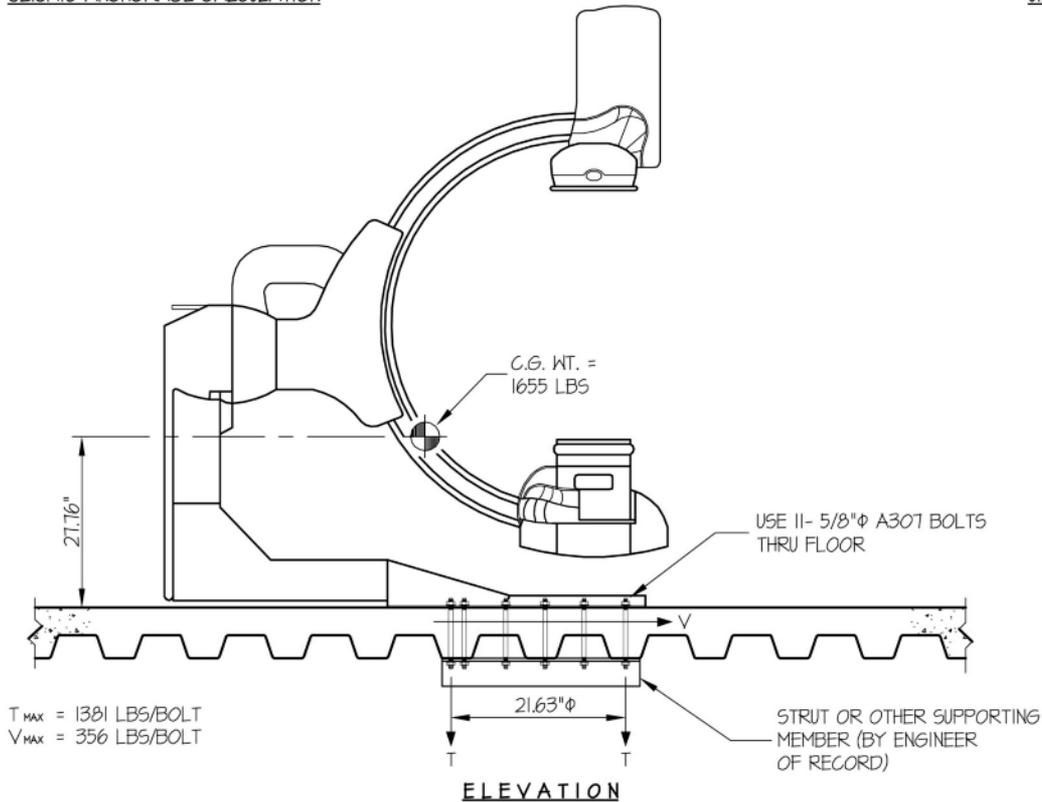
2.11 LC Positioner - Upper Floor

Illustration 9-12:

| | | |
|--|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING GEHC PIM 5160944 - Innova 2100-IQ/3100/4100 - LC Positioner | DES. R. LA BRIE | SHEET 1 |
| | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |

SEISMIC ANCHORAGE CALCULATION

UPPER FLOOR



NOTES:

1. FORCES ARE DETERMINED PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.
 HORIZONTAL FORCE (V_H) = $0.71W$ ($C \bar{a} .66, a \bar{r} 1.0, I \bar{r} 1.5, R \bar{r} 3.0$)
 VERTICAL FORCE (V_V) = $0.35W$
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.

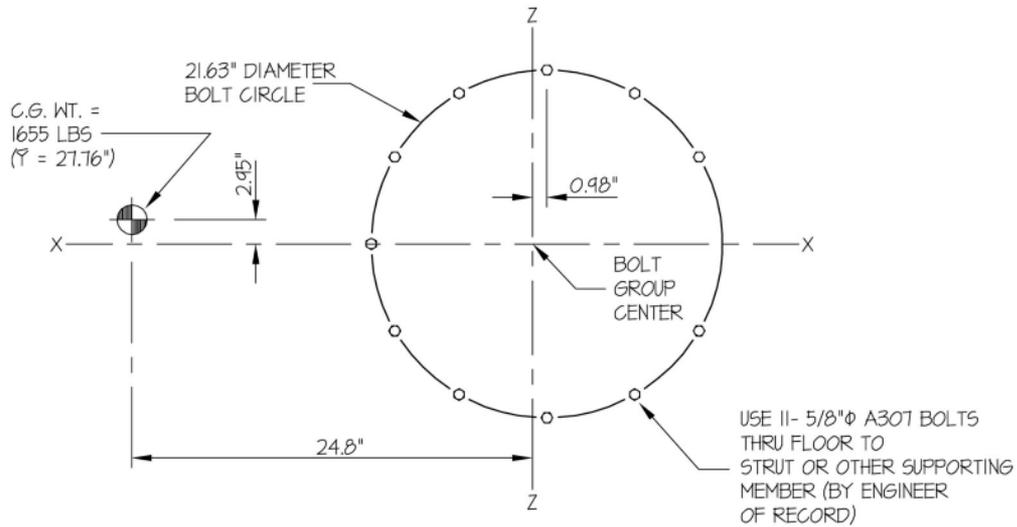
R. LaBrie
 REGISTERED PROFESSIONAL ENGINEER
 No. 3566
 EXP. 3-31-2008
 7/2/07
 STRUCTURAL
 STATE OF CALIFORNIA

Illustration 9-13:

| | | |
|---|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 2 |
| - Innova 2100-IQ/3100/4100 - LC Positioner | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |

SEISMIC ANCHORAGE CALCULATION

UPPER FLOOR



PLAN AT BASE

LOADS:

WEIGHT = 1655 LBS
 HORIZONTAL FORCE (V_H) = 1175 LBS
 VERTICAL FORCE (V_V) = 579 LBS

BOLT GROUP PROPERTIES:

$I_{X-X} = 702 \text{ in.}^4$
 $I_{Z-Z} = 575 \text{ in.}^4$
 $I_{Y-Y} = 1277 \text{ in.}^4$

MOMENTS:

$M_{XX} = 1175\#(21.76") + (1655\# + 579\#)2.95" = 39,208\#\text{in.}$
 $M_{ZZ} = 1175\#(21.76") + (1655\# + 579\#)24.8" = 88,021\#\text{in.}$
 $M_{YY} = 1175\#(25") = 29,375\#\text{in.}$

BOLT FORCES:

TENSION (T)

$$T = \frac{88021\#\text{in.}(10.35")}{575} - \frac{1655\# + 579\#}{11 \text{ BOLTS}} = 1381 \text{ LBS/BOLT (MAX)}$$

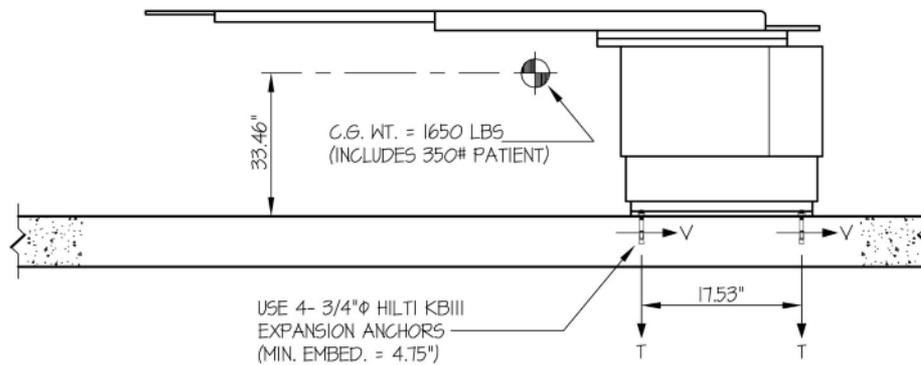
SHEAR (V)

$$V = \frac{1175\#}{11 \text{ BOLTS}} + \frac{29375\#\text{in.}(10.82")}{1277} = 356 \text{ LBS/BOLT (MAX)}$$

2.12 Omega IV Table - Slab on Grade

Illustration 9-14:

| | | |
|--|------------------------|----------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 - Innova 2100-IQ/3100/4100 - Omega IV Table | DES. R. LA BRIE | SHEET 1 |
| | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |
| <u>SEISMIC ANCHORAGE CALCULATION</u> | | <u>SLAB ON GRADE</u> |



ELEVATION

$T_{MAX} = 3054 \text{ LBS/BOLT}$
 $V_{MAX} = 799 \text{ LBS/BOLT}$

NOTES:

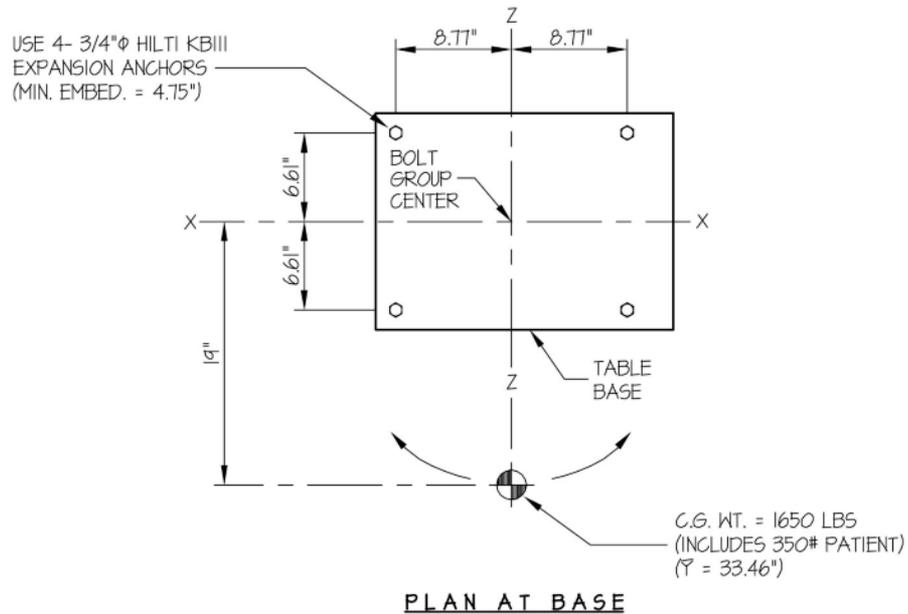
1. FORCES ARE DETERMINED PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.
 HORIZONTAL FORCE (V_H) = $0.50W$ ($C_a = .66, a_p = 1.0, I_p = 1.5, R_p = 1.5$)
 VERTICAL FORCE (V_V) = $0.33(V_H)$
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



Illustration 9-15:

| | | |
|---|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 2 |
| - Innova 2100-IQ/3100/4100 - Omega IV Table | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |

SEISMIC ANCHORAGE CALCULATION SLAB ON GRADE



LOADS:

WEIGHT = 1650 LBS (INCLUDES 350# PATIENT)
 HORIZONTAL FORCE (V_H) = 825 LBS
 VERTICAL FORCE (V_V) = 275 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \left[\frac{825\#(33.46\#)}{2 \text{ BOLTS } (13.22\#)} \times (0.3) \right] - \frac{825\#(33.46\#)}{2 \text{ BOLTS } (17.54\#)} + \frac{825\#(19\#)(33.46\#)}{13.22\#(17.54\#)} + \frac{(1650\# + 275\#)12.39\#}{2 \text{ BOLTS } (13.22\#)} = 3054 \text{ LBS/BOLT (MAX)}$$

SHEAR (V)

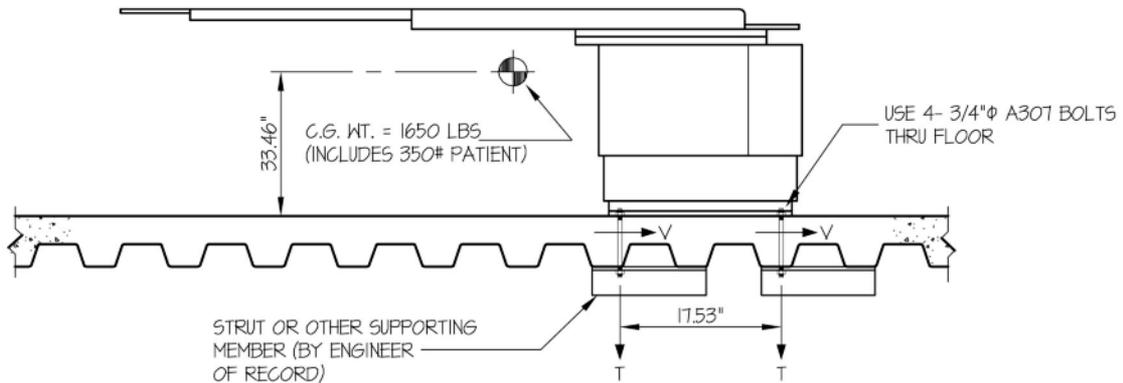
$$V = \frac{825\#(25.6\#)}{2 \text{ BOLTS } (13.22\#)} = 799 \text{ LBS/BOLT (MAX)}$$

UNITY CHECK: $\frac{T_{\text{ACTUAL}}}{T_{\text{ALLOW.}}} + \frac{V_{\text{ACTUAL}}}{V_{\text{ALLOW.}}} = \left(\frac{3054}{3956} \right)^{\frac{5}{3}} + \left(\frac{799}{4701} \right)^{\frac{5}{3}} = .70 < 1.0 \therefore \text{OK}$

2.13 Omega IV Table - Upper floor

Illustration 9-16:

| | | |
|---|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - Omega IV Table | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |
| SEISMIC ANCHORAGE CALCULATION | | UPPER FLOOR |



$T_{MAX} = 4377 \text{ LBS/BOLT}$
 $V_{MAX} = 1502 \text{ LBS/BOLT}$

ELEVATION

NOTES:

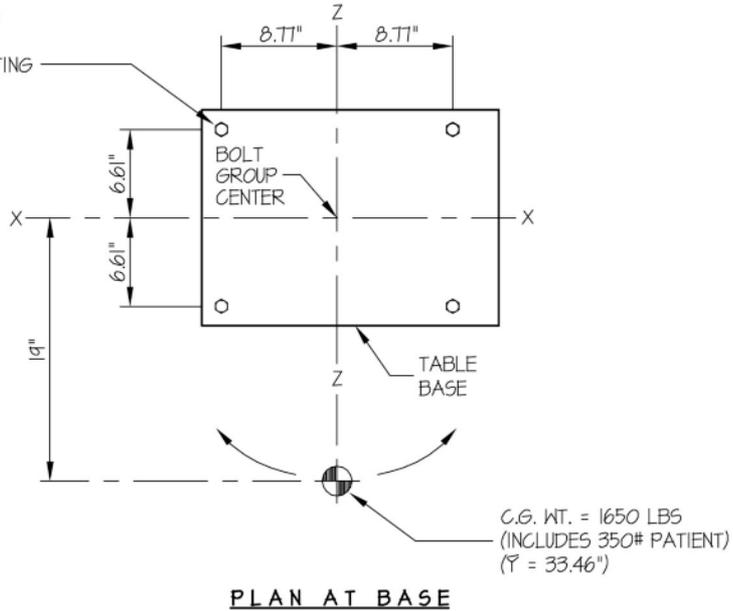
1. FORCES ARE DETERMINED PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.
 HORIZONTAL FORCE (V_H) = $0.94W (C_a = .66, a_p = 1.0, I_p = 1.5, R_p = 3.0)$
 VERTICAL FORCE (V_V) = $0.33(V_H)$
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



Illustration 9-17:

| | | |
|--|------------------------|--------------------|
| EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING GEHC PIM 5160944 - Innova 2100-IQ/3100/4100 - Omega IV Table | DES. R. LA BRIE | SHEET 2 |
| | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |
| SEISMIC ANCHORAGE CALCULATION | | UPPER FLOOR |

USE 4- 3/4"Ø A307 BOLTS
 THRU FLOOR TO
 STRUT OR OTHER SUPPORTING
 MEMBER (BY ENGINEER
 OF RECORD)



LOADS:

WEIGHT = 1650 LBS (INCLUDES 350# PATIENT)
 HORIZONTAL FORCE (V_H) = 1551 LBS
 VERTICAL FORCE (V_V) = 517 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \left[\frac{1551\#(33.46\text{'})}{2 \text{ BOLTS } (13.22\text{'})} \times (0.3) \right] - \frac{1551\#(33.46\text{'})}{2 \text{ BOLTS } (17.54\text{'})} + \frac{1551\#(19\text{'}) (33.46\text{'})}{13.22\text{'}(17.54\text{'})} + \frac{(1650\# + 517\#)12.39\text{'}}{2 \text{ BOLTS } (13.22\text{'})} = 4377 \text{ LBS/BOLT (MAX)}$$

SHEAR (V)

$$V = \frac{1551\#(25.61\text{'})}{2 \text{ BOLTS } (13.22\text{'})} = 1502 \text{ LBS/BOLT (MAX)}$$

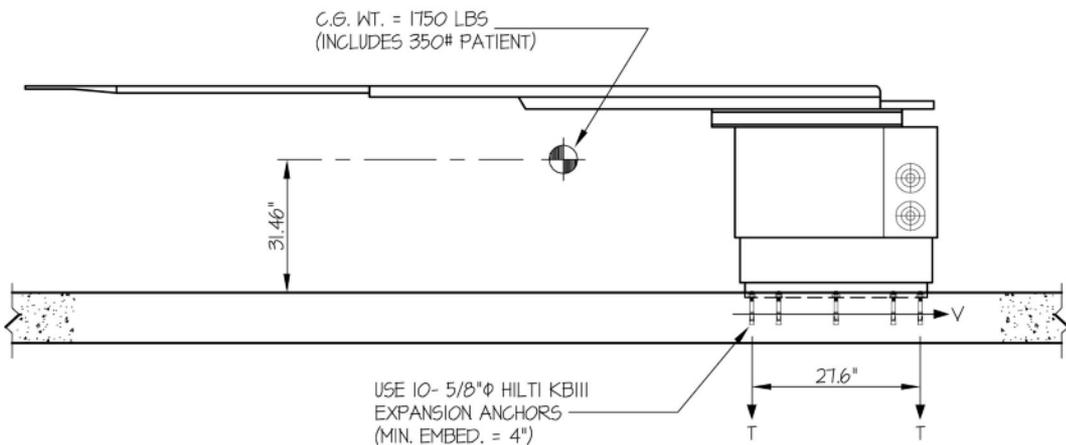
UNITY CHECK: $\frac{T_{\text{ACTUAL}}}{T_{\text{ALLOW.}}} + \frac{V_{\text{ACTUAL}}}{V_{\text{ALLOW.}}} = \left(\frac{4377}{8800} \right)^{\frac{5}{3}} + \left(\frac{1502}{4400} \right)^{\frac{5}{3}} = 4.79 < 10 \therefore \text{O.K.}$

2.14 Omega V Long Table w/baseplate - Slab on Grade

Illustration 9-18:

| | | |
|---|------------------------|----------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET |
| - Innova 2100-IQ/3100/4100 - | JOB NO. 12-0516 | 1 |
| Omega V Long Table w/baseplate | DATE 7/2/07 | 2 |
| SEISMIC ANCHORAGE CALCULATION | OF | SHEETS |

SLAB ON GRADE



$T_{MAX} = 1040 \text{ LBS/BOLT}$
 $V_{MAX} = 414 \text{ LBS/BOLT}$

ELEVATION

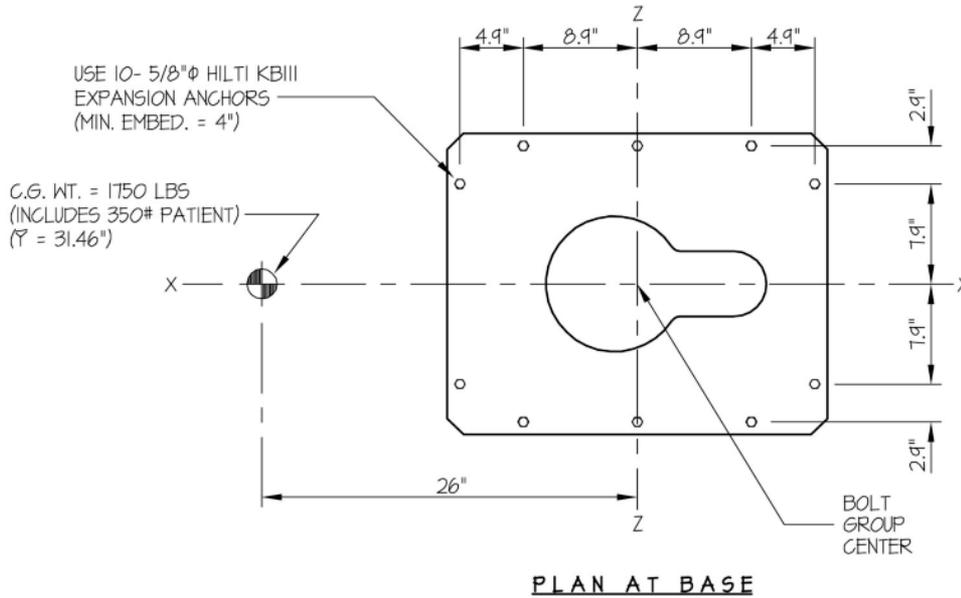
NOTES:

1. FORCES ARE DETERMINED PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.
 HORIZONTAL FORCE (V_H) = $0.50W (C_a = .66, a_p = 1.0, I_p = 1.5, R_p = 1.5)$
 VERTICAL FORCE (V_V) = $0.33(V_H)$
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



Illustration 9-19:

| | | |
|--|------------------------|--------------------|
| EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING GEHC PIM 5160944 - Innova 2100-IQ/3100/4100 - Omega V Long Table w/baseplate | DES. R. LA BRIE | SHEET 2 |
| | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |
| SEISMIC ANCHORAGE CALCULATION | | SLAB ON GRADE |



LOADS:

WEIGHT = 1750 LBS (INCLUDES 350# PATIENT)
 HORIZONTAL FORCE (V_H) = 875 LBS
 VERTICAL FORCE (V_V) = 292 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \left[\frac{875\#(31.46'')}{4 \text{ BOLTS } (18.7'')} \times (0.3) \right] - \frac{875\#(31.46'')}{4 \text{ BOLTS } (22.7'')} + \frac{875\#(26'')(31.46'')}{2 \text{ BOLTS } (18.7'')(22.7'')} + \frac{(1750\# - 292\#)16.65''}{4 \text{ BOLTS } (18.7'')} = 1040 \text{ LBS/BOLT (MAX)}$$

$T \downarrow$ $T \leftrightarrow$ $T \curvearrowright$ $T (W + V_v)$

SHEAR (V)

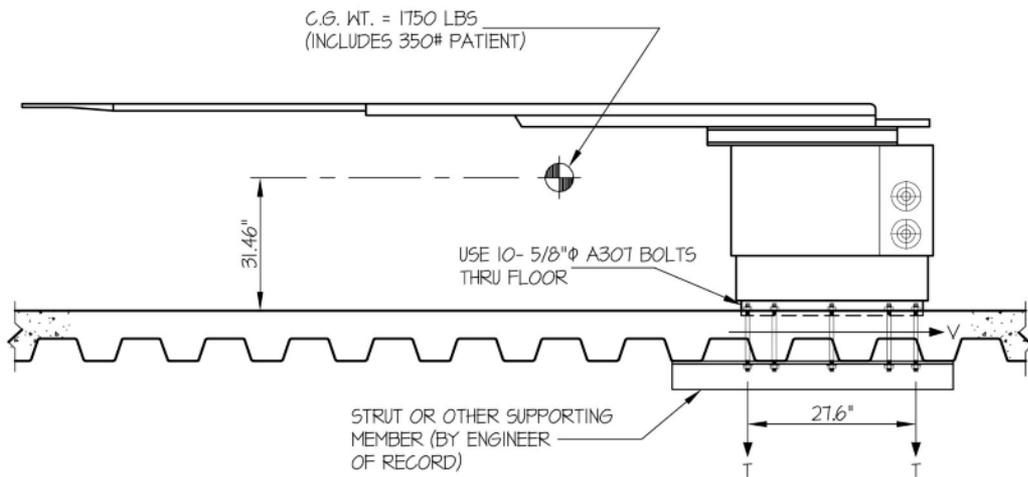
$$V = \frac{875\#(35.35'')}{4 \text{ BOLTS } (18.7'')} = 414 \text{ LBS/BOLT (MAX)}$$

UNITY CHECK: $\frac{T_{\text{ACTUAL}}}{T_{\text{ALLOW.}}} + \frac{V_{\text{ACTUAL}}}{V_{\text{ALLOW.}}} = \left(\frac{1040}{2064} \right)^{\frac{5}{3}} + \left(\frac{414}{3105} \right)^{\frac{5}{3}} = .354 < 1.0 \therefore \text{OK}$

2.15 Omega V Long Table w/baseplate - Upper floor

Illustration 9-20:

| | | |
|---|------------------------|----------------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - | JOB NO. 12-0516 | OF 2 SHEETS |
| Omega V Long Table w/baseplate | DATE 7/2/07 | |
| <small>SEISMIC ANCHORAGE CALCULATION</small> | | <small>UPPER FLOOR</small> |



ELEVATION

T_{MAX} = 1490 LBS/BOLT
 V_{MAX} = 777 LBS/BOLT

NOTES:

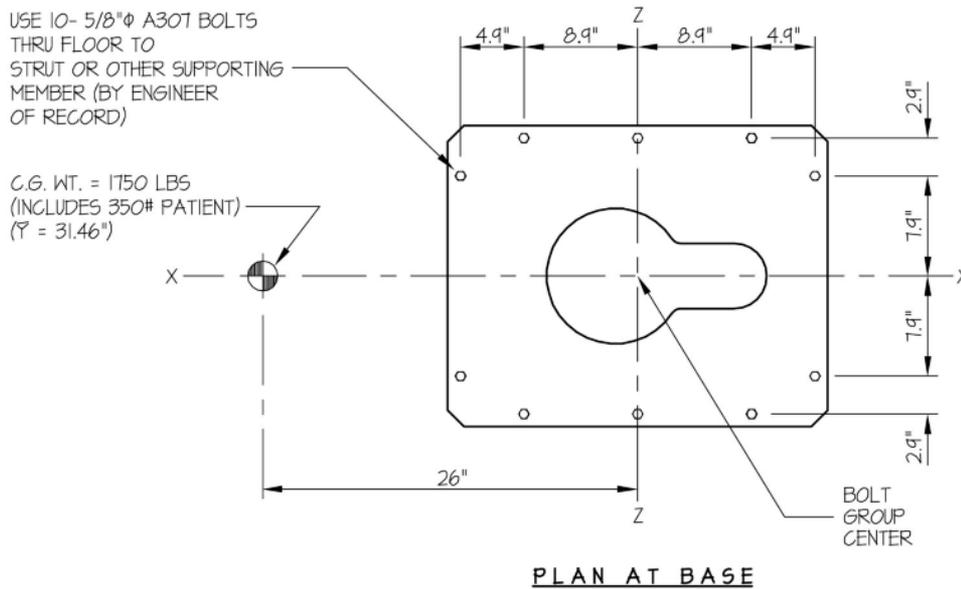
1. FORCES ARE DETERMINED PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.
 HORIZONTAL FORCE (V_H) = 0.94W (C_a = .66, a_p = 1.0, I_p = 1.5, R_p = 3.0)
 VERTICAL FORCE (V_V) = 0.33(V_H)
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



Illustration 9-21:

| | | |
|--|------------------------|--------------------|
| EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING GEHC PIM 5160944 - Innova 2100-IQ/3100/4100 - Omega V Long Table w/baseplate | DES. R. LA BRIE | SHEET 2 |
| | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |

SEISMIC ANCHORAGE CALCULATIONUPPER FLOOR



LOADS:

WEIGHT = 1750 LBS (INCLUDES 350# PATIENT)
 HORIZONTAL FORCE (V_H) = 1645 LBS
 VERTICAL FORCE (V_V) = 548 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \left[\frac{1645\#(31.46'')}{4 \text{ BOLTS } (18.7'')} \times (0.3) \right] - \frac{1645\#(31.46'')}{4 \text{ BOLTS } (22.7'')} + \frac{1645\#(26'')(31.46'')}{2 \text{ BOLTS } (18.7'')(22.7'')} + \frac{(1750\# - 548\#)16.65''}{4 \text{ BOLTS } (18.7'')} = 1490 \text{ LBS/BOLT (MAX)}$$

$T \updownarrow$ $T \leftrightarrow$ $T \curvearrowright$ $T(W + V_v)$

SHEAR (V)

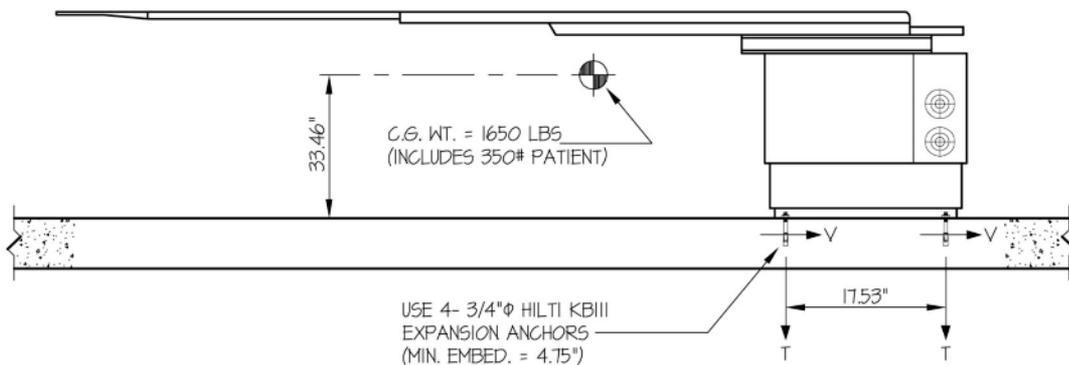
$$V = \frac{1645\#(35.35'')}{4 \text{ BOLTS } (18.7'')} = 777 \text{ LBS/BOLT (MAX)}$$

UNITY CHECK: $\frac{T_{\text{ACTUAL}}}{T_{\text{ALLOW.}}} + \frac{V_{\text{ACTUAL}}}{V_{\text{ALLOW.}}} = \left(\frac{1490}{6100} \right)^{\frac{5}{3}} + \left(\frac{777}{3050} \right)^{\frac{5}{3}} = .198 < 1.0 \therefore \text{OK}$

2.16 Omega V Table - Slab on Grade

Illustration 9-22:

| | | |
|--|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 - Innova 2100-IQ/3100/4100 - Omega V Long Table | DES. R. LA BRIE | SHEET 1 |
| | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |
| SEISMIC ANCHORAGE CALCULATION | | SLAB ON GRADE |



ELEVATION

T_{MAX} = 3753 LBS/BOLT
 V_{MAX} = 1018 LBS/BOLT

NOTES:

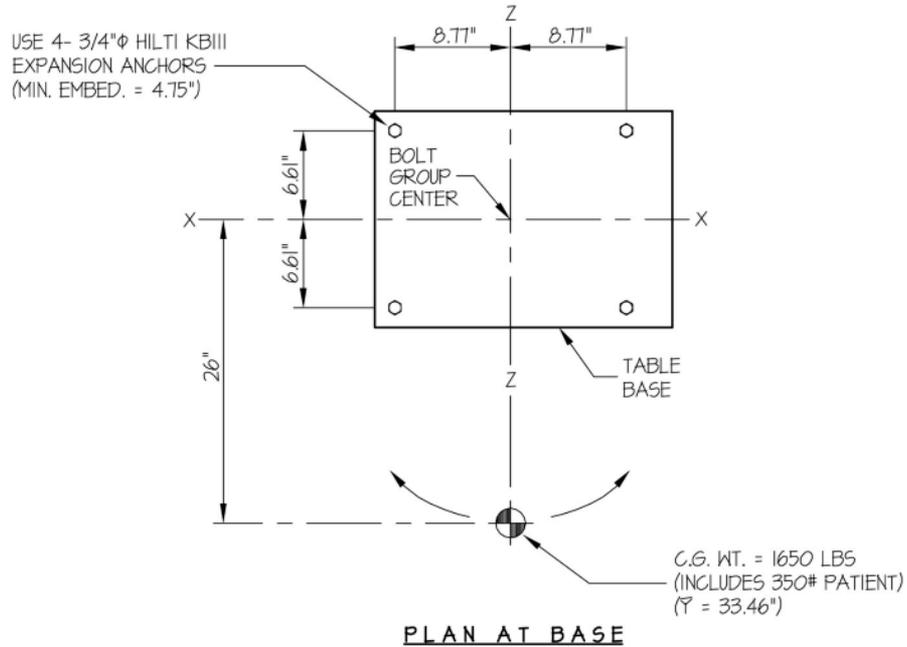
1. FORCES ARE DETERMINED PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.
 HORIZONTAL FORCE (V_H) = 0.50W (C_a = .66, a_p = 1.0, I_p = 1.5, R_p = 1.5)
 VERTICAL FORCE (V_V) = 0.33(V_H)
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



Illustration 9-23:

| | | |
|--|--|------------------------|
| EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | DES. R. LA BRIE | SHEET 2 |
| | GEHC PIM 5160944 | JOB NO. 12-0516 |
| | - Innova 2100-IQ/3100/4100 - Omega V Long Table | DATE 7/2/07 |
| OF 2 SHEETS | | |

SEISMIC ANCHORAGE CALCULATION SLAB ON GRADE



LOADS:

WEIGHT = 1650 LBS (INCLUDES 350# PATIENT)
 HORIZONTAL FORCE (V_H) = 825 LBS
 VERTICAL FORCE (V_V) = 275 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \left[\frac{825\#(33.46")}{2 \text{ BOLTS } (13.22")} \times (0.3) \right] - \frac{825\#(33.46")}{2 \text{ BOLTS } (17.54")} + \frac{825\#(26")\#(33.46")}{13.22"(17.54")} + \frac{(1650\# + 275\#)19.39"}{2 \text{ BOLTS } (13.22")} = 3753 \text{ LBS/BOLT (MAX)}$$

T ↓
T ↔
T ↷
T (W + V)

SHEAR (V)

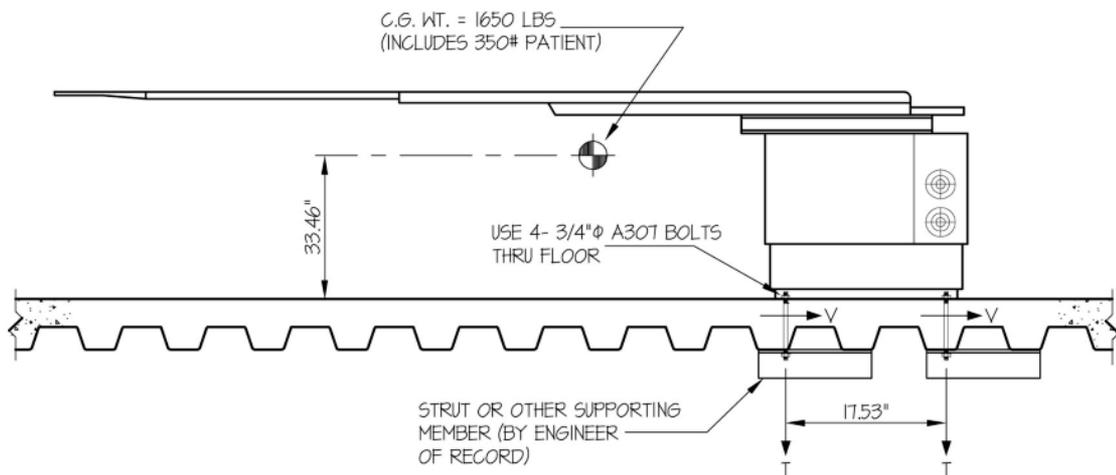
$$V = \frac{825\#(32.61")}{2 \text{ BOLTS } (13.22")} = 1018 \text{ LBS/BOLT (MAX)}$$

UNITY CHECK: $\frac{T_{\text{ACTUAL}}}{T_{\text{ALLOW.}}} + \frac{V_{\text{ACTUAL}}}{V_{\text{ALLOW.}}} = \left(\frac{3753}{3956} \right)^{\frac{5}{3}} + \left(\frac{1018}{4701} \right)^{\frac{5}{3}} = .99 < 1.0 \therefore \text{OK}$

2.17 Omega V Table - Upper floor

Illustration 9-24:

| | | |
|--|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 - Innova 2100-IQ/3100/4100 - Omega V Long Table | DES. R. LA BRIE | SHEET 1 |
| | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |
| <u>SEISMIC ANCHORAGE CALCULATION</u> | | <u>UPPER FLOOR</u> |



$T_{MAX} = 6518 \text{ LBS/BOLT}$
 $V_{MAX} = 1913 \text{ LBS/BOLT}$

ELEVATION

NOTES:

1. FORCES ARE DETERMINED PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.
 HORIZONTAL FORCE (V_H) = $0.94W$ ($C_a = .66, a_p = 1.0, I_p = 1.5, R_p = 3.0$)
 VERTICAL FORCE (V_V) = $0.33(V_H)$
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.



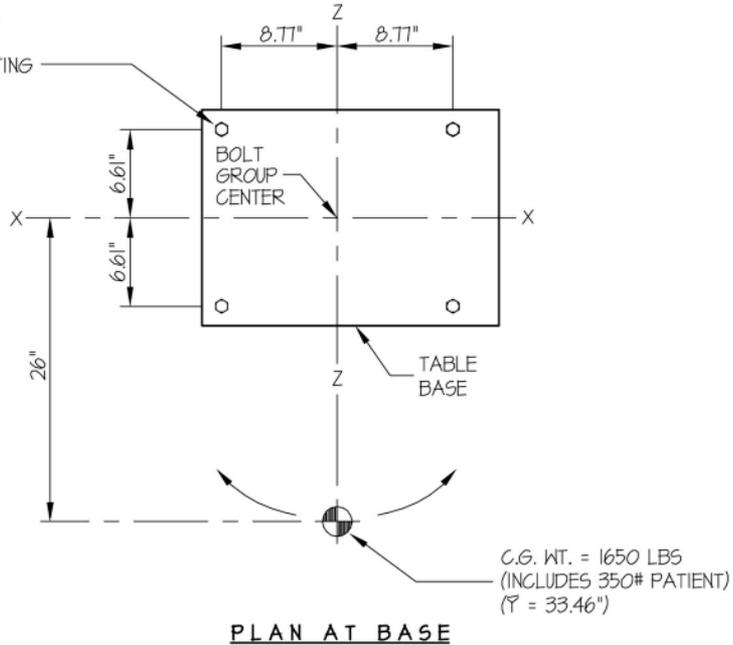
Illustration 9-25:

| | | |
|--|------------------------|--------------------|
|  EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING GEHC PIM 5160944 - Innova 2100-IQ/3100/4100 - Omega V Long Table | DES. R. LA BRIE | SHEET 2 |
| | JOB NO. 12-0516 | OF 2 SHEETS |
| | DATE 7/2/07 | |

SEISMIC ANCHORAGE CALCULATION

UPPER FLOOR

USE 4- 3/4"φ A307 BOLTS
 THRU FLOOR TO
 STRUT OR OTHER SUPPORTING
 MEMBER (BY ENGINEER
 OF RECORD)



LOADS:

WEIGHT = 1650 LBS (INCLUDES 350# PATIENT)
 HORIZONTAL FORCE (V_H) = 1551 LBS
 VERTICAL FORCE (V_V) = 517 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \left[\frac{1551\#(33.46'')}{2 \text{ BOLTS } (13.22'')} \times (0.3) \right] - \frac{1551\#(33.46'')}{2 \text{ BOLTS } (17.54'')} + \frac{1551\#(26'')(33.46'')}{13.22''(17.54'')} + \frac{(1650\# + 517\#)19.39''}{2 \text{ BOLTS } (13.22'')} = 6518 \text{ LBS/BOLT (MAX)}$$

$T \updownarrow$ $T \leftrightarrow$ $T \curvearrowright$ $T(W + V_v)$

SHEAR (V)

$$V = \frac{1551\#(32.61'')}{2 \text{ BOLTS } (13.22'')} = 1913 \text{ LBS/BOLT (MAX)}$$

UNITY CHECK: $\frac{T_{\text{ACTUAL}}}{T_{\text{ALLOW.}}} + \frac{V_{\text{ACTUAL}}}{V_{\text{ALLOW.}}} = \left(\frac{6518}{8800} \right)^{\frac{5}{3}} + \left(\frac{1913}{4400} \right)^{\frac{5}{3}} = .86 < 1.0 \therefore \text{OK}$

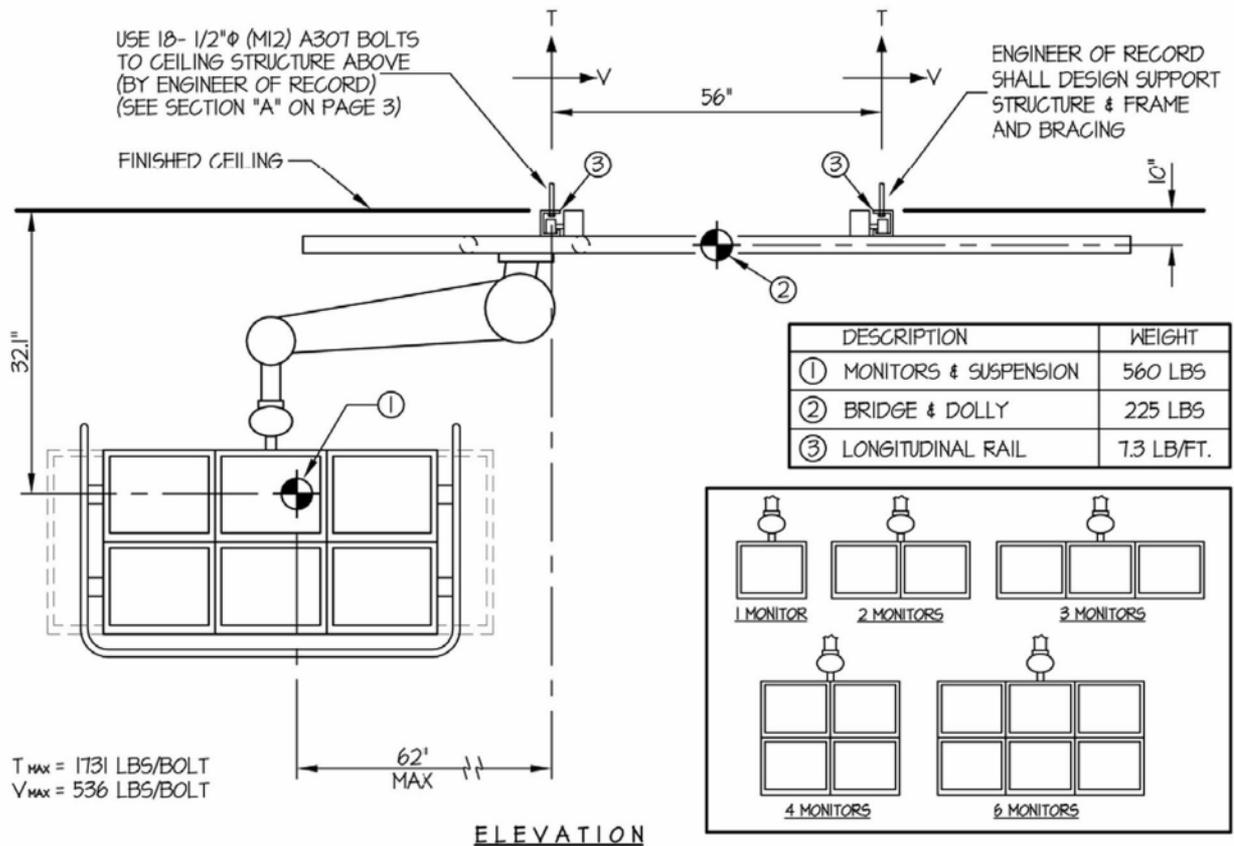
2.18 Overhead Flat Panel Suspension – Ceiling mounted

Illustration 9-26:

| | | |
|---|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC Optional Equipment | DES. R. LA BRIE | SHEET 1 |
| Overhead Flat Panel Suspension | JOB NO. 12-0414 | OF 2 SHEETS |
| | DATE 7/10/05 | |

SEISMIC ANCHORAGE CALCULATION

CEILING MOUNTED



NOTES:

1. FORCES ARE DETERMINED PER 2001 CALIFORNIA BUILDING CODE - SECTION I632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.
 HORIZONTAL FORCE (V_H) = $2.36W (C_a = .66, a_p = 2.5, I_p = 1.5, R_p = 3.0)$
 VERTICAL FORCE (V_V) = $0.33(V_H)$
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.

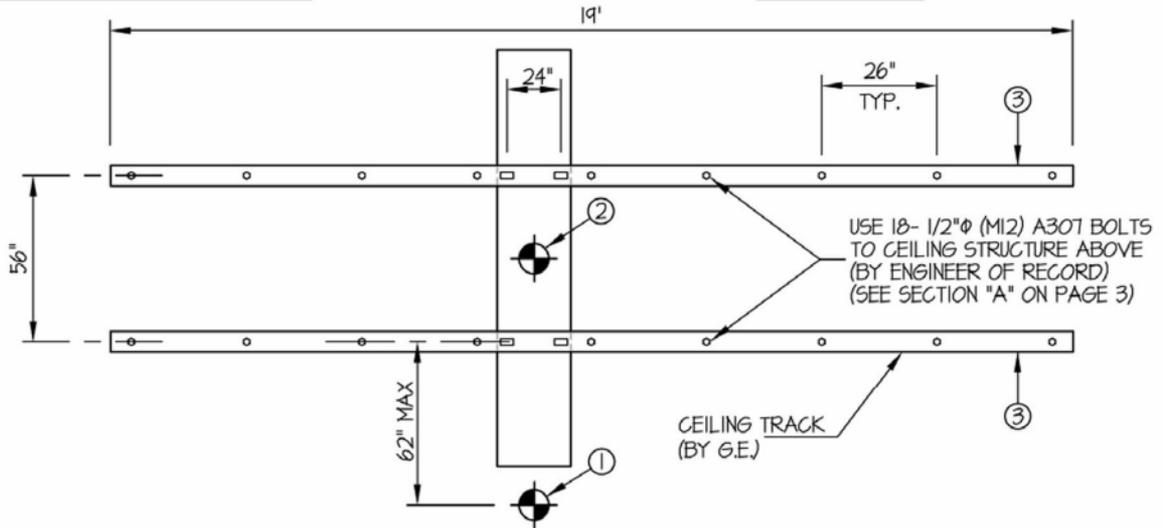


Illustration 9-27:

| | | |
|---|------------------------|------------------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC Optional Equipment | DES. R. LA BRIE | SHEET 2 |
| Overhead Flat Panel Suspension | JOB NO. 12-0414 | OF 2 SHEETS |
| | DATE 7/10/05 | |

SEISMIC ANCHORAGE CALCULATION

CEILING MOUNTED



PLAN AT CEILING

LOADS:

- | | | |
|---|---|--|
| <p>① <u>MONITORS & SUSPENSION</u> WEIGHT = 560 LBS HORIZ. FORCE (V_H) = 1322 LBS VERT. FORCE (V_V) = 441 LBS</p> | <p>② <u>BRIDGE & DOLLY</u> WEIGHT = 225 LBS HORIZ. FORCE (V_H) = 531 LBS VERT. FORCE (V_V) = 177 LBS</p> | <p>③ <u>RAILS</u> WEIGHT = 7.3 LB/FT. HORIZ. FORCE (V_H) = 17.2 LB/FT. VERT. FORCE (V_V) = 5.7 LB/FT.</p> |
|---|---|--|

BOLT FORCES:

$$TENSION (T) \quad T_1 = \left(\frac{[(560\# + 441\#)118"] + 1322\#(32.1")}{(56")} \right) \left(\frac{14"}{26"} \right) = 1544 \text{ LBS/BOLT}$$

$$T_2 = \left(\frac{[(225\# + 177\#)28"] + 531\#(10")}{(56")} \right) \left(\frac{14"}{26"} \right) = 159 \text{ LBS/BOLT}$$

$$T_3 = \frac{(7.3\#/FT. + 5.7\#/FT.)26"}{12"} = 28 \text{ LBS/BOLT}$$

$$T = 1544\# + 159\# + 28\# = 1731 \text{ LBS/BOLT (MAX)}$$

SHEAR (V)

$$V = \frac{(1322\# + 531\#)14"}{2 \text{ BOLTS } (26")} + \frac{17.2\#/FT.(26")}{12"/FT.} = 536 \text{ LBS/BOLT (MAX)}$$

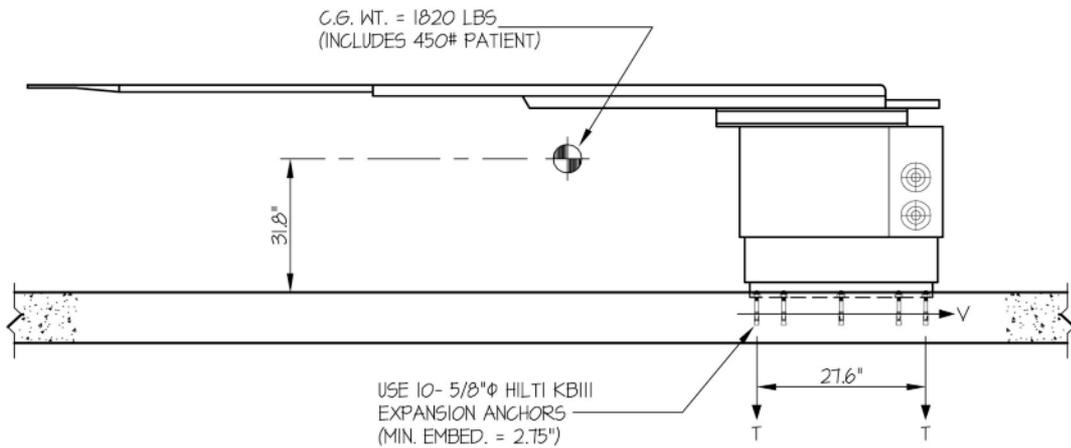
UNITY CHECK:

$$\frac{T_{ACTUAL}}{T_{ALLOW}} + \frac{V_{ACTUAL}}{V_{ALLOW}} = \frac{1731}{3900} + \frac{536}{1950} = .719 < 1.0 \therefore \underline{O.K.}$$

2.19 InnovalQ Table w/baseplate - Slab on Grade

Illustration 9-28:

| | | |
|---|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - Elegance Table w/baseplate | JOB NO. 12-0661 | OF 2 SHEETS |
| | DATE 7/2/07 | |
| <u>SEISMIC ANCHORAGE CALCULATION</u> | <u>SLAB ON GRADE</u> | |



$T_{MAX} = 793 \text{ LBS/BOLT}$
 $V_{MAX} = 354 \text{ LBS/BOLT}$

ELEVATION

NOTES:

1. FORCES ARE DETERMINED PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.
 HORIZONTAL FORCE (V_H) = $0.50W$ ($C_a = .66$, $a_p = 1.0$, $I_p = 1.5$, $R_p = 1.5$)
 VERTICAL FORCE (V_V) = $0.33(V_H)$
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.

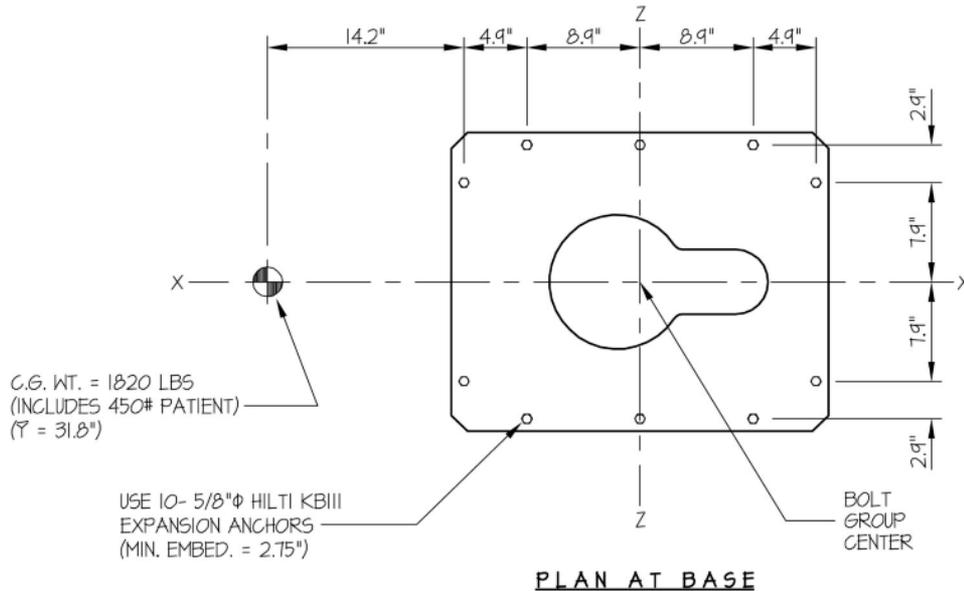


Illustration 9-29:

| | | |
|---|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 2 |
| - Innova 2100-IQ/3100/4100 - Elegance Table w/baseplate | JOB NO. 12-0661 | OF 2 SHEETS |
| | DATE 7/2/07 | |

SEISMIC ANCHORAGE CALCULATION

SLAB ON GRADE



LOADS:

WEIGHT = 1820 LBS (INCLUDES 450# PATIENT)
 HORIZONTAL FORCE (V_h) = 910 LBS
 VERTICAL FORCE (V_v) = 303 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \left[\frac{910\#(31.8'')(16.65'')}{4 \text{ BOLTS}(18.7'')(22.7'')} \times (0.3) \right] + \frac{910\#(31.8'')}{4 \text{ BOLTS}(22.7'')} + \frac{(1820\# + 303\#)16.65''}{4 \text{ BOLTS}(22.7'')} = 793 \text{ LBS/BOLT (MAX)}$$

$T \updownarrow$ $T \leftrightarrow$ $T(W + V_v)$

SHEAR (V)

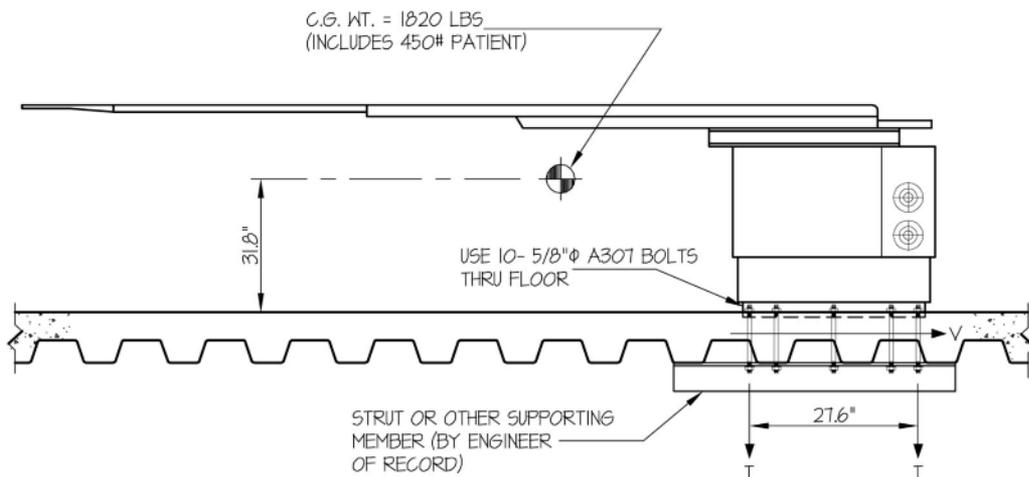
$$V = \frac{910\#(35.35'')}{4 \text{ BOLTS}(22.7'')} = 354 \text{ LBS/BOLT (MAX)}$$

UNITY CHECK: $\frac{T_{\text{ACTUAL}}}{T_{\text{ALLOW.}}} + \frac{V_{\text{ACTUAL}}}{V_{\text{ALLOW.}}} = \left(\frac{793}{1832} \right)^{\frac{5}{3}} + \left(\frac{354}{2888} \right)^{\frac{5}{3}} = 28 < 1.0 \therefore \text{OK}$

2.20 InnovalQ Table w/baseplate - Upper Floor

Illustration 9-30:

| | | |
|---|------------------------|--------------------|
| EASE EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING | | |
| GEHC PIM 5160944 | DES. R. LA BRIE | SHEET 1 |
| - Innova 2100-IQ/3100/4100 - Elegance Table w/baseplate | JOB NO. 12-0661 | OF 2 SHEETS |
| DATE 7/2/07 | | |
| <u>SEISMIC ANCHORAGE CALCULATION</u> | <u>UPPER FLOOR</u> | |



$T_{MAX} = 1198$ LBS/BOLT
 $V_{MAX} = 666$ LBS/BOLT

ELEVATION

NOTES:

1. FORCES ARE DETERMINED PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.
 HORIZONTAL FORCE (V_H) = $0.94W$ ($C_a = .66, a_p = 1.0, I_p = 1.5, R_p = 3.0$)
 VERTICAL FORCE (V_V) = $0.33(V_H)$
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS CALCULATION ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ARCHITECT OR STRUCTURAL ENGINEER OF RECORD SHALL PROVIDE SUPPORT STRUCTURE TO SUPPORT WEIGHTS AND FORCES SHOWN.

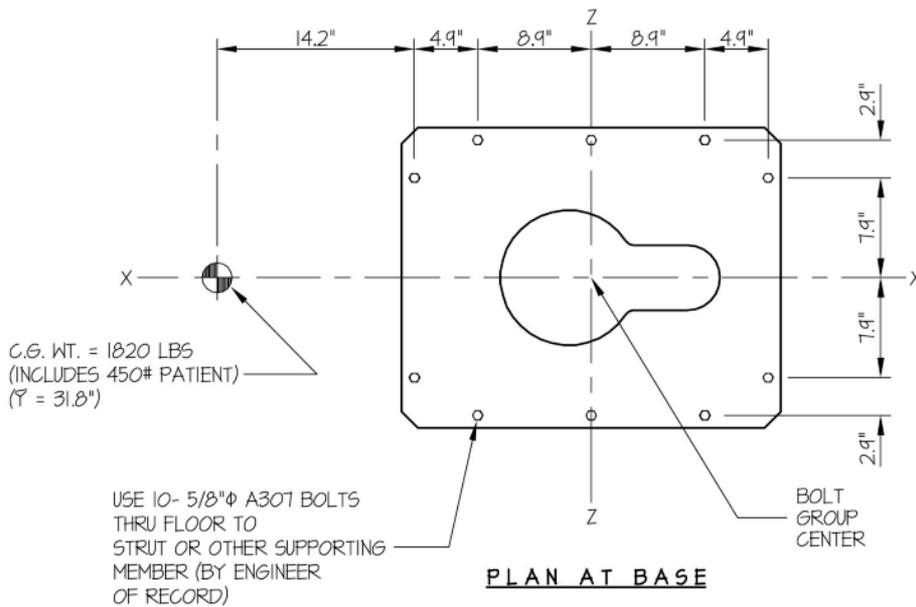


Illustration 9-31:

| | | |
|--|------------------------|--------------------|
| EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING GEHC PIM 5160944 - Innova 2100-IQ/3100/4100 - Elegance Table w/baseplate | DES. R. LA BRIE | SHEET 2 |
| | JOB NO. 12-0661 | OF 2 SHEETS |
| | DATE 7/2/07 | |

SEISMIC ANCHORAGE CALCULATION

UPPER FLOOR



LOADS:

WEIGHT = 1820 LBS (INCLUDES 450# PATIENT)
 HORIZONTAL FORCE (V_H) = 1711 LBS
 VERTICAL FORCE (V_V) = 570 LBS

BOLT FORCES:

TENSION (T)

$$T_{\text{MAXIMUM}} = \left[\frac{1711\#(31.8")}{4 \text{ BOLTS}(18.7")(22.7")} \times (0.3) \right] + \frac{1711\#(31.8")}{4 \text{ BOLTS}(22.7")} + \frac{(1820\# + 570\#)16.65"}{4 \text{ BOLTS}(22.7")} = 1198 \text{ LBS/BOLT (MAX)}$$

$T \downarrow$ $T \leftrightarrow$ $T (W + V_V)$

SHEAR (V)

$$V = \frac{1711\#(35.35")}{4 \text{ BOLTS}(22.7")} = 666 \text{ LBS/BOLT (MAX)}$$

UNITY CHECK: $\frac{T_{\text{ACTUAL}}}{T_{\text{ALLOW.}}} + \frac{V_{\text{ACTUAL}}}{V_{\text{ALLOW.}}} = \left(\frac{1198}{6100} \right)^{\frac{5}{3}} + \left(\frac{666}{3050} \right)^{\frac{5}{3}} = .15 < 1.0 \therefore \text{OK}$

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GE Medical Systems, a General Electric Company, going to market as GE Healthcare.

283, rue de la Minière

78530, Buc

FRANCE

www.gehealthcare.com

