

Optima CL320i, CL323i, IGS 320 Cardiovascular Imaging System Pre-Installation Manual



OPERATING DOCUMENTATION

5491029-1-1EN
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.

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

警告 (ZH-CN)

本维修手册仅提供英文版本。

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

警告 (ZH-HK)

本服務手冊僅提供英文版本。

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

警告 (ZH-TW)

本維修手冊僅有英文版。

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

UPOZORENJE (HR)

Ovaj servisni priručnik dostupan je na engleskom jeziku.

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

**VÝSTRAHA
(CS)**

Tento provozní návod existuje pouze v anglickém jazyce.

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

**ADVARSEL
(DA)**

Denne servicemanual findes kun på engelsk.

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

**WAARSCHUWING
(NL)**

Deze onderhoudshandleiding is enkel in het Engels verkrijgbaar.

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

**WARNING
(EN)**

This service manual is available in English only.

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

**HOIATUS
(ET)**

See teenindusjuhend on saadaval ainult inglise keeles.

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

VAROITUS
(FI)

Tämä huolto-ohje on saatavilla vain englanniksi.

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

ATTENTION
(FR)

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

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

WARNUNG
(DE)

Diese Serviceanleitung existiert nur in englischer Sprache.

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

ΠΡΟΕΙΔΟΠΟΙΗΣΗ
(EL)

Το παρόν εγχειρίδιο σέρβις διατίθεται μόνο στα αγγλικά.

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

FIGYELMEZTETÉS
(HU)

Ezen karbantartási kézikönyv kizárólag angol nyelven érhető el.

- Ha a vevő szolgáltatója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás 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 aðeins fáanleg á ensku.

- 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 lingua inglese.

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

警告
(JA)

このサービスマニュアルには英語版しかありません。

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

경고
(KO)

본 서비스 매뉴얼은 영어로만 이용하실 수 있습니다.

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

BRĪDINĀJUMS
(LV)

Šī apkopes rokasgrāmata ir pieejama tikai anglu valodā.

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

**ĮSPĖJIMAS
(LT)**

Šis eksploatavimo vadovas yra tik anglų kalba.

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

**ADVARSEL
(NO)**

Denne servicehåndboken finnes bare på engelsk.

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

**OSTRZEŻENIE
(PL)**

Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim.

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

**ATENÇÃO
(PT-BR)**

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

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

**ATENÇÃO
(PT-PT)**

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

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

**ATENȚIE
(RO)**

Acest manual de service este disponibil doar în limba engleză.

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

**ОСТОРОЖНО!
(RU)**

Данное руководство по техническому обслуживанию представлено только на английском языке.

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

**UPOZORENJE
(SR)**

Ovo servisno uputstvo je dostupno samo na engleskom jeziku.

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

**UPOZORNENIE
(SK)**

Tento návod na obsluhu je k dispozícii len v angličtine.

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

**ATENCION
(ES)**

Este manual de servicio sólo existe en inglés.

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

VARNING
(SV)

Den här servicehandboken finns bara tillgänglig på engelska.

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

OPOZORILO
(SL)

Ta servisni priročnik je na voljo samo v angleškem jeziku.

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

DİKKAT
(TR)

Bu servis kılavuzunun sadece ingilizcesi mevcuttur.

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

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Revision History

Part/Rev	Date	Reason for Change	Pages
5491029-1-1EN rev 1	Oct. 2013	Initial release of 5491029-1-1EN	236
5491029-1-1EN rev 2	Dec. 2015	Second release of 5491029-1-1EN	236

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Chapter 1 General Requirements

1 Objectives & Overview

1.1 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 Optima system.

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

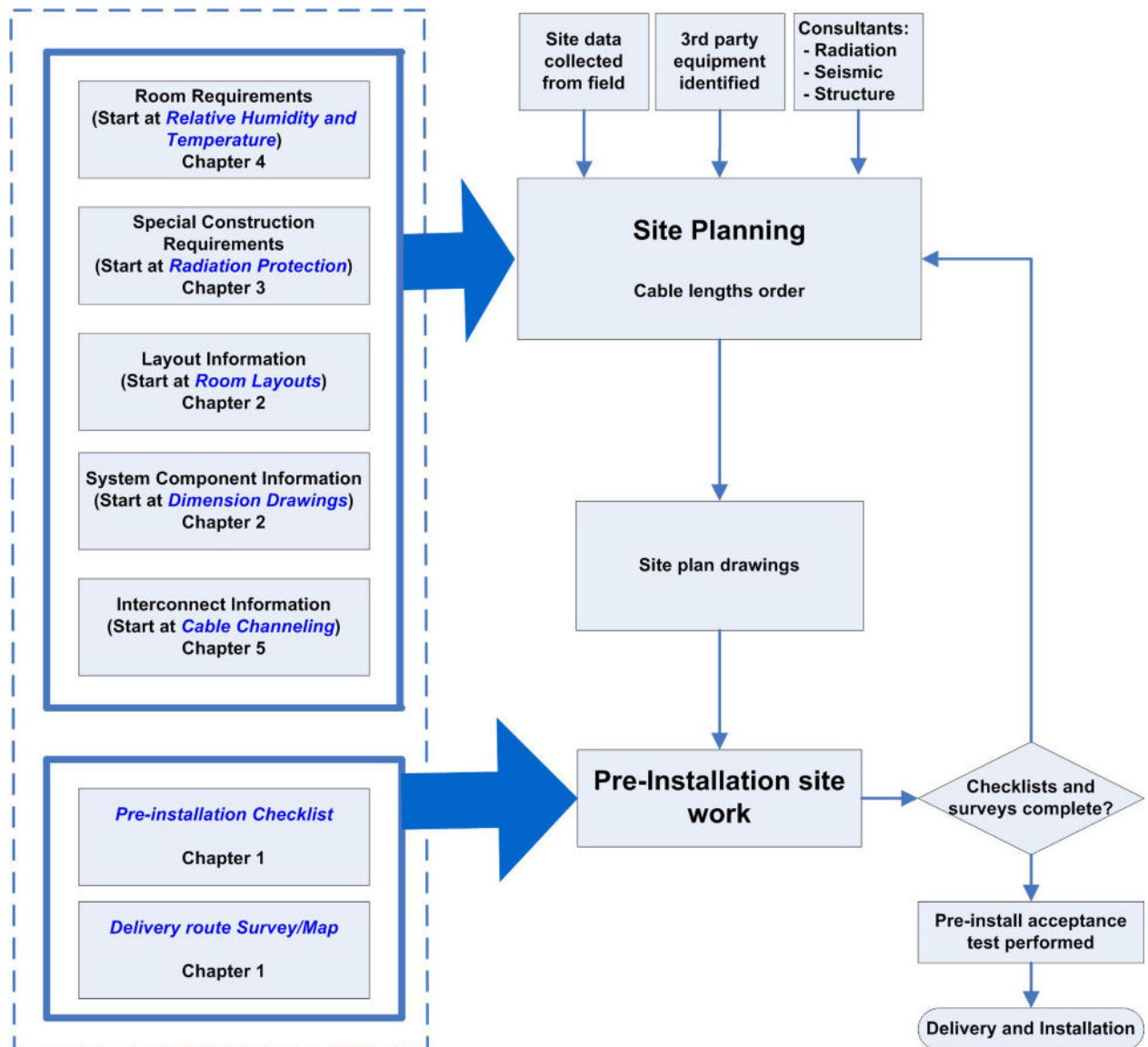
NOTE: Optima IGS320 and Optima IGS 320 are equivalent product.

1.2 Pre-Installation Process

Complete the checklists in ROOM LAYOUTS, ELECTRICAL REQUIREMENTS, and GENERAL REQUIREMENTS 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:



2 Customer Responsibilities

2.1 Responsibilities of the Purchaser/Customer

To ensure that the installation of an Optima 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 ([Tools and Test Equipment](#))
- Pre-Installation Checklist ([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 common baseplate (if applicable)

2.2 Equipment Classifications

The following equipment classifications are applicable to the product:

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/IPX8).
Method(s) of sterilization or disinfection recommended by the manufacturer	<ul style="list-style-type: none"> • Sterilization: not applicable • Disinfection: refer to Operator Manual (Chapter Safety and Regulatory, section Disinfection), Recommended disinfecting agents. The system does not fulfill the requirements for AP/APG classification (IEC 60601-1).
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 .



NOTICE

The system can only be installed in an anesthetizing location if that location is classified as Other Than Hazardous as per NFPA 70 clause 517.60



NOTICE

The product is not classified as AP, APG (Equipment not suitable for use in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide).

2.3 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. It is under its responsibility to ensure electrical installation is compliant to local regulations.							
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)					

3 Delivery Requirements

3.1 Shipping Information

3.1.1 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, Basic System Compatibility](#).

Table 1-1:

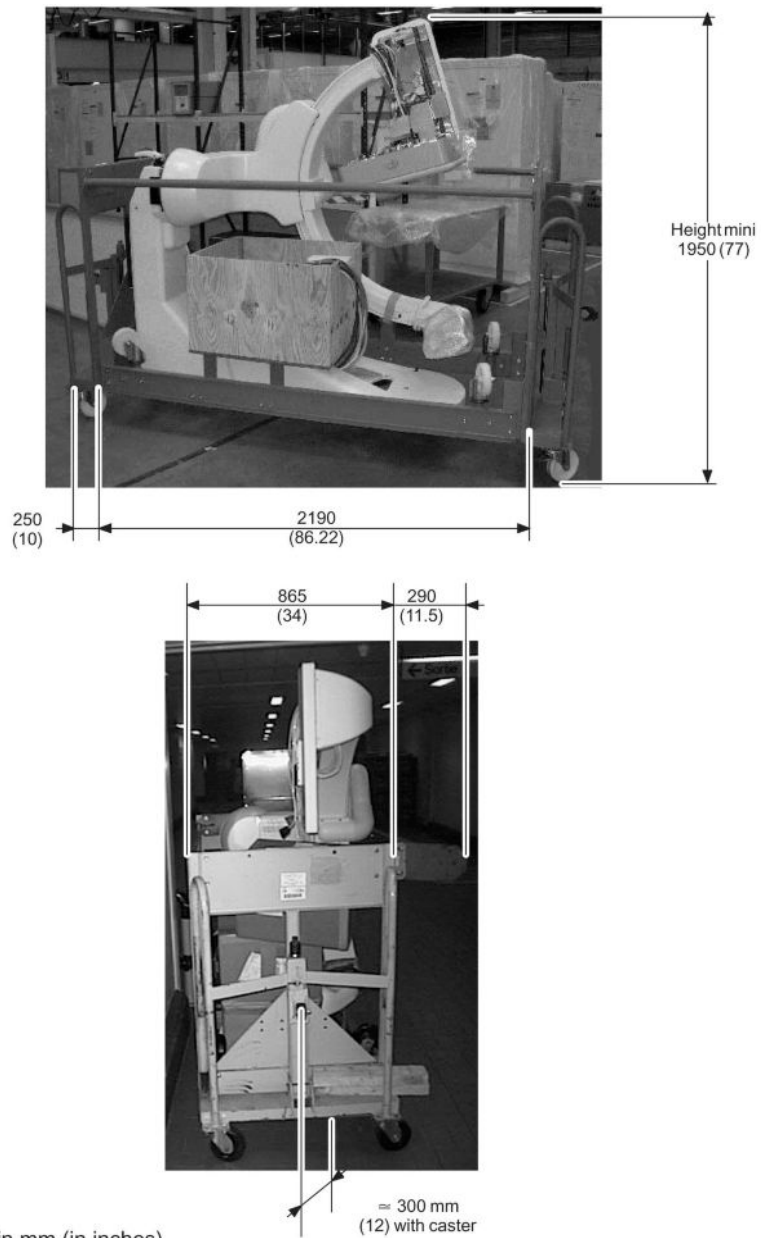
PRODUCT OR COMPONENT	DIMENSIONS MM (INCHES)			WEIGHT POUNDS (KILOGRAMS)	METHOD OF SHIPMENT
	Height	Width	Depth		
LC Positioner	1950 (77)	2790 (110)	1155 (45.5)	2,340 (1060)	Shipping Dolly. See Illustration 1-2
	2300 (90.5)	2900 (114)	1380 (54.5)	2,645 (1200)	Air shipment. See Illustration 1-3
C2 Cabinet	2084 (82.05)	1080 (42.52)	820 (32.28)	641.5(291)	On pallet. See Illustration 1-4
Omega Table Base Assembly	1240 (49)	960 (38)	2140 (84.2)	1,290 (585)	On pallet. See Illustration 1-5
Omega Table Top Assembly	220 (9)	3470 (137)	840 (33)	155 (70)	On pallet. See Illustration 1-5
C1 Cabinet	1800 (70.8)	900 (35.4)	650 (25.6)	1075.9(488)	On pallet. See Illustration 1-4
DL User parts	1040 (41)	860 (33.9)	680 (26.8)	220 (100)	On pallet
X-Ray tube housing	960 (37.7)	770 (30.3)	710 (28)	250 (113)	On pallet
Chiller 4000	1350 (53)	870 (34.8)	1040 (41)	500 (225)	On pallet
Chiller 4100	1200 (47.2)	555 (21.8)	610 (24)	264.5 (120)	
Auto-transformer (Coolix 4100 chiller)	340 (13.4)	370 (14.5)	304 (12)	97 (44)	
LC Requisites					On pallet
Cables					On pallet
Monitor susp. bridge	640 (25.2)	980 (38.6)	3060 (120.5)	445 (210)	On pallet
Monitor susp. rails	380 (15)	300 (12)	5960 (235)	355 (160)	On pallet
Fluoro UPS UL (*)	2100 (82.7)	890 (35)	1000 (39.4)	1235 (561)	On pallet
Fluoro UPS CE (*)	1750 (68.9)	890 (35)	1000 (39.4)	1287 (585)	On pallet
Ergo suspension with internal cables	1200 (47.2)	800 (31.5)	2000 (78.7)	287 (130)	On pallet
Ergo suspension - Suspension system cable harness	200 (7.8)	750 (29.5)	900 (35.4)	66 (30)	On pallet
Ergo suspension -	400 (15.7)	500 (19.6)	3500 (137.8)	287 (130)	On pallet

(*) Estimated values

3.1.2 Detail Of Shipping Information

3.1.2.1 LC Positioner Gantry On Shipping Dolly

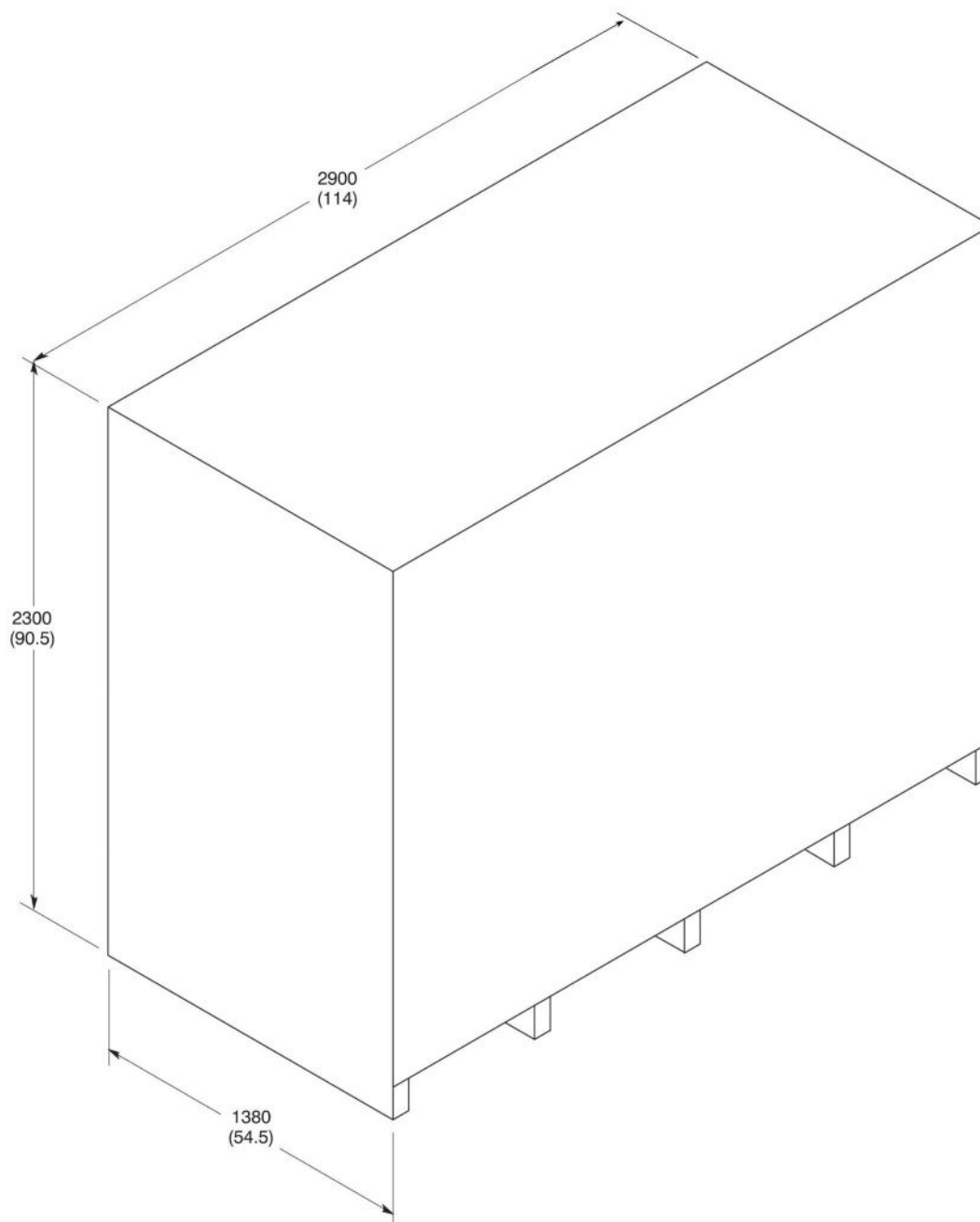
Illustration 1-2:



All dimensions are in mm (in inches)

3.1.2.2 LC Positioner Air Shipment

Illustration 1-3:

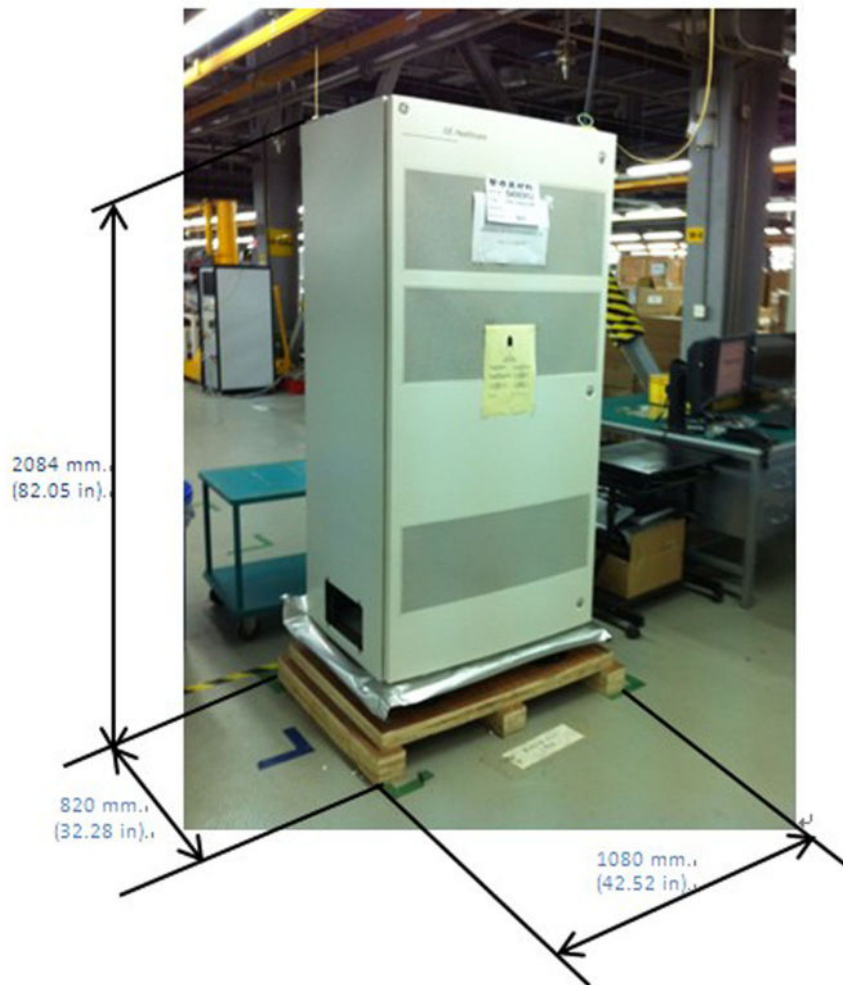


DIMENSIONS IN MM (INCHES)

NOT TO SCALE

3.1.2.3 C1 and C2 Cabinet on pallet

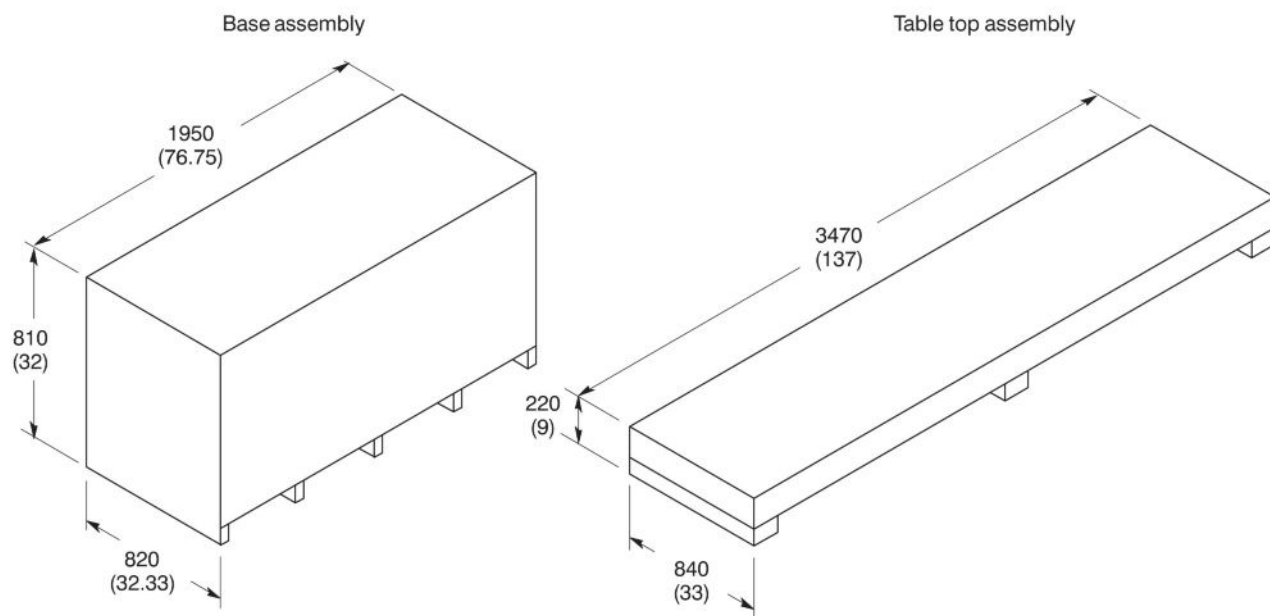
Illustration 1-4:



The shipping weight is of about 81 lbs..

3.1.2.4 Omega Shipment

Illustration 1-5:

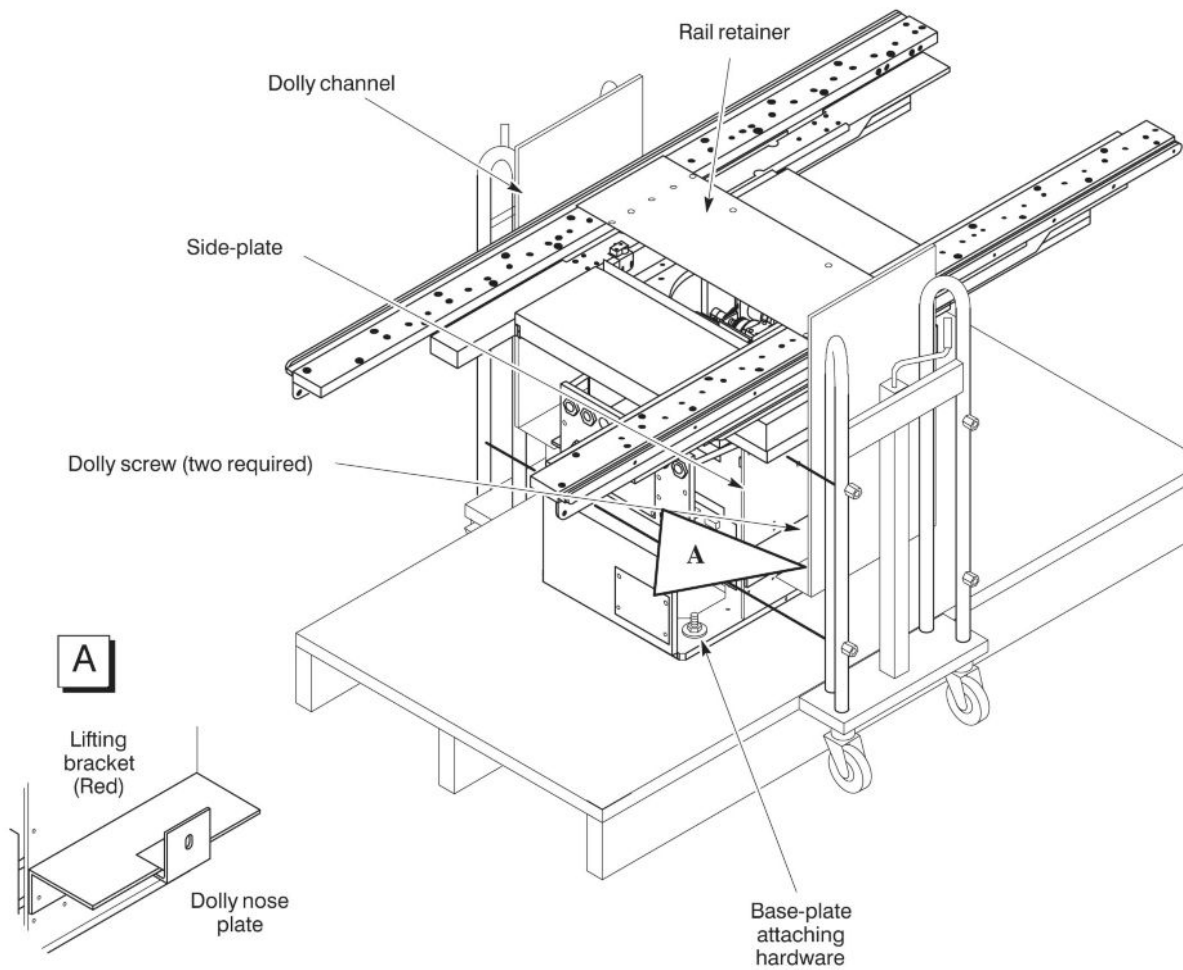


DIMENSIONS IN MM (INCHES)

NOT TO SCALE

3.1.2.5 Omega Using Positioner Dollies

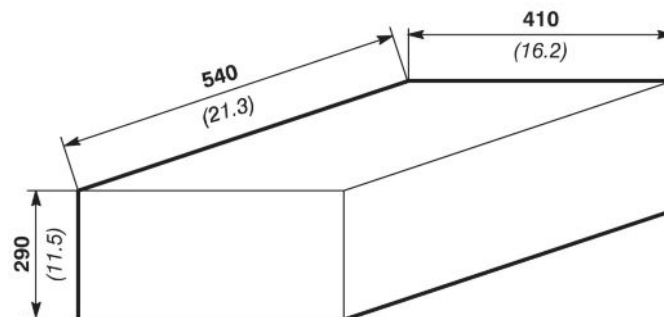
Illustration 1-6:



3.1.2.6 Other Elements Package

NOTE: All OEM parts are shipped inside there original boxes group as needed on pallets.

Illustration 1-7:



3.2 Tools and Test Equipment

Refer to [Table 1-2](#) Table 1: .To obtain a list of tools and test equipment for components not specified in , [Table 1-2](#) Table 1:refer to the appropriate component Pre-Installation Manual listed in [Chapter 2, Basic System Compatibility](#)

Table 1:

Table 1-2:

PRODUCT OR COMPONENT	TOOL OR TEST EQUIPMENT	USED FOR	SOURCE	RECEIVED (DATE)
LC Positioner	Service Engineer's Tool Case	General Use		
	Level, Protractor Type	Positioner Checks		
	Plumb Line included in 46-216640G1	Positioner Checks		
	Torque Wrench 2 to 20 daN.m (15 ft. lbs. to 150 ft. lbs.)	Positioner Checks		
	1/2 inch Ratchet Wrench (2)	Raise and Lower Positioner shipping dolly		
	Wrench, Spanner (46-176584P1)	High Voltage Cable Installation		
	Laptop Computer (MS-DOS Windows)	Positioner Configuration and Calibration		
Status Display	Same as for LC (Service Engineer's Tool Case)			
C2 Cabinet	Same as for LC (Service Engineer's Tool Case) Fill in any additional tools or test equipment as required			
X-Ray Head	Same as for LC (Service Engineer's Tool Case) Fill in any additional tools or test equipment as required			
C1 Cabinet	Same as for LC (Service Engineer's Tool Case) Fill in any additional tools or test equipment as required			
	Same as for 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)		
DL User parts				
Monitor Suspension				

Chiller	Phillips/Flathead screwdriver. Open chiller. Install wiring and hoses.			
Chiller Autotransformer (Coolix 4100)	Phillips/Flathead screwdriver. Open chiller autotransformer. Install wiring and hoses			

3.3 Door Size Requirements

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

3.3.1 Door Height

The minimum door height (to accommodate system 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.

3.3.2 Door Width

The minimum door width needed (to accommodate the System 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.

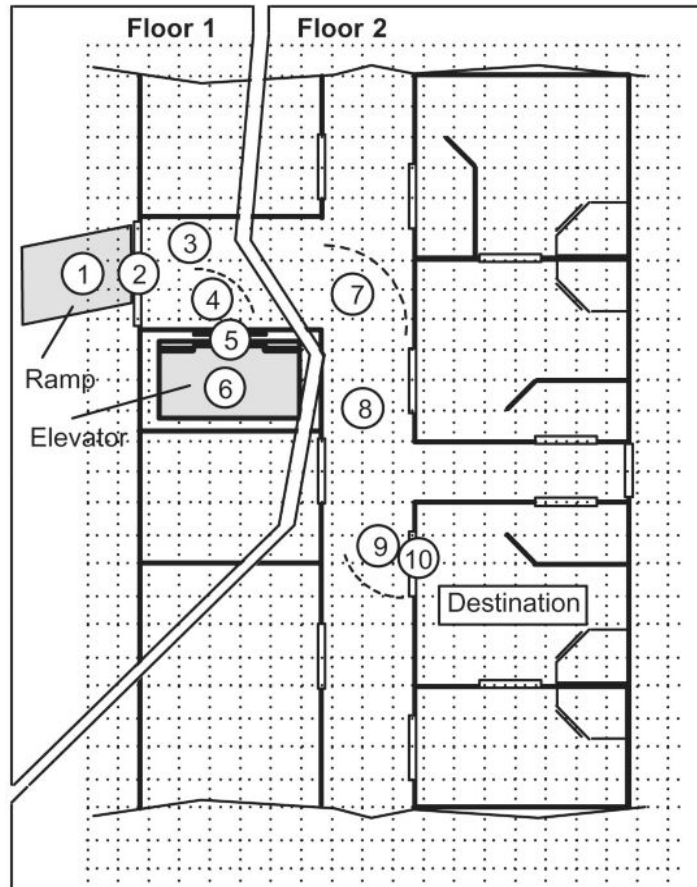
3.4 Route Survey

3.4.1 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 1-8](#).

Reference Numbers: Numbers in circles refer to Route Survey data. The Route Survey is a form on which site data are listed (see [Section 3.4.2](#)).

Illustration 1-8:



3.4.2 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.

3.4.3 Step Three — Check

Verify equipment can be transported via the route specified in [Section 3.4.1](#). Compare Route Survey compiled in [Section 3.4.2](#) to equipment specifications in this and other applicable pre-installation directions.

[illegible]

3.5 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://supportcentral.ge.com/products/sup_products.asp?prod_id=99484

4 Product Storage and Handling Requirements

4.1 Product Storage and Handling limits



NOTICE

Avoid extremes in temperatures

To obtain Temperature, Humidity or Pressure requirements for components not specified in [Table 1-4](#), refer to the appropriate component Pre-Installation Manual listed in [Chapter 2, Basic System Compatibility](#).

Table 1-4: Storage and Transport

Component	TEMPERATURE		HUMIDITY (see Note (2))		PRESSURE	
	MIN	MAX	MIN	MAX	MIN	MAX
All UPS units (see also Section 4.2)	-20°C (-4°F)	+40°C (+104°F)	10%	90%	70 kPa	103 kPa
All Monitors	-20°C (-4°F)	+55°C (+131°F)	10%	80%	70 kPa	103 kPa
All Injectors	-20°C (-4°F)	+60°C (+140°F)	10%	80%	70 kPa	106 kPa
All Footswitches	-20°C (-4°F)	+60°C (+140°F)	10%	90%	50 kPa	106 kPa
Vivid E9 Option	-40°C (-40°F)	+70°C (+158°F)	30%	60%	70 kPa	106 kPa
Cardiac Collimator	-20°C (-4°F)	+70°C (+158°F)	10%	95%	70 kPa	106 kPa
Diamantor	-20°C (-4°F)	+60°C (+140°F)	0%	85%	70 kPa	106 kPa
Downscan	-20°C (-4°F)	+70°C (+158°F)	0%	95%	70 kPa	106 kPa
All other components	-40°C (-40°F)	+70°C (+158°F)	10%	95%	50 kPa	106 kPa

NOTE: (1) 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 is shipped within GEMS packaging.

- NOTE:** (2) **Special Humidity Instructions:** The following parts can be shipped in standard shipment conditions with the requirement that on arrival to installation site, and before supplying power to these parts, they shall be kept in an environmental relative humidity equal or lower than their specified capability, and that's for a minimum of 48 hours.
- 3kVA UPS 110V & 220 V (Maximum specified relative humidity capability = 90%)
 - LDM Monitor (Maximum specified relative humidity capability = 90%)
 - CVI Injector (Maximum specified relative humidity capability = 85%)
 - Diamantor (Maximum specified relative humidity capability = 80%)
 - 1MP MX191 LCD Monitor (Maximum specified relative humidity capability = 80%)

4.2 Fluoro & 3KVA UPS Shipment Duration

NOTE: In the case the material shipped will be subject to different temperature values during shipment, the maximum shipment duration can be calculated, depending on the duration of different temperature values application, and using values given in the tables above

4.2.1 Fluoro UPS (CE and UL)

The maximum shipment duration is given in the table for both Fluoro UPS CE and UL. It depends on the temperature to which the material will be subject during shipment. This limitation is due to the capability of batteries included in UPS.

Table 1-5: Maximum shipment duration for Fluoro UPS

Temperature	Shipment max duration (Weeks)
55°C (131°F)	2
50°C (122°F)	3
40°C (104°F)	6
30°C (86°F)	12

4.2.2 3 KVA UPS (220 v and 110 v)

The maximum shipment duration is given in the table for both 3 KVA UPS 220 v and 110 V. It depends on the temperature to which the material will be subject during shipment. This limitation is due to the capability of batteries included in UPS.

Table 1-6: Maximum shipment duration for 3 KVA UPS

Temperature	Shipment max duration (Weeks)
55°C (131°F)	4
50°C (122°F)	7
40°C (104°F)	14
30°C (86°F)	25

4.3 Handling instructions

The packaging of the following components must be marked with special handling instructions for transport and storage.

- C1 Cabinet and C2 Cabinet:

Illustration 1-9:



- Gantry, Omega Table and Tilting Table:

Illustration 1-10:



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Chapter 2 Equipment Requirements

1 System Components

1.1 Presentation of the 3 Rooms

1.1.1 Examination room

- LC Positioner
- Omega Patient Table
- Performix X-Ray Tube Assembly
- Collimator
- Digital Detector



WARNING

THE ELECTRONIC CABINETS (C1, C2, OPTIONAL LD CABINET, COOLIX 4000 OR COOLIX 4100 CHILLER, DETECTOR CONDITIONER 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.

1.1.2 Technical room

- C2 Cabinet
- C1 Cabinet
- Coolix 4000 or Coolix 4100 chiller
- Detector Conditioner
- Fluoro UPS (option) (1 Cabinet)
- Fluoro UPS IF box (option)

1.1.3 Control room

- VCIM
- DL Flat Panel
- DL Keyboard

- Monitors

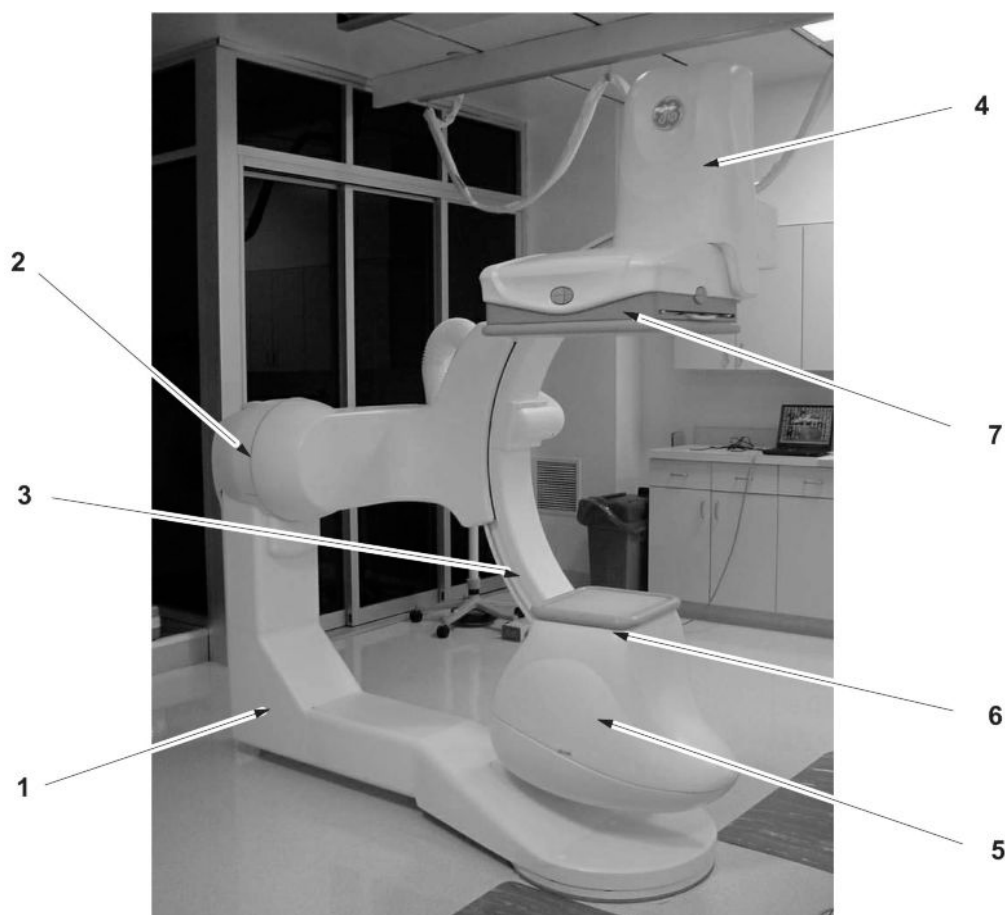
1.2 Description of System

1.2.1 Description of the Optima LC Positioner

A complete Optima LC positioner comprises only three parts.

- C2 cabinet
- positioner including a X-ray tube housing with a collimator and an Revolution Digital Detector.
- TSSC, Smart Box or Smart handle.

Illustration 2-1:



- 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),

- 20 cm Revolution Digital Detector for Optima IGS320 (Item 7).
- 31 cm Revolution Digital Detector for Optima CL320i/CL323i (Item 7).

1.2.2 Description of the Patient table

Optima CL320i, CL323i, IGS320 Systems can be supplied with an OMEGA IV or V Long patient table .

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



1.2.3 User Interfaces

Illustration 2-3: User interfaces with Omega table



1.2.4 Description of the X-Ray generator

The System uses a 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.

1.2.5 Description of the X-Ray head

The Optima 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.

Illustration 2-4: Chiller Coolix 4000



Illustration 2-5: Chiller Coolix 4100 (with auto-transformer)



1.2.6 Description of the Imaging System

An Optima 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 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),
- VCIIM console,
- Revolution Digital Detector mounted on LC positioner:
- An external Digital Detector chiller is mandatory.
- LCD 19" CHILIN Color Monitor.
- LCD 19" CHILIN B & W Monitor.
- LCD 19" EIZO GmbH SMD 19100G Color Monitor.
- LCD 19" GmbH SMD 19100G B & W Monitor.

Illustration 2-6: C1 Cabinet

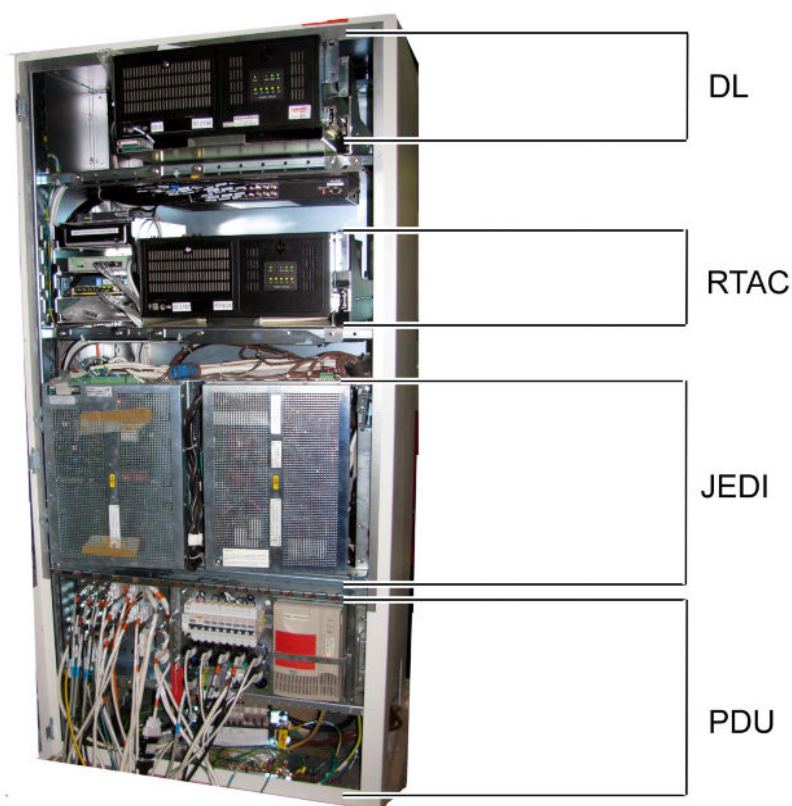


Illustration 2-7: C2 Cabinet

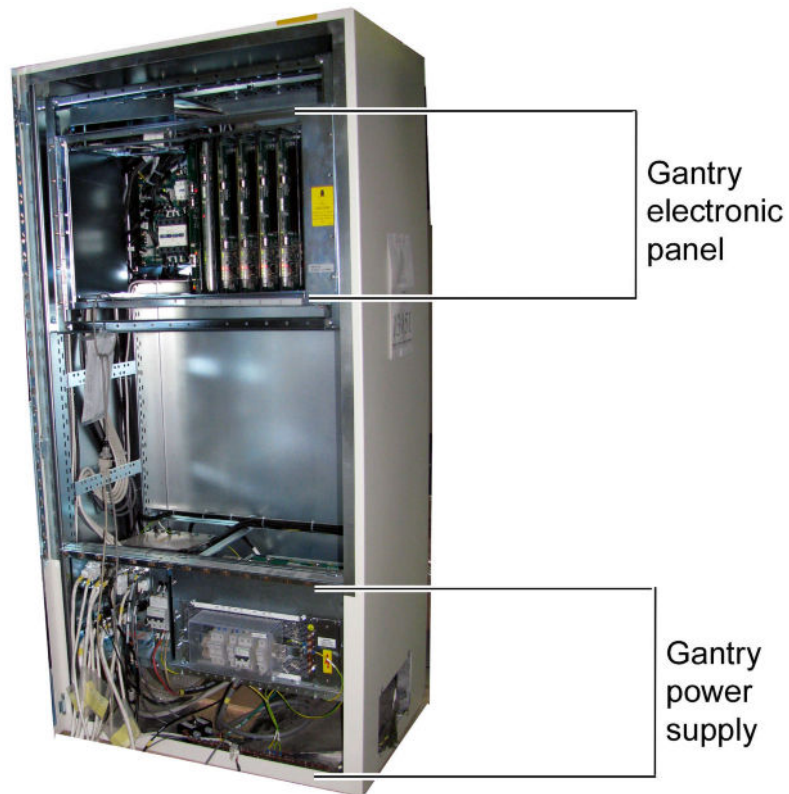


Illustration 2-8: Thermocon Digital detector chiller (for 20 cm and 31 cm systems)



1.2.7 Description of the Mavig image monitors suspensions

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

A monitor frame support receiving 4 monitors (1 life monitor, 1 reference monitor, 1 Advantage Windows monitor .

1.2.8 Description of the Ergo monitors suspensions

1.2.8.1 Suspension System Configuration

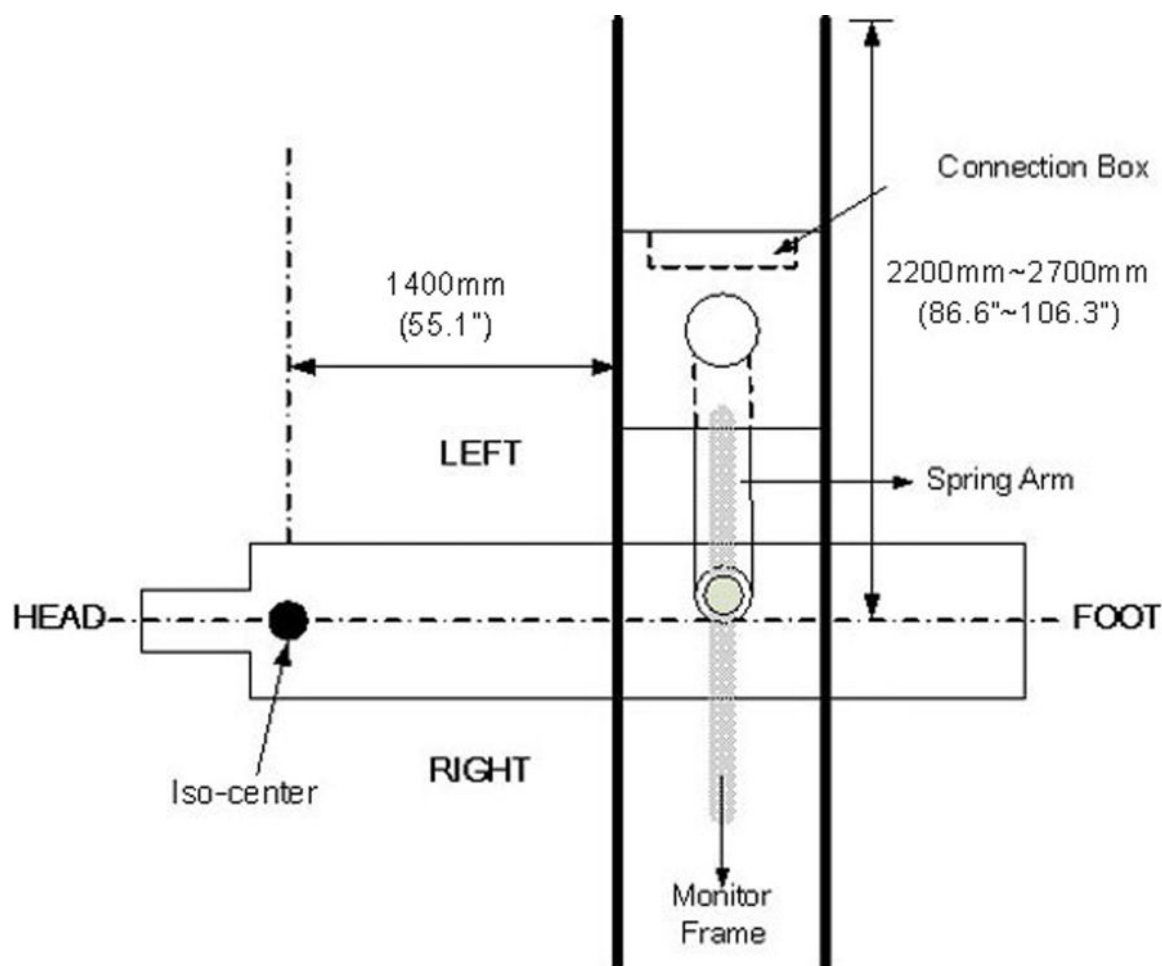
The monitor suspensions are mainly supplied with any vascular system; it enhances the X-Ray functions by adding the ability to show the image monitor in Examination Room.

Ergo LCD suspension should be mounted to one pair of stationary rails, which include the cable tracks for handling cables of suspension.

Illustration 2-9: Ergo LCD suspension



Illustration 2-10: Ergo LCD Suspension configuration



Clinical applications can be mostly covered by the above suggested installation position. The travel range of the pulley along the rails is about 2.5 m (8'2").

1.2.8.2 Monitor Configuration

Ergo LCD suspension are pre-installed with internal cable harness to run up to 3 monitors. The suspension is designed to operate with any vascular system of GE Healthcare.

Illustration 2-11: Ergo LCD monitor layout

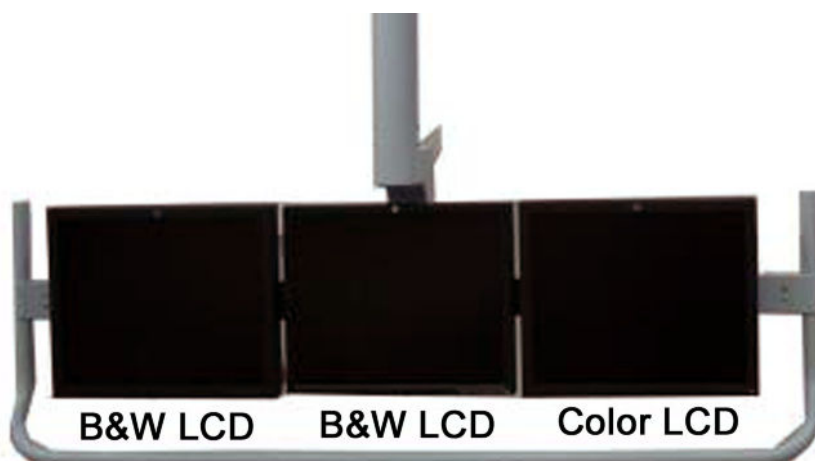


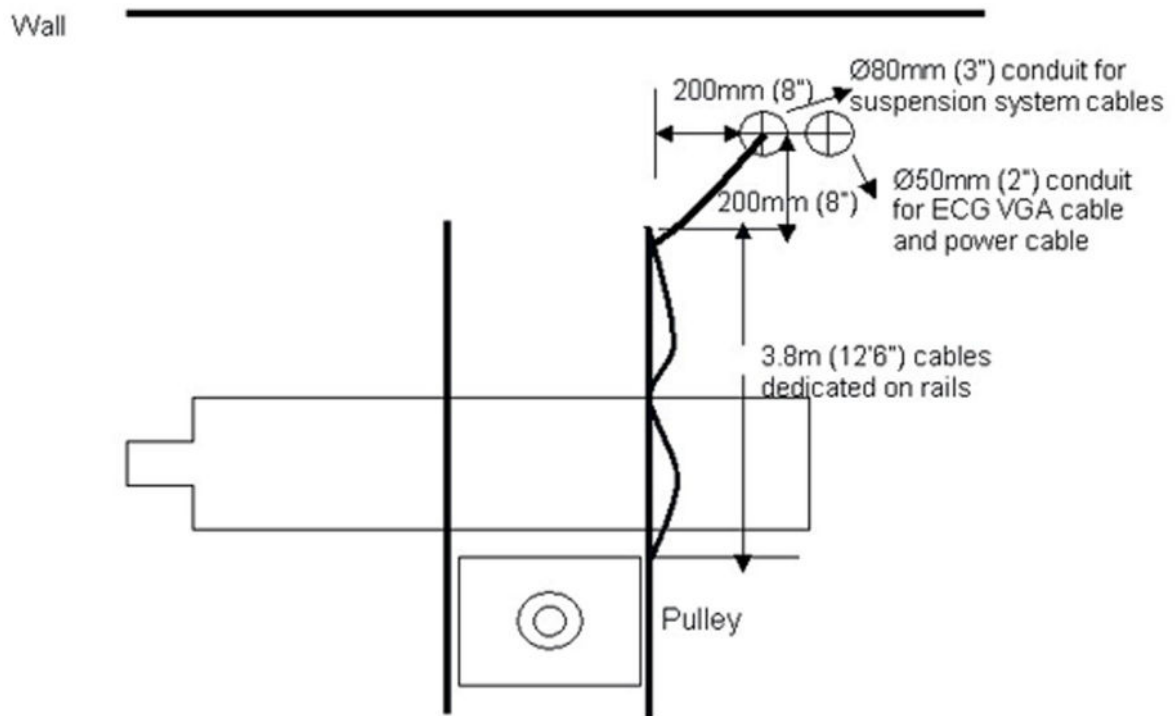
Table 2-1: Specification for Ergo LCD monitor dimension

Height:	min.: 300 mm (12")	max.: 350 mm (14")
Width:	min.: 370 mm (15")	max.: 425 mm (17")
Depth:	min.: 30 mm (2")	max.: 120 mm (4")
Weight:	min.: 5 kg (11 lbs)	max.: 7 kg (15.4 lbs)
Power:	No external power supply	
Electrical:	IEC 320 connector connected to Optima system.	
Ground:	Screw-on connector	
Video:	VGA connector	
Fixing:	VESA 100 mm x 100 mm (4" x 4") connection, in the middle on the backside	

1.2.8.3 System Cable Information

GE Healthcare provides 24 m (78'9") system cables for suspension. The length of cables dedicated on the rail cable track is recommended as 3.8 m (12'6"). After leaving cable track, system cables go to technical room through the conduit on the ceiling, ECG monitor VGA and power cable go to the EKG system through another conduit. From entrance of C1 cabinet to their correspondent connectors, the length of the cables shall be 1.3 m (4'3").

Illustration 2-12: Ergo suspension system cable routing scheme

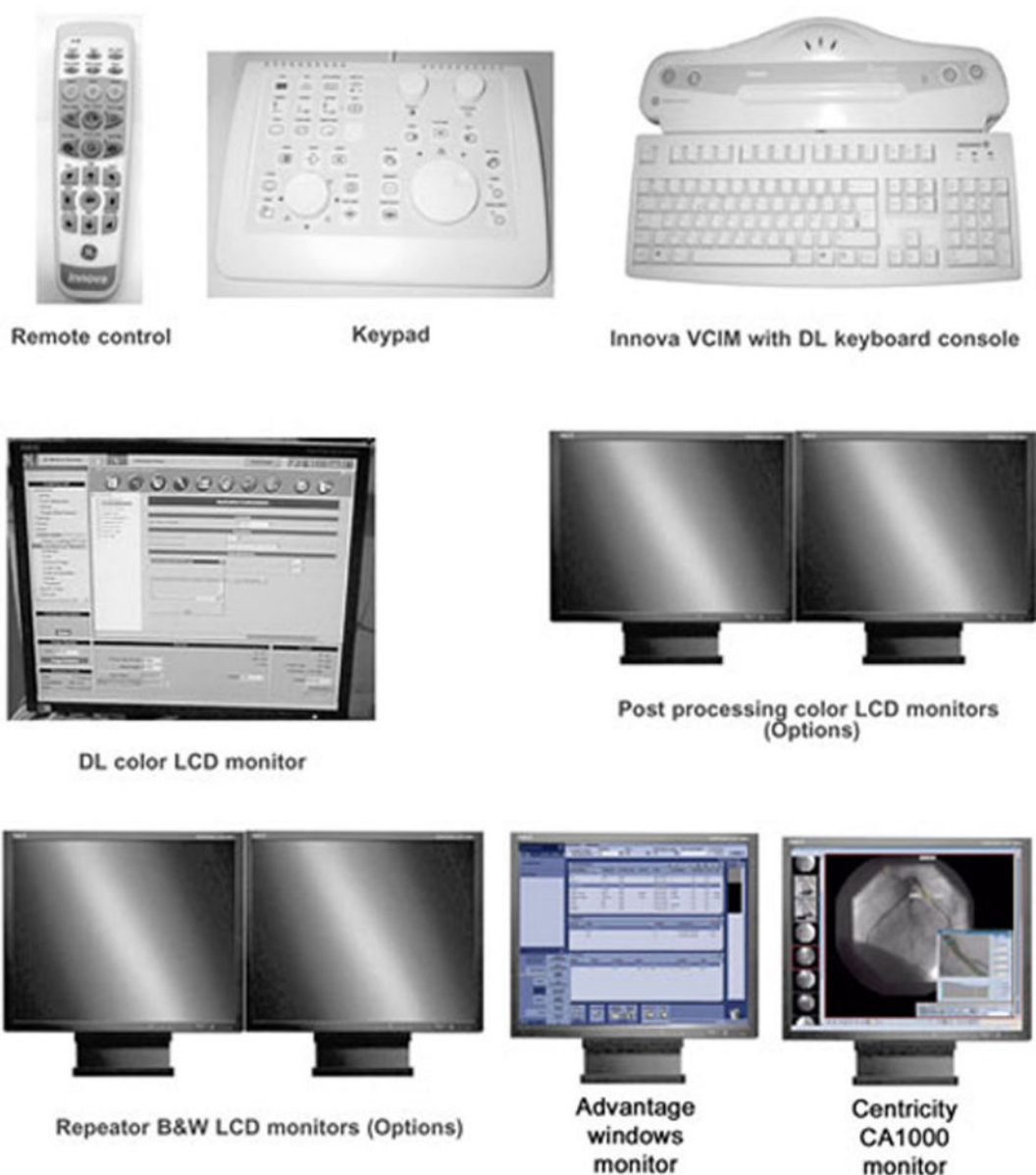


1.2.9 Description of the DL and associated devices

An Optima System uses the DL Digital Imaging system.

- The C1 Cabinet contains:
 1. DL Computer,
 2. Firewall
 3. Ethernet switch
 4. KVM-local
 5. 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

Illustration 2-13: User Area devices



1.2.10 AW workstation

AW workstation option is composed of a workstation, 1 or 2 monitors 19" flat panel in the Control Room and 1 monitor (flat panel) fixed on suspension (option) and 1 video switcher. Check Optima Installation Service Manual (JobCard *IST0093 - Advantage Window Installation (AW and Video Splitter)*) for switcher installation.

1.2.11 CENTRICITY CA1000 option

Refer to : *Centricity Cardiology CA 1000 V2.0 Preinstallation Guide* in the OEMs of the service manual.

1.2.12 Injectors

NOTE: The following inventory lists all injectors. For the list of injectors compatible with your system configuration, refer to the Operator Manual.

(For Omega Table) the recommended injectors are:

- LF Angiomat Illumina (pedestal version) or
- MedRad Mark V ProVis (table/rack mount version) or
- MedRad Avanta (pedestal version) or
- MedRad Avanta (table mount version) or
- MedRad Mark 7 (table mount version without extension cable) or
- MedRad Mark 7 (table mount version with extension cable) or
- MedRad Mark 7 (pedestal mount version without extension cable) or
- Acist CVI (pedestal version) or
- Acist E2000 Voyager (pedestal version) or
- Acist CVI (table mount version).

1.2.13 Fluoro UPS option

The Optima 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

Illustration 2-14: Fluoro UPS



- NOTE:** Refer to the UPS vendor Service Operating Manual for more details:
- [UL Model: UPS Option - Operating Manual SG-UL Series - 20 kVA](#)
 - [CE Model: UPS Option - Operating Manual SitePro 20 kVA \(series 8\)](#)

Illustration 2-15: UPS IF box



UPS IF BOX



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.

1.3 Dimension Drawings

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

Optima LC Positioner, Omega Patient Tables, C2 Cabinet, C1 Cabinet, and Chillers. In addition, refer to this section for Positioner/table relative position drawings.

Table 2-2:

TITLE	ILLUSTRATION
Optima LC Positioner Dimensions: - Side View	Illustration 2-16
Optima LC Positioner Dimensions: - Top View	Illustration 2-17
Optima LC Positioner Dimensions: - Front View	Illustration 2-18
Omega IV Compact Patient Table Dimensions	Illustration 2-19
Omega IV Table Interference Regions	Illustration 2-20
Omega V Long Patient Table Dimensions	Illustration 2-21
Omega V Long Patient Table Interference Regions	Illustration 2-22
Patient Table side clearance (CPR access)	Illustration 2-23
Table Head Extender	Illustration 2-24
Optima LC Positioner and Omega IV Compact Patient Table Relative Positions	Illustration 2-25
Optima LC Positioner and Omega V Long Patient Relative Positions	Illustration 2-26
C2 Cabinet Dimensions	Illustration 2-27
C1 Cabinet Dimensions	Illustration 2-28
Floor Space and dimension Diagram for X-Ray Tube Chiller 4000	Illustration 2-29
Dimension Diagram for X-Ray Tube Chiller 4100	Illustration 2-30
Detector Chiller Thermo-Con Dimensions & Orientation	Illustration 2-31
Fluoro UPS UL Layout (Optional)	Illustration 2-32
Fluoro UPS CE Layout (Optional)	Illustration 2-33
UPS IF Box (Optional)	Illustration 2-34
Gas box outlets Omega IV	Illustration 2-35
Gas box outlets Omega V	Illustration 2-36
DL Keypad Dimensions	Illustration 2-37
DL Image Monitor Dimensions	Illustration 2-38
Ergo LCD suspension dimension	Illustration 2-39

Illustration 2-18: Optima LC Positioner Dimensions: - Front view

All dimensions are in mm (inches)

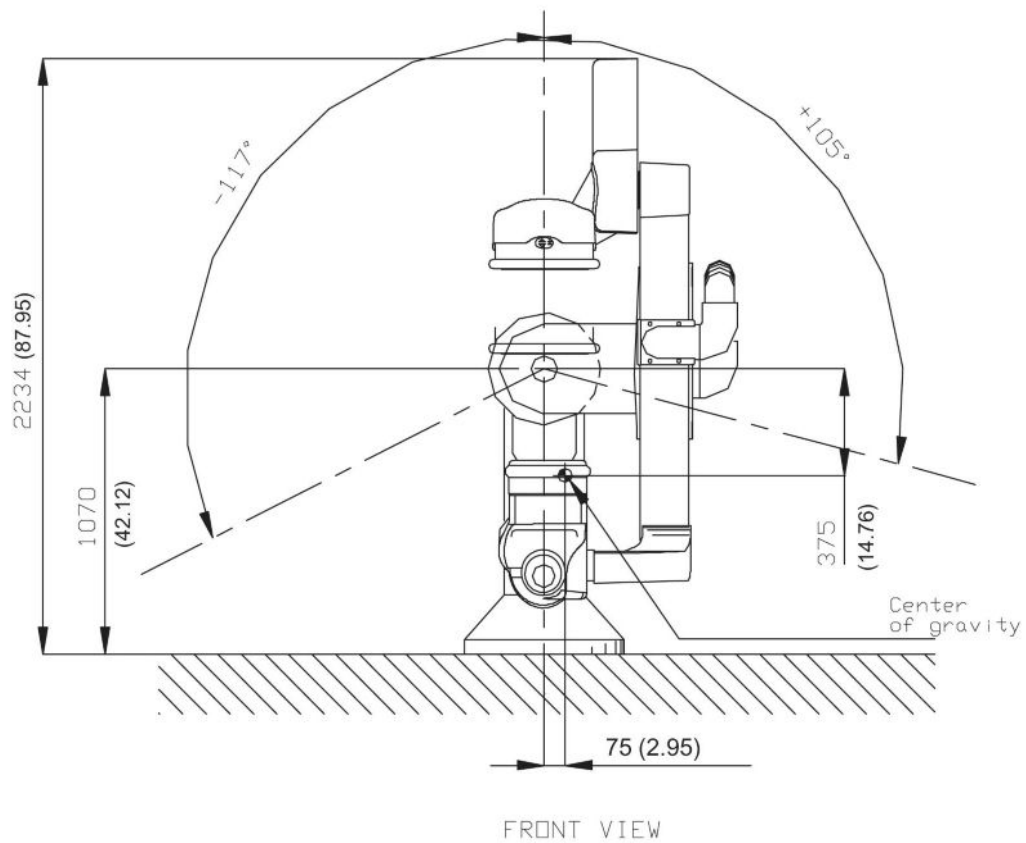


Illustration 2-19: Omega IV Compact Patient Table Dimensions

All dimensions are in mm (inches)

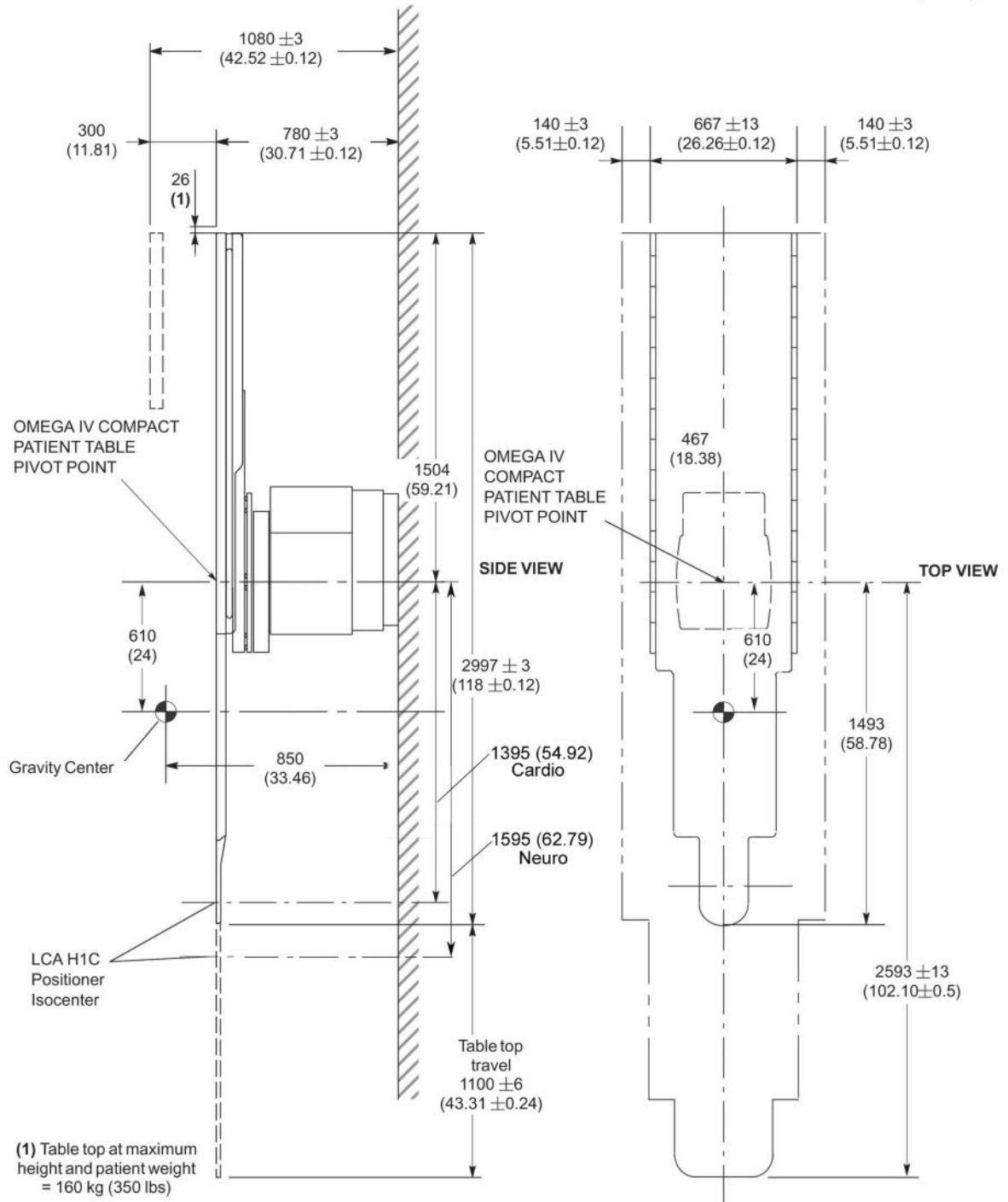


Illustration 2-20: Omega IV Compact Patient Table Interference Regions

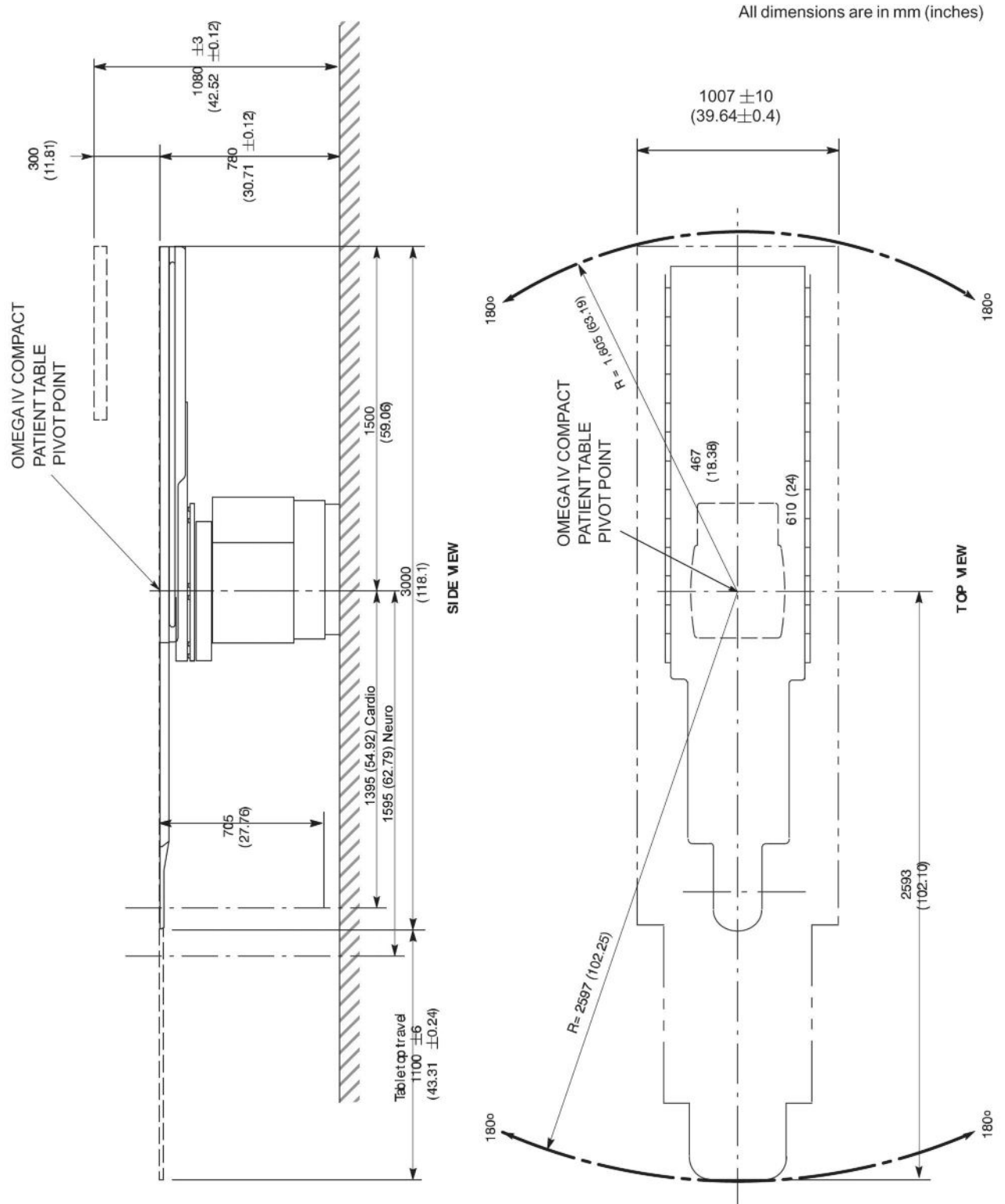
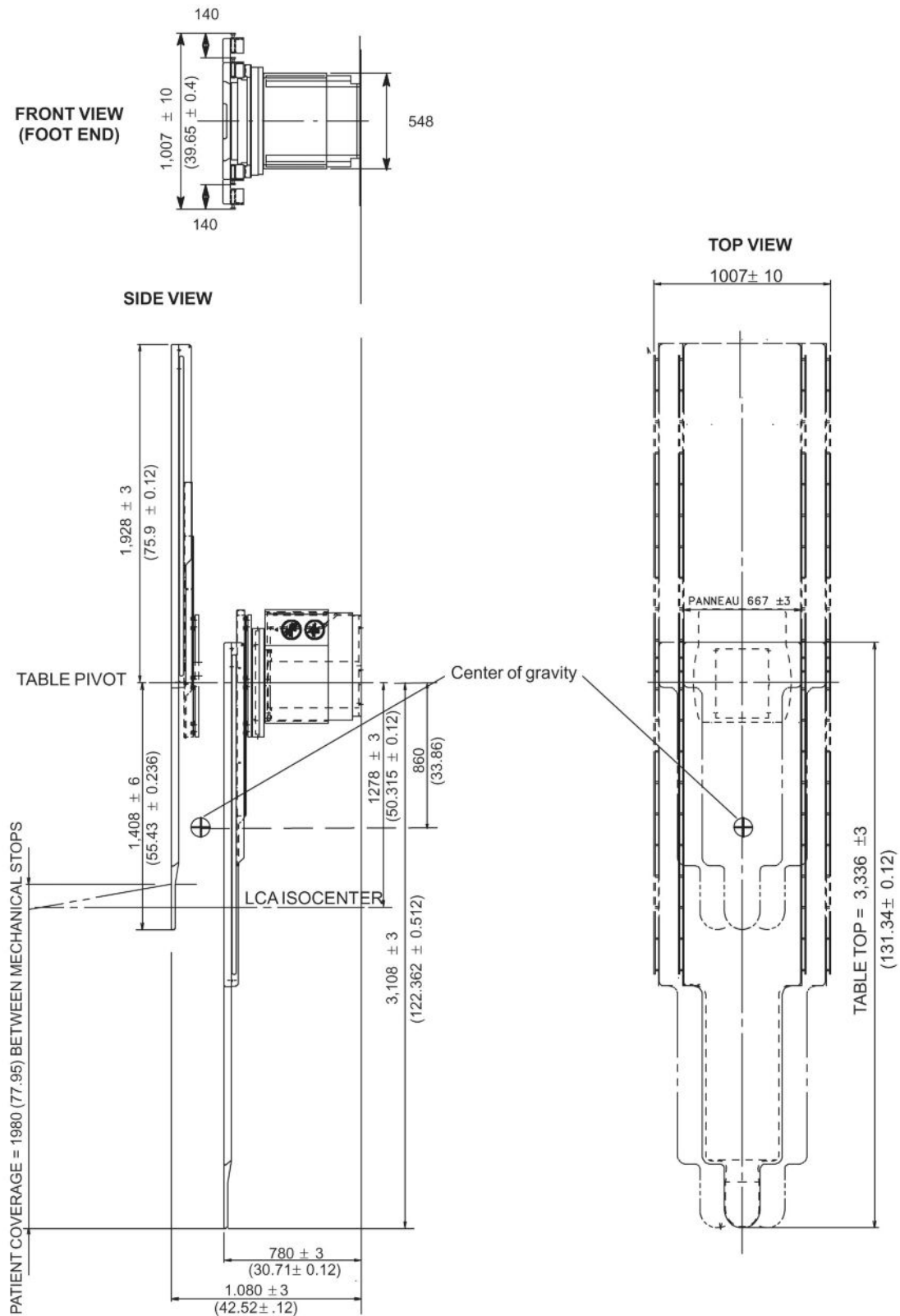


Illustration 2-21: Omega V Long Patient Table Dimensions



All dimensions are in mm (inches)

Illustration 2-22: Omega V Long Patient Table Interference Regions

All dimensions are in mm (inches)

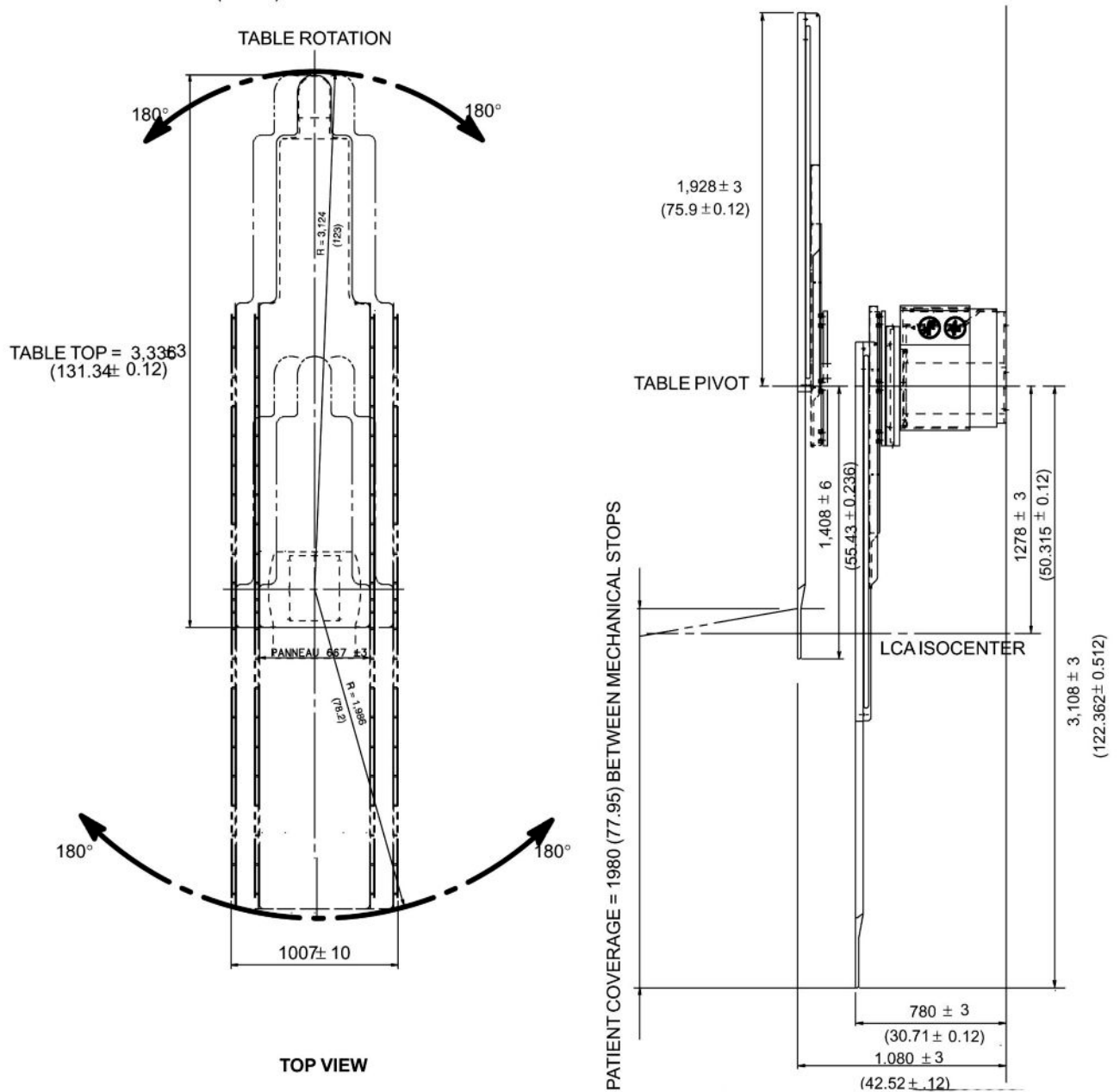


Illustration 2-23: Patient Table side clearance (CPR access)

All dimensions are in mm (inches)

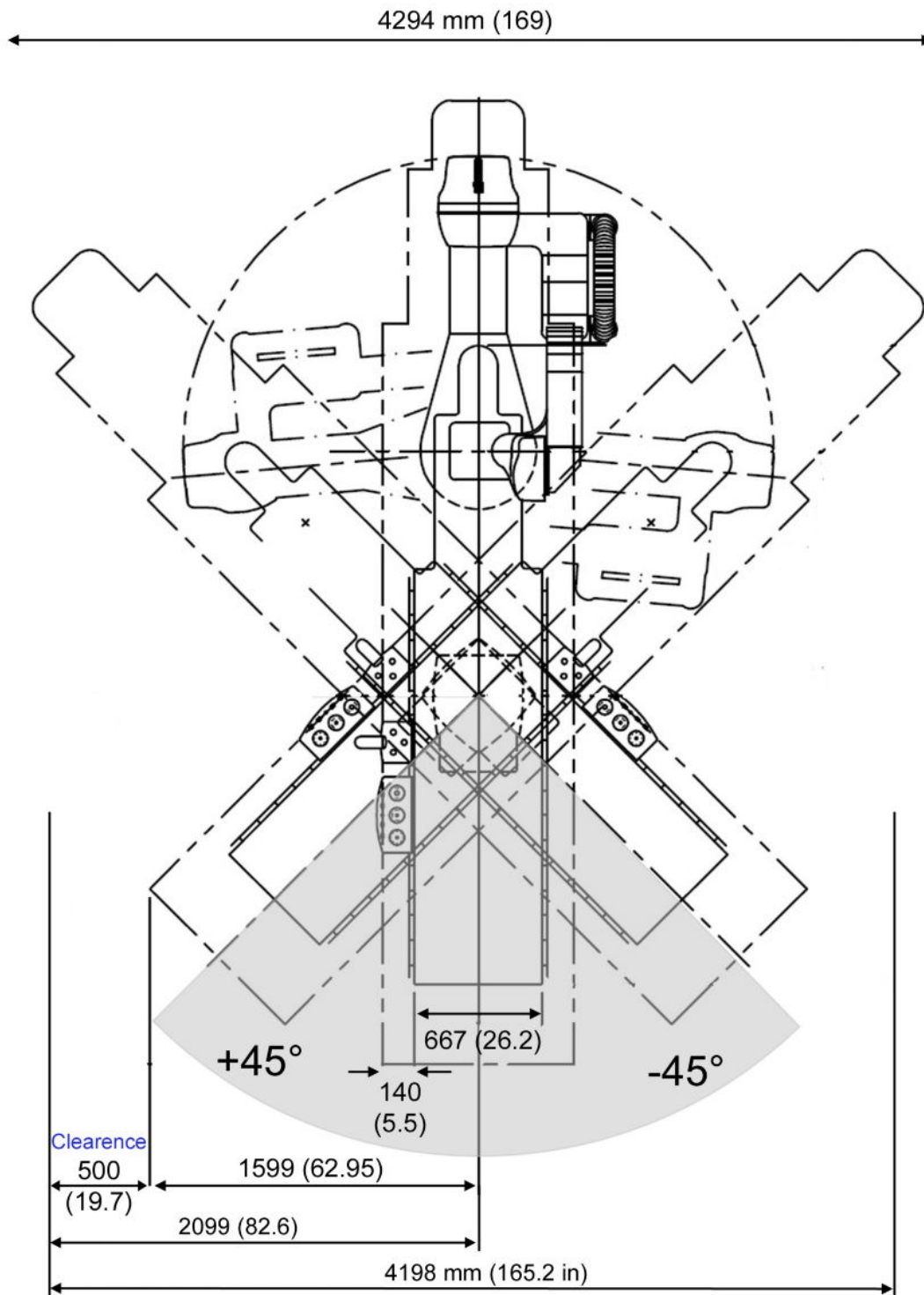


Illustration 2-24: Table Head Extender

All measurements are in mm (inches)
Based on drawing 5262690ADW

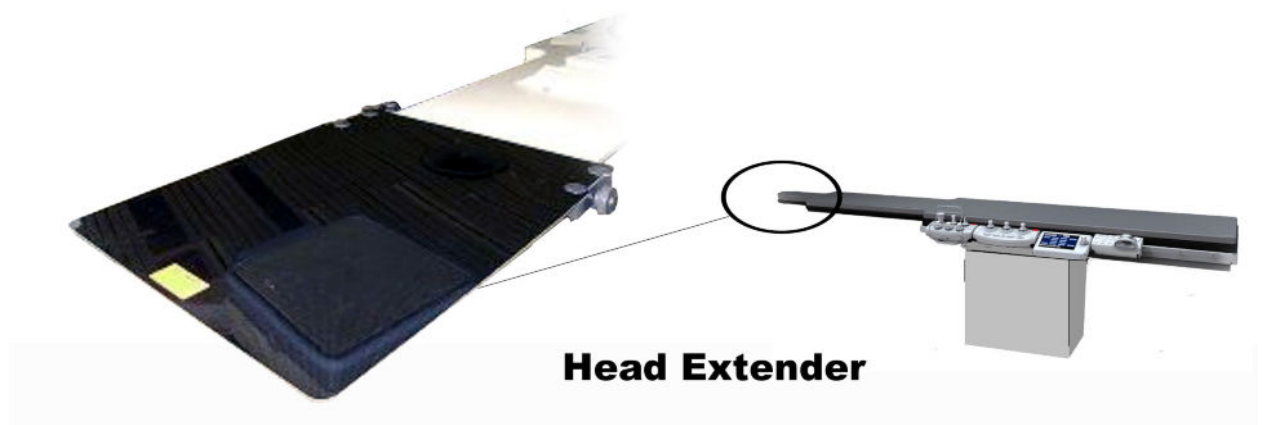
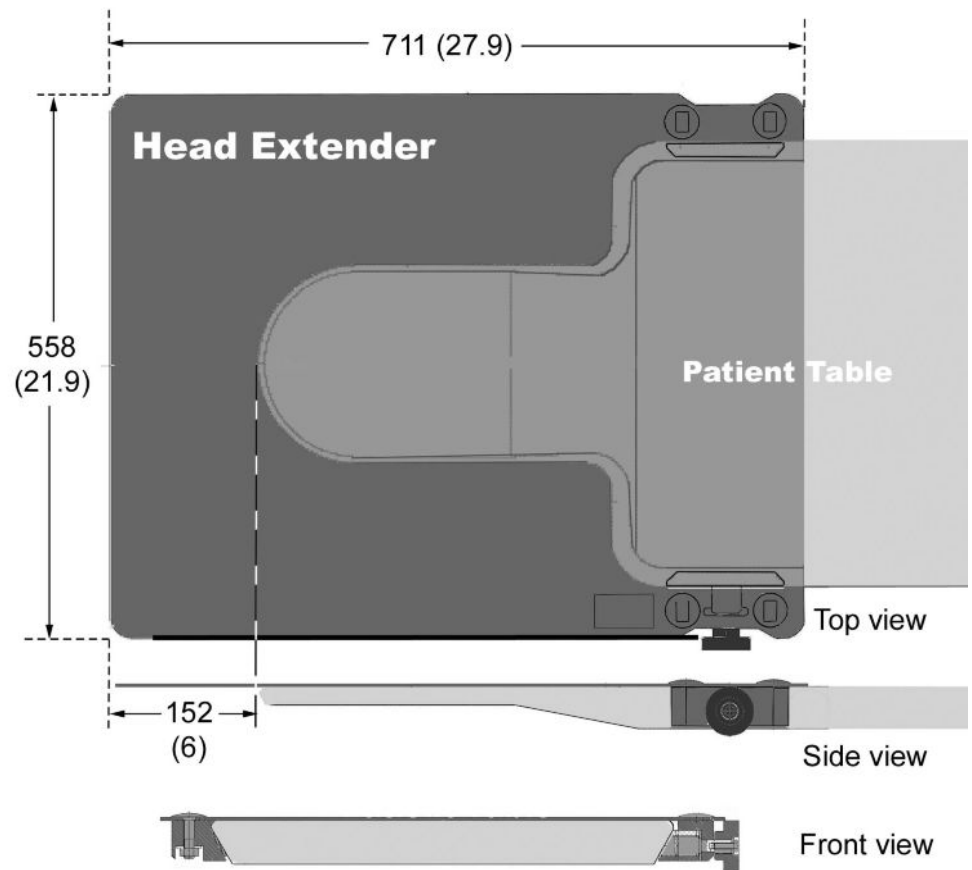


Illustration 2-25: Optima LC Positioner and Omega IV Compact Patient Table Relative Positions - side view

All dimensions are in mm (inches)

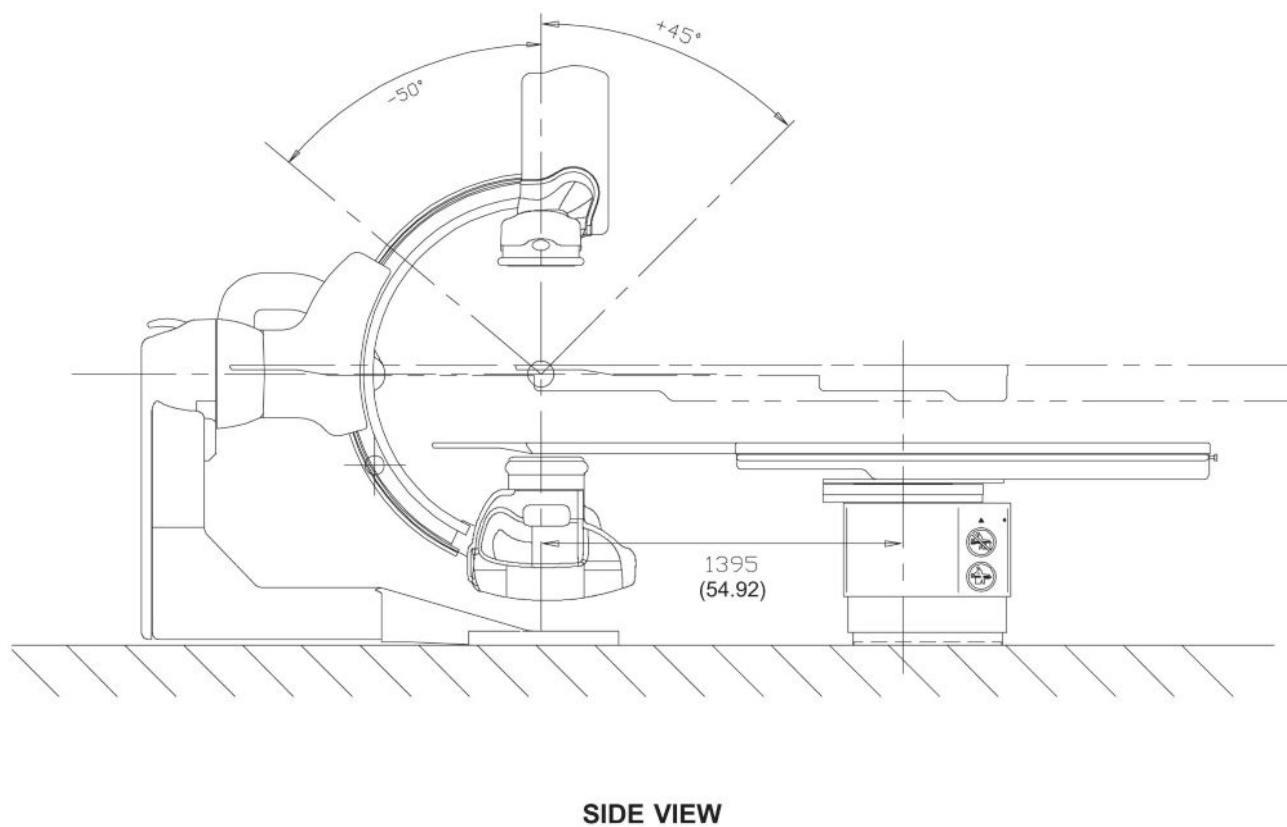


Illustration 2-26: Optima LC Positioner and Omega V Long Patient Table Relative Positions - side view

All dimensions are in mm (inches)

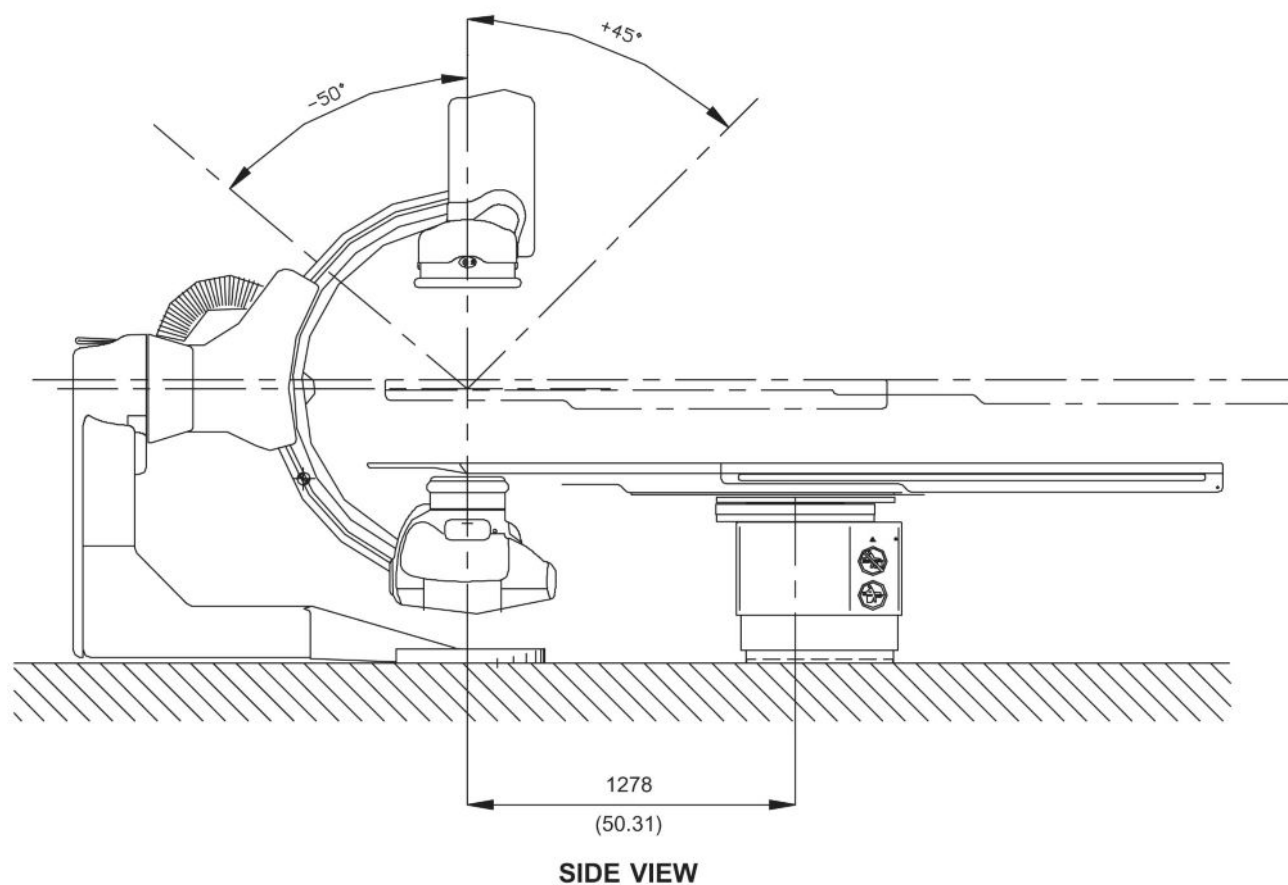


Illustration 2-27: C2 Cabinet Dimensions

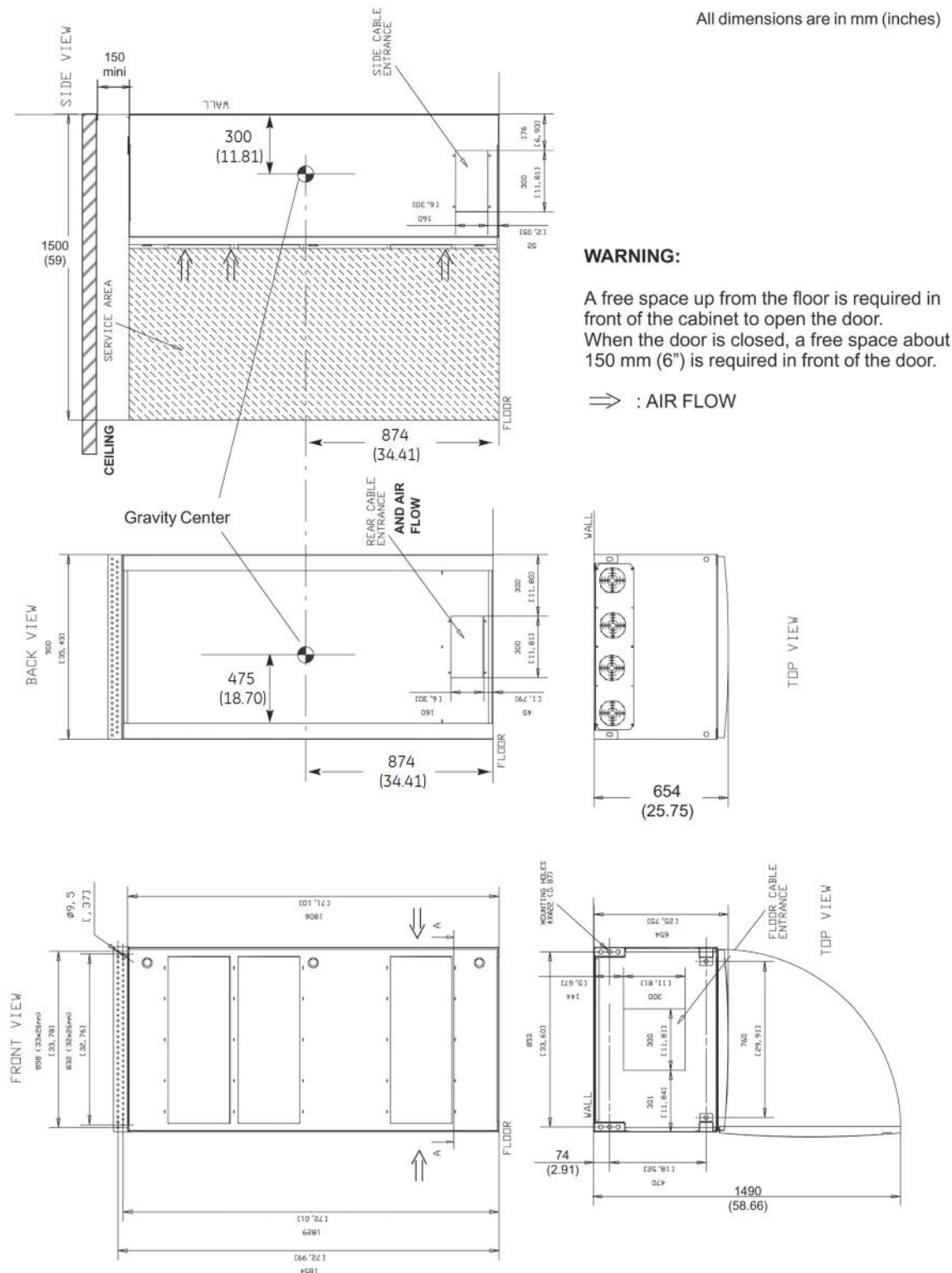
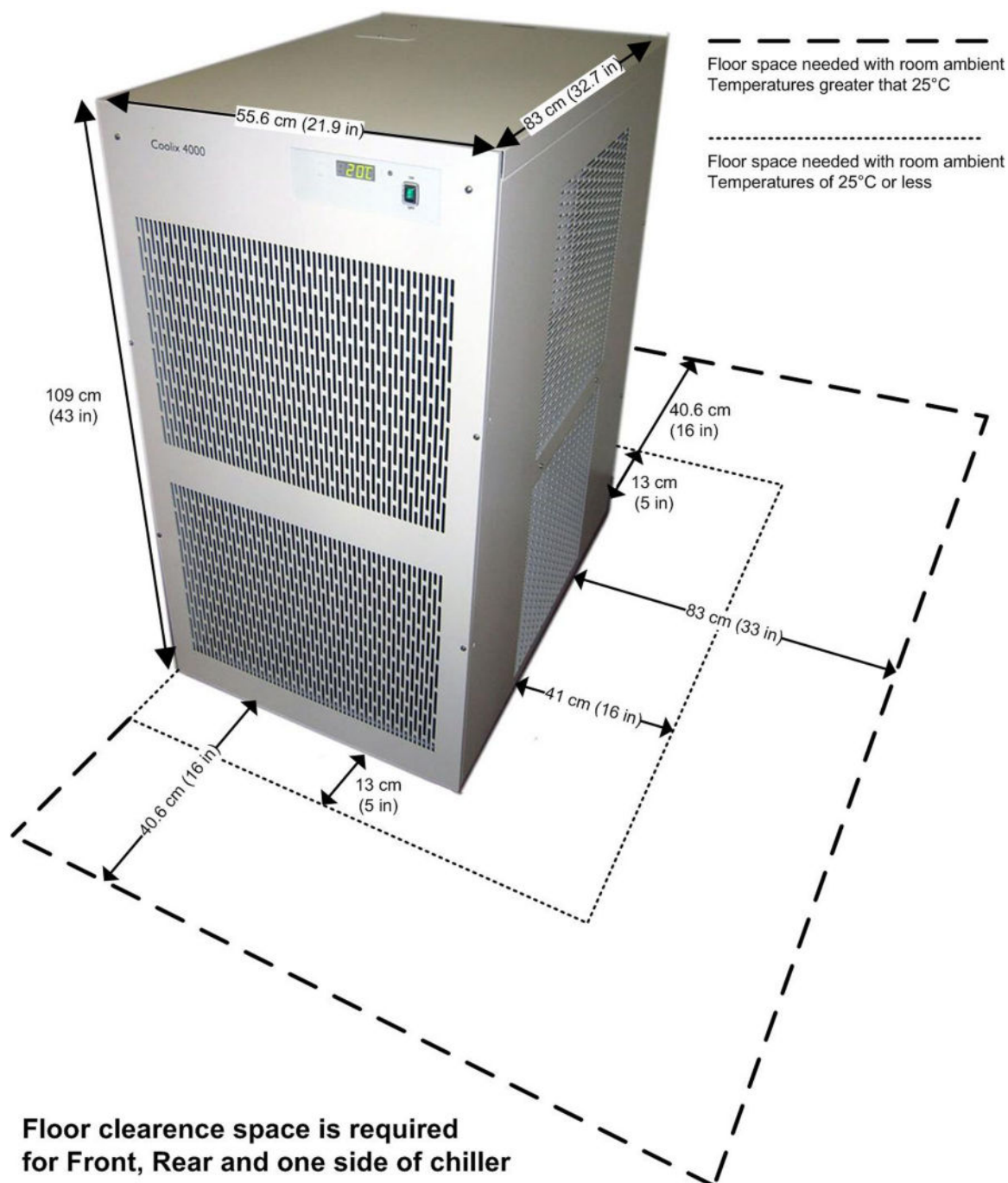


Illustration 2-29: Floor Space Diagram for Lytron Chiller

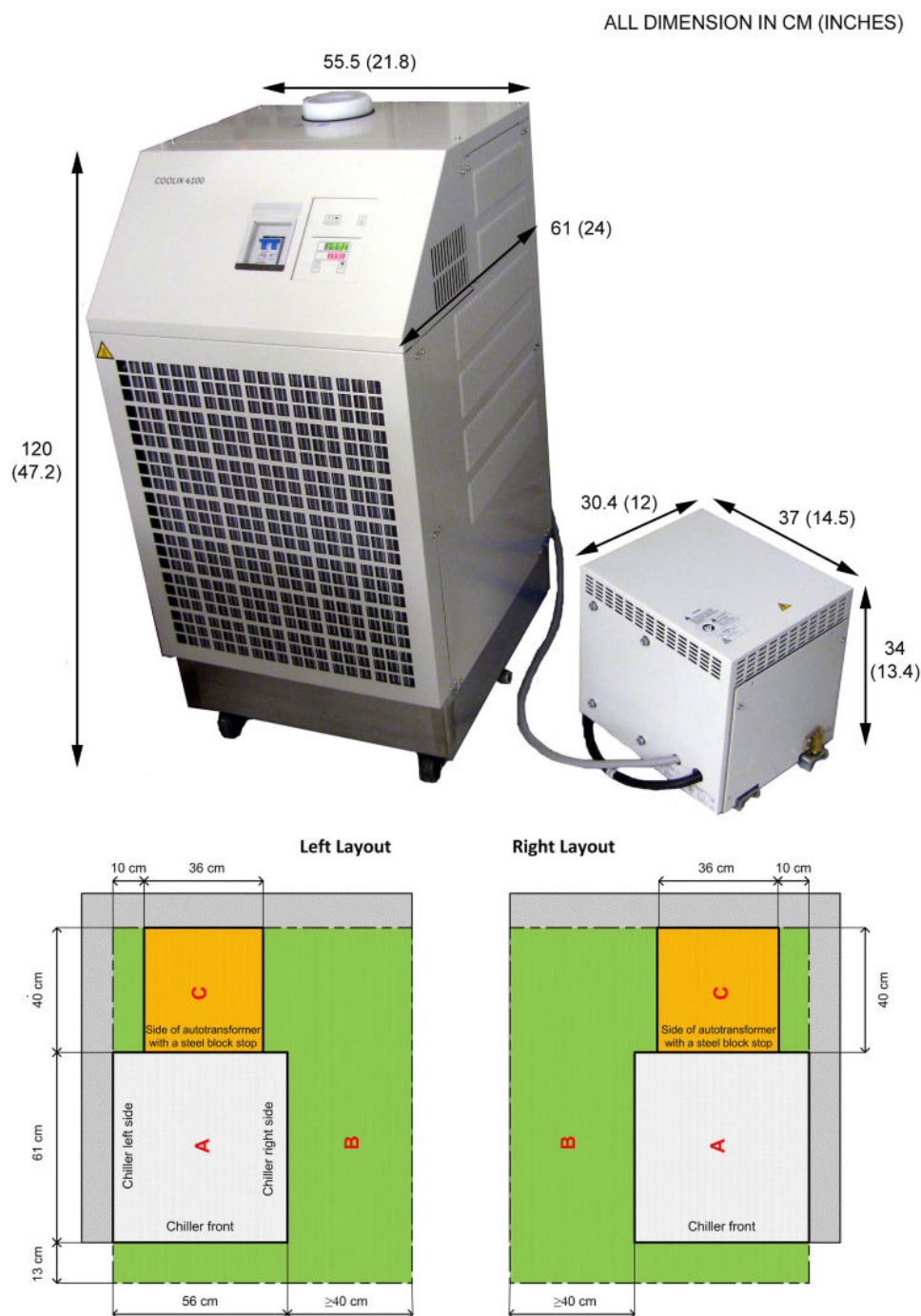


NOTICE

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 2-30: Dimension Diagram for X-Ray Tube Chiller 4100



NOTE: Floor clearance space needed follows that of the Coolix 4000 chiller, see [Illustration 2-29](#)



NOTICE

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

Illustration 2-31: Detector Chiller Thermo-Con Dimensions & Orientation

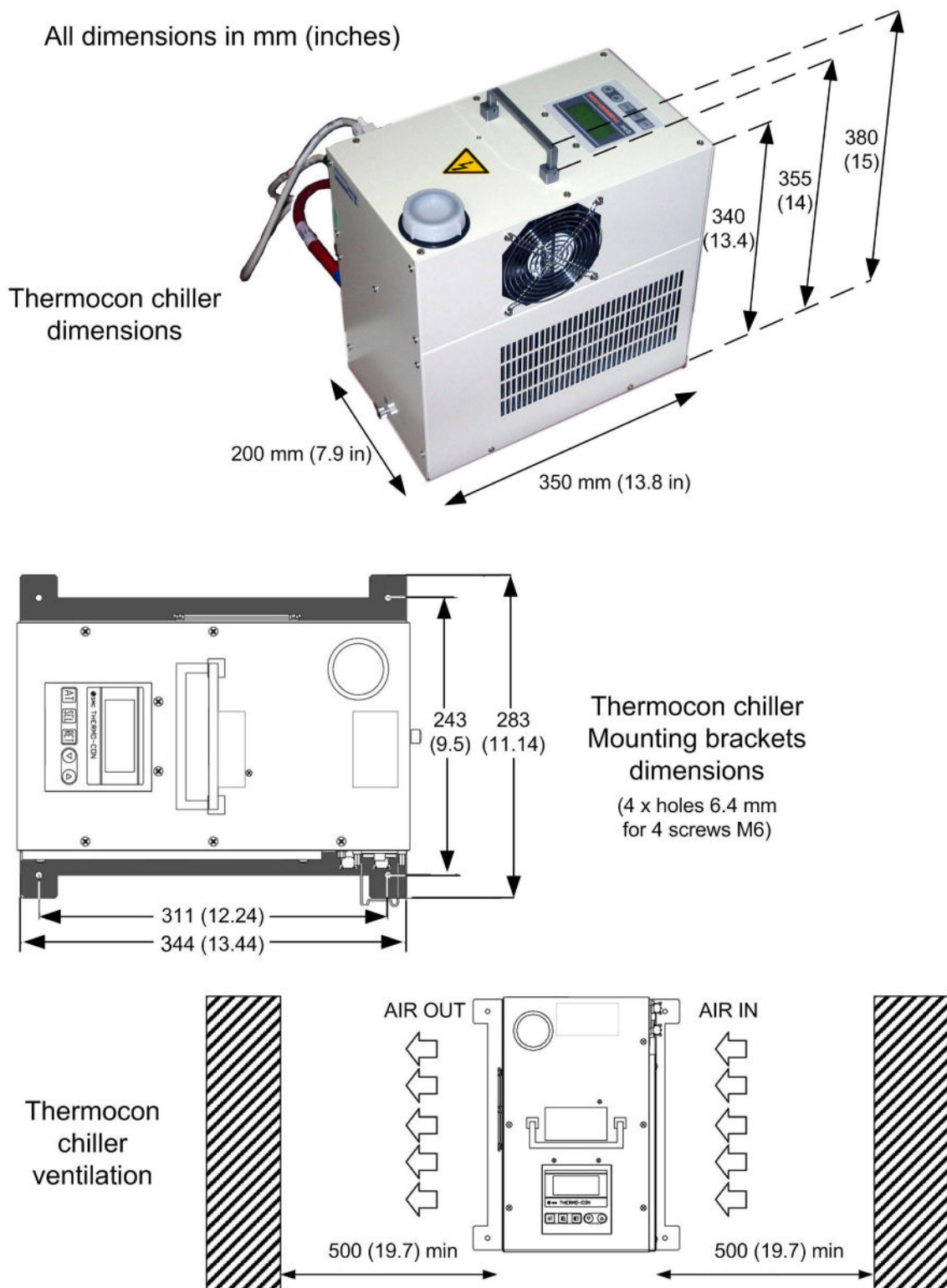
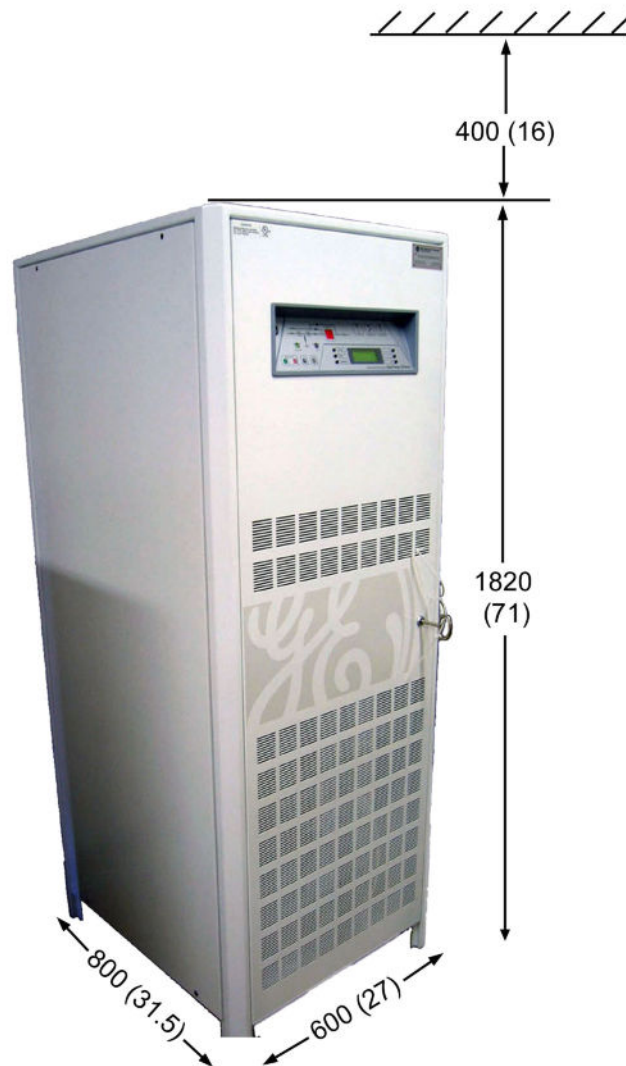


Illustration 2-32: Fluoro UPS UL Layout (Optional)

All dimensions are in mm (inches)



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.

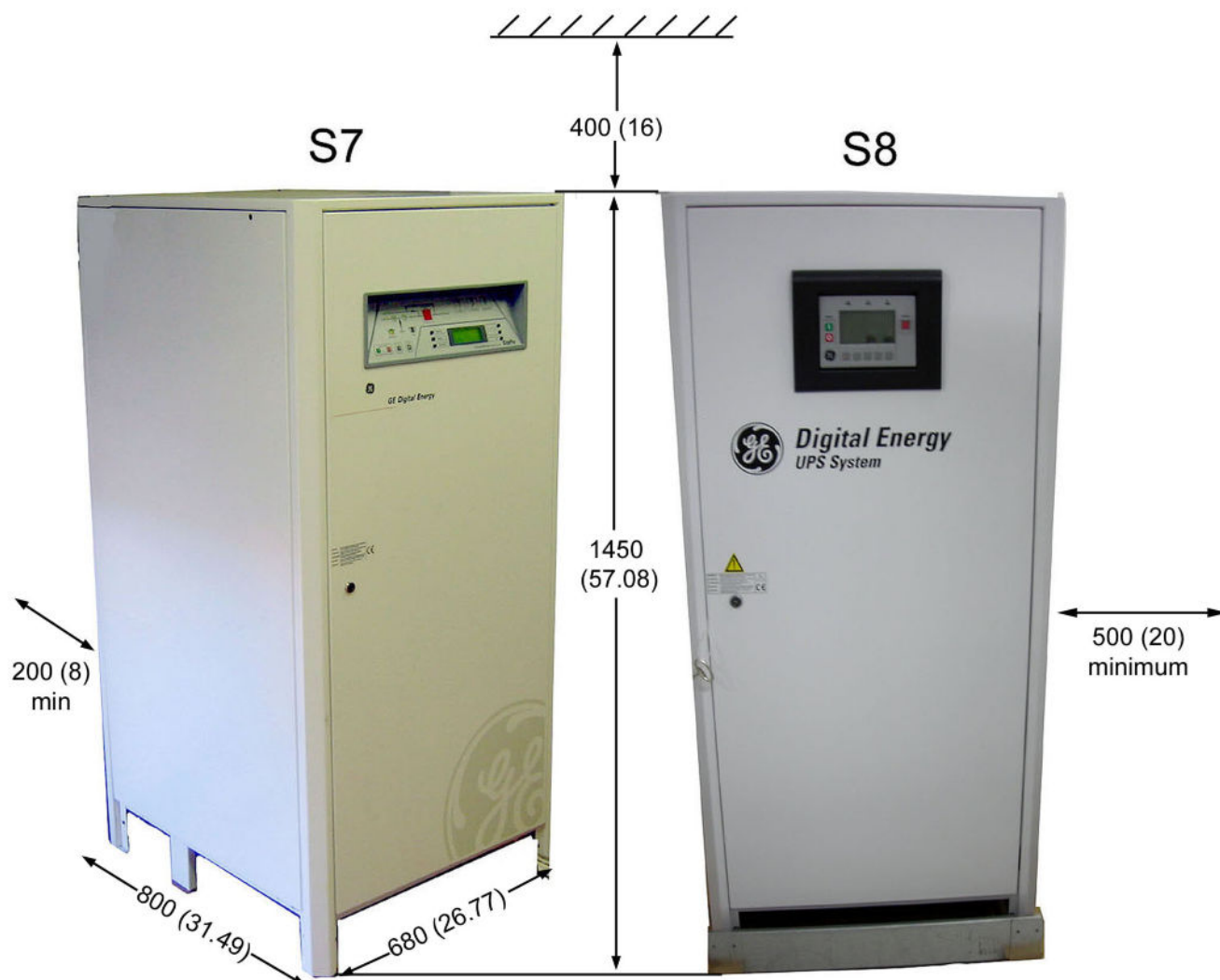
In front of the cabinet, the clear width of the service area to insure electrical safety shall be at least 0.9 m. In cases where 2 cabinets are installed face to face (both sides of the access way), the clear width shall be at least 1.2 m.

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

Illustration 2-33: Fluoro UPS CE Layout (Optional)

Both S7 and S8 series have same dimensions

All dimensions are in mm (inches)



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.

In front of the cabinet, the clear width of the service area to insure electrical safety shall be at least 0.9 m. In cases where 2 cabinets are installed face to face (both sides of the access way), the clear width shall be at least 1.2 m.

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

Illustration 2-34: UPS IF Box (Optional)

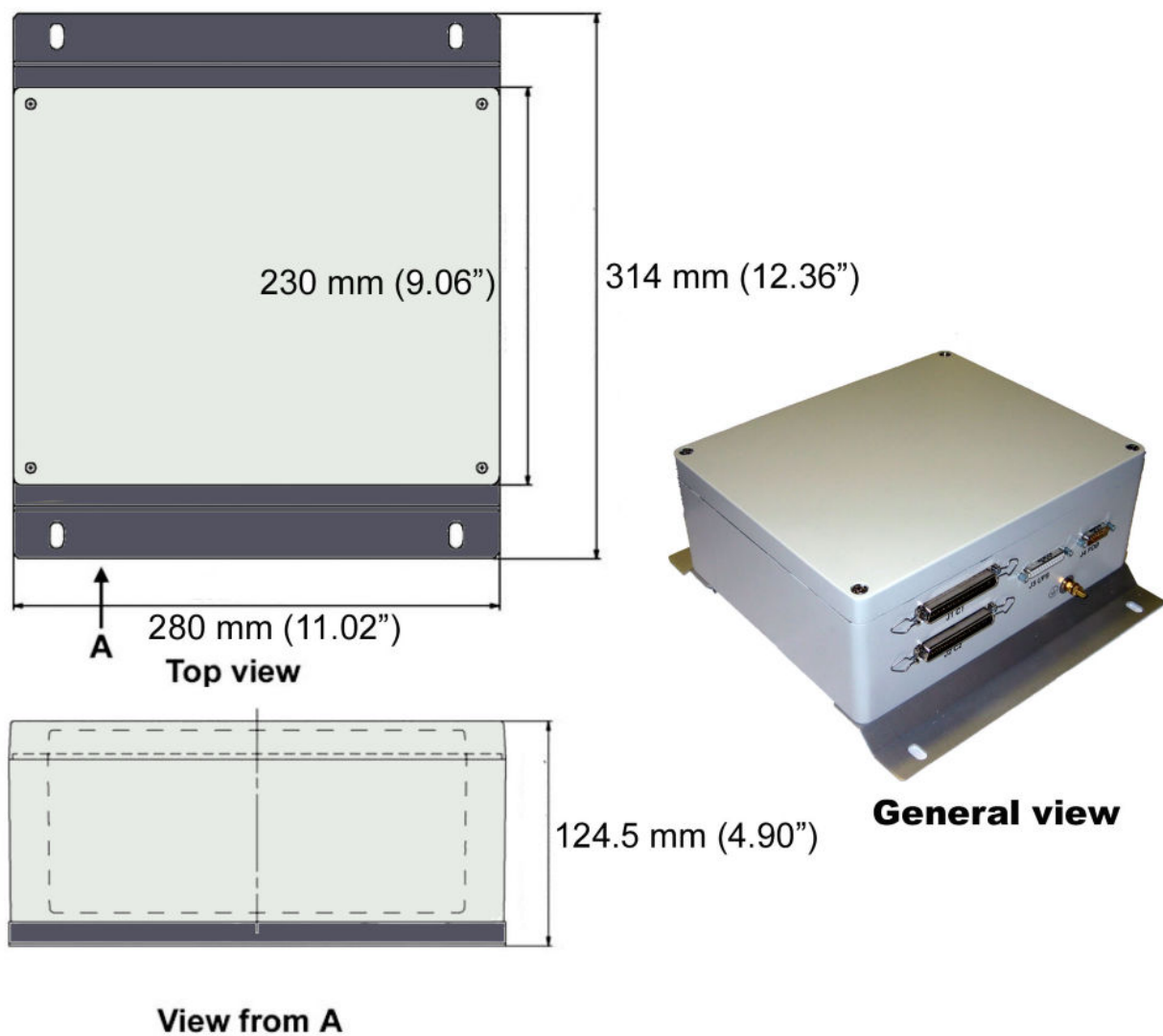


Illustration 2-35: Gas box outlets Omega IV

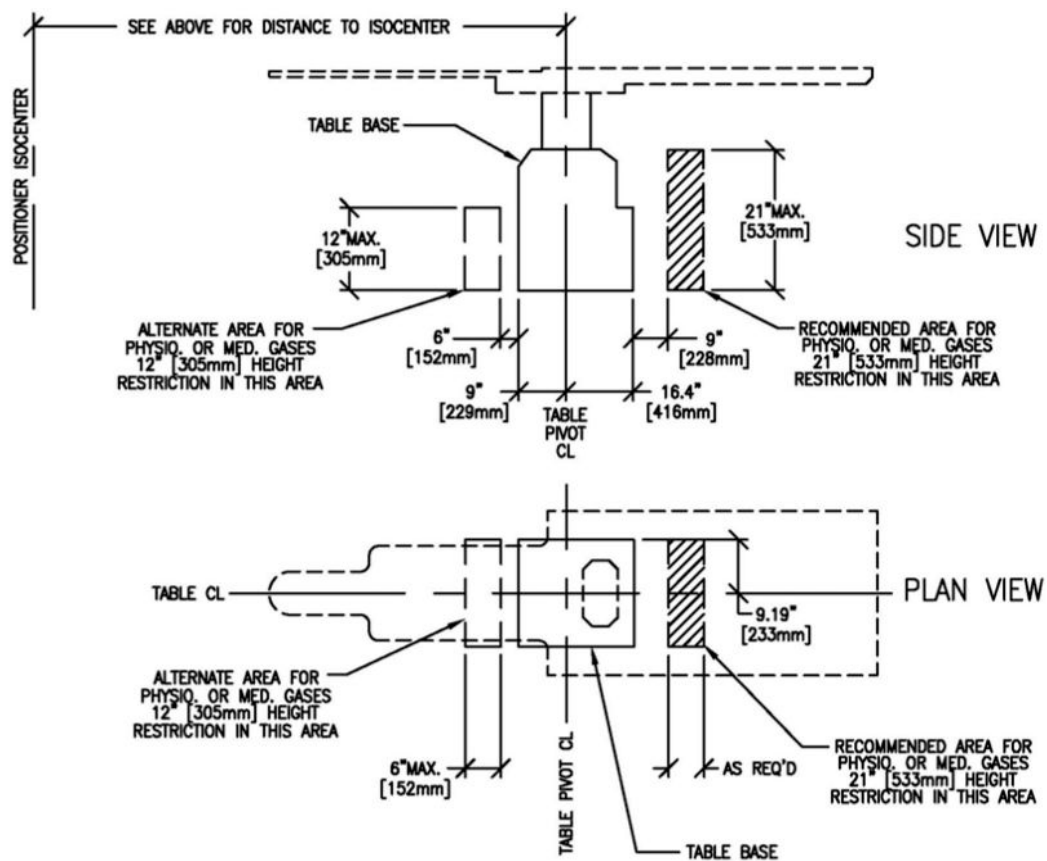


Illustration 2-36: Gas box outlets Omega V

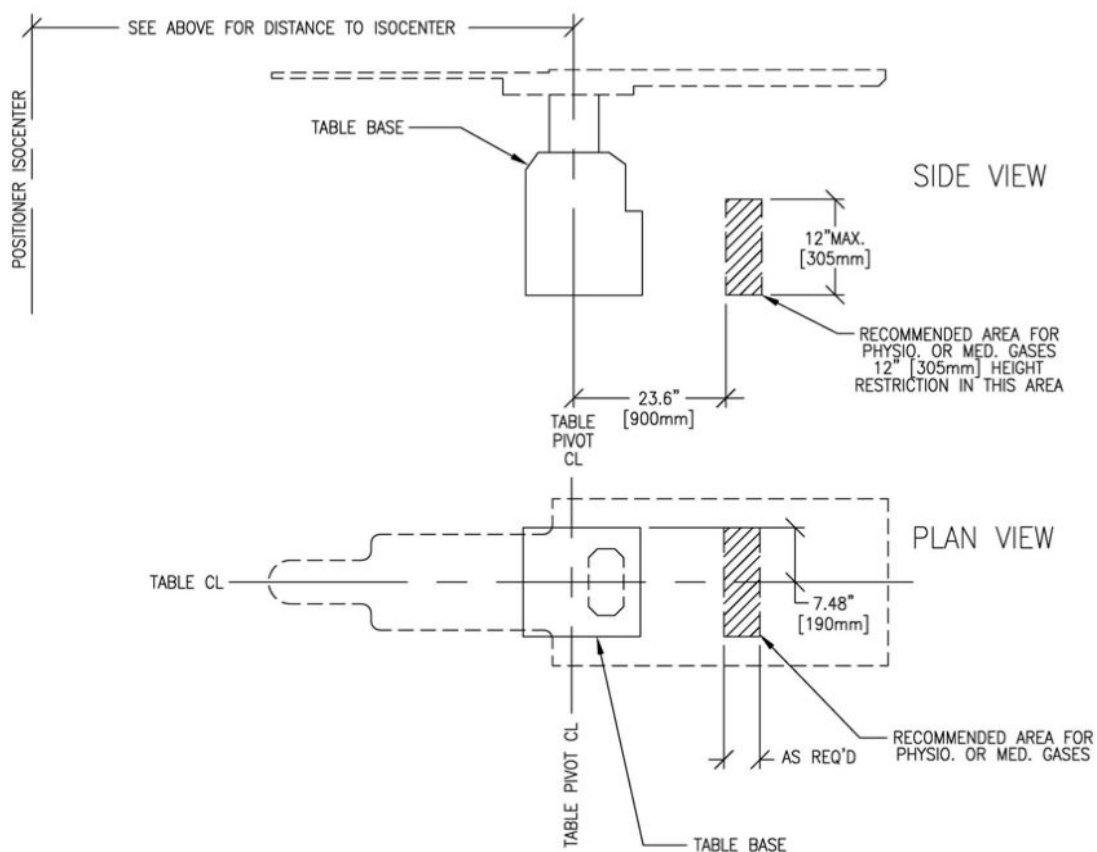
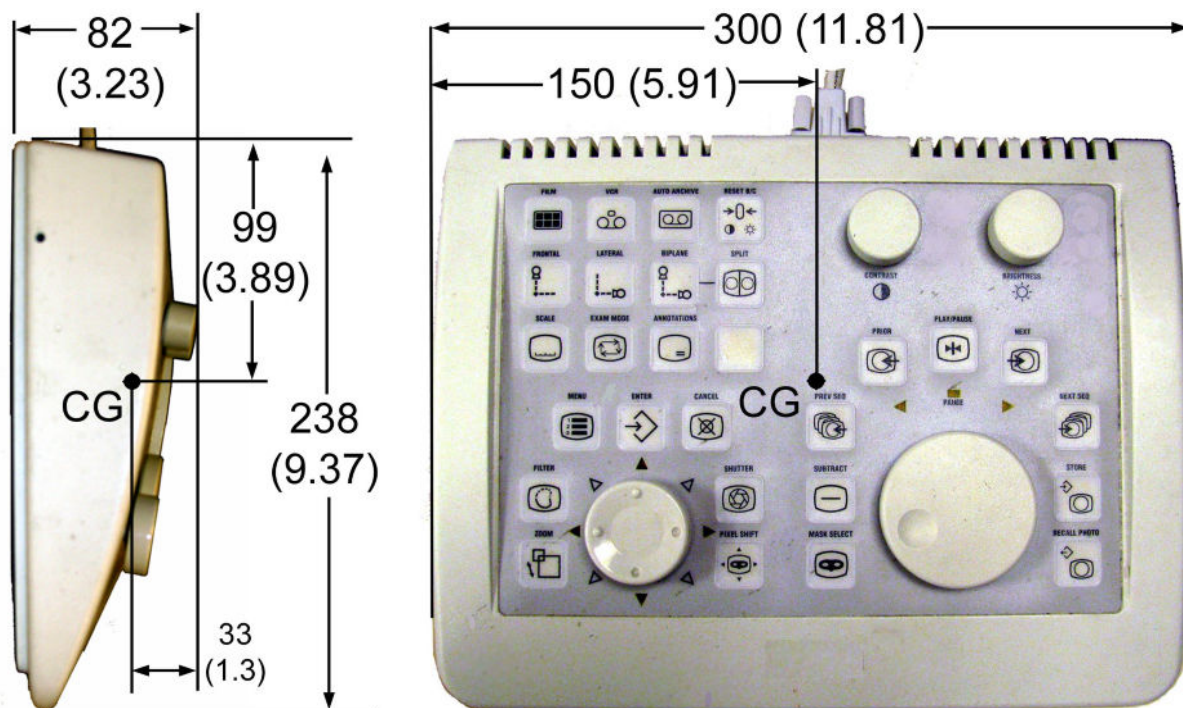
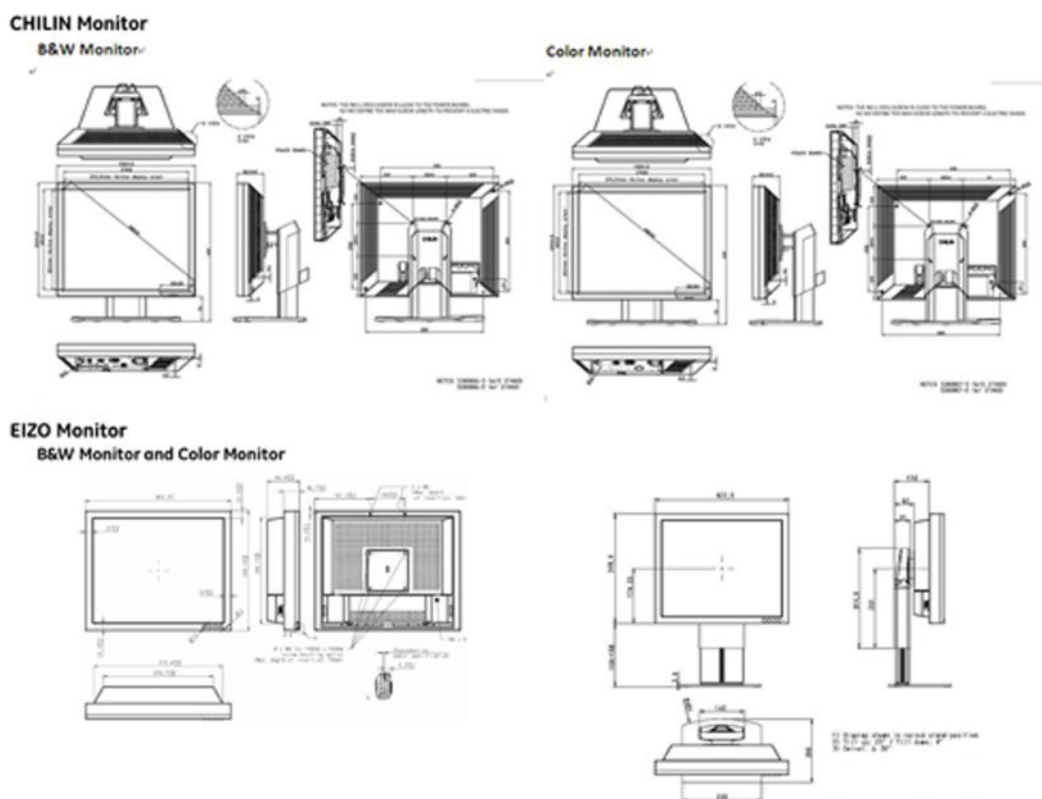


Illustration 2-37: DL Keypad Dimensions



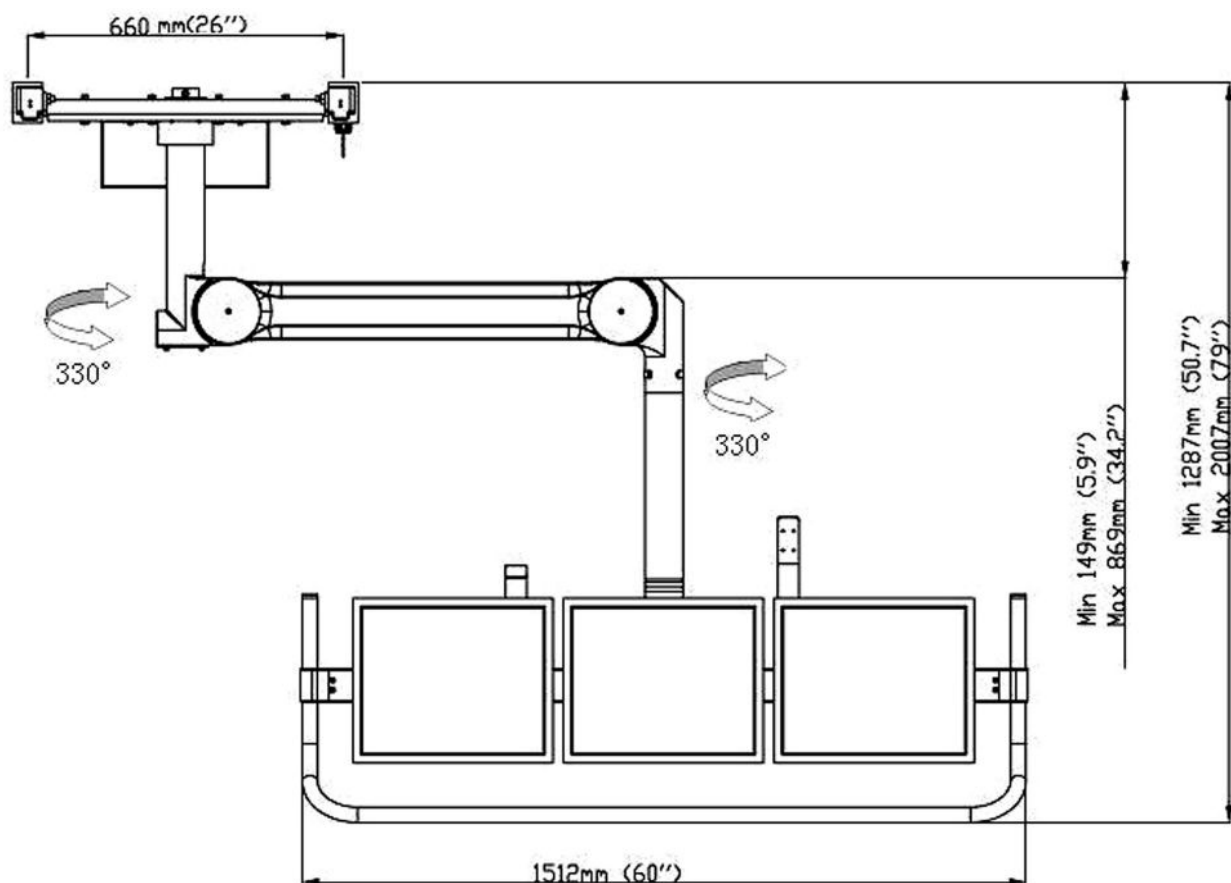
All dimensions are in mm (inches)

Illustration 2-38: DL Image Monitor Dimensions



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.

Illustration 2-39: Ergo LCD suspension dimension



1.4 Basic System Compatibility

1.4.1 System Compatibility Cross-Reference – Optima LC Positioner

PRODUCT NAME	MODEL NUMBER	PRE-INSTALLATION DOCUMENT NUMBER	NOTES
LC COMBO POSITIONER	5391266	This document	
LC CARDIO POSITIONER	5477408	This document	
C2 CABINET	5392314-2	This document	
SMART HANDLE+ SP	5309870	This document	Optional: Second MAC : For Omega table only
SMART BOX+ SP	5309866	This document	Optional: Second MAC : For Omega table only
BOLUS HANDLE	2111431	This document	Optional

1.4.2 System Compatibilities Cross-Reference – Tables Sub-System

PRODUCT NAME	MODEL NUMBER	PRE-INSTALLATION DOCUMENT NUMBER	NOTES
OMEGA IV TABLE	5391264	This document	Includes tabletop
OMEGA V LONG TABLE	5391265	This document	Includes tabletop
TSSC+ W/ CF	5309858	This document	Optional: Second MAC : For Omega table only
TABLE PANNING DEVICE	5184068	NA	3m
TABLE PANNING DEVICE	5184673	NA	5m

1.4.3 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

1.4.4 System Compatibility Cross-Reference – X-Ray Head

PRODUCT NAME	MODEL NUMBER	PRE-INSTALLATION DOCUMENT NUMBER	NOTES
Performix 160 A X-Ray tube	2216450	Not applicable	D2801A
Cardio collimator	5127609	Not applicable	
Angio collimator	5245319	Not applicable	
COOLIX 4000 Chiller	5115497	2358897-100	
COOLIX 4100 Chiller	5416114	Not applicable	
Coolix 4100 Autotransformer	5416111 (UL version) or 5416110 (IEC version)	Not applicable	

1.4.5 System Compatibility Cross-Reference – Optima LC Imaging And X-Ray Control

PRODUCT NAME	MODEL NUMBER	PRE-INSTALLATION DOCUMENT NUMBER	NOTES
VCIM	5416853	NA	

PRODUCT NAME	MODEL NUMBER	PRE-INSTALLATION DOCUMENT NUMBER	NOTES
C1 cabinet	5392313-2	This document	
21 cm Revolution Digital detector	5478871	This document	
31 cm Revolution Digital detector	5394241	This document	
Detector Chiller Thermo-Con	5416854	This document	

1.4.6 System Compatibility Cross-Reference – Monitor Support & Suspension

PRODUCT NAME	MODEL NUMBER	PRE-INSTALLATION DOCUMENT NUMBER	CATALOG NUMBER
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 Optima			
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 ERGO SUSPENSION: <ul style="list-style-type: none"> IN ROOM CABLE 24m or IN ROOM CABLE 36 m 	5394361-1 <ul style="list-style-type: none"> 5410760 5410760-3 	This document	

1.4.7 System Compatibilities Cross-Reference – 19" Monitors

PRODUCT NAME	MODEL NUMBER	PRE-INSTALLATION DOCUMENT NUMBER	CATALOG NUMBER
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		
LCD 19" –Chilin B& W with Stand	5389896-2	DOC15M0039	
LCD 19" – Chilin B& W without Stand	5380806-3		
LCD 19" – Chilin Color with Stand	5414707	DOC15M0040	
LCD 19" – Chilin Color without Stand	5380807-3	DOC15M0038	

1.5 Optional System Components

System Compatibilities Cross-Reference – Omega Table Sub-System

PRODUCT NAME	MODEL NUMBER	PRE-INSTALLATION DOCUMENT NUMBER	CATALOG NUMBER
SMART HANDLE+SP	5309870	This document	
SMART BOX +SP	5309866	This document	
TSSC+ W/ CF	5309858	This document	
Note 1: w/CF means with Contour Filter and w/o CF means without Contour Filter.			

2 Room Layouts

2.1 Room Dimension Requirements



WARNING

LOCATION IN TECHNICAL ROOM FOR ELECTRICAL CABINETS IS MANDATORY.

THE ELECTRONIC CABINETS (C1, C2, OPTIONAL LD CABINET, COOLIX 4000 OR COOLIX 4100 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.

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 [Patient Room Layout](#) and [Control Room Layout](#) to see recommended exam / control rooms layouts.

Table 2-3: 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 Table 2-4 , Table 2-5 and Illustration 2-40	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)			

For the tables below, refer to [Illustration 2-40](#)

Note: For Head Extender Dimensional drawing, refer to [Dimension Drawings](#)

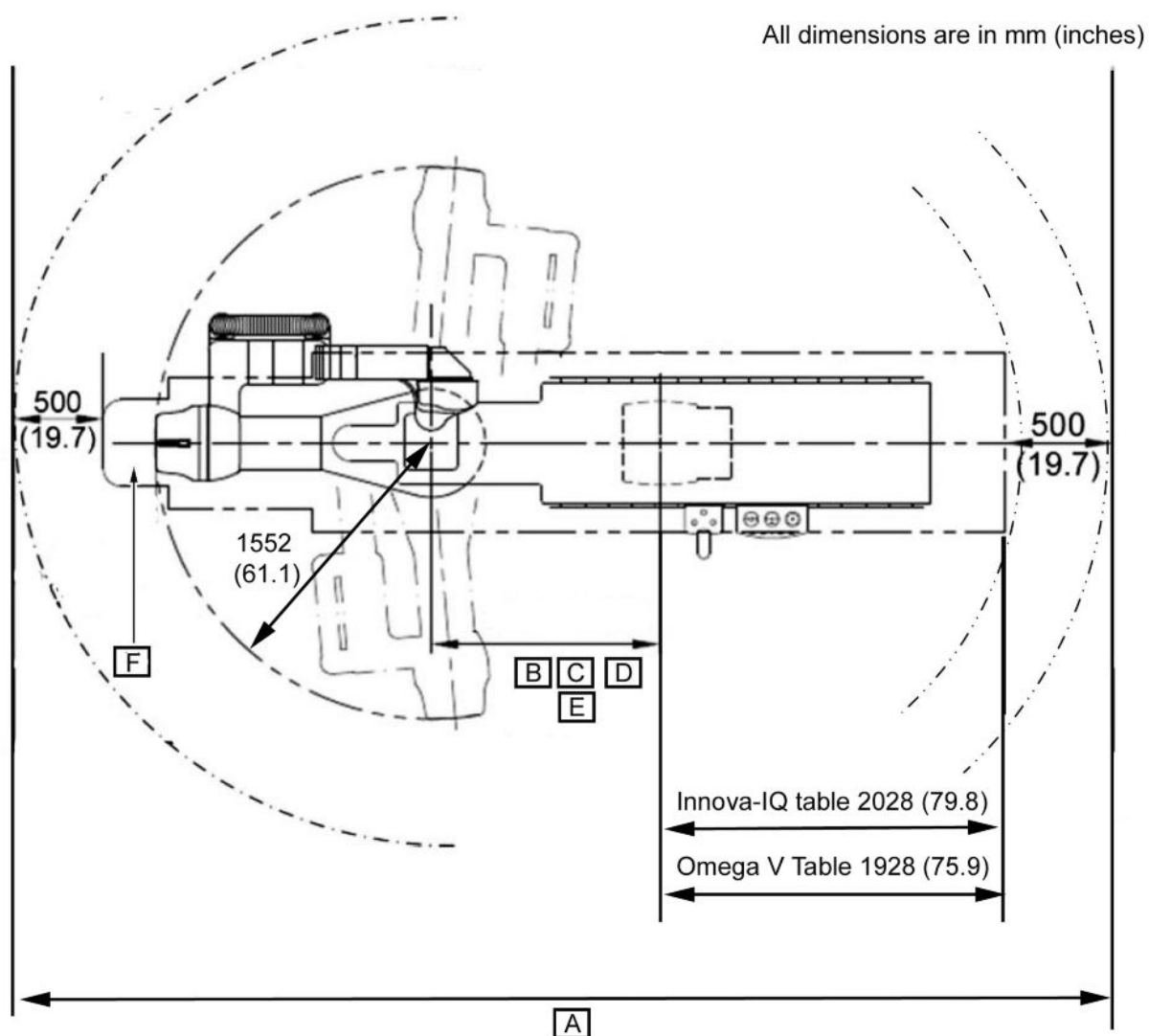
Table 2-4: Omega IV Table

Configuration	Minimum Room length in mm (inches) A	
	without Head Extender (see note above)	with Head Extender (see note above) F
Cardio 1395 mm (54.9 in) B	5470 (215.3)	5470 (215.3)

Table 2-5: Omega V Table

Configuration	Minimum Room length in mm (inches) A	
	without Head Extender	with Head Extender F
Angio 1278 mm (50.3 in) C	6036 (237.6)	6036 (237.6) + 150 (6)
Cardio and Neuro 1395 mm (54.9 in) B	6036 (237.6)	6036 (237.6) + 150 (6)

Illustration 2-40: Minimum Room Length Dimension



2.2 Room Layout Drawings

2.2.1 Patient Room Layout

2.2.1.1 Room Layout for Optima System (examples of room layouts)



WARNING

LOCATION IN TECHNICAL ROOM FOR ELECTRICAL CABINETS IS MANDATORY.

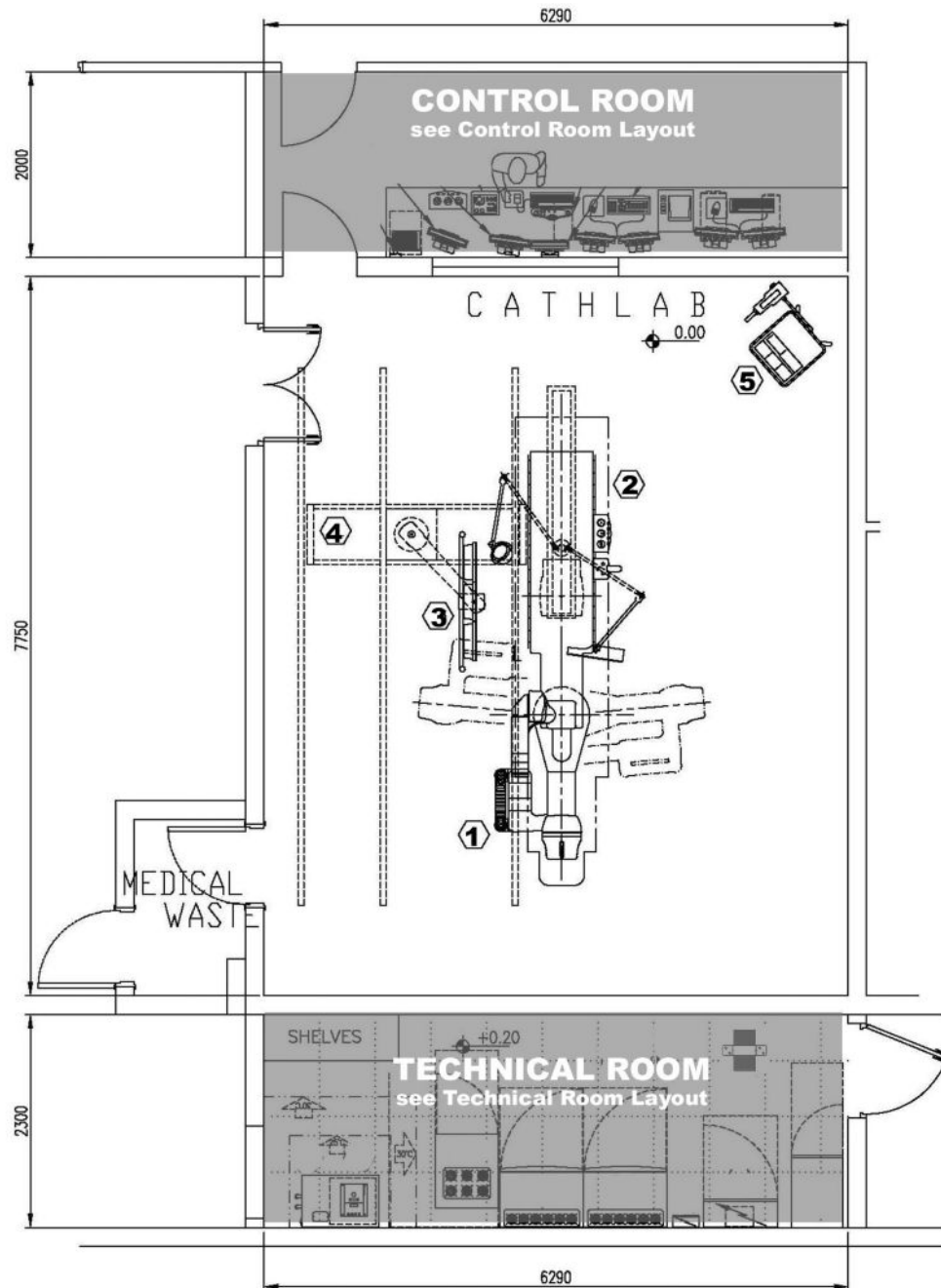
THE ELECTRONIC CABINETS (C1, C2, OPTIONAL LD CABINET, COOLIX 4000 OR COOLIX 4100 CHILLER, DETECTOR CHILLER AND FLUORO UPS WHEN INSTALLED) INCLUDE FANS THAT ARE CREATING AIR-CIRCULATION OF PULSED-AIR. WHEN THIS PULSED AIR IS IN AN ENVIRONMENT THAT MAY CONTAIN AIRBORNE PATHOGENS LIKE AN EXAM ROOM/CONTROL 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 2-41](#), [Illustration 2-42](#), [Illustration 2-43](#), [Illustration 2-44](#) and [Illustration 2-45](#).

1. LC positioner
2. Patient table
3. XT monitor suspension
4. Monitor frame
5. Injector on Pedestal

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

Illustration 2-41: Monitor suspensions rails parallel to patient table (to side of table)



WARNING

ILLUSTRATION 2-41 IS MANDATORY WITH HOSPITAL HAVING AIR FLOW INSTALLATION

Illustration 2-42: Monitor suspensions rails parallel to patient table (over table)

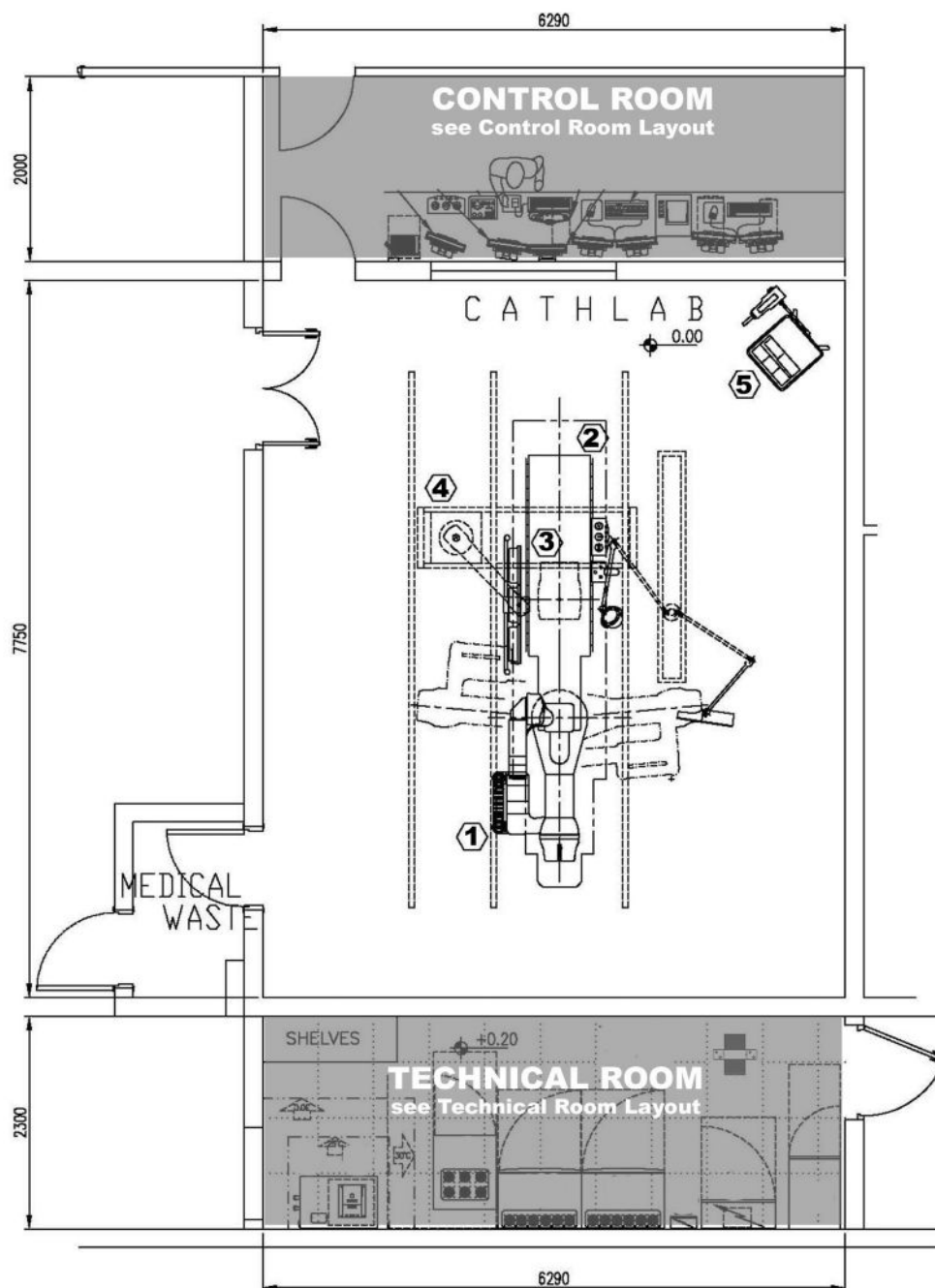


Illustration 2-43: Monitor suspensions rails perpendicular to patient table (LC positioner side)

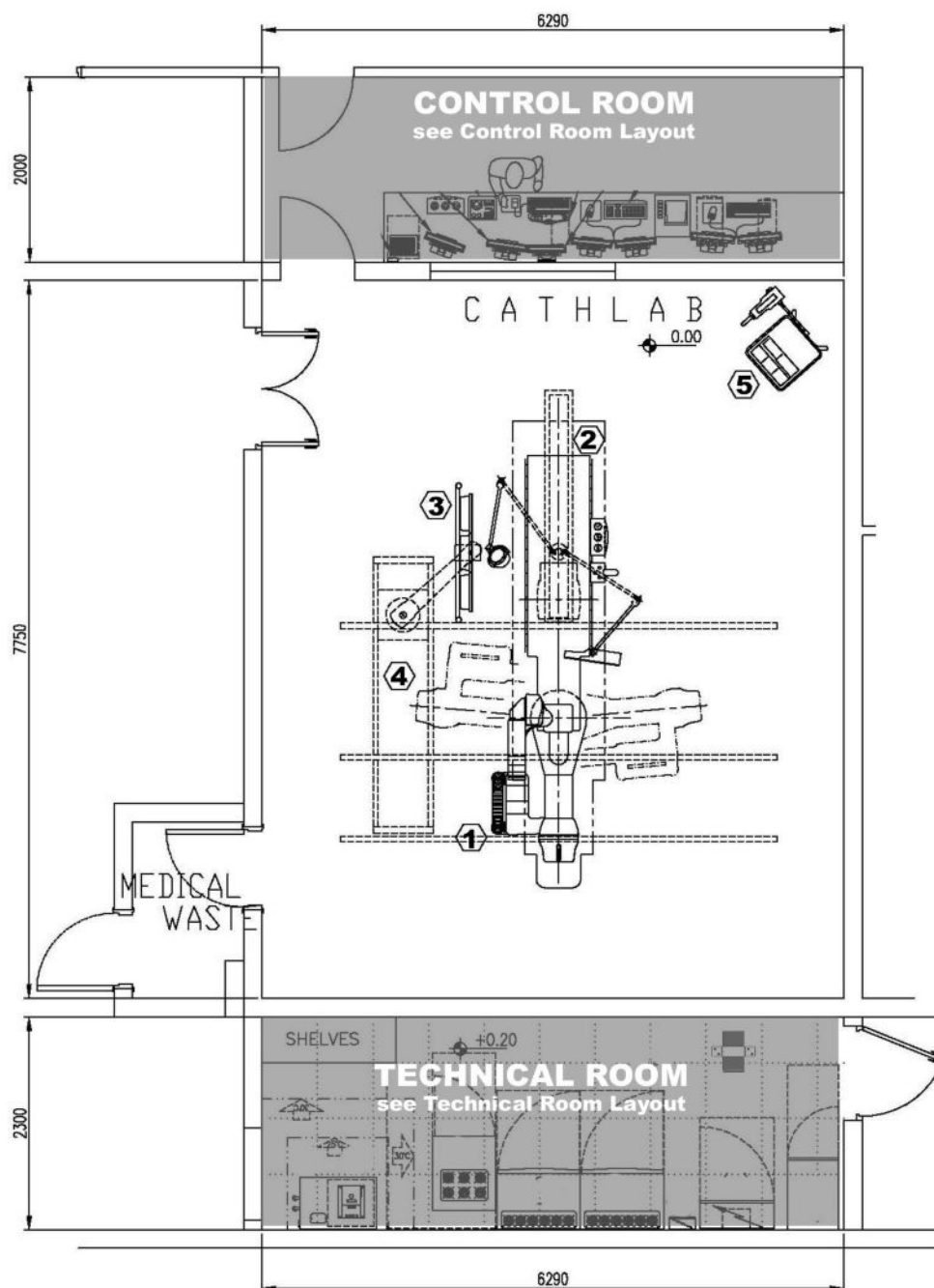
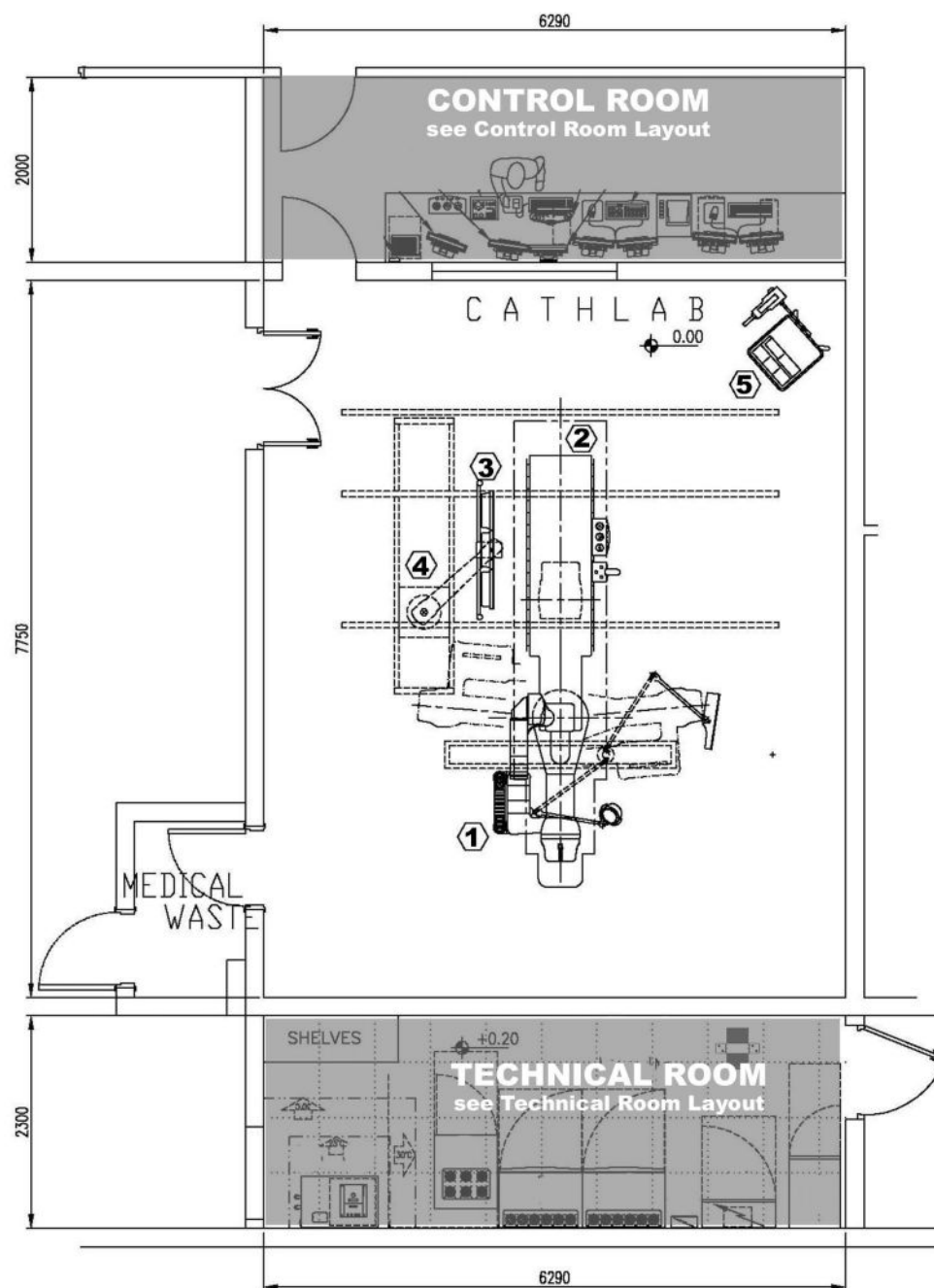
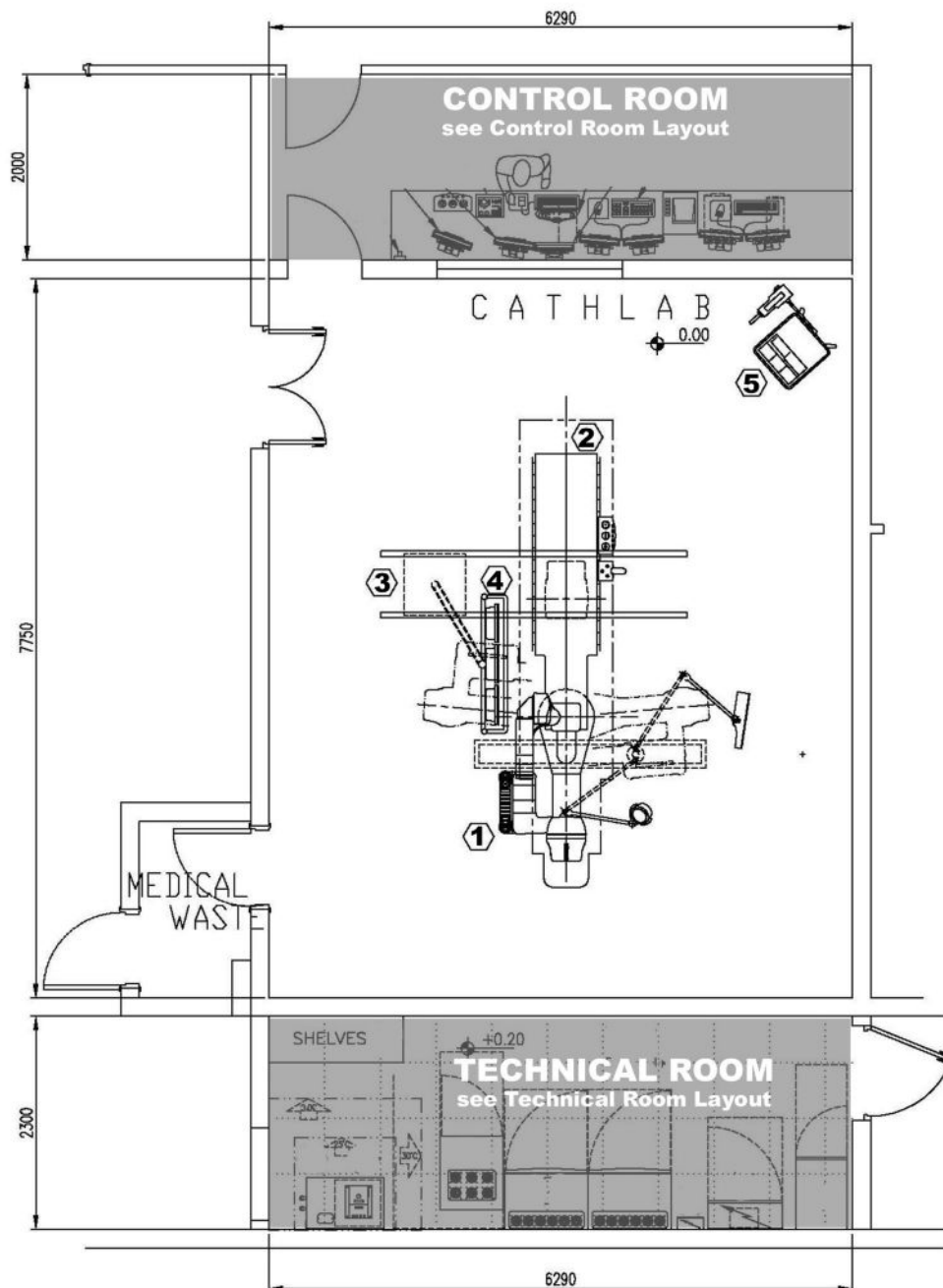


Illustration 2-44: Monitor suspensions rails perpendicular to patient table (table side)



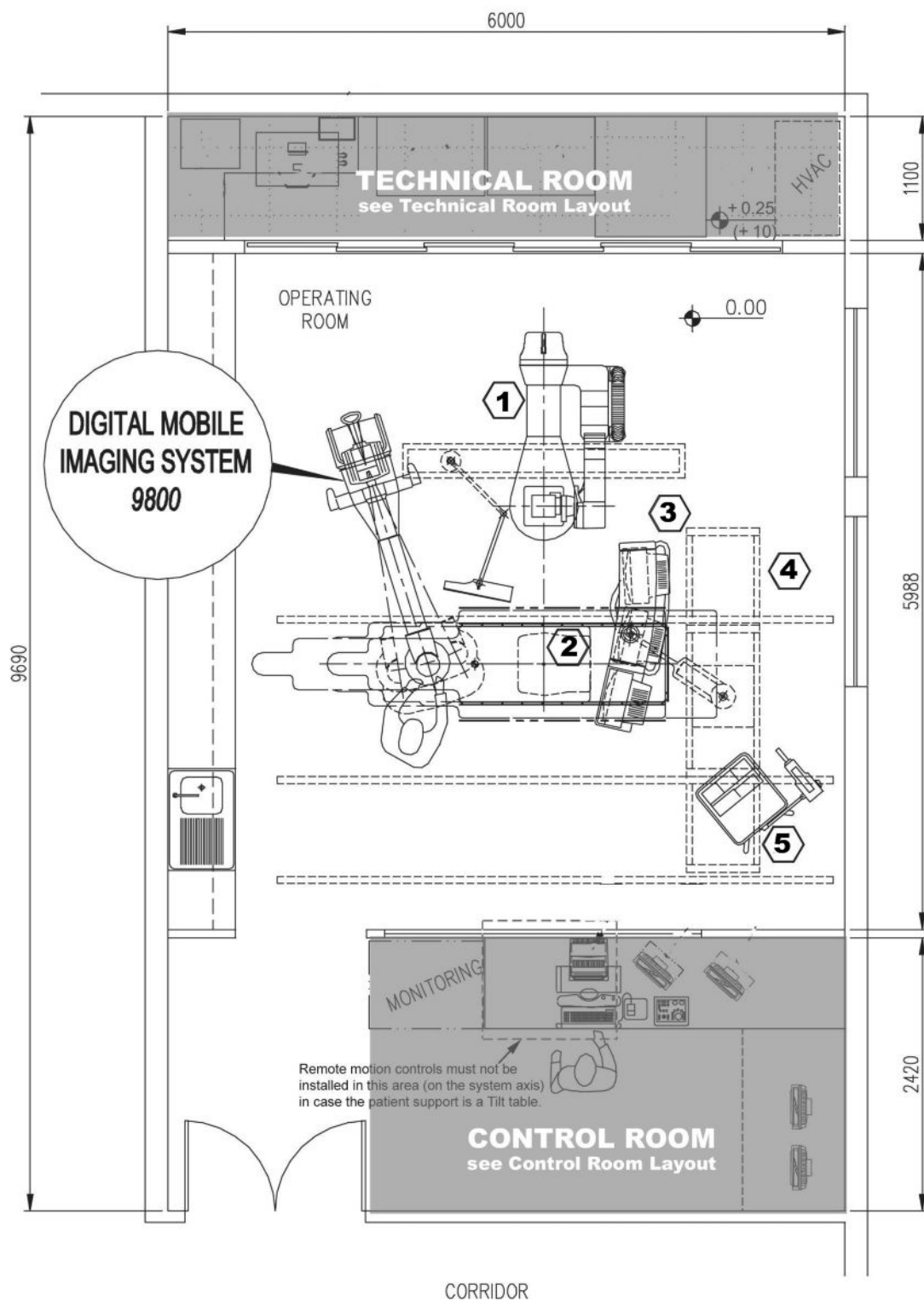
2.2.1.2 Room Layout for Optima System (with Ergo suspension)

Illustration 2-45: System with Ergo suspension room layout drawing



2.2.1.3 Room Layout for Optima System (example with Mobile system 9800)

Illustration 2-46: Room Layout for Optima System



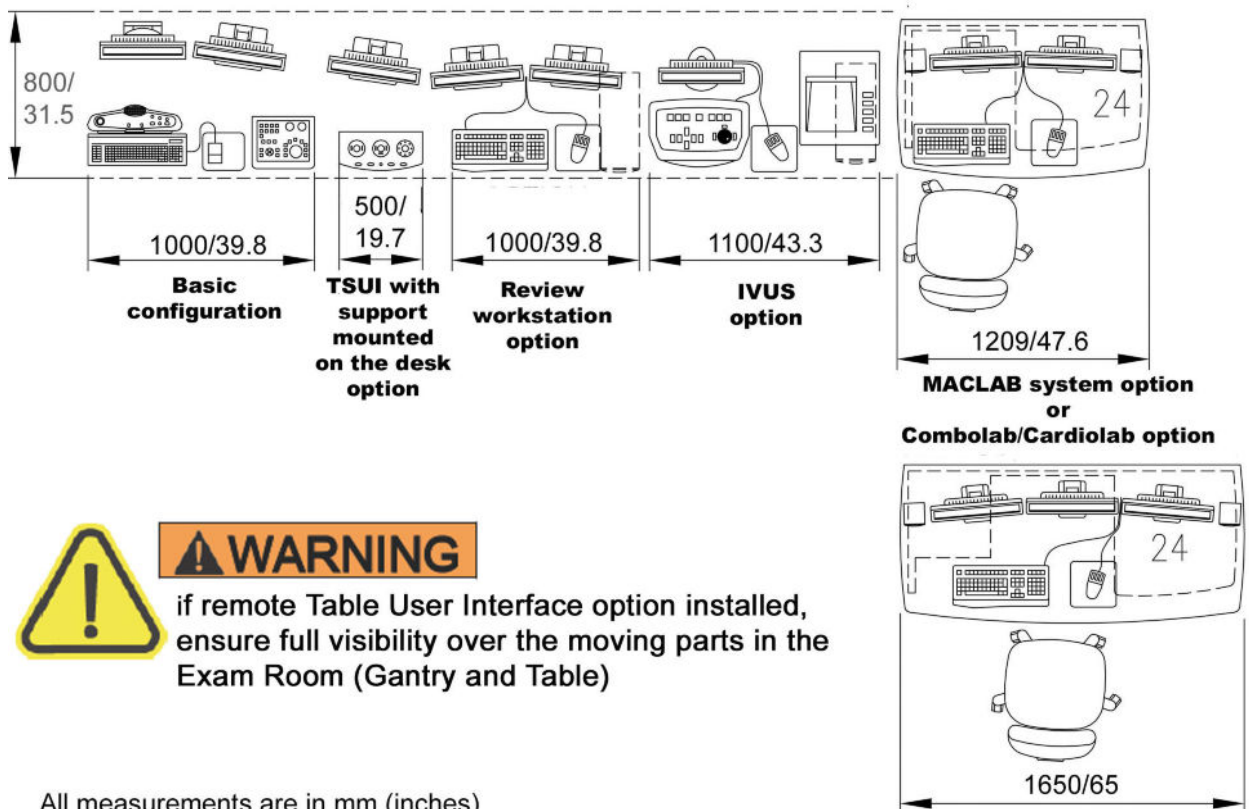
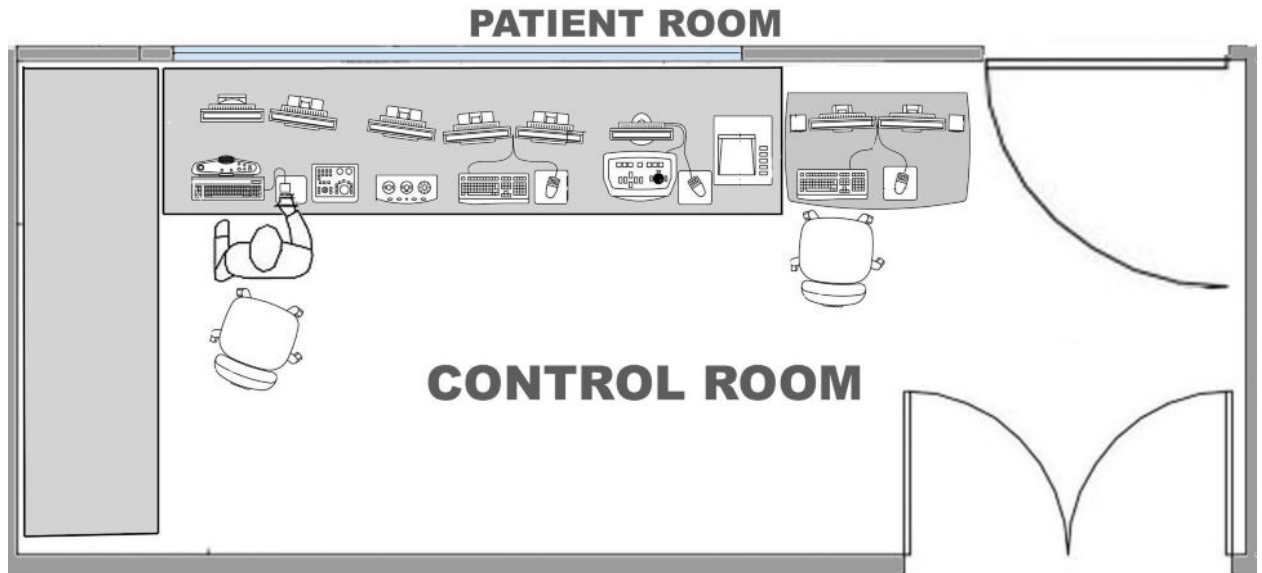
Legend of [Illustration 2-46](#)

1. LC positioner
2. Patient table
3. XT monitor suspension
4. 21" (53 cm) FFD Monitors put on frame with monitoring screen
5. Injector on Pedestal

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

2.2.2 Control Room Layout

Illustration 2-47:



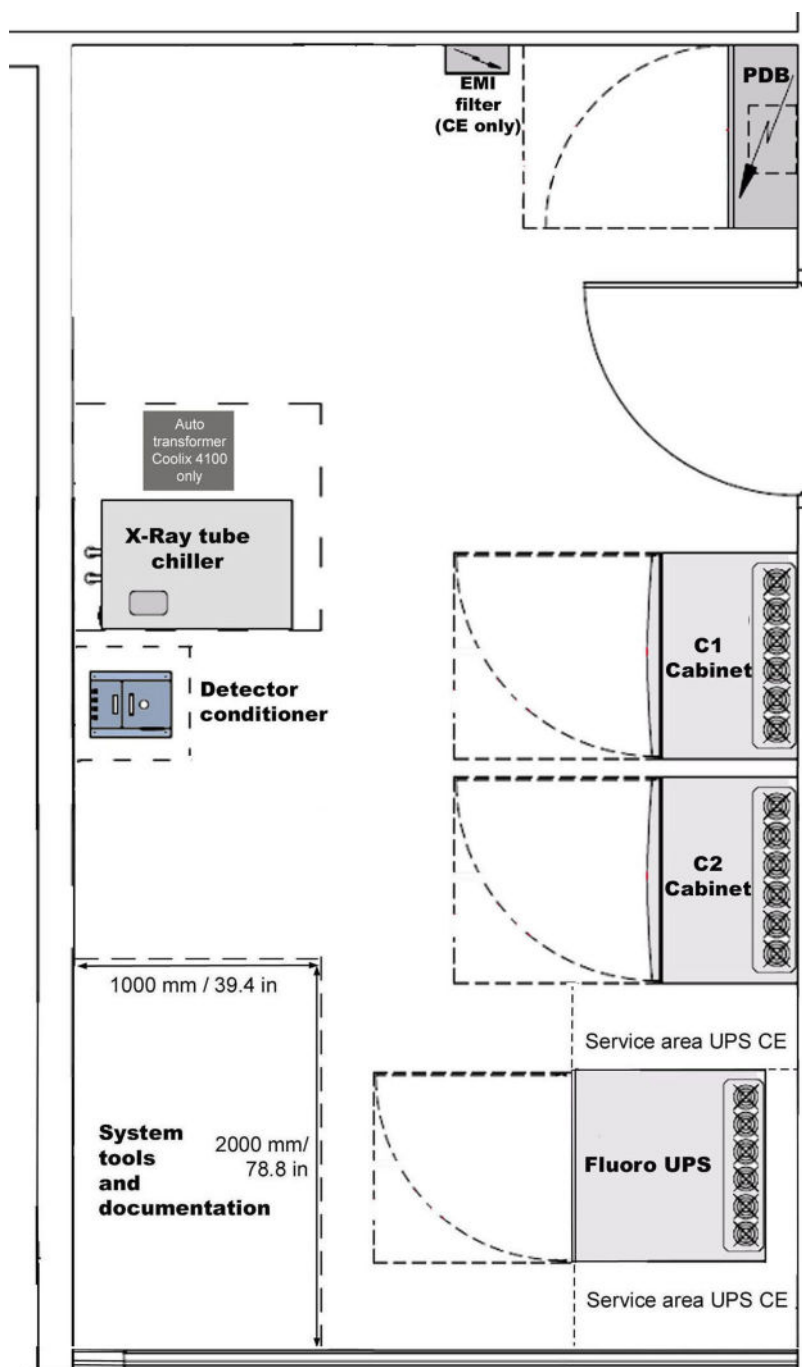
All measurements are in mm (inches)

2.2.3 Technical Room Layout

For the service access and ventilation restraint dimensions below, see [Dimension Drawings](#) and [Room Layout Considerations](#).

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

Illustration 2-48:



2.3 Room Layout Considerations

2.3.1 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 advice on radiation protection in x-ray rooms.

2.3.2 Service Access

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

2.3.3 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 cm (25.6 in) if the Header Extender is used).
- 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.

2.3.4 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.

2.3.5 Emergency Stop

Protect the Emergency Stop from accidental actuation.

2.3.6 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 Optima System, the equipment are:

- Table
- C-arm
- Monitors
- Injector
- Rad-Shield
- Patient Interface Module(s).
- Table Side User Interfaces (TSUI)
 - Smart Box
 - Table Side System Control
 - Table Panning Handle

NOTE: No IPX4 components shall be installed on a cart.

-
- Accessories:
 - Table Head Extender
 - Armboard
 - IV pole
 - Quick Strap
 - Head holder: Attach Head Positioning device onto the head end of the table with the head cradle pointing to the end of the table. The clamp angle pressure bar should be resting on top of the table and the blue stabilizing feet under the table. Tighten the clamping systems with the four- pronged knob. Test to check that head holder is

securely attached to the table. Adjust the height and angle of the head cradle by loosening the long handled knob. Once cradle is set at desired position tightened the long handled top. Place the patient's head in the head cradle. Use the two velcro® straps to hold the forehead and chin in place. Additional adjustment maybe made to the position of the head cradle by loosening and tightening the long handled knob if desired.

- Clear-Vu Arm Support
- Mattress and mattress slicker
- Shoulder Rests
- Footrest
- Rail Extender
- Head Widener



HEAD WIDENER IS NOT COMPATIBLE WITH HEAD EXTENDER & SHOULDER REST.

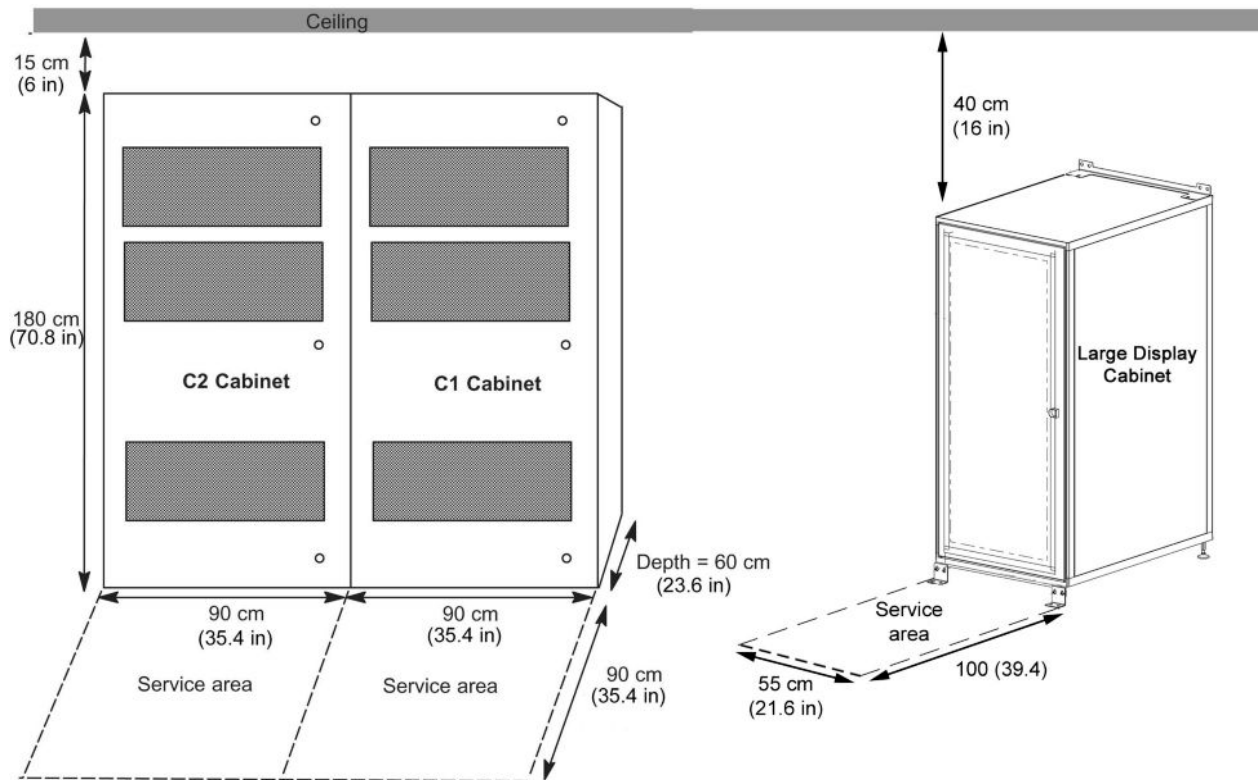
- Adaptor rail for table side controls
- Width Extender
- Armboard with thick pad (armrest)
- Universal Clamp
- Patient restraint strap

2.3.7 Preference Cabinet locations

NOTE: This is applicable for all types of cabinets (including PDB).

The clear width of the service area in front of the cabinet doors to insure electrical safety shall be at least 0.9 m for all cabinets except the cabinet (1 meter is necessary for cabinet). In cases where 2 cabinets are installed face to face (both sides of the access way), the clear width shall be at least 1.2 m.

Illustration 2-49:



CAUTION

The service area dimensions shown above are minimum requirements. Service areas must comply with local regulations if more stringent.

2.3.8 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.

3 Room Structural Requirements

3.1 General Policy

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

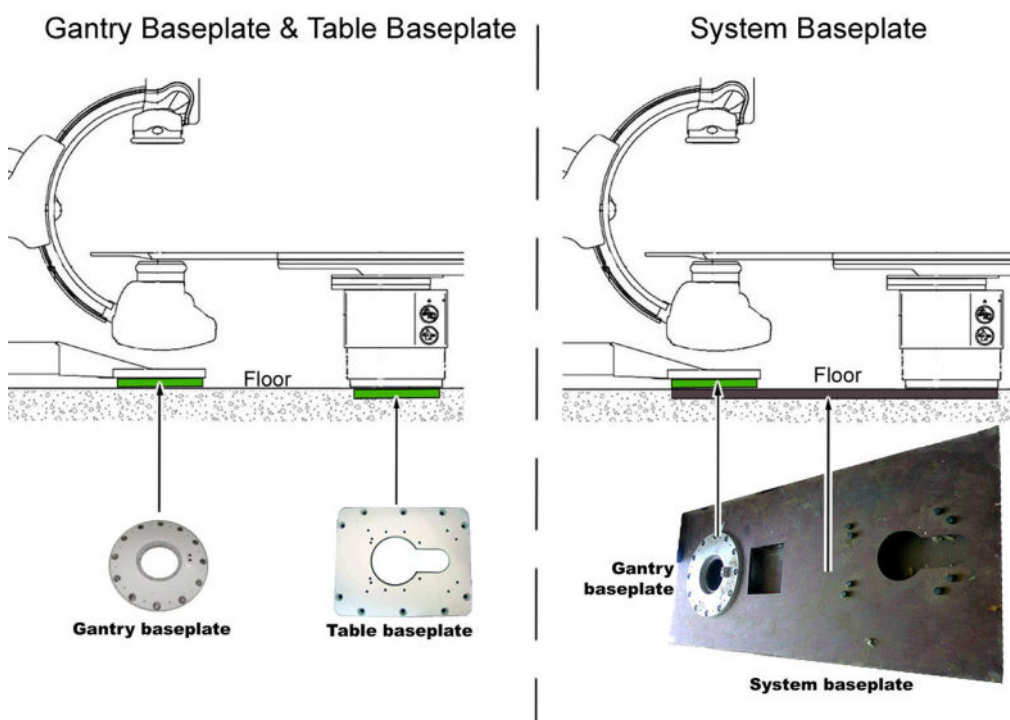
The floor level cannot exceed a general levelness of 5 mm (0.2 in) for any 2 meters (79 in).



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 below.

Illustration 2-50: Types of baseplate installation



NOTICE

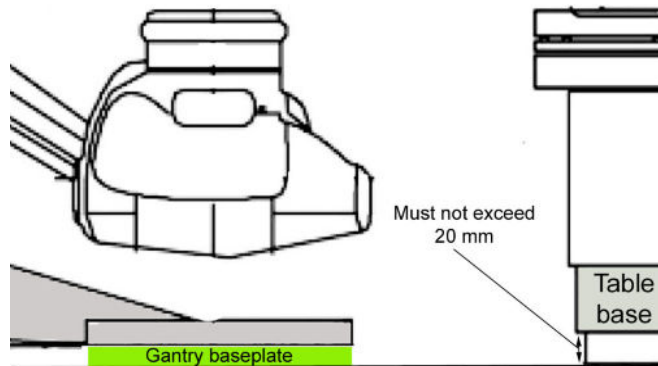
Augmented Calibration requires that the patient table and gantry be installed following Pre-installation instructions. Any deviation may result in a non-augmented calibration.



NOTICE

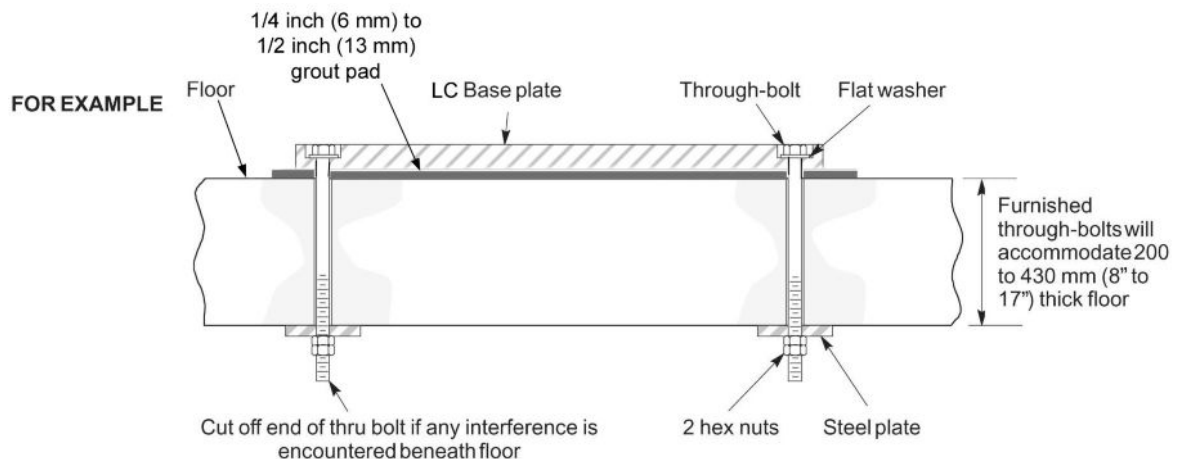
The gap between the Table Foot bottom end and the Gantry Baseplate bottom end shall be lower than 20 mm (0.97 in).

Illustration 2-51: Gap between Table Foot bottom end and the Gantry Baseplate bottom



The preferred installation method for the 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 2-52: Through-Bolt Supplied (Slab Type Floor Construction)



3.2 Floor Requirements

3.2.1 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.

3.2.2 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 2-53](#).

NOTE: For specific floor preparation procedures, refer to PIM Optima CL320i, CL323i, IGS320 cardiovascular Imaging System Pre-Installation Kit Installation Procedures.

Illustration 2-53: Through-Bolt Supplied (Pan Type Floor Construction)

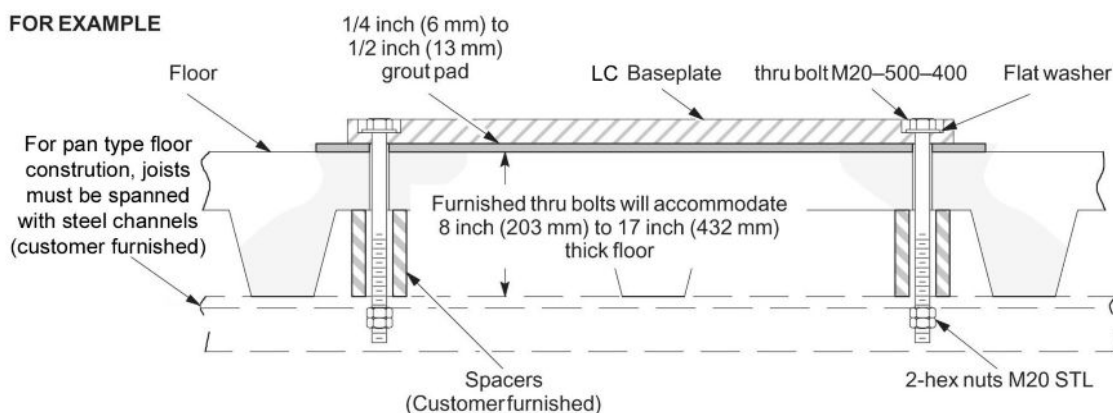
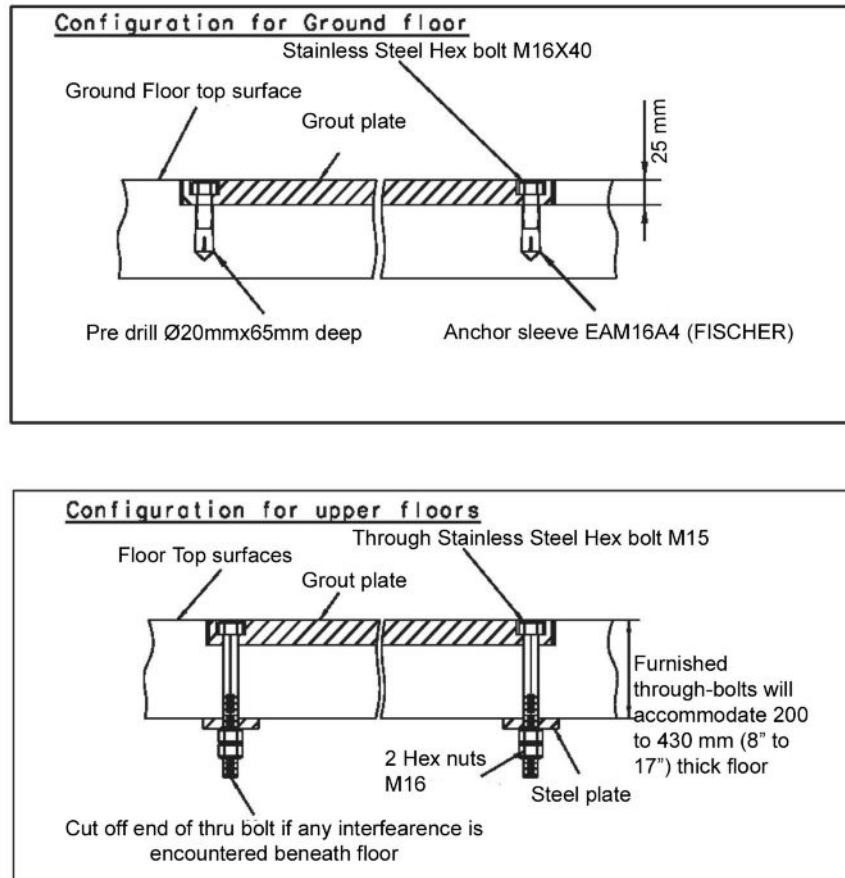


Illustration 2-54: Table floor mounting layout



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

3.2.3 Hole dimension and preferred location in concrete floor

In the examination room, the 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 2-55: Hole location in concrete floor

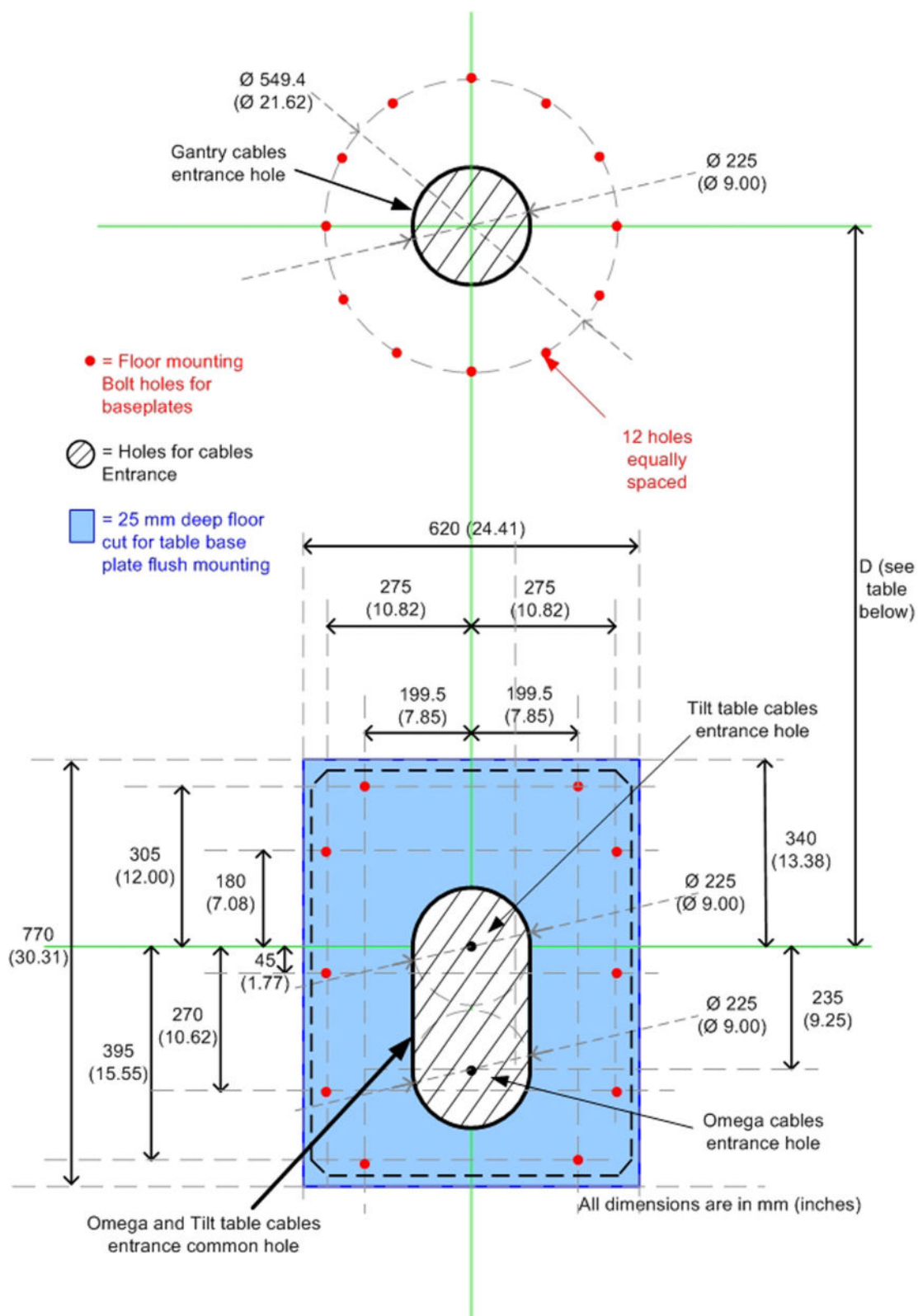


Table 2-6: D distance

	ANGIO	CARDIO	NEURO
Omega IV Compact	NA	1395 mm (54.9 in)	NA
Omega V Long	1278 mm (50.3 in)	1395 mm (54.9 in)	1395 mm (54.9 in)



NOTICE

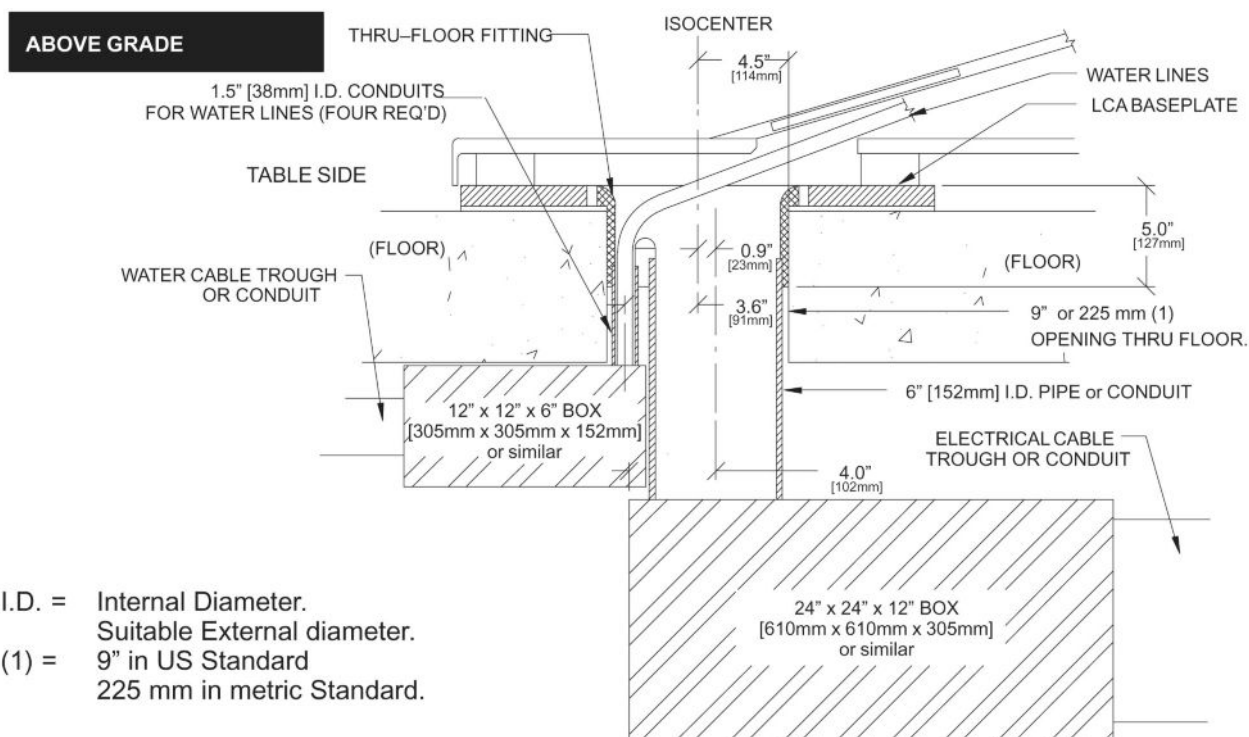
Due to the plastic bushing used in the USA to protect cables from the sharp edges of conduits it is necessary to place the cable conduit inside the table cable access opening but the height of the outcoming conduit plus bushing is limited to 1/2 in (12.7 mm).

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

3.2.4 Water Pipe Requirements

- An LC System uses a Performix 160 A X-Ray tube with a recirculating chiller.
- Two water hoses are supplied to allow water circulation between 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 LC Positioner entrance.
- Depending on the method used, one of the two options shown hereafter (Illustrations [Illustration 2-56](#) and [Illustration 2-57](#)) must be used.

Illustration 2-56: Water Conduit location with "Above Grade" anchor kits



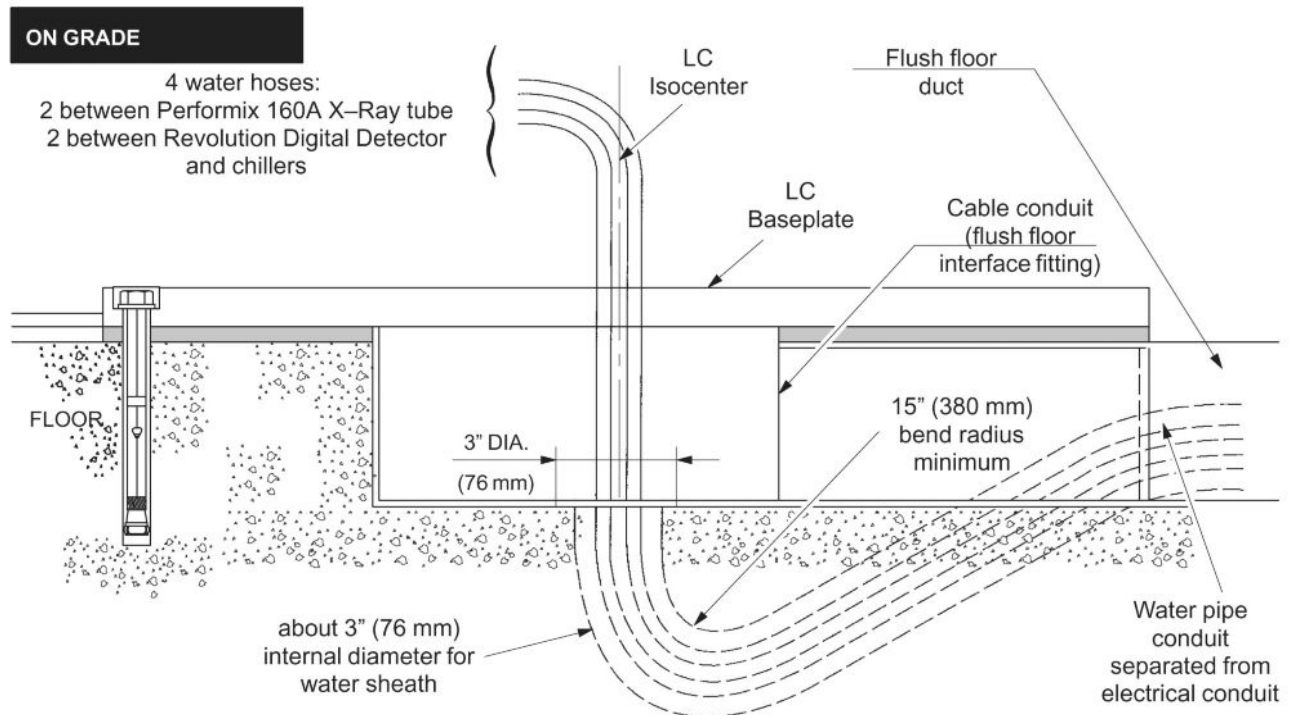
Note: Pipe, junction box and duct or conduit are to be supplied and installed by Customer or customer's Contractor.



NOTICE

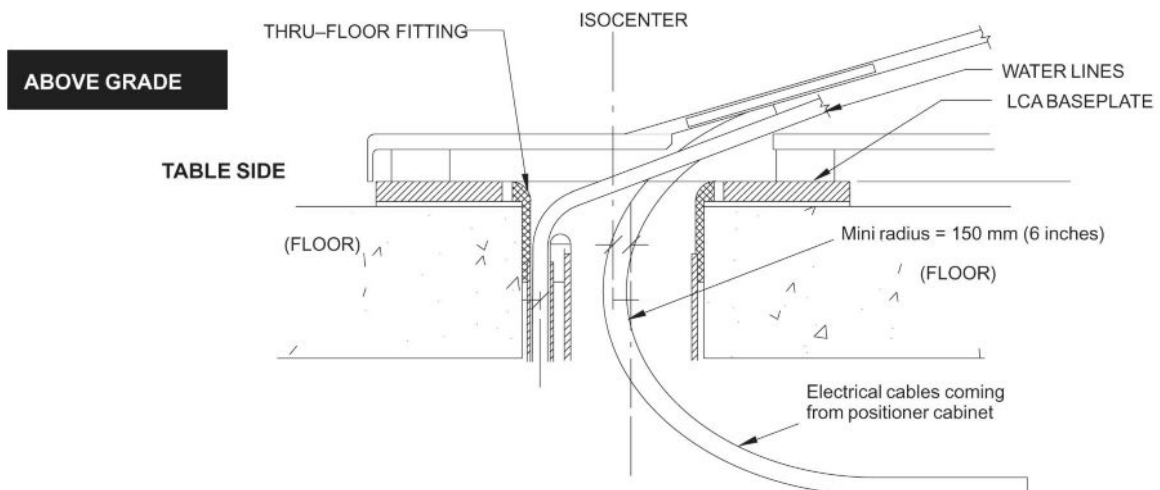
In some countries, depending on local regulations, it may be forbidden to run electrical cables and water pipes in the same conduit. In this case, two separate conduits are required.

Illustration 2-57: Water Conduit location with “On Grade” anchor kits



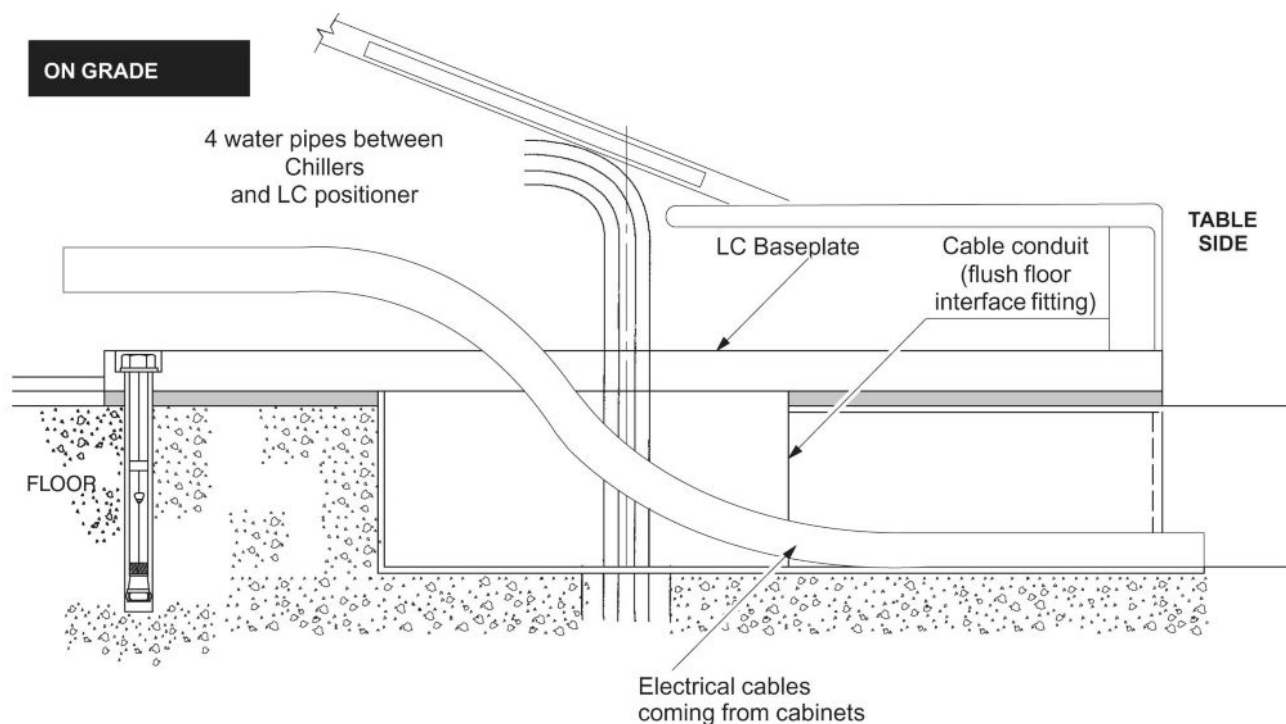
Note: Flush floor interface fitting is part of GEMS installation kit 2286398 and is installed by Customer or customer's Contractor.

Illustration 2-58: Cable Curvature with “Above Grade” anchor kits



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 2-59: Cable Curvature with “On Grade” anchor kits



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 LC Positioner and patient table.

3.3 Mounting Requirements

3.3.1 Floor Loading and Recommended Mounting Methods

See [Table 2-7](#). To obtain floor loading and recommended mounting methods for components not specified in [Table 2-7](#), refer to the appropriate component Pre-Installation Manual listed in [Basic System Compatibility](#).

Table 2-7:

PRODUCT OR COMPONENT	NET WEIGHT KG (LBS)	DIMENSIONS MM (INCHES)			LOAD BEARING AREA MM (INCHES)	WEIGHT/ OCCUPIED AREA	MOUNTING METHOD
		WIDTH	DEPTH	HEIGHT			
LC Positioner	750 (1655)	See Illustrations <i>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: <ul style="list-style-type: none"> On Grade 5/8 in. Anchors (12) Above Grade 3/4 in. Anchors (12) See Illustration 2-60 , Illustration 2-61 and Illustration 2-62
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 LC Positioner See IMPORTANT NOTICE below.
C2 Cabinet	249 (549)	See Illustration <i>C2 Cabinet Dimensions</i> in Dimension Drawings			600x900 (23.63x35.44)	461 kg/m ² (94 lb/ft ²)	
C1 Cabinet	446 (983)	See Illustration <i>C1 Cabinet Dimensions</i> in Dimension Drawings			600x900 (23.63x35.44)	826 kg/m ² (169 lb/ft ²)	
COOLIX 4000	160 (350) 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	
COOLIX 4100	120 (264.5)	555 (21.8)	610 (24)	1200 (47.2)			
Autotransformer (Coolix 4100)	30 (66)	370 (14.5)	304 (12)	340 (13.4)			
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

PRODUCT OR COMPONENT	NET WEIGHT KG (LBS)	DIMENSIONS MM (INCHES)			LOAD BEARING AREA MM (INCHES)	WEIGHT/ OCCUPIED AREA	MOUNTING METHOD
		WIDTH	DEPTH	HEIGHT			
PDB US (4)	148 (326)	685 (27)	225 (9)	1850 (73)			Wall-mounted
PDB CE (4)	110 (242)	800	300	1200			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)			
Pre-cabled Ergo LCD monitor suspension (self weight without monitor and accessories given)	94 (208)	See Illustration <i>Ergo LCD suspension dimension</i> in Dimension Drawings					Ceiling-mounted
1 pair of Stationary rails (include cable track) for Ergo Suspension	33 (73)	See Illustration <i>Ergo LCD suspension dimension</i> in Dimension Drawings					Ceiling-mounted

NOTE: (1) including patient weight (patient weight considered is 204 Kgs/450 lbs).

NOTE: (2) Depth.

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

NOTE: (4) Recommended supplier.

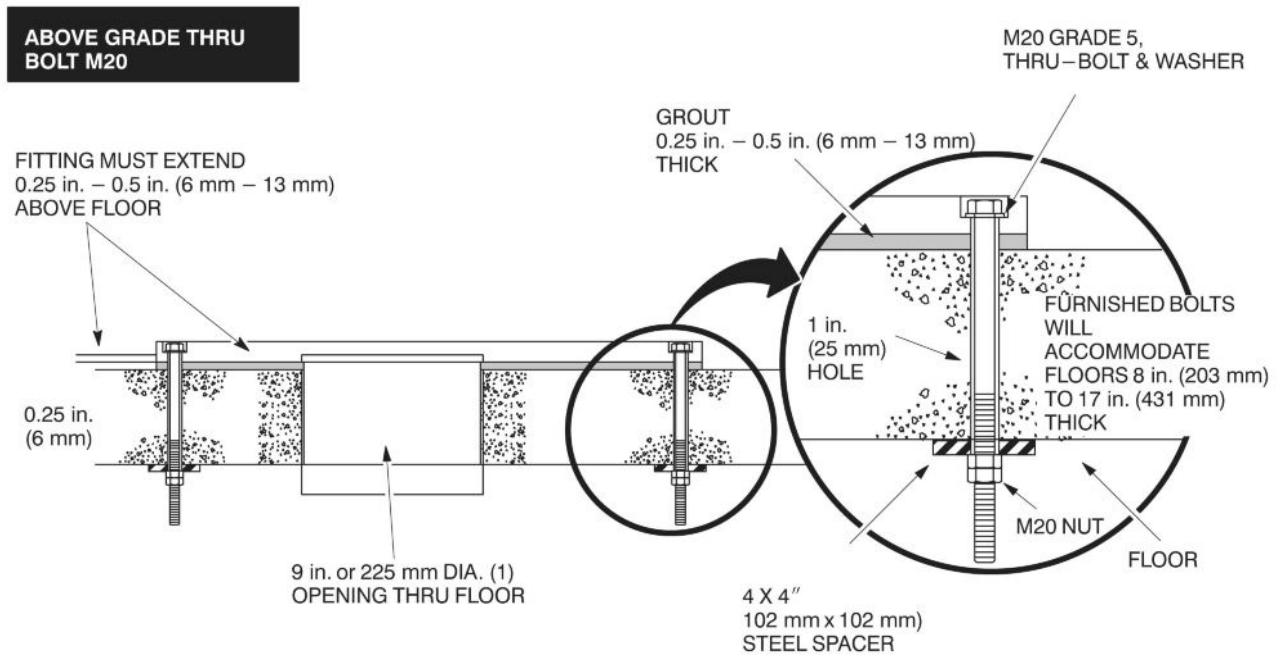
3.3.2 Positioner and Table Floor Mounting

The distances between the 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 2-8:

Title	Illustration
LC Positioner Floor Mounting Methods	Illustration 2-60 and Illustration 2-61
Cable Conduit For On-Grade Floor Anchor Kit	Illustration 2-62
Inner Base Plate For Above Grade Floor Anchor Kit	Illustration 2-63
LC Positioner Floor Mounting Template	Illustration 2-65 and Holes location in concrete floor illustration in Floor Requirements .
Fixing Bolt Overview	Illustration 2-64

Illustration 2-60:



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

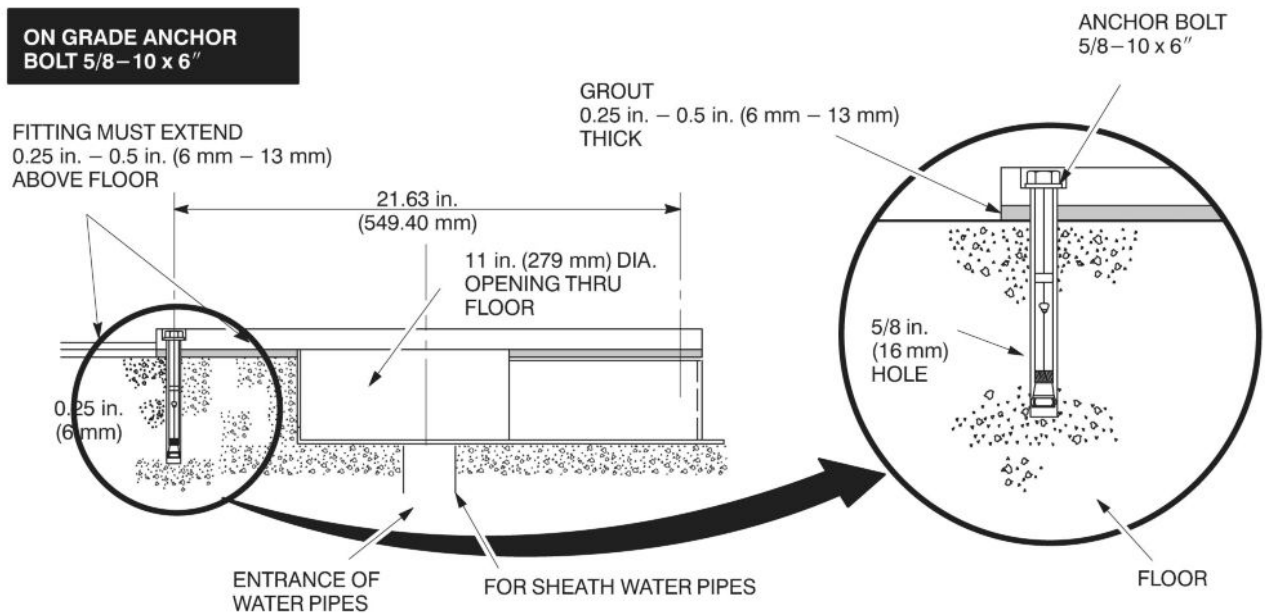


Illustration 2-61:

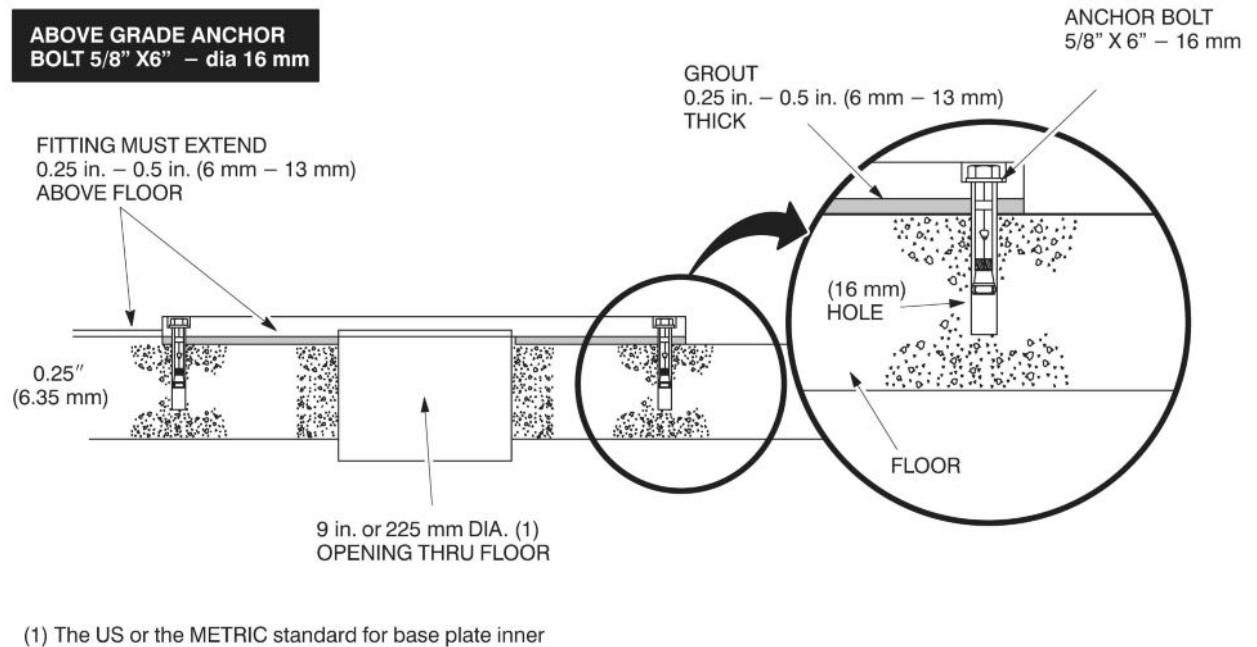
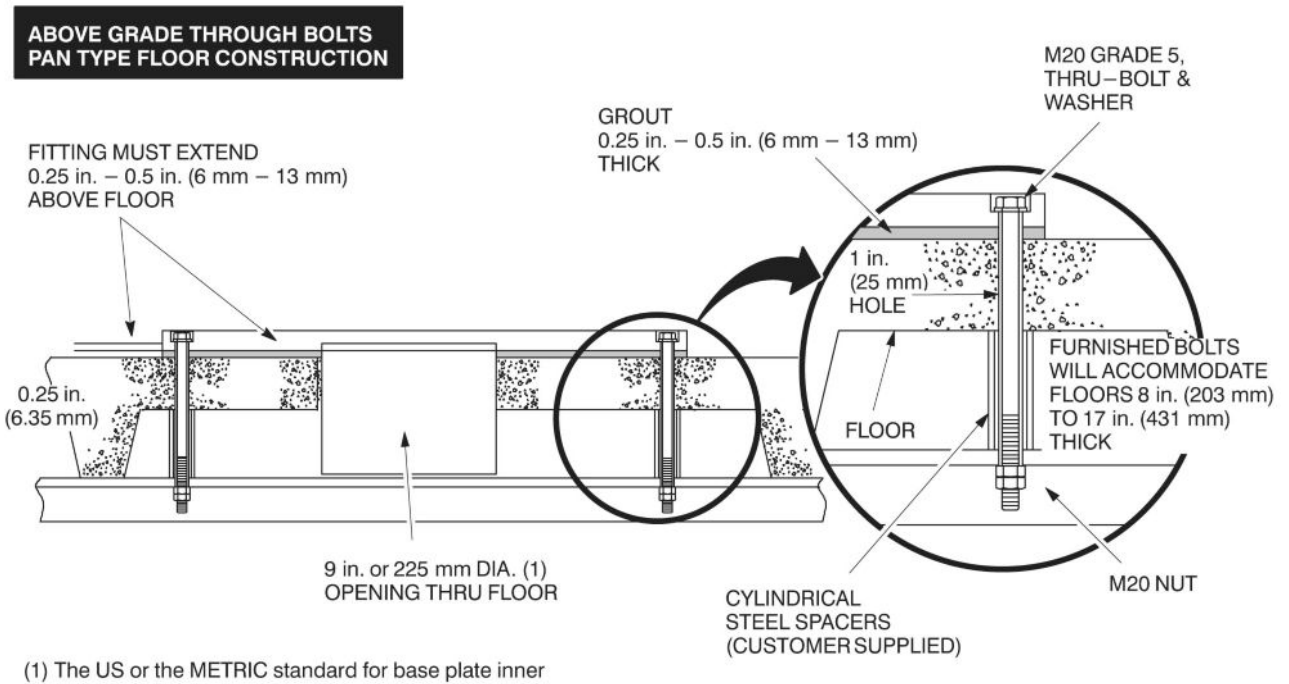
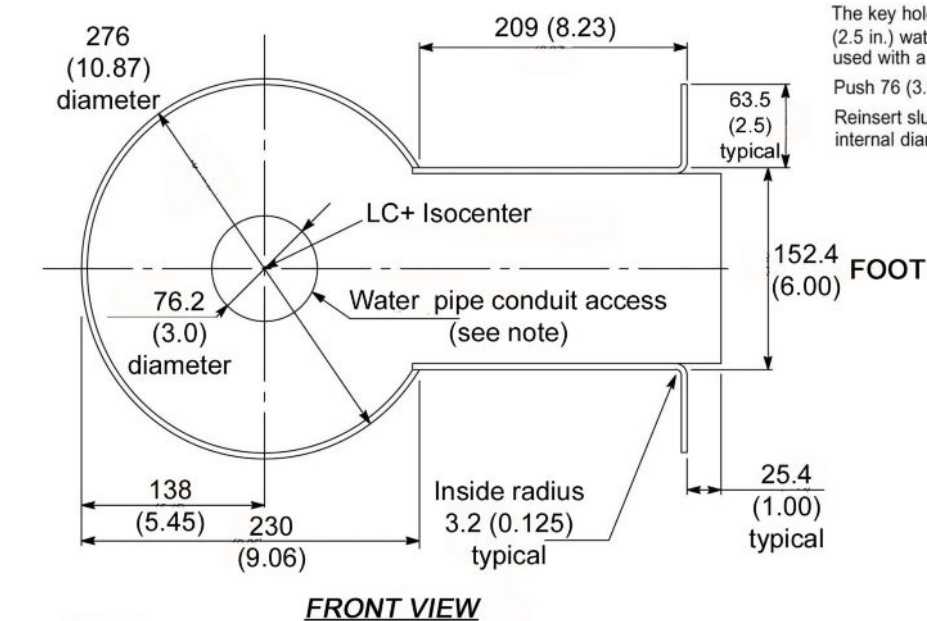
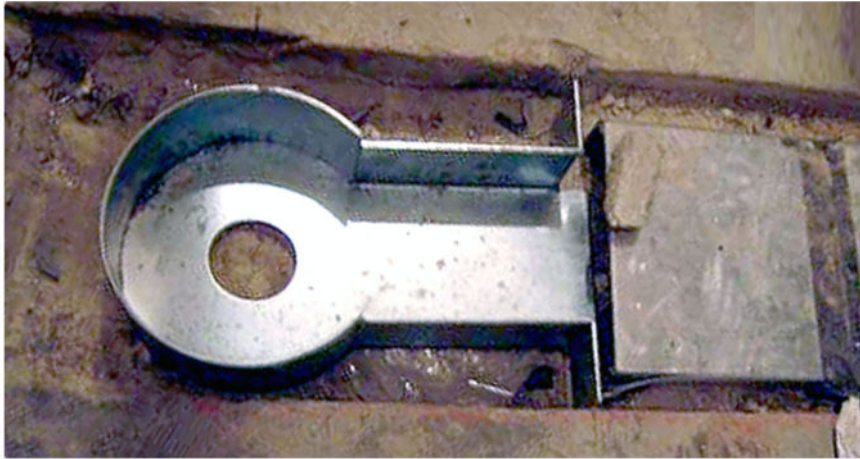


Illustration 2-62: Metallic Conduit



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 well in one spot hole is for 63.5 (2.5) internal diameter conduit tack well from bottom if possible.

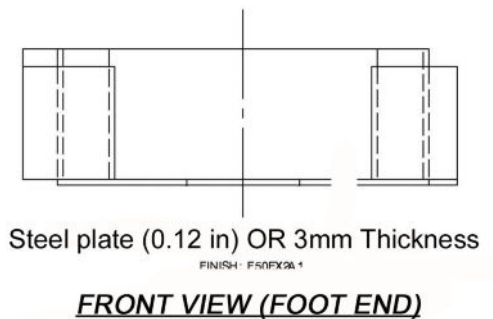
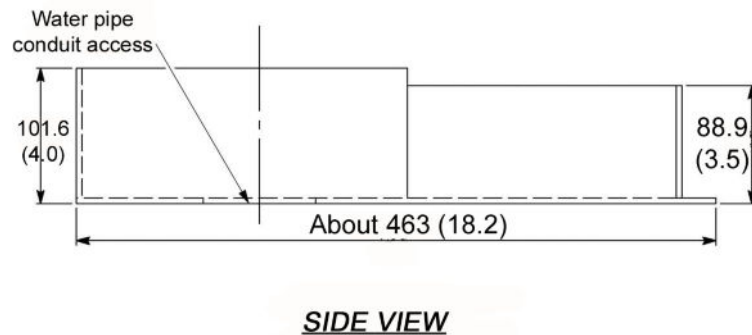
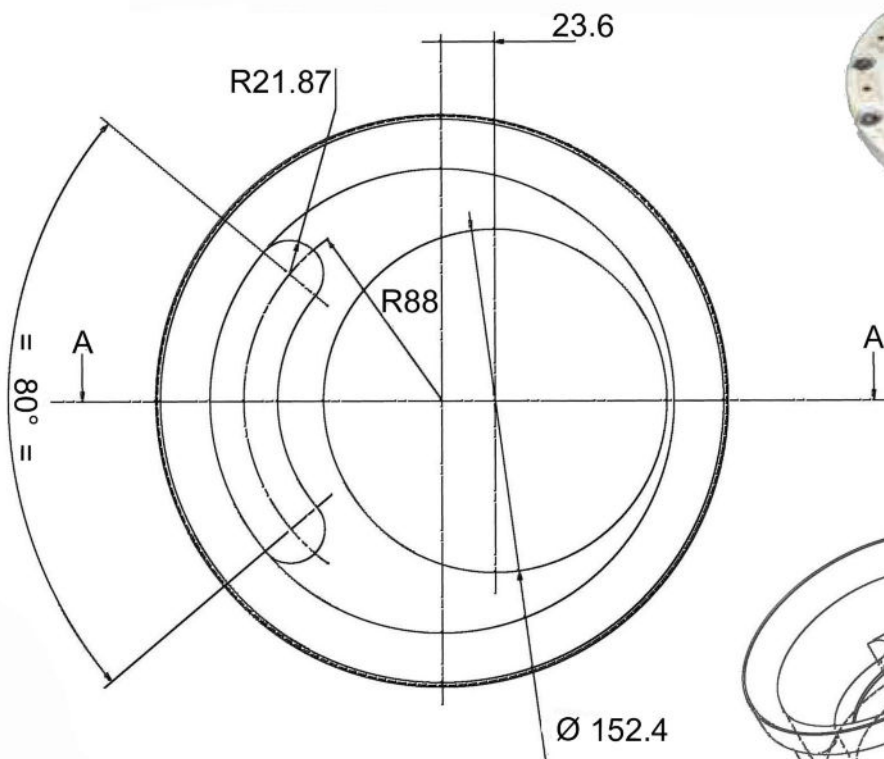
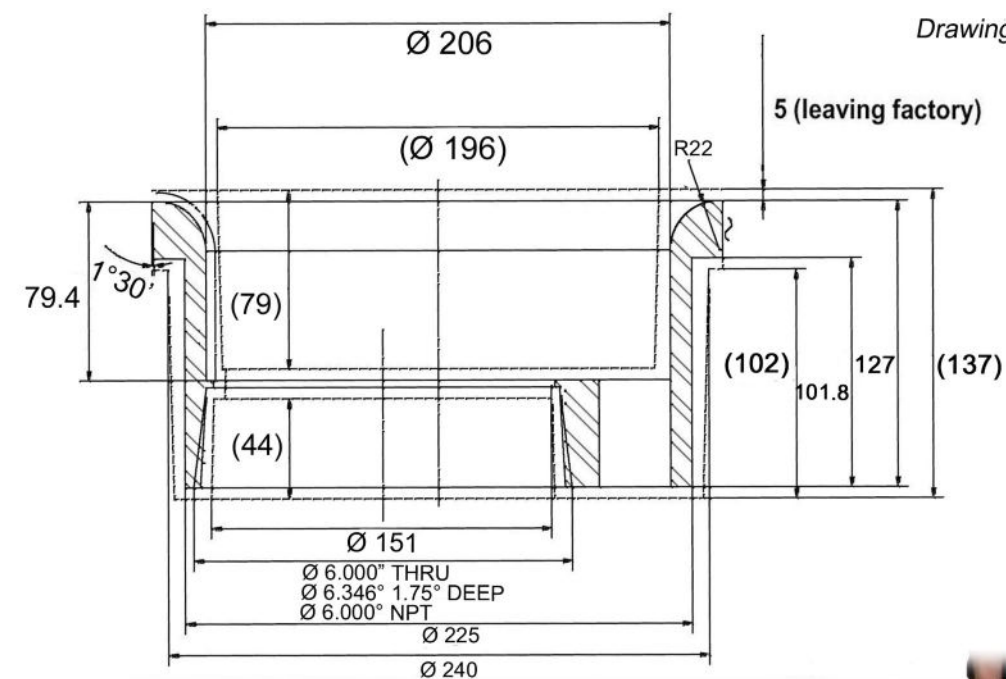


Illustration 2-63: Water Electric Separator

Drawing from 2268647DDW



Water electric separator

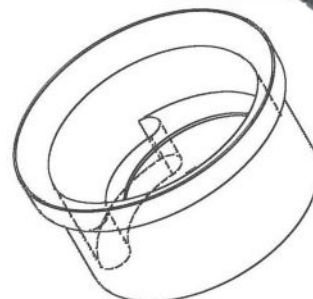
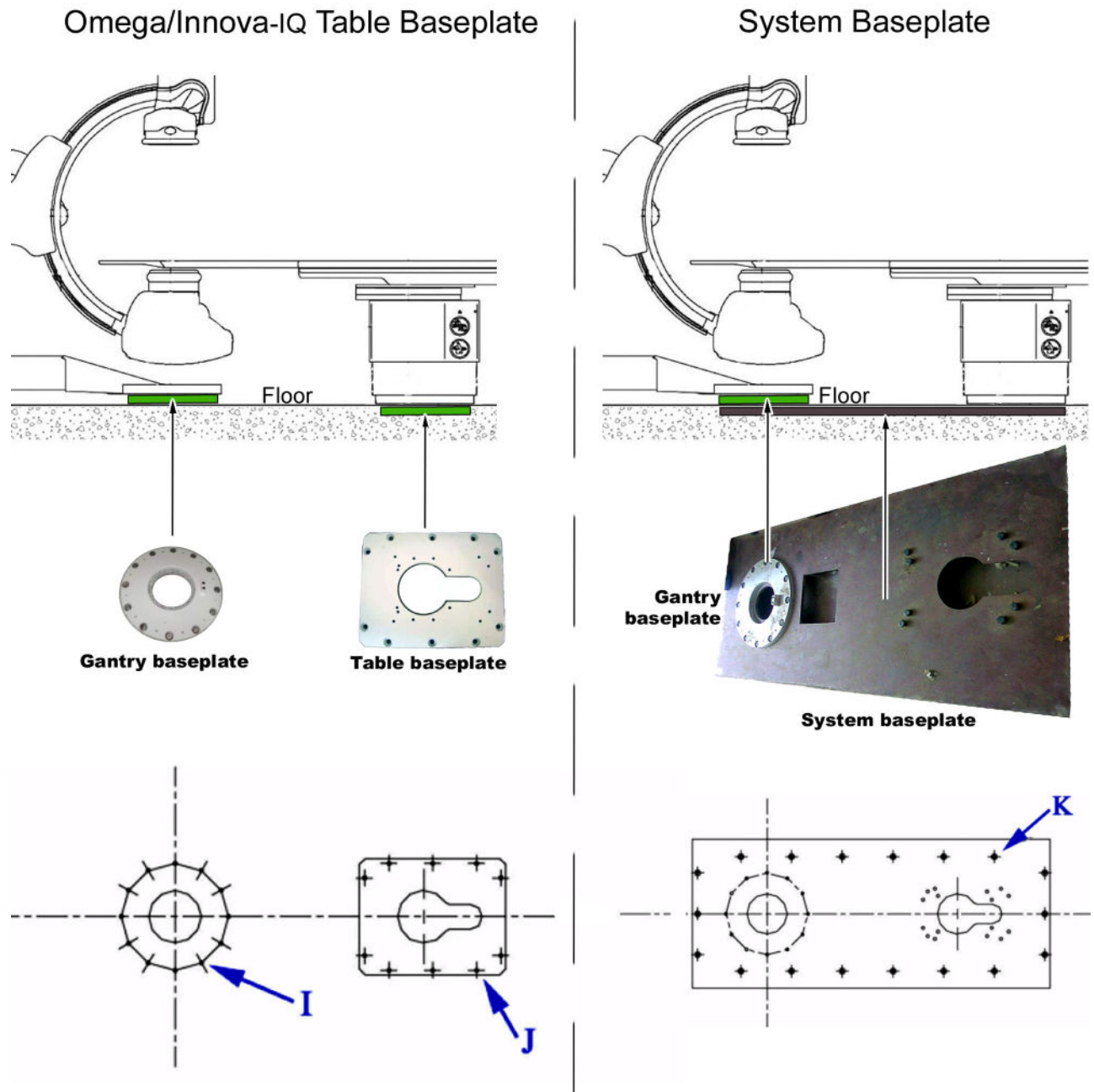


Illustration 2-64: Fixing Bolt Overview



NOTE: For more details on Floor plate or Baseplates, refer to [Illustration 2-65](#) and illustration [Holes location in concrete floor in Floor 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 2-9: Chemical anchors Pull out efforts and recommendations

	Gantry baseplate	Table baseplate Omega	Table Omega	Floor plate (to be ordered locally)
Mark	I on Illustration 2-64	J on Illustration 2-64	A on Illustration 2-65	K on Illustration 2-64
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.

Illustration 2-65: Gantry and table mounting holes.

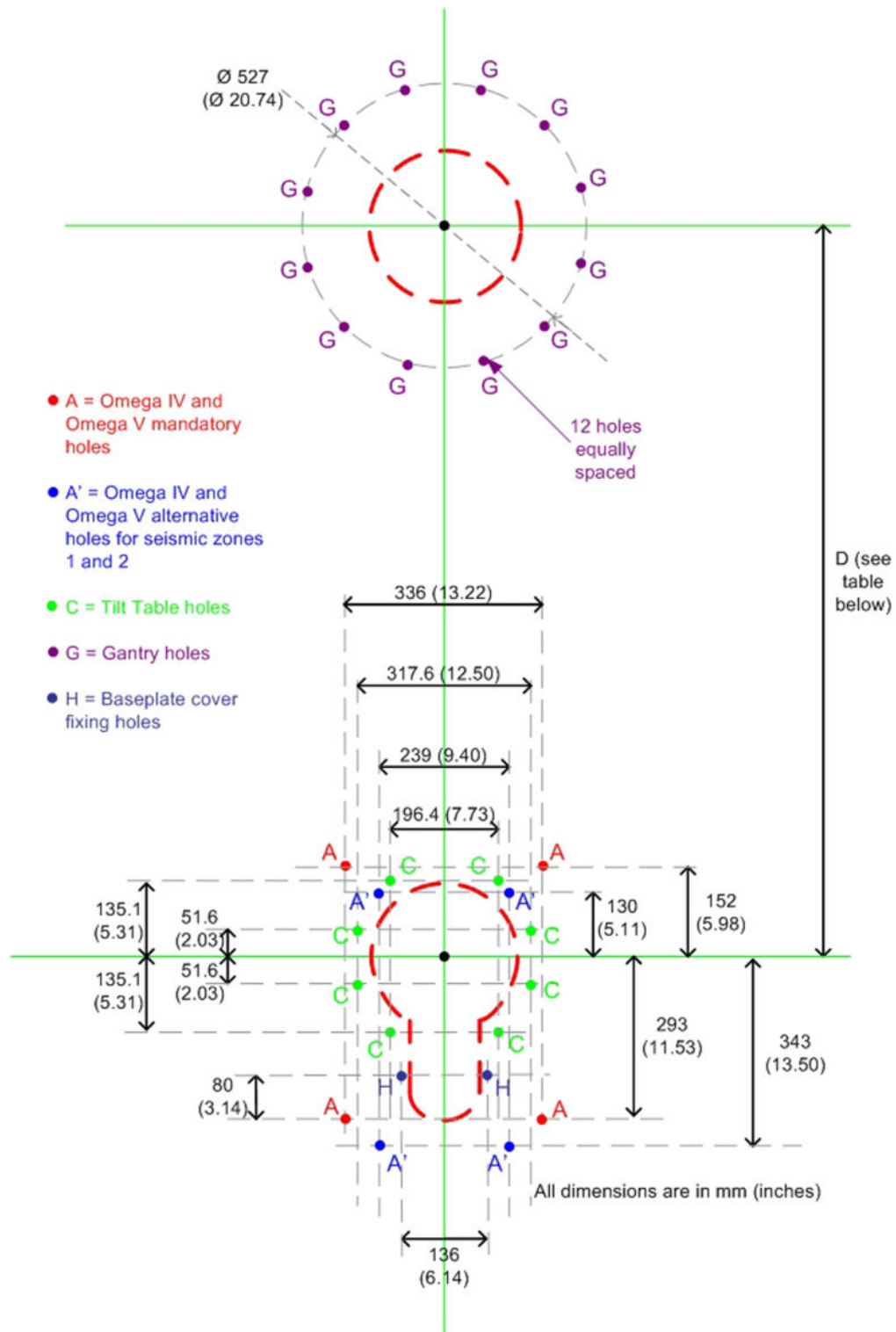
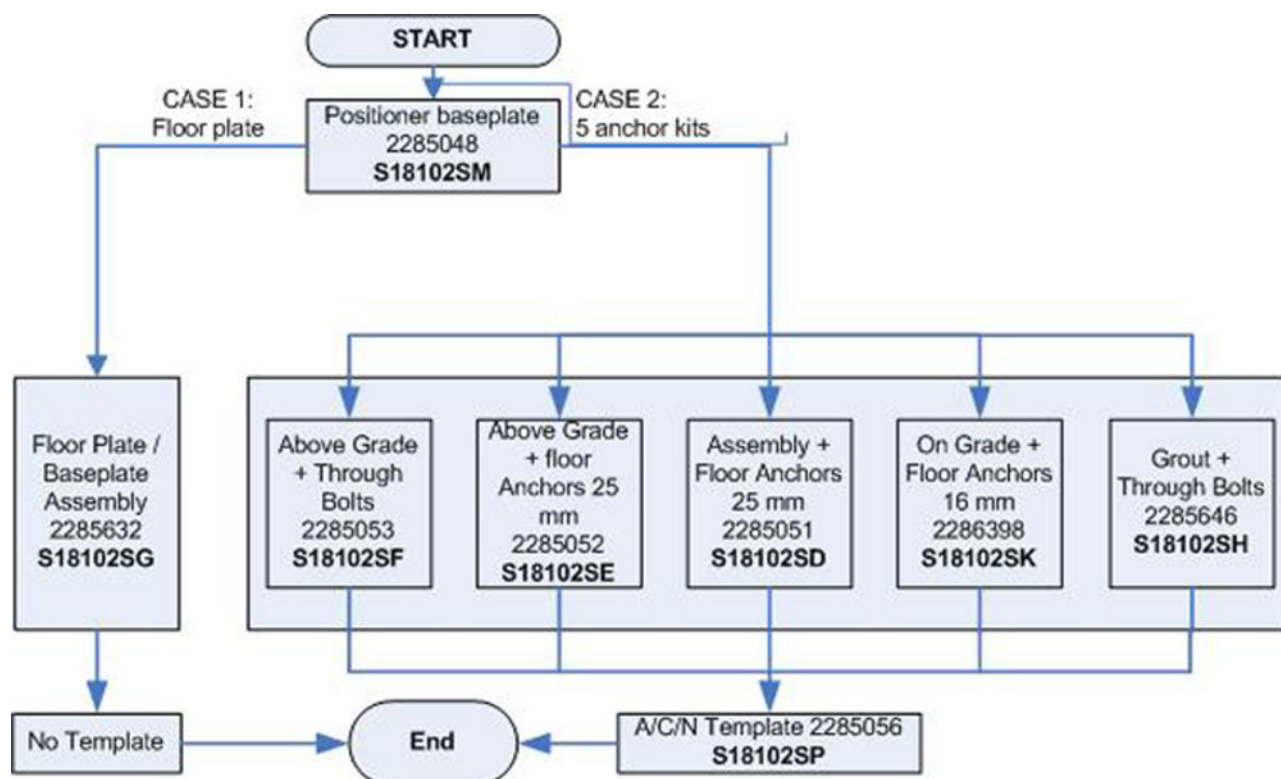


Table 2-10: D distance

	ANGIO	CARDIO	NEURO
Omega IV Compact	NA	1395 mm (54.9 in)	NA
Omega V Long	1278 mm (50.3 in)	1395 mm (54.9 in)	1395 mm (54.9 in)

3.3.3 LC Positioner and Omega Table Floor Preparation Kits (GEMS supplied)

Illustration 2-66:









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.

- Base plate assembly (mandatory) 2285048 – Refer to [Table 2-11](#)
- If there is no integrated baseplate plan (2359194) delivered with S18101SG, please refer to drawings 2359194 (Angio and Cardio configuration [Illustration 2-67](#)) Please order locally the integrated base plate based on this plan.
- Assembly and separation (Select kit) 2285050 – Refer to tables, [Section 3.3.3.1](#)
 - 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 [Section 3.3.3.3](#)
Angio/Cardio/Neuro templates – 2285056.

3.3.3.1 2285048 - Base Plate Assembly

Table 2-11:

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	5421635-1-1EN	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)

3.3.3.2 2285050 – Assembly and separation select kit







3.3.3.2.1 2285051 – Above grade, Floor Anchors without insert

Table 2-12:

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	





3.3.3.2.2 2285646 – Through bolts without insert

Table 2-13:

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	




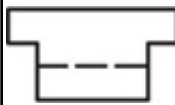
3.3.3.2.3 2286398 – On grade, Floor anchor

Table 2-14:

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 Con- duit	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	







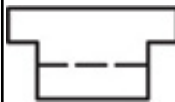
3.3.3.2.4 2285052 – Above grade, Floor anchor with insert

Table 2-15:

Item	Name	Part #	Description	Quan.	Notes
	Floor An- chor	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 Elec- tric Separa- tor	2268647	Manufactured part introduced in Positioner key hole to fit 1 electri- cal conduit of 6".	1 pc	Electrical and water con- duits separated inch size.




3.3.3.2.5 2285053 – Through bolts with insert

Table 2-16:

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 Elec- tric Separa- tor	2268647	Manufactured part introduced in Positioner key hole to fit 1 electri- cal conduit of 6".	1 pc	Electrical and water con- duits separated inch size.

3.3.3.2.6 2285632 – Floor plate / Base plate assembly

Table 2-17:


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 posi- tioner 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.

3.3.3.3 2285054 – Templates

3.3.3.3.1 2285056 - A/C/N Templates

Table 2-18:

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 2-65
		2127792	LCV+ Gantry and Omega A Patient Table floor mounting template	1 pc	

3.3.3.3.2 2186109 – EP Template

Table 2-19:

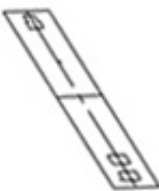
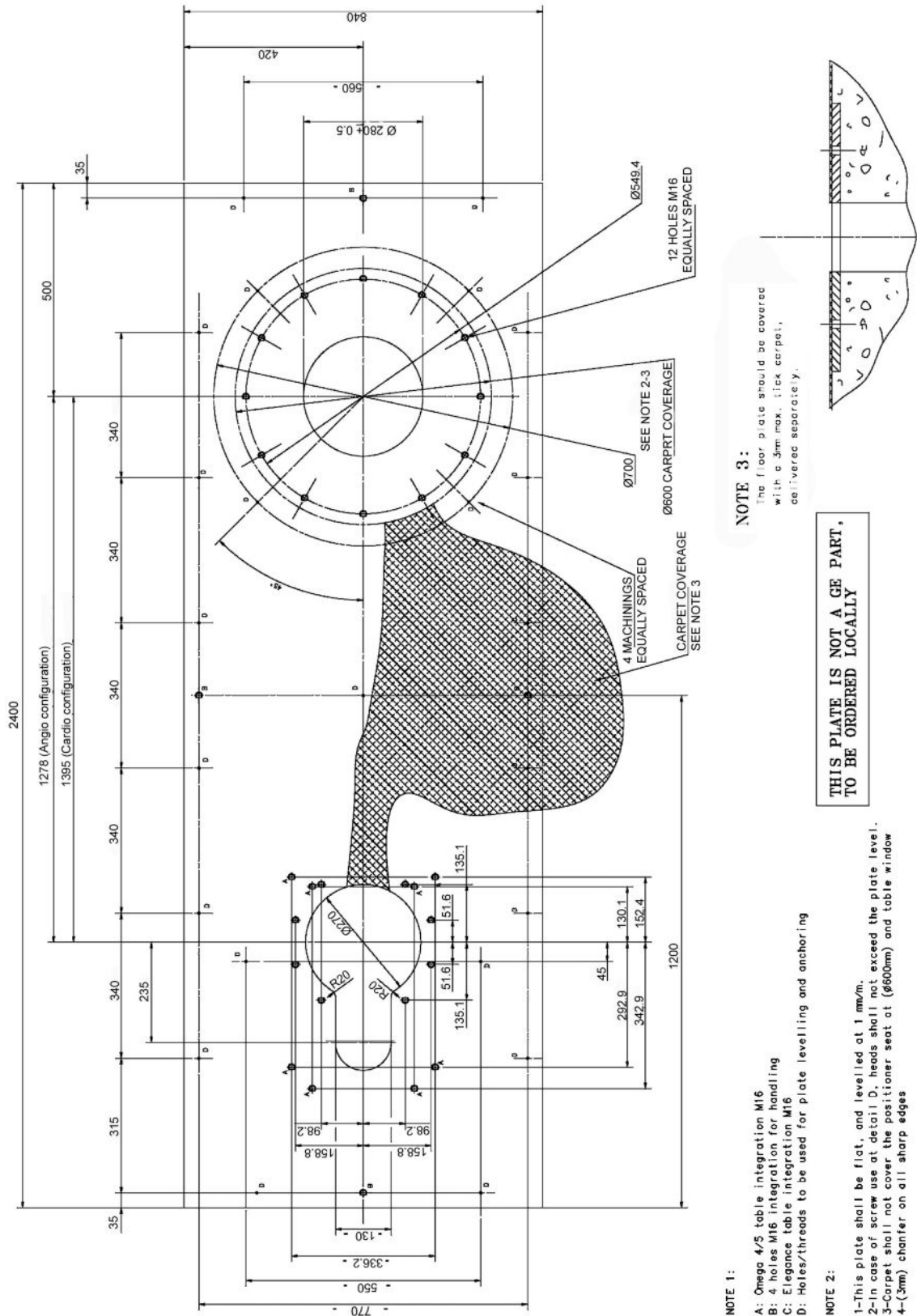
Item	Name	Part #	Description	Quan.	Notes
	EP Template	2186109	LCV+ Gantry and EP Patient Table floor mounting template	1 pc	

Illustration 2-67: Baseplate plan 2359194 - Angio and Cardio configurations



3.3.4 Injector Mounting Requirements



CAUTION

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), 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.

3.4 Ceiling Requirements

Aluminum rails support the In-Room Monitor bridge used in Optima 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.

(For Ergo suspension) Holes for diameter 12 mm (1/2") bolt are mandatory. For normal use, each part of the ceiling rails must be fixed at the correct level. The tolerance of the fit level is ± 1.5 mm (0.06").

3.4.2 Bolt Specifications

3.4.2.1 Mavig suspensions

- 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**.

3.4.2.2 Ergo suspension

The stationary rail hole accepts normal bolts used by HALFEN or UNISTRUT with 12 mm (1/2") diameter. GE Healthcare provides M12 mm (1/2")- 40 mm (1-1/2") long metric bolts together with the rail assembly. For other special bolts required, local Field Service supplies them according to country standard or the additional structure mounted on site.

The maximum load per bolt will not exceed **1895 N** (426 lbs).

Each bolt must not "pull out" or otherwise fail under a vertically downward "dead" load of **7580 N** (1704 lbs).

NOTE: For GEMS–Am:

Special 1/2"–11 bolts in US Standard for mounting stationary rails are furnished with each pair of rails. The bolts are case hardened "Whiz–lock" flange bolts, requiring no separate flat washer or lock washer. Bolts of this type must be used to obtain adequate clearances and permit unrestricted longitudinal movement of the bridge along the rails, substitution is not recommended.

The furnished bolts are 1–1/2"long (GE part No. 59136). For lengths other than this, contact:

MacLean–Fogg Lock Nut Company

1000 Allanson Road

Phone 312–566–0010

(thread length from 3/4' to 2' available).

For GEMS-Euro:

Special metric bolts are not supplied. Local Field Service supplies them according to the additional structure mounted on site. (Unistrut or Halfen parts).

Table 2-20: European parts for bolts mounting on ceiling

Size	HALFEN	UNISTRUT MARK		WITHOUT SPECIFIC MARK (**)	
		LOAD kg (lbs)	TORQUE WRENCH Nm (lbs.ft)	LOAD kg (lbs)	TORQUE WRENCH Nm (lbs.ft)
M12	PT 2128 or PT2114 (*)	700 (1,543)	55 (40.6)	500 (1,102)	36 (26.55)

NOTE: (*) Threaded plate with spring

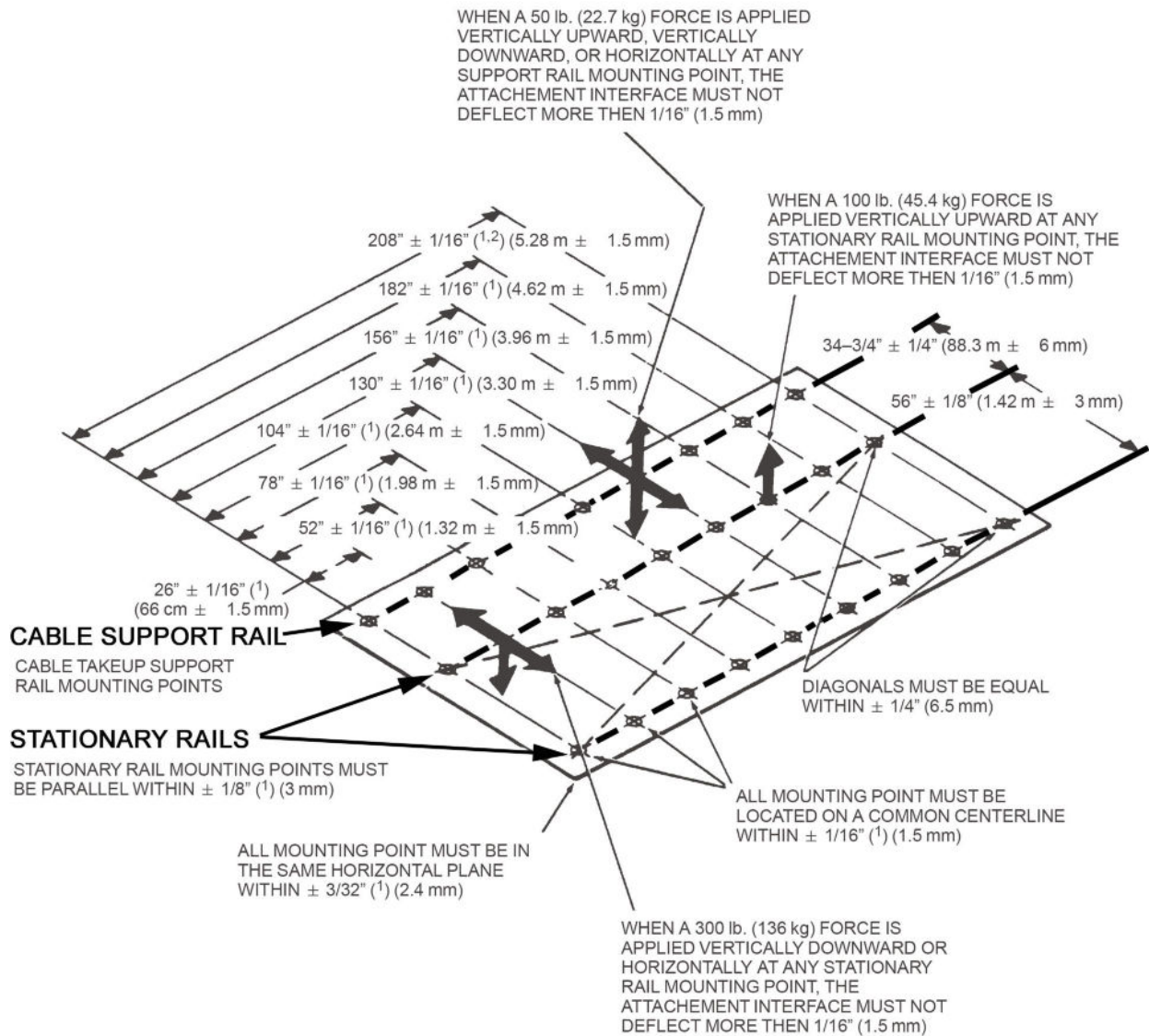
(**) New parts

3.4.3 Select Rails

3.4.3.1 Rails for Mavig suspension

All XT Stationary rails are with a select length process. Detail of available length is illustrated in [Chapter 1, European Process Order Select](#).

Illustration 2-68: SPECIFICATIONS FOR A TYPICAL 17'-10" (5.44 M) INBOARD STATIONARY RAIL MOUNTING INTERFACE (BOTH RAILS CEILING MOUNTED), FOR MAVIG SUSPENSION



NOTES: 1. NONE CUMULATIVE ERROR.
2. SPACE BETWEEN LAST 2 HOLES MAY BE LESS THAN 26" (66 cm)

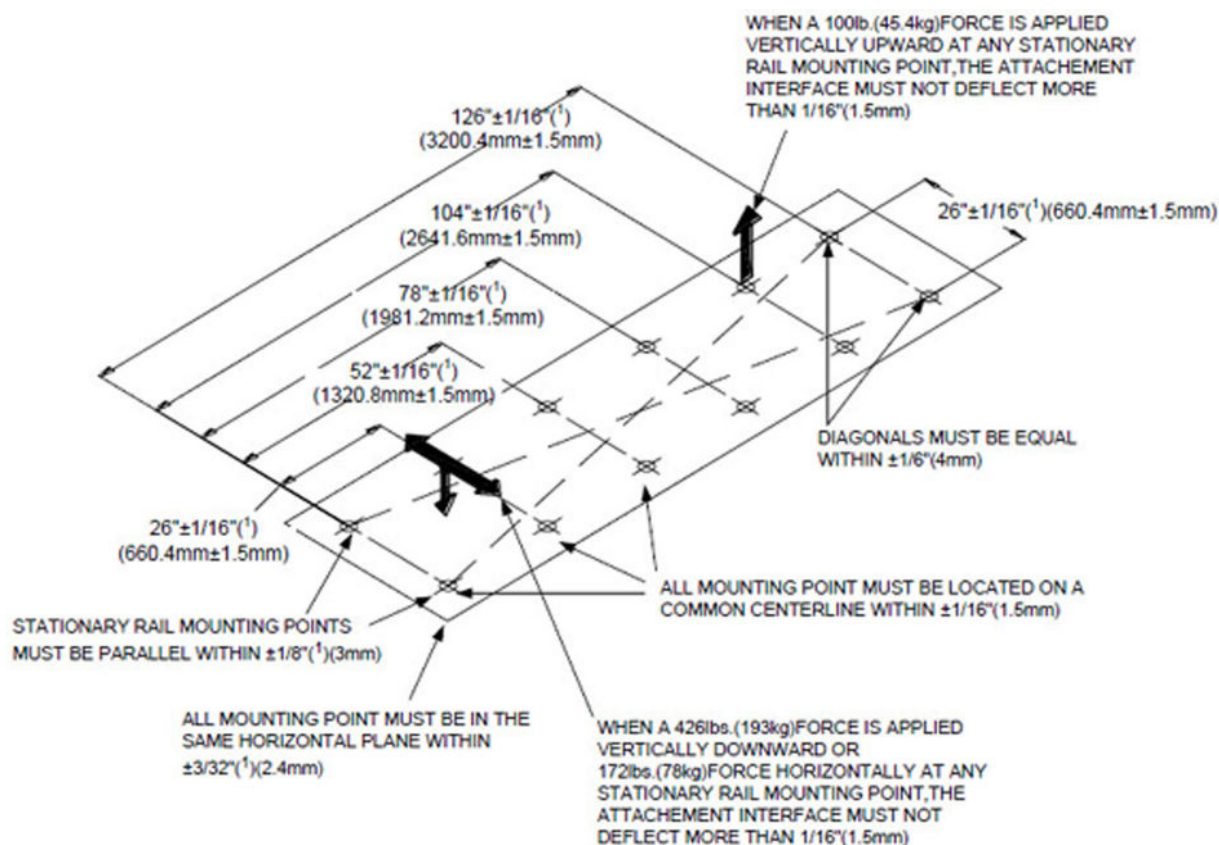
Table 2-21: Stationary rail in different length

Rail length mm (ft)	A	C	D	INBOARD RAILS
4,724 (15'6")	7*660.4=4,623		51	B0186JA
5,639 (18'6")	8*660.4=5,283	254	51	B0222JA
5,791 (19')	8*660.4=5,283	406	51	B0228JA

3.4.3.2 Rails for Ergo suspension

The stationary rails are with fixed length of 3.3 m (10'10"). The margin between the first hole of the rail and the beginning of the rail is 50.8 mm (2").

Illustration 2-69: SPECIFICATIONS FOR STATIONARY RAIL MOUNTING INTERFACE (BOTH RAILS CEILING MOUNTED), FOR ERGO SUSPENSION



NOTES: 1.NONE CUMULATIVE ERROR.

3.4.4 Boom Mounted for Monitor Suspension

The purchaser/customer should prepare a Unistrut/ Halfen or equivalent ceiling structure. The distance between center lines of the two longitudinal rails shall be 660.4 mm (26").

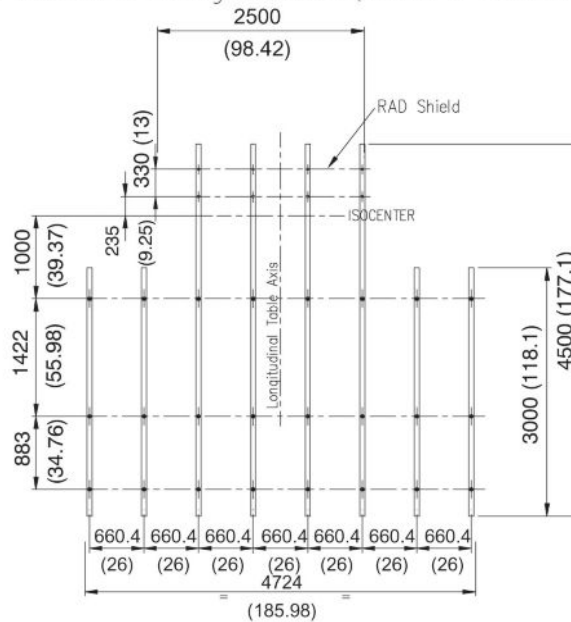
One type of boom mounted is supplied as counterpoised monitor suspension not adjusted on site as follows:

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

Illustration 2-70: Recommended locations for 3 monitor suspension

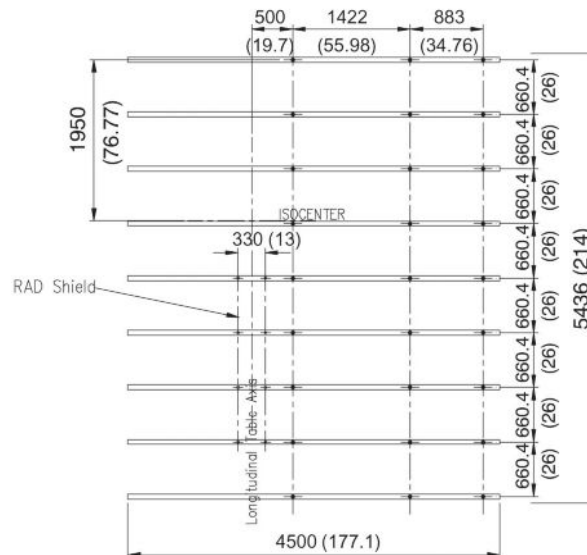
Solution 1: Stationary rails perpendicular to Patient Table
Stationary rails item # B0186JA, long or short bridge

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 a 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 Wall Requirements

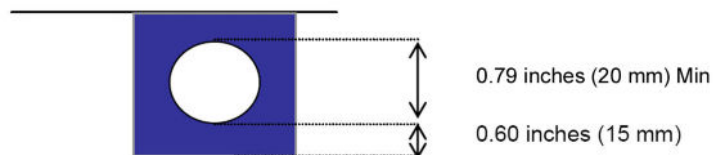
The C1 Cabinet, the C2 Cabinet, the PDB Cabinet and LD cabinet (optional) must be securely fastened to the wall to prevent them from tipping.

The optional LD secondary monitor outside the patient room is mounted on wall. The swingout arm that holds the LD additional monitor shall be mount according to the manufacturer mounting manual, see *Articulating Arm Wall Mount Installation Manual* in **OEM manuals list**.

An hooking point shall be provided in order to uplift the LD additional monitor at the swingout arm level during its installation:

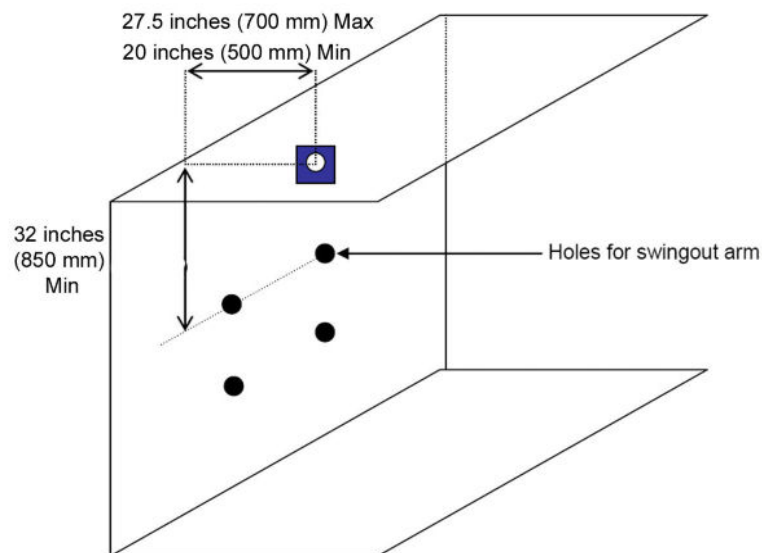
- Hooking point characteristic: It must withstand up to 440 lbs (200 Kgs)
- Recommended hooking point dimensions:

Illustration 2-71: hooking point dimensions



- Hooking point position:

Illustration 2-72: Hooking point position



4 Mounting Data, Including Seismic

4.1 Seismic areas

4.1.1 Floors

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 [Basic System Compatibility](#) for referential documents. C1 & C2 Cabinets: Wall support 5404587.

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

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

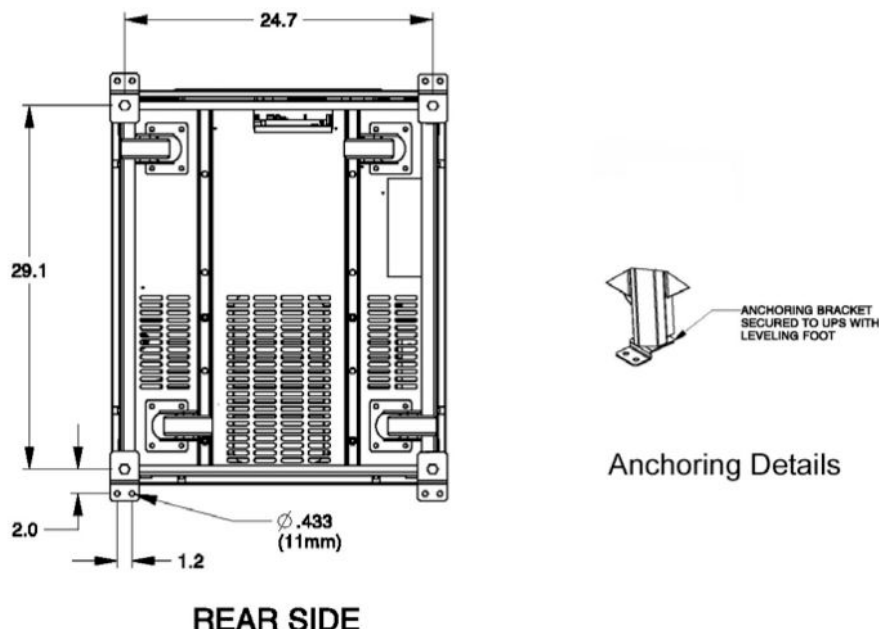
Anti-seismic means be installed before opening the system for normal use.

4.1.2 Walls

NOTE: For Fluoro UPS option (US version only), the Fluoro UPS supplier will deliver anchoring brackets (see [Illustration 2-73](#)). 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 [Basic System Compatibility](#) for referential documents.

Illustration 2-73:



4.2 Seismic Calculations

Seismic requirements are determined and specified by the hospital/ Design Professional 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 local GE Installation Program Manager to obtain seismic calculations.

Seismic calculations are per California Building Code (CBC) and International Building Code (IBC).

The following shows center-of-gravity information for system components:

- C1 cabinet, [Illustration 2-74](#)
- C2 cabinet, [Illustration 2-75](#)
- Fluoro UPS UL, [Illustration 2-76](#)
- Fluoro UPS CE, [Illustration 2-77](#)
- PDB UL, [Illustration 2-78](#)
- PDB CE, [Illustration 2-79](#)
- Tube Chiller Coolix 4000, [Illustration 2-80](#)
- Tube Chiller Coolix 4100, [Illustration 2-81](#)
- Detector Conditioner, [Illustration 2-82](#)
- Omega IV Table, [Illustration 2-83](#)
- Omega V Long Table, [Illustration 2-84](#)
- LC positioner, [Illustration 2-85](#)
- 19" Desk Mounted Monitor, [Illustration 2-86](#)
- Mavig Overhead Flat Panel Suspension, [Illustration 2-87](#)
- Ergo Overhead Flat Panel Suspension, [Illustration 2-88](#)

Illustration 2-74: C1 cabinet

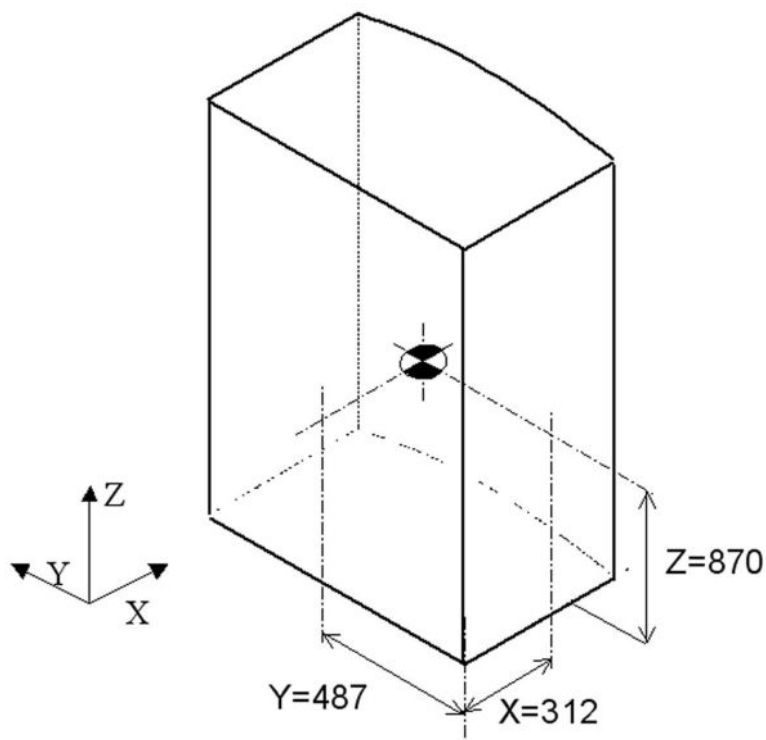


Illustration 2-75: C2 cabinet

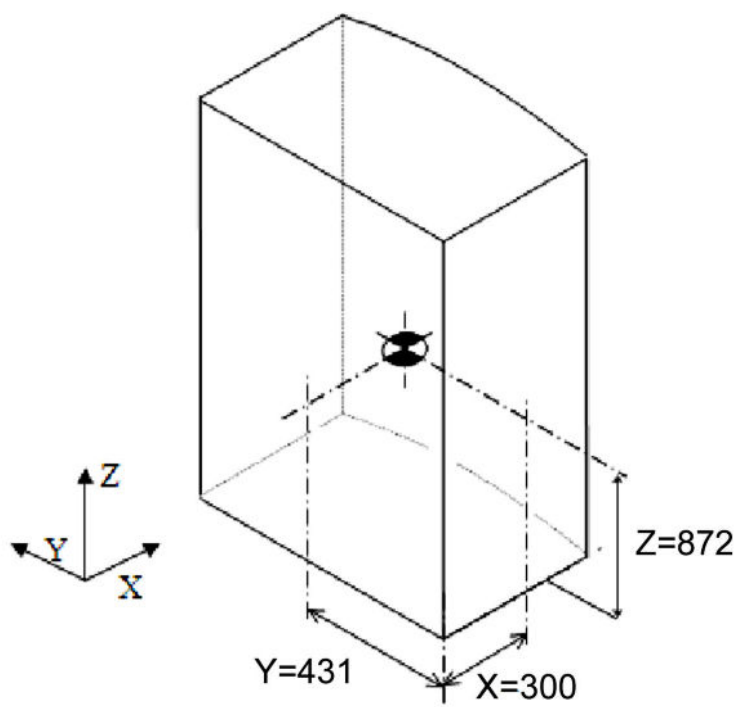


Illustration 2-76: Fluoro UPS UL

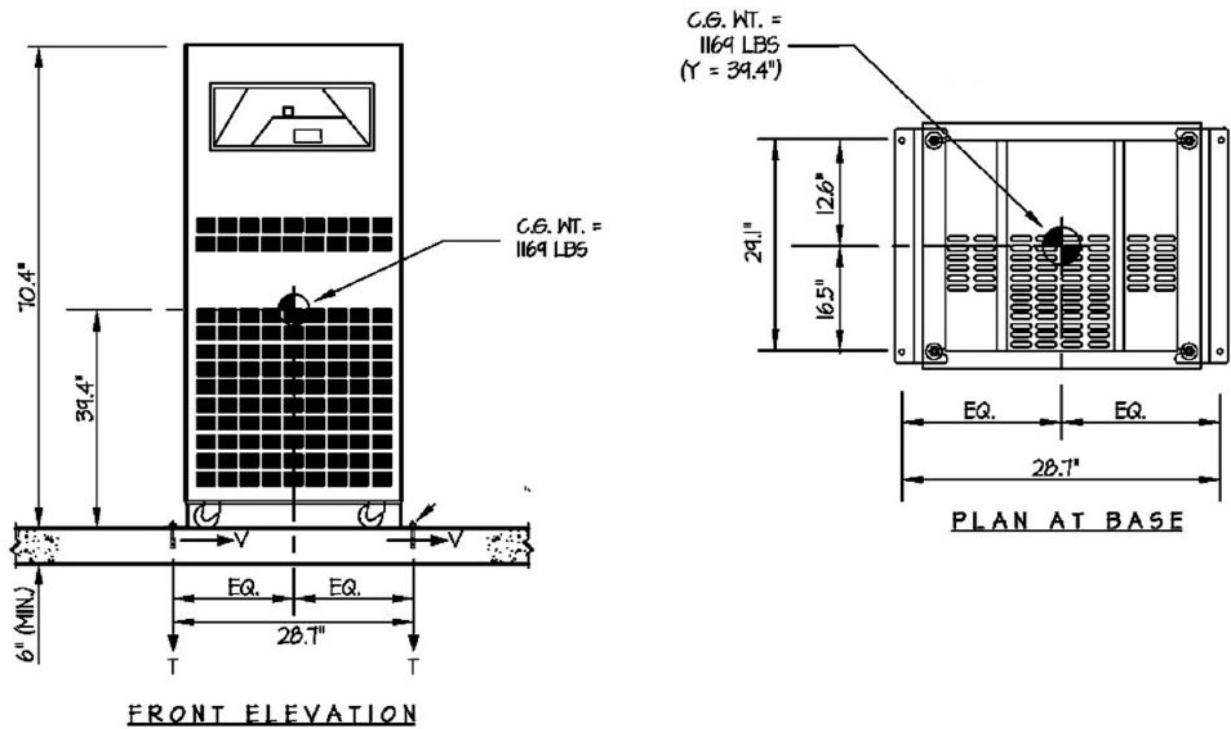


Illustration 2-77: Fluoro UPS CE

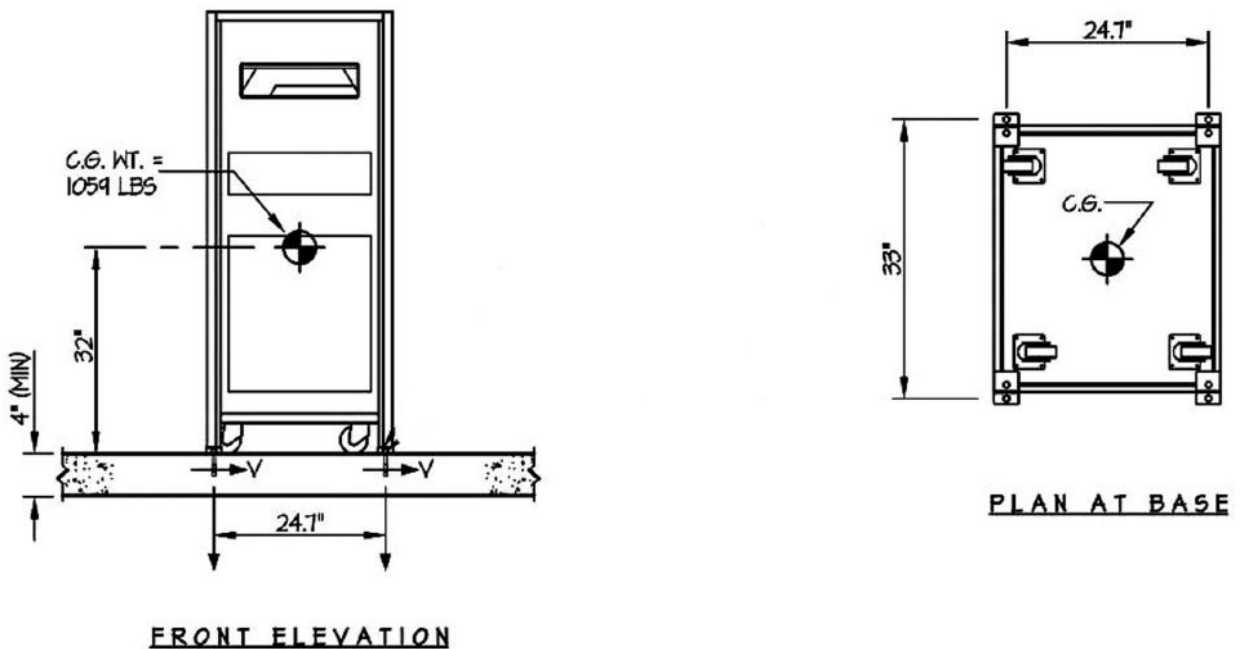


Illustration 2-78: PDB UL

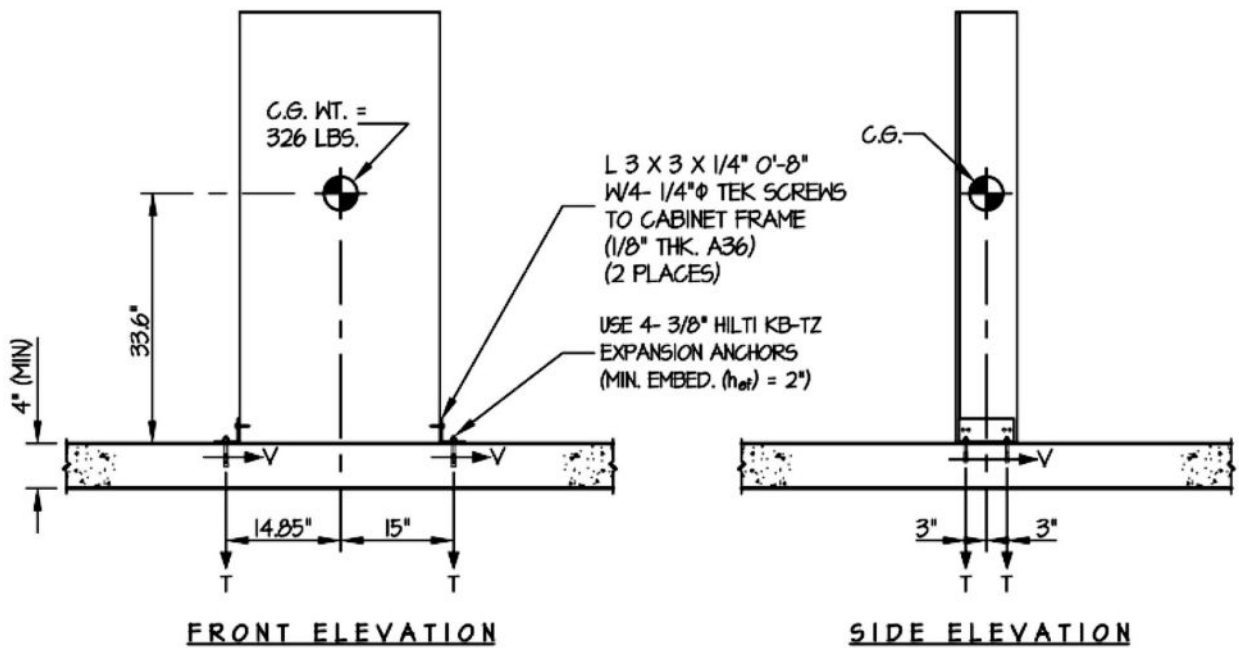


Illustration 2-79: PDB CE

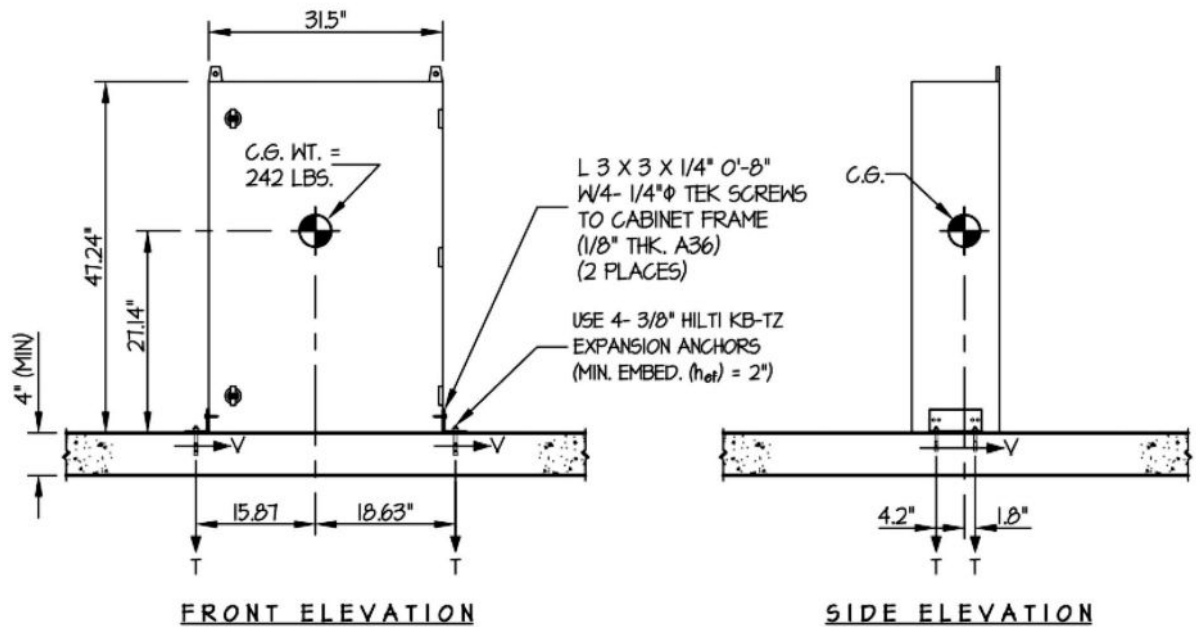


Illustration 2-80: Tube Chiller Coolix 4000

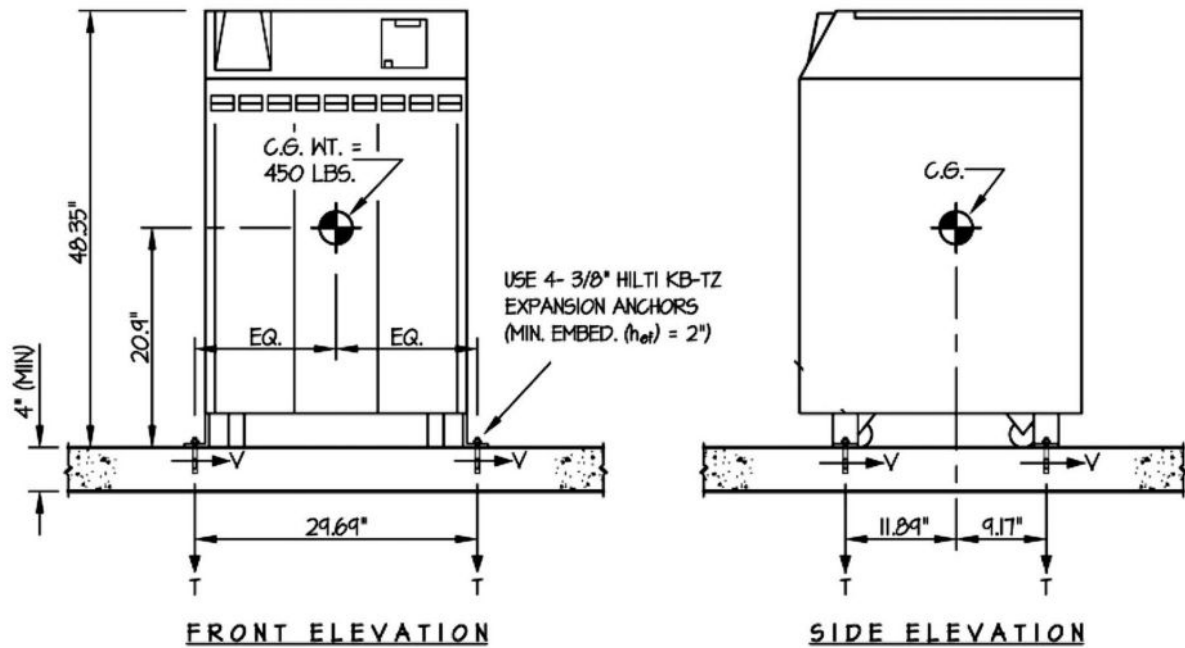


Illustration 2-81: Tube Chiller Coolix 4100

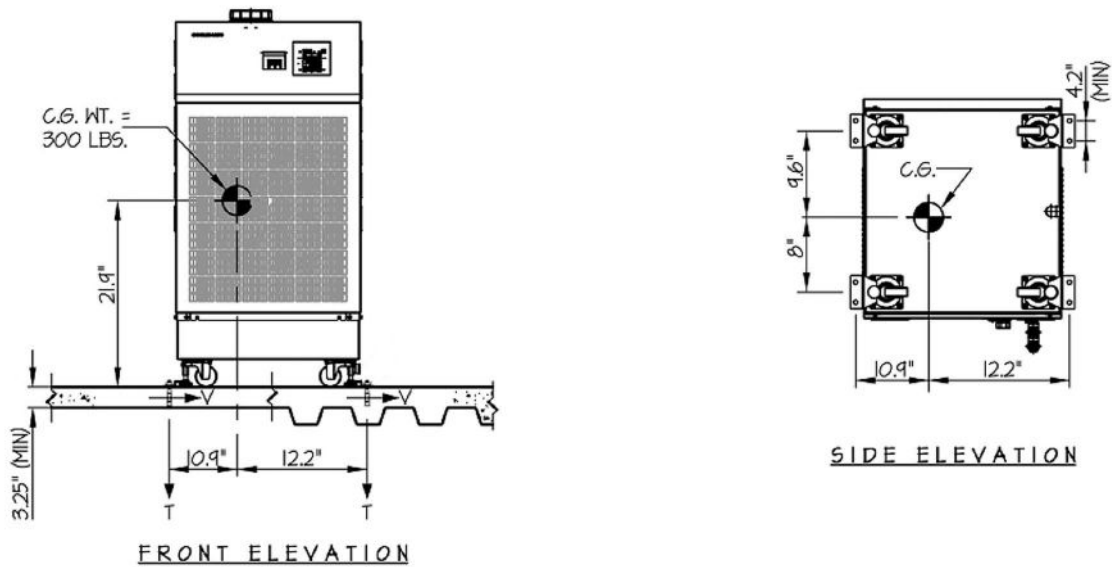


Illustration 2-82: Detector Conditioner

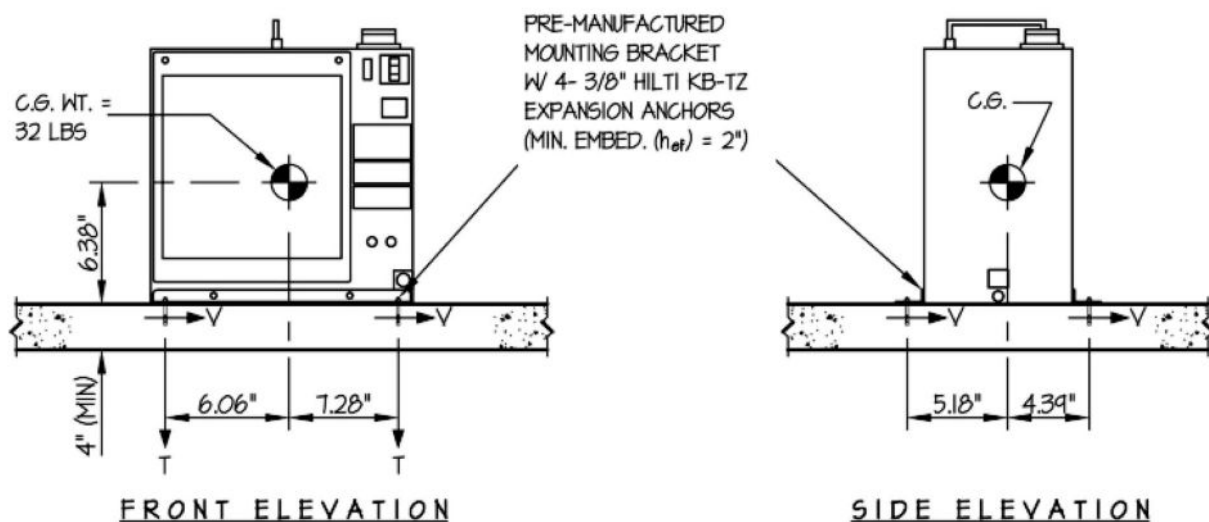


Illustration 2-83: Omega IV Table

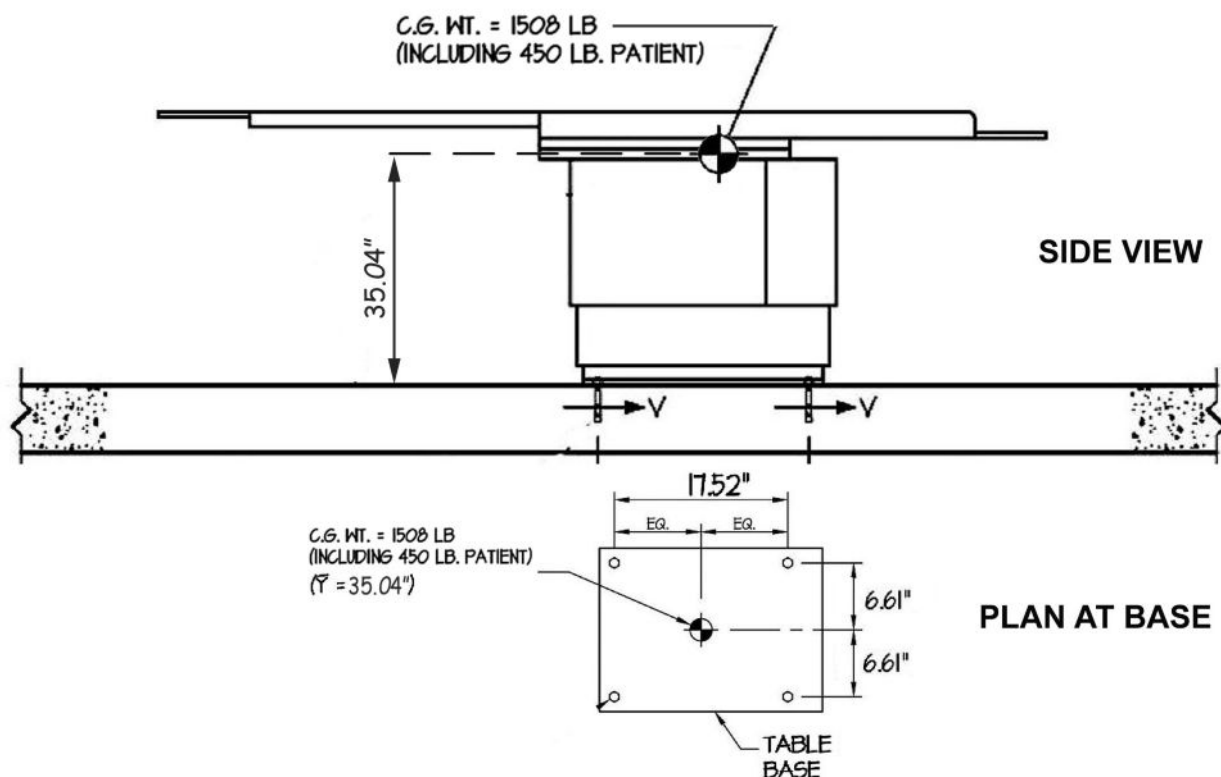


Illustration 2-84: Omega V Long Table

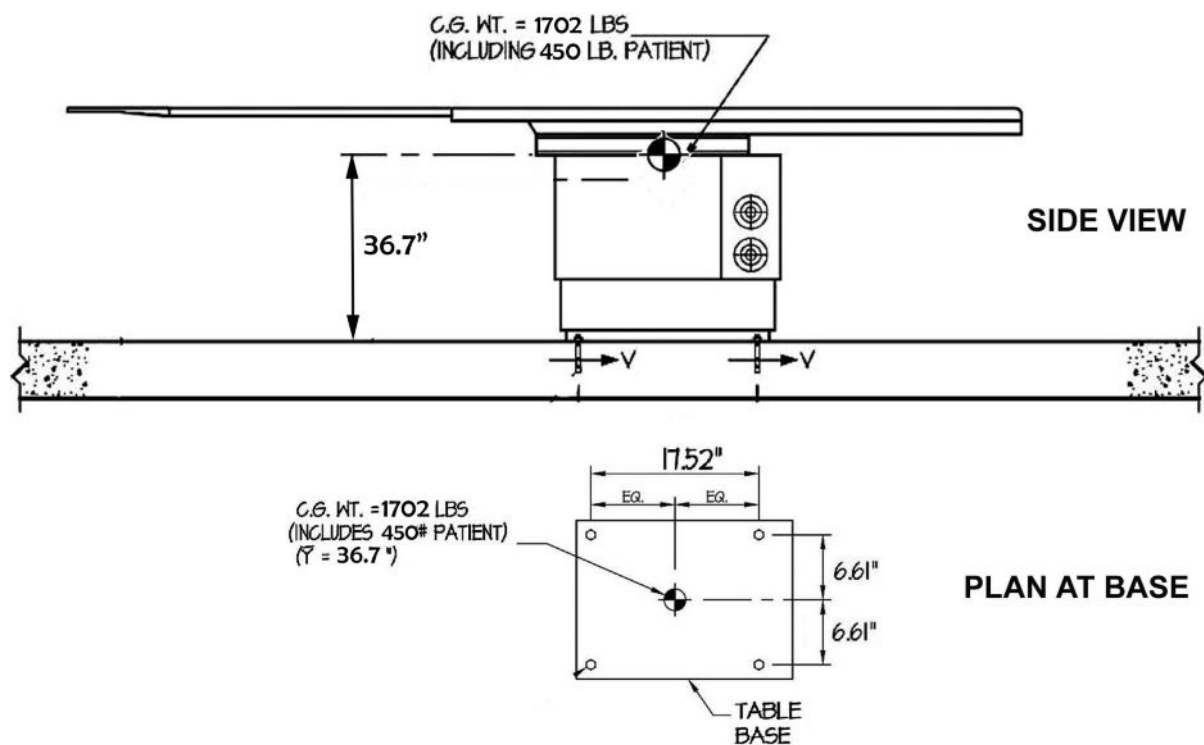


Illustration 2-85: LC positioner

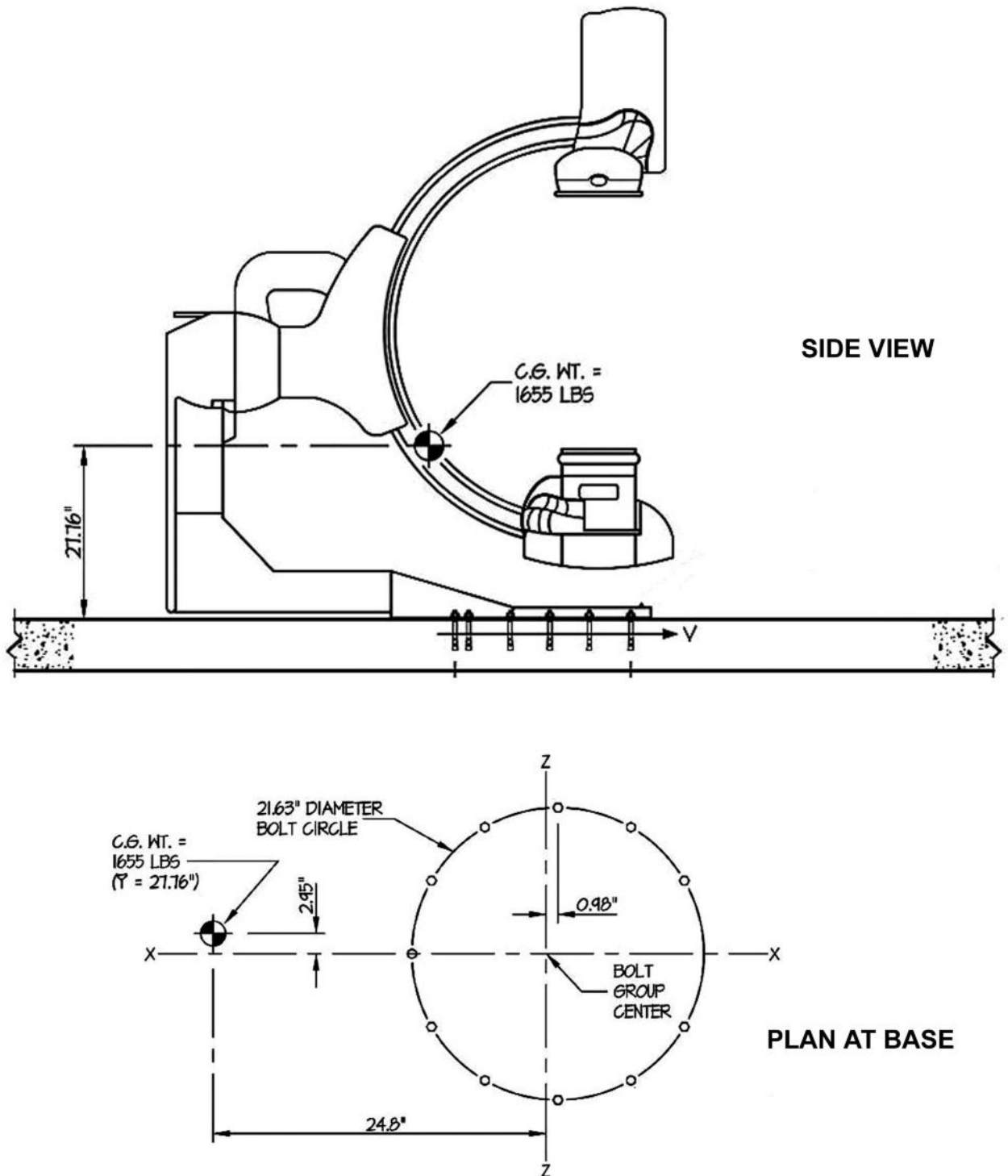


Illustration 2-86: 19" Desk Mounted Monitor

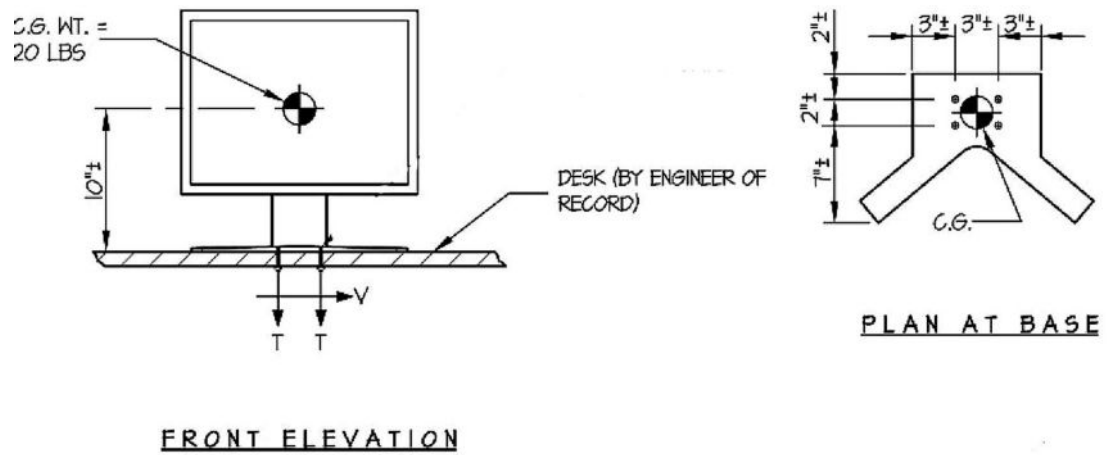


Illustration 2-87: Mavig Overhead Flat Panel Suspension

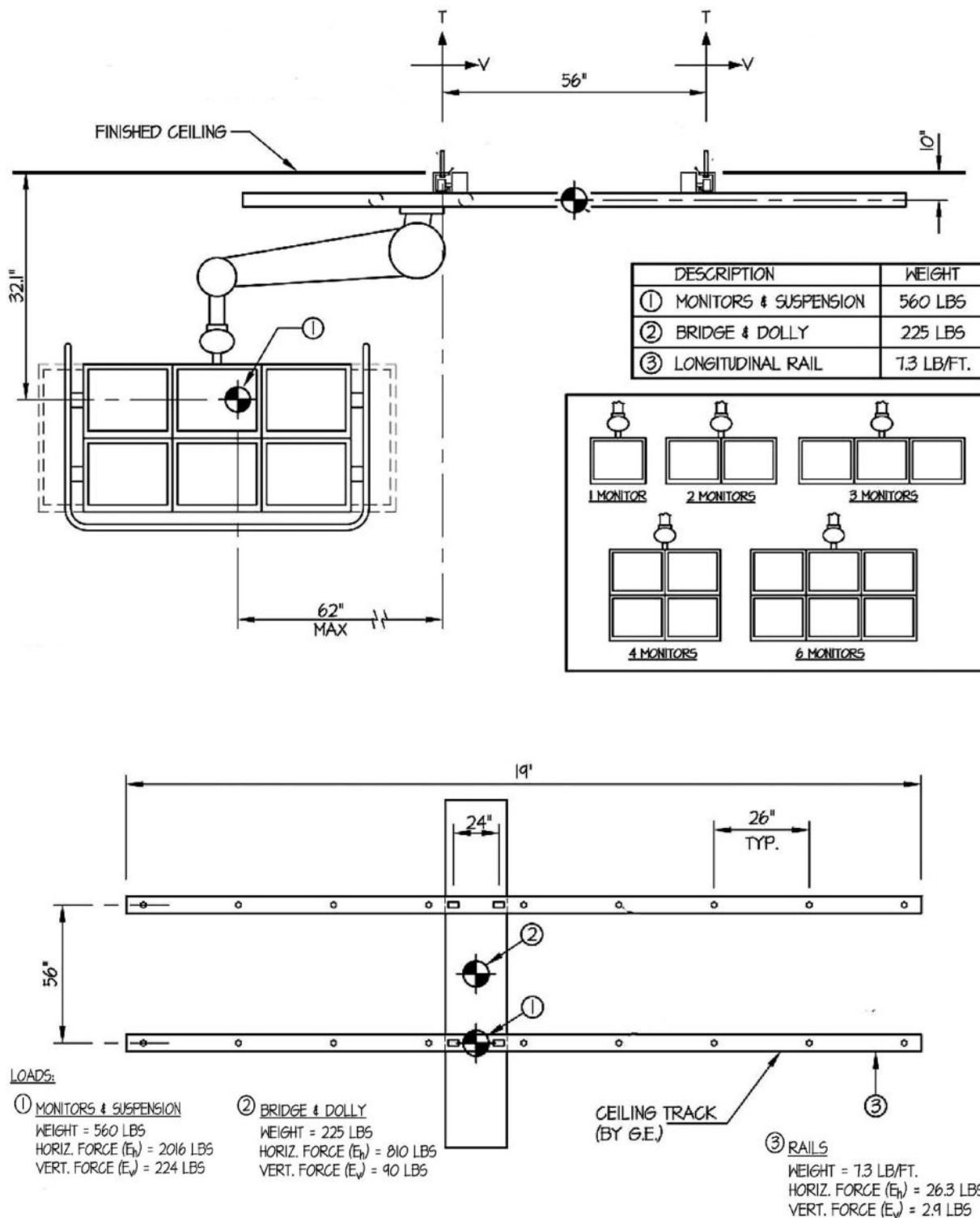
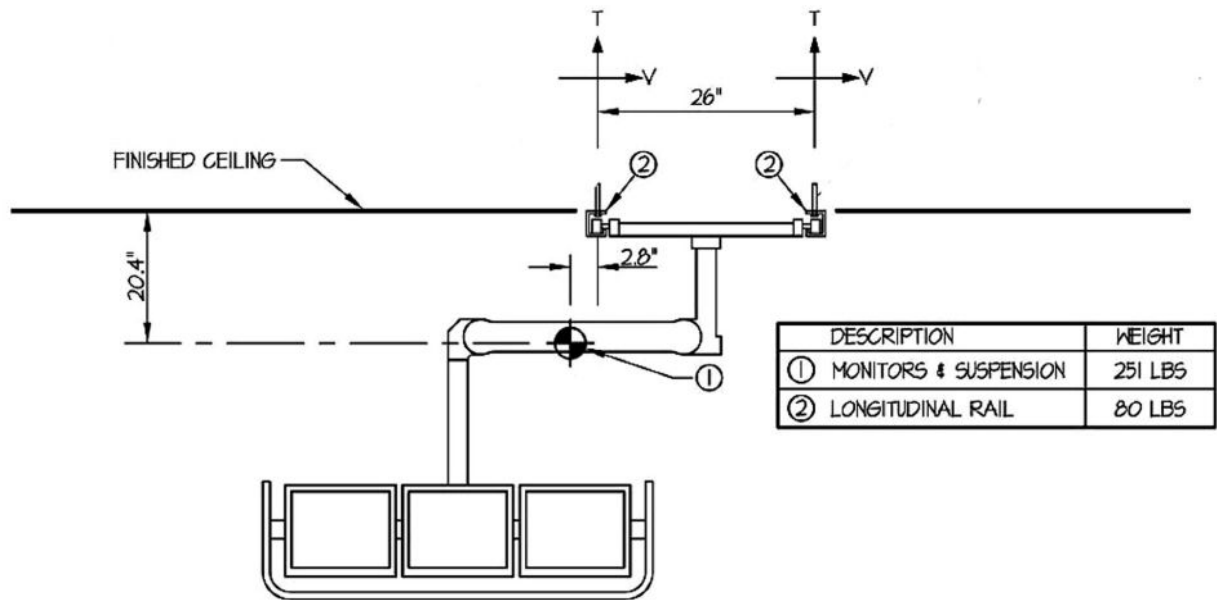
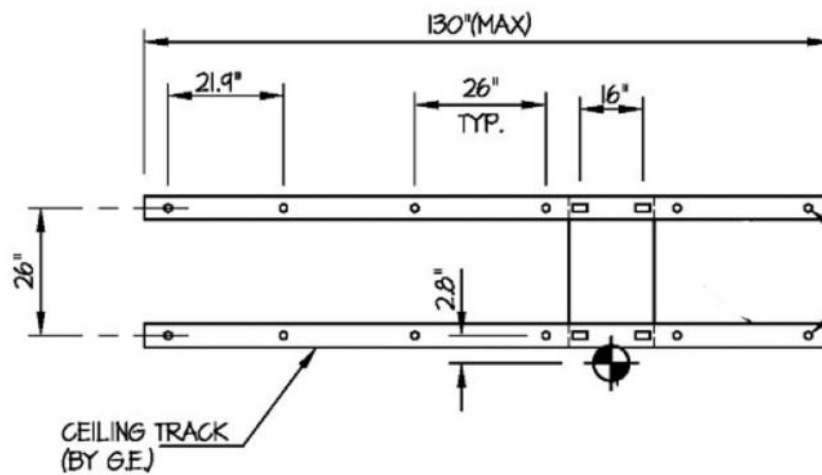


Illustration 2-88: Ergo Overhead Flat Panel Suspension



Front View



Top View

Chapter 3 Special Construction Requirements

1 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 EMI Consideration

IEC60601–1–2 Electromagnetic Standard Compliance & Documentation

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

2.1 General Scope

This equipment complies with IEC-60601-1-2: Edition 2.1 and Edition 3 standard for medical devices

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

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

2.2 Electromagnetic Emission

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

Table 3-1:

Emissions	Test Compliance	Electromagnetic Environment
Radio–Frequency Emissions CISPR11	Group1 Class A limits	The 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 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 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 system is suitable for use only in establishments not directly connected to a public low voltage power supply network.

2.3 Electromagnetic Immunity

2.3.1 Electromagnetic Immunity

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

Table 3-2:


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 system requires continued operation during power mains interruptions, it is recommended that the 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.			

2.3.2 Electromagnetic Immunity IEC 60601-1-2

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

Table 3-3:

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 $[V_{2=}]$ 0.3 V	Portable and mobile RF communications equipment are used no closer to any part of the system, including cables, than the recommended separation distance calculated from the equation appropriate for the frequency of the transmitter. 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. 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.

Immunity Test	IEC 60601-1-2 Test Level	Compliance Level	Electromagnetic Environment
	3 V/m, 800 MHz to 2.5 GHz	<p>[E₂₌] 0.3 V/m</p> <p>[E₃₌] 0.3 V/m</p> <p>[E₄₌] 0.3 V/m</p>	<p>At that disturbance amplitude the system is fully operational.</p> <p>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.</p> <p>At that disturbance amplitude level the system is fully operational.</p> <p>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).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,* are less than the compliance level in each frequency range.**</p> <p>Interference may occur in the vicinity of equipment marked</p> <div style="text-align: center;">  </div> <p>with the following symbol:</p>

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 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 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 3-4](#).

These are guidelines. Actual conditions may vary.

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

Table 3-4:

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	$d = [3.5 / V_2] \sqrt{P}$	$d = [3.5 / V_2] \sqrt{P}$	$d = [3.5 / E_2] \sqrt{P}$	$d = [3.5 / E_4] \sqrt{P}$
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 Limitations Management

Adhering to the distance separation recommended in [Table 3-4](#), 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 3-4](#)) apart from the system (in order to avoid images interferences risks).

2.5 Use Limitation

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

In case of an Optima 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.

Other electrical equipment may disturb and interfere with these Optima components. The control of the clearing distances from the noise sources is recommended from the HF electrosurgery generator, power supplies converters from nearby monitors or from other close electrical equipment). Refer to respective device manufacturers instructions & recommendations in such cases.

2.6 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 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 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 system (& subsystems as the Advantage Workstation). The separated AC power line should supply the panel.

- Stacked components & equipment:

The system should not be used adjacent to or stacked with other equipment; if adjacent or stacked use is necessary, the 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 Optima 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 : The system is compatible with the Earth magnetic Field. Earth magnetic Field is lower than 1 Gauss.

- 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 (CE) option requires an EMI filter box placed upstream the PDB. The EMI filter box will be delivered as a single product by GE Consumer & Industrial. For further information on the EMI filter box, see *Typical EMI Filter box* in [Chapter 5, Power and Grounding Requirements](#)

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Chapter 4 Environmental Requirements

1 Relative Humidity and Temperature



NOTICE

Avoid extremes in temperatures

Optima system room climate requirements – relative humidity and temperature (individual products or components are classed by their installation area for **In use** see -[Table 4-1](#))

Table 4-1:

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

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

NOTE: (2a): **In use temperature limits** specify the range where the system shall work. Operating outside these limits could occur severe performance and reliability issues.

(2b): **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 4-1](#). To obtain relative humidity and temperature requirements for components not specified in the table, refer to the appropriate component Pre-Installation Manual listed in [Chapter 2, Basic System Compatibility](#).



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.

Table 4-2: IVUS Rev 2 and Rev 2+

Humidity (non condensing) :	30 - 80 %	
Temperature (at 20% Relative Humidity) :	5 - 35 C	(41 - 95 F)

2 Altitude and Atmospheric Pressure

Refer to [Table 4-3](#). To obtain altitude and atmospheric pressure requirements for components not specified in [Table 4-3](#), refer to the appropriate component Pre-Installation Manual listed in [Chapter 2, Basic System Compatibility](#).

Table 4-3: Altitude and Atmospheric Pressure

INSTALLATION ROOM OF PRODUCT OR COMPONENT	ALTITUDE (meters)		ATMOSPHERIC PRESSURE (kPa)	
	IN-USE		IN-USE	
	MIN	MAX	MIN	MAX
Examination room	0	2000	70	106
Technical room (See Notice below)	0	2000	70	106
Control room	0	2000	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.

3 Heat Output

3.1 Equipment Heat Output tables

Refer to [Table 4-4](#). To obtain heat output information for components not specified in [Table 4-4](#), refer to the appropriate component Pre-Installation Manual listed in [Chapter 2, Basic System Compatibility](#).

Table 4-4:

		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	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	
	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)

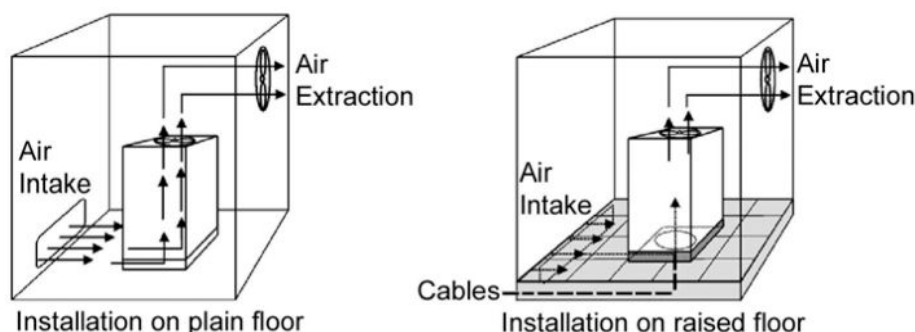
NOTE: (2) For more details, consult appropriate pre-installation manual

NOTE: (3) For UPS 20 kVA option refer to [Section 3.2](#)

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

3.2 Fluoro UPS Option

Illustration 4-1:



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 4-5: Fluoro UPS CE

Losses		Cooling air flow	
VFI	SEM	VFI	SEM
2.14 kW	0.64 kW	625 m³/h	190 m³/h

Table 4-6: Fluoro UPS UL

Losses		Cooling air flow	
BTU / hr	kW	CFM	m³/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 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 Operating Manual for more details:

- [UL Model: UPS Option - Operating Manual SG-UL Series - 20 kVA](#)
- [CE Model: UPS Option - Operating Manual SitePro 20 kVA \(series 8\)](#)

4 Acoustic Specifications

- Less than 50 dB (A) at 1 meter for a LC Positioner.
- Limited to 50 dB (A) at 1 meter for Omega IV, Omega V tables.
- Limited to 55 dB (A) at 1 meter for C2 Cabinet.
- Limited to 60 dB (A) at 1 meter for the COOLIX 4000 or COOLIX 4100.
- Limited to 65 dB (A) at 1 meter for C1 Cabinet.
- 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.
- less than 55 dB(A) at 20 degrees Celsius, measured in the operators head position, 20 cm in front of the keyboard's right corner, at 1.30 m above the floor, and in a distance of 1 meter at all four sides.

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.

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Chapter 5 Electrical Requirements

1 Power Requirements

1.1 Electrical Requirements

1.1.1 Electrical 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).

Optima System requires two specific power lines, two three phase for C1 cabinet (see Illustration *AC Interconnect without Fluoro UPS* in [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 5-1: 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, $\pm 10\%$)	0.09 to 0.12	228 to 180 for C1	16 to 13	4 wires (3 ph + GND).

Table 5-2: 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, $\pm 10\%$)	0.09 to 0.12	180 for C1	13	5 wires (3 ph + N + GND)

Table 5-3: 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, $\pm 10\%$)	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.

- 10A / 120V / AWG10 (UL option)
- 10A / 230V / AWG10 (CE option)



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 [Power and Grounding Requirements](#).

Optional Isolation transformer specifications:



WARNING

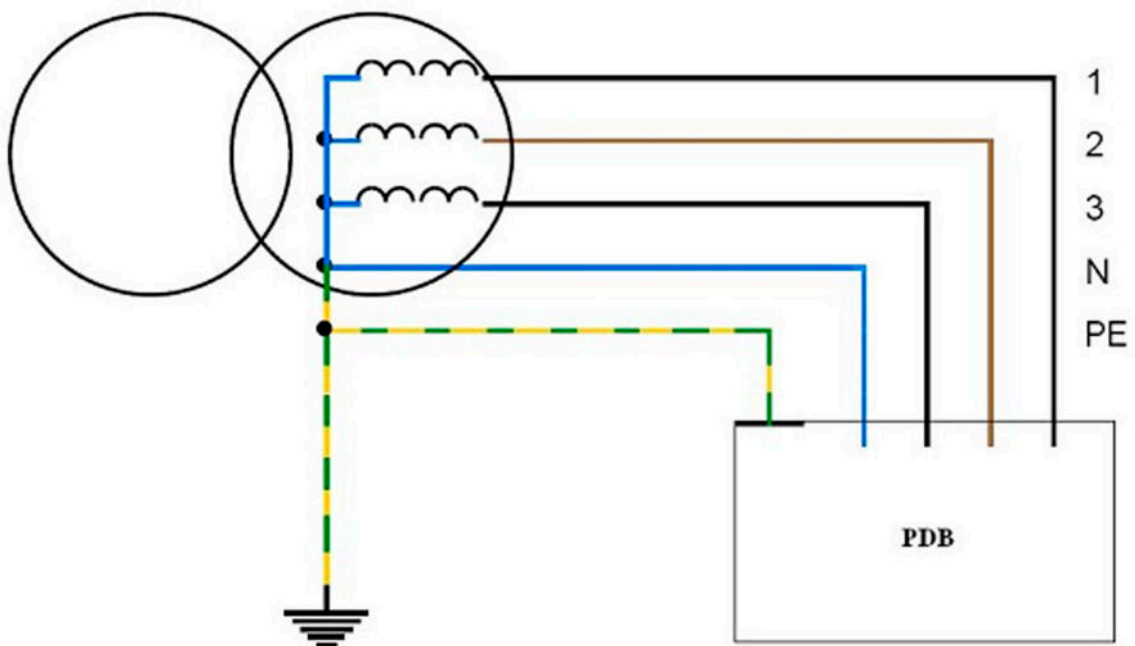
POWER TO THE ECG MONITOR ON MONITOR SUSPENSION (OPTION) SHALL BE SUPPLIED FROM A MEDICAL GRADE ISOLATION TRANSFORMER.

It shall be :

- Secondary star 3Ph+N
- 150 kVA minimum
- Power distribution shall be of TNS type with Neutral grounded
- Primary-Secondary transformer voltage drop shall be less than 3.1% during following peak current:

Line V	380	400	415	480
I peak	243	233	223	192

Illustration 5-1: TNS scheme



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 4000** or **autotransformer of Chiller 4100** 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.

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.

1.2 Power Distribution

===== 3 Phase cable supplied by hospital
 ===== 3 Phase cable
 ————— Single Phase cable
 - - - - - Injector cable

Mains supply
 3 phase,
 Neutral
 And Ground

Hospital LOTO

PDB

3 x AWG10 / 6 mm²

3 x AWG2 / 35 mm²
 3 x AWG10 / 6 mm²

C2 Cabinet

3 x AWG10 / 6 mm²

C1 Cabinet

2 x AWG16 / 1 mm²

2 x AWG6 / 10 mm²

2 x AWG16 / 1 mm²

2 x AWG6 / 10 mm²

Tube Chiller and auto-transformer

Detector conditioner

2 x AWG16 / 1 mm²

2 x AWG6 / 10 mm²

PATIENT AREA

Monitor & Suspension

Patient table PWS

Detector Power supply

2 x AWG16 / 1 mm²

Injector

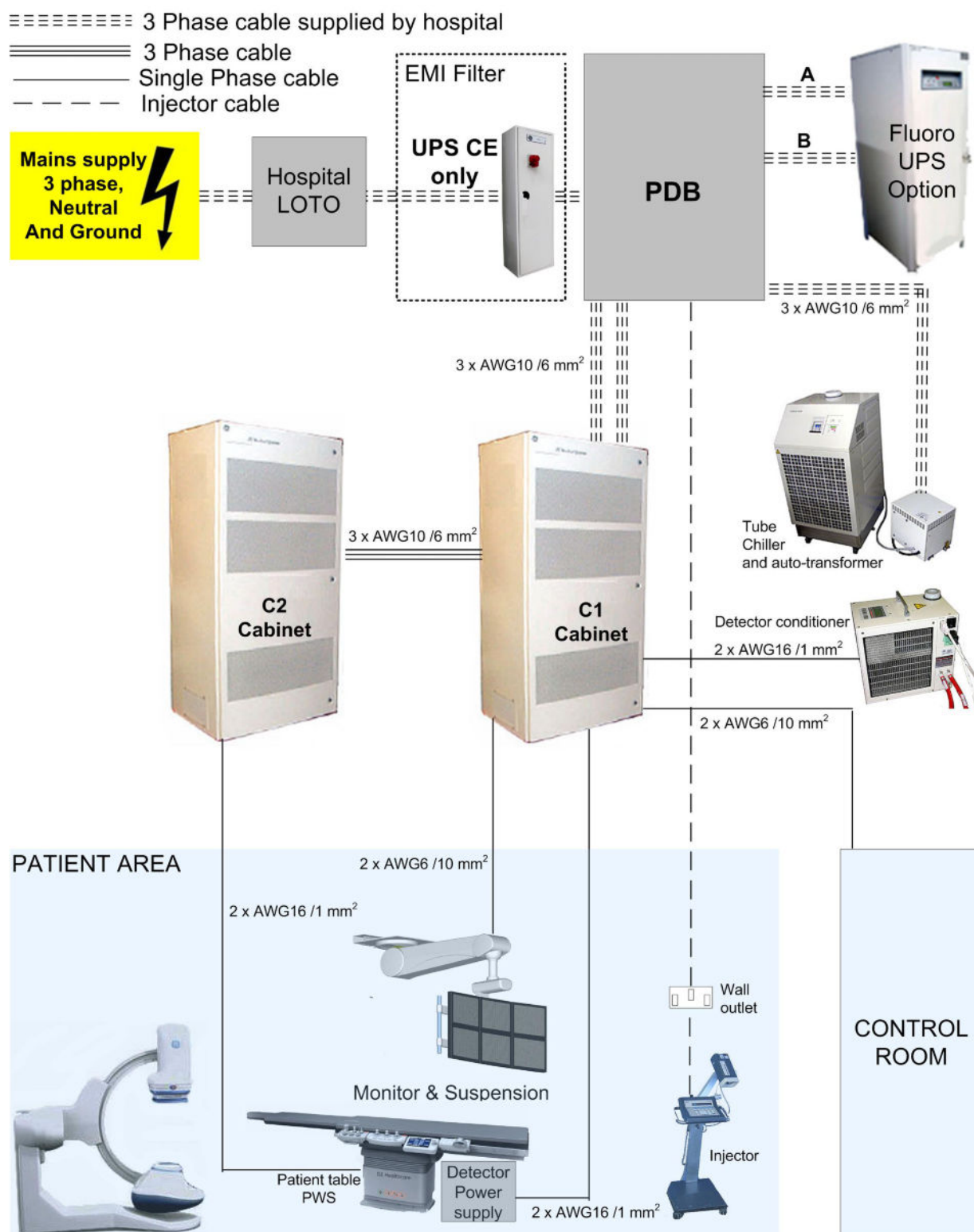
Wall outlet

Control Room

Chapter 5 Electrical Requirements

1.2.2 AC Interconnect with Fluoro UPS

Illustration 5-3: 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 5-4: A and B 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	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.					

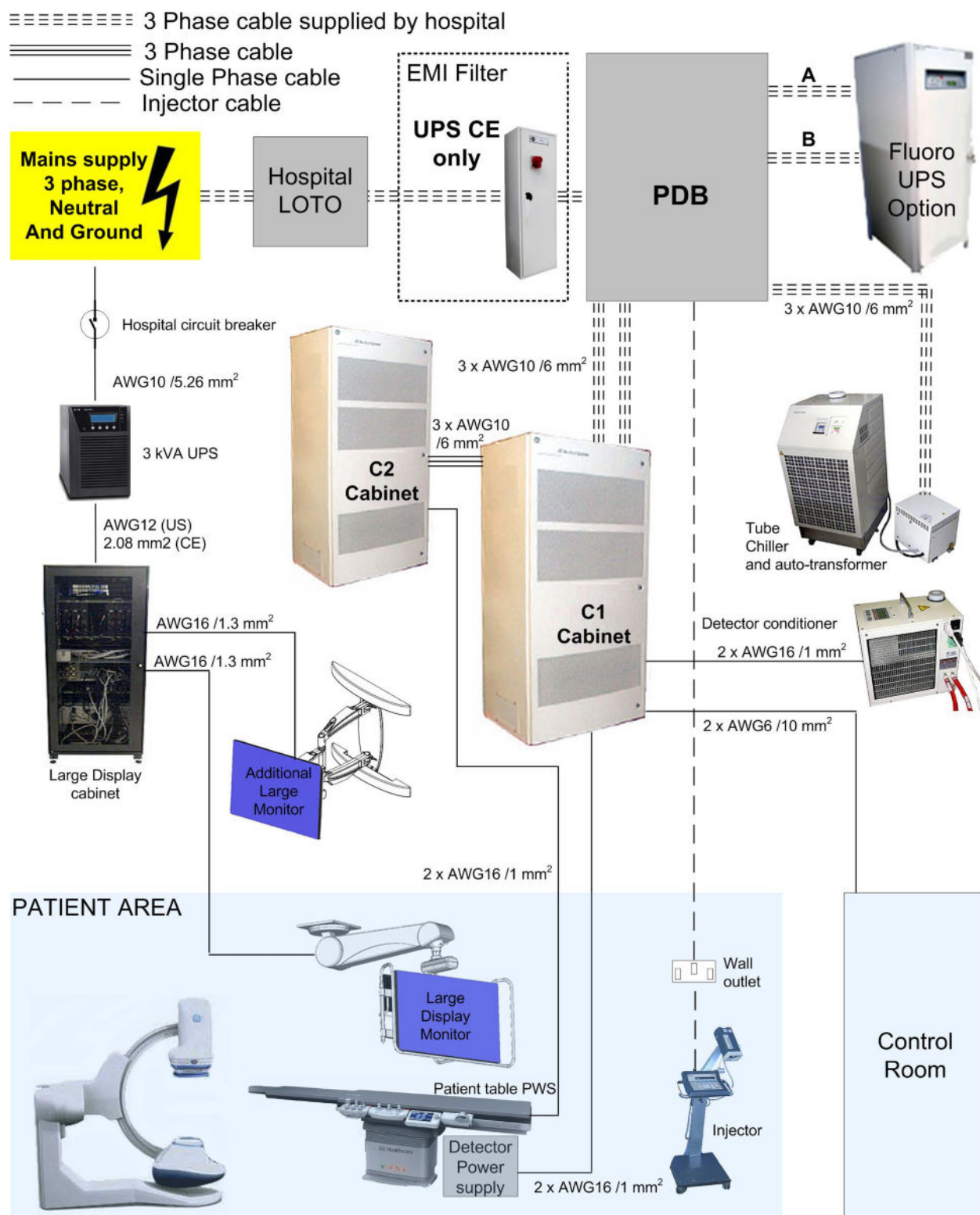
NOTE: The PDB shall include the switch allowing the commutation of generator supply to the UPS. Neutral shall be fed by the hospital. The customer provides the cables A and B.

NOTE: Refer to the UPS vendor Service Operating Manual for more details:

- UL Model: [UPS Option - Operating Manual SG-UL Series - 20 kVA](#)
- Ce Model: [UPS Option - Operating Manual SitePro 20 kVA \(series 8\)](#)

1.2.3 AC Interconnect for Large Display Monitor display

Illustration 5-4:



NOTE: Large Display Cabinet can provide power to an optional secondary large monitor outside of the patient VICINITY.

Electrical contractor is responsible for providing the power cables from Hospital mains to Large Display UPS and the ground cable from Hospital mains to Large Display Cabinet as per local regulations.

For Europe only, place a differential breaker on the hospital main supply, upstream the Large Display Cabinet, the differential shall be set to 30mA.

1.3 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.

1.3.1 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.

1.3.2 Typical PDB (Europe CE)

Typical PDB (Europe CE) - model number XR_765_4

Illustration 5-5: CE PDB 1/2

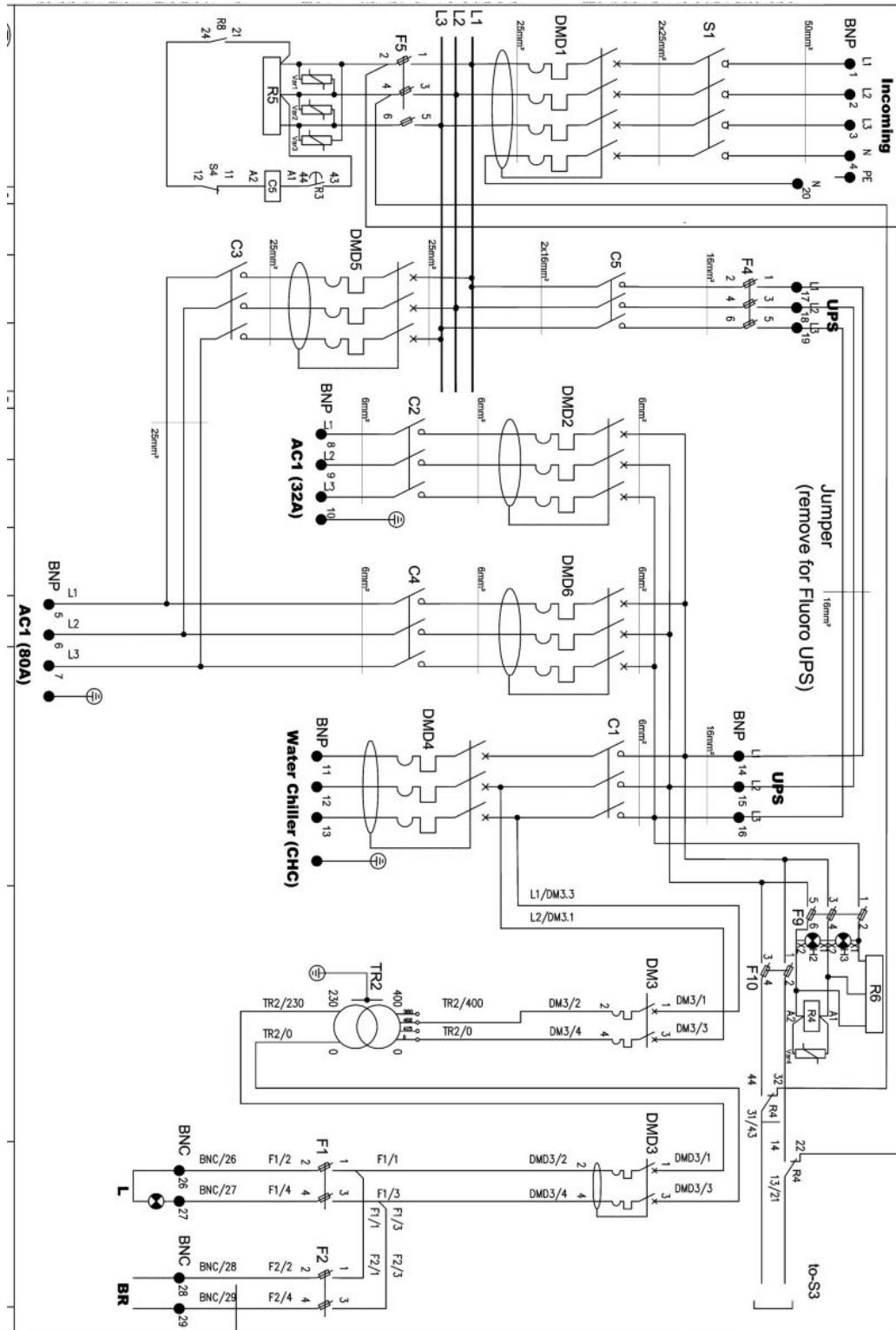


Illustration 5-7: System Power (Block Diagram)

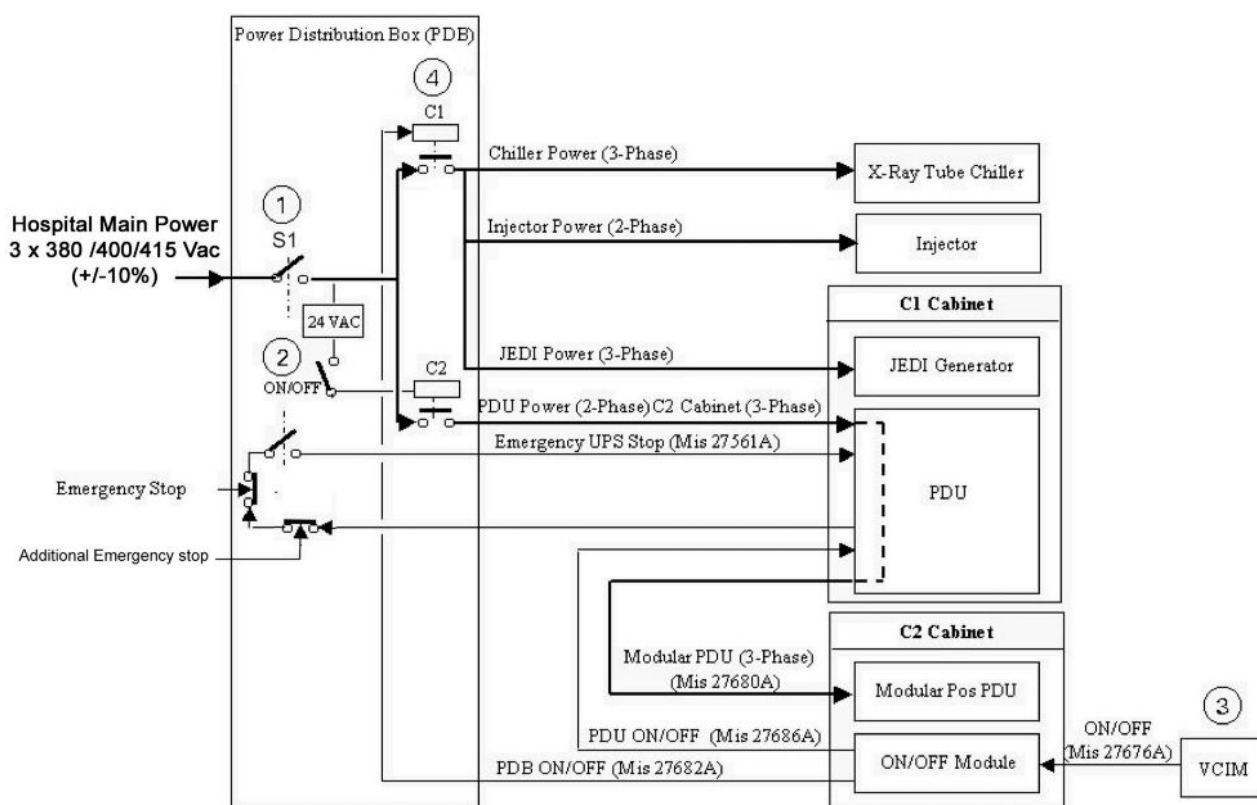
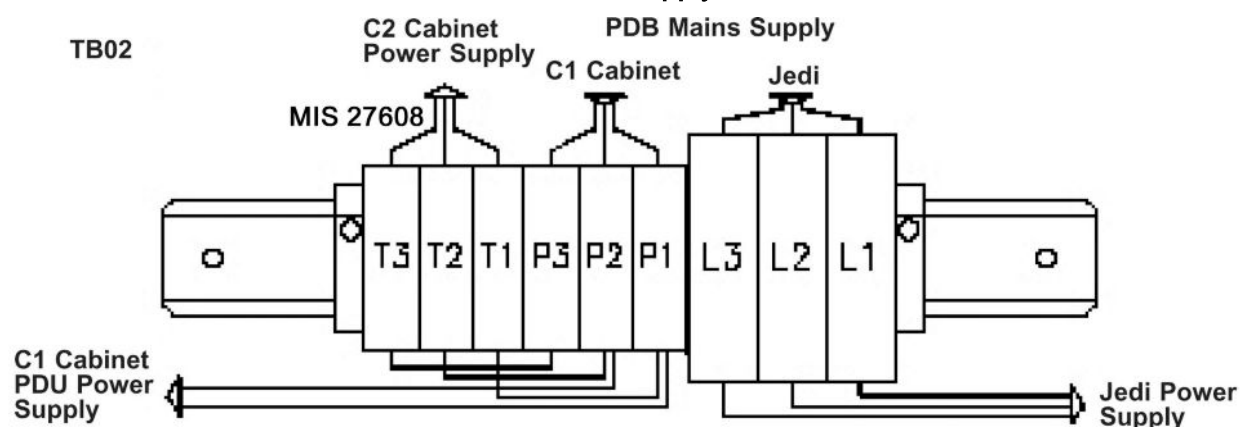
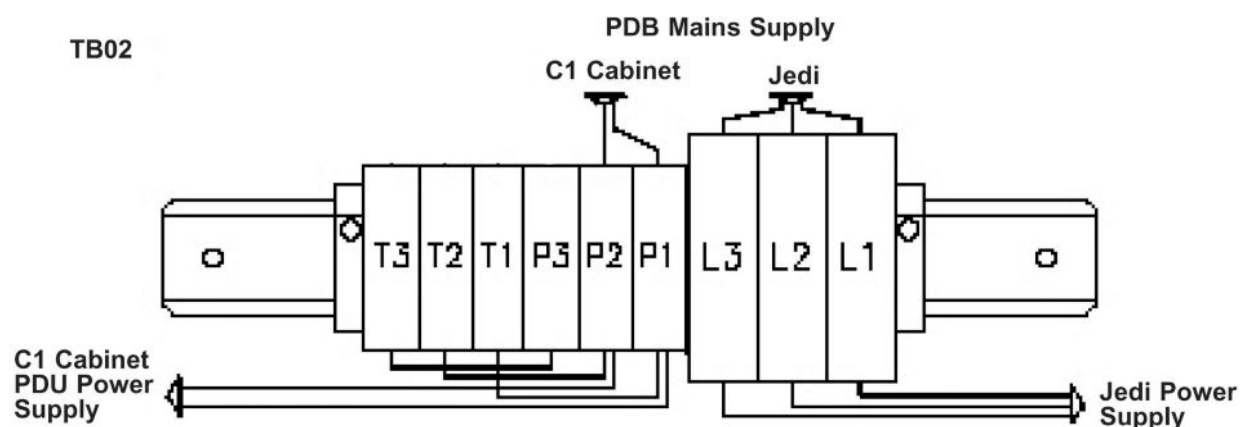


Illustration 5-8: Detail Of General Power Supply – C1 Power Terminal Connection



CE CONFIGURATION



UL CONFIGURATION

Illustration 5-10: PDB UL layout (2/2)

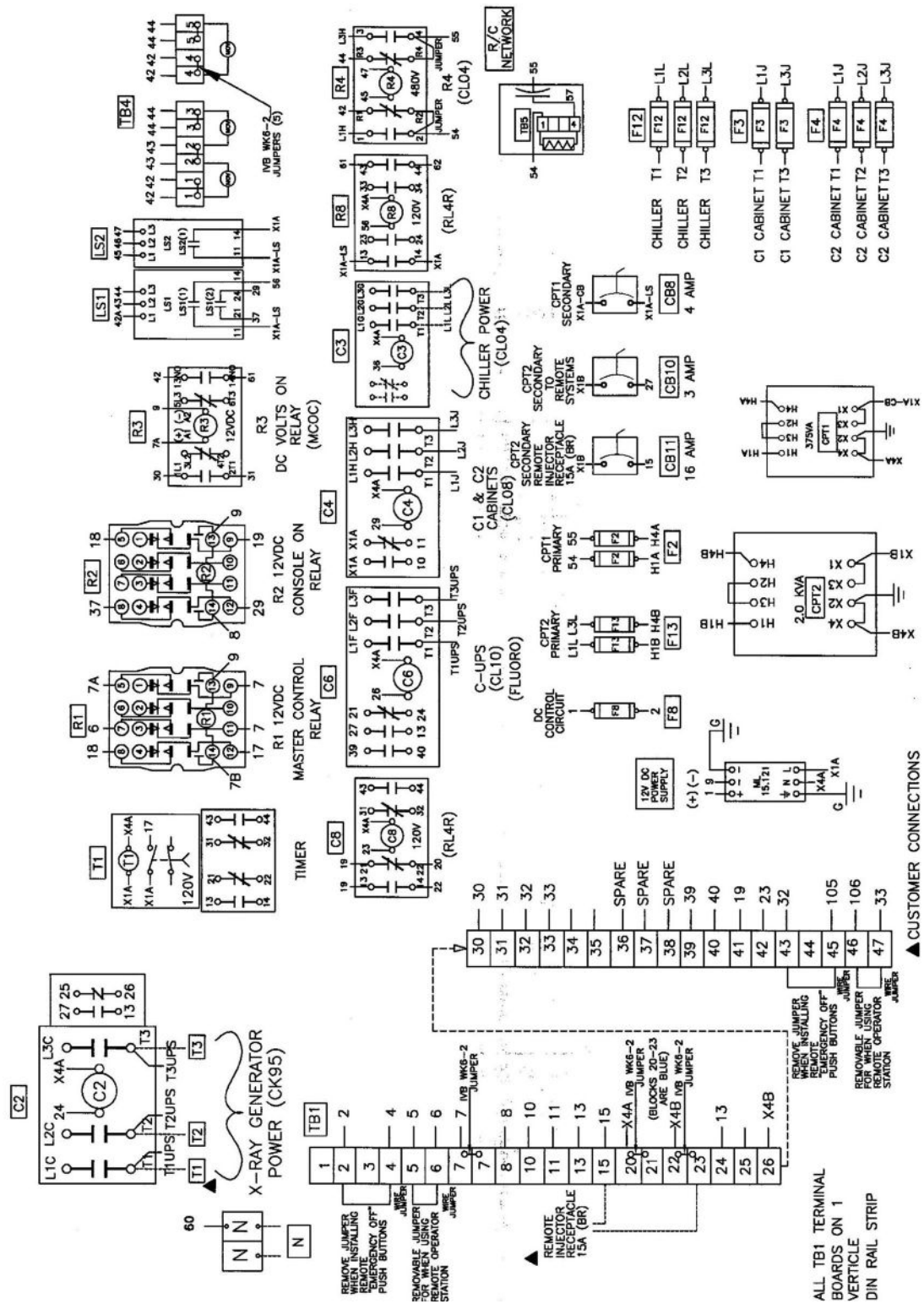
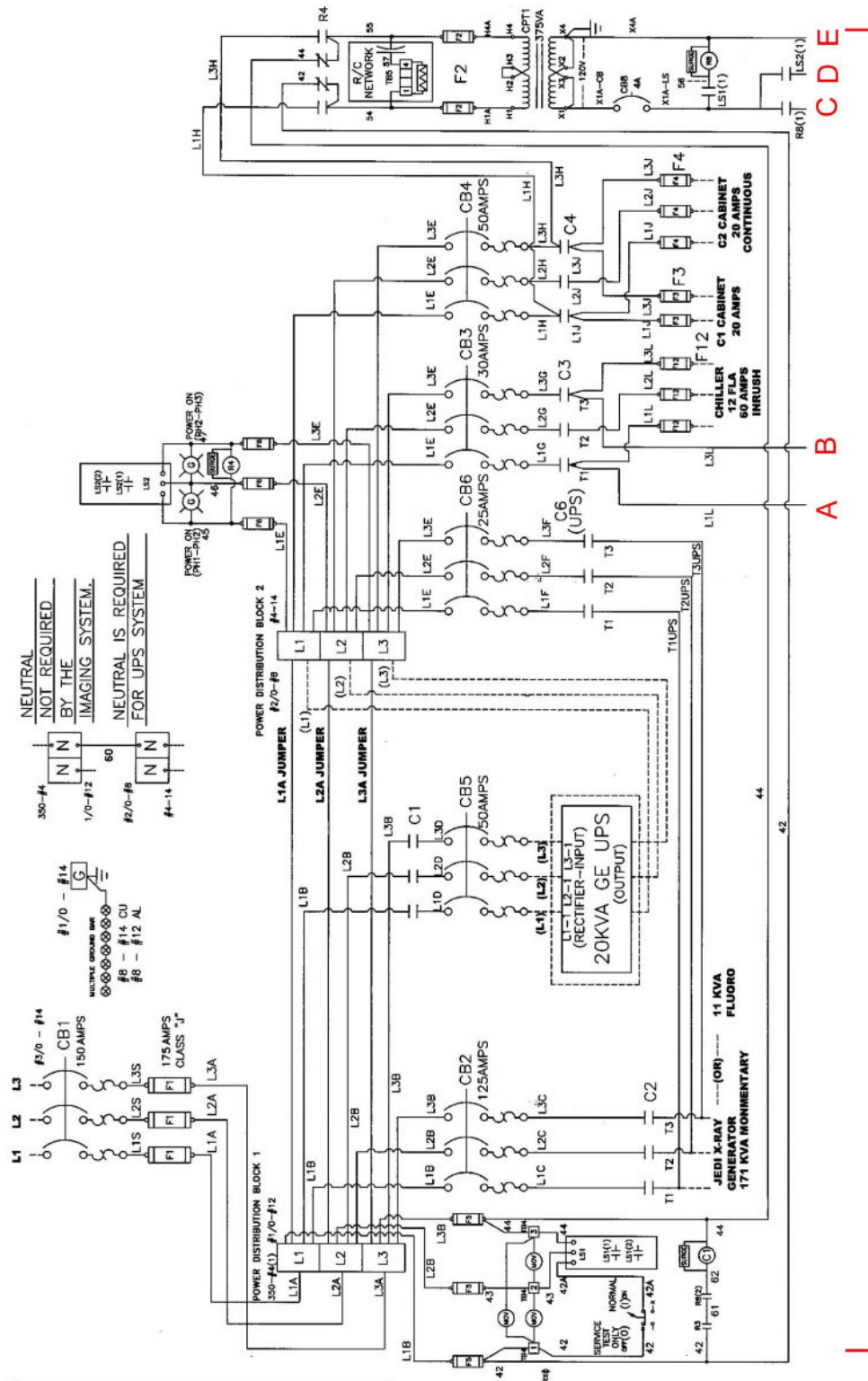
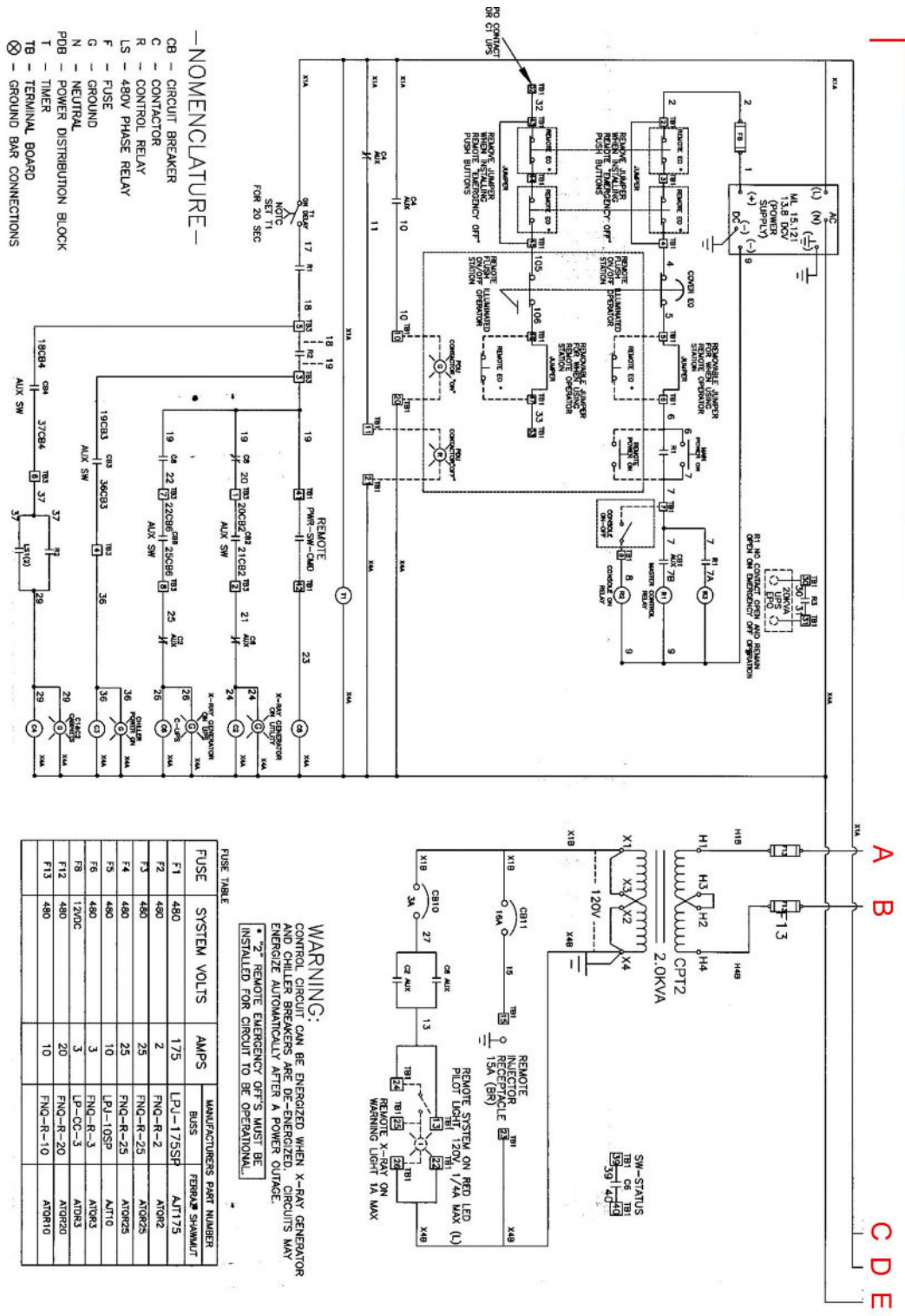


Illustration 5-11: PDB UL Electrical Schematic (1/2)



Continued on illustration UL PDB 2/2

Illustration 5-12: PDB UL Electrical Schematic (2/2)



1.3.4 Typical EMI Filter Box (CE configuration only)

The EMI filter box shall be installed on the sites with fluoro UPS CE.

The EMI Filter Box will be delivered as a single product (not part of Fluoro UPS or PDB) by GE Consumer & Industrial.

Illustration 5-13:

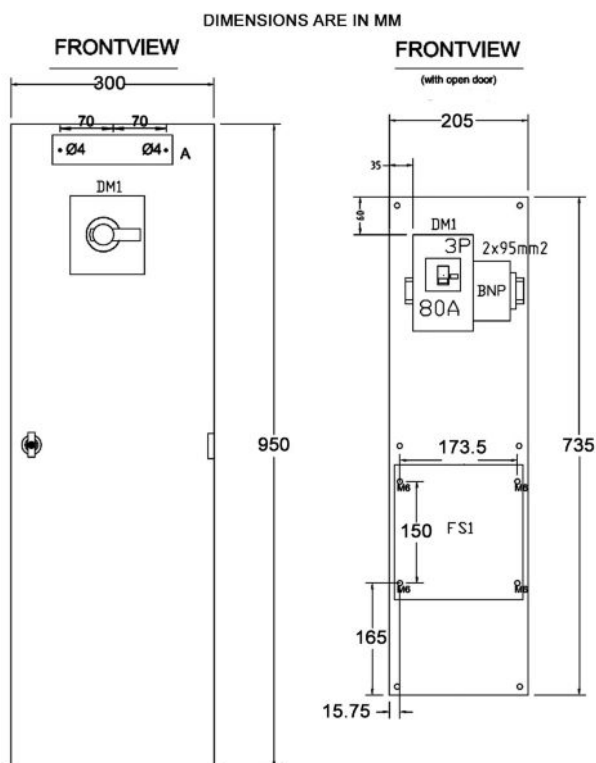


Table 5-5: EMI Filter Box Dimensions

External dimensions	950 mm x 300 mm
Internal dimensions	735 mm x 205 mm

1.4 Emergency

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

1.4.1 Main power supply cut

In this case, refer to [Physical Runs](#).

1.4.2 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 LC Positioner. The table has to rotate to 90°.

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

1.5 Power Failure Events

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

1.5.1 Main power supply cut

In this case, refer to [Physical Runs](#).

1.5.1.1 Full UPS Record (compatibility)

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.

1.5.1.2 Partial UPS Fluoro (option)

A Fluoro UPS (20 kVA) has been designed for the 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.

1.5.2 Electrical Requirements for Fluoro UPS



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.

1.6 Emergency 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 LC Positioner. The table has to rotate to 90°.

Refer to illustration Room Layout for Optima System (Digital Mobile Imaging System 9800) contained in [Chapter 2, Patient Room Layout](#) for a surgical imaging mobile use.

2 Grounding

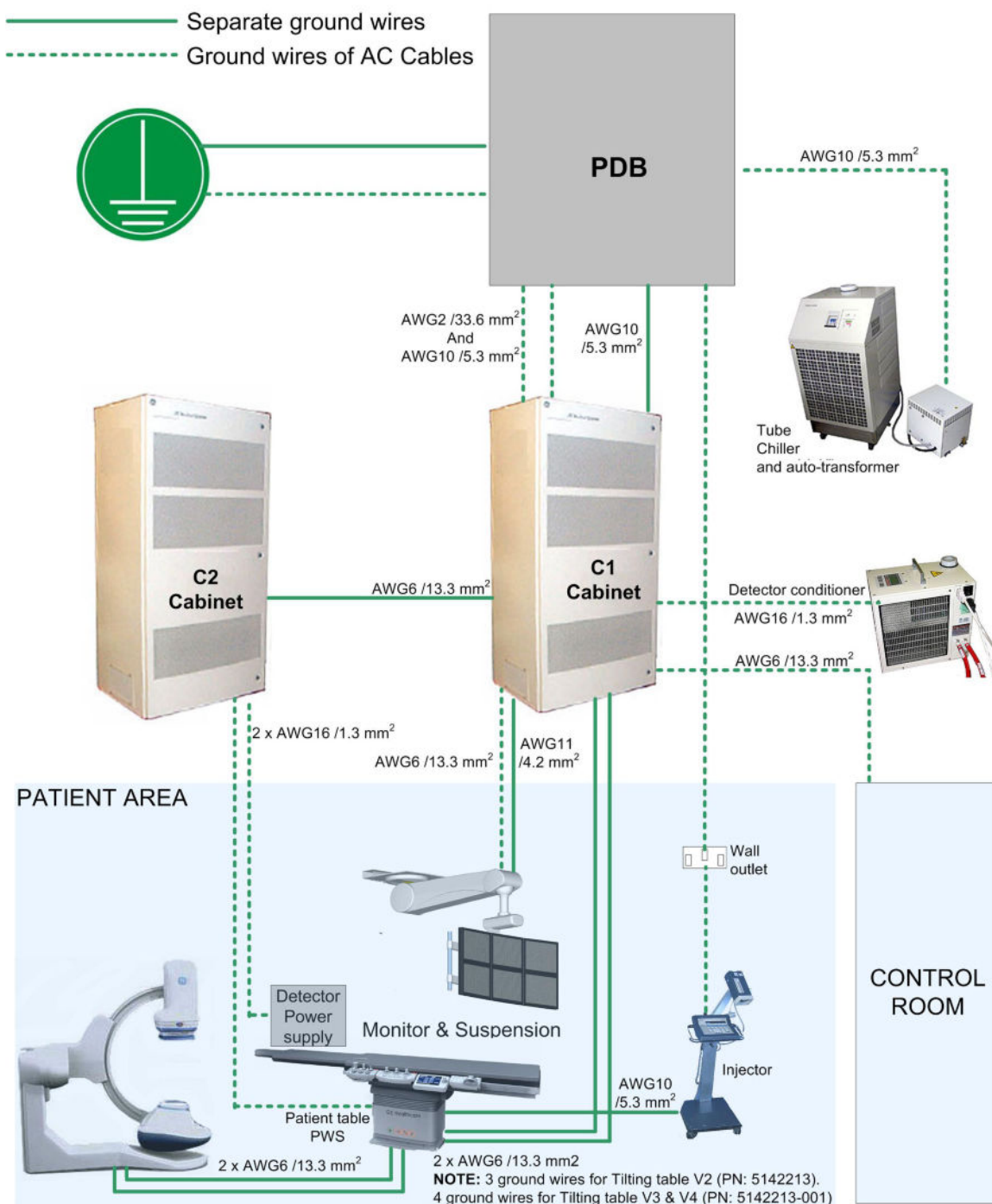
2.1 Grounding

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.

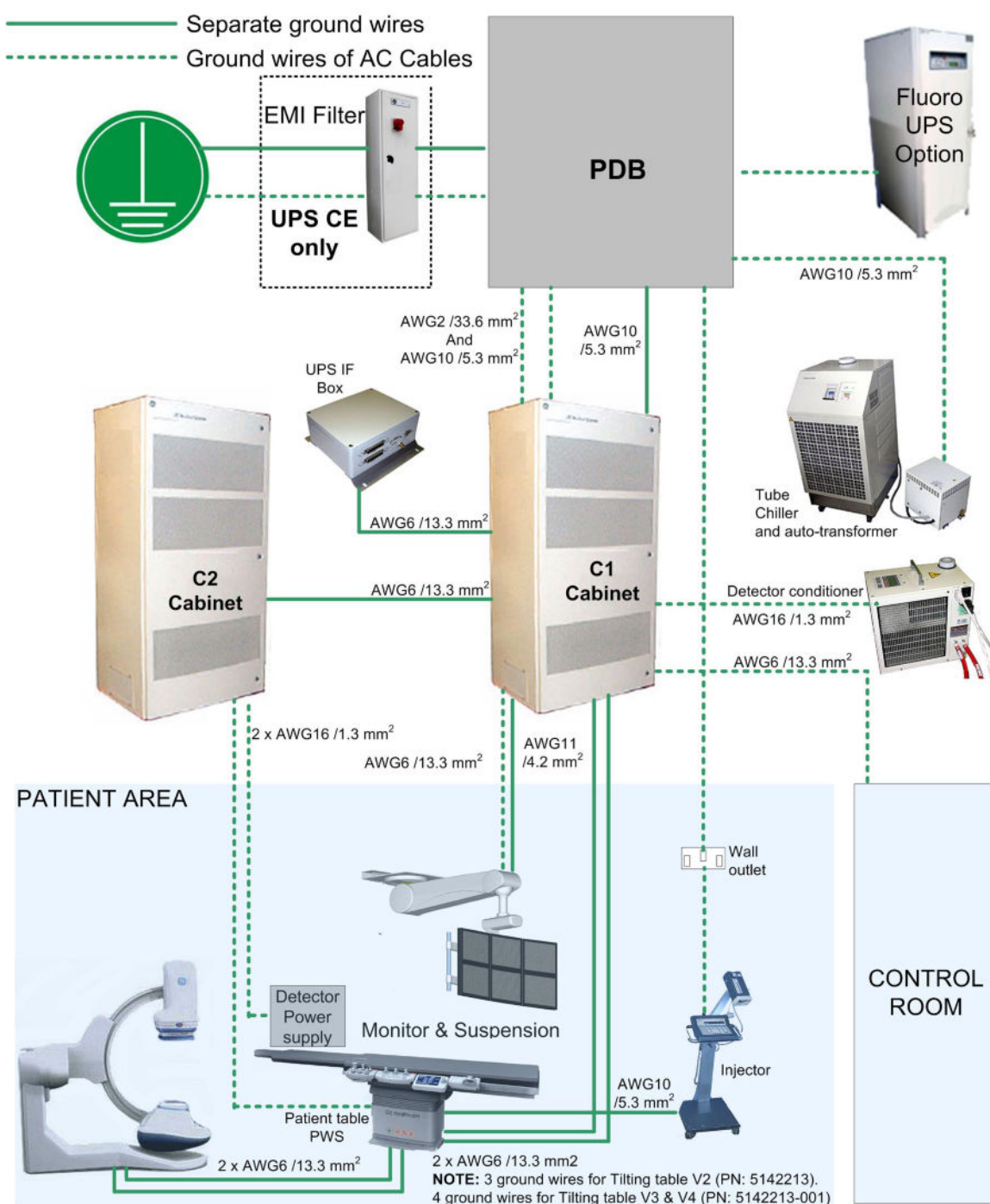
2.1.1 Grounding Interconnect without Fluoro UPS

Illustration 5-14: System with LCD Monitors Suspension



2.1.2 Grounding Interconnect with Fluoro UPS

Illustration 5-15: System with LCD Monitors Suspension



2.2 Power and Grounding Requirements

2.2.1 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.

2.2.2 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 (Coolix 4000 or Coolix 4100 auto-transformer) (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 5-6:

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 [Power Distribution](#).

2.2.3 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 [MIS \(Master Interconnect System\)](#).

3 Interconnections

3.1 X-Ray Lamp Room Distribution

The fitter shall install a lamp in:

- Exam room,
- Control room.

NOTE: The color of the X-ray ON lamp is dependant on local regulations. Refer to local regulations.

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

LC provides a room distribution from C2 cabinet as follows:

- X-ray-on-line drive by low voltage relay 24 V. Acting during X-Ray exposures in Control Room.
- X-ray-on-line drive by low voltage relay 24 V.

In the Exam Room, visible from any place in the room.

Acting during X-ray exposures.



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.

3.2 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.

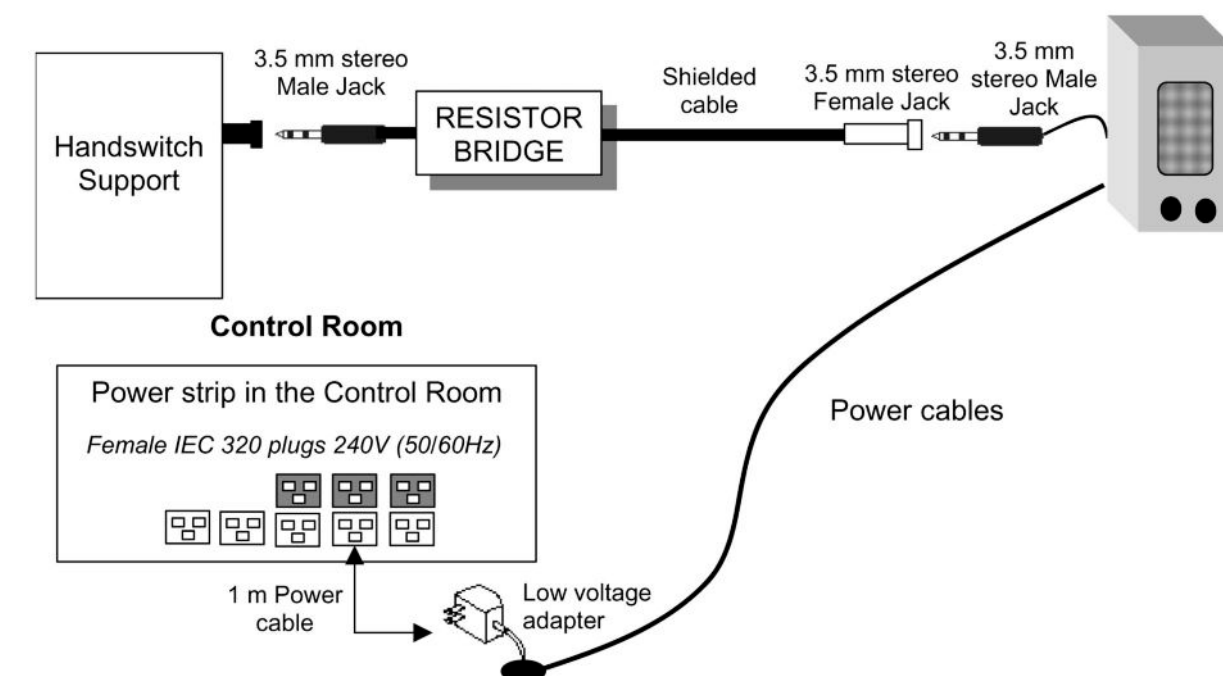
The door interlocks is wired to the C2 cabinet.

3.3 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 5-16:



WARNING

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

Patient Vicinity Definition : see *Patient Environment Equipment* in [Chapter 2, Room Layout Considerations](#)

3.4 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.

3.5 Injectors

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

3.5.1 Remote Injector (rack mount)

A power cord is supplied with the injector.

It is mandatory to connect it to a wall outlet fed by the main disconnect room device.

3.5.2 Pedestal Injector

A power cord is supplied with the injector.

A wall outlet (110 VAC or 230 VAC) will supply the injector. Power is provided through the power distribution box of the system and can be disrupted from the main disconnect room device.

3.5.3 Injector Medrad Avanta table mounted

Omega table only: Electronic rack can be located either in the technical room or in the patient room.

3.5.4 Injector L.F. ILLUMINA

As a result of power demand availability for all functions of this injector, it has to be connected to the wall outlet supplied by the main disconnect room device.

3.5.5 Injector Medrad Mark 7

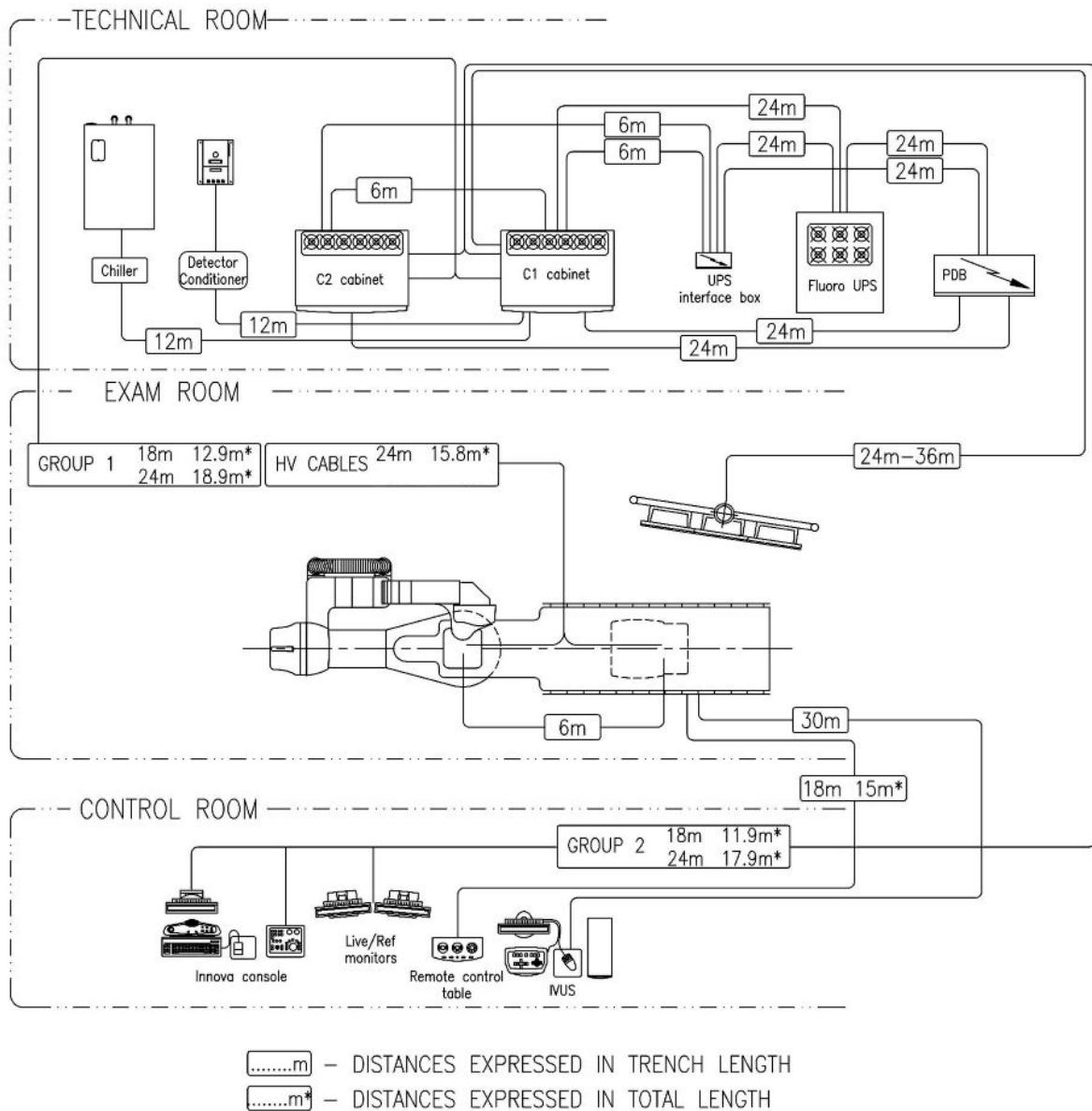
With extension cable (pedestal or table mount injector). Table mount injector is only available on Omega table.

4 System Cable Information

4.1 Physical Runs

4.1.1 Physical Run Synoptic

Illustration 5-17: Mini / Maxi Interconnection Length



NOTE: A 24m Emergency UPS stop cable 27561A is available in FRU.

4.1.2 System Core Matrix



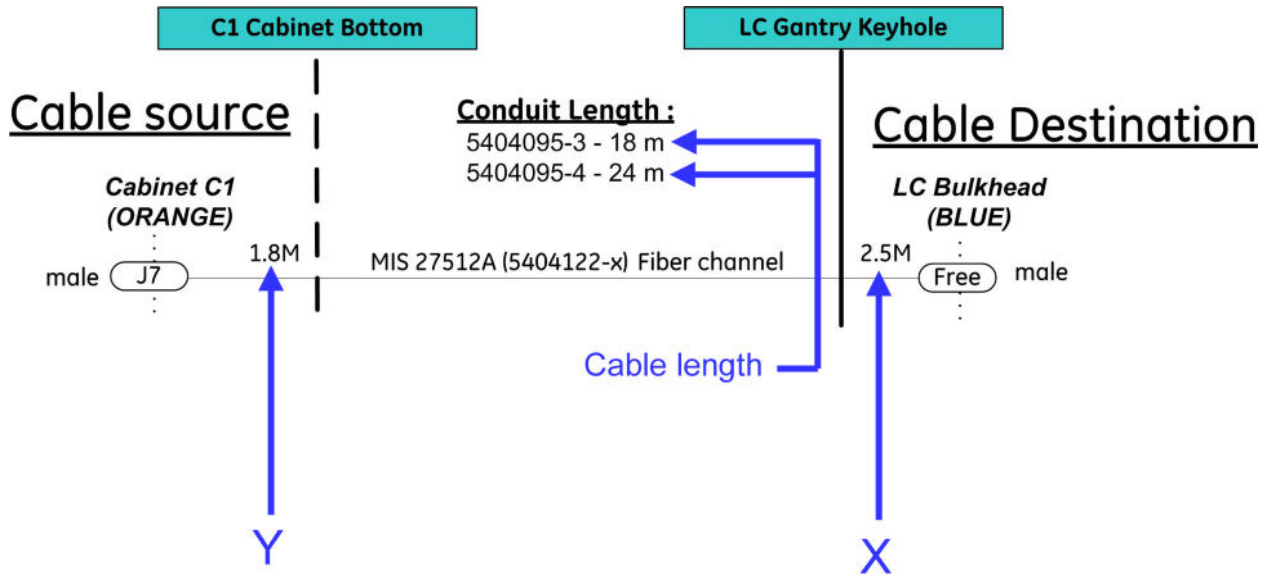
NOTICE

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:

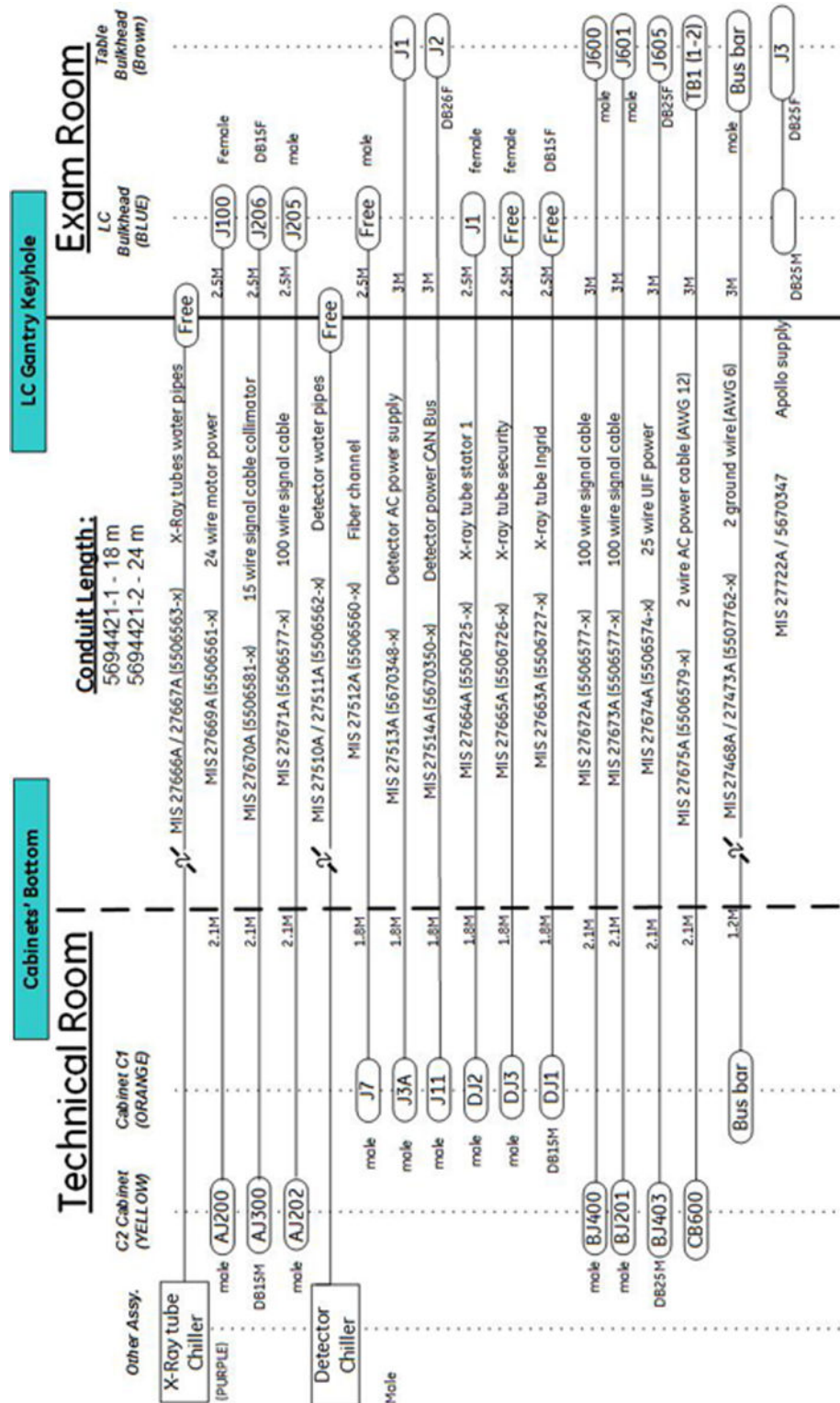
Illustration 5-18: Example of cable group schematic



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 4.3 meters).
- **Cable Length - (X + Y)** = available length for conduit run (example above is 13.7 or 19.7 meters).

Illustration 5-19: Cable Group 1 – From Technical Area To Exam Room





NOTE: For roadmap monitor cable 27500A 5506799-x, it is not included in Cable Group 2, but included in the package of ref. monitor kit in control room (the kit includes monitor and signal cable).



Illustration 5-22: Cable Group 4-4 with LCD Mavig Suspension

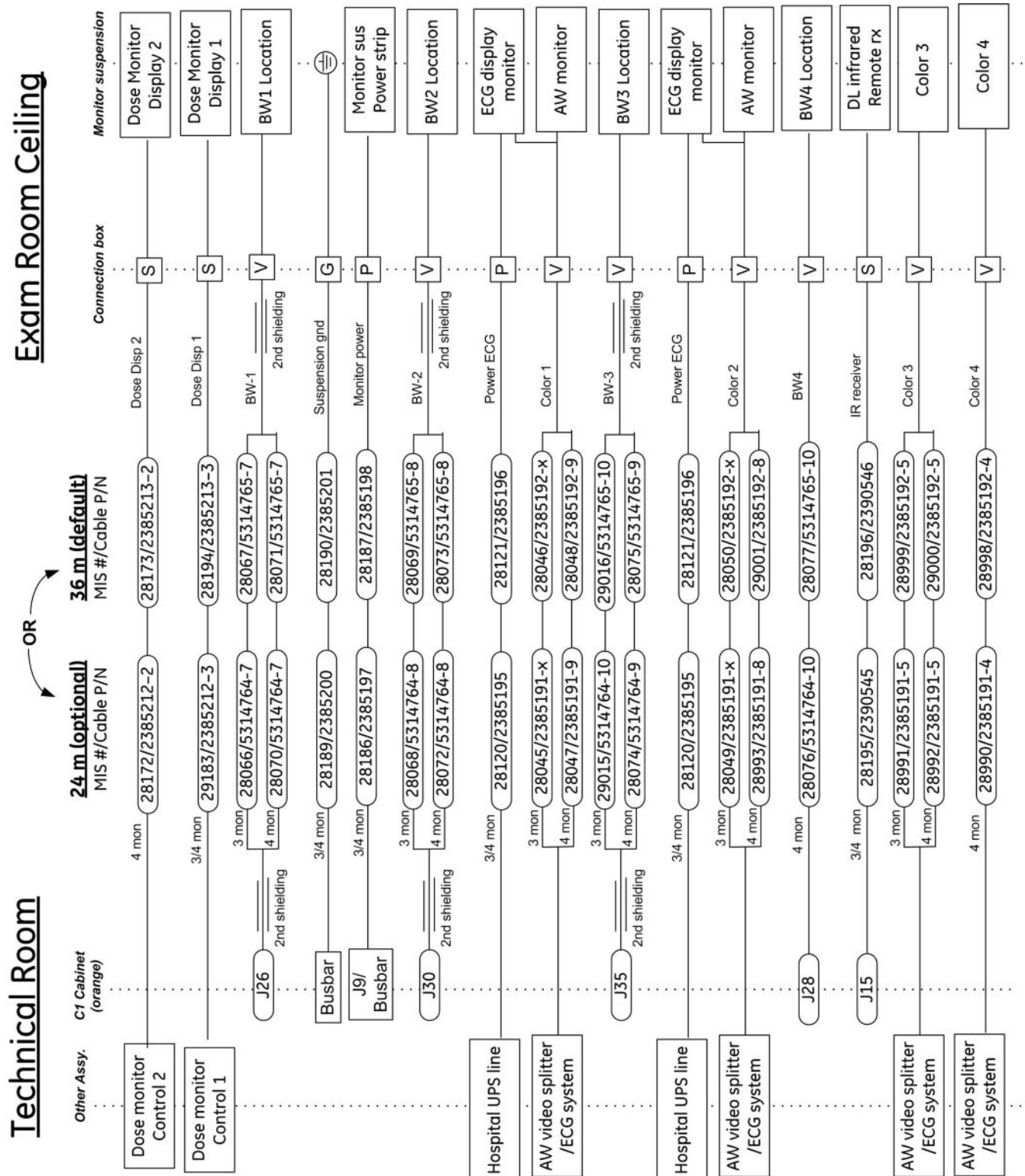


Illustration 5-23: Ergo Suspension System Cable Group

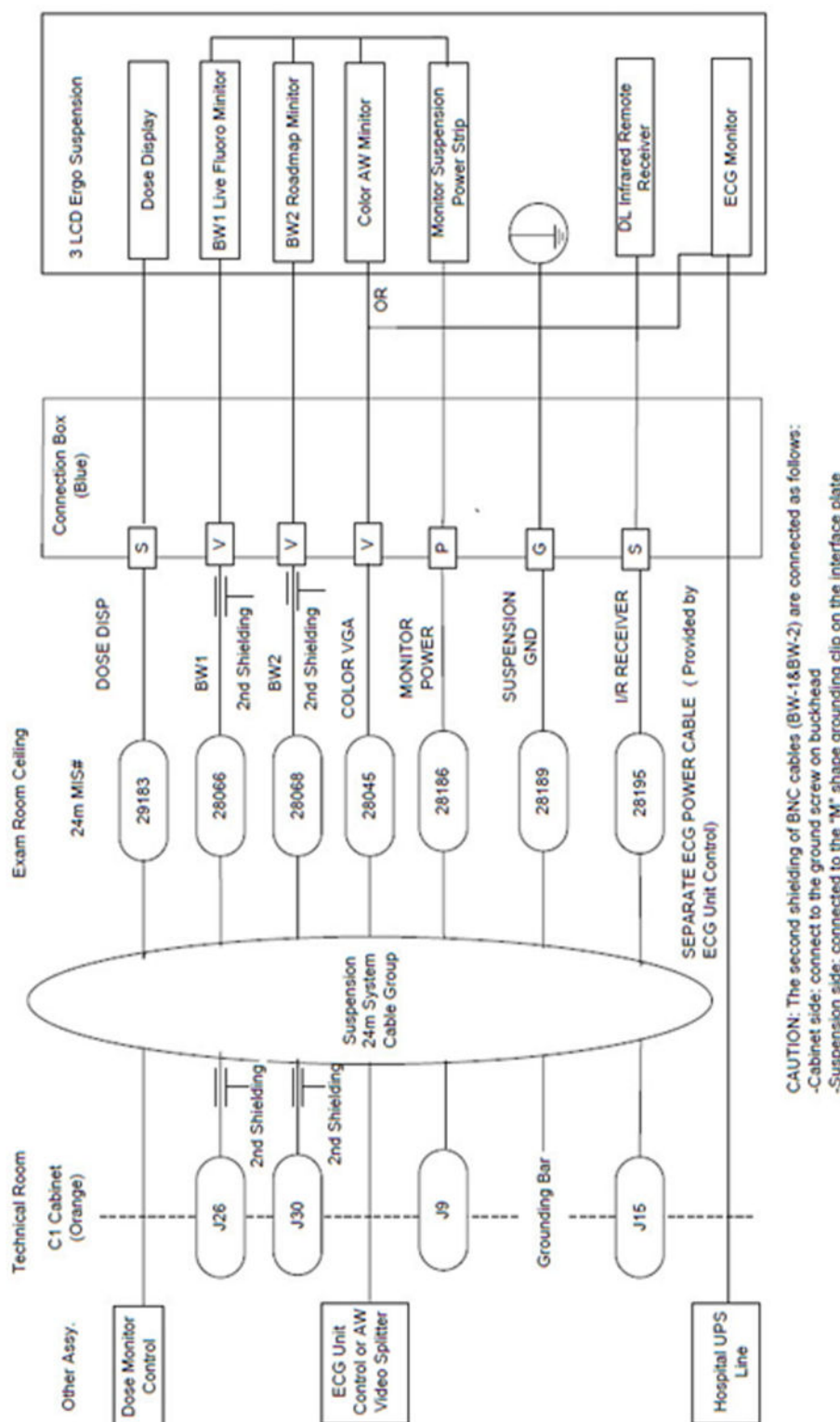
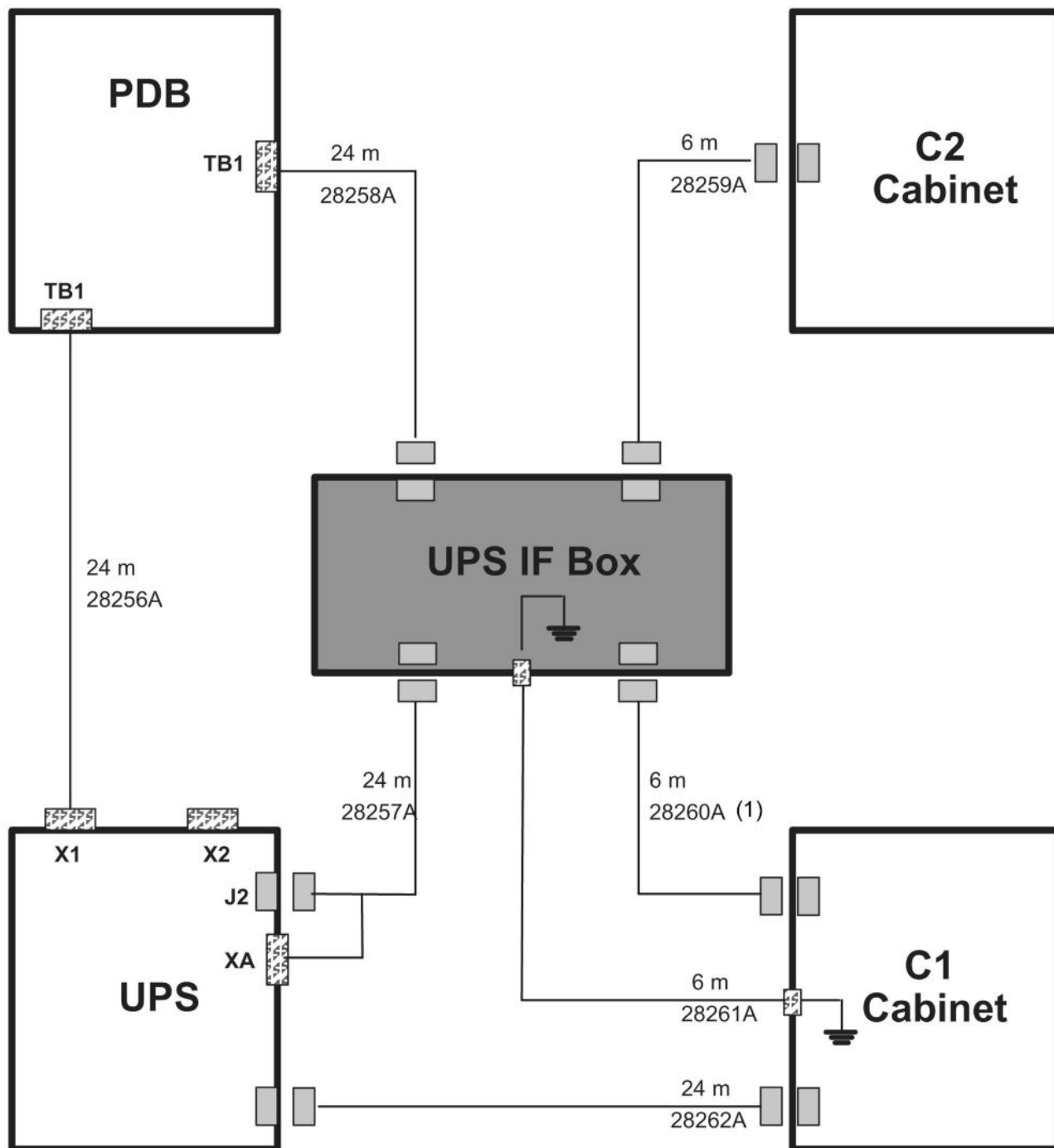


Illustration 5-24: Fluoro UPS Option Cable Set p/n 5507664



NOTE: (1): provided in Group 3 (27678A).

4.1.3 PHYSICAL RUN – SYSTEM CORE DETAIL

Table 5-7:

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	5506727-x	2789	600		13.8	DB 11 pin	34.4
27664A	5506725-x	2463	600		8.3	Metrimate 6 pin	29
27665A	5506726-x	2463	300		9.2	Metrimate 6 pin	29
27666A	5506563-x	WATER HOSE					
27667A	5506563-x	WATER HOSE					
27468A	5507762-x	1019	600		9.1	Pre-stripping, ring terminal	12
27473A	5507762-x	1019	600		9.1	Pre-stripping, ring terminal	12
27670A	5506581-x	2789	300			HES 15 pin	
27510A	5506562-x	WATER HOSE					
27511A	5506562-x	WATER HOSE					
27512A	5506560-x	FIBER OPTIC					
27513A	5670348-x	2464	300		7	CEI 320 - HBL4570C plug	38.6
27514A	5670350-x	2789	30		7.3	DB 26 pin	41.2
27675A	5506579-x	Type CL2	150		8.2	Pre-stripping	8.2
27662A	5641187-x		30		7	AMP 8 pin RJ45	
27669A	5506561-x	2464	300		16.2	Circular connector	47.8
27671A	5506577-x	2789	30		10.9	Amplimite 100 pin	84.6
27673A	5506577-x	2789	30		10.9	Amplimite 100 pin	84.6
27672A	5506577-x	2789	30		10.9	Amplimite 100 pin	84.6
27674A	5506574-x	2464	300		10.6	DB 25 pin	56.6
27722A	5670347		300		15	AMP 25 pin	55
Group no.2 (From C1 / C2 cabinets to Control Booth)							
27676A	5506786-x		300		8.3	SCSI.50	60
27472A	5506802-x	4299	300	250		8 plug power strip CEI320 - (HBL4570C plug - ring terminal)	39
27492A	5506799-x	1354					
27493A	5506785-x	Category 5	150		5.5	RJ45	14.1
27494A	5506805-x	2464	300		6	DB 9 pin	30.9
27505A	5506785-x	Category 5	150		5.5	RJ45	14.1
29010A	5506782	2464	300			IEC Power Connectors	
29011A	5506782	2464	300			IEC Power Connectors	
29012A	5506782	2464	300			IEC Power Connectors	
29013A	5506783-x	2464	300			IEC Power Connectors	

MIS number	Cable Assembly	UL Style	Voltage rating (V)	Max Voltage carried (V)	Cable diameter (mm)	Connector type	Bigger Plug size (mm)
29024A	5506782	2464	300			IEC Power Connectors	
29041A	5506804						
Group no.3 (From C1 to C2 cabinets)							
27677A	5506739-2	2463	600		8.3	Metrimate 6 pin	29.8
27678A	5670357	Type CL2	Low Volt-age SCSI		10	SCSI 50C	77
28260A	5506777-x	Type CL2	Low Volt-age SCSI		10	SCSI 50C	77
27679A	5670349	Fiber Optic					
27522A	5506729-2	2464	300		7	CEI 320 - HBL4570C plug	38.6
27523A	5506733-2						
27680A	5670356			600			
27681A	5670354						
27682A	5506769-4						
27683A	5670358						
27684A	5670355						
27686A	5670360	2464	300		8.1	DB 9 pin	34.4
28254A	5506737-2						
27561A	5506773-4						
Group no. 4-4 (LCD Suspension)							
28045	2385191		30V			VGA	
28046	2385192		30V			VGA	
28047	2385191		30V			VGA	
28048	2385192		30V			VGA	
28049	2385191		30V			VGA	
28050	2385192		30V			VGA	
28051	2385191						
28052	2385192						
28053	2385191						
28054	2385192						
28066	5314764	1354	30V			BNC	14.4
28067	5314765	1354	30V			BNC	14.4
28068	5314764	1354	30V			BNC	14.4
28069	5314765	1354	30V			BNC	14.4
28070	5314764	1354	30V			BNC	14.4
28071	5314765	1354	30V			BNC	14.4
28072	5314764	1354	30V			BNC	14.4

MIS number	Cable Assembly	UL Style	Voltage rating (V)	Max Voltage carried (V)	Cable diameter (mm)	Connector type	Bigger Plug size (mm)
28073	5314765	1354	30V			BNC	14.4
28074	5314764	1354	30V			BNC	14.4
28075	5314765	1354	30V			BNC	14.4
28076	5314764	1354	30V			BNC	14.4
28077	5314765	1354	30V			BNC	14.4
28078	5314764						
28079	5314765						
28080	5314764						
28081	5314765						
28082	5314764						
28083	5314765						
28084	5314764						
28085	5314765						
28086	5314764						
28087	5314765						
28088	5314764						
28089	5314765						
28120	2385195		300			Power	
28121	2385196		300			Power	
28172	2385212	2789	30			DB-9pin	
28173	2385213	2789	30			DB-9pin	
28186	2385197		300			Power	
28187	2385198		300			Power	
28189	2385200					G/Y	
28190	2385201					G/Y	
28194	2385213	2560	30		6.6		
28195	2390545	2789	300			DB-9pin	
28196	2390546	2789	300			DB-9pin	
28990	2385191						
28991	2385191						
28992	2385191						
28993	2385191						
28998	2385192						
28999	2385192						
29000	2385192						
29001	2385192						
29015	5314764						

MIS number	Cable Assembly	UL Style	Voltage rating (V)	Max Voltage carried (V)	Cable diameter (mm)	Connector type	Bigger Plug size (mm)
29016	5314765						
29183	2385212	2560	30		6.6		
Ergo Suspension System Cable Group							
28045	5389522-2	2919				VGA	
28047	5389522-2	2919				VGA	
28066	5411950	1354				BNC	
28068	5411952	1354				BNC	
28070	5411950	1354				BNC	
28072	5411952	1354				BNC	
29183	5389527-2	2941				DB9	
28186	5389524-2						
28189	5389525-2	1283					
28195	5389526-2	2517				DB9	
50001	5406224-2	2464					
Fluoro UPS Option Cable Set							
28256A	5507666-2						
28258A	5507676-2						
28262A	5507679-4						
28257A	5507680-2						
28261A	5507762						
28259A	5506777-1 2						
28260A	5506777-1 1						
Reference Monitor Cable in 'ref. monitor kit in control room'							
27500A	5719295						

4.2 MIS (Master Interconnect System)

Optima 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

- *Optima CL320i, CL323i, IGS320 MIS Map*
- *Optima CL320i, CL323i, IGS320 MIS Charts*

General Guidelines

Optima 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.

4.3 Cable Channeling

4.3.1 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 [Physical Runs](#).

4.3.2 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).

4.3.3 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.

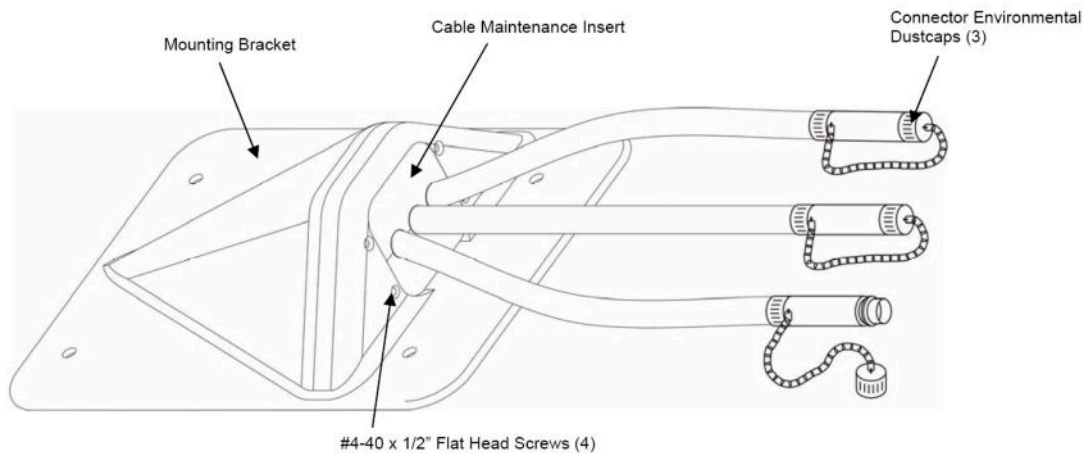
NOTE: Medrad AVANTA and Mac-lab cables exit behind the table in the patient room.

NOTE:

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 5-25: 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 5-26: MEDRAD Avanta floor mounting methods

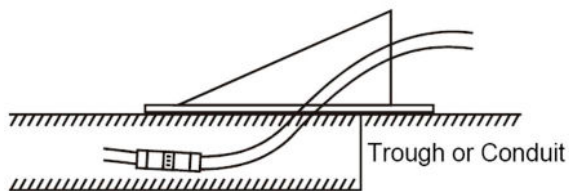


Figure 1

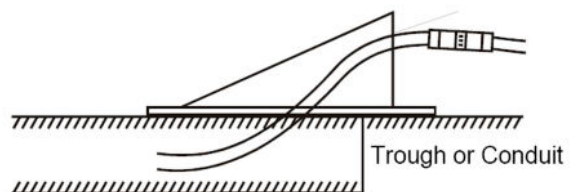
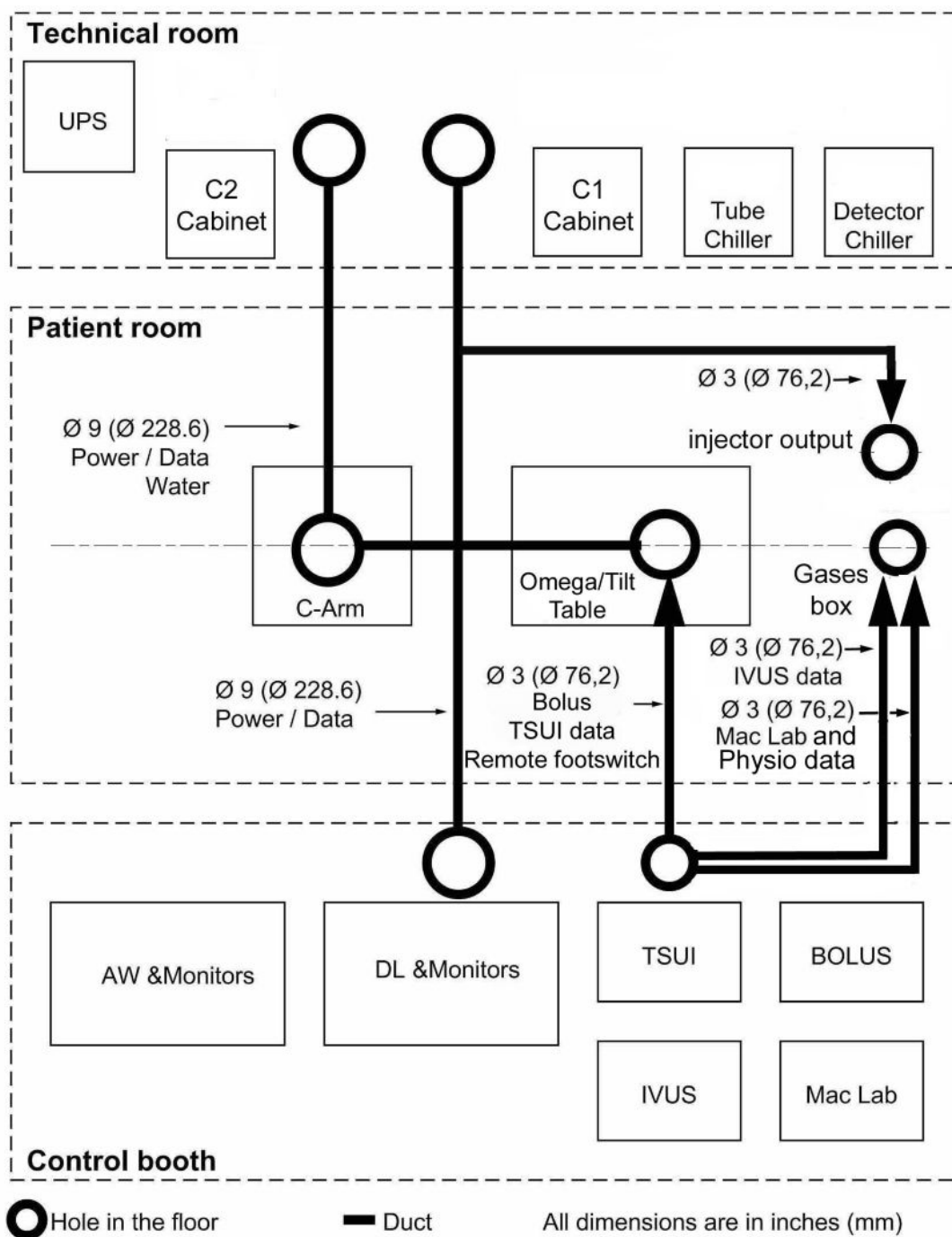


Figure 2

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

Illustration 5-27: 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.

NOTE: Never connect the **Physio** module to the ground.

The Physio cable can run in the same conduit as the Bolus cable. In this case, it is required to have a conduit between the table and the physio gases box.

If no conduit available between rear of table and Control Room (no Remote TSUI, no MacLab...), need to define proper cable routing or create new conduit as per PIM requirements.

If there is no physio gases box behind the table in the lay out, find a local solution to hide the hole in the floor and the cable exit.

On some sites there is only one conduit between Exam room and Control room for the MacLab

5 Lighting Specifications

5.1 Room Light Distribution

5.1.1 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.

Technical room, operating room and control room shall be provided with appropriate lighting in the maintenance area (maintenance area to be considered are service workplaces). It corresponds to service areas as defined for any of the product components.

The minimum required average luminance E_m shall be of 500Lx and minimum color rendering factor Ra of 80 as per IEC/EN 12464-1 (Light and lighting. Lighting of work places. Indoor work places: Illumination requirements for indoor workplaces corresponding to assembly of medium size electrical components, e.g. control panel) for the electrical industry).

5.1.2 Lighting Relay

Optima CL320i, CL323i, IGS320 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.

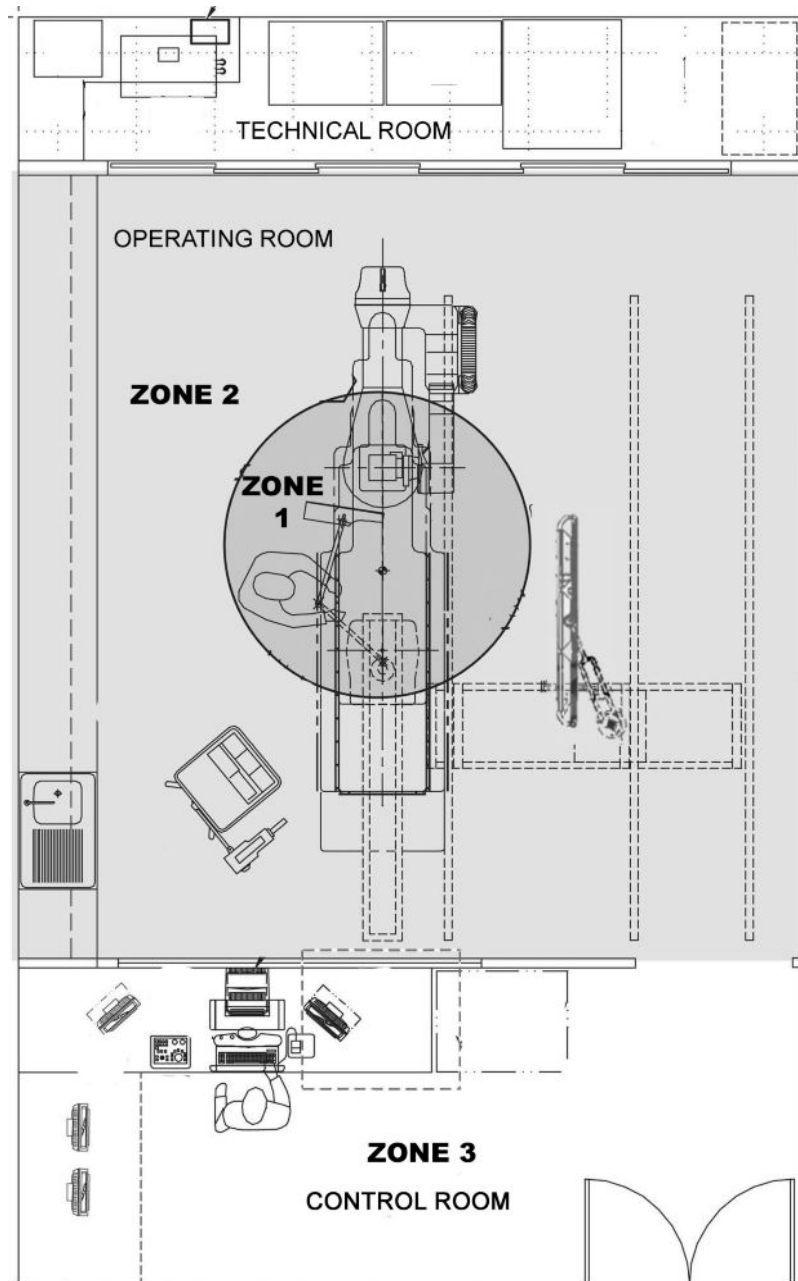
The wire size to connect to the C2 cabinet is 1.5 mm² (AWG 14).

Relay rating is max 600 VAC

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

5.1.3 Room Lighting for System

Illustration 5-28: Room Lighting Zones



5.1.4 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.

Chapter 6 Communication Requirements

1 Network Requirements

1.1 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 System.

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



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.

2 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

Chapter 7 Appendix

1 PIST0021 - US Fluoro UPS and PDB connection

1.1 Personnel Requirements

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

1.2 Preliminary Requirements

1.2.1 Tools and Test Equipment

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

1.2.2 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.	-	-

1.3 Procedure

1.3.1 Connection of the Power Distribution Box

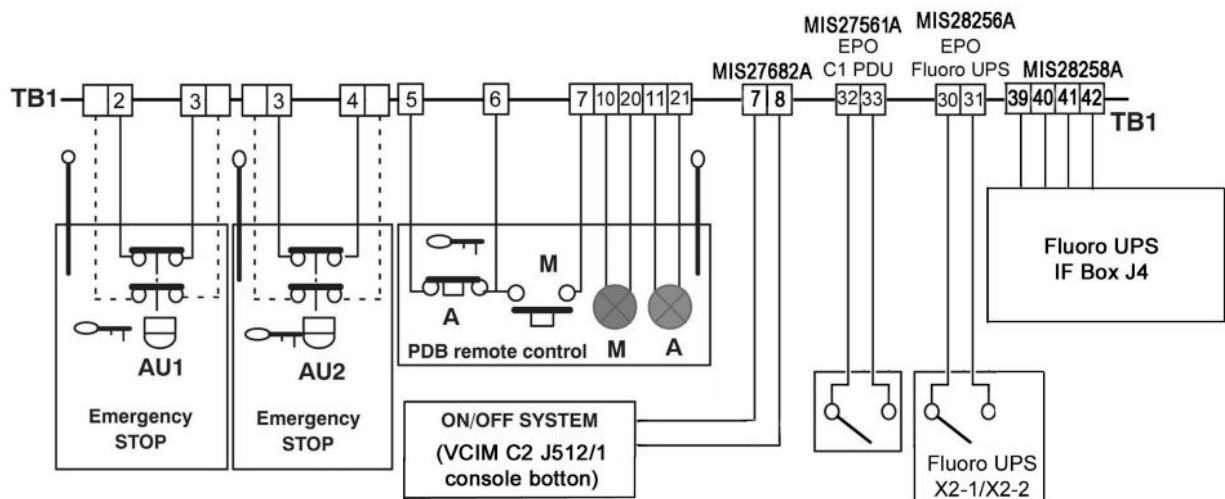


NOTICE

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.

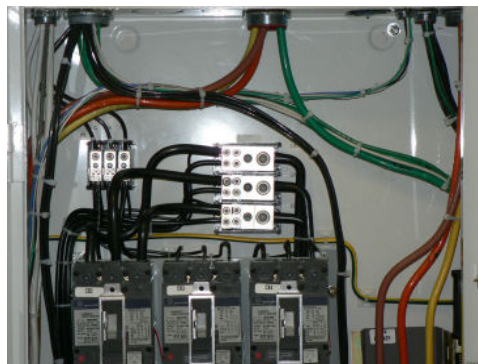
1. Connect the ON/OFF, Remote control and Emergency Power Off devices.

Illustration 7-1:



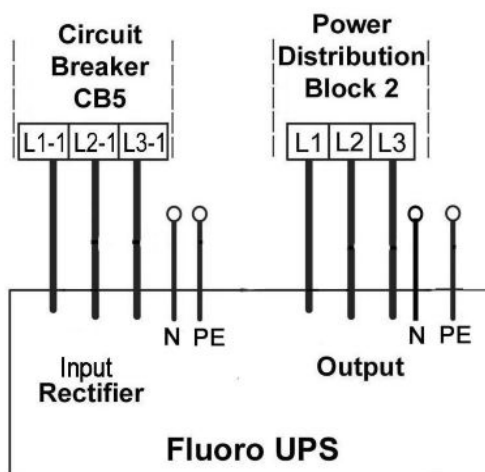
2. If the Fluoro UPS option is installed, remove the L1A, L2A and L3A jumpers linking the Power Distribution Block 1 and the Power Distribution Block 2.

Illustration 7-2:



3. Connect the Power distribution cables.

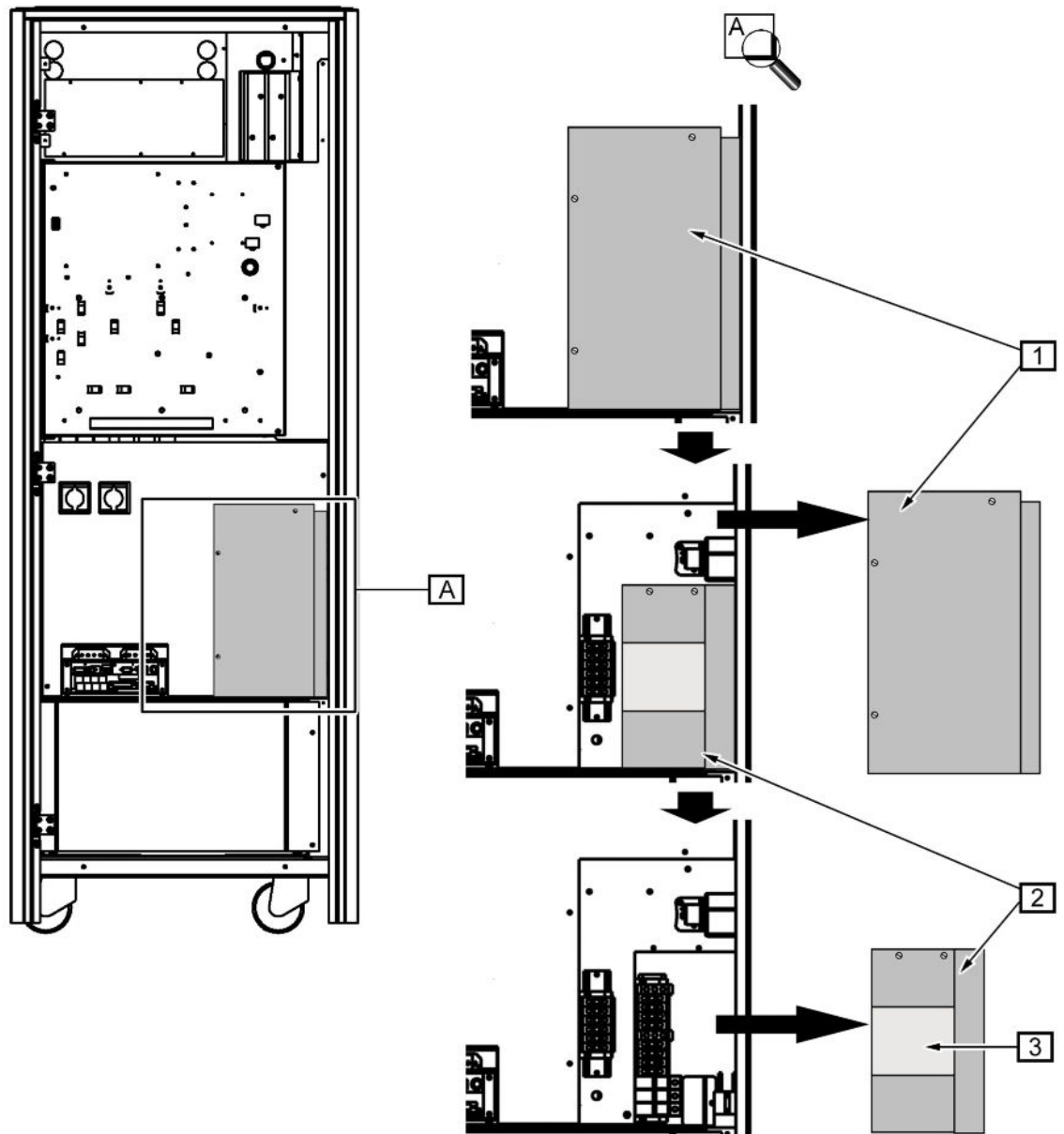
Illustration 7-3:



1.3.2 Connection of the Fluoro UPS Option Cables

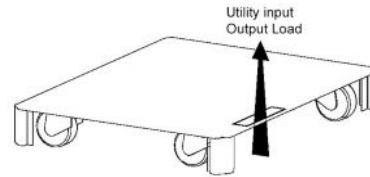
1. Connect the Fluoro UPS power cables.
 - a. Remove the protection panel **1**.

Illustration 7-4:



- b. Remove the protection panel (2, Illustration 7-4).
- c. Remove the metallic window (3) from the protection panel (2) (Illustration 7-4).
- 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 7-5:



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



WARNING

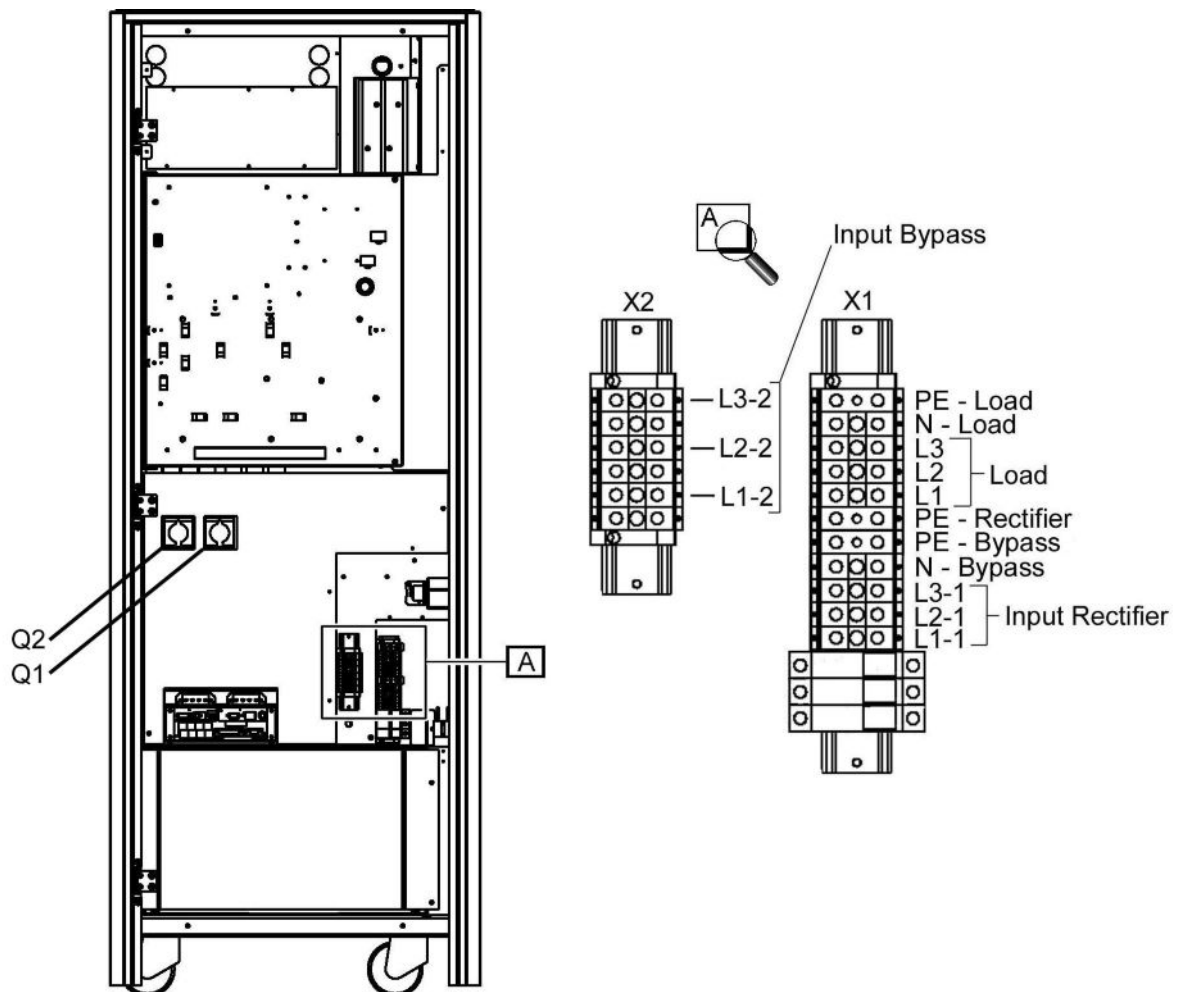
RISK OF ELECTRIC SHOCK

HIGH VOLTAGE PRESENT

THE FLURO UPS REQUIRES COMMON 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 7-6:



- f. Connect the Fluoro UPS rectifier input cable from PDB CB5 as follows ([Illustration 7-6](#)):

- 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 output cable from PDB power block 2 as follows ([Illustration 7-6](#)):
- 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.

1.4 Finalization

No finalization steps.

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