Discovery™ IGS 7, Discovery™ IGS 7 OR

Pre-Installation Manual

5730951-1EN
3

Language policy

Direction 2128126 - Language Policy For Service Documentation

ПРЕДУПРЕЖДЕНИЕ (BG)	Това упътване за работа е налично само на английски език. • Ако доставчикът на услугата на клиента изиска друг език, задължение на клиента е да осигури превод. • Не използвайте оборудването, преди да сте се консултирали и разбрали упътването за работа. • Неспазването на това предупреждение може да доведе до нараняване на доставчика на услугата, оператора или пациента в резултат на токов удар, механична или друга опасност.
警告 (ZH-CN)	本**维**修手册**仅**提供英文版本。 • 如果客**户**的**维**修服**务**人**员**需要非英文版本，**则**客**户**需自行提供翻**译**服**务**。 • 未**详细阅读**和完全理解本**维**修手册之前，不得**进**行**维**修。 • 忽略本警告可能**对维**修服**务**人**员**、操作人**员**或患者造成**电击**、机械**伤**害或其他形式的**伤**害。
警告 (ZH-HK)	本服務手冊僅提供英文版本。 • 倘若客**戶**的服務供應商需要英文以外之服務手冊，客**戶**有責任提供翻譯服務。 • 除非已參**閱**本服務手冊及明白其**內**容，否則切勿嘗試維修設備。 • 不遵從本警告或會令服務供應商、網絡供應商或病人受到觸電、機械性或其他的危險。
警告 (ZH-TW)	本維修手冊僅有英文版。 • 若客**戶**的維修廠商需要英文版以外的語言，應由客**戶**自行提供翻譯服務。 • 請勿試圖維修本設備，除非 您已**查閱**並瞭解本維修手冊。 • 若未留意本警告，可能導致維修廠商、操作員或病患因觸電、機械或其他危險而受傷。
UPOZOR-ENJE (HR)	Ovaj servisni priručnik dostupan je na engleskom jeziku. • Ako davatelj usluge klijenta treba neki drugi jezik, klijent je dužan osigurati prijevod. • Ne pokušavajte servisirati opremu ako niste u potpunosti pročitali i razumjeli ovaj servisni priručnik. • Zanemarite li ovo upozorenje, može doći do ozljede davatelja usluge, operatera ili pacijenta uslijed strujnog udara, mehaničkih ili drugih rizika.
VÝSTRAHA (CS)	Tento provozní návod existuje pouze v anglickém jazyce. • V případě, že externí služba zákazníkům potřebuje návod v jiném jazyce, je zajištění překladu do odpovídajícího jazyka úkolem zákazníka. • Nesnažte se o údržbu tohoto zařízení, aniž byste si přečetli tento provozní návod a pochopili jeho obsah. • V případě nedodržování této výstrahy může dojít k poranění pracovníka prodejního servisu, obslužného personálu nebo pacientů vlivem elektrického proudu, respektive vlivem mechanických či jiných rizik.

ADVARSEL (DA)	Denne servicemanual findes kun på engelsk. • Hvis en kundes tekniker har brug for et andet sprog end engelsk, er det kundens ansvar at sørge for oversættelse. • Forsøg ikke at servicere udstyret uden at læse og forstå denne servicemanual. • Manglende overholdelse af denne advarsel kan medføre skade på grund af elektrisk stød, mekanisk eller anden fare for teknikeren, operatøren eller patienten.
WAAR-SCHUWING (NL)	Deze onderhoudshandleiding is enkel in het Engels verkrijgbaar. • Als het onderhoudspersoneel een andere taal vereist, dan is de klant verantwoordelijk voor de vertaling ervan. • Probeer de apparatuur niet te onderhouden alvorens deze onderhoudshandleiding werd geraadpleegd en begrepen is. • Indien deze waarschuwing niet wordt opgevolgd, zou het onderhoudspersoneel, de operator of een patiënt gewond kunnen raken als gevolg van een elektrische schok, mechanische of andere gevaren.
WARNING (EN)	This service manual is available in English only. • If a customer's service provider requires a language other than English, it is the customer's responsibility to provide translation services. • Do not attempt to service the equipment unless this service manual has been consulted and is understood. • Failure to heed this warning may result in injury to the service provider, operator or patient from electric shock, mechanical or other hazards.
HOIATUS (ET)	See teenindusjuhend on saadaval ainult inglise keeles. • Kui klienditeeninduse osutaja nõuab juhendit inglise keelest erinevas keeles, vastutab klient tõlketeenuse osutamise eest. • Ärge üritage seadmeid teenindada enne eelnevalt käesoleva teenindusjuhendiga tutvumist ja sellest aru saamist. • Käesoleva hoiatuse eiramine võib põhjustada teenuseosutaja, operaatori või patsiendi vigastamist elektrilöögi, mehaanilise või muu ohu tagajärjel.
VAROITUS (FI)	Tämä huolto-ohje on saatavilla vain englanniksi. • Jos asiakkaan huoltohenkilöstö vaatii muuta kuin englanninkielistä materiaalia, tarvittavan käännöksen hankkiminen on asiakkaan vastuulla. • Älä yritä korjata laitteistoa ennen kuin olet varmasti lukenut ja ymmärtänyt tämän huolto-ohjeen. • Mikäli tätä varoitusta ei noudateta, seurauksena voi olla huoltohenkilöstön, laitteiston käyttäjän tai potilaan vahingoittuminen sähköiskun, mekaanisen vian tai muun vaaratilanteen vuoksi.

ATTENTION (FR)	Ce manuel d'installation et de maintenance est disponible uniquement en anglais. • Si le technicien d'un client a besoin de ce manuel dans une langue autre que l'anglais, il incombe au client de le faire traduire. • Ne pas tenter d'intervenir sur les équipements tant que ce manuel d'installation et de maintenance n'a pas été consulté et compris. • Le non-respect de cet avertissement peut entraîner chez le technicien, l'opérateur ou le patient des blessures dues à des dangers électriques, mécaniques ou autres.
WARNUNG (DE)	Diese Serviceanleitung existiert nur in englischer Sprache. • Falls ein fremder Kundendienst eine andere Sprache benötigt, ist es Aufgabe des Kunden für eine entsprechende Übersetzung zu sorgen. • Versuchen Sie nicht diese Anlage zu warten, ohne diese Serviceanleitung gelesen und verstanden zu haben. • Wird diese Warnung nicht beachtet, so kann es zu Verletzungen des Kundendiensttechnikers, des Bedieners oder des Patienten durch Stromschläge, mechanische oder sonstige Gefahren kommen.
ΠΡΟΕΙΔΟΠΟΙΗΣΗ (EL)	Τοπαρόν εγχειρίδιο σέρβις διατίθεται στα αγγλικά μόνο. • Εάν το άτομο παροχής σέρβις ενός πελάτη απαιτεί το παρόν εγχειρίδιο σε γλώσσα εκτός των αγγλικών, αποτελεί ευθύνη του πελάτη να παρέχει υπηρεσίες μετάφρασης. • Μηνεπιχειρήσετε την εκτέλεση εργασιών σέρβις στον εξοπλισμό εκτός εάν έχετε συμβουλευτεί και έχετε κατανοήσει το παρόν εγχειρίδιο σέρβις. • Εάν δεν λάβετε υπόψη την προειδοποίηση αυτή, ενδέχεται να προκληθεί τραυματισμός στο άτομο παροχής σέρβις, στο χειριστή ή στον ασθενή από ηλεκτροπληξία, μηχανικούς ή άλλους κινδύνους.
FIGYELMEZTETÉS (HU)	Ezen karbantartási kézikönyv kizárólag angol nyelven érhető el. • Ha a vevő szolgáltatója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészíttetése. • Ne próbálja elkezdeni használni a berendezést, amíg a karbantartási kézikönyvben leírtakat nem értelmezték. • Ezen figyelmeztetés figyelmen kívül hagyása a szolgáltató, működtető vagy a beteg áramütés, mechanikai vagy egyéb veszélyhelyzet miatti sérülését eredményezheti.
AÐVÖRUN (IS)	Þessi þjónustuhandbók er aðeins fáanleg á ensku. • Ef að þjónustuveitandi viðskiptamanns þarfnast annas tungumáls en ensku, er það skylda viðskiptamanns að skaffa tungumálaþjónustu. • Reynið ekki að afgreiða tækið nema að þessi þjónustuhandbók hefur verið skoðuð og skilin. • Brot á sinna þessari aðvörun getur leitt til meiðsla á þjónustuveitanda, stjórnanda eða sjúklings frá raflosti, vélrænu eða öðrum áhættum.

AVVERTENZA (IT)	Il presente manuale di manutenzione è disponibile soltanto in lingua inglese. • Se un addetto alla manutenzione richiede il manuale in una lingua diversa, il cliente è tenuto a provvedere direttamente alla traduzione. • Procedere alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto. • Il mancato rispetto della presente avvertenza potrebbe causare lesioni all'addetto alla manutenzione, all'operatore o ai pazienti provocate da scosse elettriche, urti meccanici o altri rischi.
警告 (JA)	このサービスマニュアルには英語版しかありません。 • サービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。 • このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないでください。 • この警告に従わない場合、サービスを担当される方、操作員あるいは患者 さんが、感電や機械的又はその他の危険により負傷する可能性があります。
경고 (KO)	본 서비스 매뉴얼은 영어로만 이용하실 수 있습니다. • 고객의 서비스 제공자가 영어 이외의 언어를 요구할 경우, 번역 서비스를 제공하는 것은 고객의 책임입니다. • 본 서비스 매뉴얼을 참조하여 숙지하지 않은 이상 해당 장비를 수리하려고 시도하지 마십시오. • 본 경고 사항에 유의하지 않으면 전기 쇼크, 기계적 위험, 또는 기타 위험으로 인해 서비스 제공자, 사용자 또는 환자에게 부상을 입힐 수 있습니다.
BRĪDINĀJUMS (LV)	Šī apkopes rokasgrāmata ir pieejama tikai angļu valodā. • Ja klienta apkopes sniedzējam nepieciešama informācija citā valodā, klienta pienākums ir nodrošināt tulkojumu. • Neveiciet aprīkojuma apkopi bez apkopes rokasgrāmatas izlasīšanas un saprašanas. • Šī brīdinājuma neievērošanas rezultātā var rasties elektriskās strāvas trieciena, mehānisku vai citu faktoru izraisītu traumu risks apkopes sniedzējam, operatoram vai pacientam.
ĮSPĖJIMAS (LT)	Šis eksploatavimo vadovas yra tik anglų kalba. • Jei kliento paslaugų tiekėjas reikalauja vadovo kita kalba – ne anglų, suteikti vertimo paslaugas privalo klientas. • Nemėginkite atlikti įrangos techninės priežiūros, jei neperskaitėte ar nesupratote šio eksploatavimo vadovo. • Jei nepaisysite šio įspėjimo, galimi paslaugų tiekėjo, operatoriaus ar paciento sužalojimai dėl elektros šoko, mechaninių ar kitų pavojų.
ADVARSEL (NO)	Denne servicehåndboken finnes bare på engelsk. • Hvis kundens serviceleverandør har bruk for et annet språk, er det kundens ansvar å sørge for oversettelse. • Ikke forsøk å reparere utstyret uten at denne servicehåndboken er lest og forstått. • Manglende hensyn til denne advarselen kan føre til at serviceleverandøren, operatøren eller pasienten skades på grunn av elektrisk støt, mekaniske eller andre farer.

OSTRZEŻE-NIE (PL)	Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim. • Jeśli serwisant klienta wymaga języka innego niż angielski, zapewnienie usługi tłumaczenia jest obowiązkiem klienta. • Nie próbować serwisować urządzenia bez zapoznania się z niniejszym podręcznikiem serwisowym i zrozumienia go. • Niezastosowanie się do tego ostrzeżenia może doprowadzić do obrażeń serwisanta, operatora lub pacjenta w wyniku porażenia prądem elektrycznym, zagrożenia mechanicznego bądź innego.
ATENÇÃO (PT-BR)	Este manual de assistência técnica encontra-se disponível unicamente em inglês. • Se outro serviço de assistência técnica solicitar a tradução deste manual, caberá ao cliente fornecer os serviços de tradução. • Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica. • A não observância deste aviso pode ocasionar ferimentos no técnico, operador ou paciente decorrentes de choques elétricos, mecânicos ou outros.
ATENÇÃO (PT-PT)	Este manual de assistência técnica só se encontra disponível em inglês. • Se qualquer outro serviço de assistência técnica solicitar este manual noutro idioma, é da responsabilidade do cliente fornecer os serviços de tradução. • Não tente reparar o equipamento sem ter consultado e compreendido este manual de assistência técnica. • O não cumprimento deste aviso pode colocar em perigo a segurança do técnico, do operador ou do paciente devido a choques eléctricos, mecânicos ou outros.
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 şi 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.

UPOZOR-ENJE (SR)	Ovo servisno uputstvo je dostupno samo na engleskom jeziku. • Ako klijentov serviser zahteva neki drugi jezik, klijent je dužan da obezbedi prevodilačke usluge. • Ne pokušavajte da opravite uređaj ako niste pročitali i razumeli ovo servisno uputstvo. • Zanemarivanje ovog upozorenja može dovesti do povređivanja servisera, rukovaoca ili pacijenta usled strujnog udara ili mehaničkih i drugih opasnosti.
UPOZORNE-NIE (SK)	Tento návod na obsluhu je k dispozícii len v angličtine. • Ak zákazníkov poskytovateľ služieb vyžaduje iný jazyk ako angličtinu, poskytnutie prekladateľských služieb je zodpovednosťou zákazníka. • Nepokúšajte sa o obsluhu zariadenia, kým si neprečítate návod na obluhu a neporozumiete mu. • Zanedbanie tohto upozornenia môže spôsobiť zranenie poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, mechanické alebo iné ohrozenie.
ATENCION (ES)	Este manual de servicio sólo existe en inglés. • Si el encargado de mantenimiento de un cliente necesita un idioma que no sea el inglés, el cliente deberá encargarse de la traducción del manual. • No se deberá dar servicio técnico al equipo, sin haber consultado y comprendido este manual de servicio. • La no observancia del presente aviso puede dar lugar a que el proveedor de servicios, el operador o el paciente sufran lesiones provocadas por causas eléctricas, mecánicas o de otra naturaleza.
VARNING (SV)	Den här servicehandboken finns bara tillgänglig på engelska. • Om en kunds servicetekniker har behov av ett annat språk än engelska, ansvarar kunden för att tillhandahålla översättningstjänster. • Försök inte utföra service på utrustningen om du inte har läst och förstår den här servicehandboken. • Om du inte tar hänsyn till den här varningen kan det resultera i skador på serviceteknikern, operatören eller patienten till följd av elektriska stötar, mekaniska faror eller andra faror.
OPOZORILO (SL)	Ta servisni priročnik je na voljo samo v angleškem jeziku. • Če ponudnik storitve stranke potrebuje priročnik v drugem jeziku, mora stranka zagotoviti prevod. • Ne poskušajte servisirati opreme, če tega priročnika niste v celoti prebrali in razumeli. • Če tega opozorila ne upoštevate, se lahko zaradi električnega udara, mehanskih ali drugih nevarnosti poškoduje ponudnik storitev, operater ali bolnik.
DİKKAT (TR)	Bu servis kılavuzunun sadece ingilizcesi mevcuttur. • Eğer müşteri teknisyeni bu kılavuzu ingilizce dışında bir başka lisandan talep ederse, bunu tercüme ettirmek müşteriye düşer. • Servis kılavuzunu okuyup anlamadan ekipmanlara müdahale etmeyiniz. • Bu uyarıya uyulmaması, elektrik, mekanik veya diğer tehlikelerden dolayı teknisyen, operatör veya hastanın yaralanmasına yol açabilir.

Revision History

Part/Rev	Date	Reason for Change	Pages
5730951-1EN rev 1	April 10, 2017	Initial Release of 5730951-1EN	204
5730951-1EN rev 2	September 19, 2017	Release after HII review	220
5730951-1EN rev 3	November 6, 2017	Post FDR3 release	220

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Contents

Chapter 1 General Requirements

1.1 Objectives & Overview

1.1.1 Object and Scope of this manual

1.1.1.1 Object and Scope

The Pre-installation Manual is a specification document used for planning and preparing a site for a Discovery™ IGS System installation.

The name Discovery™ IGS system is used to designate indifferently Discovery™ IGS 730 or Discovery™ IGS 740. In this case, the procedure and /or tests are applicable indifferently to both systems.

This document applies to following configurations:

- Discovery™ IGS 730 configuration delivered with Innova^{IQ} table or Innova^{IQ} OR table,
- Discovery™ IGS 730 configuration compatible with the Magnus Maquet OR Table (delivered without table),
- Discovery™ IGS 740 configuration delivered with Innova^{IQ} table or Innova^{IQ} OR table,
- Discovery™ IGS 740 configuration compatible with the Magnus Maquet OR Table (delivered without table).

In addition, this document provides references to the pre-installation documents of the various products included in the 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 System, environmental and electrical requirements and some additional planning aids.

This document does not cover the Magnus Maquet OR table pre-installation, for information refer to the manufacturer Pre-installation Manual.

WARNING

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

1.1.1.2 Quebec

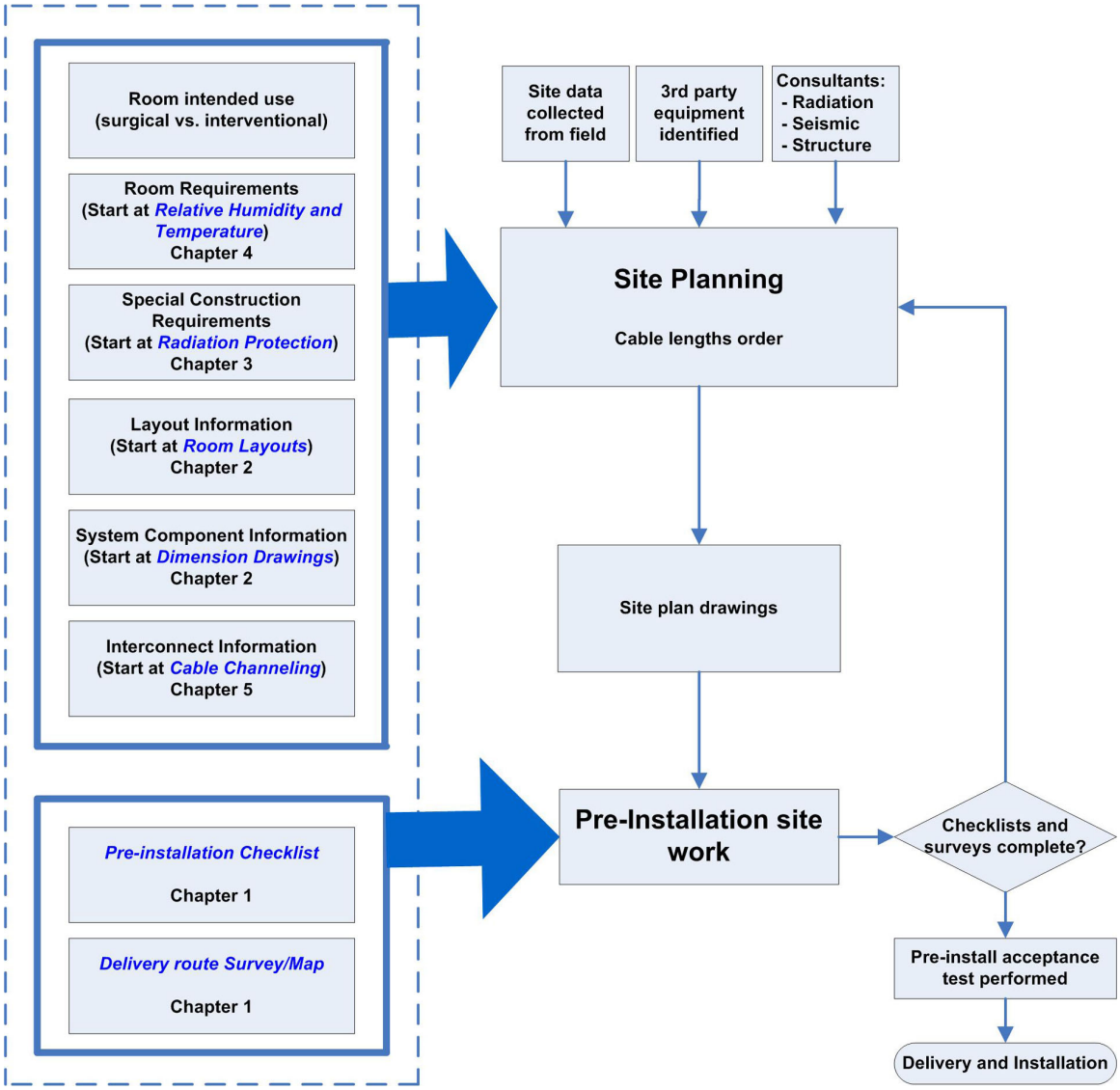
GE Healthcare is "GE Santé" in Province of Quebec - Canada.

1.1.2 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.

Figure 1 Pre-Installation Process



1.2 Customer Responsibilities

1.2.1 Responsibilities of the Purchaser/Customer

To ensure that the installation of the 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 with the customer and assign responsibilities as appropriate.

Contract Changes:

The cost of any alteration or modification not specified in the sales contract will be payable by the customer.

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

1. GE-supplied equipment:
    - **(For Suspension with rails)** Monitor suspension stationary rails (if part of the order)
    - **(For LDM Suspension with fixed point Dual Arm)** Substructure for Dual Arm suspension (S18391MX)

      NOTE

      Means necessary to anchor of the Substructure for Dual Arm suspension (anchors, bolts, screws, etc.) are not delivered with the kit and should be provided and designed under customer responsibility.
    - **(For Innova^{IQ} Table and Innova^{IQ} OR Table)** Table base plate

      NOTE

      It is critical to have the Table base plate flushed in the concrete.
    - **(For USA only)** System of Anchorage for Seismic Event (SAFE).

      NOTE

      Means of attachment (anchors, bolts, screws) necessary to anchor the pole of the SAFE are not delivered with the kit and should be provided under customer responsibility.

2. Customer supplied equipment:
    - MDP (Mains Disconnect Panel).
    - Power cables to PDU
    - EPO cable MDP-PDU
    - Ground cable MDP-PDU
    - **(For USA only)** Means of attachment (anchors, bolts, screws) necessary to anchor the pole of the SAFE

- **(For LDM Suspension with fixed point Dual Arm)** Means necessary to anchor of the Substructure for Dual Arm suspension (anchors, bolts, screws, etc.)

NOTICE

The mechanical interface design for the CMS fixation falls under the customers contractor responsibility, including the means for reducing potential air leakage to meet the room overpressure specification (if applicable).

The Magnus Maquet OR table is **not a GE-supplied** equipment. Its installation is under customer responsibility.

1.2.2 Equipment Classifications

The following equipment classifications are applicable to the product.

Table 1

Classification category	Equipment classification
Protection against electric shock	Class I  **WARNING** TO AVOID THE RISK OF ELECTRIC SHOCK, THIS EQUIPMENT MUST ONLY BE CONNECTED TO A SUPPLY MAINS WITH PROTECTIVE EARTH.
Degree of protection against electric shock	With InnovaIQ Table and InnovaIQ OR Table: Type B applied parts  Applied parts complying with the specified requirements of the IEC 60601-1 standard to provide protection against electric shock, particularly regarding allowable patient leakage current and patient auxiliary current include: • Innova^{IQ} Table and Innova^{IQ} OR Table mattress • Innova^{IQ} Table and Innova^{IQ} OR Table accessories: shoulder rest, foot rest, digital head holder, table head extender, armboard with replacement pad, Quick strap, Clear-Vu arm support, Removable rails (sleeve), Head widener with pad/cushion, Width extender with pad/cushion, armboard with thick pad/cushion, rail extender and patient restraint strap with cushion. With Magnus Maquet OR Table: Refer to the manufacturer Pre-installation Manual.
Degree of protection against harmful ingress of water	Ordinary equipment (enclosed equipment without protection against ingress of water, IPX0) except: • Smart Box, TSSC, Central touch screen (ITU) (all protected against splashing, IPX4), • Footswitch (protected against the effects of permanent submersion, IPX8). **(For Innova^{IQ} Table and Innova^{IQ} OR Table)** Table, Table Panning Device (all protected against splashing, IPX4). **(For System configuration compatible with Magnus Maquet OR Table)** Refer to the Magnus Maquet OR table Pre-installation Manual for equipment complying with the specified requirements.

continued	
Classification category	**Equipment classification**
Method(s) of sterilization or disinfection recommended by the manufacturer	• Sterilization: not applicable • Disinfection: refer to operator manual (Chapter Safety and Regulatory section Disinfection), recommended disinfecting agents.
Degree of safety of application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide	Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide. The system does not fulfill the requirements for AP/APG classification (IEC 60601-1).
Mode of operation	Continuous operation with intermittent loading.
Specification of Laser system	Protection class: Class 1 (in accordance with IEC 60825-1 and certified devices according to 21 CFR). **CLASS 1 LASER PRODUCT** Location of Laser Aperture: Through front clear window of the scanner (see picture in Service Manual in Safety and Regulatory /) • Laser Wavelength: 780 nm nom. • Pulse Duration: 0.5 µs nom. • Scanner Average Output Power: 20 µW max • Internal Laser Source Power: 1.8 mW max • Divergence: Horizontal <0.5 mrad Vertical 25 mrad nom. • Beam Out of Plane: <60 mm @ 10 m The product integrates a laser product for localization purposes. The laser is mounted on the vehicles pole above 2 meters height and continuously rotates to scan its environment. It emits an infrared laser beam invisible for a human eye. The emitted beam poses no risk to a person's eyes or skin.

(For Innova^{IQ} OR Table) The Innova^{IQ} OR Table mattress has antistatic properties. As it is connected to the ground and placed on a conductive tabletop, this provides an antistatic leakage path for the surgical configuration: it is mandatory to use the Innova^{IQ} OR Table mattress provided with the equipment.

The Discovery systems are compliant to electromagnetic compatibility IEC 60601-1-2 Edition 1 (1993) Edition 2.1 (2004) and Edition 3 (2007) standards for medical devices.

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).

1.2.3 Pre-Installation Checklist

Refer to the document *Global Site Readiness Checklist DI - DOC1809666* for standard HPM requirements on Room preparation for Vascular Systems installation.

See also the specific preparation requirements for IGS Systems installation given in sections 3, 4 and 5 of the Tab "Installation Prerequisites" in document *IGS System Installation Prerequisites - DOC2024755*.

NOTE

DOC1809666 and DOC2024755 are available from MyWorkshop.

1.3 Delivery Requirements

1.3.1 Shipping Information

1.3.1.1 Product Shipping Information

For the packaged parts dimensions and weights, refer to:

- Table 2 on page 7 and Table 3 on page 9 for systems with Innova^{IQ} Table or Innova^{IQ} OR Table.
- Table 2 on page 7 and Table 4 on page 10 for system configuration compatible with the Magnus Maquet OR Table.

Table 2 Products or Components for all Discovery IGS systems configurations

PRODUCT OR COMPONENT	DIMENSIONS MM (INCHES)			WEIGHT KILOGRAMS (POUNDS)	METHOD OF SHIPMENT
	Height	Length	Depth		
Gantry (shipping & moving): Full configuration	2060 (81.1)	1410 (55.5)	2890 (113.7)	1100 (2425)	On dolly, see Figure 2 on page 11
Gantry (moving): Left Top Handle removed and Right Top Handle inside	2060 (81.1)	1280 (50.4)	2890 (113.7)	1088 (2398)	
Gantry (moving): Short lifts configuration	2120 (83.5)	1280 (50.4)	2300 (90.5)	940 (2072)	
Gantry (moving): No dolly Configuration	2000 (78.7)	1260 (49.6)	2150 (84.6)	715 (1576)	For moving in hospital only

Products or Components for all Discovery IGS systems configurations continued					
PRODUCT OR COMPONENT	**DIMENSIONS MM (INCHES)**			**WEIGHT KILOGRAMS (POUNDS)**	**METHOD OF SHIPMENT**
	Height	**Length**	**Depth**		
Gantry Dolly Packaging (Gantry full configuration (on dolly) + pallet)	2280 (89.8)	1560 (61.4)	3080 (121.3)	1250 (2755)	See Figure 3 on page 12
Bottom antico covers	480 (18.9)	900 (35.4)	1755 (69.1)	18.3 (40.3)	On pallet
Gantry Cover set	1250 (49.2)	1000 (39.4)	1200 (47.2)	29 (63.9)	On pallet
Gantry Pole and laser covers	485 (19.1)	710 (27.9)	1755 (69.1)	9.1 (20.1)	On pallet
Gantry Saucer technical covers	-	-	-	0.9 (1.98)	On pallet
(For USA only) Pole of Gantry Anchorage System for Seismic Event	1550 (61)	1100 (43.3)	1100 (43.3)	180 (396.8)	On pallet
(For USA only) Covers of Gantry Anchorage System for Seismic Event	1200 (47.2)	1200 (47.2)	800 (31.5)	25 (55.1)	On pallet
(For USA only) Documentation of Gantry Anchorage System for Seismic Event	-	-	-	-	Cardbord box
Cable Management System	1465 (57.7)	923 (36.3)	1812 (71.3)	475 (1047)	On pallet, see Figure 4 on page 13
CMS Pallet Assembly	1750 (68.9)	1100 (43.3)	2000 (78.7)	-	See Figure 5 on page 14
Cable Management System short covers	-	-	-	8.4 (18.5)	On pallet
Fixation parts for Y cover	170 (6.7)	180 (7.1)	470 (18.5)	1.5 (3.3)	On pallet
C-FRT Cabinet	2200 (87)	1480 (59)	850 (34)	645 (1.421)	On pallet, see Figure 6 on page 15
NPA PDU	2020 (80)	985 (39)	567 (22)	380 (838)	On pallet, see Figure 7 on page 16
X-Ray Tube housing	960 (37.7)	770 (30.3)	710 (28)	113 (250)	On pallet
Tube Chiller	1200 (47.2)	555 (21.8)	610 (24)	120 (264.5)	On pallet

Products or Components for all Discovery IGS systems configurations continued					
PRODUCT OR COMPONENT	**DIMENSIONS MM (INCHES)**			**WEIGHT KILOGRAMS (POUNDS)**	**METHOD OF SHIPMENT**
	Height	**Length**	**Depth**		
Detector Conditioner	550 (21.6)	470 (18.5)	350 (13.7)	17.6 (38.8)	On pallet
Cables	-	-	-	-	On pallet
Monitor susp. bridge	640 (25.2)	980 (38.6)	3060 (120.5)	210 (445)	On pallet
Monitor susp. rails	380 (15)	300 (12)	5960 (235)	160 (355)	On pallet
Fluoro UPS UL	2100 (82.7)	890 (35)	1000 (39.4)	561 (1235)	On pallet
Fluoro UPS CE	1750 (68.9)	890 (35)	1000 (39.4)	585 (1287)	On pallet
Gty Pole Cable set	200 (7.9)	400 (15.7)	400 (15.7)	1.2 (2.6)	On pallet
AGVC inner cable 3100	300 (11.8)	600 (23.6)	400 (15.7)	10 (22)	On pallet
Large Display Monitor (Eizo and Barco)	1050 (41.3)	1500 (59)	800 (31.4)	95 (209)	On pallet, see Figure 10 on page 18
LD system suspension with rails	1100 (43.3)	1100 (43.3)	1850 (72.8)	168 (370)	On pallet
LD suspension with rails 36m harness	230 (9)	800 (34.5)	800 (34.5)	62 (134)	On pallet

Table 3 Products or Components specific to systems with Innova^{IQ} Table or Innova^{IQ} OR Table

PRODUCT OR COMPONENT	**DIMENSIONS MM (INCHES)**			**WEIGHT KILOGRAMS (POUNDS)**	**METHOD OF SHIPMENT**
	Height	**Length**	**Depth**		
Innova^{IQ} / Innova^{IQ} OR Table Base Assembly	1160 (45.7)	1000 (39.4)	2150 (84.6)	700 (1534)	On pallet, see Figure 8 on page 17
Innova^{IQ} / Innova^{IQ} OR Table covers	600 (23.6)	940 (37)	940 (37)	50 (110)	On pallet, see Figure 9 on page 18
AGVC inner cable 4100	300 (11.8)	600 (23.6)	400 (15.7)	10 (22)	On pallet

Products or Components specific to systems with InnovaIQ Table or InnovaIQ OR Table continued					
PRODUCT OR COMPONENT	**DIMENSIONS MM (INCHES)**			**WEIGHT KILOGRAMS (POUNDS)**	**METHOD OF SHIPMENT**
	Height	**Length**	**Depth**		
Substructure for Dual Arm suspension (for Mavig suspension with fixed point dual arm for Large Display Monitor)	330 (13)	1040 (41)	490 (19.3)	70 (154.3)	On pallet, see Figure 11 on page 19
Mavig suspension with fixed point dual arm for Large Display Monitor	1860 (73.2)	2150 (84.6)	900 (35.4)	370 (815.7)	On pallet, see Figure 12 on page 20

Table 4 Products or Components specific to system configuration compatible with the Magnus Maquet OR Table

PRODUCT OR COMPONENT	**DIMENSIONS MM (INCHES)**			**WEIGHT KILOGRAMS (POUNDS)**	**METHOD OF SHIPMENT**
	Height	**Length**	**Depth**		
System cables group 1M (std length)	400 (15.7)	800 (31.5)	600 (23.6)	54.6 (120.4)	On pallet
I-Box	550 (21.6)	430 (16.9)	50 (1.9)	-	Box
I-Point	173 (6.8)	100 (3.9)	77 (3)	-	Box
Discovery Control Center (not equipped)	1450 (57.1)	540 (21.3)	580 (22.8)	-	On pallet

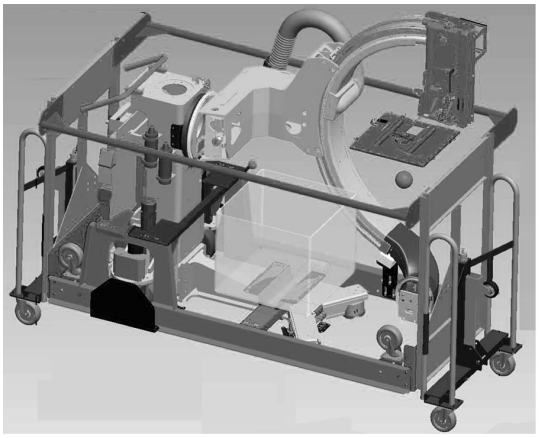
NOTE

For shipping information of the Magnus Maquet OR table, refer to the manufacturer Pre-installation Manual.

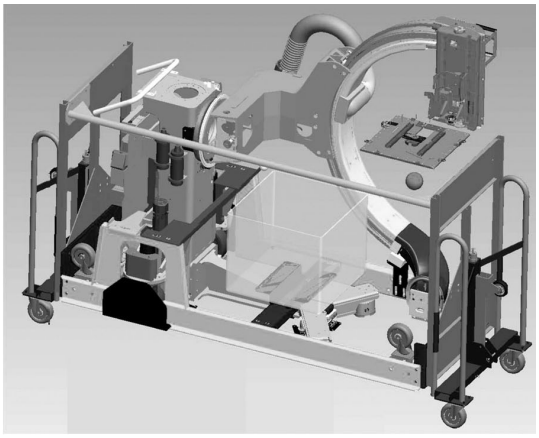
1.3.1.2 Detail of System Shipping Information

1.3.1.2.1 Gantry on Shipping Dolly

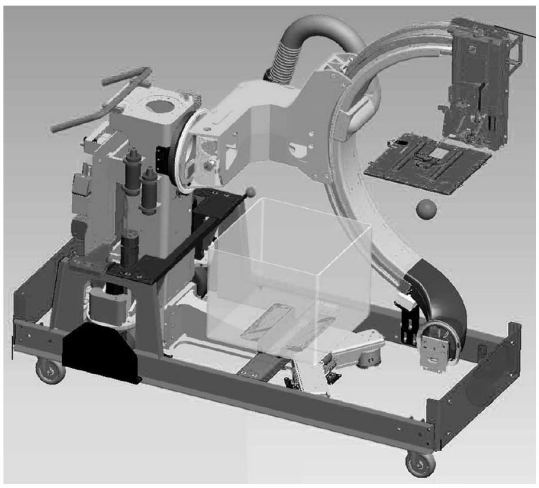
Figure 2 Gantry on Shipping Dolly



Full configuration : Right and Left Top handles outside



Left Top Handle removed and Right Top Handle inside



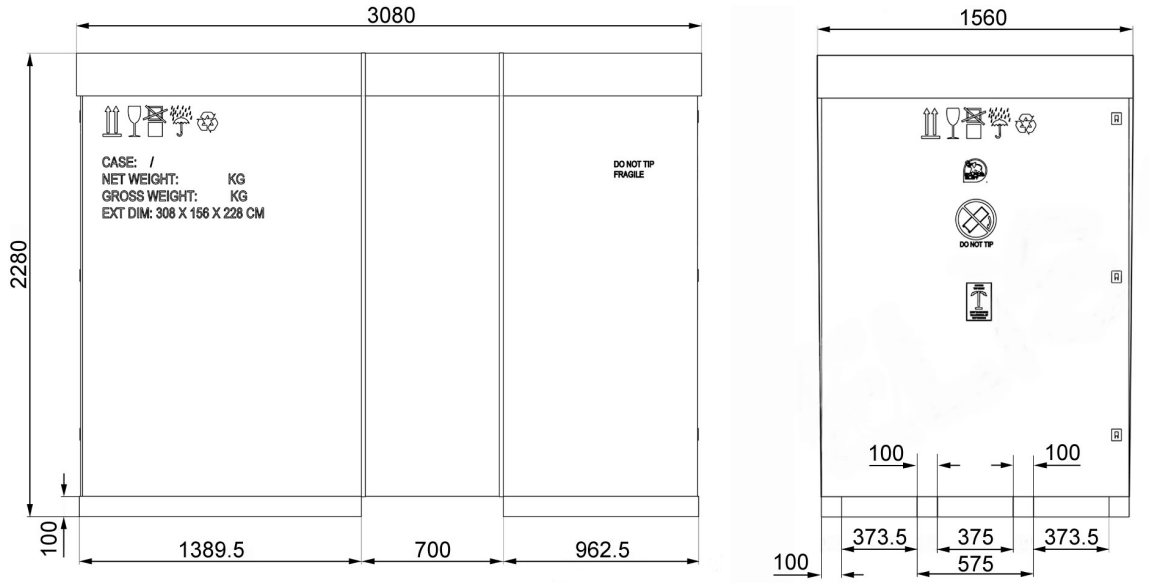
Short lifts configuration

NOTICE

If moving the Gantry without shipping dolly, there is a risk of damaging the floor surface.

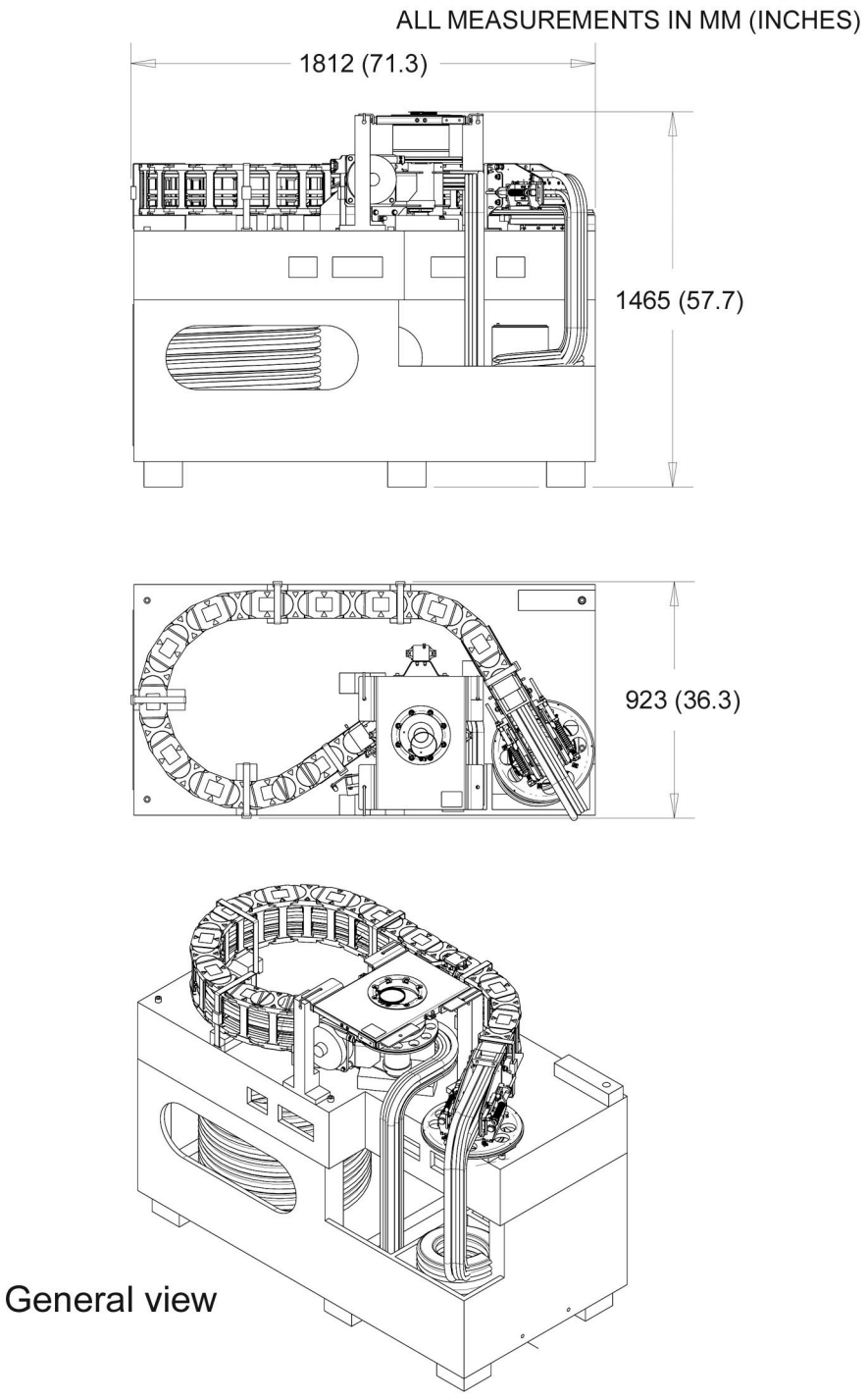
The gantry's dolly described above is packaged inside a specific transportation packaging as defined below:

Figure 3 Gantry Shipment



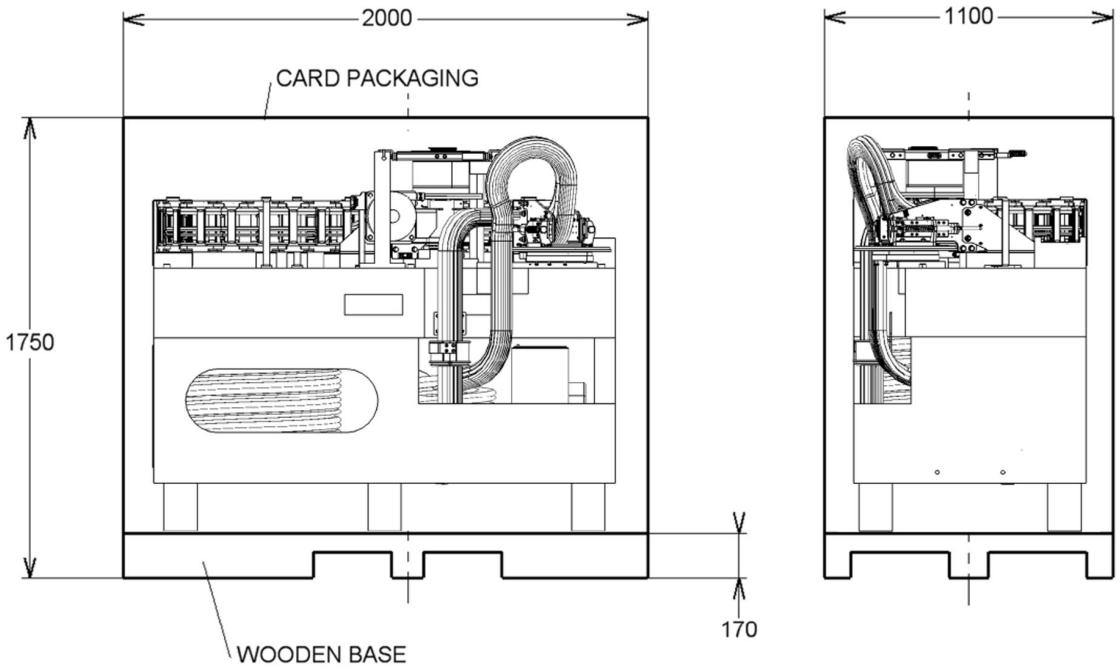
1.3.1.2.2 Cable Management System

Figure 4



The CMS Pallet Assembly described above is packaged inside a specific transportation packaging as defined below:

Figure 5 CMS Shipment



1.3.1.2.3 C-FRT Cabinet Shipment

Figure 6 C-FRT Cabinet Shipment

NOTE

Pallet is delivered as part of C-FRT Cabinet packaging.

1.3.1.2.4 NPA PDU Shipment

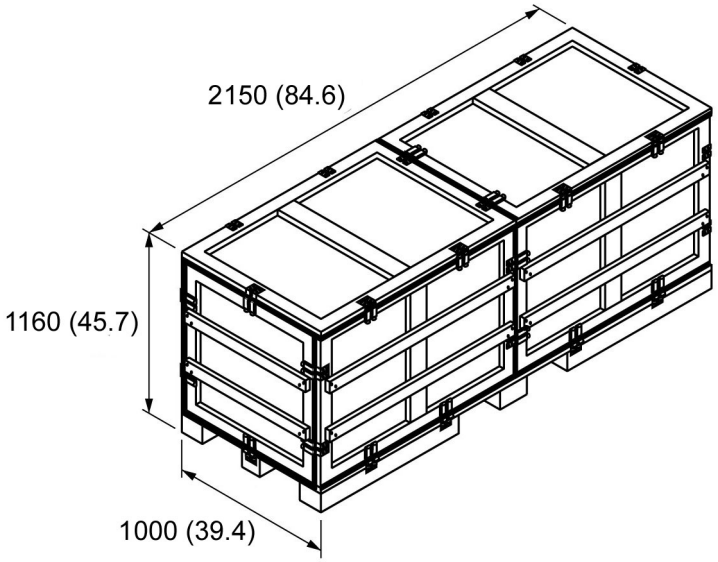
Figure 7 NPA PDU Shipment

NOTE

Pallet is delivered as part of NPA PDU packaging.

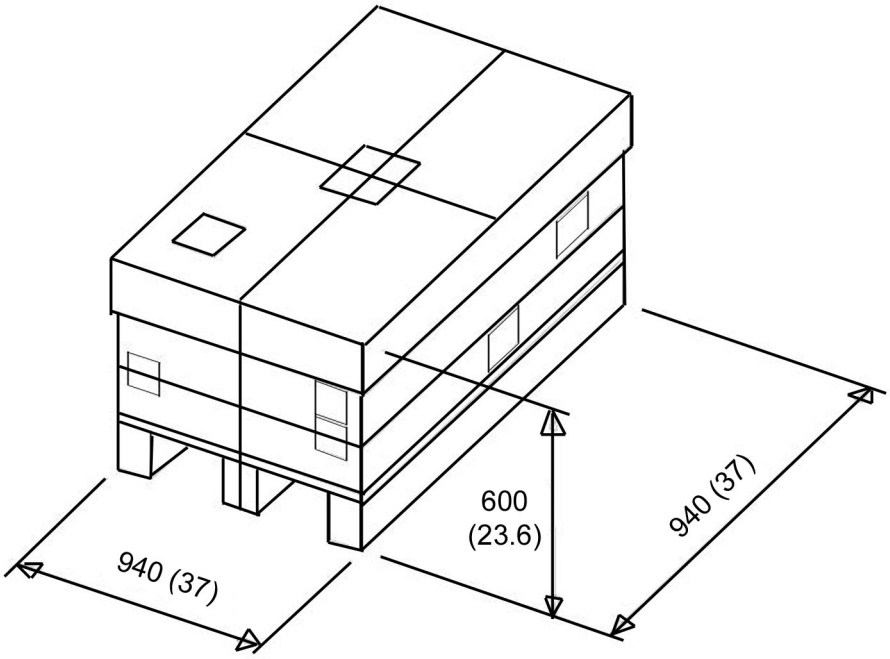
1.3.1.2.5 Innova^{IQ} Table and Innova^{IQ} OR Table Shipment

Figure 8 Innova^{IQ} Table and Innova^{IQ} OR Table Shipment



All dimensions are in mm (inches)

Figure 9 Covers Shipment



All dimensions are in mm (inches)

1.3.1.3 Large Display Monitor (Option)

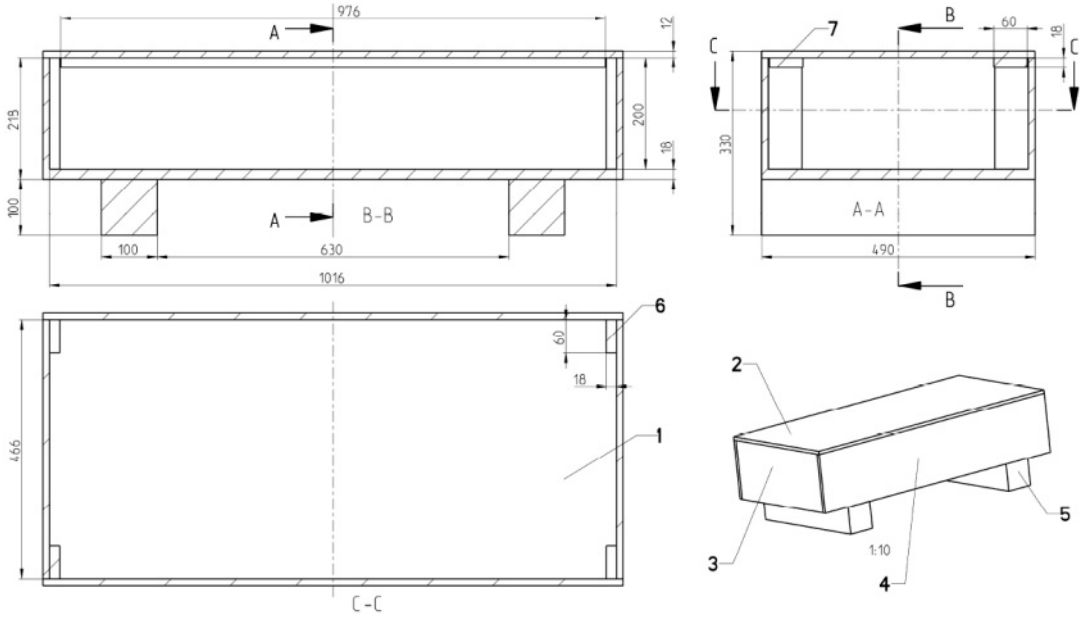
Figure 10 Large Display Monitor Shipment

Dimensions in mm (in)

1.3.1.4 Large Display Monitor suspension with fixed point dual arm

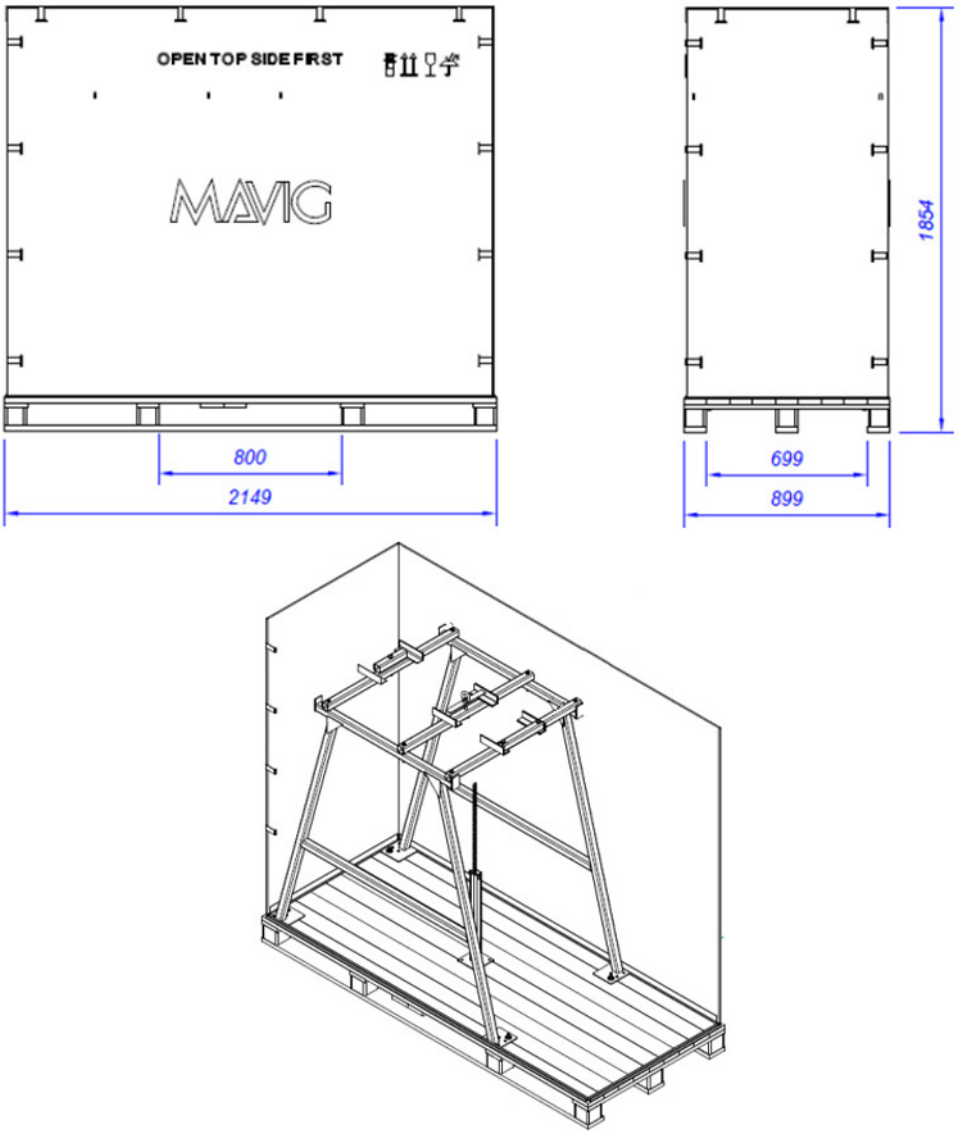
1.3.1.4.1 Substructure for Dual Arm suspension

Figure 11 Shipment of Substructure for Dual Arm suspension



1.3.1.4.2 Mavig suspension with fixed point dual arm for Large Display Monitor

Figure 12 MAVIG suspension with fixed point dual arm Shipment

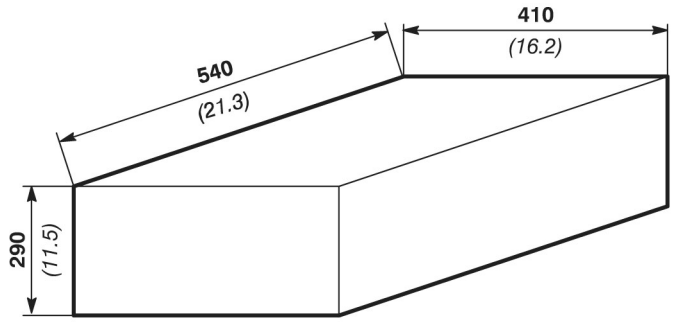


1.3.1.5 Other Elements Package

NOTE

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

Figure 13 Other Standard Shipping Box



1.3.2 Door Size Requirements

Minimum door sizes also apply to hallways and elevators. For additional details, refer to 1.3.1 Shipping Information on page 7.

1.3.2.1 Door Height

The minimum door height shall be determined to accommodate for the following components:

- The Gantry on its dolly: **2.06 m** (81.1 in).
- The C-FRT Cabinet on its pallet: **2.20 m** (87 in).

If the door height is not sufficient, you may need to:

- move the Gantry in no dolly configuration (refer to 1.3.1 Shipping Information on page 7),
- put the C-FRT Cabinet on its wheels (refer to Figure 38 on page 53 and to *IST0527 - C-FRT Cabinet Installation* in the Service Manual).

WARNING

Adhere to the limit of use described in the Installation Job Card.

1.3.2.2 Door Width

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

- 1.41 m (55.5 in) with protective side rail,
- 1.28 m (50.4 in) with Left Top Handle removed and Right Top Handle inside.

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.

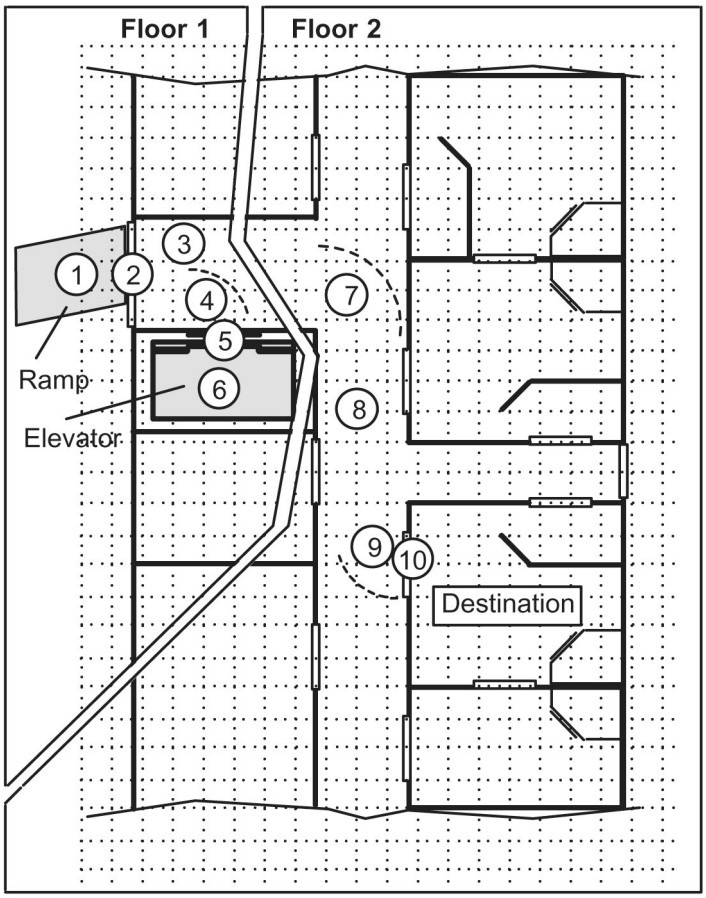
1.3.3 Route Survey

1.3.3.1 Step One – Sketch

Start preparing Route Survey by sketching a floor plan of the hospital or clinic which will receive the equipment. Include all areas on the delivery route from outside the building to destination. See Figure 14 on page 22.

Reference Numbers: Numbers in circles refer to Route Survey data. The Route Survey is a form on which site data are listed (see Step Two – Survey on page 22).

Figure 14



1.3.3.2 Step Two – Survey

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

1.3.3.3 Step Three – Check

Verify equipment can be transported via the route specified in Step One – Sketch on page 22. Compare Route Survey compiled in Step Two – Survey on page 22 to equipment specifications in this and other applicable pre–installation directions.

Table 5

Ref. no.	*Area:* loading dock, doorway, hallway, turn, elevator, obstruction, etc.	*Limitations:* loading capacity, height, width, depth flooring material, radius, etc.

1.4 Product Storage and Handling Requirement

1.4.1 Post-delivery warm up period

After delivery, and before unpacking the system components, allow 12 hours for the equipment to adjust to room temperature to avoid condensation or rapid temperature change.

For the monitors and UPS, allow 48 hours before the first power on if they have been exposed to higher than specified humidity level.

This warm up period is not required if the shipping environment has met the same temperature and humidity requirement as the destination room and the system components are already at steady room temperature.

Table 6 Transport Requirement

Component	TEMPERATURE		HUMIDITY		PRESSURE	
	MIN	MAX	MIN	MAX	MIN	MAX
All components except UPS, monitors and detector	-20°C (-4°F)	+55°C (+131°F)	10%	95%	700 hPa	1030 hPa
All UPS	-20°C (-4°F)	+40°C (+104°F)	10%	90%	700 hPa	1030 hPa

Transport Requirement continued						
Component	TEMPERATURE		HUMIDITY		PRESSURE	
	MIN	MAX	MIN	MAX	MIN	MAX
All Monitors	-20°C (-4°F)	+55°C (+131°F)	10%	80%	700 hPa	1030 hPa
Detector	+10°C (+50°F)	+40°C (+104°F)	10%	90%	700 hPa	1030 hPa

1.4.2 System Storage

If storing a system prior to installation, the system shall be stored in its original packaging in a temperature and humidity controlled environment protected from water and dust.

Table 7 Storage Requirement

Component	TEMPERATURE		HUMIDITY		PRESSURE	
	MIN	MAX	MIN	MAX	MIN	MAX
All components	+10°C (+50°F)	+40°C (+104°F)	10%	80%	700 hPa	1030 hPa

It is recommended that the temperature for storage does not exceed +25°C (+77°F).

Systems with the Fluoro UPS shall be stored for less than 6 weeks if the storage temperature is above 30°C (86°F), and less than 12 weeks if the storage temperature is above +25°C (+77°F).

Systems with the 8 kVA UPS shall be stored for less than 14 weeks if the storage temperature is above 30°C (86°F), and less than 25 weeks if the storage temperature is above +25°C (+77°F).

The overall storage time for the system shall be less than 6 months.

Special instructions for the detector:

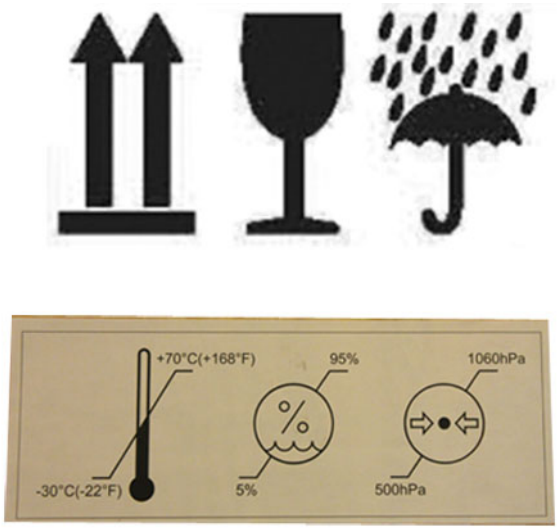
The detector is shipped separately from the system and is very sensitive to temperature and humidity, as irreparable damage to the detector scintillator will occur. As defined in Table 7 on page 24, it shall be stored between +10 and +40°C (+50 to +104°F) and less than 80% RH inside its unopened shipping box, the lowest temperature and humidity being preferable. If it is to be stored outside of its shipping box or if the plastic wrapping has been removed, it should be stored at +20°C (68°F) or less and 30% RH or less.

1.4.3 Handling instructions

The packaging of the following components must be marked with special handling instructions for transport:

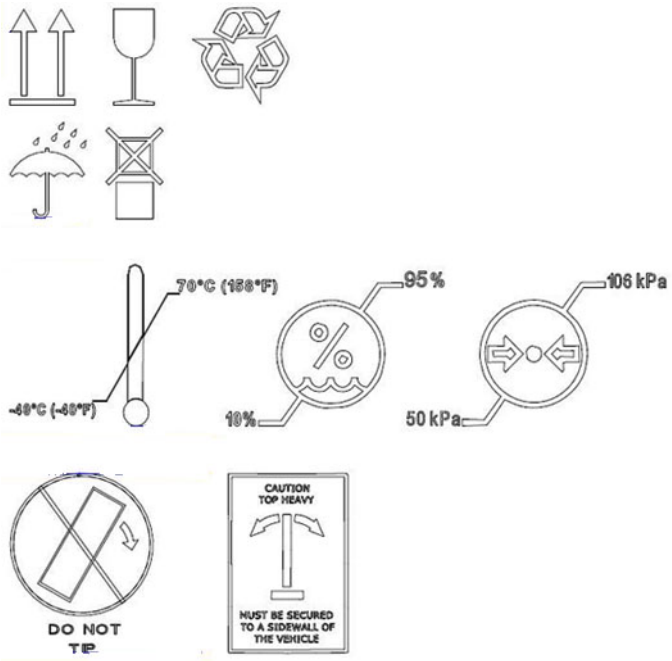
- NPA PDU

Figure 15 NPA PDU - Labels on packaging



- C-FRT Cabinet

Figure 16 C-FRT Cabinet - Labels on packaging



- Gantry

Figure 17 Gantry - Label on packaging

- **(For Innova^{IQ} Table and Innova^{IQ} OR Table)** Patient Table

Figure 18 Patient Table - Label on packaging

Chapter 2 Equipment Requirements

2.1 System Components

2.1.1 Presentation of the 3 Rooms

The components shall be installed in three different rooms with different constraints: the Exam Room, the Control Room and the Technical Room.

2.1.1.1 Exam Room

This is where the patient is situated. It contains the table on which the patient is lying, the table side user interfaces (TSUI), the gantry, the exam monitors, and accessories.

2.1.1.2 Control Room

This room contains user interface and control monitors. No intentional or unintentional contact with the patient shall occur with the patient in this area.

2.1.1.3 Technical Room

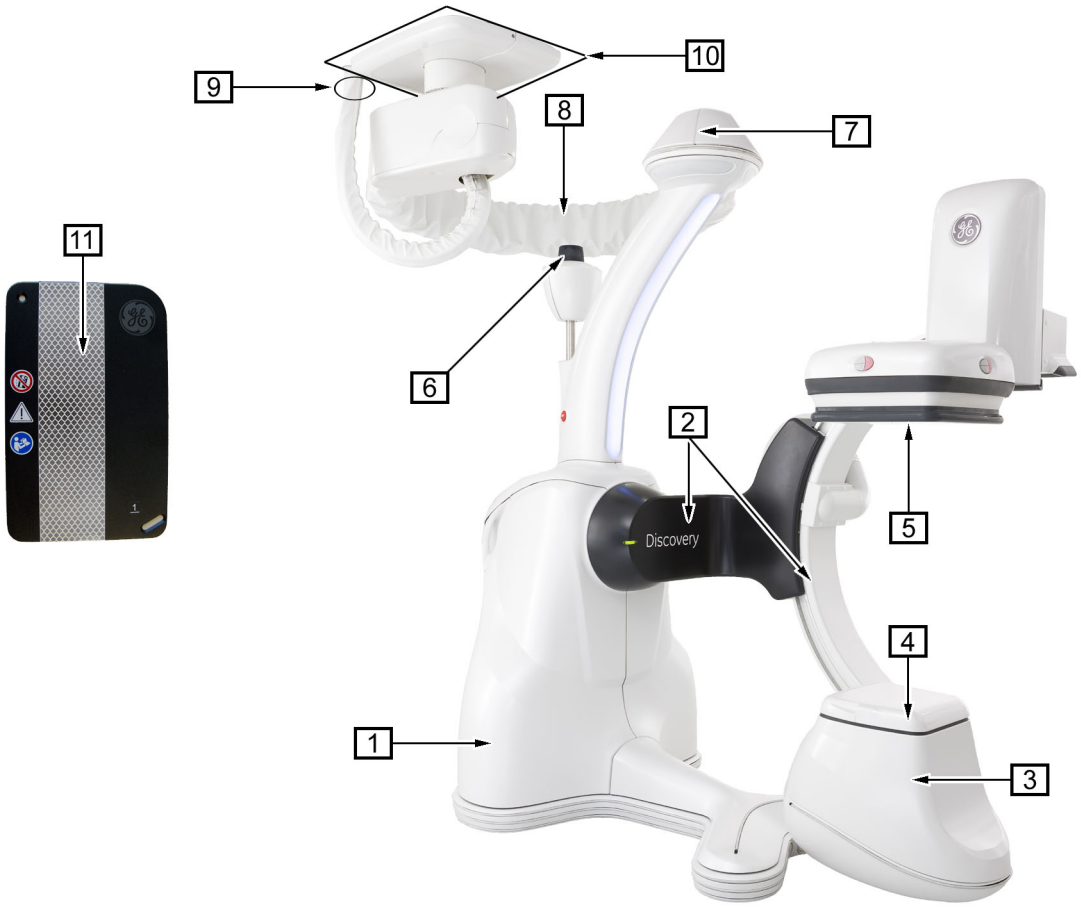
This room contains electronic cabinets. No intentional or unintentional contact with the patient shall occur with the patient in this area. It is strongly recommended that this room is separated from the Control Room, in order to minimize risks of transmission of airborne pathogens. Its construction should be adapted to minimize ambient noise level; for example the use of glass doors instead of louvered hung doors.

2.1.2 Description of the System

2.1.2.1 Core System

2.1.2.1.1 Gantry

Figure 19 Gantry



1. AGV
2. Pivot and C-Arc
3. X-Ray tube with collimator
4. X-Ray Tube cover spacer

NOTE

Depending on country regulation (i.e. USA and New Zealand), the tube cover Spacer must be installed over the X-ray tube cover.

5. Detector 31 cm or 41 cm

6. Laser
7. Saucer
8. Cable Management System (CMS)
9. CMS cable entry point to ceiling
10. CMS mounting interface
11. Positioning targets

(For USA only) As per California Building Code Section 1616A.1.18, a means to secure temporarily the gantry in place when the equipment is not in use for a period longer than 8 hours may be required by the enforcement agency of the hospital for the installation in California (US).

(For USA only) The System of Anchorage for Seismic Event (SAFE) is used to secure the gantry. The SAFE is a mechanical device to be anchored in the exam room floor. It is designed for Discovery IGS systems.

Figure 20 (For USA only) System of Anchorage for Seismic Event

2.1.2.1.2 Patient Table

Three tilting patient tables are available with the Discovery IGS System:

- Innova^{IQ} Table for interventional configuration (delivered by GE).
- Innova^{IQ} OR Table for surgical configuration (delivered by GE).
- Magnus Maquet OR Table for surgical configuration (delivered by Maquet).

NOTE

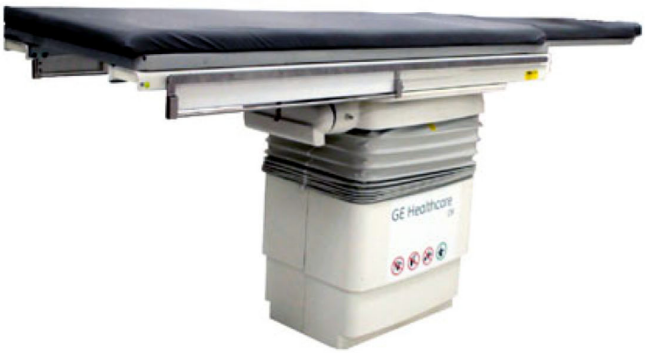
The Innova^{IQ} OR Table is compliant with the IEC 60601-2-46 standard.

NOTE

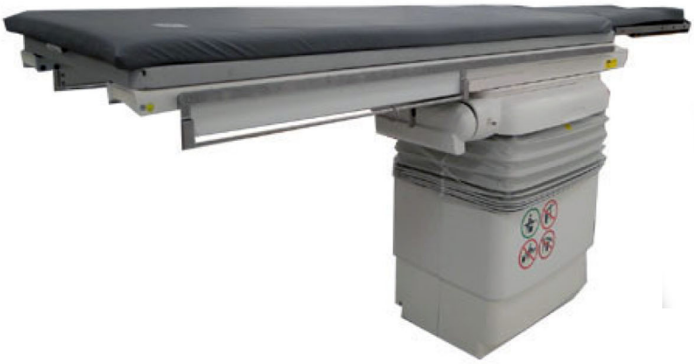
For details on Magnus Maquet OR Table, refer to the manufacturer Pre-installation Manual.

Figure 21 Innova^{IQ} Table and Innova^{IQ} OR Table

OR Table



Interventional Table



2.1.2.1.3 User Interfaces

Figure 22 User Interfaces for all Discovery IGS System configurations

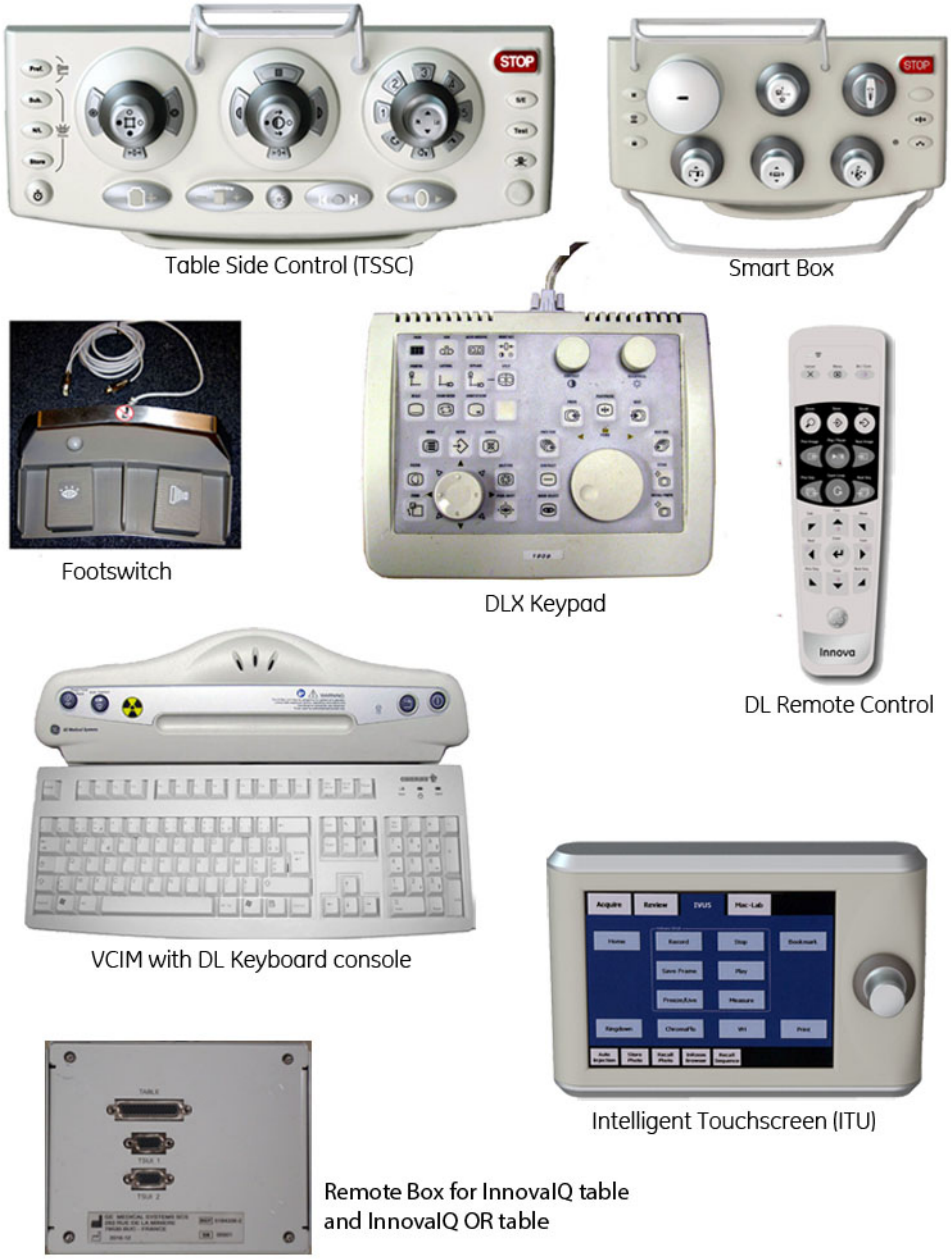
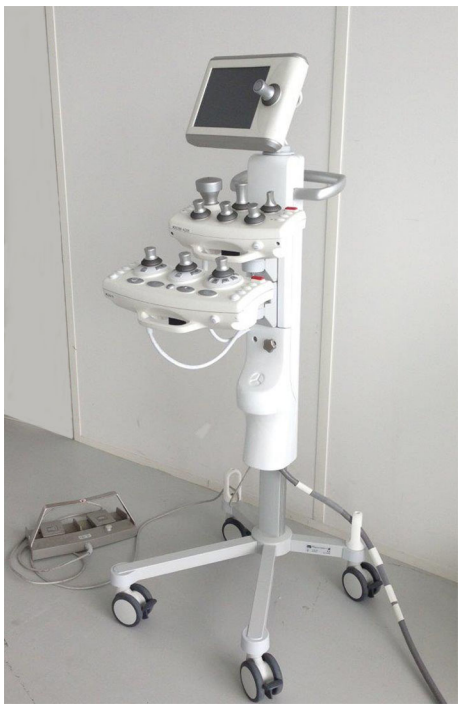


Table Panning device is not available for system configuration compatible with the Magnus Maquet OR Table.

Figure 23 (For Innova^{IQ} Table and Innova^{IQ} OR Table) Table Panning device

For system configuration compatible with the Magnus Maquet OR Table, it is mandatory to mount the TSSC, Smart Box and ITU on the Discovery Control Center.

Figure 24 Discovery Control Center



2.1.2.1.4 Monitors

By default:

- Two 19” monitors are provided in the Exam Room:
  - LIVE monitor,
  - REVIEW monitor.
- Two 19” monitors are provided in the Control Room:

- LIVE monitor,
- DL monitor.

2.1.2.1.5 Electronic Cabinets

The following cabinets are provided with the system:

- C-FRT cabinet, which contains the High Voltage generator, 2 PCs, IT components and the boards for the Gantry and Table control.
- NPA PDU (Power Distribution Unit)
- One UPS among:
  - 8 kVA UPS to maintain all functions except X-Ray acquisitions during power failures
  - Fluoro UPS (2 different models for UL and CE markets): to complete an exam in fluoroscopy mode during power failures. The autonomy is 5 minutes of fluoroscopy every 24 hours.
- Tube Chiller
- Detector Conditioner
- **(For System configuration compatible with Magnus Maquet OR Table)** I-Box

NOTE

The power supply of the Magnus Maquet OR Table must be installed in the Technical Room (refer to the manufacturer Pre-installation Manual).

2.1.2.2 Options

2.1.2.2.1 Large Display Monitor (LDM)

The system can integrate a Large Display solution to:

- see images larger at full IQ with greater flexibility in monitor distance in the procedure room,
- display multiple video images simultaneously at different sizes based on stage of workflow,
- conveniently switch operator defined video layouts at different points in procedure workflow.

This option consists in a 58” color monitor and 2 backup 19” monitors in the Exam Room. A second optional 58" monitor can be provided.

2.1.2.2.2 User Interfaces

User interfaces available on option are:

- **(For Innova^{IQ} Table and Innova^{IQ} OR Table)** In-room AW mouse interface kit.

  NOTE

  The dongle and the mouse are not provided in the kit.

- **(For Innova^{IQ} Table and Innova^{IQ} OR Table)** Bolus Handle

Figure 25 Optional User Interfaces

In-room AW mouse interface kit

Bolus handle

2.1.2.2.3 Monitors

According to the subscribed options, up to 9 optional monitors can be installed:

- 1 additional 19" monitor in the Exam Room (Roadmap),
- up to 2 additional 19" monitors in the Control Room (Review and Roadmap),
- up to 6 additional 19" monitors in the Exam Room or in the Control Room.

Table 8 Location of 19" monitors (mandatory and optional)

Video Splitter Output	Output 1	Output 2	Output 3	Output 4
Live	**Exam Room**	**Control Room**	Exam Room or Control Room	Exam Room or Control Room (1)
Review	**Exam Room**	Control Room	Exam Room or Control Room	Exam Room or Control Room (1)
Roadmap	Exam Room	Control Room	Exam Room or Control Room	Exam Room or Control Room (1)

NOTE

Text in **bold** for mandatory 19" monitors.

(1): without LDM option.

2.1.2.2.4 Monitor Suspensions

NOTICE

In the OR configuration of the System, it is mandatory to use a suspension that is compatible with the OR environmental constraints. The suspension provided by GE are not compatible with the OR environment and shall not be used.

GE provides as option several types of suspensions; alternatively, the customer can install the suspension of his choice (third party monitor suspension), provided all requirements in the paragraph Third party monitor suspension according to GEHC specifications on page 35 are met.

2.1.2.1 19" monitors suspension (without LDM)

The system can be equipped with a suspension for 4 monitors or 6 monitors.

The common type of this suspension is an XT inboard monitor bridge. A monitor frame support receiving 4 or 6 monitors (fixed monitor suspension).

This suspension is delivered and installed by GE.

2.1.2.2 LDM suspension

For the systems with the LDM option, a specific suspension can be provided:

- a suspension with rails
- a suspension with fixed point dual arm.

These suspensions are delivered and installed by GE.

The two backup monitors are mounted on the back of this suspension for faster access in case of failure.

For the second optional LDM, a wall mounting kit can be provided.

2.1.2.3 Third party monitor suspension according to GEHC specifications

The systems can be provided with a kit to interface a third-party suspension. It allows to power two B&W 19" monitors, up to 4 additional in-room 19" monitors (B&W or Color), and up to 2 Large Display monitors on one or several third-party suspensions of customer choice, in addition or in replacement of the standard Mavig Suspension usually provided with the system. The Live and Review monitors are mandatory in the Exam Room.

Third party monitors from external sources can also be installed on these suspensions, but shall not powered by the system.

Only the monitors provided by the system can be powered by the system:

- 19" monitors: Eizo RX150 GE or Eizo MX193,
- Large Display monitors: Eizo LS580W GE or Barco GEH-8258 L.

WARNING

It is the customer responsibility to ensure that the following requirements are met:

- The suspension shall not be electrically motorized for up/down motion.
- The suspension shall comply with the IEC 60601-1 standard and the applicable standards enforced in the country of installation (e.g. when installed in a European Community country, the suspension(s) shall be CE marked). In addition, for North America each suspension shall comply with UL/Canada deviations.
- The suspension shall be manually adjustable in height and the force to be applied to lift the suspension when fully equipped shall not exceed 200 N in static in the vertical axis, in order to mitigate the risk of patient being jammed between the table and monitor suspension when the table is lifted up.
- Each suspension shall be installed in order to mitigate the risk of suspension fall on patients and the risk of collisions with the gantry, the table or any other suspension.
- The monitors and other parts attached to the suspension shall be compliant with the maximum load supported by the suspension.
- Each suspension shall be attached to the ceiling in accordance to the manufacturer's instructions. It shall withstand the maximum suspension load with safety factors in accordance to applicable standards (at least 4x).
- Each suspension shall be compatible with the Environmental Requirements chapter of the Pre- Installation Manual of the system.
- When the system is installed in an operating room (OR configuration), each suspension shall be compatible with OR environmental constraints.

The kits to interface a third-party suspension contain the following cables:

Table 9

	Destination	4 monitors	6 monitors	LDM
Power and Ground	PDU	30 m	30 m	36 m
Infrared Receiver	C-FRT	30 m	30 m	36 m
Optional dose displays	Dose monitor control device	2 x 30 m	2 x 30 m	2 x 36 m

continued				
	Destination	**4 monitors**	**6 monitors**	**LDM**
Video cables for system monitors (RJ45 cables)	C-FRT	4 x 30 m	6 x 30 m	2 x 36 m
VGA cables for third-party monitors	Third-party video sources	2 x 30 m	2 x 36 m	—

NOTICE

In order to maintain the IQ performance of the system, only the video cables for the system monitors shall be used. No extension or additional restpoint is allowed.

The mechanical installation of the third-party suspension and the electrical installation of the third-party monitors are fully under the customer and the installer responsibility. They shall ensure that the third-party suspension and its cables are installed prior to the GE equipment (gantry, table, cabinet) so that the standard GE Service Process can be followed during the system installation. Monitors installation and connections to the GE equipment shall only be made in presence of a GE service representative.

The customer is responsible for providing and replacing any parts of the third-party suspension and monitors.

The overhead monitor suspension shall be installed by strictly following the GEHC installation instructions. GE specifically disclaims any and all liability arising out of or relating to the use or performance of the monitor suspension (including cables), including, without limitation, any liability or claims relating to patient injury, death, or the reliability of such monitors suspension.

The association of Discovery system delivered with kit to interface a third-party suspension and the customer monitors suspension(s), is not covered by the Discovery product certification.

Type of fixation:

- 19" monitors: standard VESA 100 x 100 mm
- Large display monitors: standard VESA 400 x 400 mm.

Weight for the maximum load calculation (for the monitors, refer to

Table 10

Part	**Max Weight (kg)**	**Dimensions W x H x D (mm)**
IR Receiver module	0.3	112 x 31 x 76
Dose display module	1	210 x 146 x 58

2.1.2.2.5 Advantage Windows workstation (AW)

The AW workstation option is composed of a workstation, 1 or 2 19" flat panel monitors in the Control Room.

One optional 19" flat panel monitor can be fixed on the Exam Room suspension, or both AW screens can be displayed on the LDM if the option is present.

2.1.2.2.6 CENTRICITY CA1000 option

NOTICE

Full CA1000 compatibility with a Tilting table is achieved with CA1000 V2 Spa8. All earlier versions are not compatible with a Lab equipped with a Tilting table. This restriction is related to sites where the images created by a lab with the Tilting table will be viewed on a CA1000. There is no restriction for sites where the images are viewed on an AW or other vendor's workstation.

Refer to :*Centricity Cardiology CA 1000 V2.0 Preinstallation Guide* in the OEMs of the Discovery™ IGS 7 Service Manual.

2.1.2.2.7 Injectors

The injectors certified for use with the system are:

Table 11

Certified Injectors	Innova^{IQ} Table	Innova^{IQ} Table	Magnus Maquet OR Table
Acist CVI (pedestal version)	Yes	Yes	Yes
MEDRAD Avanta (pedestal version)	Yes	Yes	Yes
MEDRAD Mark 7 (pedestal version)	Yes	Yes	Yes
MEDRAD Mark 7 (table mount version)	Yes	Yes	No
MEDRAD Mark 7 (ceiling mount)	Yes	Yes	Yes

NOTE

For MEDRAD Mark 7 table mount and ceiling mount, rack connected to C-FRT cabinet is located in technical room.

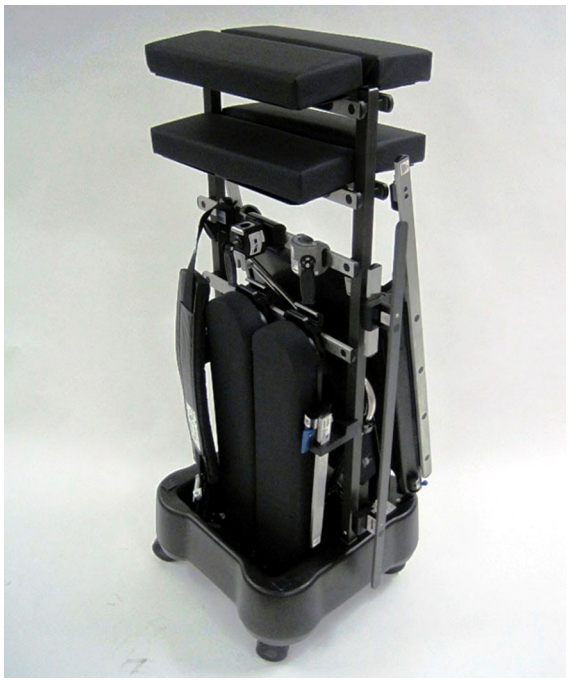
(For Innova^{IQ} Table and Innova^{IQ} OR Table) Table accessory rail load considerations:

Each table rail can withstand a load of 40 kg (88 lbs) at 150 mm (5.9") (60 N.m or 44.25 ft/lbs). Therefore, only a light load not exceeding 5 kg (11 lbs) at 100 mm (0.33 ft) can be mounted on the same table rail as the injector: for example IV pole with its accessories, pressure head, and so on. The front table rail is generally used for the TSUI.

The radiation protection and the injector shall never be installed on the same table rail.

2.1.2.2.8 Comfort accessories Cart

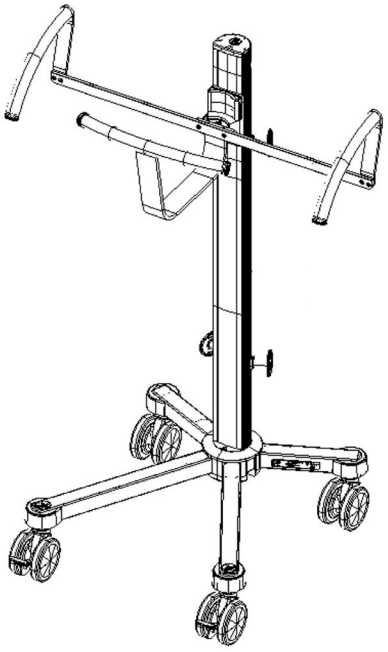
Figure 26 Comfort Accessories Cart



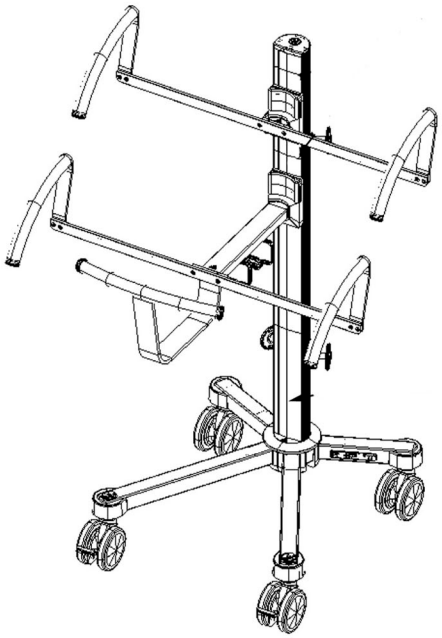
2.1.2.2.9 (For Innova^{IQ} Table and Innova^{IQ} OR Table) Tableside Cart

Figure 27 Tableside Cart

One rail configuration



Two rails configuration



2.1.2.3 Components location and characteristics

Table 12

PRODUCT OR COMPONENT	Number of components in:			NET WEIGHT kg (lbs)	DIMENSIONS WIDTH x DEPTH x HEIGHT mm (in)	LOAD ON THE FLOOR kg/m^2 (lb/ft^2)
	Exam Room	Control Room	Technical Room			
Gantry	1	-	-	Distributed load: 990 (2183) for Discovery IGS 730 and 1000 (2205) for Discovery IGS 740 Rear isolated load: 350 (772) Front isolated load: 110 (243)	See: • Figure 29 on page 45 • Figure 30 on page 46 • Figure 31 on page 47	Distributed load: 990 (202.7) for Discovery IGS 730 and 1000 (204.8) for Discovery IGS 740 Rear isolated load : 5.5 MPa Front isolated load : 8.1 MPa Refer to Figure 28 on page 45
System of Anchorage for Seismic Event (SAFE)	1	-	-	Not applicable	See Figure 33 on page 48	Not applicable
Innova^{IQ} Table Innova^{IQ} OR Table	1	-	-	1017 (2,242) See NOTE (1)	See Figure 35 on page 50	2260 (463)
(For Innova^{IQ} Table and Innova^{IQ} OR Table) Table Panning Device	1	-	-	Not applicable	Not applicable	Not applicable
Magnus Maquet OR Table	1	-	-	Refer to the manufacturer Pre-installation Manual	Refer to the manufacturer Pre-installation Manual	Refer to the manufacturer Pre-installation Manual
Footswitch	1	-	-	-	Not applicable	Not applicable

continued						
PRODUCT OR COMPONENT	**Number of components in:**			**NET WEIGHT kg (lbs)**	**DIMENSIONS WIDTH x DEPTH x HEIGHT mm (in)**	**LOAD ON THE FLOOR kg/m² (lb/ft²)**
	Exam Room	**Control Room**	**Technical Room**			
19" Monitors	2	1	-	5.5 (12)	See Figure 46 on page 59	Not applicable
Smart Box	1	-	-	6 (13)	Not applicable	Not applicable
TSSC	1	-	-	6 (13)	Not applicable	Not applicable
ITU	1	-	-	3.8 (8)	Not applicable	Not applicable
VCIM & X-ray handle	-	1	-	1 (2)	450 (17.7) x 150 (5.9) x 50 (2)	Not applicable
DL Keypad	-	1	-	1.4 (3)	See Figure 47 on page 60	Not applicable
DL Monitor	-	1	-	8.2 (18)	See Figure 45 on page 59	Not applicable
C-FRT Cabinet	-	-	1	531 kg (without LDM) 536 kg (with LMM802) 541 kg (with LMM56800)	see Figure 38 on page 53	643 (132)
NPA PDU	-	-	1	285 (628)	See Figure 39 on page 54	847 (173)
8 kVA UPS	-	-	1	84 (185)	see Figure 40 on page 55	Not applicable
Fluoro UPS UL	-	-		530 (1169)	See Figure 41 on page 56	975 (200)
Fluoro UPS CE				480 (1059)	See Figure 42 on page 57	883 (181)
Tube Chiller	-	-	1	120 (265)	See Figure 43 on page 58	424 (87)
Detector Conditioner	-	-	1	14.6 (32)	See Figure 44 on page 58	Not applicable
OPTIONS						
Monitors						

continued						
PRODUCT OR COMPONENT	**Number of components in:**			**NET WEIGHT kg (lbs)**	**DIMENSIONS WIDTH x DEPTH x HEIGHT mm (in)**	**LOAD ON THE FLOOR kg/m² (lb/ft²)**
	Exam Room	**Control Room**	**Technical Room**			
19" Monitors with stand	1 in Exam Room only Up to 2 in Control Room only Up to 6 in Exam Room **or** in Control Room		-	9.2 (20)	See Figure 46 on page 59	Not applicable
LD Monitor	Up to 2	-	-	47 (103)	1319 (52) x 146 (6) x 776 (31)	Not applicable
User Interfaces and accessories						
Additional Smart Box	1 in Exam Room **or** 1 in Control Room		-	6 (13)	Not applicable	Not applicable
Additional TSSC	1 in Exam Room **or** 1 in Control Room		-	6 (13)	Not applicable	Not applicable
(For Innova^{IQ} Table and Innova^{IQ} OR Table) In-room AW mouse interface kit	1		-	Not applicable	Not applicable	Not applicable
ECG Acquisition Device Modules						
Hubican	-	1	-	Not applicable	See Figure 48 on page 61	Not applicable
Physio box	1		-	Not applicable	See Figure 48 on page 61	Not applicable
Suspension						
Precabled 19" LCD monitor suspension for 4 monitors	1	-	-	102 (225)	See Figure 49 on page 62	Not applicable
Precabled 19" LCD monitor suspension for 6 monitors	1	-	-	115 (254)	See Figure 50 on page 63	Not applicable

continued						
PRODUCT OR COMPONENT	**Number of components in:**			**NET WEIGHT kg (lbs)**	**DIMENSIONS WIDTH x DEPTH x HEIGHT mm (in)**	**LOAD ON THE FLOOR kg/m² (lb/ft²)**
	Exam Room	**Control Room**	**Technical Room**			
Precabled LD suspension with rails (self weight without monitor and accessories given)	1	-	-	215 (474)	See Figure 51 on page 64	Not applicable
(For Innova^{IQ} Table and Innova^{IQ} OR Table) Precabled LD Mavig suspension with fixed point dual arm	1	-	-	190 (419)	See Figure 52 on page 65	Not applicable
(For Innova^{IQ} Table and Innova^{IQ} OR Table) Substructure for Dual Arm suspension (for LD Mavig suspension with fixed point dual arm)	1	-	-	58 (128)	See Figure 53 on page 66	Not applicable

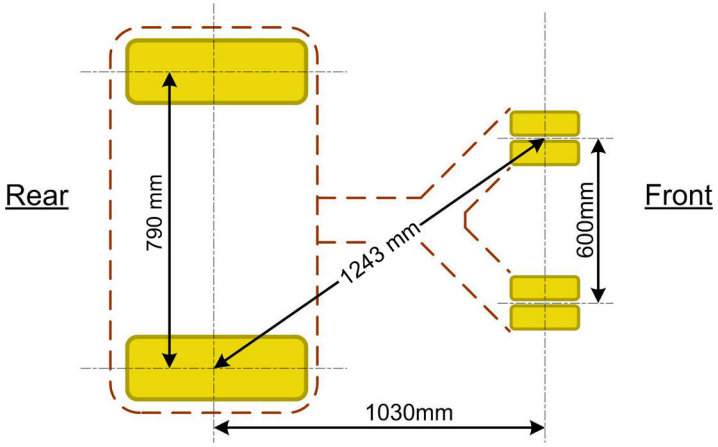
NOTE

(1) Including patient weight. Patient weight considered is 250 kg (551 lbs), for Innova^{IQ} Table and Innova^{IQ} OR Table.

WARNING

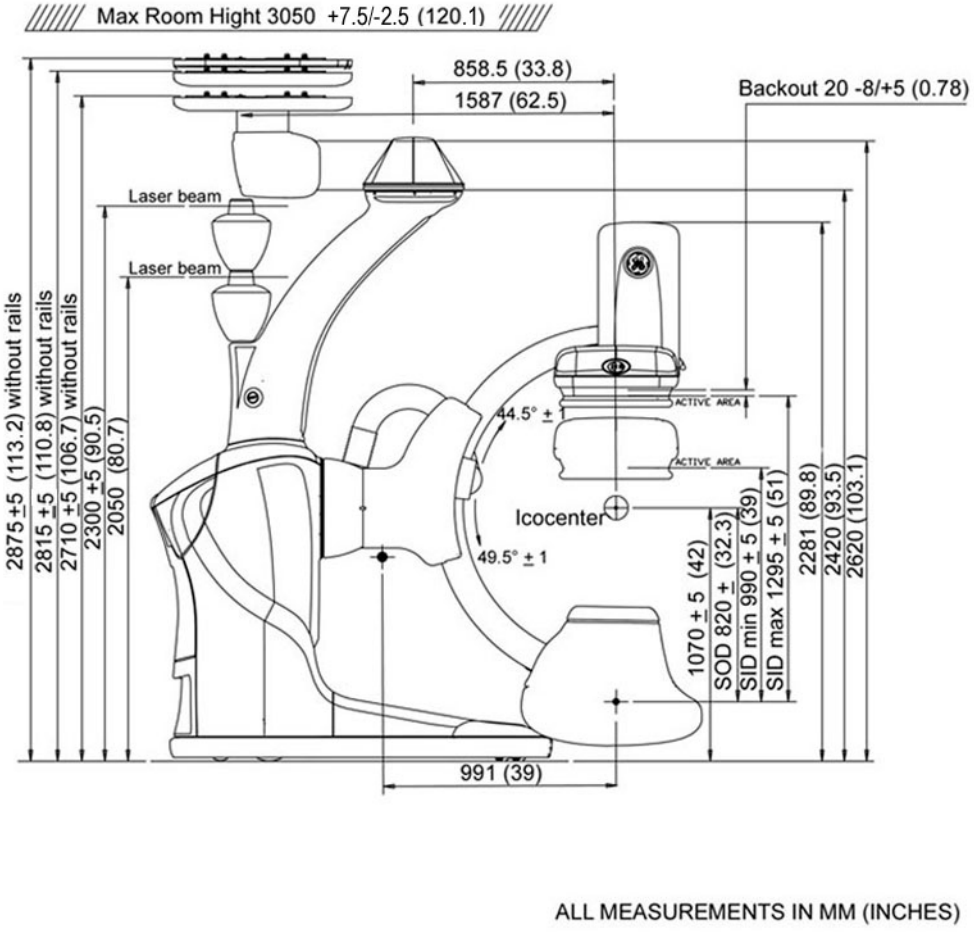
The components identified as to be installed in the technical room are not certified for use outside of this area. It is mandatory to install them in the technical room.

Figure 28 AGV occupied area



2.1.3 Dimension Drawings

Figure 29 Gantry Side View Dimensions



ALL MEASUREMENTS IN MM (INCHES)

Figure 30 Gantry Front view Dimensions

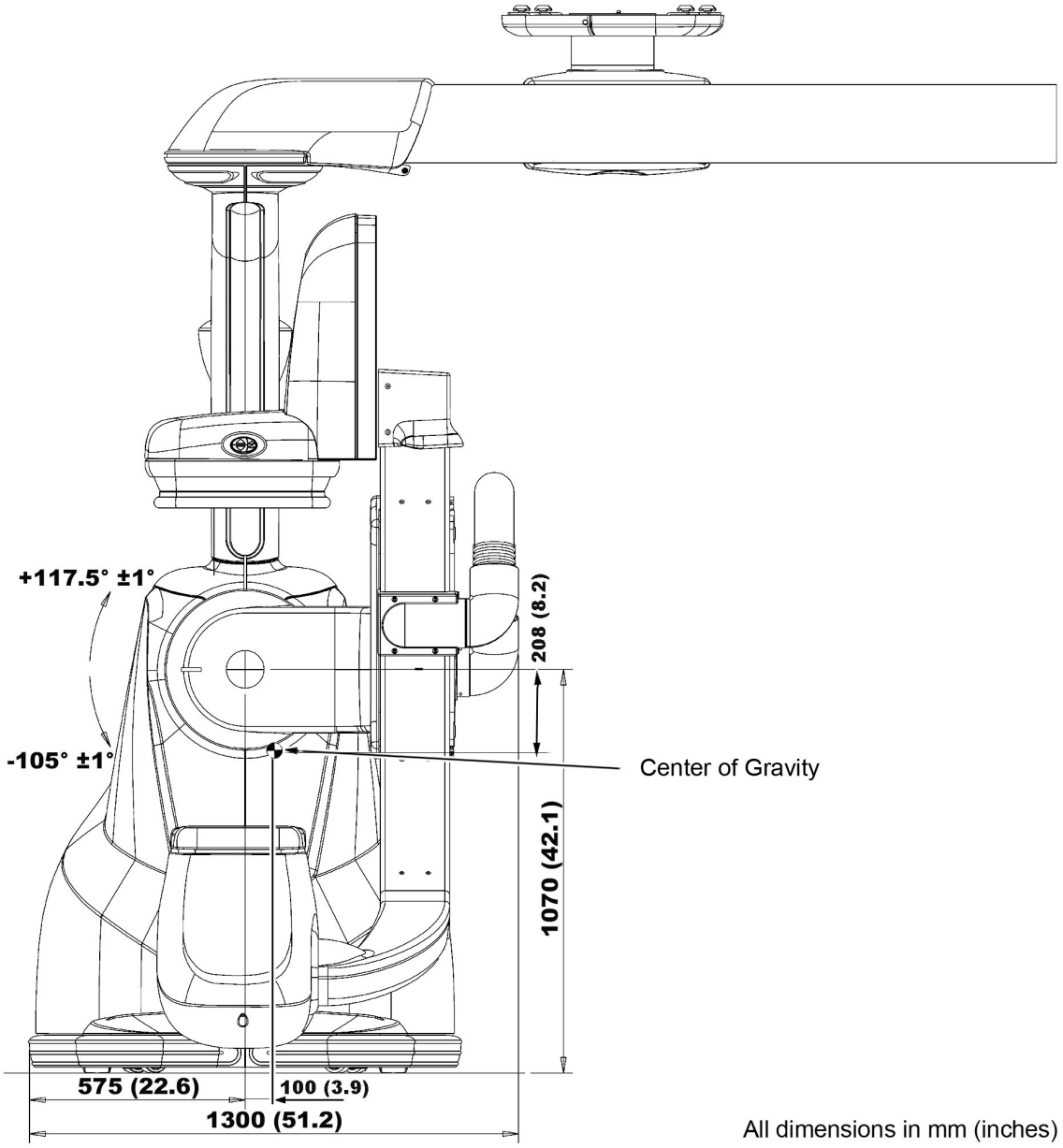


Figure 31 Gantry Top view Dimensions

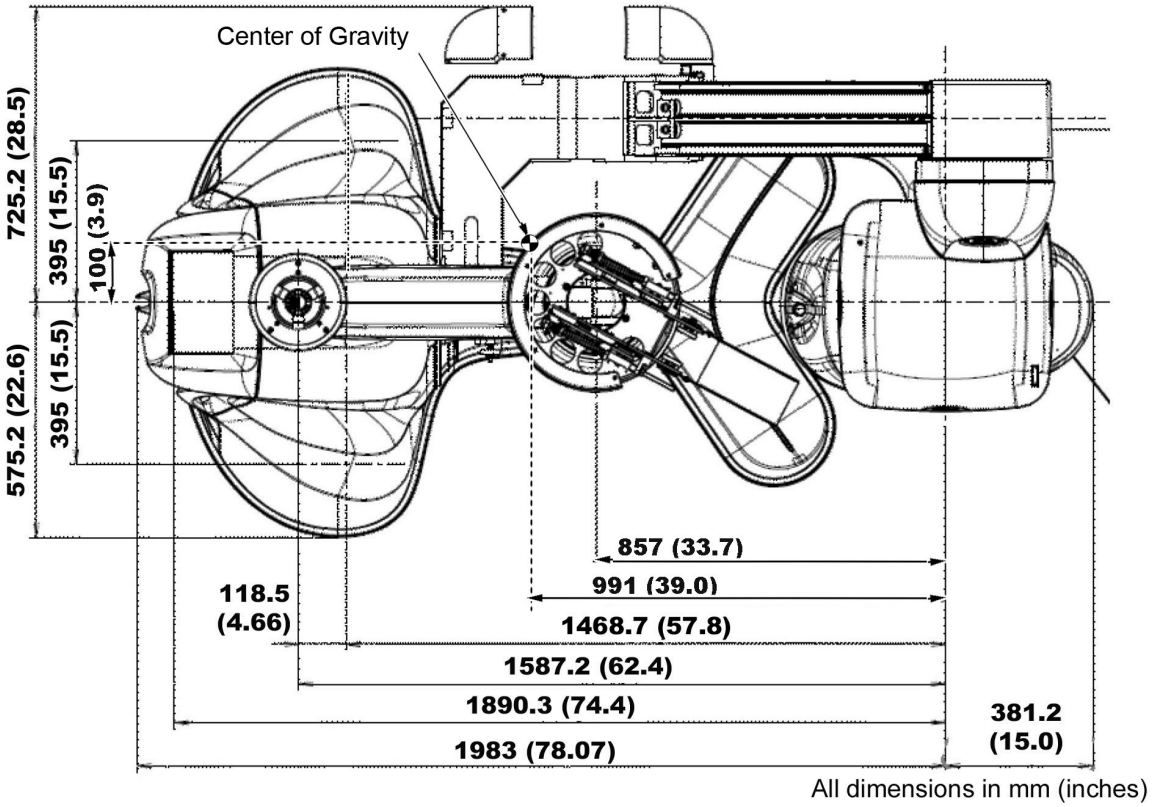


Figure 32 Laser Target Reflector Dimensions

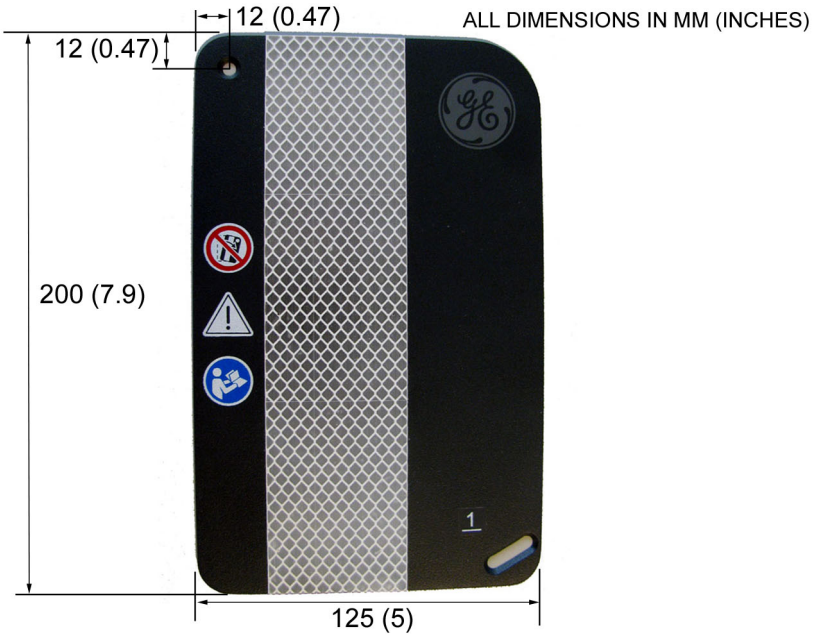
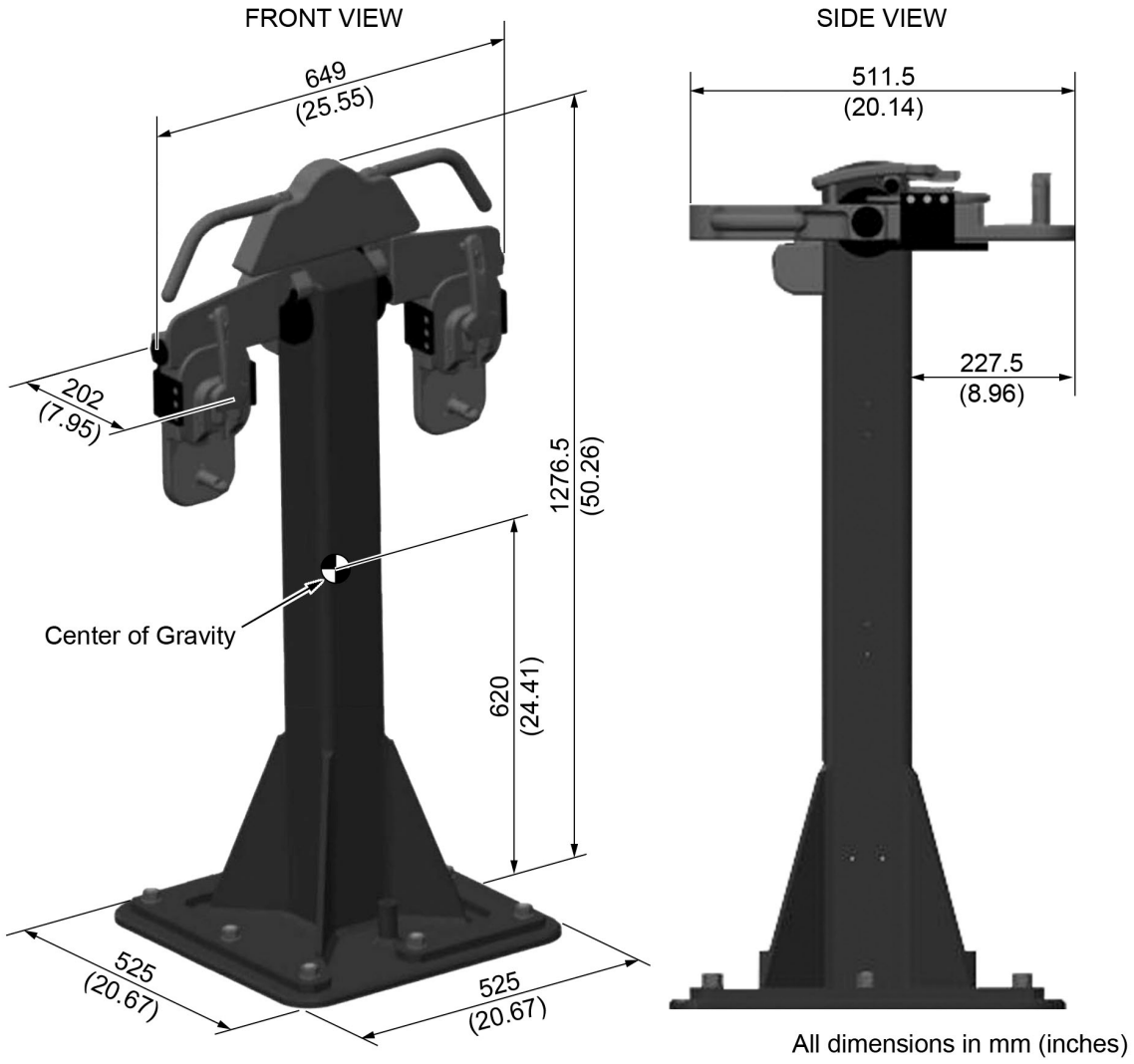


Figure 33 (For USA only) SAFE Dimensions

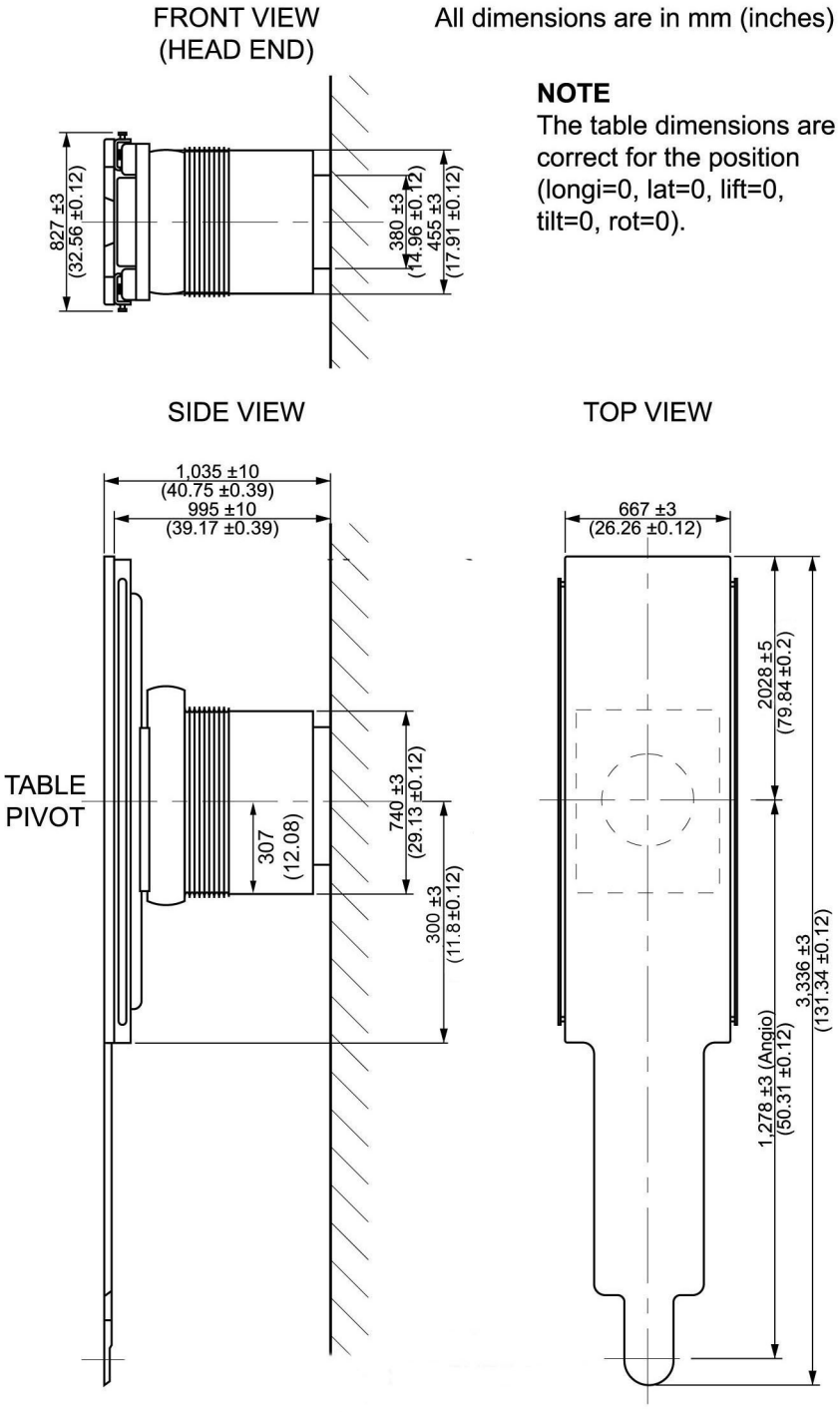


NOTE

The center of gravity (COG) is located on the central vertical axis of the post.

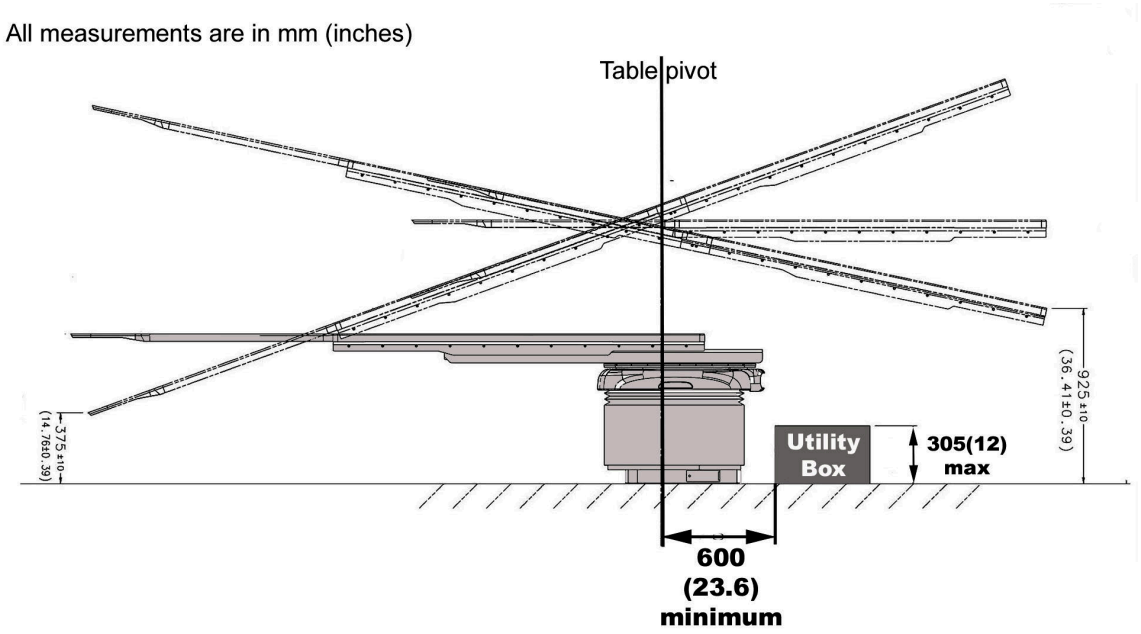
Figure 34 (For USA only) SAFE Covers Footprint

Figure 35 (For Innova^{IQ} Table and Innova^{IQ} OR Table) Patient Table Dimensions



For dimensions of the Magnus Maquet OR table, refer to the manufacturer Pre-installation Manual.

Figure 36 (For Innova^{IQ} Table and Innova^{IQ} OR Table) Utility Box Outlets Dimensions



NOTE

(For Innova^{IQ} Table and Innova^{IQ} OR Table) The minimum distance from table pivot to the medical Utility Box is 600 mm and the maximum dimensions of the medical Utility Box are:

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

NOTICE

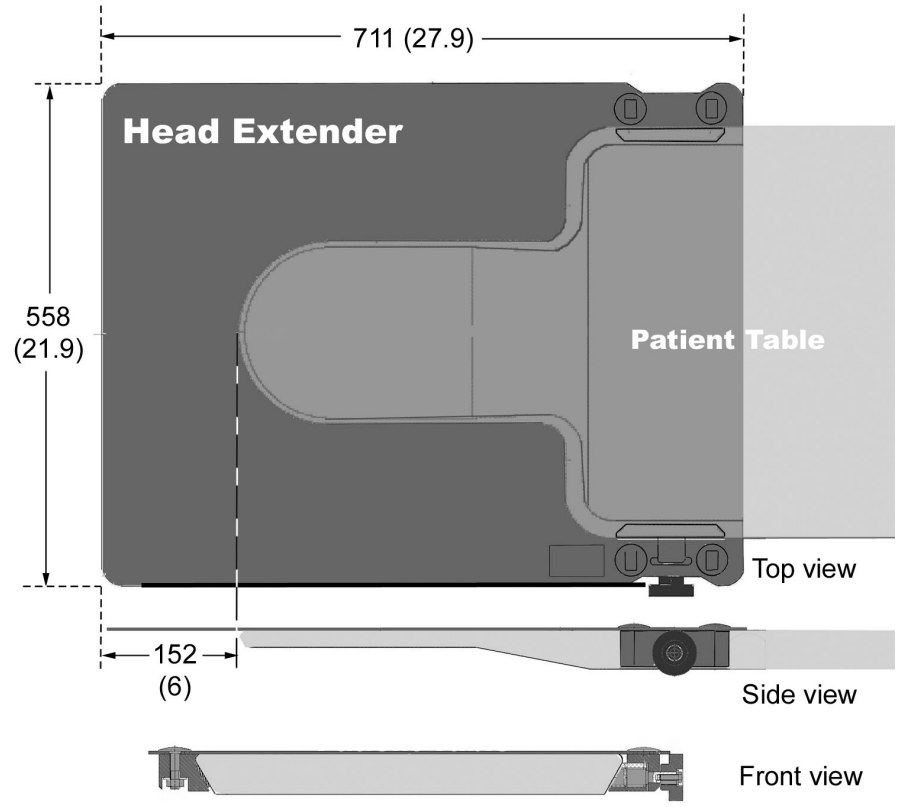
The Utility box under the table is not recommended for the surgical configuration.

NOTICE

It is forbidden to place or install objects under the table towards head end that could interfere with the AGV motion.

Figure 37 (For Innova^{IQ} Table and Innova^{IQ} OR Table) Patient Table Head Extender Dimensions

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



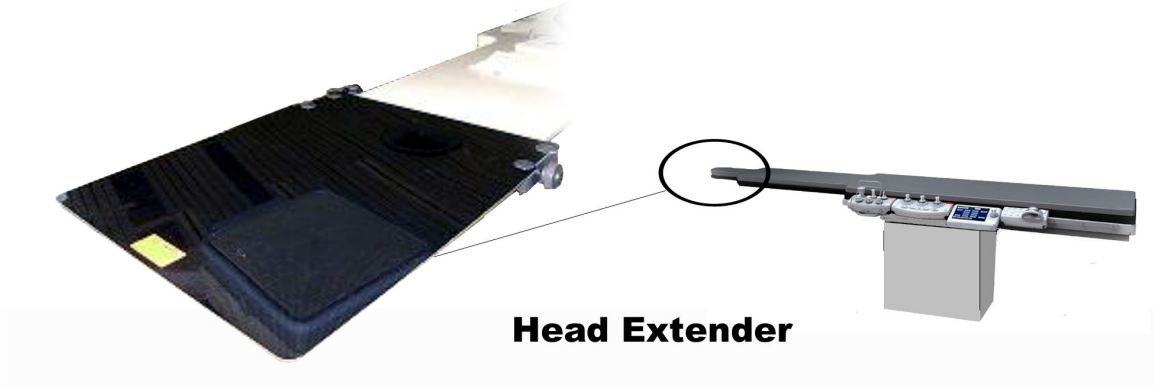
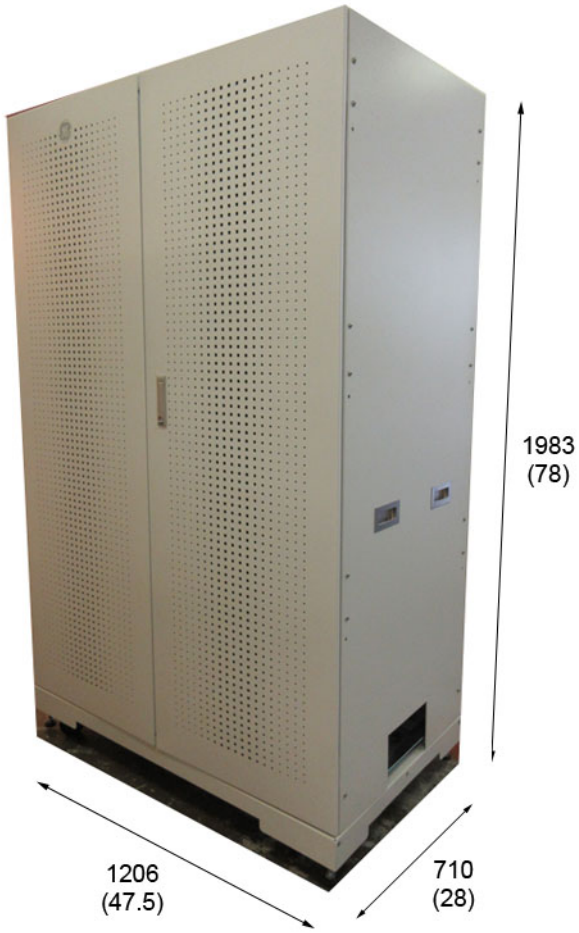
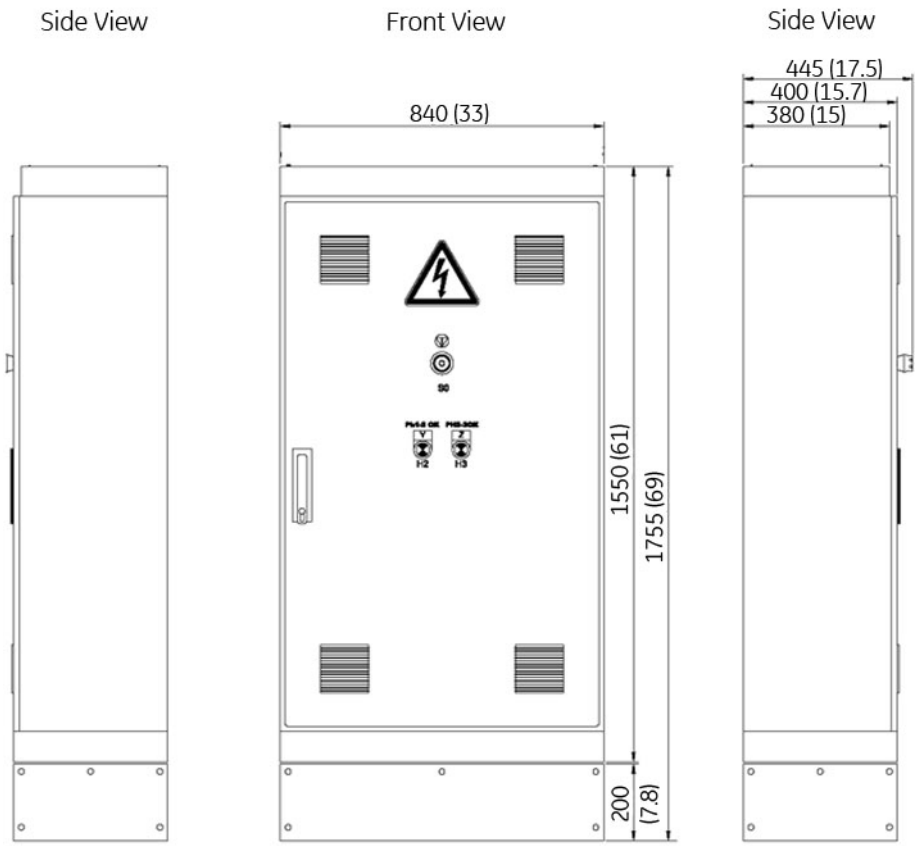


Figure 38 C-FRT Cabinet Dimensions



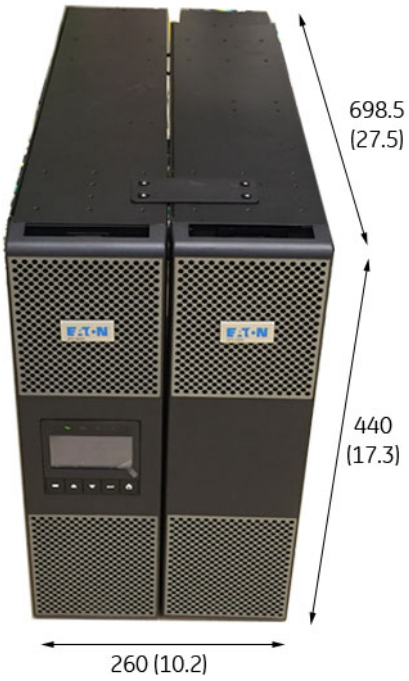
Dimensions in mm (in)

Figure 39 NPA PDU Dimensions



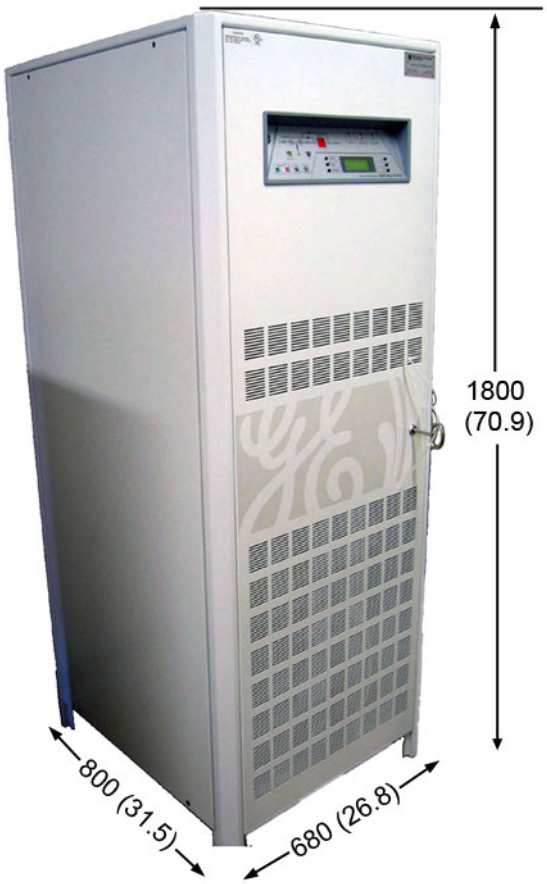
Dimensions in mm (in)

Figure 40 8 kVA UPS dimensions



Dimensions in mm (in)

Figure 41 Fluoro UPS UL Dimensions



Dimensions in mm (in)

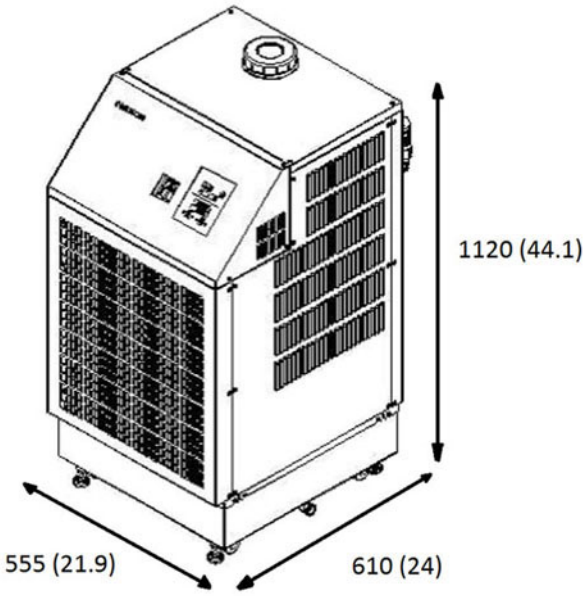
Figure 42 Fluoro UPS CE Dimensions

Dimensions in mm (in)

NOTE

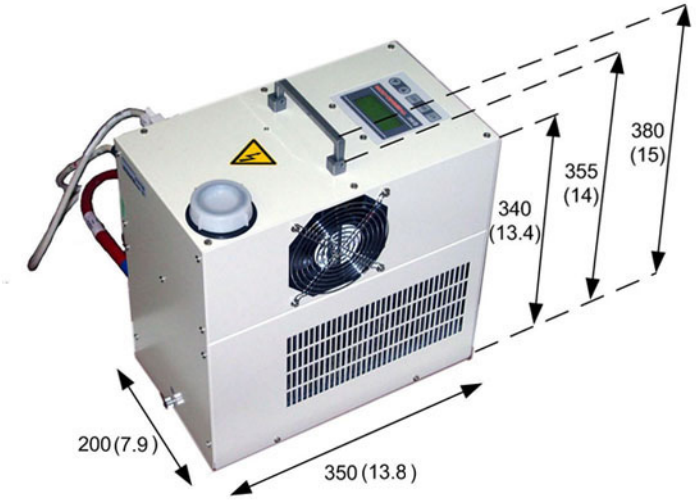
A Fire extinguisher (non-water type, ex. CO^2) must be installed close to the Fluoro UPS CE cabinet.

Figure 43 X-Ray Tube Chiller Dimensions



Dimensions in mm (in)

Figure 44 Detector Conditioner Dimensions



Dimensions in mm (in)

Figure 45 DL Monitor

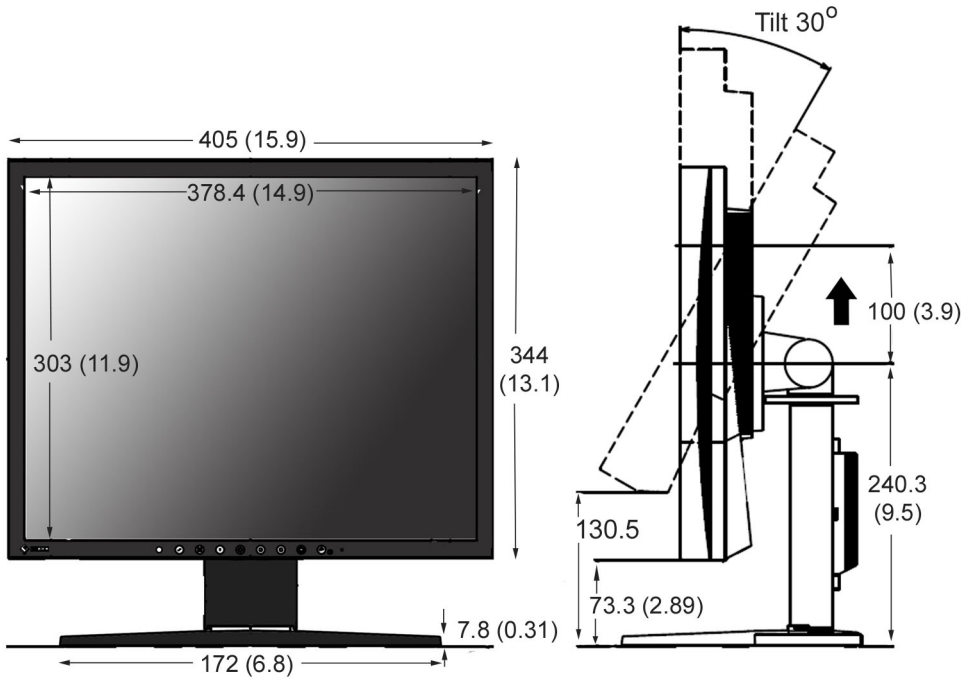


Figure 46 B&W and Color Monitors Dimensions

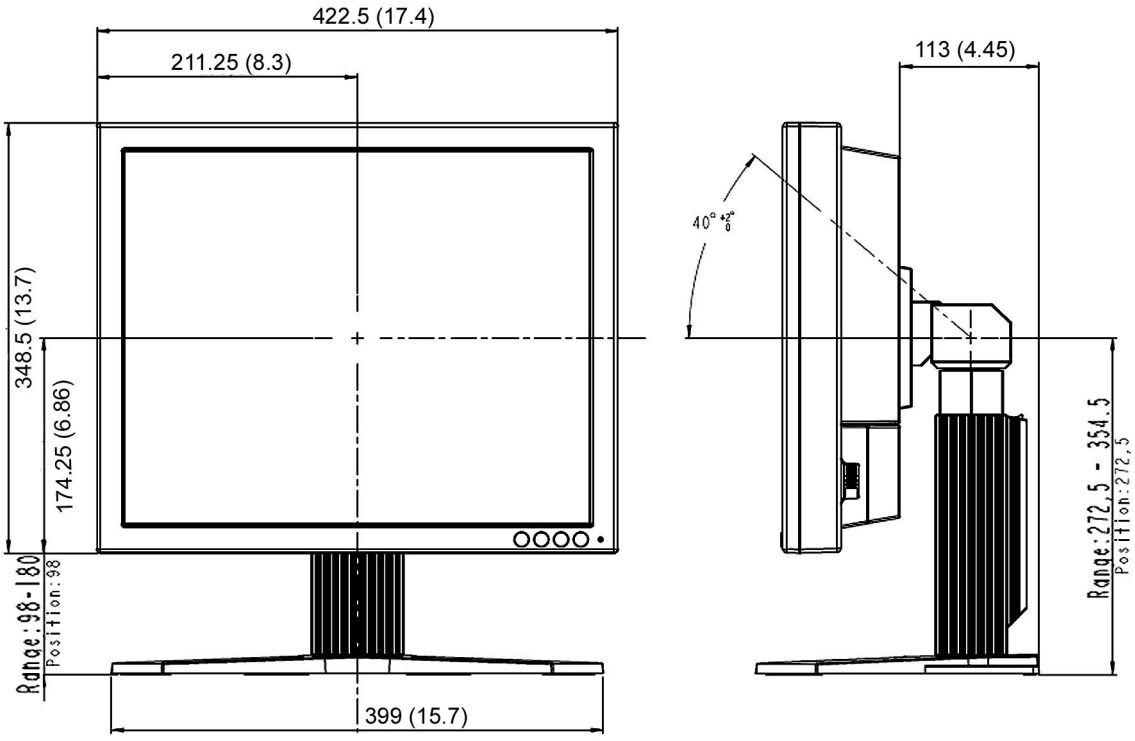


Figure 47 DL Keypad Dimensions

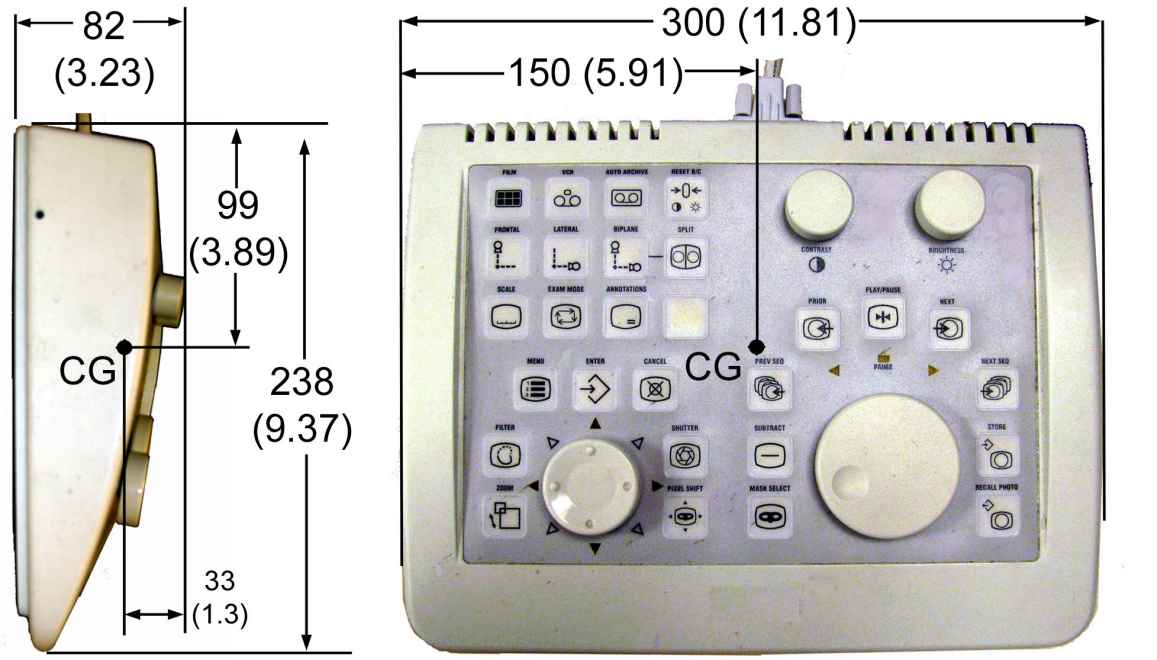
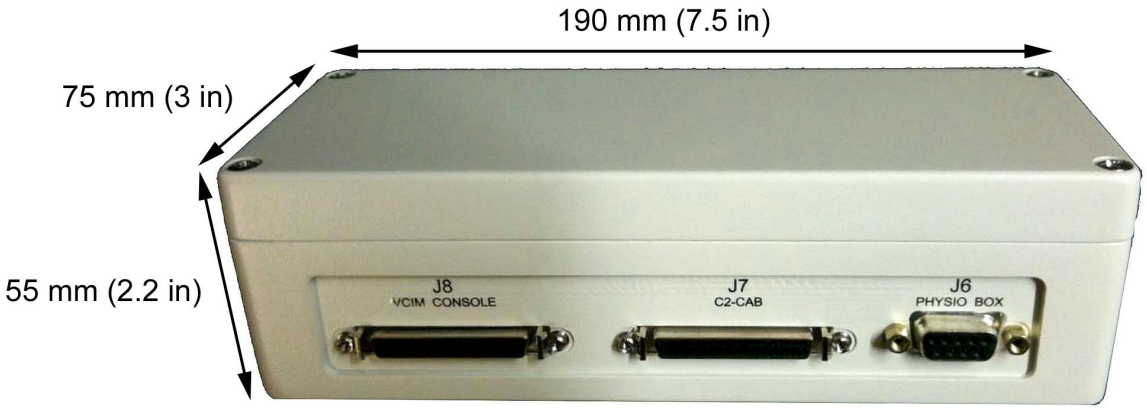
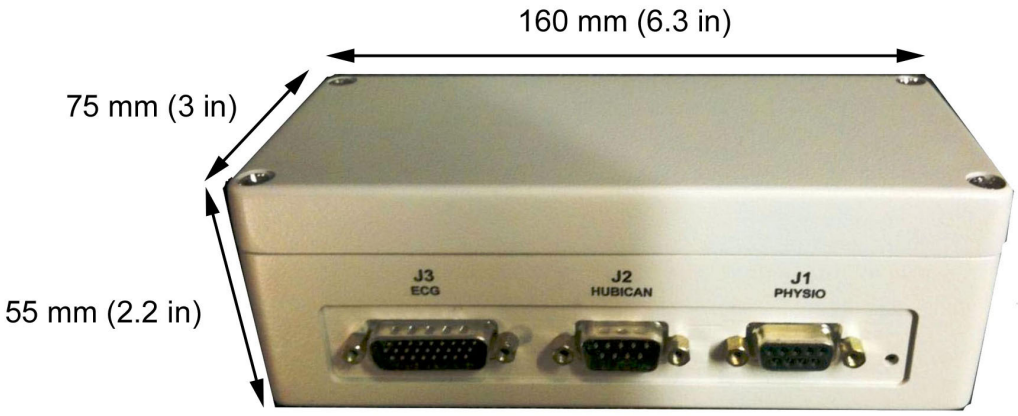


Figure 48 ECG Acquisition Device Modules Dimensions



Hubican Module



Physio Module

Figure 49 LCD 4 monitors suspension dimensions (Optional)

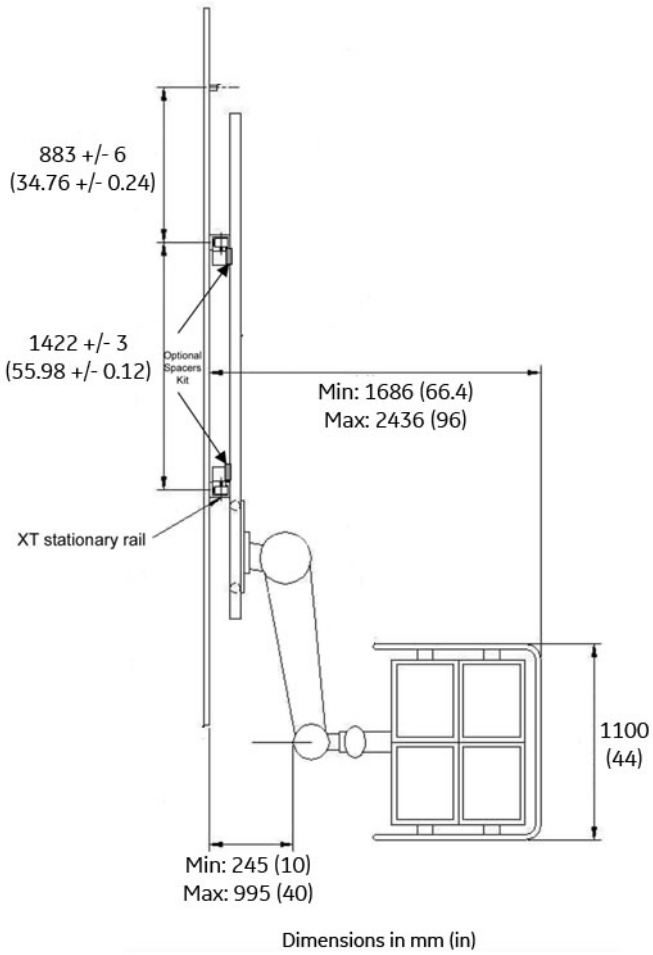


Figure 50 LCD 6 monitors suspension dimensions (Optional)

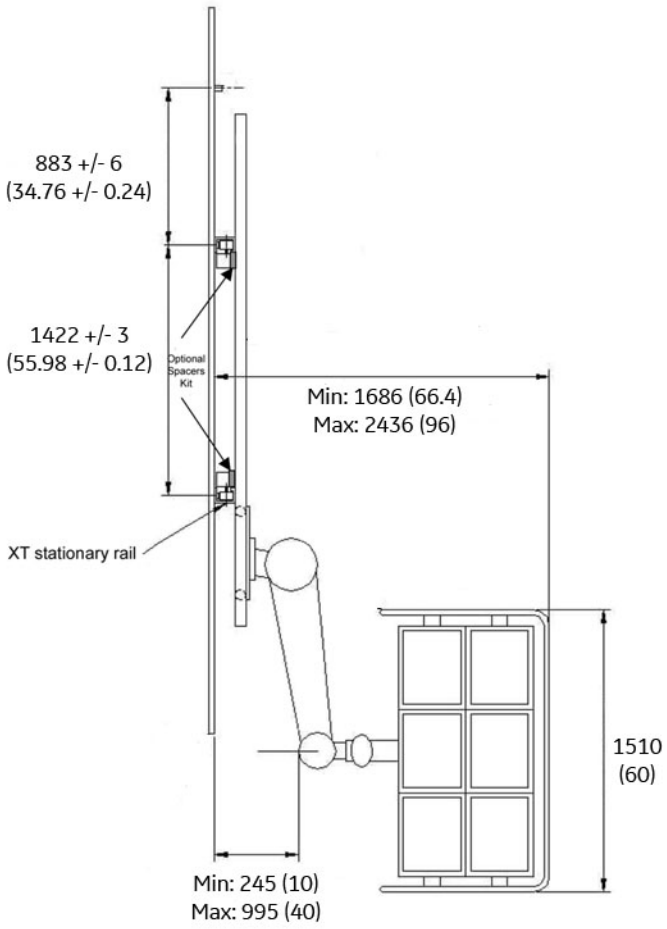


Figure 51 Large Display Suspension with rails (Optional) Dimensions

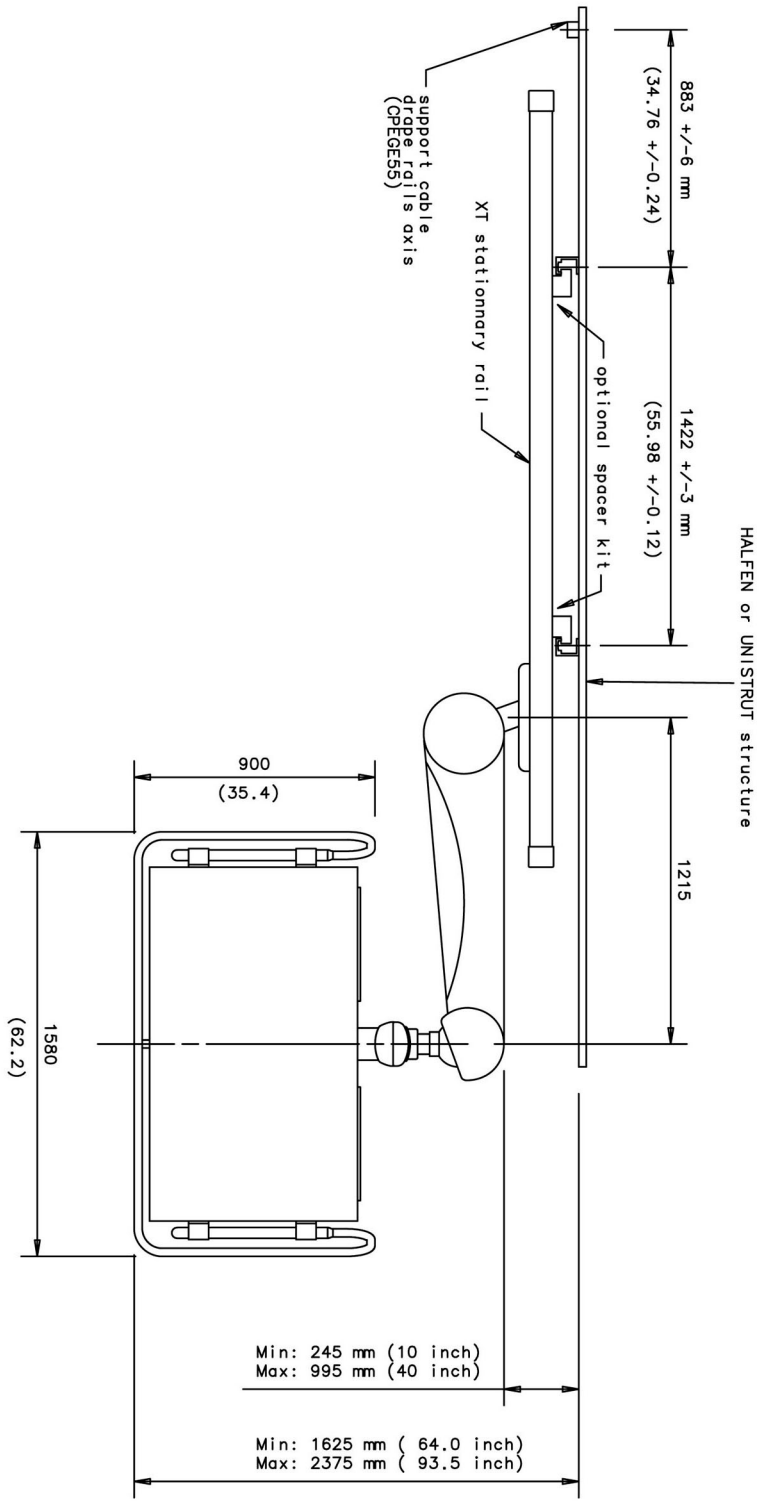


Figure 52 Top view of Mavig suspension with fixed point dual arm for Large Display Monitor (optional) Dimensions

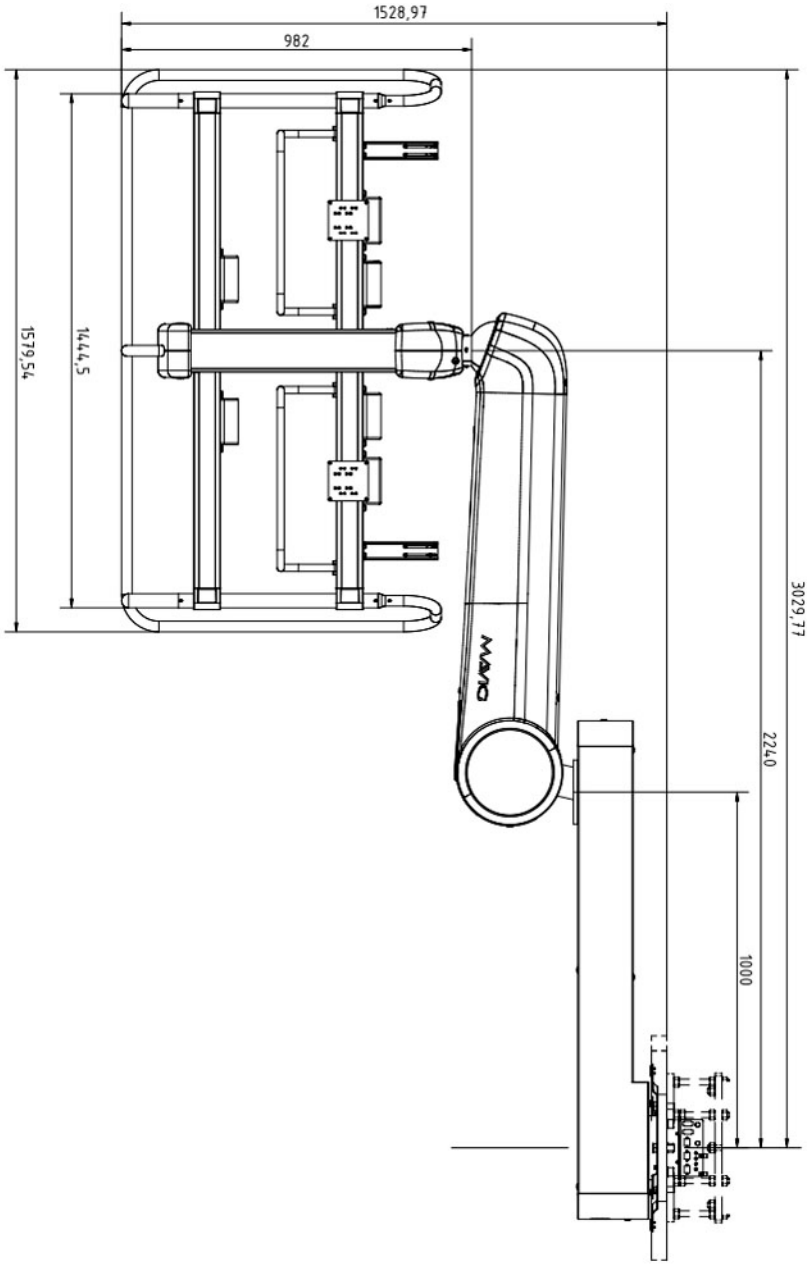
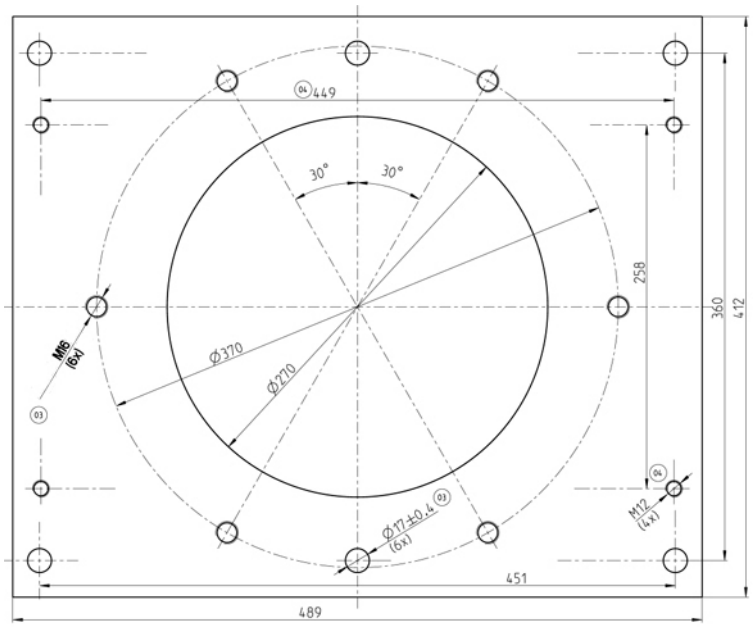


Figure 53 Top view of Ceiling Plate of Substructure for Dual Arm suspension Dimensions



2.2 Room Layouts

2.2.1 Room Layout Drawings

2.2.1.1 Exam Room Layout

2.2.1.1.1 Exam Room Dimension Requirements

2.2.1.1.1.1 Exam Room Length / Width

2.2.1.1.1.1.1 Length / Width Dimensions

Table 13 Exam Room Lengths/Widths for systems with Innova^{IQ} Table or Innova^{IQ} OR Table

Configuration	Length	Width	Comment
Minimum	6600 mm (260 in)	5200 mm (205 in)	Parking depending on purchased options and room geometry
Typical	8500 mm (335 in)	7000 mm (276 in)	With backout and parking
Maximum	10000 mm (393.7 in)	8000 mm (315 in)	Optimization between backout and parking

Table 14 Exam Room Lengths/Widths for system configuration compatible with the Magnus Maquet OR Table

Configuration	Length	Width	Comment
Minimum	6240 mm (246 in)	5200 mm (205 in)	Parking depending on purchased options and room geometry
Typical	8500 mm (335 in)	7000 mm (276 in)	With backout and parking
Maximum	10000 mm (393.7 in)	8000 mm (315 in)	Optimization between backout and parking

For the values above, see Figure 54 on page 68.

For a view of **Parking** positions, see Figure 55 on page 69, Figure 56 on page 70 & Figure 57 on page 71.

For a view of **Backout** positions, see Figure 58 on page 72, Figure 59 on page 73 & Figure 60 on page 73.

For a view of **Arm Backin and Panning** positions, see Figure 62 on page 76, Figure 63 on page 76 & Figure 64 on page 77.

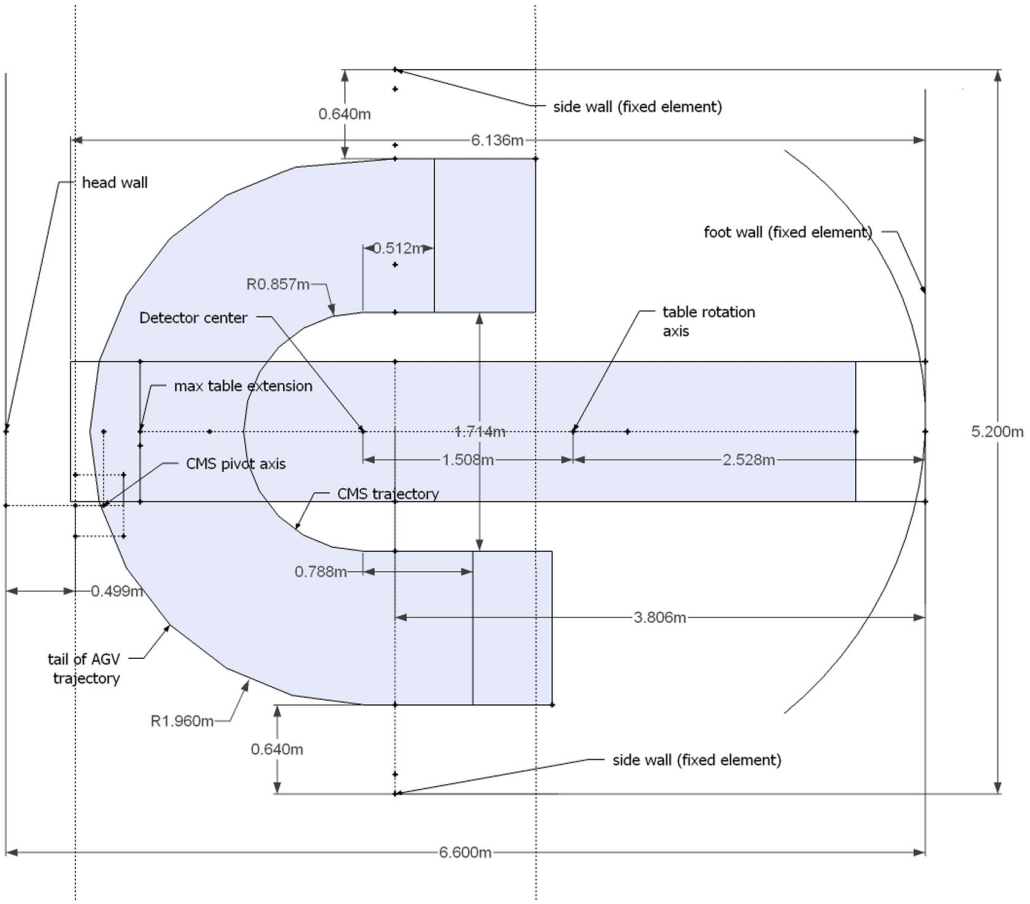
NOTE

The values above are calculated with the table **without** accessories, such as the Table Head Extender. For details of Head Extender dimensions, see 2.1.3 Dimension Drawings on page 45.

NOTE

The values in Table 13 on page 66 include a 700 mm safety clearance zone behind the CMS.

Figure 54 Exam Room size (RIRP 1508 mm)



2.2.1.1.1.1.2 Gantry Parking Positions

NOTICE

Parking trajectories, which are available according to installation option chosen by customer, need to be specified during room planning and are customizable during the system installation with the following constraints:

- Choice of trajectories: Minimum is NONE. Maximum is TWO parking trajectories (positions).
- Each parking trajectory has a specific starting point on the swivel circuit.
- Each parking trajectory has a given gantry orientation in the parking position.
- Each parking trajectory has a minimum length by design.

In the following illustrations and tables, the **R**oom **I**nterventional **R**eference **P**oint (RIRP) is the gantry isocenter when the gantry is in head position. It is measured from the table rotation axis, along the table longitudinal axis.

RIRP location is dependent of the System. It is configured to:

- for systems with Innova^{IQ} Table or Innova^{IQ} OR Table:

- 1278 mm, or
- 1508 mm.

- for system configuration compatible with the Magnus Maquet OR Table: 1120 mm.

The RIRP is configured at system installation and cannot be changed afterwards.

Figure 55 Gantry Parking (RIRP 1120 mm) versus Exam Room size

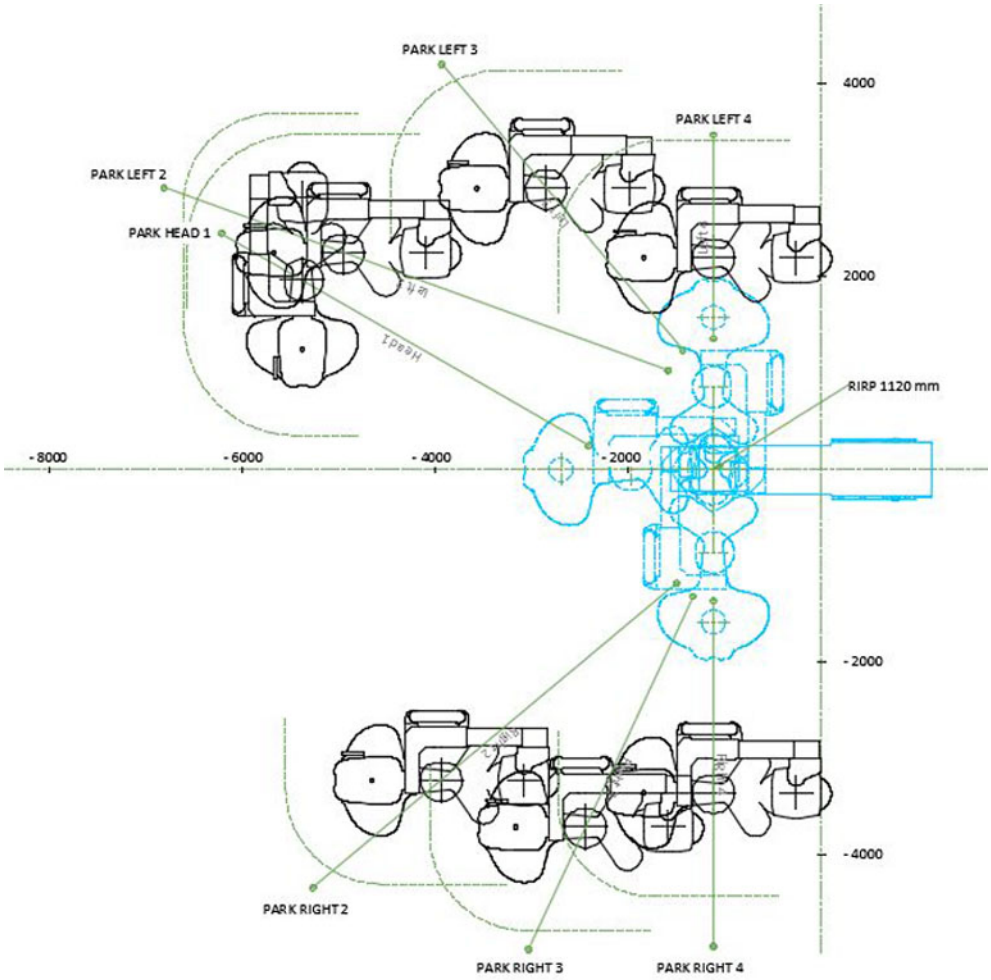


Figure 56 Gantry Parking (RIRP 1278 mm) versus Exam Room size

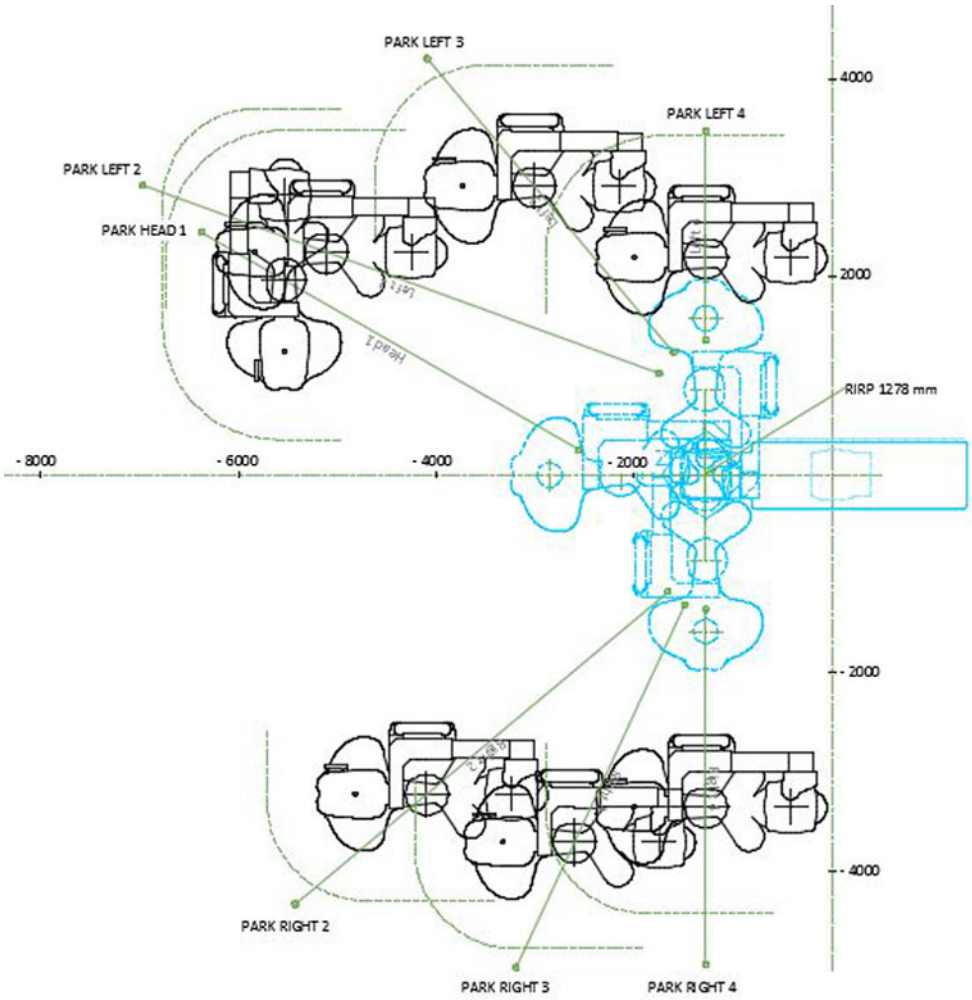


Figure 57 Gantry Parking (RIRP 1508 mm) versus Exam Room size

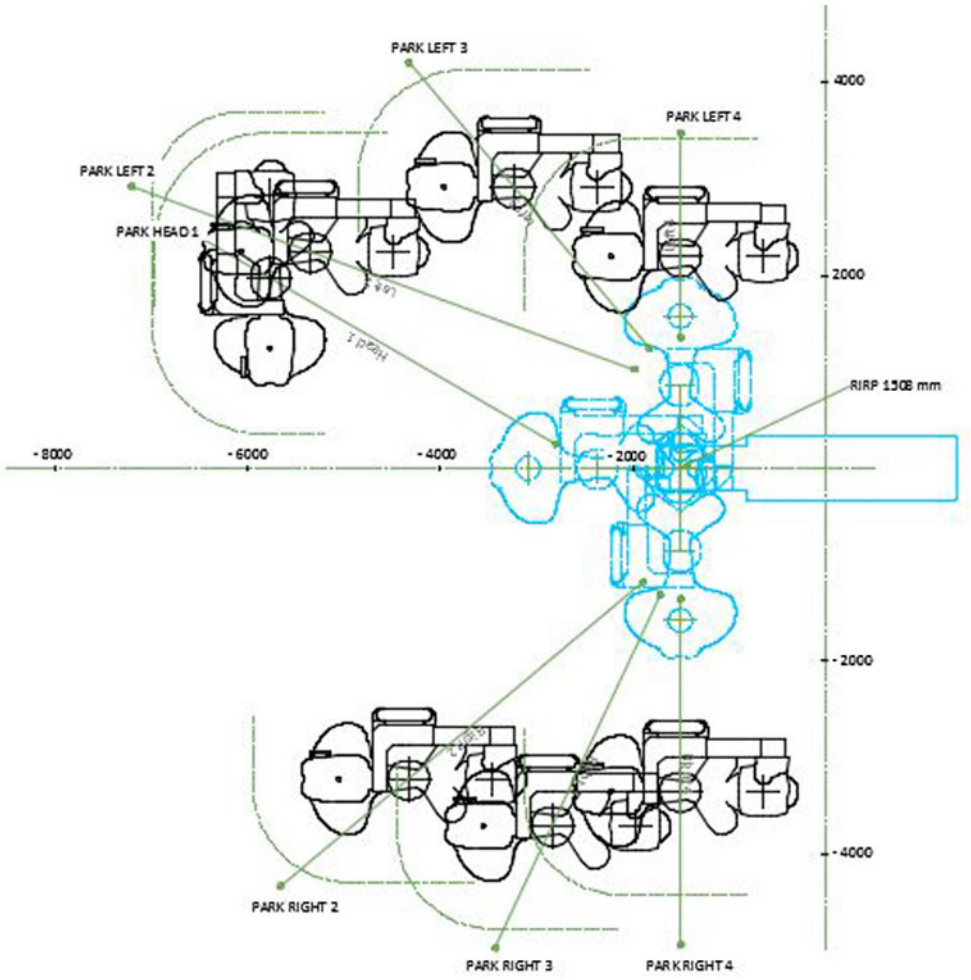


Table 15 Minimum/Typical/Maximum Parking Positions

Name	RIRP 1120 mm (Figure 55 on page 69)			RIRP 1278 mm (Figure 56 on page 70)			RIRP 1508 mm (Figure 57 on page 71)		
	Typical	Min	Max	Typical	Min	Max	Typical	Min	Max
Park Head 1*	-	500	3930	-	500	3930	-	500	3930
Park Left 2	-	500	4080	-	500	4080	-	500	4080
Park Left 3	-	500	2690	-	500	2690	-	500	2690
Park Left 4*	-	500	1340	-	500	1340	-	500	1340
Park Right 2	-	500	3680	-	500	3680	-	500	3680
Park Right 3	-	500	3140	-	500	3140	-	500	3140

Minimum/Typical/Maximum Parking Positions continued									
Name	RIRP 1120 mm (Figure 55 on page 69)			RIRP 1278 mm (Figure 56 on page 70)			RIRP 1508 mm (Figure 57 on page 71)		
	Typical	Min	Max	Typical	Min	Max	Typical	Min	Max
Park Right 4	-	500	2490	-	500	2490	-	500	2490
*: **(For USA only)** Not authorized with System of Anchorage For Seismic Event (SAFE)									

2.2.1.1.1.1.3 Gantry Backout Positions

NOTICE

Backout positions need to be specified during the room planning activities and are customizable during the installation.

Figure 58 Backout positions (RIRP 1120 mm)

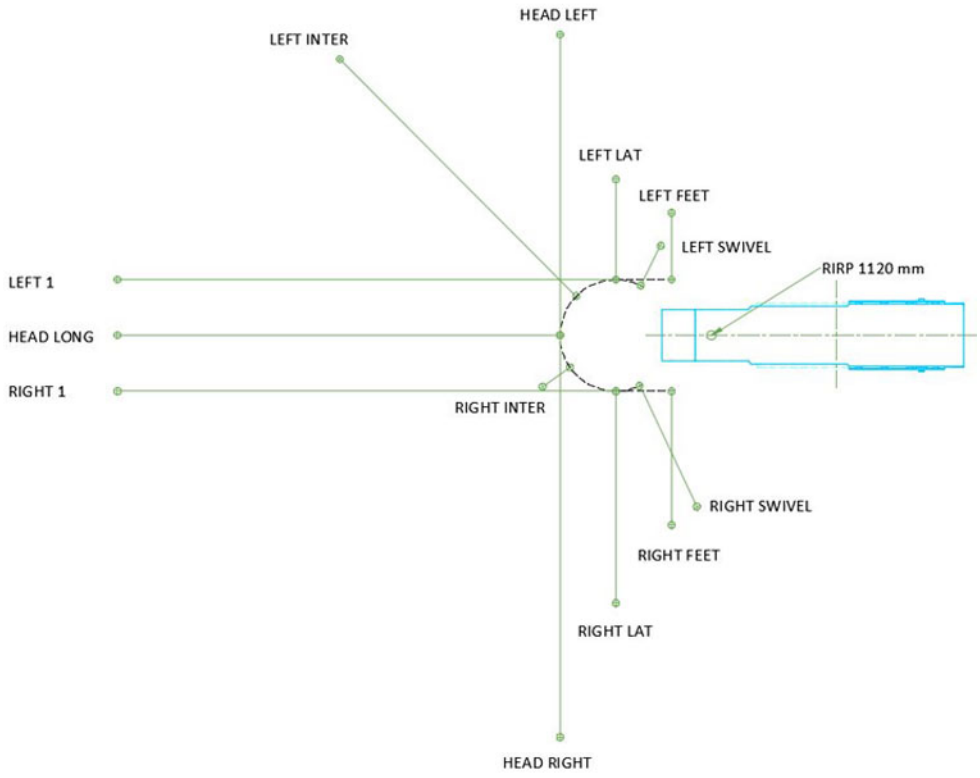


Figure 59 Backout positions (RIRP 1278 mm)

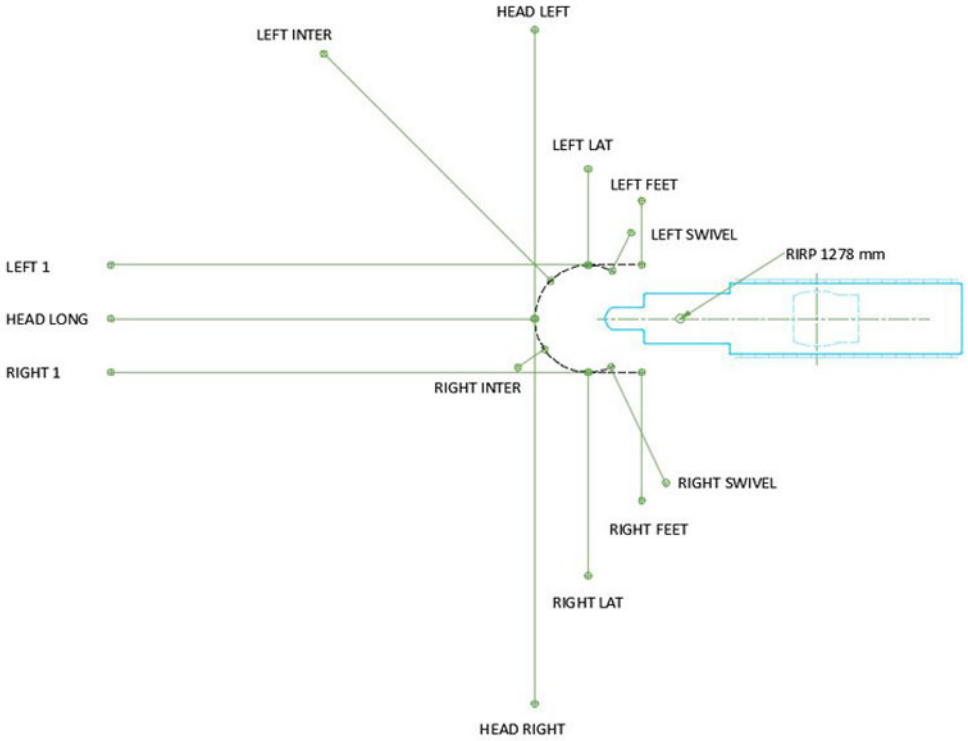


Figure 60 Backout positions (RIRP 1508 mm)

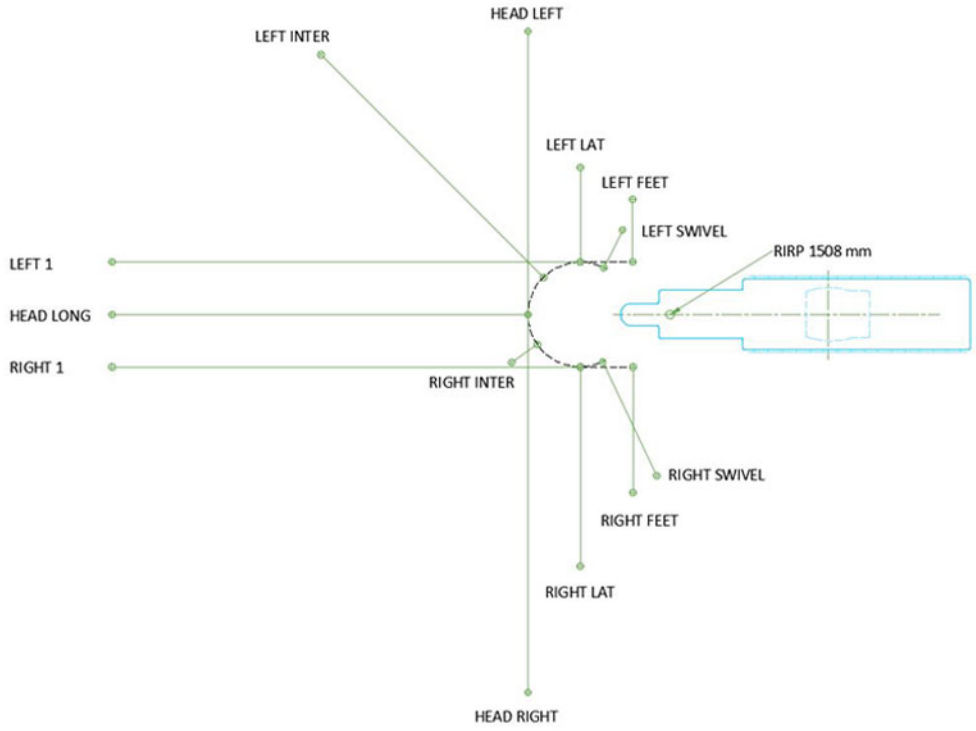


Table 16 Backout Positions

Type	Name	RIRP 1120 mm (Figure 58 on page 72)			RIRP 1278 mm (Figure 59 on page 73)			RIRP 1508 mm (Figure 60 on page 73)		
		Typi-cal	Min	Max	Typi-cal	Min	Max	Typi-cal	Min	Max
Backouts	Head Long	1200	500	4468	1200	500	4540	1200	500	4310
	Head Left	2700	500	2700	2700	500	2700	2700	500	2700
	Head Right	2700	500	3600	2700	500	3600	2700	500	3600
	Left Lat	900	500	1400	900	500	1400	900	500	1400
	Left Feet	900	500	1100	900	500	1100	900	500	1100
	Left 1	1200	500	4468	1200	500	4540	1200	500	4310
	Right Lat	900	500	2400	900	500	2400	900	500	2400
	Right Feet	900	500	1700	900	500	2100	900	500	2100
	Right 1	1200	500	4468	1200	500	4540	1200	500	4310
Arm backouts	Left Inter	-	500	3500	-	500	3500	-	500	3500
	Right Inter	-	500	800	-	500	800	-	500	800
	Left Swivel	-	500	900	-	500	900	-	500	900
	Right Swivel	-	500	1700	-	500	1700	-	500	1700

2.2.1.1.1.1.4 Requirements specific to SAFE

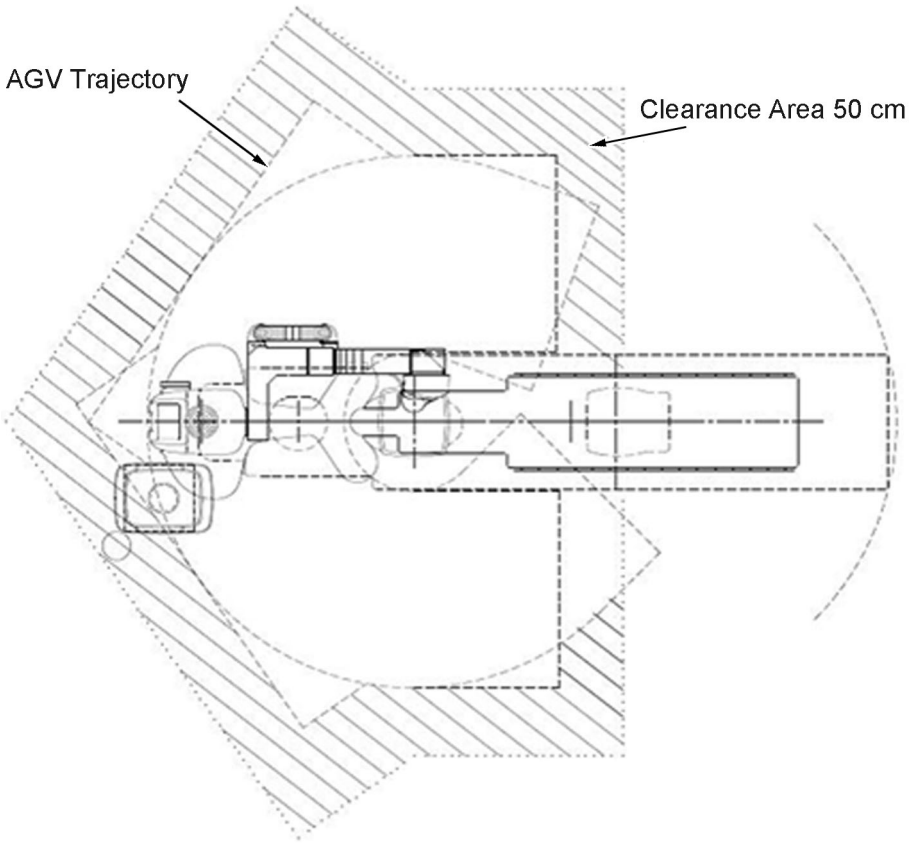
(For USA only)

The System of Anchorage For Seismic Event (SAFE) shall be installed at one of the following Gantry trajectories that are qualified for the Gantry attachment:

- Back-out Left 1
- Park Left 2
- Park Left 3
- Park Right 2
- Park Right 3
- Park Right 4

The exact SAFE location will be determined by the GE Field Engineer during the installation of the Discovery IGS 730, Discovery IGS 740 system. The pole shall be installed at a **minimum 50 cm clearance distance** from AGV on all customized trajectories to avoid entrapment between the pole and all moving parts.

Figure 61 Requirement for Pole Installation



2.2.1.1.1.1.5 Arm Backin and Panning Positions

Figure 62 Arm Backin and Panning (RIRP 1120 mm)

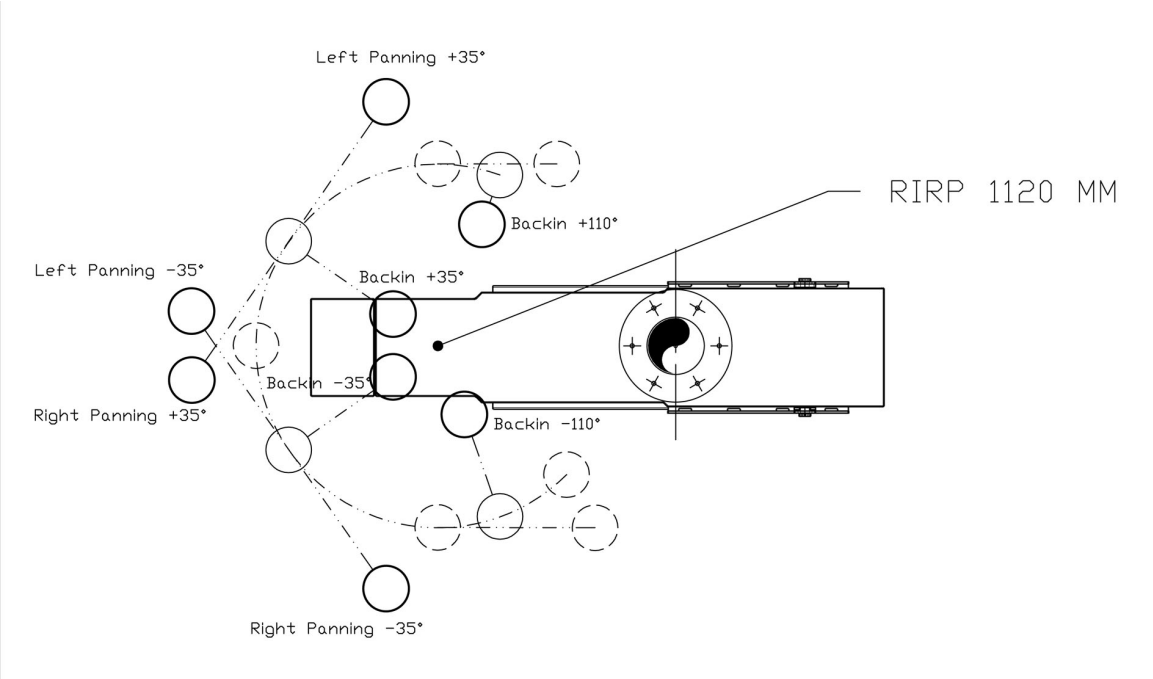


Figure 63 Arm Backin and Panning (RIRP 1278 mm)

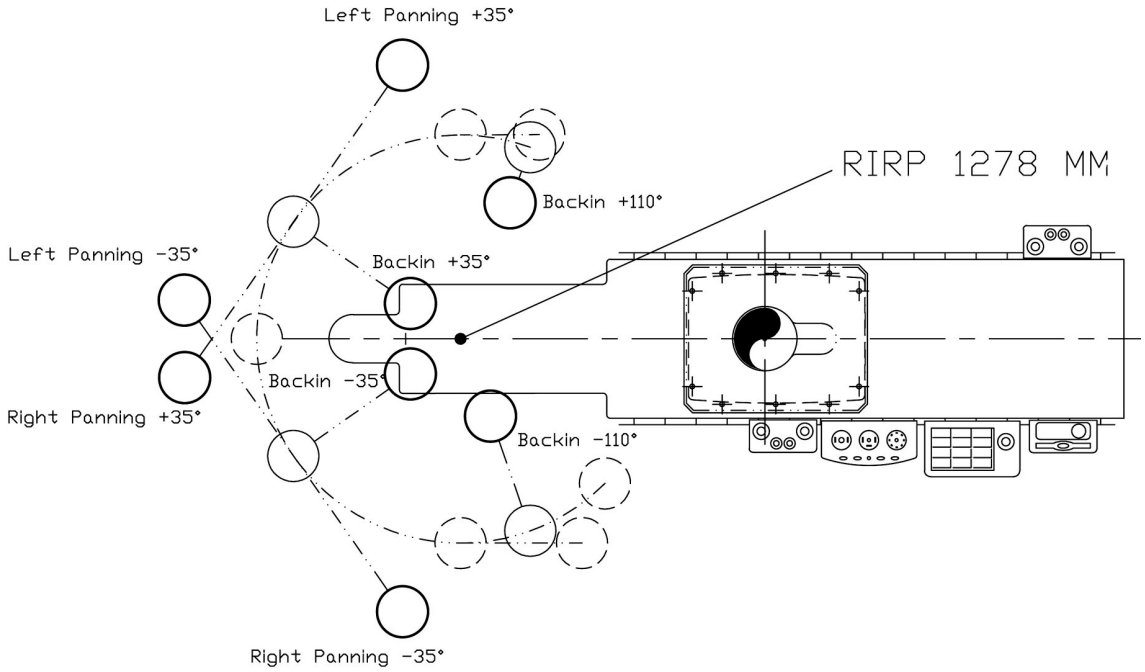


Figure 64 Arm Backin and Panning (RIRP 1508 mm)

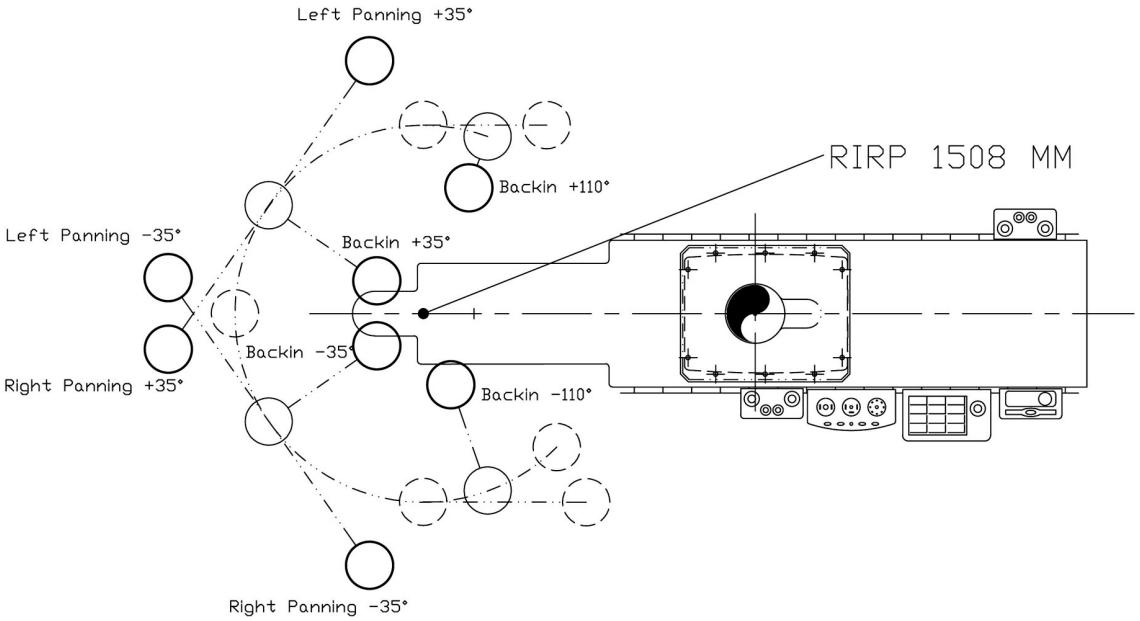


Table 17 Arm Backin and Panning

Type	Name	RIRP 1120 mm (Figure 62 on page 76)			RIRP 1278 mm (Figure 63 on page 76)			RIRP 1508 mm (Figure 64 on page 77)			
		Typi-cal	Min	Max	Typi-cal	Min	Max	Typi-cal	Min	Max	
Arm Backin (fixed)	backin +35°	600	-	-	600	-	-	600	-	-	fixed value
	backin -35°	600	-	-	600	-	-	600	-	-	fixed value
	backin +110°	250	-	-	250	-	-	250	-	-	fixed value
	backin -110°	500	-	-	500	-	-	500	-	-	fixed value
Arm Pan-ning (fixed)	left +35°	800	-	-	800	-	-	800	-	-	fixed value
	right +35°	800	-	-	800	-	-	800	-	-	fixed value
	left -35°	800	-	-	800	-	-	800	-	-	fixed value
	right -35°	800	-	-	800	-	-	800	-	-	fixed value

2.2.1.1.1.2 Exam Room Height

The room height, which can be defined as the distance between the finish floor surface and the plane on which the CMS pivot is attached, must be set to one of the 4 values specified in table below in order to be able to install this product.

Failing in respecting these dimensions will have an impact on performance and safety.

The Cable Management System (CMS) may require the installation of "intermediate" rails and/or spacers as defined in the table column "CMS Mounting requirements".

See 2.3.3 Ceiling Requirements on page 111 section for more details on CMS Installation requirements.

Table 18

Configuration *	Height	CMS Mounting Requirements
Height 1 (Lowest configuration)	2740 mm (107.8 in) ±5 mm with CMS rails 2710 mm (106.7 in) ±5 mm with mounting plate	CMS rails are 30 mm high and can be used for IR rooms. **CMS spacer is not allowed** with this configuration. ** Acceptable for OR rooms if: • Mounting plate designed locally (not provided). • CMS mounting structure or rails area to be closed with rest of ceiling surface (drop-down box, covers...). • Local solution to be designed to avoid interference with other components close to the CMS (e.g booms).
Height 2 (Small configuration)	2845 mm (112 in) ±5 mm with CMS rails 2815 mm (110.8 in) ±5 mm with mounting plate	CMS rails are 30 mm high and can be used for IR rooms. **Small CMS spacer (105 mm)** must be mounted too. Acceptable for OR rooms if: • Mounting plate designed locally (not provided). • CMS mounting structure or rails area to be closed with rest of ceiling surface (drop-down box, covers...). • Local solution to be designed to avoid interference with other components close to the CMS (e.g booms).
Height 3 (Medium configuration)	2905 mm (114.4 in) ±5 mm with CMS rails **NOTE** For existing ceiling, minimum height shall be 2900 mm (114.2 in) +10/-0 mm with CMS rails 2875 mm (113.2 in) ±5 mm with mounting plate	CMS rails are 30 mm high and can be used for IR rooms. **Medium CMS spacer (165 mm)** must be mounted too. Acceptable for OR rooms if: • Mounting plate designed locally (not provided). • CMS mounting structure or rails area to be closed with rest of ceiling surface (drop-down box, covers...). • Local solution to be designed to avoid interference with other components close to the CMS (e.g booms).

continued		
Configuration *	**Height**	**CMS Mounting Requirements**
Height 4 (Highest configu-ration)	3050 mm (120.1 in) +7.5/-2.5 mm with mounting plate	**CMS rails are typically not used** with this configuration. *** **Large CMS spacer (340 mm)** must be mounted.
	3080 mm (121.3 in) +7.5/-2.5 mm with CMS rails (if allowed)	If the 30 mm CMS rails can be used, they need to be mounted on a structure at 3080 mm from floor. If the CMS mounting structure height is between 2900 and 3050, lower it so that you're back in the same configura-tion as for Height 3 with use of the 165 mm Spacer (but a bigger drop-down will be required to close mounting area).

NOTE

* See 2.1.3 Dimension Drawings on page 45 (Illustration "Gantry Dimensions - Side View") for views in the 4 configurations. It clearly shows for example that the CMS chain lower surface shall be at 2420 mm from the finished floor whatever solution is used to mount the CMS to the ceiling.

** CMS spacers are used only for the 3 highest ceiling heights (above 2740 mm). Spacers and CMS rails are provided with the system.

*** The max height of 3050 mm is considered to be only for surgical configuration (OR rooms) where use of rails - like the CMS intermediate rails - is forbidden.

NOTE

The ceiling height has to be measured between the surface where the CMS Pivot Platform will be mounted and the top surface of the finish floor once completely done (typically 7 mm above the rectified concrete level on which the resin will be poured).

2.2.1.1.2 Exam Room Layout

NOTE

Optional remote Smart Box and TSUI shall be installed at a location where all the gantry axis are visible by the operator, but not on the longitudinal axis of the table (to avoid any operator visual dead angle due to tilted table hiding the patient).

Room Layouts:

The following are two layout senarios:

NOTICE

11 targets (reflectors) shall be installed on the walls at a height of 2050 mm min and 2300 mm max. Care should be taken not to install the targets on moving objects (doors etc) or in postitions where they can be obscured by moving components (monitor suspensions etc). For additional information on AGV laser targets, see **Preparing targets mounting on the wall** in 2.3.4 Wall Requirements on page 125.

NOTE

The parking/backout axis of the gantry is either parallel or perpendicular to the patient table longitudinal axes.

2.2.1.1.2.1 Layout for interventional configuration (minimum room)

Figure 65 Interventional configuration with Mavig suspension with rails (minimum room)

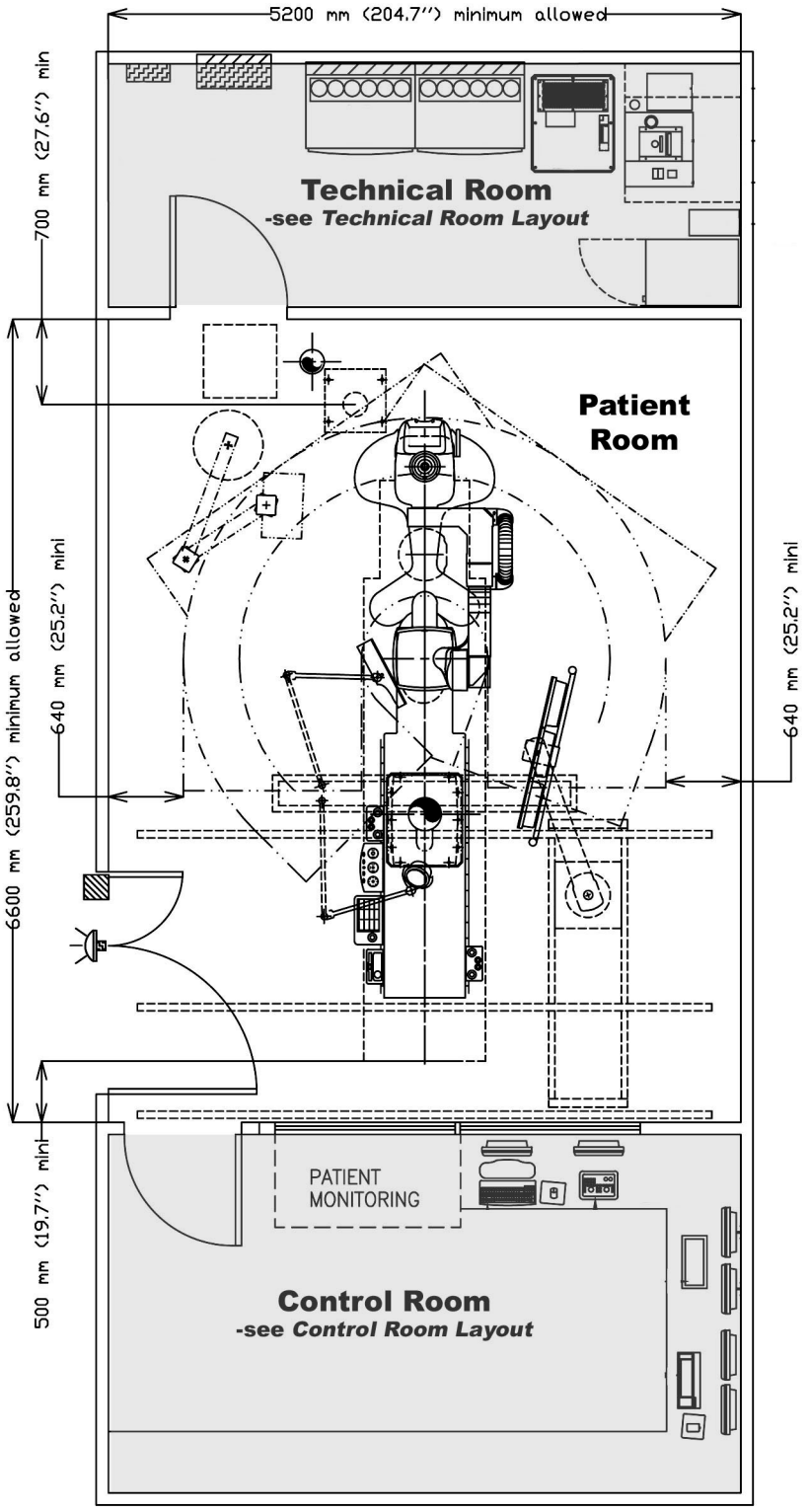
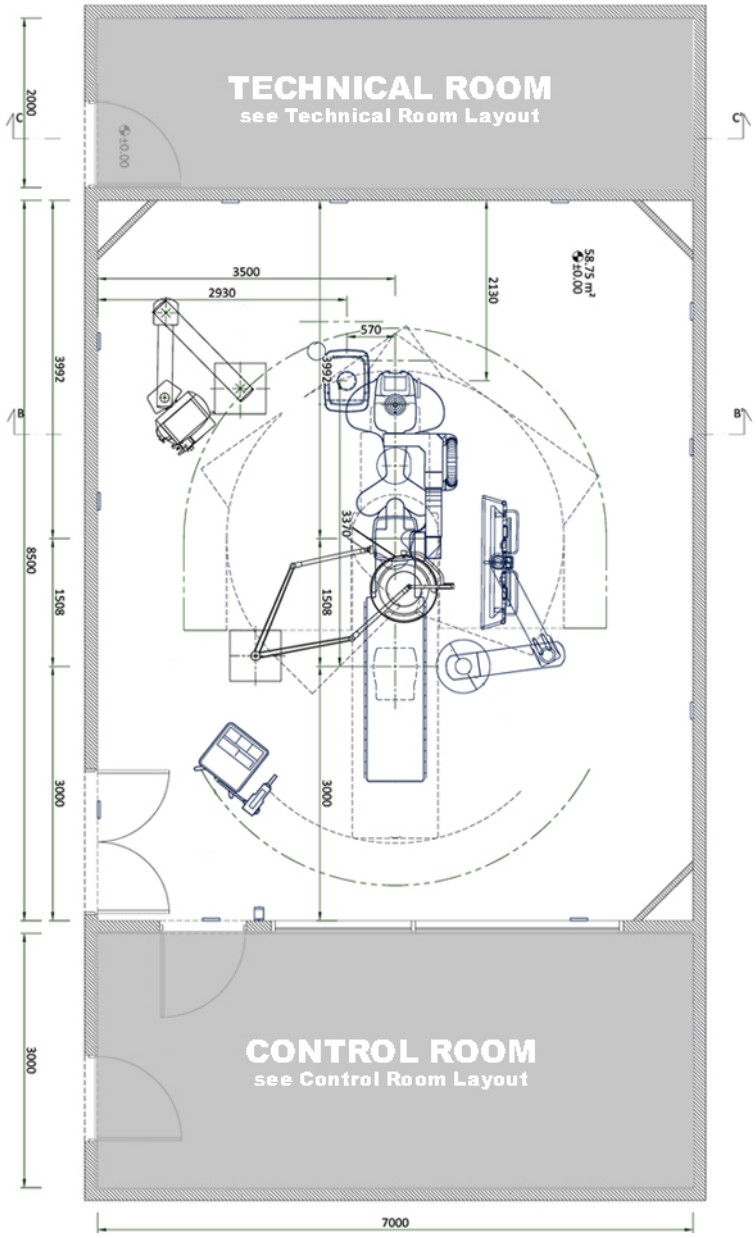


Figure 66 Interventional configuration with MAVIG suspension with fixed point with dual arm for Large Display Monitor (minimum room)



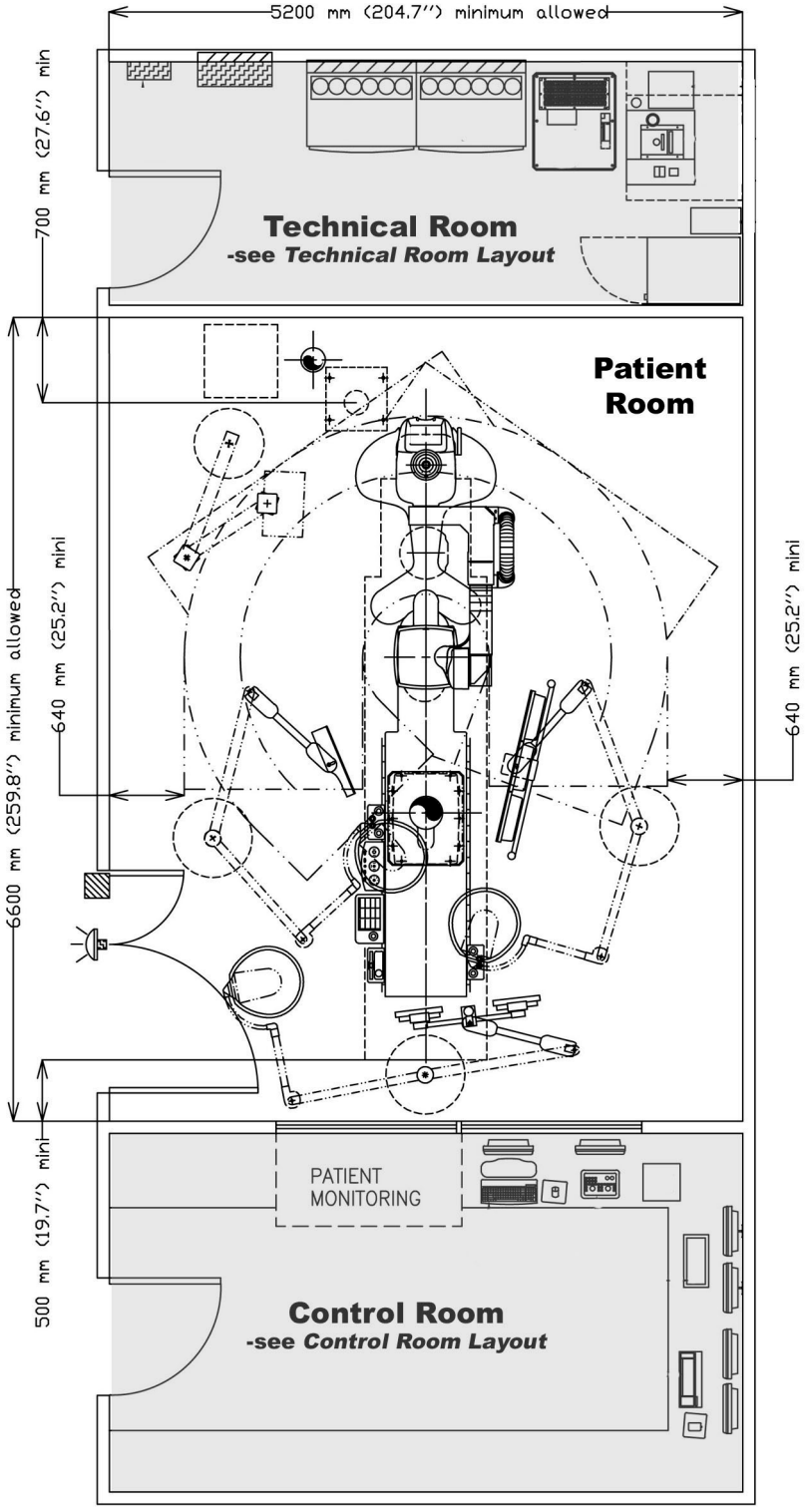
NOTE

The suspension ceiling fixation shall be determined taking into account at least:

- Clinical need: with an overall radius coverage of 2.03 m, ensure the monitor will be able to reach the position required by medical staff.
- Parking position.
- Ceiling constraints: other component and air flow.
- Cable output and ceiling trap.

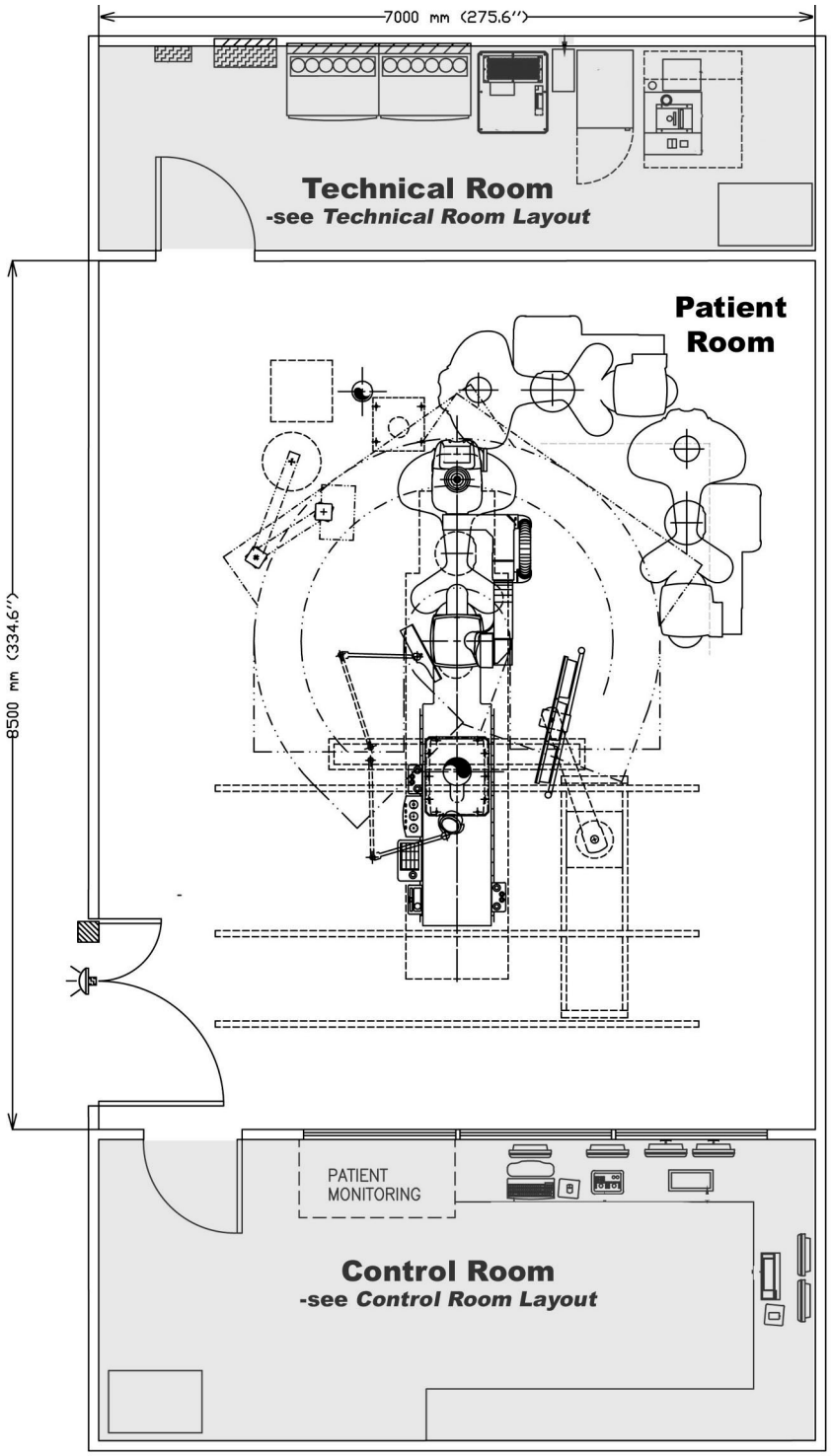
2.2.1.1.2.2 Layout for surgical configuration (minimum room)

Figure 67 Surgical configuration (minimum room)



2.2.1.1.2.3 Layout for interventional configuration (typical room)

Figure 68 Interventional configuration with Mavig suspension with rails (typical room)

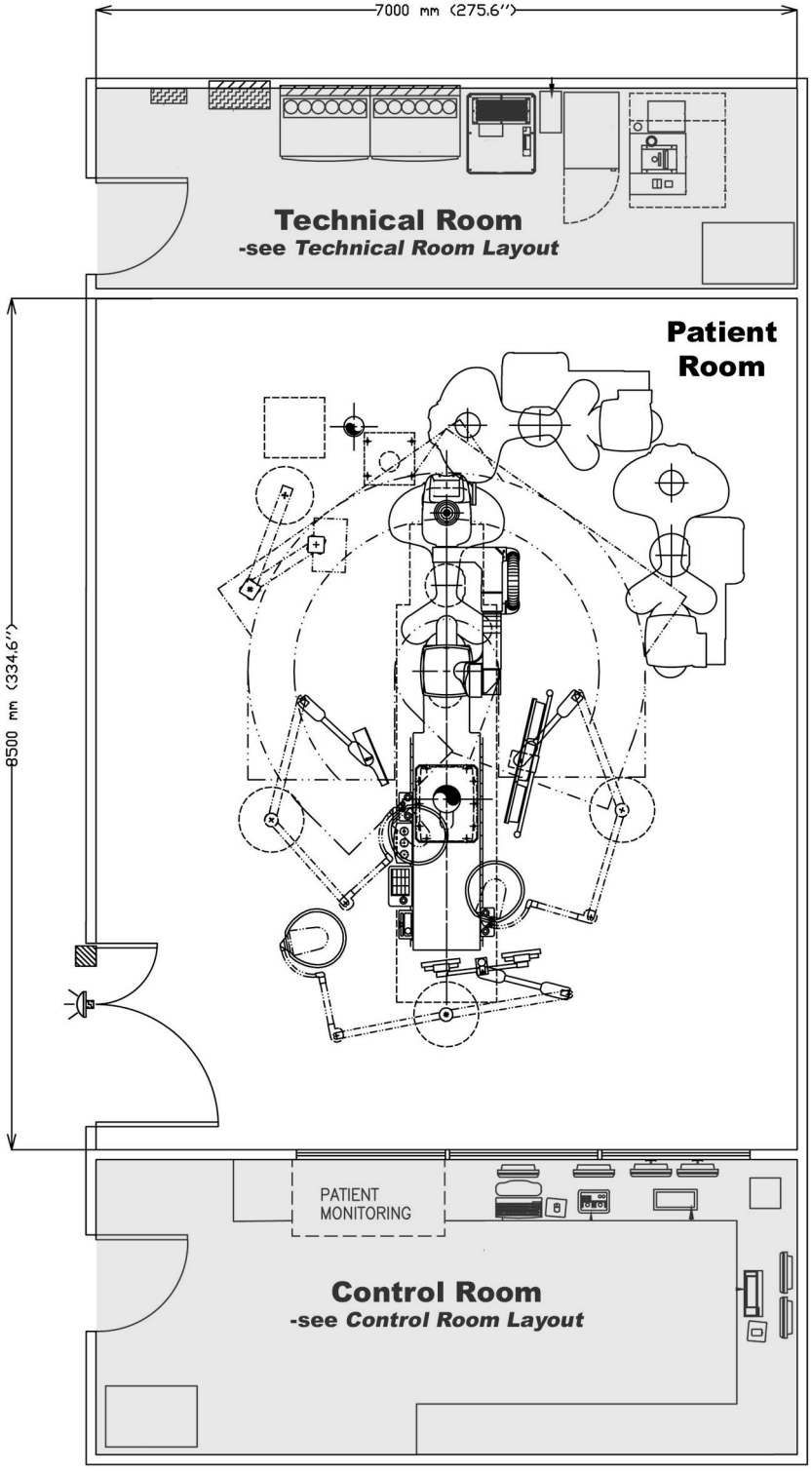


NOTE

The minimum ceiling height for Mavig suspension with rails above gantry area is 2.93 m (115 inch).

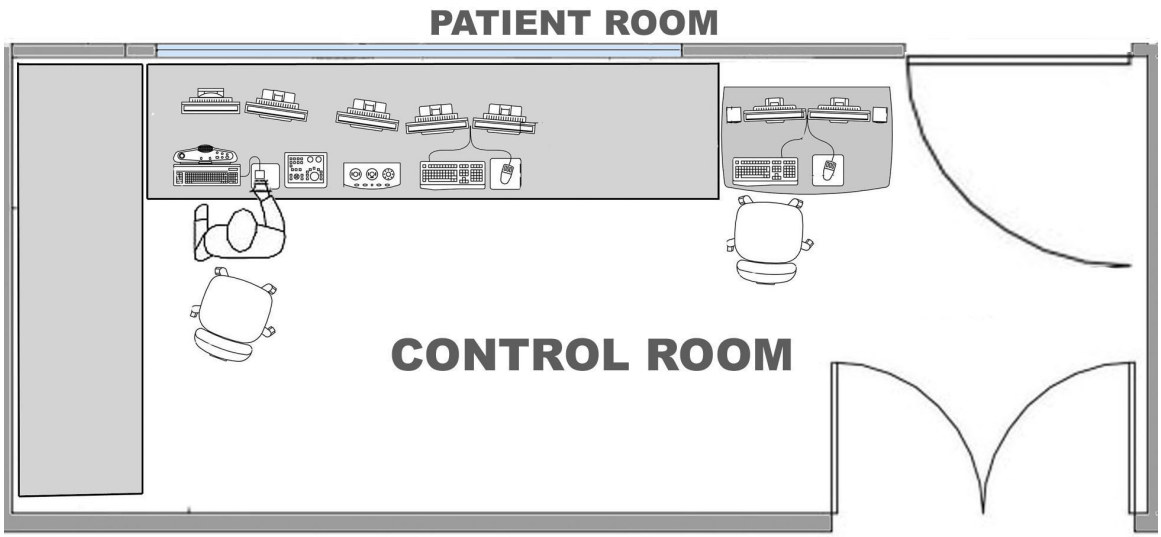
2.2.1.1.2.4 Layout for surgical configuration (typical room)

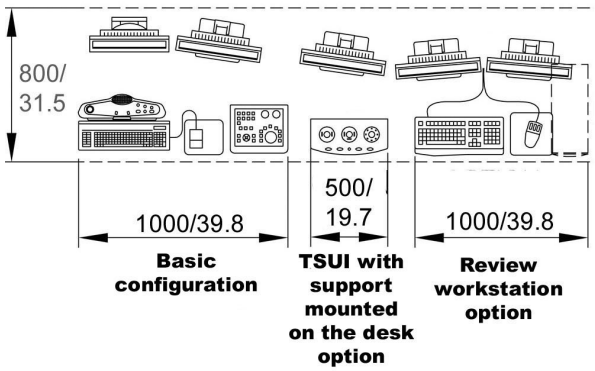
Figure 69 Surgical configuration (typical room)

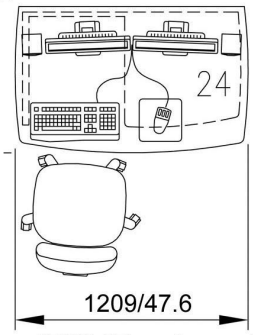


2.2.1.2 Control Room Layout

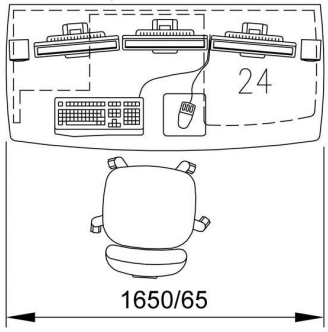
Figure 70







MACLAB system option or Combolab/Cardiolab option



WARNING

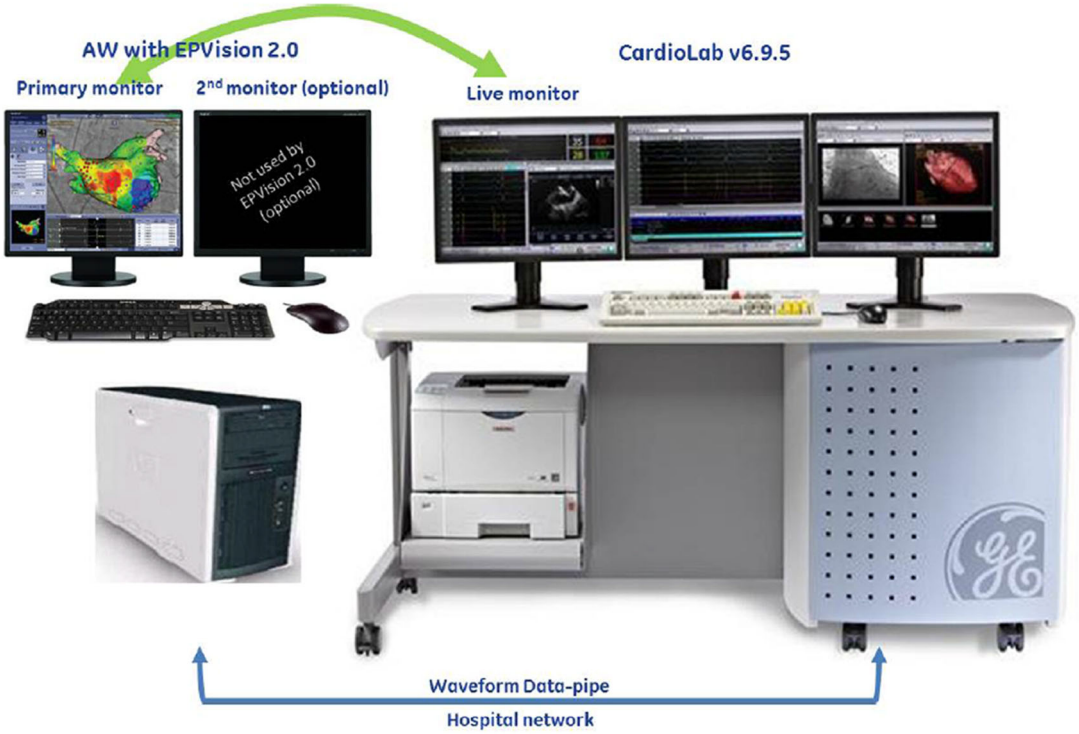
if remote Table User Interface option installed, ensure full visibility over the moving parts in the Exam Room (Gantry and Table)

All measurements are in mm (inches)

Recommended layout for control room when Innova EPVision 2.0 is installed:

To have optimal arrangement, place AW primary monitor close to CardioLab Live monitor.

Figure 71



2.2.1.3 Technical Room Layout

NOTICE

Condensation may occur on the outlets and pipes of the air conditioning system, therefore, it is critical to install the cabinets where there is no risk of water drops from the air conditioner.

2.2.1.3.1 General Requirements

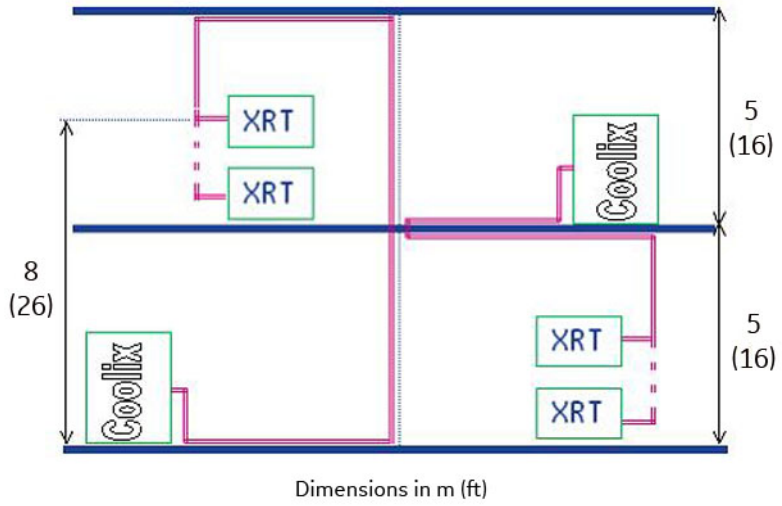
It is not allowed to store objects on cabinet top, or to stack cabinets one on another.

In cases 2 cabinets are installed face to face (both sides of the access way), the clearance width shall be at least 1.2 m.

In order to maintain their cooling capacities:

- The Tube Chiller shall be no more than 5 m (16 feet) above or 8 m (26 feet) below the upper position of the X-Ray Tube.

Figure 72 Distance between Tube Chiller and X-Ray Tube



NOTE

The highest point of the water network can be 10 m (32 feet) above the floor of the Technical Room where the Coolix-4100 is located (case where the Technical Room is one floor under the Exam Room).

- The Detector Conditioner shall not be located more than 3 m (10 feet) below or 20 cm (8 inches) above the CMS interface.

It is the customer responsibility to install a fire extinguisher (non-water type, ex. CO2) close to the Fluoro UPS CE Cabinet.

Figure 73 Technical Room Layout - Configuration 8 kVA UPS

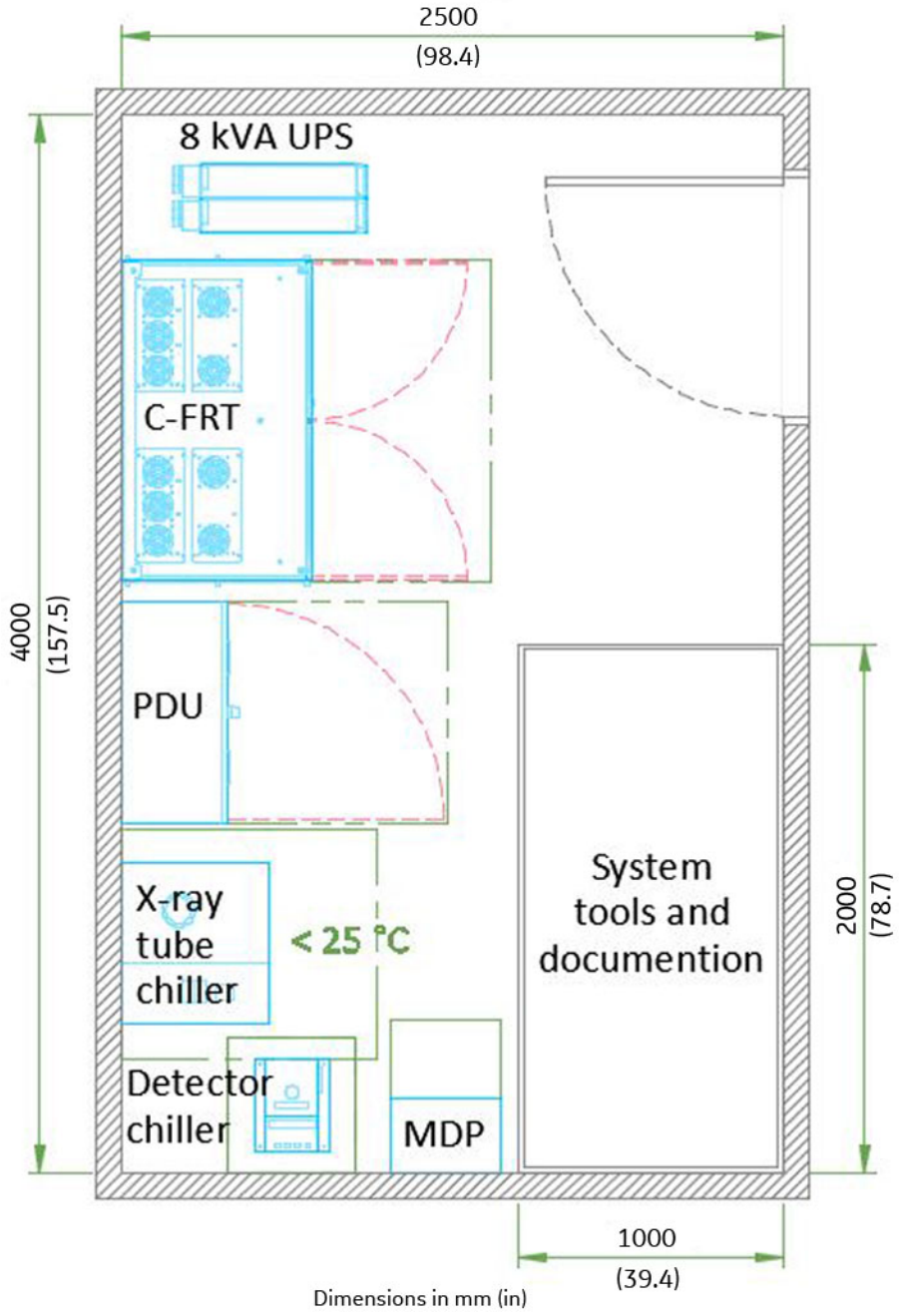
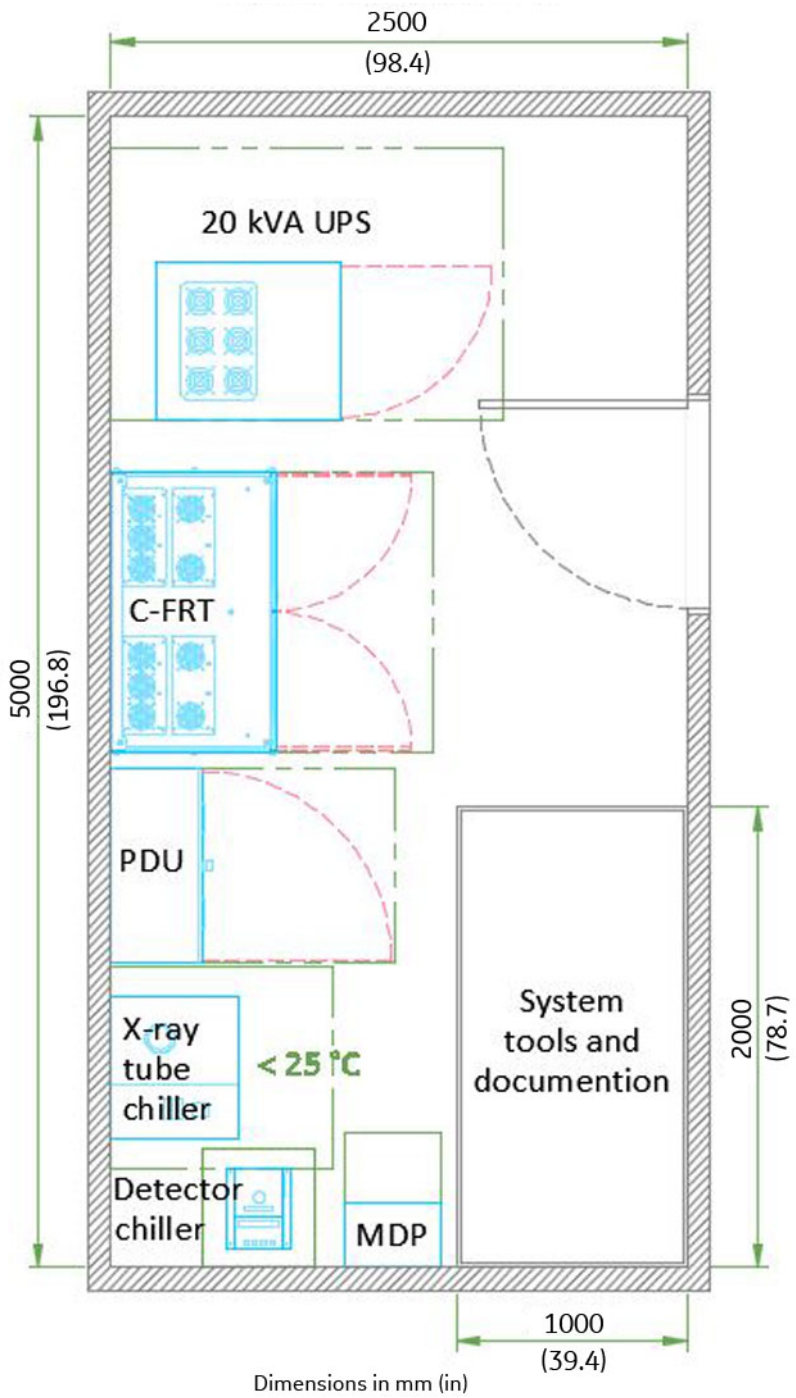


Figure 74 Technical Room Layout - Configuration 20 kVA UPS (Fluoro UPS)



2.2.1.3.2 Electromagnetic Requirements

The Detector inside the Gantry (in all its positions) shall be more than 1 meter from the front of the C-FRT Cabinet to minimize low frequency magnetic field interference risks.

2.2.1.3.3 Requirements for Service Access and Equipment Airflow

For the service access see 2.2.3 Room Layout Considerations on page 97.

If the Technical Room is in a dusty environment, it is strongly recommended to install filters on the air inlet of the Technical Room. These filters can cause reduced speed at the air inlet, and the size of the air inlet has therefore to be dimensioned accordingly.

The following distances shall be respected to guarantee proper cooling air exhaust.

C-FRT Cabinet:

- The minimum clearance between the ceiling and the top of the C-FRT Cabinet is 30 cm (11.8 in).

NPA PDU:

- The minimum clearance between the ceiling and the top of the NPA PDU is 30 cm (11.8 in).

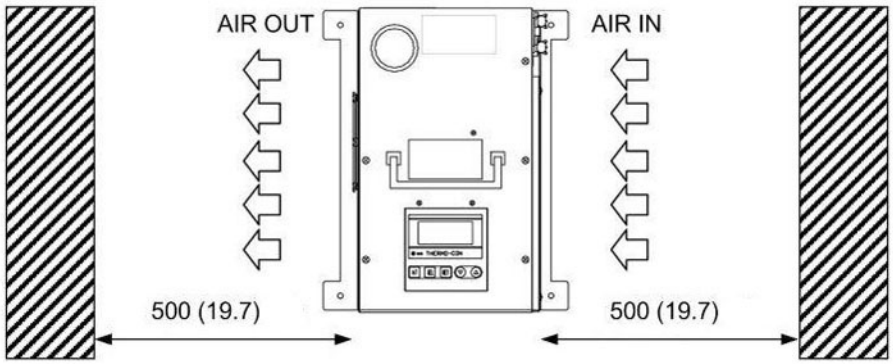
Tube Chiller:

- The Chiller can operate normally when installed against a wall or another cabinet (no possible air flow) on 1 side. The following clearance must be respected: back and one side: 40 cm minimum, front: 13 cm.
- Minimum 40 cm is needed for servicing on the left and right side panel.

Detector Conditioner:

- The following 50 cm clearance on the sides must be respected.

Figure 75 Detector Conditioner – Minimum clearance



Fluoro UPS:

- The minimum clearance between the ceiling and the top of the UPS is 40 cm.
- UL version: the left, right or back side of the UPS can be positioned against the wall or another cabinet.
- CE version: a clearance of 20 cm between the UPS back and the wall must be respected. A clearance of 50 cm is needed on the right side of the UPS cabinet for service.

- 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 the Standard IEC 62040-1-2).

2.2.2 System Mechanical Curves

For the System Mechanical Curves of the Patient Tilting table, refer to:

- **(For Innova^{IQ} Table and Innova^{IQ} OR Table)** this section.
- **(For Magnus Maquet OR Table)** the manufacturer Pre-installation Manual.

Table 19

TITLE	ILLUSTRATION
Patient Tilting Table Interference Regions	Figure 76 on page 94
Table Rotation Axis vs Table Flange	Figure 77 on page 95
Tilting Table side clearence (CPR access)	Figure 78 on page 96

Figure 76 Patient Tilting Table Interference Regions

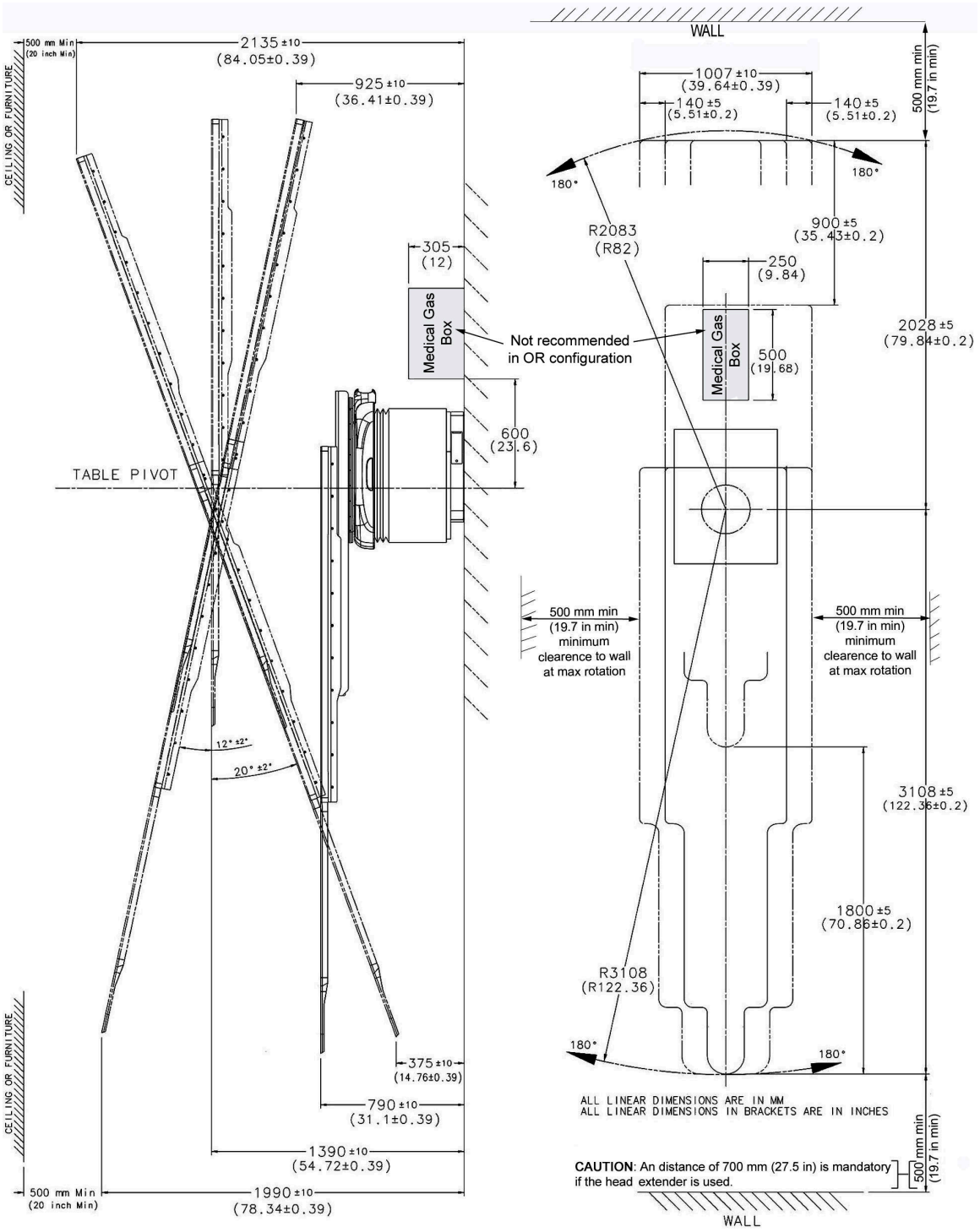


Figure 77 Table Rotation Axis vs Table Flange

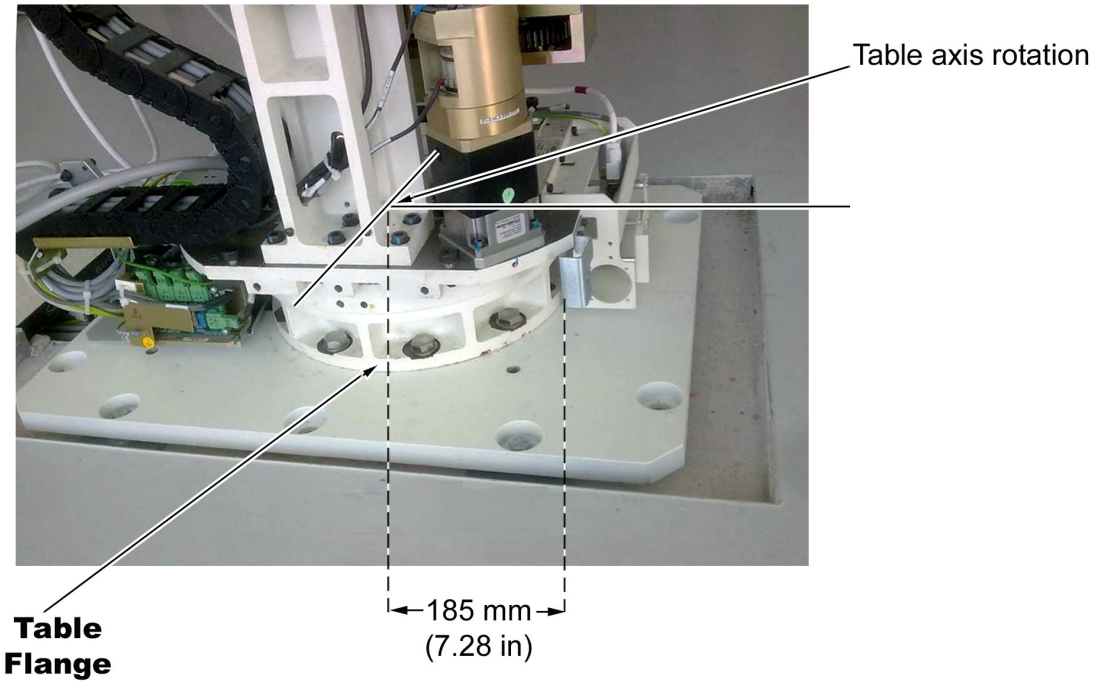
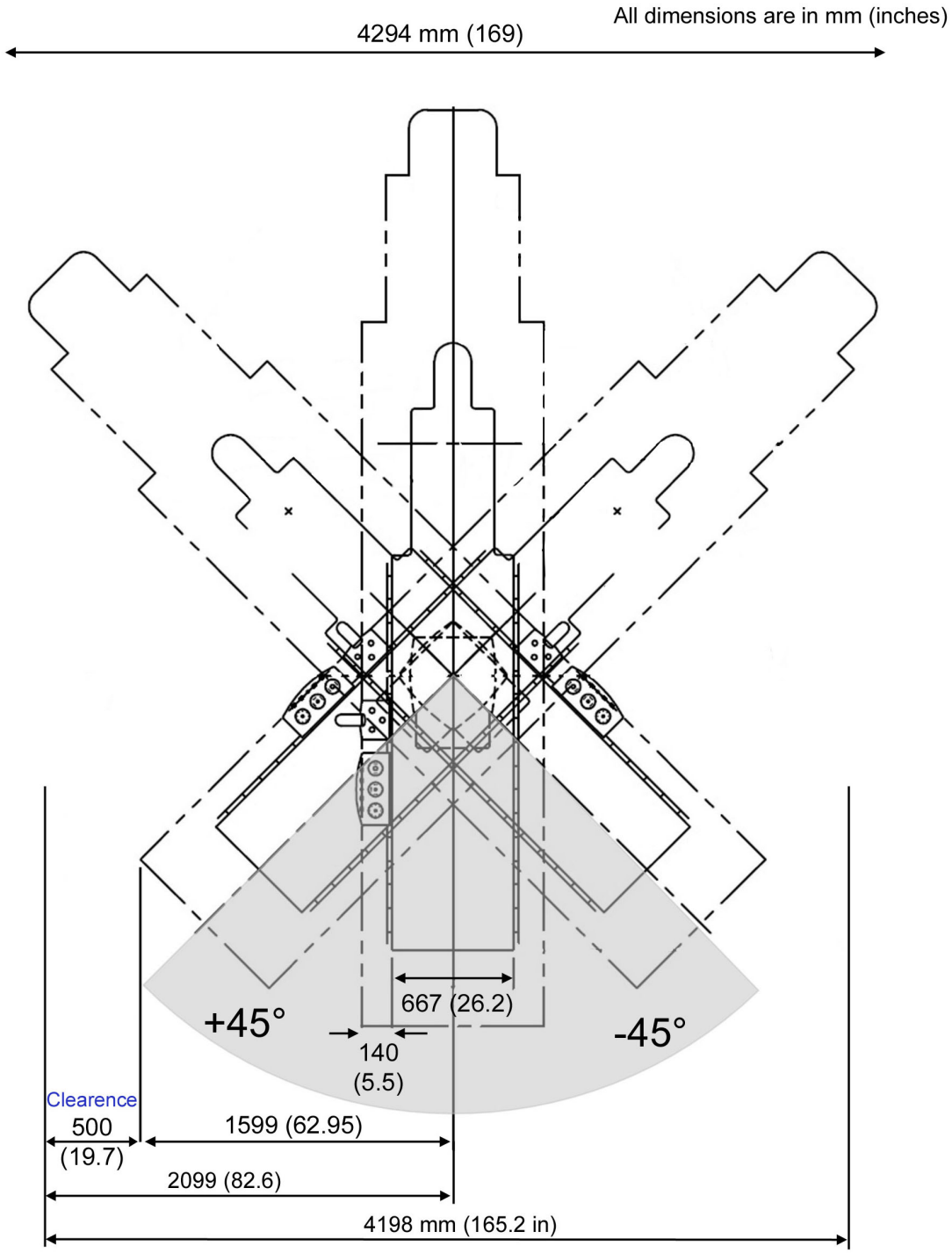


Figure 78 Tilting Table side clearence (CPR access)



2.2.3 Room Layout Considerations

2.2.3.1 Service Access

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

In particular for the CMS assembly described in 2.3.3 Ceiling Requirements on page 111, it is required to manage the following access:

- a minimum of 700 mm between the wall and the CMS rotation axis to give access to both the CMS assembly and cables during installation and maintenance (refer to 2.3.3 Ceiling Requirements on page 111).
- a service opening (800 mm x 400 mm min typically) in the ceiling window to give access to the both CMS assembly and cables during installation and maintenance (refer to 2.3.3 Ceiling Requirements on page 111).

2.2.3.2 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), taking into account the fact that the Innova^{IQ} and Innova^{IQ} OR Table can rotate 180°.
- Provide sufficient space around the patient table for the unimpeded conduct of CPR (Cardiac Pulmonary Resuscitation). With the table in this position, the table must be capable of rotating ± 45°.
- Clinicians at the patient table must be able to communicate with assistants in the control area.
- There must be an unrestricted view of the video monitors and physiological monitoring equipment from the vascular table.
- Operators in the control area must have easy access to the control console. However, position the controls (including handswitches) so that the operator cannot take exposures while looking around or standing outside the control booth’s lead glass window.
- Operators in the control area must have easy access to video recorders, injector programmers, and service and operating manuals.
- Consult customer on the number and location of nonelectrical lines (air, oxygen, vacuum, water, etc.) in the vascular room.
- For systems with the LDM, make sure the backup monitors are easily accessible to view in case of failure of the LDM. For the systems where the backup monitors are mounted at the back of the LDM, plan a clearance so that the monitor can be flipped at 180°.

2.2.3.3 Peripheral Equipment

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

- Sinks
- Oxygen stations
- IV apparatus
- Injectors
- Heart monitoring equipment
- Crash cart
- Ultrasound equipment.

2.2.3.4 Emergency Stop

Protect the Emergency Stop from accidental actuation.

2.2.3.5 Patient Environment Equipment

As defined in the IEC60601-1, the patient vicinity is defined as the space within the room 1.83 m (70.7") beyond the perimeter of the table and extending vertically 2.29 m (90.2") above the floor. Only the following components of the system can be installed within the patient vicinity:

- Table and its accessories
- Monitors
- Injector
- Rad-Shield
- Table Side User Interfaces
- **(For Innova^{IQ} Table and Innova^{IQ} OR Table)** In-room AW mouse.

For the Magnus Maquet OR table, the table accessories that can be installed within patient vicinity are given in the manufacturer Pre-installation manual.

2.2.3.6 Use of Room Template

The Room Template delivered as pre-install item can be used to clearly identify the mounting position for the main system components.

It also provides good information to help during the target positioning survey.

The Room Template is identified by:

- **(For System with Innova^{IQ} Table or Innova^{IQ} OR Table)** p/n 5447156
- **(For System configuration compatible with Magnus Maquet OR Table)** p/n 5447156-5

NOTE

This template can be ordered in advance with pre-installation parts. When using the room template to install the table baseplate, mark on the template (in the boxes close to the reference point) the X and Y values corresponding to the distances between the wall and the reference point so the template can be repositioned accurately during the mechanical installation.

2.3 Room Structural Requirements

2.3.1 General Policy

2.3.1.1 Baseplates Mounting

The customer is responsible for the structural analysis and mounting of the base plates.

(For Innova^{IQ} Table and Innova^{IQ} OR Table) If GEHC is forced to mount the base plate, the Local Customer Team must hire a structural engineer to design and approve the mounting method and provide GEHC with an engineering report.

NOTICE

Floor, walls and ceiling structural design that meet mechanical constraints of supporting the system, fall under the customer's responsibility.

NOTICE

The customer is responsible for the preparation of the floor according to the specifications below.

The preferred installation method for the patient table 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.

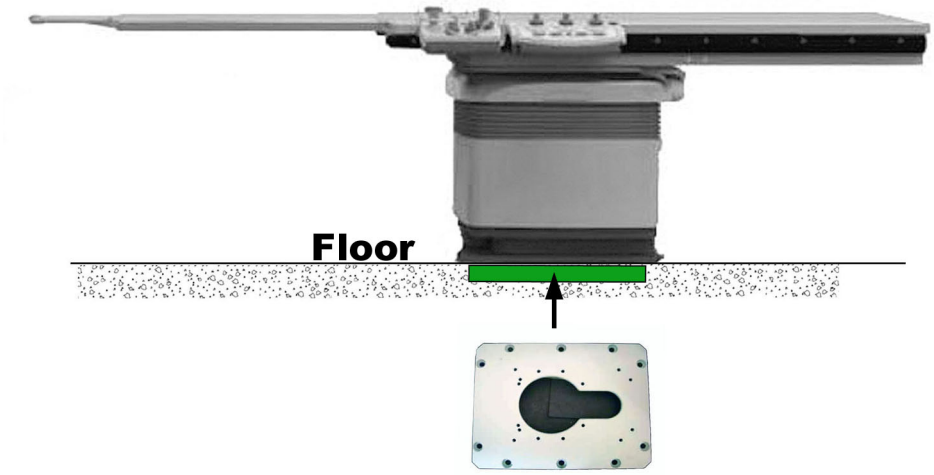
2.3.1.1 Innova^{IQ} table and Innova^{IQ} OR table

NOTICE

The baseplate is mandatory to install the table (patient support).

The table must never be installed on grade.

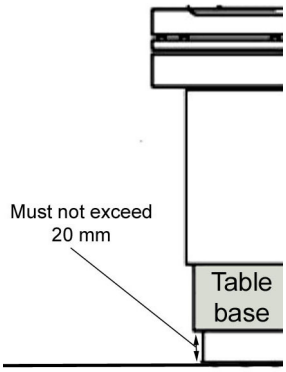
Figure 79 Table on table baseplate



NOTICE

The gap between the Table Foot bottom and the floor end shall be lower than 20 mm (0.97 in). Any bigger gap would make the system incompatible with the Innova Vision Applications.

Figure 80 Gap between Table Foot bottom and the floor

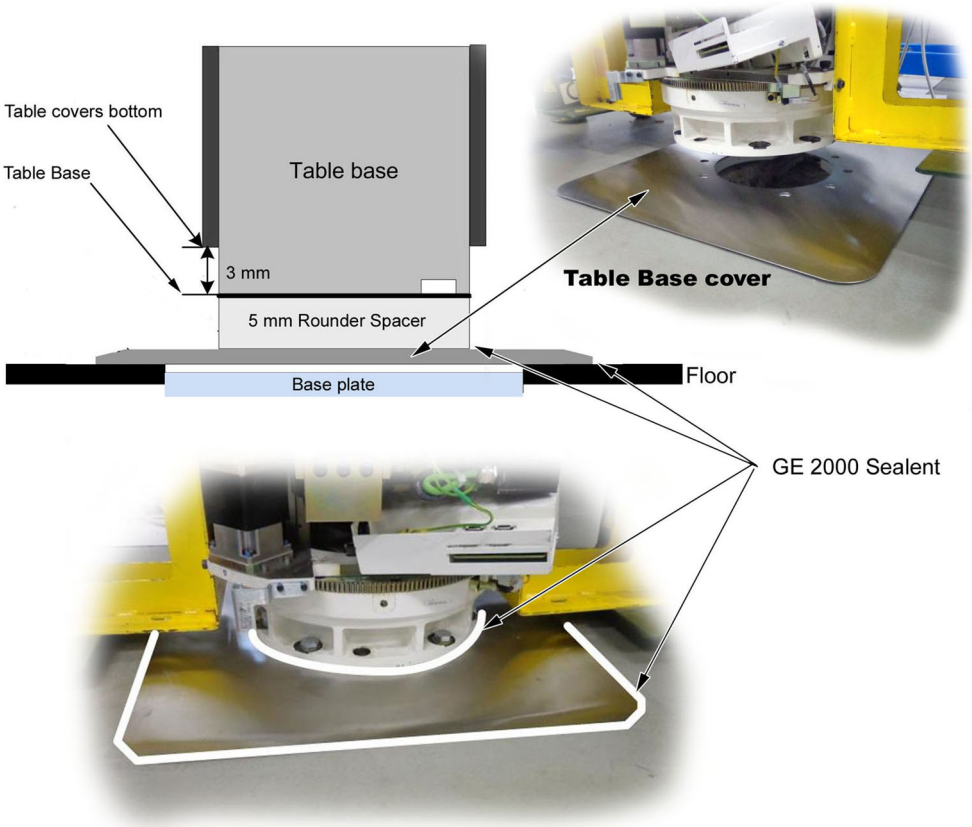


NOTICE

It is recommended to seal the table base by adding a special cover on top of the table base plate. This recommendation particularly applies to Discovery IGS systems installation where the floor finish (top resin layer) may be higher than the table base plate.

Gap between the Table base and the Base plate must be sealed using GE 2000 Silicone Sealant. Any Sealant that may protrude along the edges can be removed.

Figure 81 Table Baseplate cover



NOTE

Any gap between the table base plate top surface and the stainless cover shall be shimmed so that it does not bend when tightening bolts which secure the table base on the floor.

The 5 mm spacer not shown on all pictures.

Refer to provided in the service manual for more details on the mounting instruction.

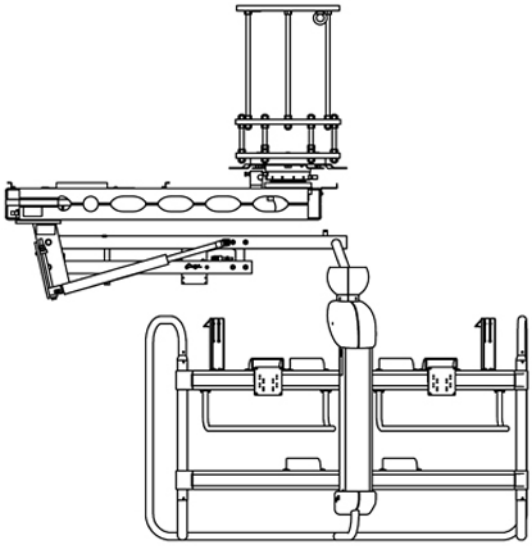
2.3.1.2 Magnus Maquet OR Table

For mounting instructions of Magnus Maquet OR table, refer to the manufacturer Pre-installation Manual.

2.3.1.2 Substructure for Dual Arm suspension Mounting (for Mavig suspension with fixed point dual arm)

The customer is responsible for the structural analysis and mounting of the Substructure for Dual Arm suspension in the solid ceiling (in case of a Large Display Monitor and the MAVIG suspension with fixed point dual arm). If customer requires GEHC to mount the Substructure for Dual Arm suspension, the customer must hire a structural engineer to design and approve the mounting method and provide GEHC with an engineering report.

Figure 82 Medium Height Substructure for Dual Arm Suspension and MAVIG Suspension with Fixed Point Dual Arm



NOTICE

The Substructure for Dual Arm suspension is mandatory to install the MAVIG suspension with fixed point dual arm.

NOTICE

The lower edge of the Substructure for Dual Arm suspension should be the same height as the lower edge of the false ceiling.

2.3.2 Floor Requirements

2.3.2.1 Requirement for sub-floor

NOTICE

A detailed Sub-Flooring Control Report (measurements before flooring) shall be provided by the applicator. It shall contain at least the following information:

- substrate flatness
- tensile test of substrate
- compression strength test on substrate
- substrate humidity
- substrate level

Table 20 Acceptance specifications for concrete Substrate before monopur application

CONTROLS	SPEC (Metric)	Spec (Imperial)
Before Flooring (substrate = concrete)		
Substrate flatness	< 3 mm under 2 m straight-edge	< 3 mm under 6 foot straightedge
Substrate levelness	< 1 mm/m	< 1 mm/m
Pull-off strength (i.e Elcometer Adhision ester)	> 1.5 MPa	> 218 PSI
Hardness (i.e Schmidt Hammer Sclerometer)	> 30 N/ mm^2	> 4300 PSI

2.3.2.2 Requirements for Innova^{IQ} table and Innova^{IQ} OR table baseplate installation

NOTICE

The following requirements are only applicable to Innova^{IQ} table and Innova^{IQ} OR table.

Magnus Maquet OR table mounting is under customer responsibility. For information, refer to the manufacturer Pre-installation Manual.

NOTICE

The Innova^{IQ} Table baseplate is mandatory to install Innova^{IQ} table and Innova^{IQ} OR table.

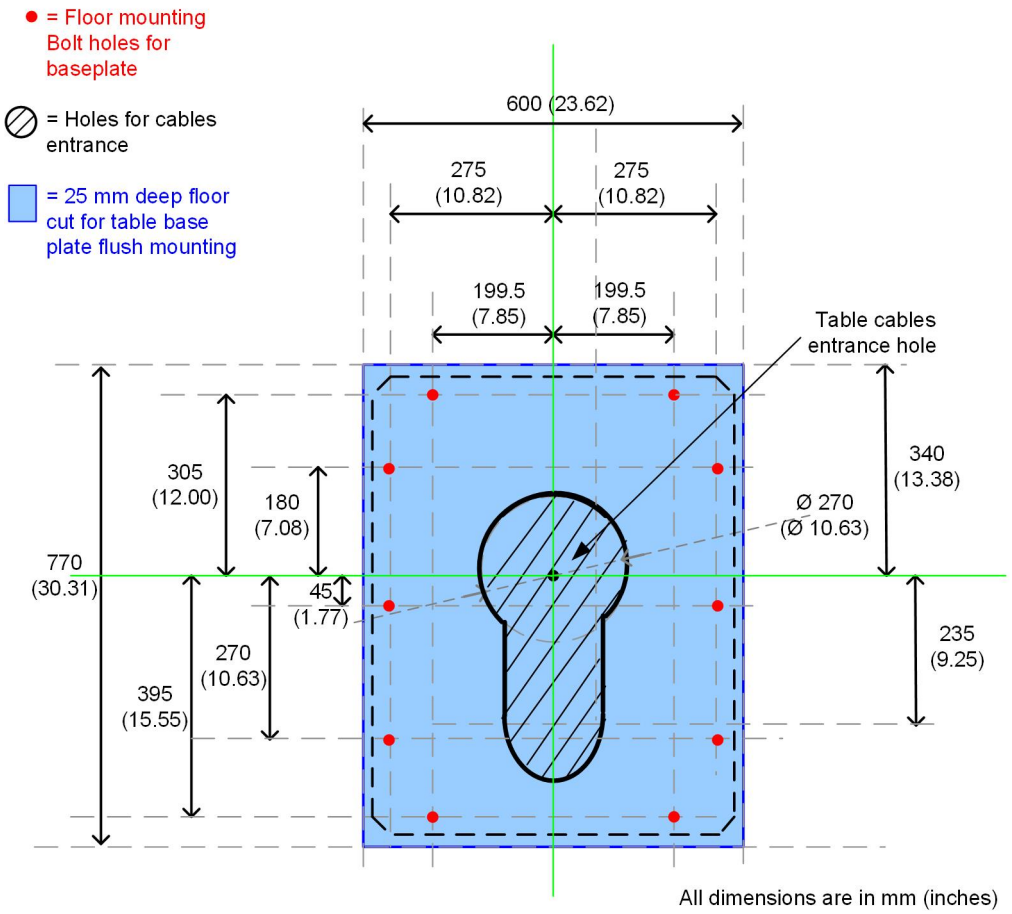
2.3.2.2.1 Preferred location in concrete floor and hole dimension

In the examination room, the patient table baseplate is placed directly on the concrete floor. The location of the cable access needs to be carefully planned.

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 a hole for the patient table.

The diameter of the cable entrance hole must be 270 mm or 10.63 in.

Figure 83 Holes location in concrete floor



NOTE

With any kind of fixation methods (Bolts M20, Mechanical anchors or Chemical anchors), the number of holes used mandatorily is: ***Table baseplate : 10 max and 8 min holes used are acceptable***.

We can have only 2 consecutive holes omitted.

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. The height of the outcoming conduit plus bushing is limited to 1/2 in (12.7 mm).

NOTE

Refer to Table 21 on page 106 for:

- diameter and depth of mounting holes for baseplate
- pull out effort on each fixation bolts.

2.3.2.2.2 Floor requirements when using provided floor anchors

The maximum pullout force per provided anchor was calculated assuming:

- A concrete compression strength of **30 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.

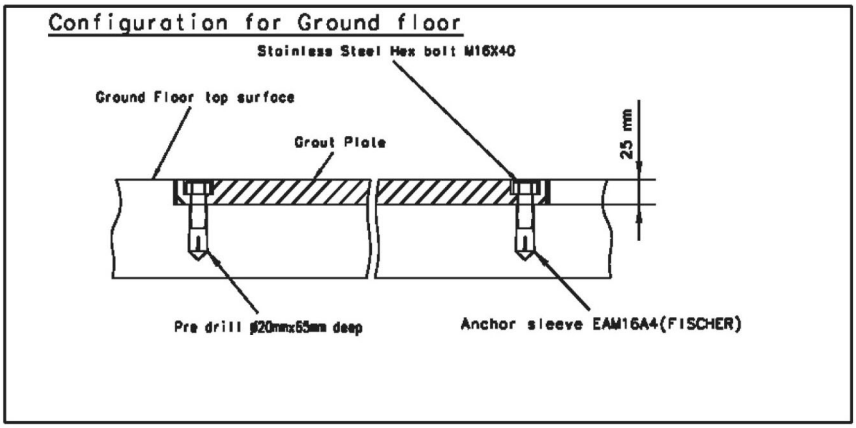
2.3.2.2.3 Pan Type Floor Construction Requirement

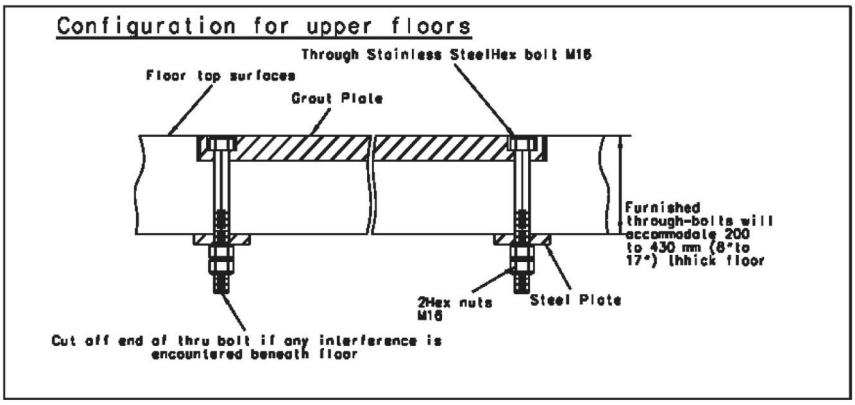
For Pan type floor construction, steel channels must be designed by a local structural engineer to span floor joists.

NOTE

For specific floor preparation procedures, refer to Discovery™ IGS 730, Discovery™ IGS 740 Pre-Installation Kit Installation Procedures.

Figure 84 Table floor mounting layout





NOTICE

Prepare the floor such that the Table baseplate will be flush with the floor finish surface, taking into account the thickness of the floor finish material.

2.3.2.2.4 Pull out efforts, holes specifications and recommended chemical anchors

NOTE

Chemical anchors are not provided by GE.

Table 21 Chemical anchors Pull out efforts and recommendations

see *Floor mounting Bolts for baseplate* in Figure 83 on page 104	
Pull out effort	1120 daN per bolt if 10 used and 2000 daN per bolt if 8 used
Number of holes in the plate	10 max (8 min mandatory)
Recommended chemical anchors example 1	Supplier HILTIHVU adhesive capsule + HAS Anchor rod

Chemical anchors Pull out efforts and recommendations continued	
see *Floor mounting Bolts for baseplate* in Figure 83 on page 104	
Threaded rod	M20 A4-70 / 333 135 3/4
Hole diameter in the floor	24 mm (7/8 in)
Hole depth in the floor	170 mm (6-5/8 in)
Minimum floor thickness	220 mm (8-1/2 in)
Max Tightening Torque	150 N.m (110 ft-lb)

NOTE

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

NOTE

For Floor mounting holes location, refer to Figure 83 on page 104.

2.3.2.3 Requirement for Innova^{IQ} table and Innova^{IQ} OR table installation

NOTICE

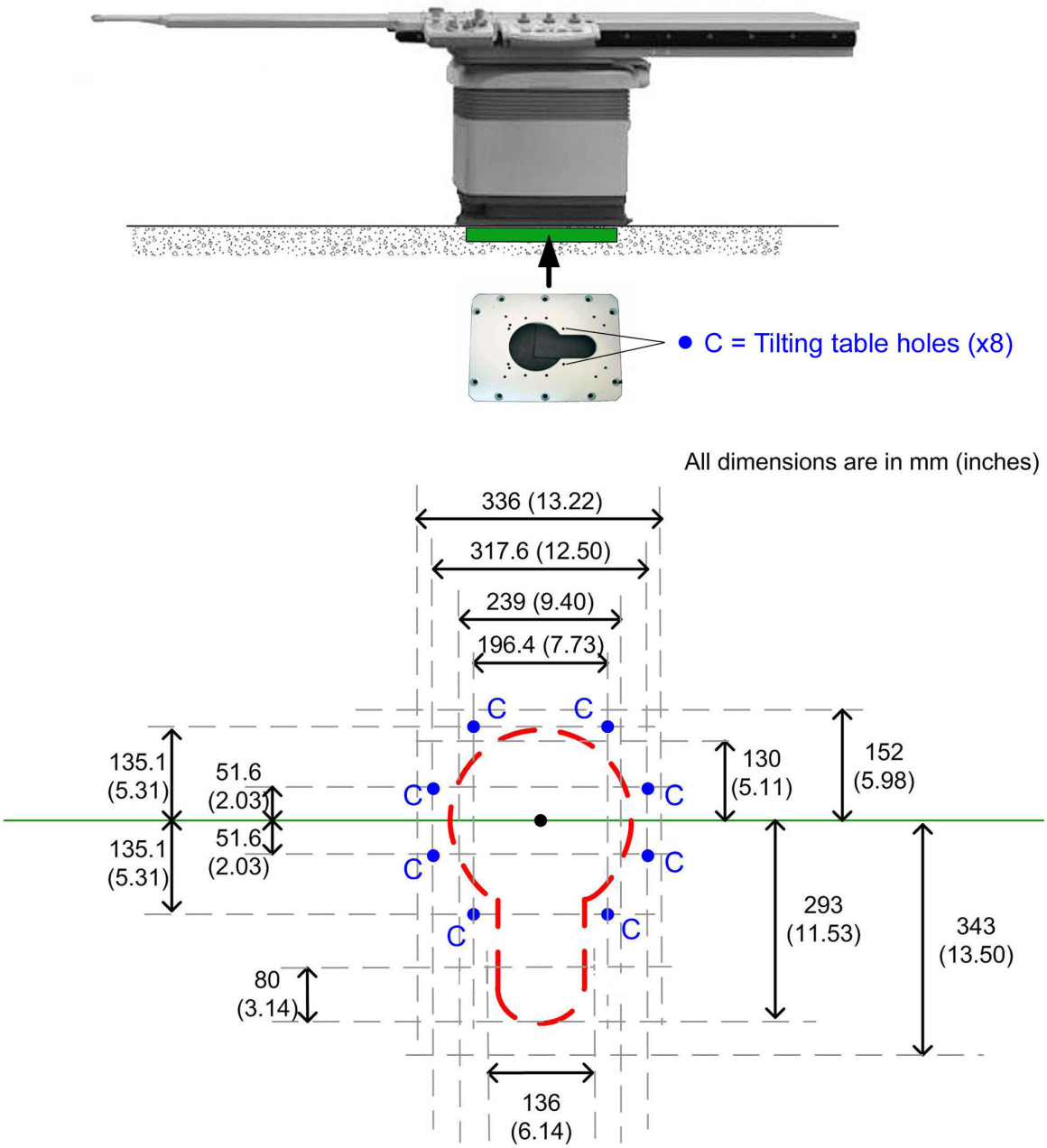
The following requirement is only applicable to Innova^{IQ} table and Innova^{IQ} OR table.

Magnus Maquet OR table mounting is under customer responsibility. For information, refer to the manufacturer Pre-installation Manual.

NOTICE

The Innova^{IQ} table and Innova^{IQ} OR table must never be installed on grade. "Above the floor" mounting of the Table Baseplate is not allowed. It would cause collisions with the gantry.

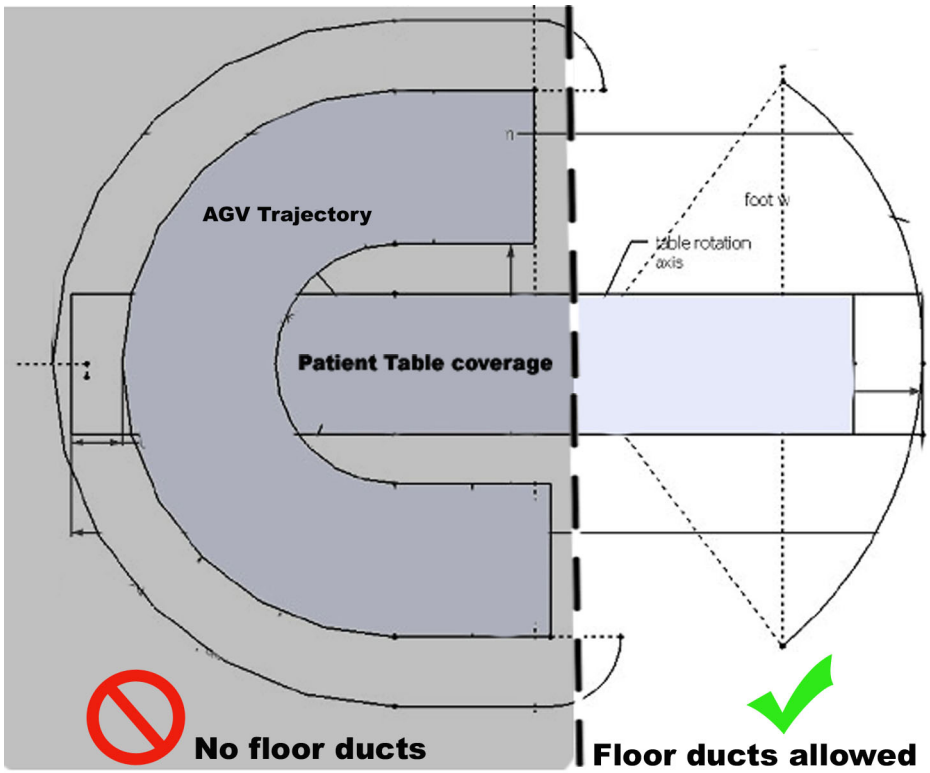
Figure 85 Table mounting holes



2.3.2.4 Requirement for cables route in the floor restrictions

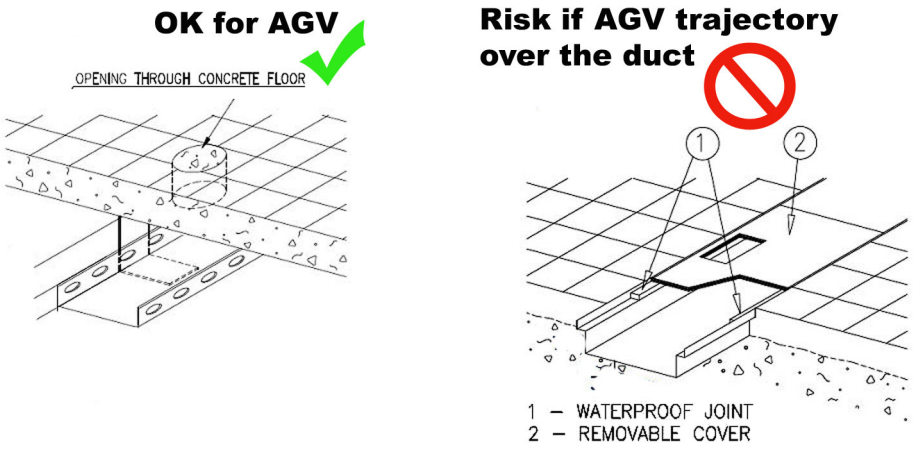
Placing of Floor ducts are not allowed in the area covered by the passage of the Gantry.

Figure 86



The presence of ducts presents a risk to the AGV.

Figure 87



CAUTION

Caution! No floor drain in Gantry area

2.3.2.5 Requirement for flooring system

The floor system compatible with the Discovery™ IGS systems is the “Monopur 4+3” monolithic flooring. It consists of 5 layers as described below:

1. primer layer “Monopur industry Primer”
2. bulk layer “Monopur industry”
3. conductive adherence layer of the two components conductive epoxy “Monopox conductive primer WB”
4. surface layer of PU-cement three components mix “Monopur industry SL conductive”
5. hardtop conductive layer.

Contact your local GE representative for a list of certified applicators of the flooring system.

NOTICE

(Bare) concrete floor preparation and floor resin application falls under the customer responsibility.

No expansion joint shall be present in the concrete in the area where the flooring system will be applied.

The resulting finished floor surface shall meet the following specifications:

- Levelness 1 mm/m
- Flatness 3 mm/2m

WARNING

Meeting the required specifications for the flooring system is critical for the performance of the Discovery IGS systemS.

NOTICE

A detailed Flooring Control Report (measurements during/after flooring) shall be provided by the applicator. It shall contain at least the following information:

During the application of the flooring system (for each individual layer):

- used material quantity
- thickness monitoring (comb method)
- curing time
- substrate temperature
- substrate humidity
- ambient temperature
- ambient humidity.

After the application of the flooring system:

- tensile test of floor finish on substrate
- hardness measurement
- conductivity measurement
- flatness measurement.

2.3.3 Ceiling Requirements

2.3.3.1 Cable Management System

The gantry Cable Management System assembly (CMS) must be mounted to the ceiling according to the requirements given in this section.

Subsequent sections describe different mounting configurations depending on the type of room.

Load on the interface

maximum load per bolt (4 bolts):

- max axial effort **1530 N**.
- max shear force **125 N**.

The supporting structure design shall take into consideration the safety coefficient of 4 (customer's contractor responsibility).

2.3.3.1.1 CMS Fixation modes to the ceiling

There are two fixation modes to the ceiling:

1. Using a structure provided by the customer: typically the case for OR Room (surgical environment) where use of rail is not recommended.
2. Using the CMS intermediate rails provided with the system: normally the case for any standard interventional rooms.

For the allowed configurations of Exam Room Height, refer to the configuration table in 2.2.1.1.1 Exam Room Dimension Requirements on page 66, § Exam Room Height.

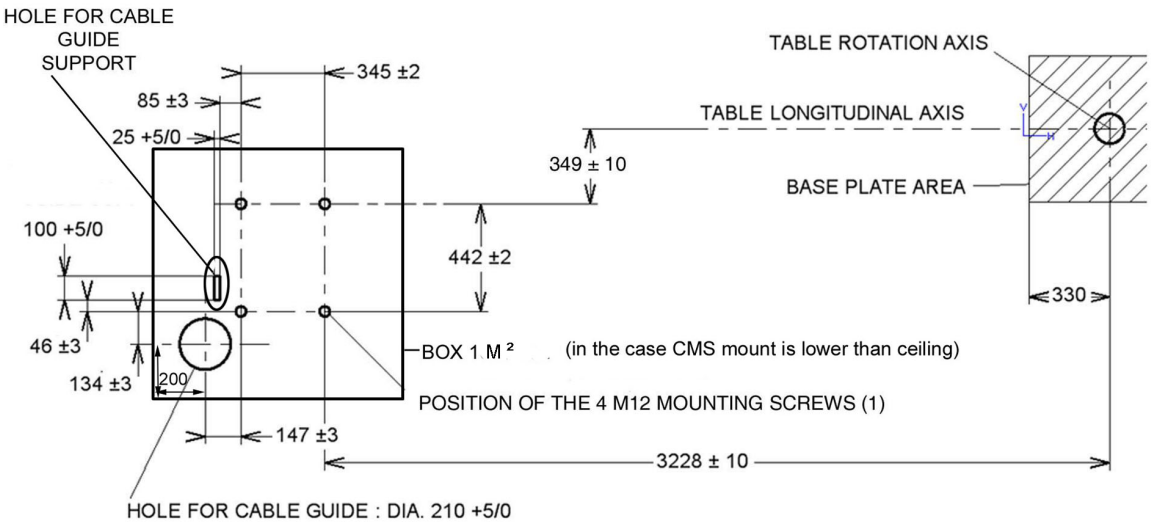
CAUTION

The ceiling structure is the customer's contractor responsibility.

2.3.3.1.1.1 CMS Mounting directly on the structure

The ceiling structure shall be constructed considering the CMS specifications given in CMS fixing plate pivot versus the patient table axis on page 117.

Figure 88 Mechanical interface with mechanical support or concrete ceiling



(1): Position needs to be controlled while drilling holes or installing the CMS mounting structure to make sure that position is within the specified range.

(2): The Mechanical interface (mounting plate) shall be adjustable in height to allow final adjustment once the flooring is done.

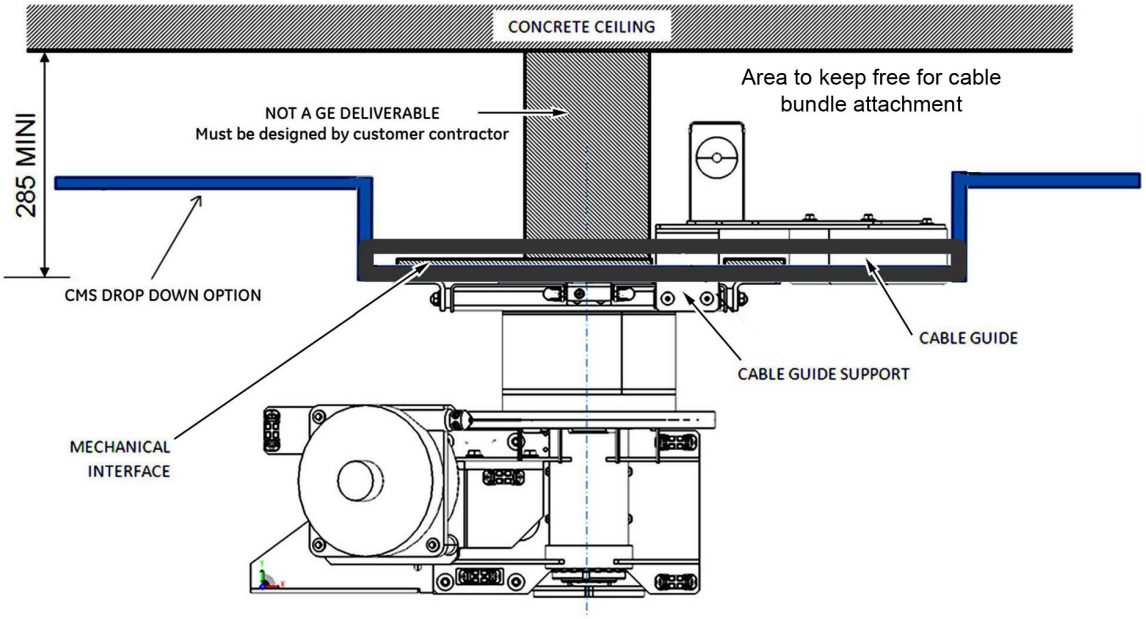
(3): The Mechanical interface (mounting plate) dimension shall be kept typically under the 520mm x 490mm so that the CMS top covers mounted at the end of install can nicely hide them.

(4): Refer to CMS fixing plate pivot versus the patient table axis on page 117 below for more information on CMS fixation constraints.

NOTE

In OR (without the intermediate rails 50 / 30): the distance between the bearing face of the mounting brackets of carriage and the slab ceiling must be 285 mm.

Figure 89 CMS OR fixation mode side view



NOTE

In the case of hard (sealed) ceiling (surgical configuration), a service entry point shall be designed (customer responsibility) near the CMS fixation point to allow for the service access for installation and maintenance operations.

Enough space shall be managed in the ceiling around the CMS fixation area so the top part of the cable guide support mounted above the ceiling can actually be used to attach the cable bundle with no risk of damaging the cables. If not possible, a local solution needs to be designed to ensure the cable bundle is securely attached.

NOTE

Screws for attaching the CMS to the mounting structure are not coming with the system and shall be provided locally based on the type of mechanical interface to be used and following recommendations below.

Figure 90 Mounting on mechanical interface with smooth holes

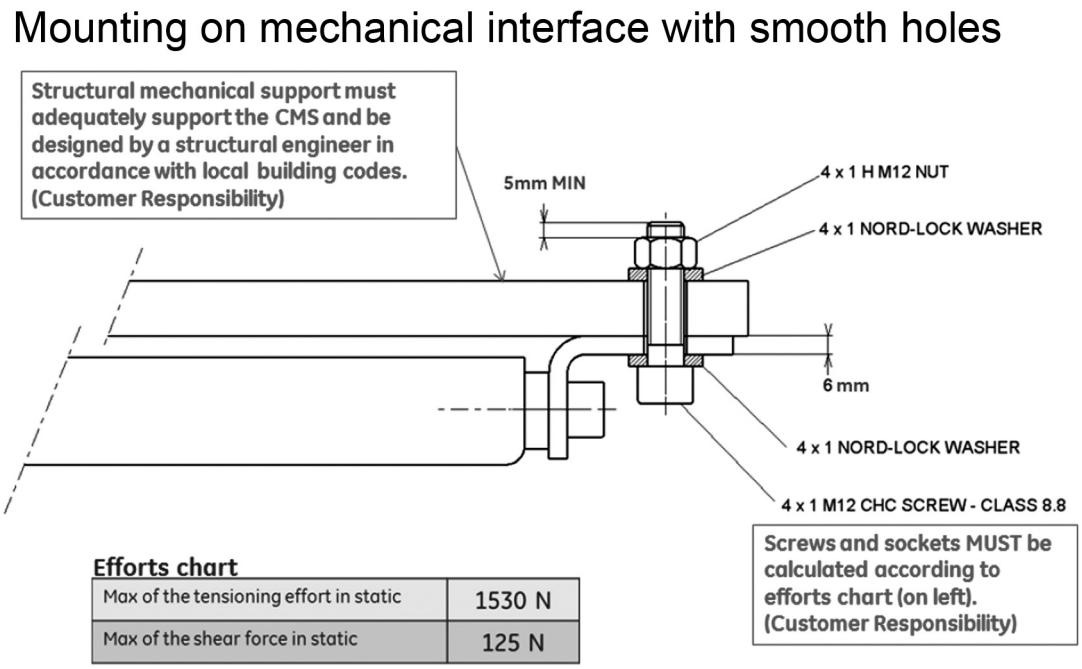
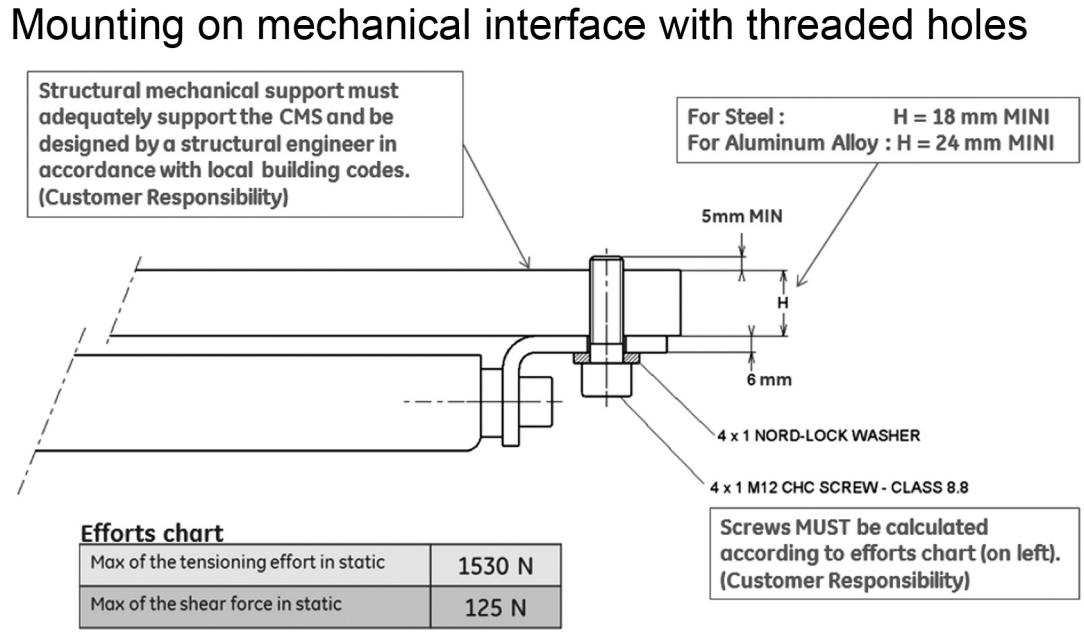


Figure 91 Mounting on mechanical interface with threaded holes



2.3.3.1.1.2 CMS Mounting with intermediate rails (for interventional configuration)

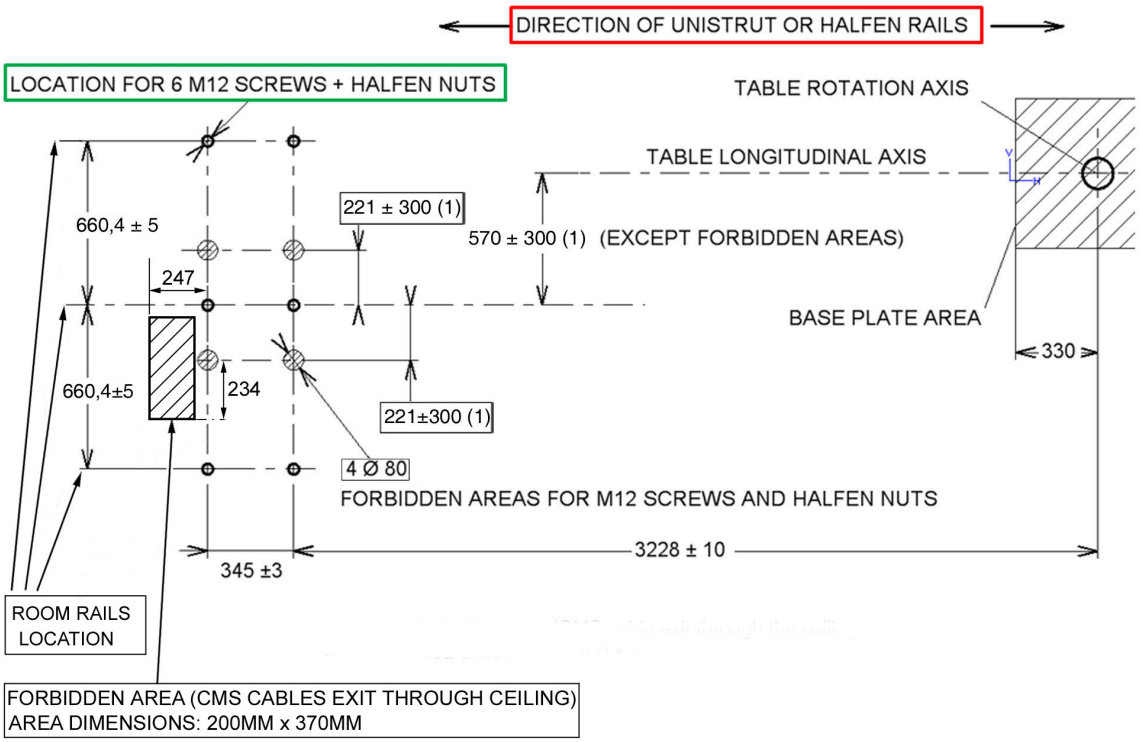
The CMS (intermediate) rails are designed to be mounted on a ceiling structure under customer's owneship.

NOTE

It is assumed that the ceiling structure is made of rails at a distance of 660.4 ±5 mm (either parallel or perpendicular to table axis).

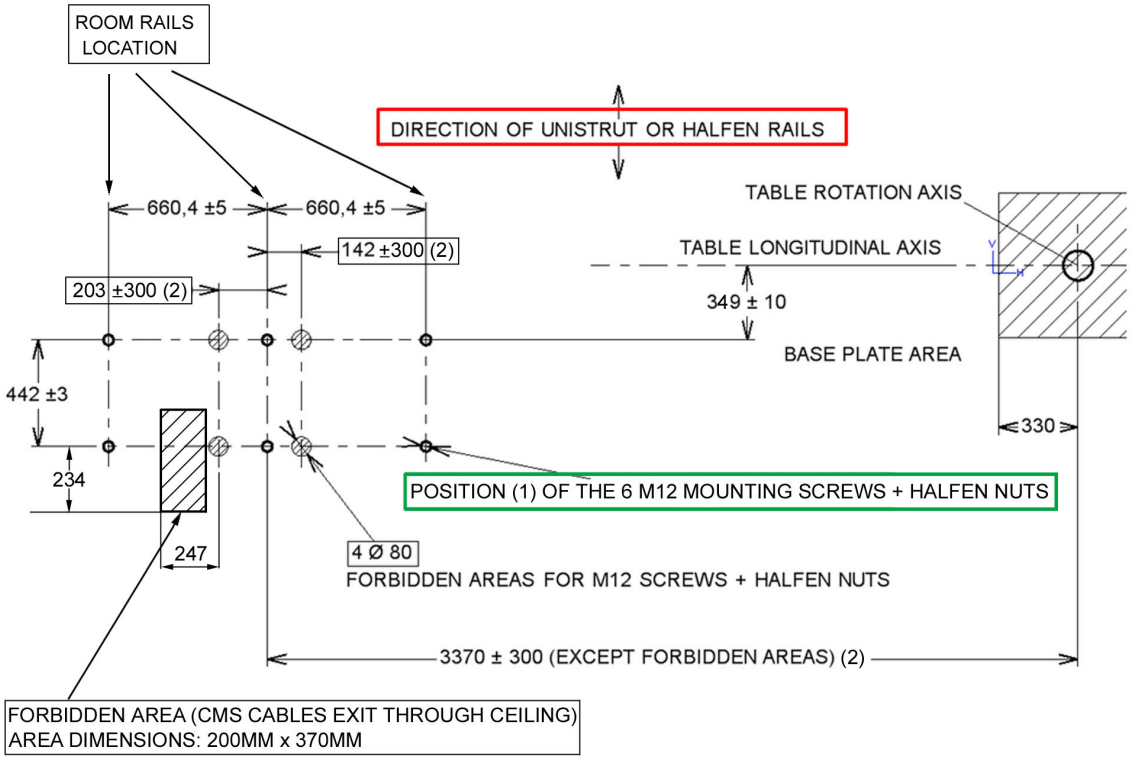
Refer to Select Rails on page 120 for detail on similar structure recommended for Mavig Suspension with rails.

Figure 92 Interface definition with rails parallel to the table



(1): Forbidden areas correspond typically to mounting configurations for which either the nuts would interfere (see the 4 areas of 80 mm diameter that are not allowed) or the CMS screws would be too close to the CMS rail fixations. The CMS cables exit area (200 mm x 370 mm) need also to be taken into account.

Figure 93 Interface definition with rails perpendicular to the table



(1): Position need to be controlled while drilling holes or installing the CMS mounting structure to make sure position is within the specified range.

(2): Forbidden areas correspond typically to mounting configurations for which either the nuts would interfere (see the 4 areas of 80mm diameter that are not allowed) or the CMS screws would be too close to the CMS rail fixations. The CMS cables exit area (200mm x 370mm) need also to be taken into account.

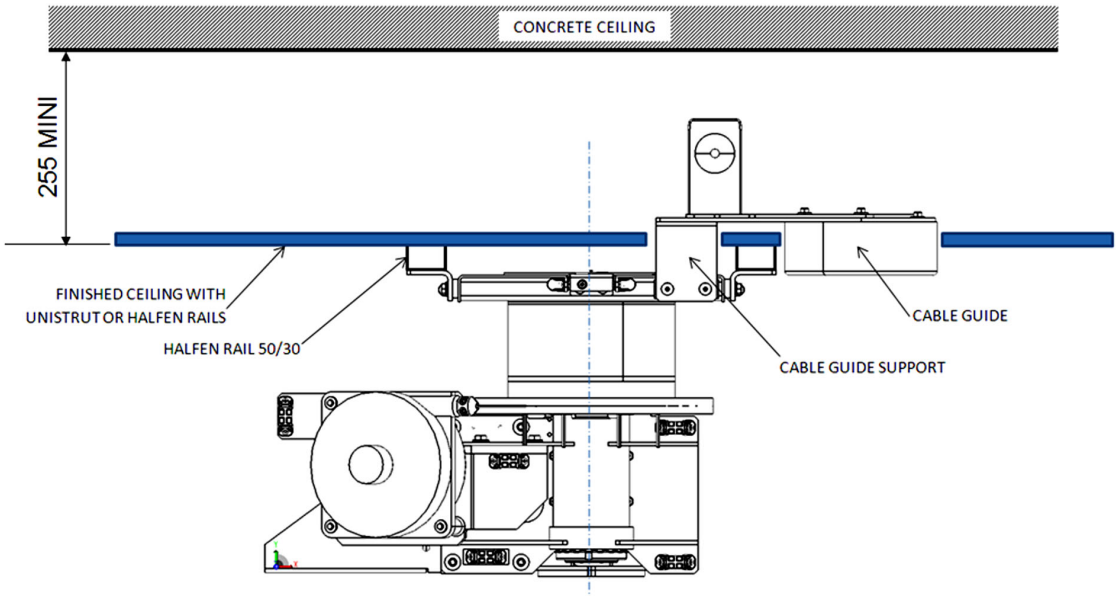
NOTE

In IR (with CMS rails provided): the distance between the underside of the rails or Halfen Unistrut 41/41 and ceiling slab shall be 255 mm.

NOTE

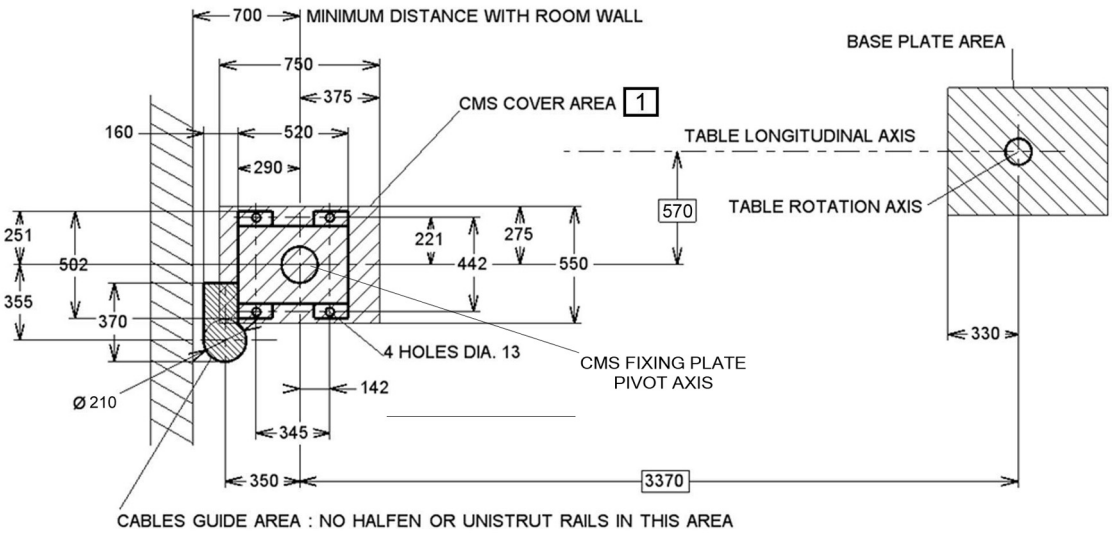
CMS (intermediate) rails are standard Alfen 50/30: other type of rails can be used in replacement if fully equivalent (e.g. for aesthetic reason).

Figure 94 CMS IR fixation mode side view



2.3.3.1.2 CMS fixing plate pivot versus the patient table axis

Figure 95 CMS layout at ceiling



CAUTION

The CMS fixing plate pivot axis is NOT in the center of the four fixation points. It is 30mm shifted towards to table (345/2-142=30.5mm).

NOTE

The minimal distance to the wall on the rear is required to manage access during CMS installation and maintenance.

NOTE

The room template can be used to easily mark position on the floor and ceiling using a laser.

2.3.3.1.3 Space requirement for CMS plate fixation covers

WARNING

NO MOUNTED HARDWARE CAN PROTRUDE BELOW THE FINISHED CEILING HEIGHT IN THE CMS COVERS AREA SUCH AS UNISTRUT MOUNTING BOLTS, SUPPORT BRACKETS, SPRINKLERS, AIR VENTS, ETC.

Refer to (1, Figure 95 on page 117) for CMS covers area.

2.3.3.2 Monitors suspensions

2.3.3.2.1 Third Party Monitor suspension

Attention must be paid to the height of suspended elements of the open suspension, collision must be avoided with the gantry.

Figure 96 (For Innova^{IQ} Table and Innova^{IQ} OR Table) Potential collision between laser, detector lift and mast/chain

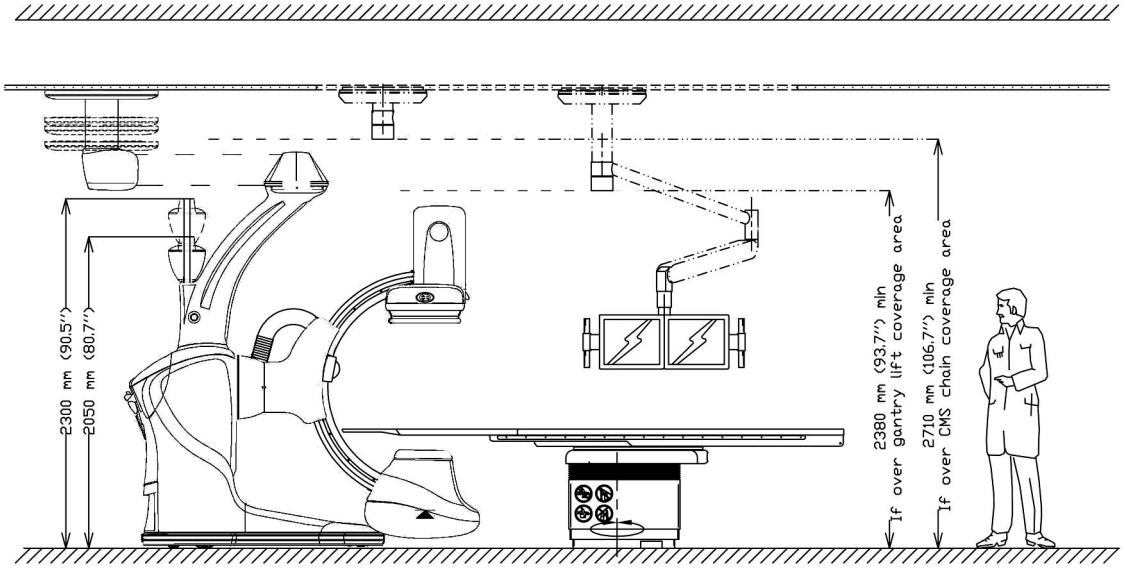
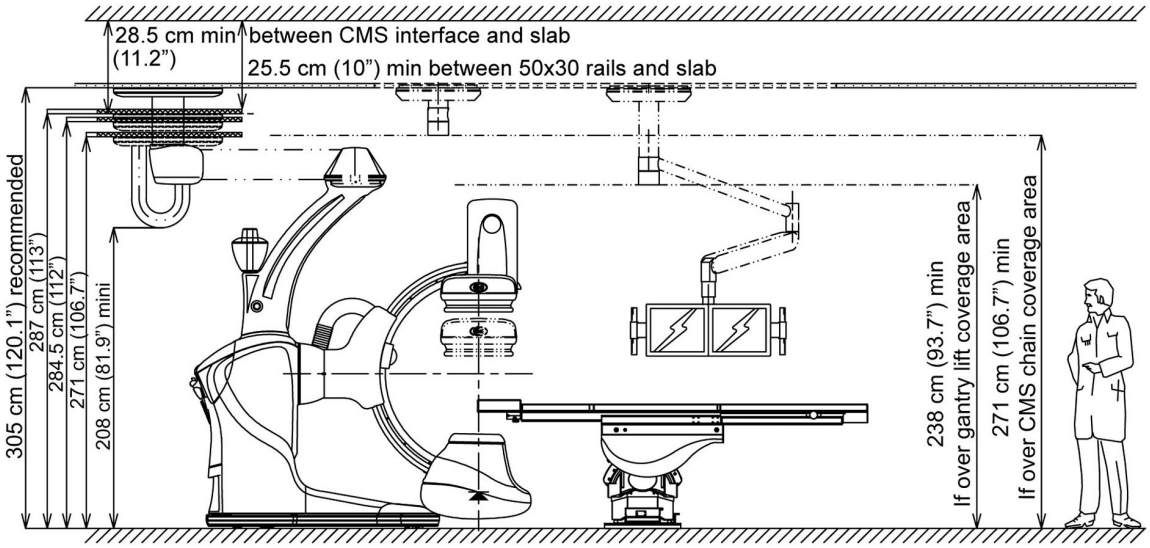


Figure 97 (For Magnus Maquet OR Table) Potential collision between laser, detector lift and mast/chain



2.3.3.2.2 Mavig Suspension with rails

Aluminum rails support the In–Room Monitor bridge used in the 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:

2.3.3.2.2.1 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.

2.3.3.2.2.2 Bolt Specifications

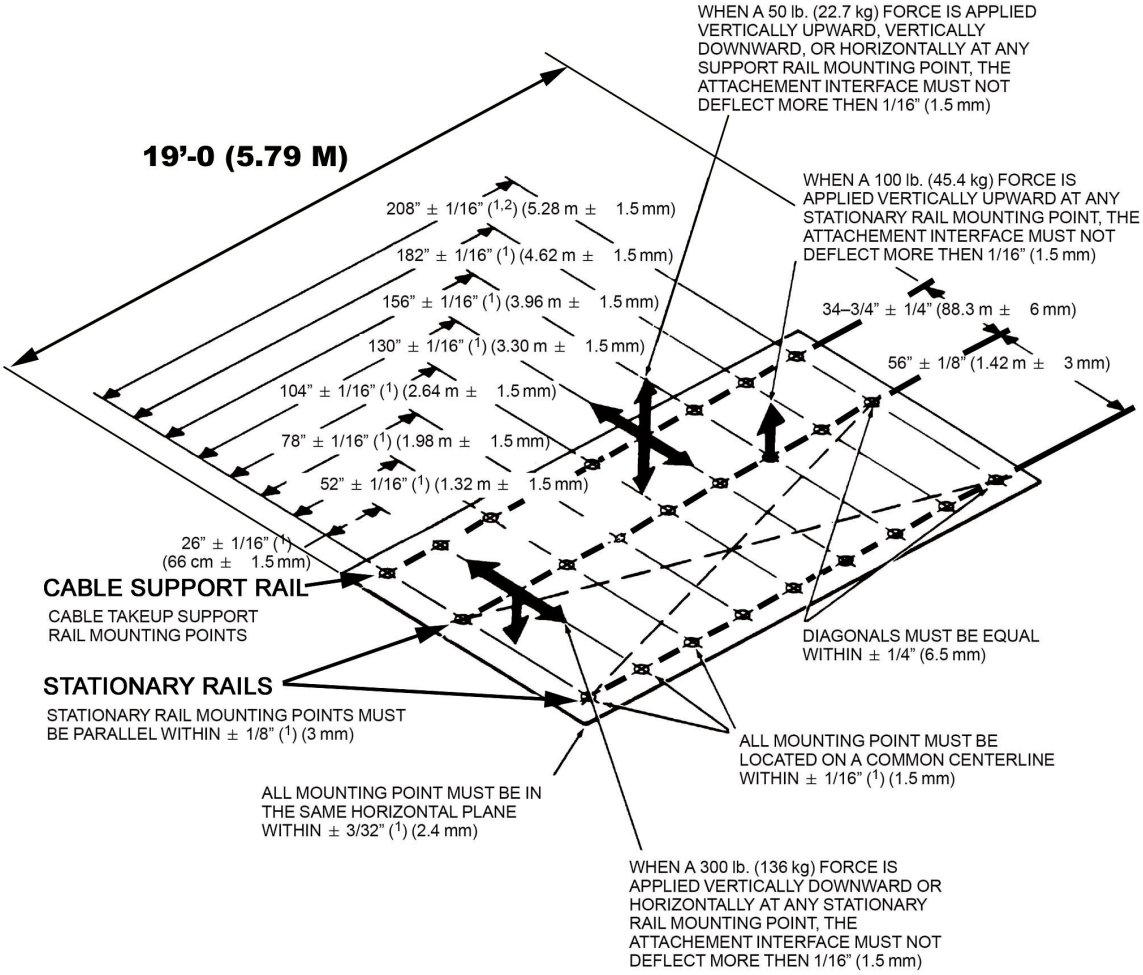
- The maximum load per bolt will not exceed **1557 N**.
- Each bolt must not “pull out” or otherwise fail under a vertically downward *dead* load of **6227 N**.

2.3.3.2.2.3 Select Rails

Rails for Mavig suspension:

All XT Stationary rails are with a select length process.

Figure 98 Specifications for a typical 19'-0 (5.79 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 22 Stationary rail in different length

Rail length cm (in)	A	C	D	INBOARD RAILS
472 (186")	7*660.4=4,623		51	S18121RC
579 (228")	8*660.4=5,283	406	51	S18121RA

2.3.3.2.2.4 Cable Support for Monitor Cables

A cable support (cable drape) is provided with the System.

The cable support kit contains:

S18101SX (Drape with 3 M Bridge, on suspensions for X-Ray tubes and monitors, contains 9’6” track, three carriers, and mounting hardware)

NOTE

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

2.3.3.2.3 MAVIG suspension with fixed point dual arm for Large Display Monitor

The Substructure for Dual Arm suspension is used to attach the MAVIG suspension with fixed point dual arm to the solid ceiling. It is used as the bridging element between the solid ceiling and the false ceiling for the installation and the fixation of the suspension.

Also, it provides a hooking point required for the installation and the replacement of the Large Display Monitor.

The Substructure for Dual Arm suspension is mandatory to install the MAVIG suspension with fixed point dual arm for Non-seismic Zones. For Seismic Zone installations, refer to Structural Engineer for appropriate design of the structure for installing the MAVIG suspension system.

For standard site configurations, the distance between the ceiling and the lower edge of the false ceiling should be in a range of minimum 175 mm and maximum 610 mm.

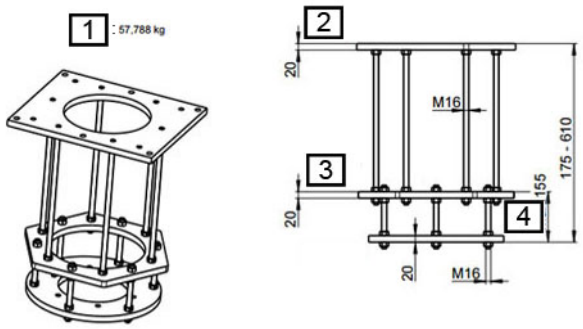
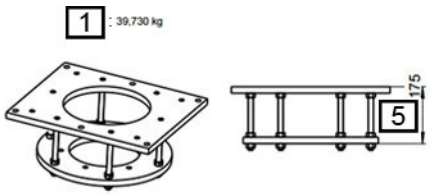
If the distance between the ceiling and the false ceiling is less than 175 mm, then the middle plate is not installed. Refer to Table 23 on page 123.

The Substructure for Dual Arm suspension is delivered with each system. In the GEHC system catalogue (Pre-Installation item), its purchase number is S18391MX (MAVIG Purchase number GD60D022).

NOTICE

If the distance between the ceiling and the lower edge of the false ceiling is more than 610 mm, Long variation of the Substructure for Dual Arm suspension solution could be proposed by MAVIG.

Table 23

Distance between ceiling and false ceiling	Configuration of the Substructure for Dual Arm suspension	Item and Description
Minimum is 175 mm and maximum is 610 mm		1: Weight in kg 2: Ceiling Plate 3: Middle Plate 4: Maximum is 155 mm 5: Maximum is 175 mm
Less than 175 mm		

2.3.3.1 Substructure for Dual Arm suspension mounting

The length of the Substructure for Dual Arm suspension S18391MX can be adapted to any individual situation (distance between solid ceiling and the lower edge of the false ceiling).

Length calculation and adaptation instruction are provided in the MAVIG substructure assembly instructions DBF01O0X (where X may be 1 or higher).

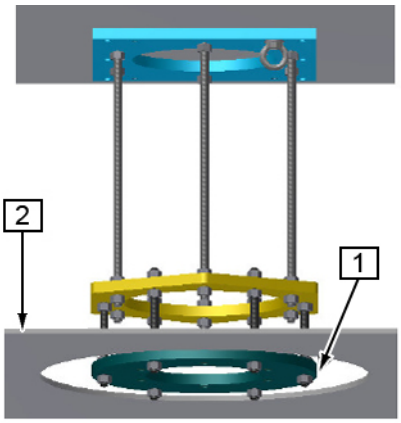
The Substructure for Dual Arm suspension must be fastened to the ceiling using six suitable screws.

These screws must be dimensioned according to the conditions of the ceiling and provided by the customer and must be checked by the structural engineer.

The ceiling plate (Figure 53 on page 66) must be seated flush to the ceiling in order to ensure optimum load distribution.

The lower edge of the Substructure for Dual Arm suspension (Interface plate 1) should be the same as the height as the lower edge of the false ceiling 2

Figure 99 False ceiling alignment versus interface plate



2.3.3.2 Bolt Specifications

The Substructure shall be fastened to the ceiling with following specifications:

- The maximum axial load per bolt will not exceed 7210 N.
- The maximum Shear load per bolt will not exceed 957 N.
- The maximum pullout force shall be calculated in accordance with local building codes and it is part of structural analysis done by customer.

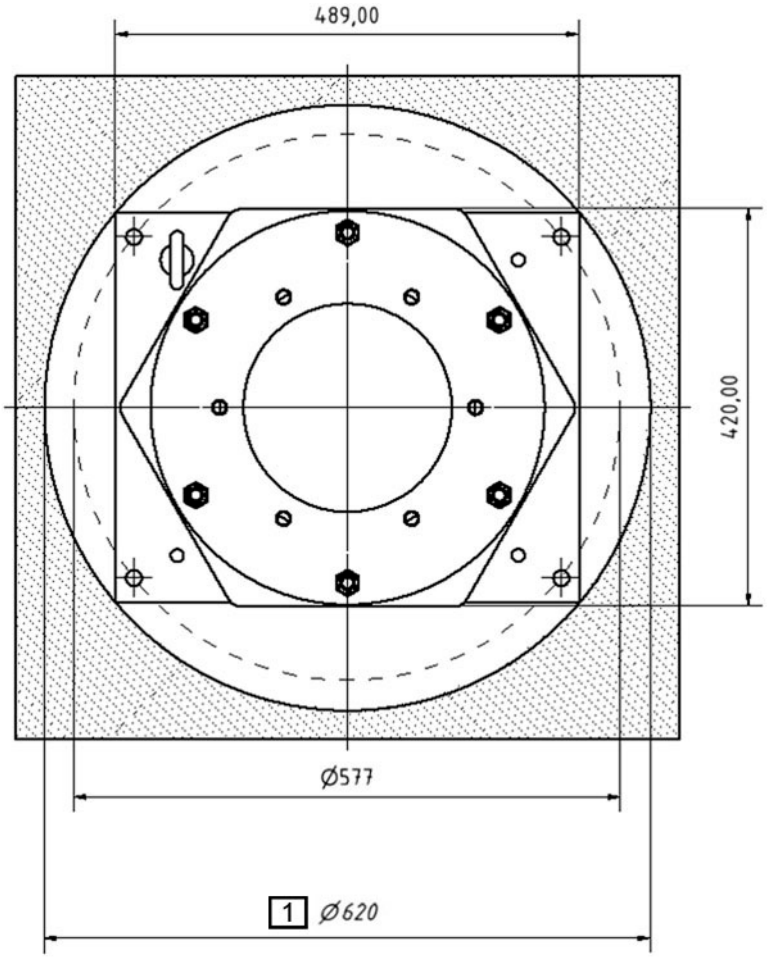
2.3.3.3 False ceiling specifications

The false ceiling should include an opening around the interface plate to allow service engineers to install and replace the suspension and the Large Display Monitor.

The diameter of the opening should be in the range of 489-620 mm (#concept_crg_xr4_mz/fig_m2w_vpn_mz).

A trapdoor in the false ceiling should be provided to allow service access for cables management after mechanical installation of the suspension.

The distance between the substructure and the trapdoor should be less than 50 cm.



Item	Description
1	Port diameter of the false ceiling: maximum is 620 mm.

2.3.4 Wall Requirements

2.3.4.1 General Requirement

(For System configuration compatible with Magnus Maquet OR Table) The I-Box is securely fastened to the Technical Room wall: the fixations are sized to support a load of 15 kg (33 lb). The I-points and Inj-Point are securely fastened to the Exam Room walls.

2.3.4.2 I-Points Installation Requirements

The 2 I-Points and the I-Point for injector (Inj-Point) are the connection point of the Discovery Control Center and of the injector. Their position is determined by the customer during the layout consideration.

The 2 I-Points shall be fixed to the wall of the Exam Room.

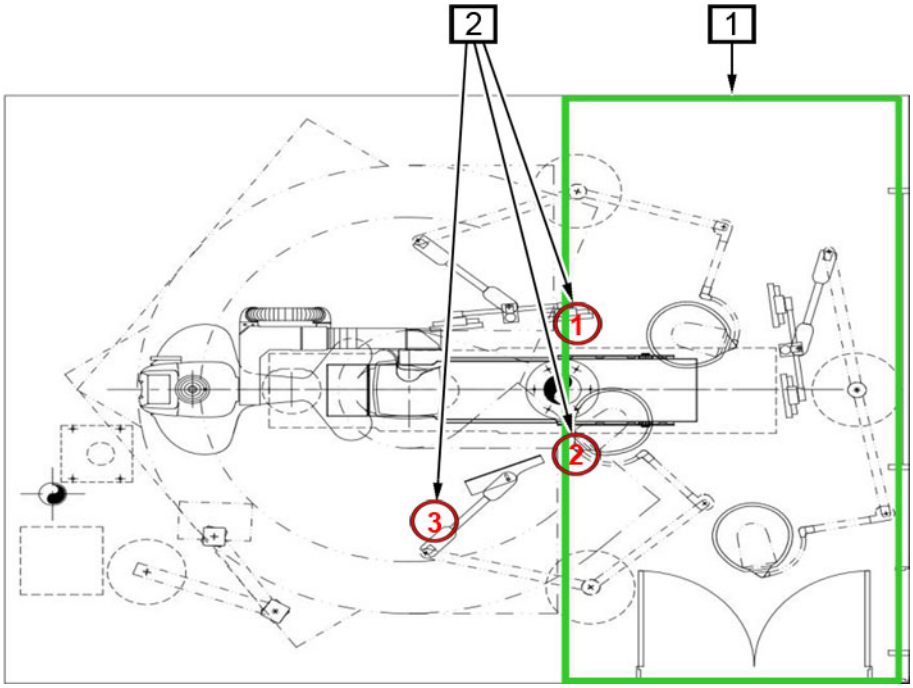
The Inj-Point can be fixed to the wall or embedded on a boom (recommended for larger rooms). Such boom shall allow the routing of a cable of diameter 9,5 mm and guarantee a minimum curvature radius of 57 mm.

Recommendations:

- Installation height: between 800 mm and 1200 mm from finished floor.
- The I-Points should be located in the rear part of the table column to avoid impacts with the AGV during motion.

The illustration below shows recommended installation area for:

- the 2 I-Points and the Inj-Point (1),
- the injector (2).



The I-Points and the Inj-Point can be installed on plaster walls or structural walls.

For plaster walls, the minimum required inner distance between the structural wall and the plaster wall is 70 mm.

For structural walls, the I-Point shall be installed in an additional device (e.g. box) to allow its installation on the wall.

Conduits on the wall are also necessary to route the cables. These devices are not provided by GE and must be designed, calculated and supplied locally.

Means of fixation of the I-Points are not delivered with the system (to be provided by the hospital).

The recommended opening dimensions in the plaster wall or box are:

- Hole diameter 90 mm or hole 100 mm x 70 mm for the I-Points.
- Hole diameter 70 mm or hole 60 mm x 60 mm for the Inj-Point.

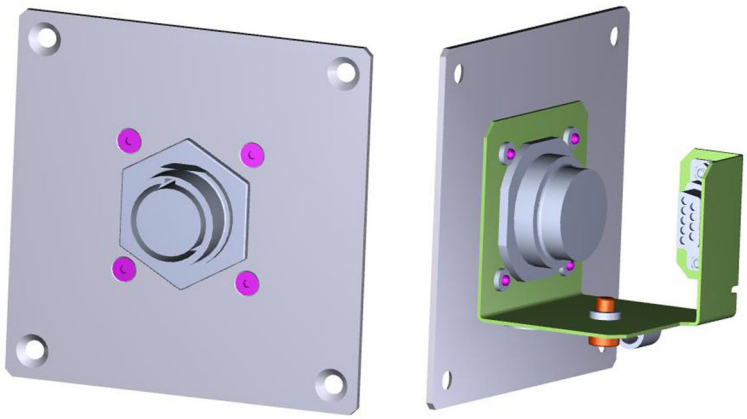
I-Point dimensions:

- Length: 210 mm
- Width: 210 mm
- Depth: 75 mm

Inj-Point dimensions:

- Length: 100 mm
- Width: 100 mm
- Depth: 55 mm

Figure 100



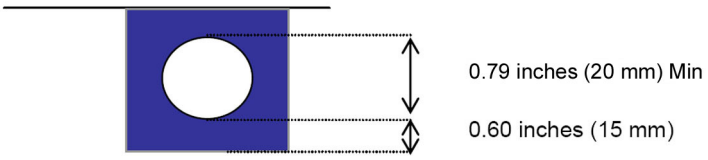
2.3.4.3 Optional Large Display secondary monitor

An optional wall mounting kit for a 2nd LDM can be provided by GE. It shall be mounted according to the manufacturer's mounting manual, see *Articulating Arm Wall Mount Installation Manual* in OEM manuals list.

A hooking point shall be provided in order to lift the monitor to the swingout arm during installation:

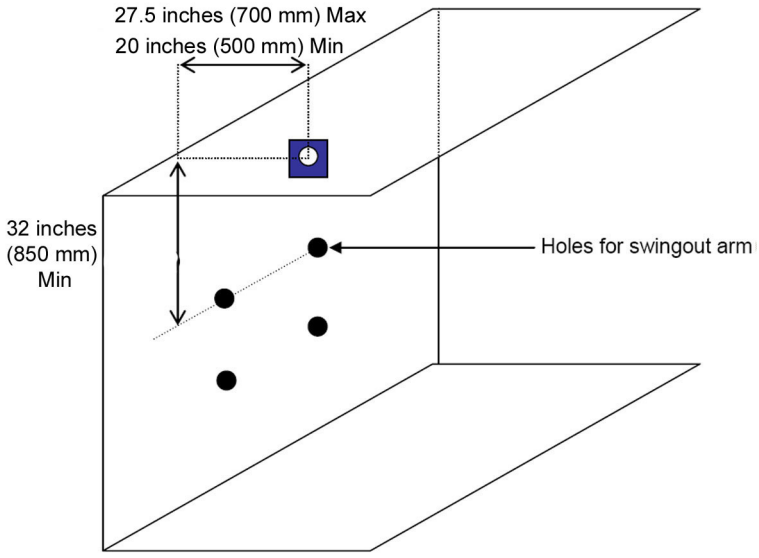
- Hooking point characteristic: It must withstand up to 440 lbs (200 Kgs)
- Hooking point dimensions:

Figure 101 Hooking point dimensions



- Recommended hooking point position:

Figure 102 Hooking point dimensions for the swingout arm



2.3.4.4 Preparing targets mounting on the wall

Target positions need to be checked and adequate space allocated during the pre-installation process. This will ensure no issue will be encountered during the target installation phase which takes place during the gantry calibration process.

NOTICE

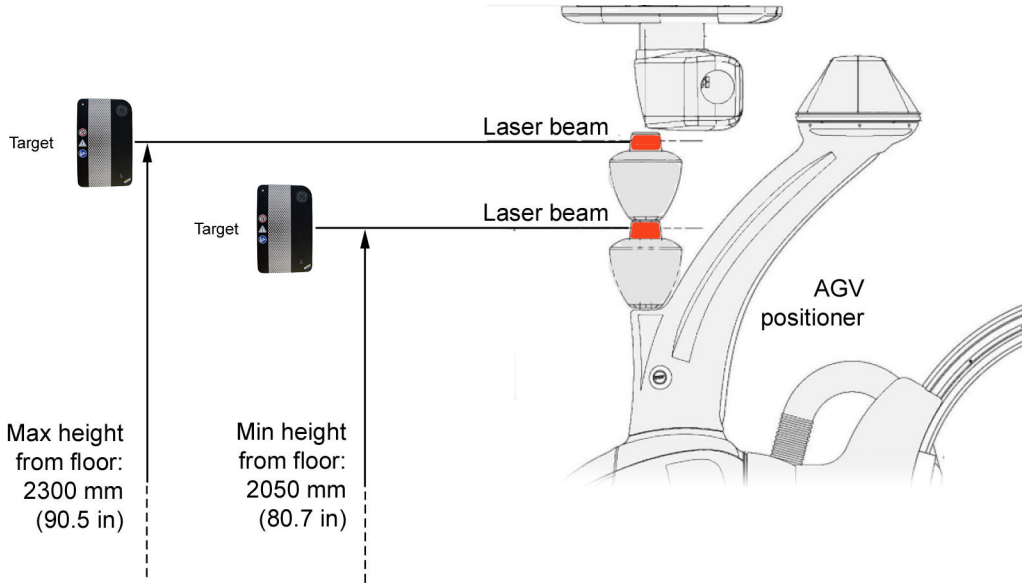
Targets should be visible to the laser source of the AGV and therefore should not be mounted on movable surface (door etc.). Neither should they be mounted on a surface that could be hidden in operation by door or movable component.

The 11 targets are mounted at the time of Gantry installation. The walls must be capable of holding the 2 screws wall anchors (Diam 5mm - 25 mm long) also (supplied with the reflectors).

2.3.4.4.1 Target Heights

The maximum/minimum target center line heights are 2300 mm (90.5 in) / 2050 mm (80.7 in). The center line of the targets will be mounted during install between these two heights at the point where the walls are best visible.

Figure 103 Target Heights



NOTE

The best achievable height (named HLP - Height of Laser Plane - in the installation procedure) will be determined at install depending on final implementation for the booms, monitors, etc...

The center line of each target will need to be kept within +/-15mm of the HLP to ensure good laser beam reflection for all AGV positions in the room.

2.3.4.4.2 Target Angles

Predefined angles from laser at head position.

NOTE

(For Innova^{IQ} Table and Innova^{IQ} OR Table) The angles are defined from a reference point located at 2300 mm (90.5 in) vs table baseplate border. The room template can be used to identify the position of the survey station (laser) and visualize target orientations.

Figure 104 (For Innova^{IQ} Table and Innova^{IQ} OR Table) Target positioning vs table baseplate border

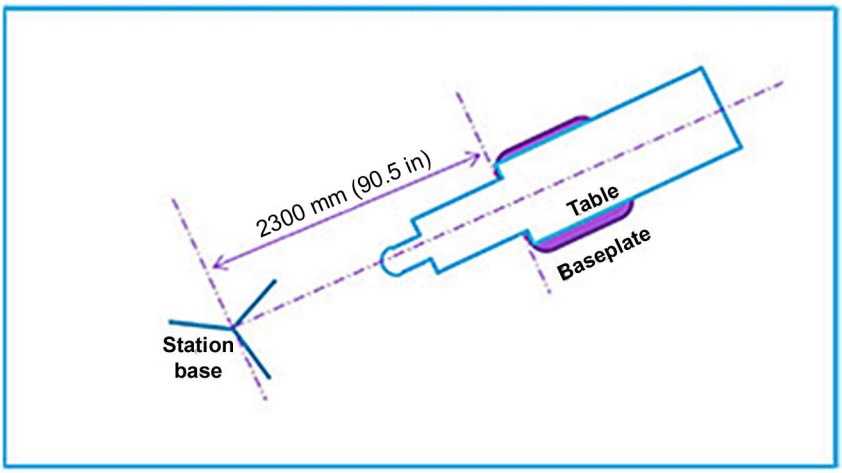
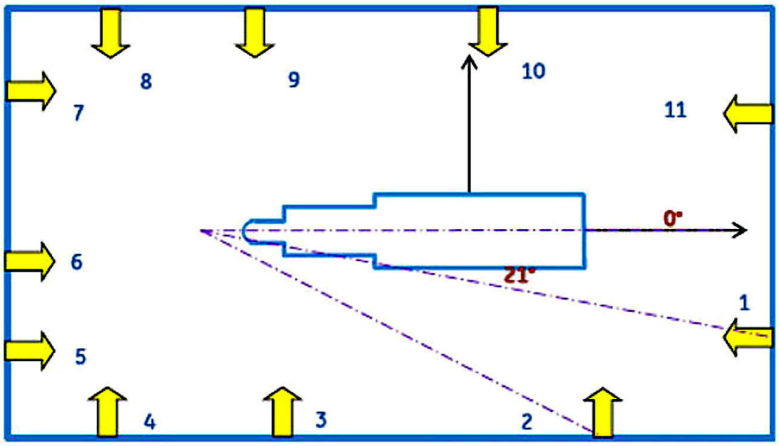


Figure 105 Target Angles



NOTICE

The table below is a predefined and recommended layout. Targets positions can be changed whenever it is not possible to mount the reflector at the given angle (as long as target minimum spacing and maximum angles are respected).

Table 24 Reflector ID / Angle

Reflector ID	Hz Angle
1	21°
2	39°
3	79°
4	109°
5	146°

Reflector ID / Angle continued	
Reflector ID	**Hz Angle**
6	167°
7	214°
8	246°
9	271°
10	312°
11	339°

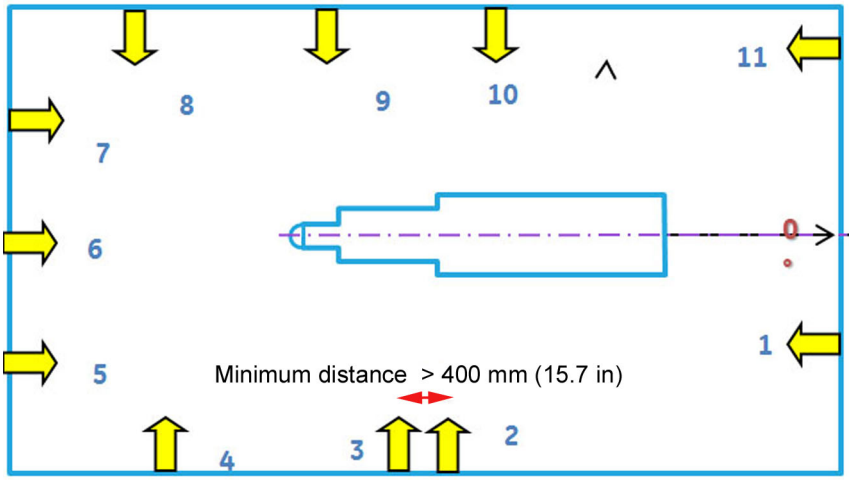
2.3.4.4.3 Target Adjustment Rules

The optimization of the targets placement will be done during the system installation, to maximize their visibility vs. ceiling mounted components (booms, lamps, etc).

NOTICE

The minimum distance between two targets is 400 mm (15.7 in).

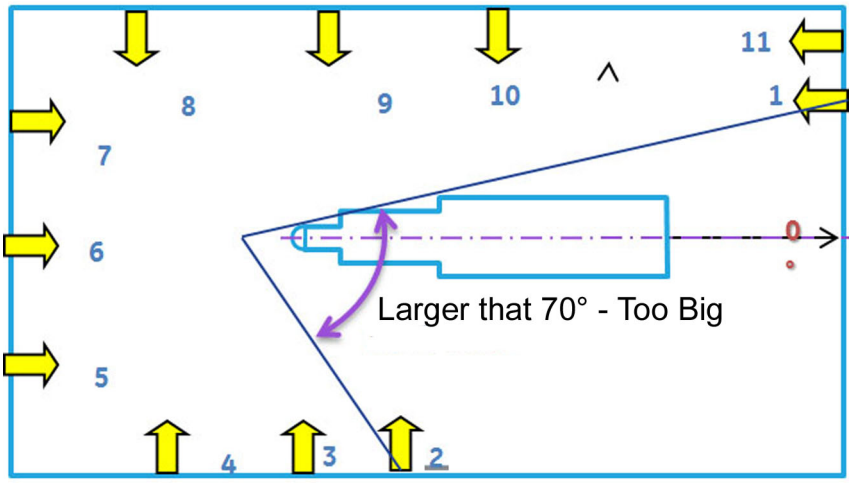
Figure 106



NOTICE

The maximum angle between two adjacent targets is 70°.

Figure 107



2.4 Mounting Data, Including Seismic

2.4.1 Seismic areas

Consider local seismic requirements when planning cabinet mounting.

Consult seismic expert to determine which mounting method is appropriate for the seismic region. Seismic requirements are determined and specified by the hospital/ Design Professional of record and may require approval by the specific state or country agency. Additional reinforcement in the walls may be required by specific seismic areas.

Contact your local GE Installation Program Manager to obtain the latest seismic calculations per the California Building Code (CBC) and the International Building Code (IBC).

The C-FRT Cabinet and the NPA PDU must be securely fastened to the wall and with their seismic kit to prevent them from tipping.

The C-FRT Cabinet, the NPA PDU, the Detector, the Tube Chillers and the Fluoro UPS are each provided with their own seismic kits, excluding the bolts, that shall be provided locally by the customer.

The following seismic kits can be ordered separately:

- Monitor Flat Panel Seismic Kit: 2353317
- VCIM seismic kit: 2365510
- 8 kVA UPS seismic kit: E4502YB.

(For LDM Suspension with fixed point Dual Arm):

CAUTION

THE STANDARD SUBSTRUCTURE (MAVIG GD60D022) SHOULD NOT BE USED WITH SYSTEM IN SEISMIC ZONE.

Contact MAVIG or Local contractor to design and supply specific substructure including M12 threaded holes requirement (see below).

Four M12 threaded holes with hooking point are required for the installation of the dual arm suspension, the installation and replacement of the Large Display Monitor. The structural support plate (Figure 123 on page 144) should include these 4 x M12 threaded holes.

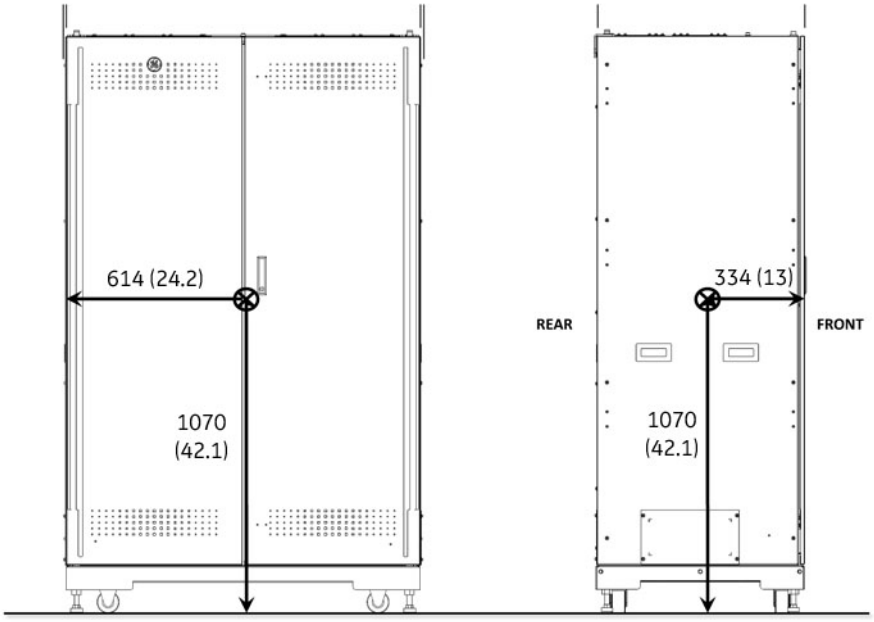
For the threaded holes positioning on the structural support plate refer to Figure 53 on page 66.

2.4.2 Center of Gravity

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

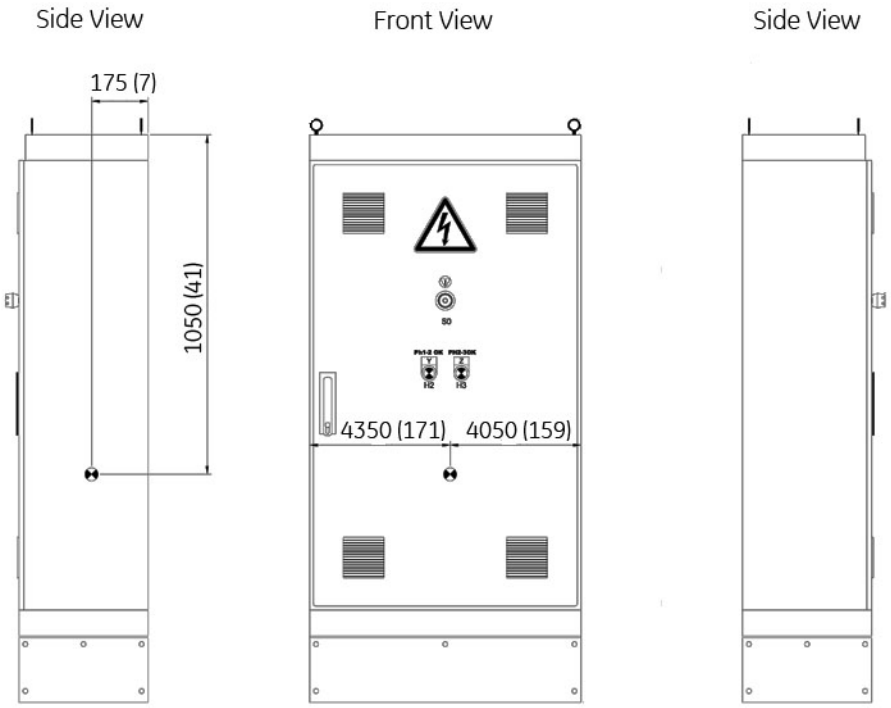
- C-FRT Cabinet, Figure 108 on page 134
- NPA PDU Cabinet, Figure 109 on page 134
- 8 kVA UPS:
  - Power Module, Figure 110 on page 135
  - Battery Module, Figure 111 on page 135
- Fluoro UPS CE, Figure 112 on page 136
- Fluoro UPS UL, Figure 113 on page 136
- Tube Chiller, Figure 114 on page 137
- Detector Conditioner, Figure 115 on page 137
- Gantry:
  - AGV, Figure 116 on page 138
  - **(For USA only)** System of Anchorage for Seismic Event, Figure 117 on page 139
- Cable Management System, Figure 118 on page 139
- Patient Table, Figure 119 on page 140
- Mavig Overhead Flat Panel Suspension, Figure 120 on page 141
- Large Display Monitor suspension with rails, Figure 121 on page 142
- LD secondary monitor Swing out arm, Figure 122 on page 143
- Large Display MAVIG suspension with fixed point dual arm, Figure 123 on page 144

Figure 108 C–FRT Cabinet - Center of Gravity



Dimensions in mm (in)

Figure 109 NPA PDU Cabinet - Center of Gravity



Dimensions in mm (in)

Figure 110 8 kVA UPS Power Module - Center of Gravity

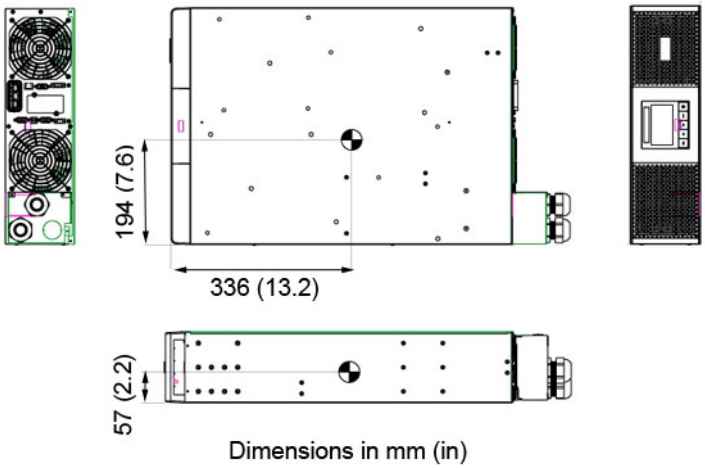


Figure 111 8 kVA UPS Battery Module - Center of Gravity

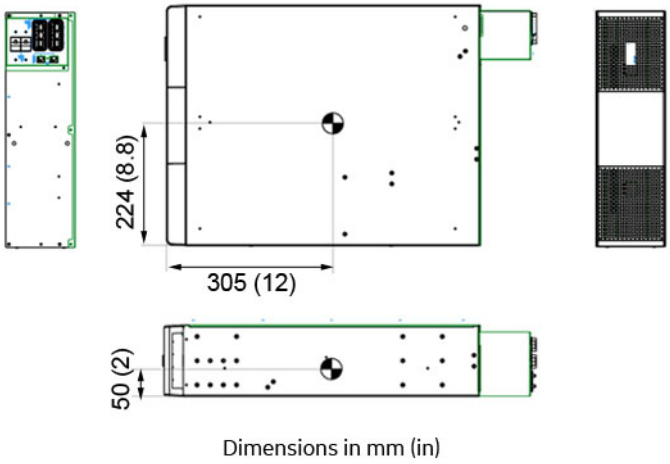


Figure 112 Fluoro UPS CE - Center of gravity

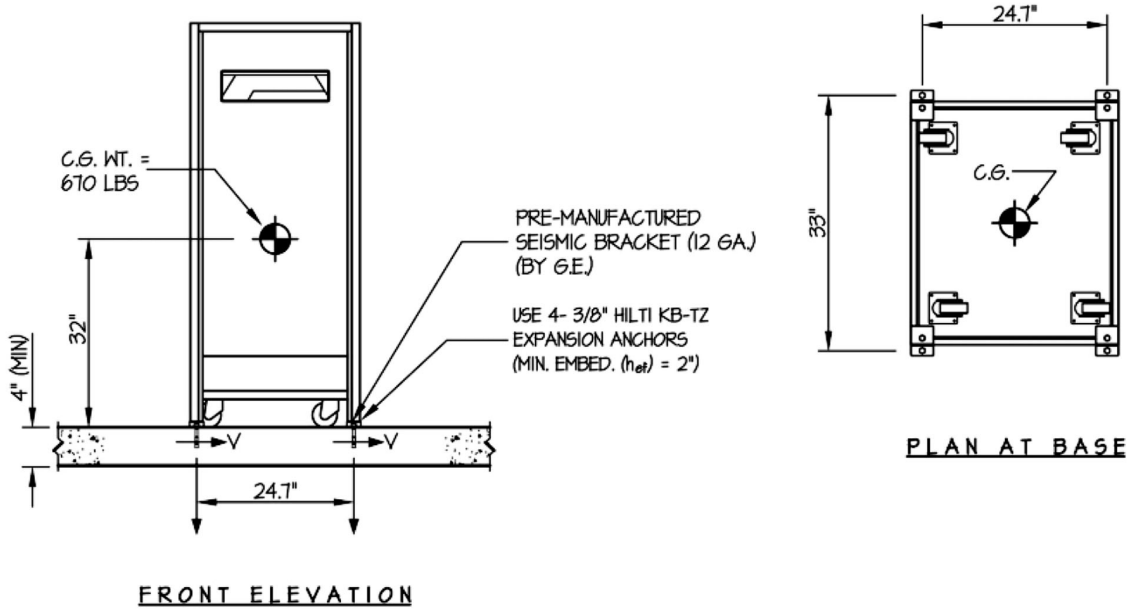


Figure 113 Fluoro UPS UL - Center of gravity

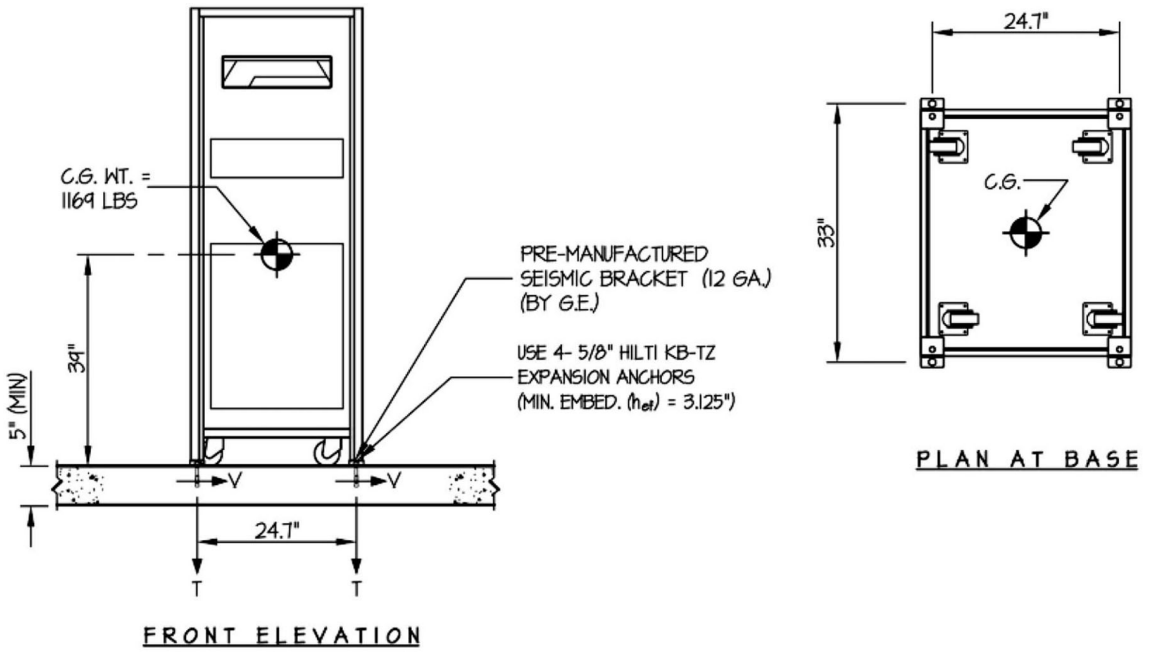


Figure 114 Tube Chiller - Center of Gravity

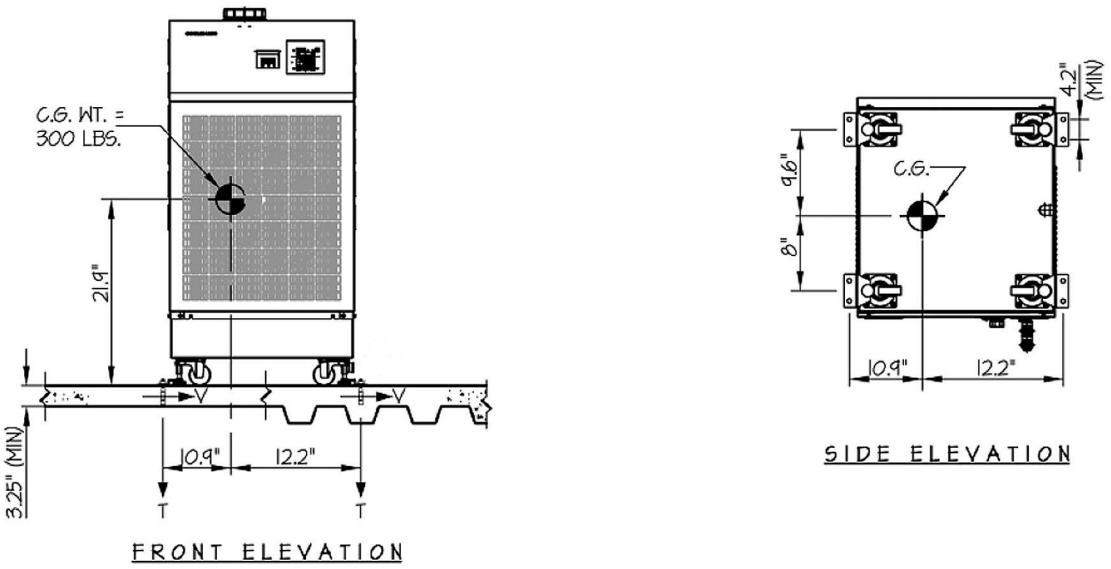


Figure 115 Detector Conditioner - Center of Gravity

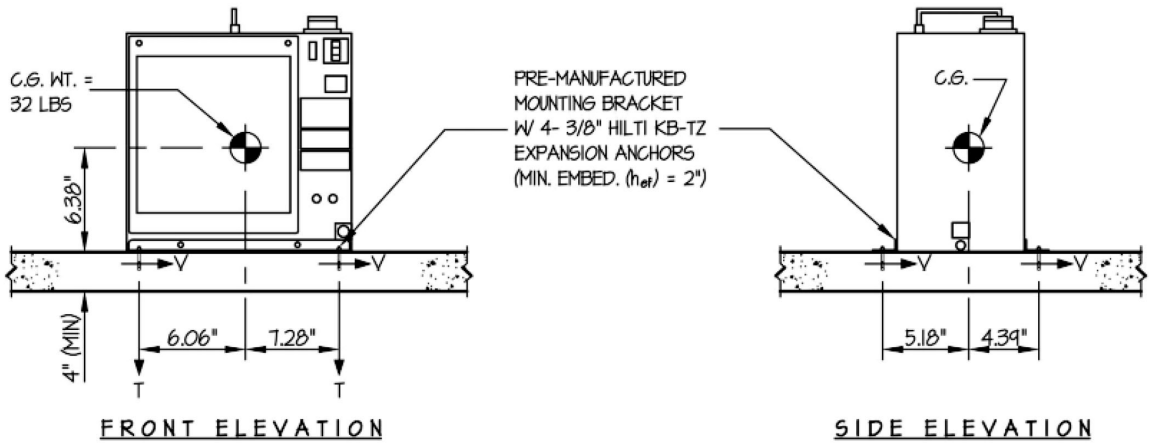


Figure 116 Gantry - Center of Gravity

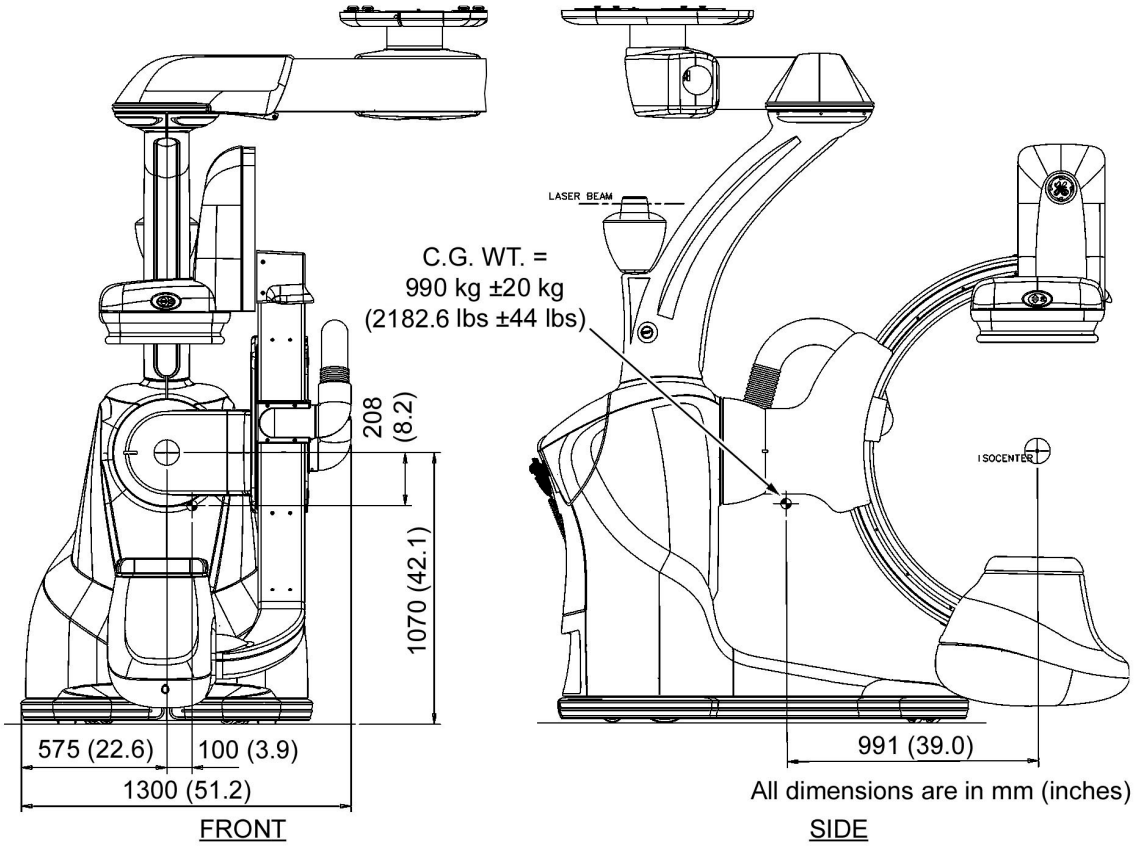


Figure 117 (For USA only) Gantry System of Anchorage for Seismic Event - Center of Gravity

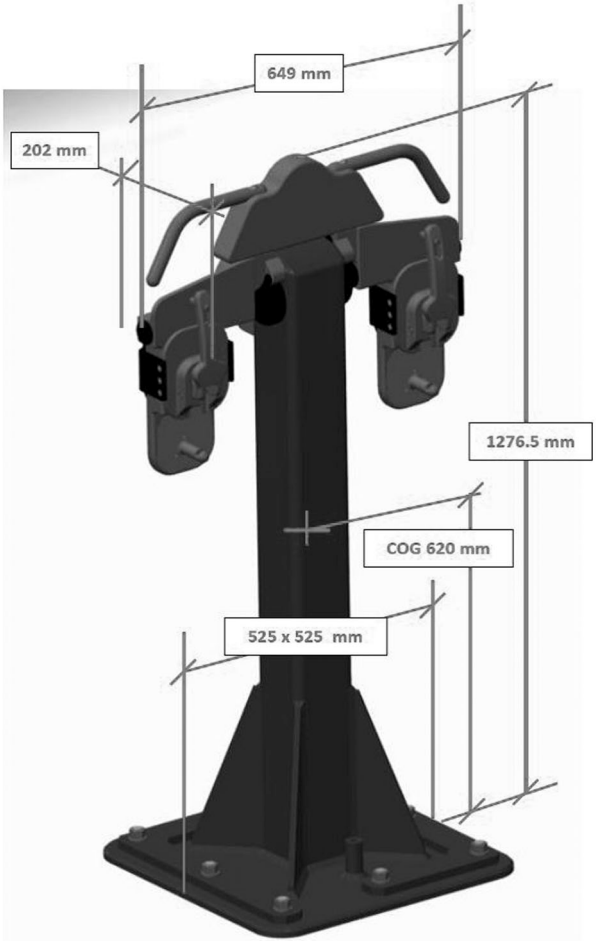


Figure 118 Cable Management System - Center of Gravity

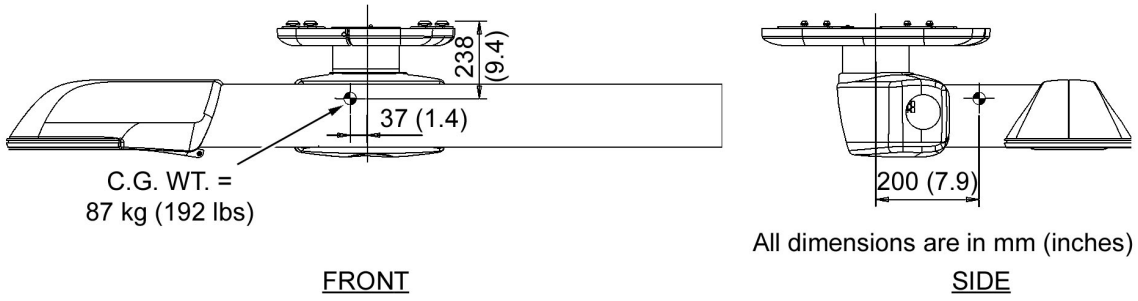
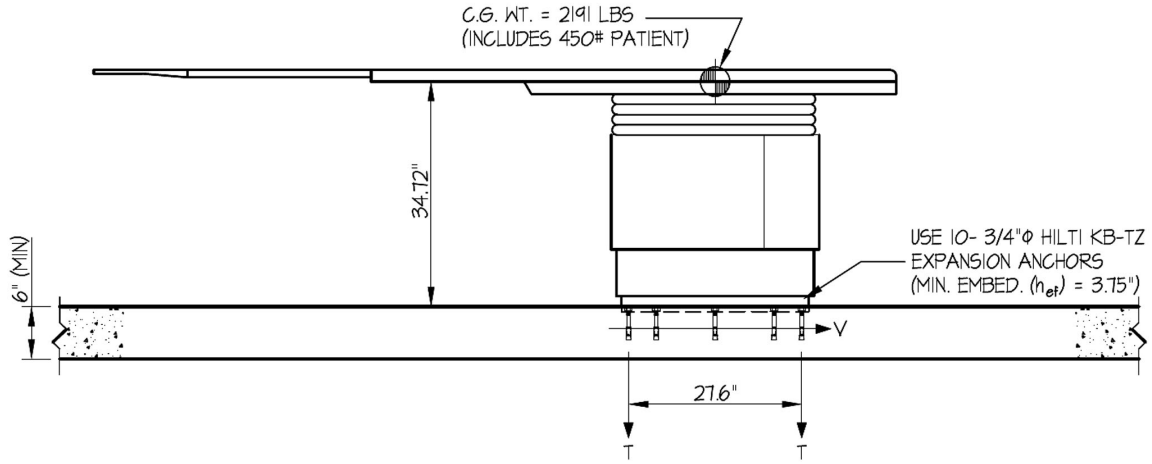


Figure 119 (For Innova^{IQ} Table and Innova^{IQ} OR Table) Patient Table - Center of Gravity



For center-of-gravity information of the Magnus Maquet OR table, refer to the manufacturer Pre-installation Manual.

Figure 120 Mavig Overhead Flat Panel Suspension - Center of Gravity

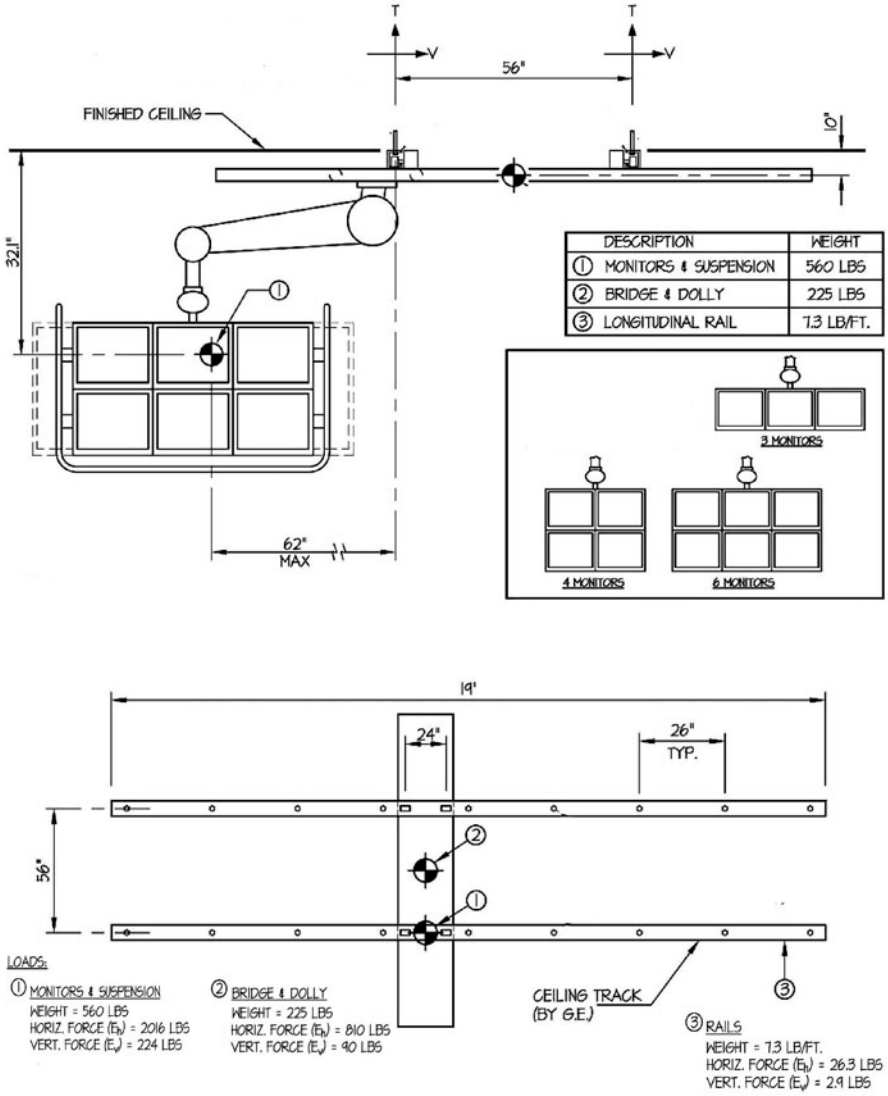


Figure 121 Large Display Monitor suspension with rails - Center of Gravity

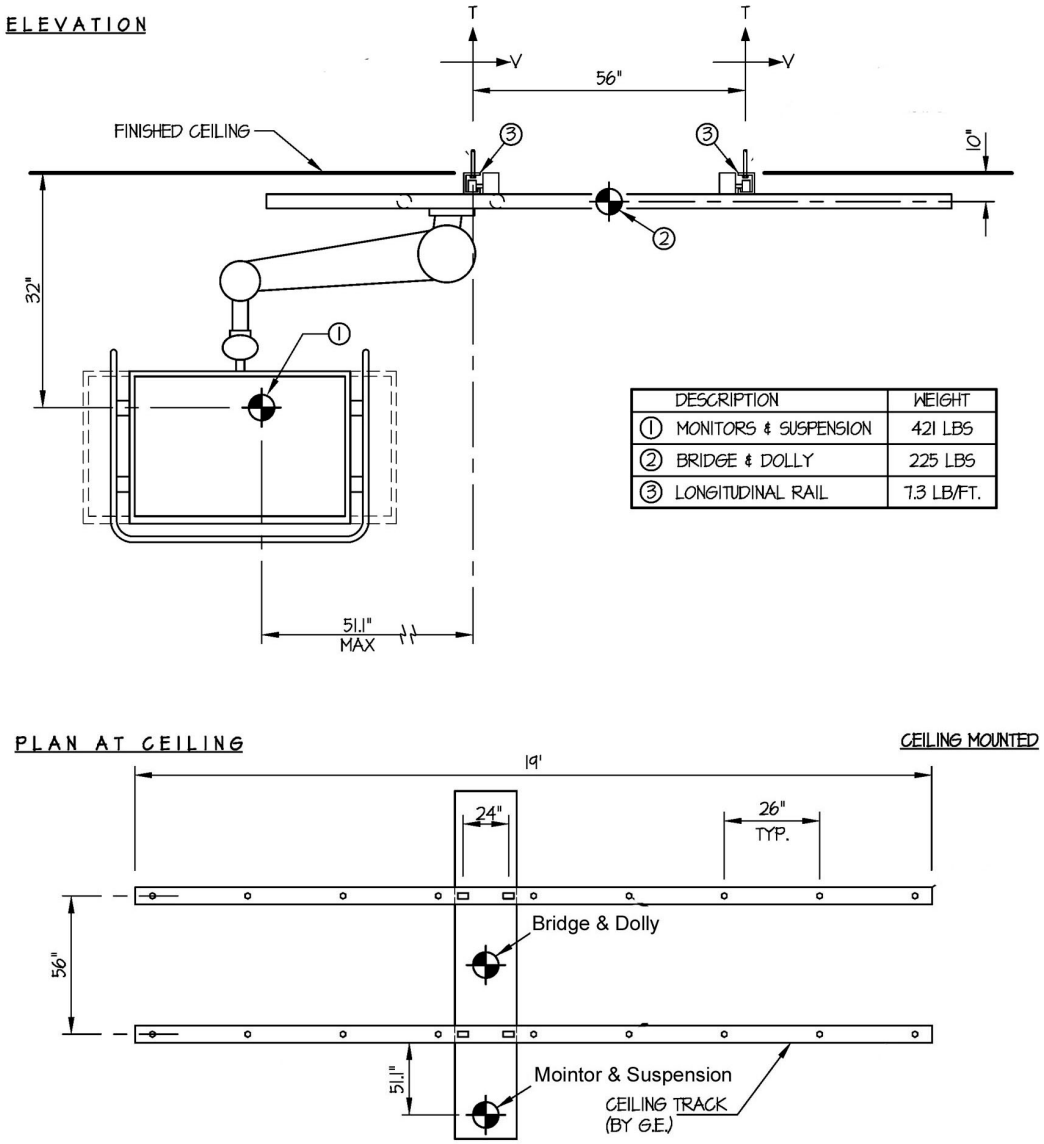


Figure 122 Large Display secondary monitor Swing out arm - Center of Gravity

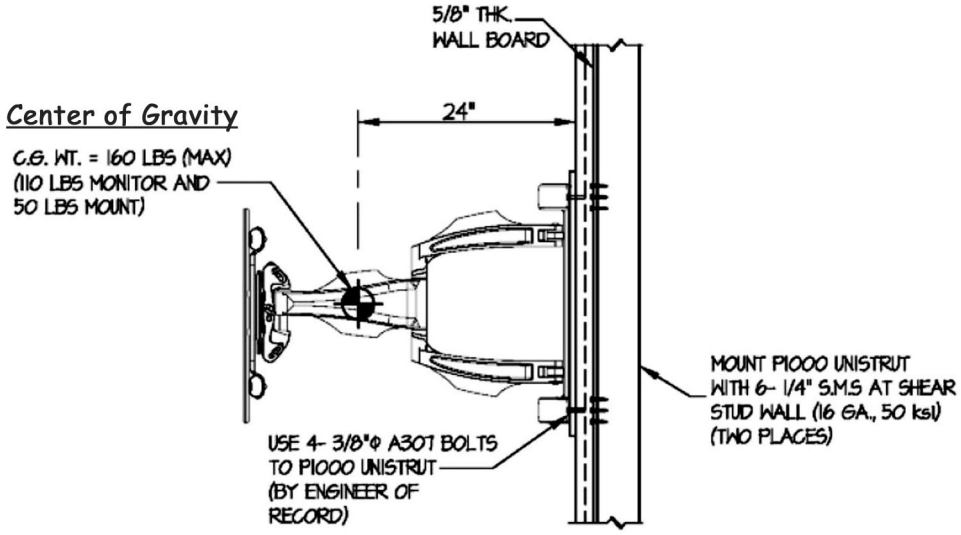
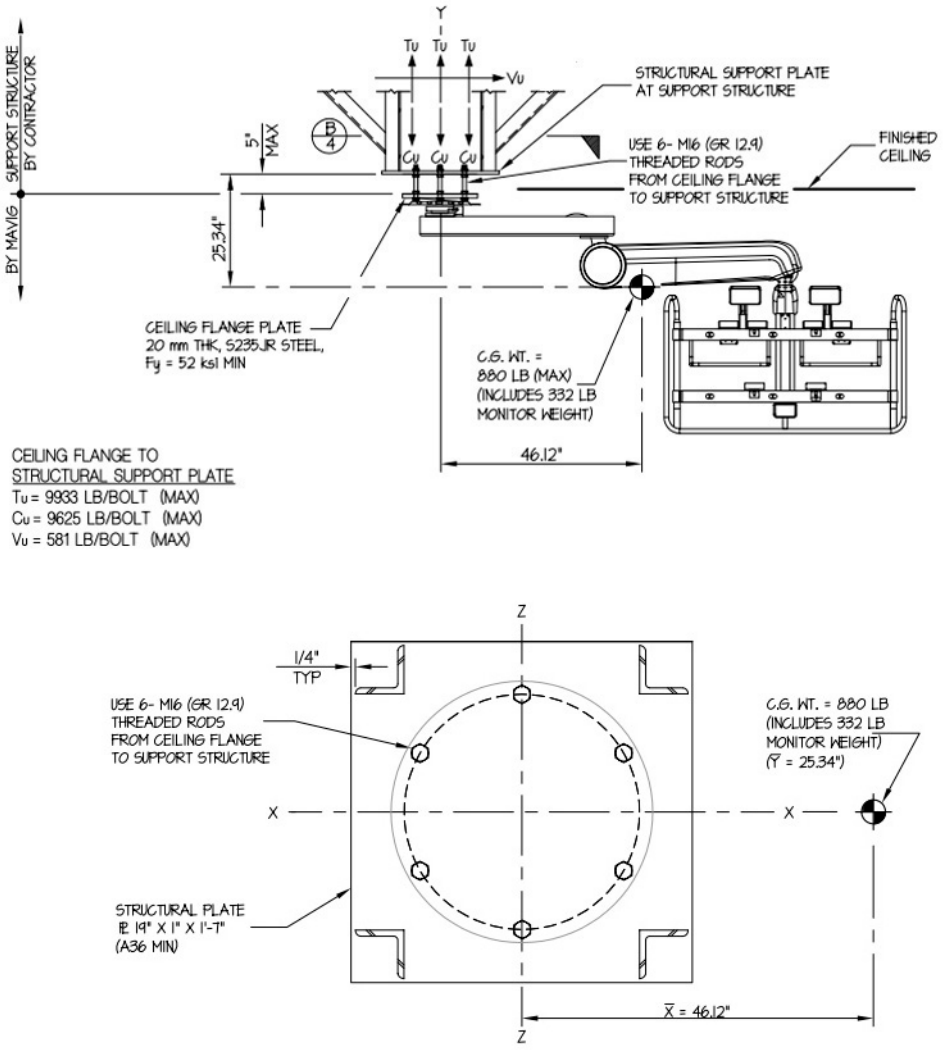


Figure 123 Large Display MAVIG suspension with fixed point dual arm - Center of Gravity



Chapter 3 Special Construction Requirements

3.1 Radiation Protection

Because X–ray equipment produces radiation, special precautions may be needed or special site modifications may be required. GEHC does not make recommendations regarding radiation protection. It is the customer's responsibility to consult a radiation physicist for advise on radiation protection in x–ray rooms.

3.2 EMI Consideration

Information below on IEC60601-1-2 Electromagnetic Standard Compliance & Documentation can also be found in the IGS System Operator Manual.

3.2.1 General Scope

This equipment complies with IEC 60601-1-2: Edition 2.1, Edition 3 and Edition 4 EMC standard for medical devices.

The IGS System is intended to be used:

- in a PROFESSIONAL HEALTHCARE facility environment and,
- in a SPECIAL ENVIRONMENT for OR configuration System (vicinity of active HF SURGICAL EQUIPMENT – refer to Installations Requirements & Environment Control.

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 25 on page 146).
- Immunity Compliance level & recommendations to maintain equipment clinical utility (see Table 26 on page 147, Table 27 on page 148 and Table 30 on page 152).

3.2.2 Electromagnetic Emission

The IGS System is intended for use in the electromagnetic environment specified below.

The Customer or the user of the System should assure that it is used in such an environment.

Table 25

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

NOTE

The EMISSIONS characteristics of this equipment make it suitable for use in industrial areas and hospitals (CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.

3.2.3 Electromagnetic Immunity

3.2.3.1 Electromagnetic Immunity IEC 60601-1-2

The IGS System is intended for use in the electromagnetic environment specified below.

The Customer or the user of the System should assure that it is used in such an environment.

Table 26

Immunity Test	IEC 60601-1-2 Ed2.1 & 3 Test Level	IEC 60601-1-2 Ed4 Test Level (professional healthcare environment)	Compliance Level	Electromagnetic Environment
Electrostatic discharge (ESD) IEC 61000-4-2	+/-6 kV contact +/-8 kV air	+/-8 kV contact +/-15 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 %.
Electrical fast transient/ burst IEC 61000-4-4	+/-2 kV for power supply lines +/-1 kV for input/output lines 5 kHz burst repetition frequency	+/-2 kV for power supply lines +/-1 kV for input/output lines 100 kHz burst repetition frequency	+/-2 kV for power supply lines +/-1 kV for input/output lines 5 kHz & 100 kHz burst repetition frequency	Mains power quality is that of a typical commercial 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	+/-1 kV line(s) to lines(s) +/-2 kV line(s) to earth	Mains power quality is that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (> 95 % dip in U_T) 0% for 5 sec	0 % U_T; 250/300 cycle	<5 % U_T (> 95 % dip in U_T) 0% for 5 sec 0 % U_T; 250/300 cycle	Mains power quality is that of a typical commercial or hospital environment. If the user of the IGS System requires continued operation during power mains interruptions, it is recommended that the System be powered from an uninterruptible power supply.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	30 A/m	30 A/m	Power frequency magnetic fields is at levels characteristic of a typical location in a typical commercial or hospital environment.
Note: U_T is the AC mains voltage prior to application of the test level. 250/300 cycle means 250 periods at 50Hz or 300 periods at 60Hz.				

The IGS System is intended for use in the electromagnetic environment specified below.

The Customer or the user of the System should assure that it is used in such an environment.

Table 27

Immunity Test	IEC 60601-1-2 Ed2.1 & 3 Test Level	IEC 60601-1-2 Ed4 Test Level (professional healthcare environment)	Compliance Level	Electromagnetic Environment
Conducted Radio Frequency IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands (1)	V_1 = 3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands (1)	Portable and mobile RF communications equipment is used no closer to any part of the IGS System, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance:** $d = [3.5/V1]\sqrt{P}$ $d = [3.5/E1]\sqrt{P}$, from 80 MHz to 800 MHz $d = [7/E1]\sqrt{P}$, from 800 MHz to 2.5 GHz Where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and *d* is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey (2), are less than the compliance level in each frequency range (3). Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated Radio Frequency IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m 80 MHz to 2.7 GHz	E_1 = 3 V/m (4)	

NOTE

(1): The ISM (industrial, scientific and medical) bands between 0,15 MHz and 80 MHz are 6,765 MHz to 6,795 MHz; 13,553 MHz to 13,567 MHz; 26,957 MHz to 27,283 MHz; and 40,66 MHz to 40,70 MHz.

(2): 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 IGS 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 IGS System.

(3): Over the frequency range 150 kHz to 80 MHz, field strengths are less than 3 V/m.

(4): Refer to Table and Notice below.

NOTICE

The IGS System is a Large, Permanently-Installed Medical Equipment for which the simulated operation in an anechoic chamber is not feasible and consequently is exempt from the testing requirement specified by IEC 61000-4-3.

The IGS System has not been tested for radiated RF immunity over the entire frequency range 80 MHz to 6 GHz.

The IGS System has been tested for radiated RF immunity only at selected frequencies. Use nearby of emitters at other frequencies could result in improper operation.

Table 28 IEC 60601-1-2 Ed2.1 &3 field level & frequencies

Tested frequencies (MHz)	Field Level (V/m)	Modulation
433.92 (ISM)*	3	80 % AM at 1 kHz rate
915 (ISM)*		
1440		
1750		
1920		
2450 (ISM)*		

NOTE

* Industrial, Scientific and Medical (ISM) radio bands.

NOTE

These are guidelines. Actual conditions may vary.

The associated recommended separation distances as per IEC 60601-1-2 Ed2.1 & 3 are listed in Table 30 on page 152.

Additional IEC 60601-1-2 Ed4.0 field level & frequencies - immunity to proximity fields from RF wireless equipment:

Table 29 IEC 60601-1-2 Ed4.0 field level & frequencies

Tested frequencies (MHz)	Field Level (V/m)	Modulation
385	27	Pulse modulation (50% duty cycle) – 18 Hz
450	28	Pulse modulation (50% duty cycle) – 18 Hz
710	9	Pulse modulation (50% duty cycle) – 217 Hz
710	9	Pulse modulation (50% duty cycle) – 217 Hz
745	9	Pulse modulation (50% duty cycle) – 217 Hz
780	9	Pulse modulation (50% duty cycle) – 217 Hz
810	28	Pulse modulation (50% duty cycle) – 18 Hz
870	28	Pulse modulation (50% duty cycle) – 18 Hz
930	28	Pulse modulation (50% duty cycle) – 18 Hz
1720	28	Pulse modulation (50% duty cycle) – 217 Hz
1845	28	Pulse modulation (50% duty cycle) – 217 Hz
1970	28	Pulse modulation (50% duty cycle) – 217 Hz
2450 (ISM)*	28	Pulse modulation (50% duty cycle) – 217 Hz
5240	9	Pulse modulation (50% duty cycle) – 217 Hz
5500	9	Pulse modulation (50% duty cycle) – 217 Hz

IEC 60601-1-2 Ed4.0 field level & frequencies continued		
Tested frequencies (MHz)	**Field Level (V/m)**	**Modulation**
5785	9	Pulse modulation (50% duty cycle) – 217 Hz
5800 (ISM)*	9	Pulse modulation (50% duty cycle) – 217 Hz

NOTE

* Industrial, Scientific and Medical (ISM) radio bands.

NOTE

These are guidelines. Actual conditions may vary.

Equipment used for tests:

- RF signal generator,
- RF power amplifier,
- Transmitting antenna,
- Field sensor,
- Field meter.

WARNING

PORTABLE RF COMMUNICATIONS EQUIPMENT INCLUDING PERIPHERALS (SUCH AS ANTENNA CABLES AND EXTERNAL ANTENNAS) SHOULD BE USED NO CLOSER THAN 30 CM (12 INCHES) TO ANY PART OF THE IGS SYSTEM INCLUDING CABLES SPECIFIED BY THE MANUFACTURER. OTHERWISE, DEGRADATION OF THE PERFORMANCE OF THIS EQUIPMENT COULD RESULT.

3.2.3.2 Recommended Separation Distances for Portable and Mobile RF Communications Equipment IEC 60601-1-2 (Ed2.1 & 3)

Table 30

Frequency of Transmitter	150 KHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2.5 GHz
Equation	$d = [3.5 / V_1]\sqrt{P}$	$d = [3.5 / E_1]\sqrt{P}$	$d = [7 / E_1]\sqrt{P}$
Rated Power of Transmitter (watts)	Distance (meters)	Distance (meters)	Distance (meters)
10 mW	0.11	0.11	0.22
100 mW	0.37	0.37	0.74
1	1.1	1.1	2.3 (*)
10	3.7	3.7	7.4
100	12	12	23

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.

3.2.4 Limitations Management

Adhering to the distance separation recommended in Table 30 on page 152, 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 IGS 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 2.3 meters (see (*) Table 30 on page 152) apart from the IGS System (in order to avoid images interferences risks).

3.2.5 Installations Requirements & Environment Control

WARNING

USE OF ACCESSORIES, TRANSDUCERS AND CABLES OTHER THAN THOSE SPECIFIED OR PROVIDED BY THE MANUFACTURER OF THIS EQUIPMENT COULD RESULT IN INCREASED ELECTROMAGNETIC EMISSIONS OR DECREASED ELECTROMAGNETIC IMMUNITY OF THIS EQUIPMENT AND RESULT IN IMPROPER OPERATION.

Compatibility with HF SURGICAL EQUIPMENT:

The System configurations that could be used in operating room are compatible with HF surgical equipment. During HF surgery, the System shall remain in stand-by mode (no motions or X-Ray acquisition) when the HF surgical equipment is activated.

NOTICE

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

- Electrical equipment may disturb and interfere with System 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.
- 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 within the specification defined in 4.1 Humidity, Temperature and Altitude on page 155.
  - The dissipative material shall be connected to the room protective earth or equipotential conductor, if applicable.

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Chapter 4 Environmental Requirements

4.1 Humidity, Temperature and Altitude

4.1.1 Humidity

Table 31 Relative Humidity (non- condensing)

	MIN	MAX
Exam Room	30%	70%
Control Room	30%	75%
Technical Room	30%	75%

4.1.2 Temperature and Altitude

The system is certified for use up to 3000 m.

Above 2000 m, the thermal dissipation is reduced because the air pressure is lower. Therefore, a temperature derating shall be applied for the Technical Room as defined in the table below.

Table 32 Exam Room and Control Room - Temperature

	MIN	MAX	RECOMMENDED
Exam Room	+15°C (+59°F)	+32°C (+90°F)	Design for Patient/ Operator comfort
Control Room	+15°C (+59°F)	+35°C (+95°F)	Design for Operator comfort

Table 33 Technical Room - Temperature

	Temperature up to 2000 m			Temperature above 2000 m		
	MIN	MAX	RECOMMENDED	MIN	MAX	RECOMMENDED
Technical Room (with 8 kVA or the Fluoro UPS)	+15°C (+59°F)	+25°C (+77°F)	+20°C (+68°F)	+15°C (+59°F)	+20°C (+68°F)	+20°C (+68°F)

NOTE

For the systems that are planned to be installed at the second floor or above, the temperature and humidity of the rooms that are directly below the gantry room should be the same as the Exam Room requirement.

Differences in temperature or humidity between the Exam room and the room located below will cause condensation within the gantry or patient table, resulting in part failure or rust. Failure to do so will void the equipment warranty. Avoid above grade installations if the temperature is high in the area below the cables entrance of the gantry or table.

4.2 Heat Output

In the table:

- Moderate Use corresponds to 8 cases per 10 hours,
- Typical Use corresponds to 11 cases per 10 hours,
- Maximum Use is during the case.

Table 34

		HEAT OUTPUT							
		Stand by		Moderate Use		Typical Use		Maximum Use	
Room	Core System	kW	BTU/hr	kW	BTU/hr	kW	BTU/hr	kW	BTU/hr
Exam Room	Gantry and Table	0.41	1,399	0.55	1,877	0.89	3,037	1.62	5,528
	6 19" monitors on suspension or	0.30	1,024	0.30	1,024	0.30	1,024	0.30	1,024
	LDM suspension with 2 backups	0.50	1,706	0.50	1,706	0.50	1,706	0.50	1,706
	Typical Injector	0.09	307	0.09	307	0.09	307	0.09	307
Control Room	DL console and Live monitor	0.10	341	0.10	341	0.10	341	0.10	341
Technical Room	C-FRT Cabinet	0.70	2,388	0.70	2,388	0.70	2,388	0.70	2,388
	PDU	0.40	1,365	0.40	1,365	0.40	1,365	0.40	1,365
	Tube Chiller	2.53	8,633	4.49	15,321	5.49	18,733	6.93	23,646
	Detector Conditioner	0.21	717	0.21	717	0.21	717	0.21	717
	UPS 8 kVA	0.52	1,760	0.52	1,760	0.52	1,760	0.52	1,760
	Fluoro UPS	2.14	7,302	2.14	7,302	2.14	7,302	2.14	7,302

continued									
		HEAT OUTPUT							
		Stand by		Moderate Use		Typical Use		Maximum Use	
Room	Core System	kW	BTU/hr	kW	BTU/hr	kW	BTU/hr	kW	BTU/hr
Total for Core System with the 8 kVA UPS		5.76	19,640	7.86	26,805	9.20	31,377	11.37	38,782
Total for Core System with the Fluoro UPS		7.38	25,182	9.48	32,347	10.82	36,919	12.99	44.324

4.3 Acoustic Specifications

- Less than 50 dB (A) at 1 meter for Gantry.
- Limited to 58 dB (A) at 1 meter for Innova^{IQ} Table and Innova^{IQ} OR Table.
- Limited to 59 dB (A) at 1 meter for C-FRT Cabinet and NPA PDU.
- Limited to 60 dB (A) at 1 meter for the Tube Chiller.
- Limited to 52 dB (A) (background of 35 dB (A)) at 1 meter for Detector Conditioner.
- Limited to 39 dB (A) at 1 meter for UPS 8 kVA.
- 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.

4.4 Room Light

4.4.1 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, Exam 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 Em shall be of 500 lux 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).

4.4.2 Windows and Curtains

When the Exam 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.

NOTE

In Germany: Ambient luminance of 100 lux maximum is required to maintain Exam Room class 2 according to DIN 6868-157.

4.4.3 Surgical Lights

WARNING

If a surgical light is installed by the customer, it has to be powered from an independent power supply (provided by the hospital not by the System).

Chapter 5 Electrical Requirements

5.1 System Electrical Ratings

5.1.1 Electrical Ratings

Table 35

Nominal voltage	Frequency	Power consumption			Type of power input	
		Long time	Momentary	Peak	With 8 kVA UPS	With 20 kVA UPS
380 V	50 Hz or 60 Hz	18 kVA	100 kVA	150 kVA	3~	3N~
400 V						
415 V						
480V	60 Hz					

Long time rating is measured in fluoroscopy mode at 30 fps, 120 kV, 89 mA, 10 ms.

Momentary rating is measured in record DSA mode at 7.5 fps, 125 kV, 640 mA, 50 ms.

For the rating of the external devices not powered by the system (AW, injector, and so on), refer to the OEM documentation.

Max Line Impedance for the line phase to phase at the entry of the X-rays Generator in C-FRT Cabinet (from IEC 601-2-7):

Table 36

V	380	400	415	480
Ω	0.09	0.096	0.102	0.12

5.1.2 Additional Transformer characteristics

If a transformer is needed to power the system (e.g. when the mains is not within the nominal value of the system, or if an insulation from other devices is needed), it shall have the following characteristics:

- 150 kVA minimum for input voltage of 380 V and 400 V.
- 100 kVA minimum for input voltage of 415 V and 480 V.
- The transformer impedance shall be 4.5 % or less (this parameter is also called %Z or short circuit voltage).

5.1.3 Additional Full UPS

If it is required to power continuously the system in record mode during power failure, a 150 kVA UPS can be used in front of the system. Such an UPS will provide to the customer about 10 minutes of autonomy. This UPS comes in addition to the UPS provided with the system.

5.2 Power Distribution Schematics

Information below specifies the cables provided by GE and the cables provided by the Hospital. Refer to Cabling Requirements on page 168.

5.2.1 System with 8 kVA UPS

Figure 124 (For System with Innova^{IQ} Table or Innova^{IQ} OR Table) Power Distribution with 8 kVA UPS

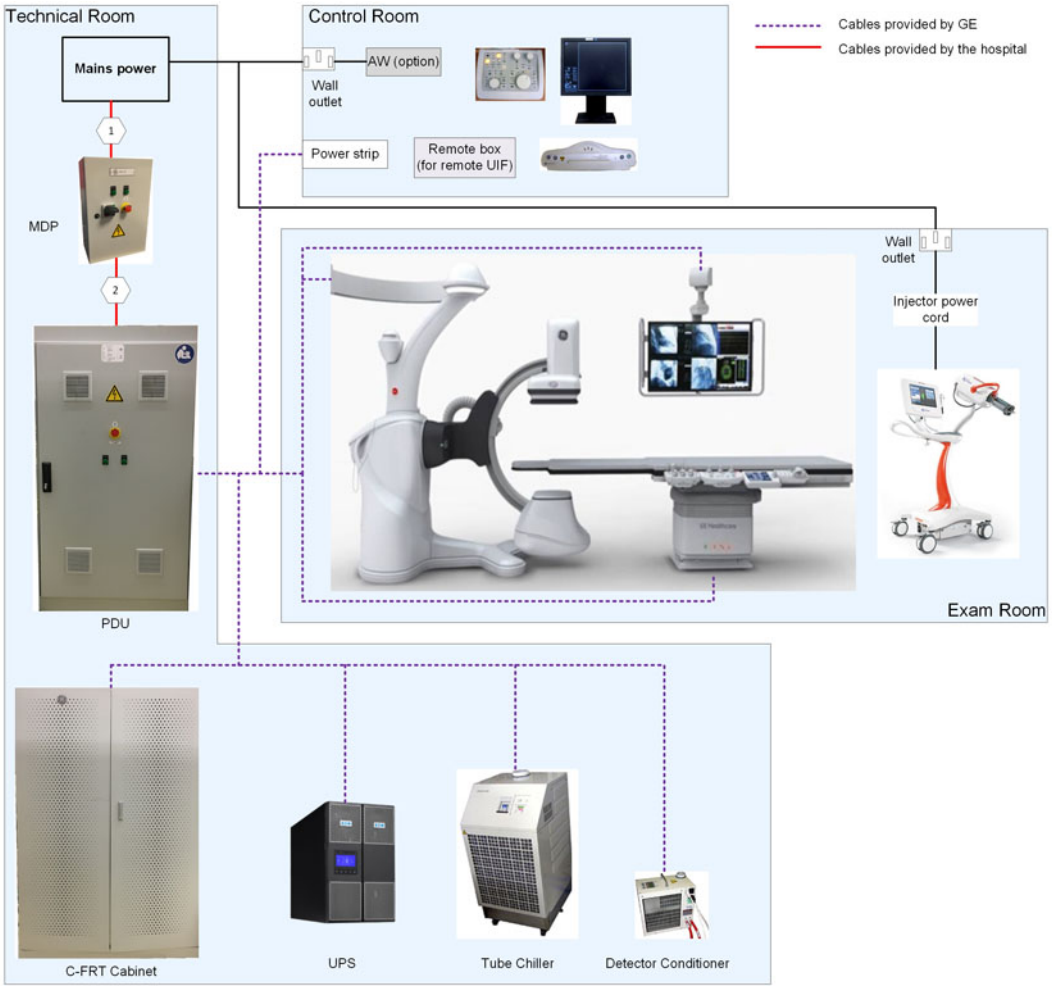
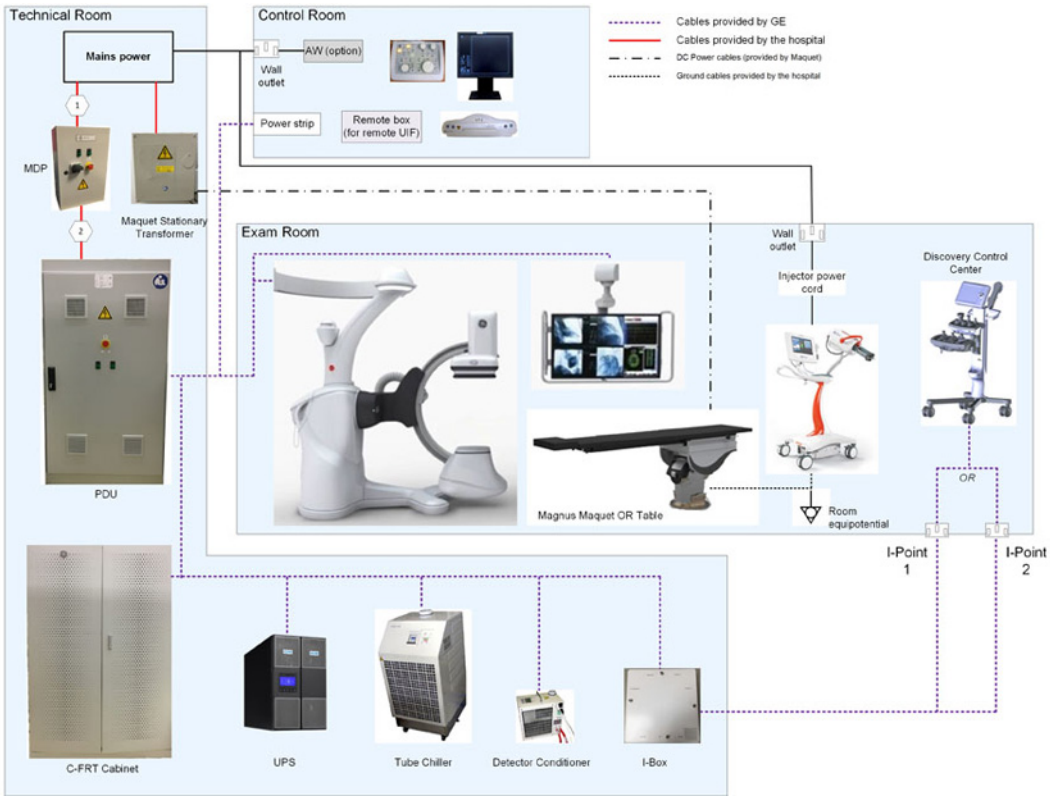


Figure 125 (For System configuration compatible with Magnus Maquet OR Table) Power Distribution with 8 kVA UPS



5.2.2 System with Fluoro UPS

Figure 126 (For System with Innova^{IQ} Table or Innova^{IQ} OR Table) Power Distribution with Fluoro UPS

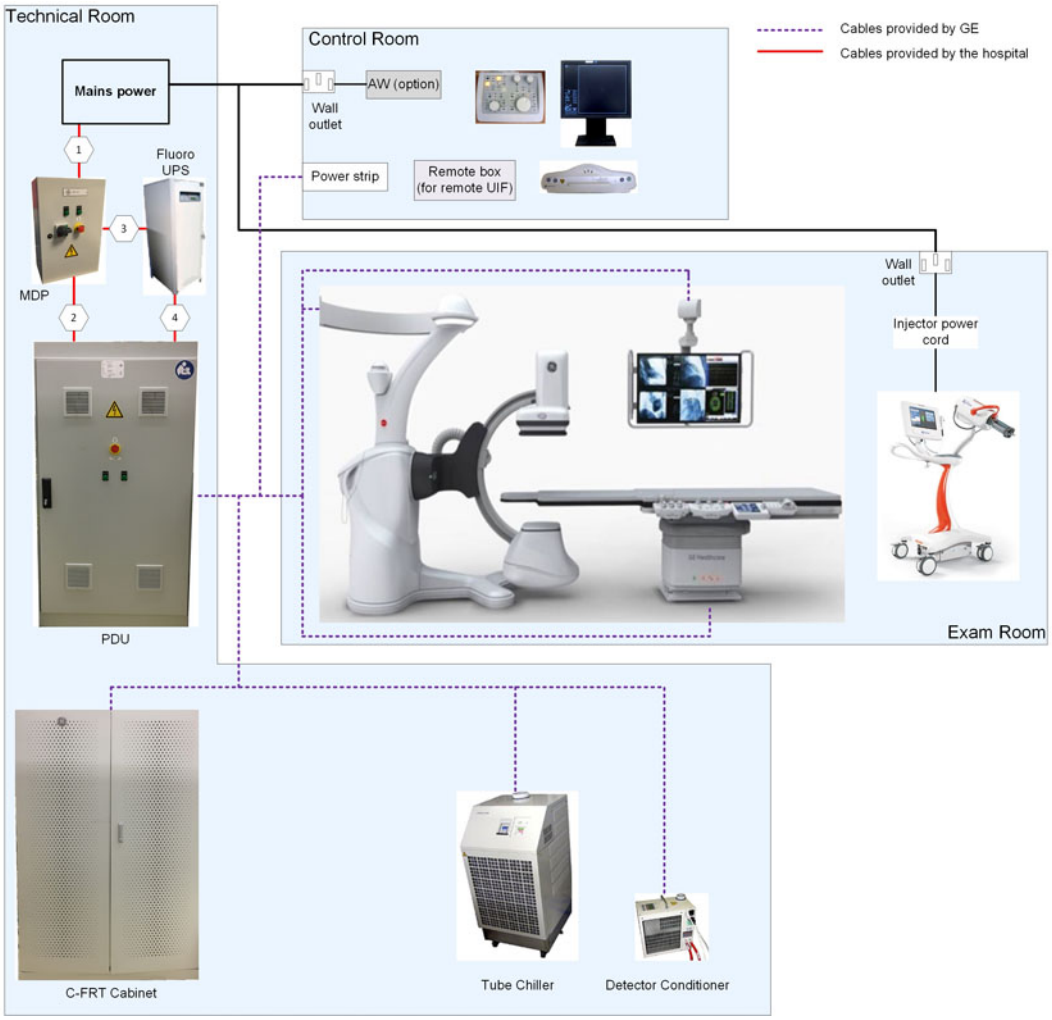
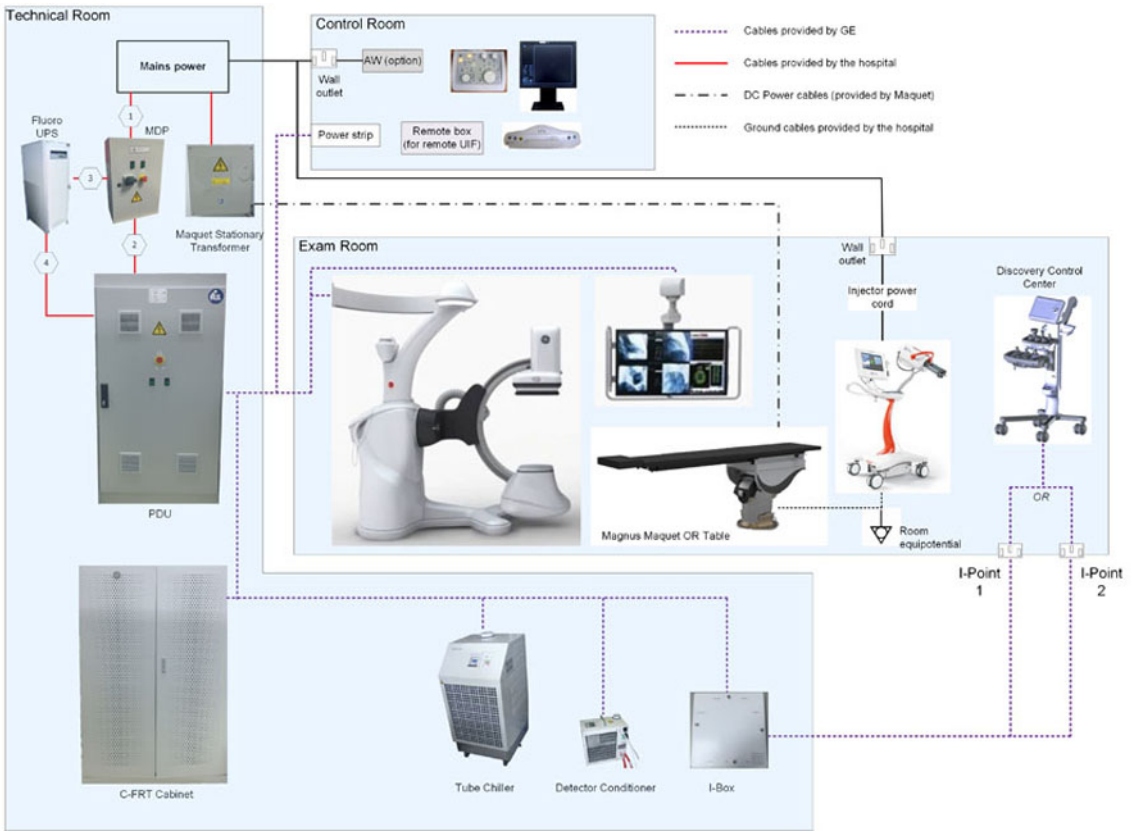


Figure 127 (For System configuration compatible with Magnus Maquet OR Table) Power Distribution with Fluoro UPS



5.2.3 System with Fluoro UPS and IT Electrical Network

The Fluoro UPS requires a Neutral line connected to the Protective Earth. For hospitals with an IT Electrical Network, a transformer is required with Delta-Wye or Delta-Star connection.

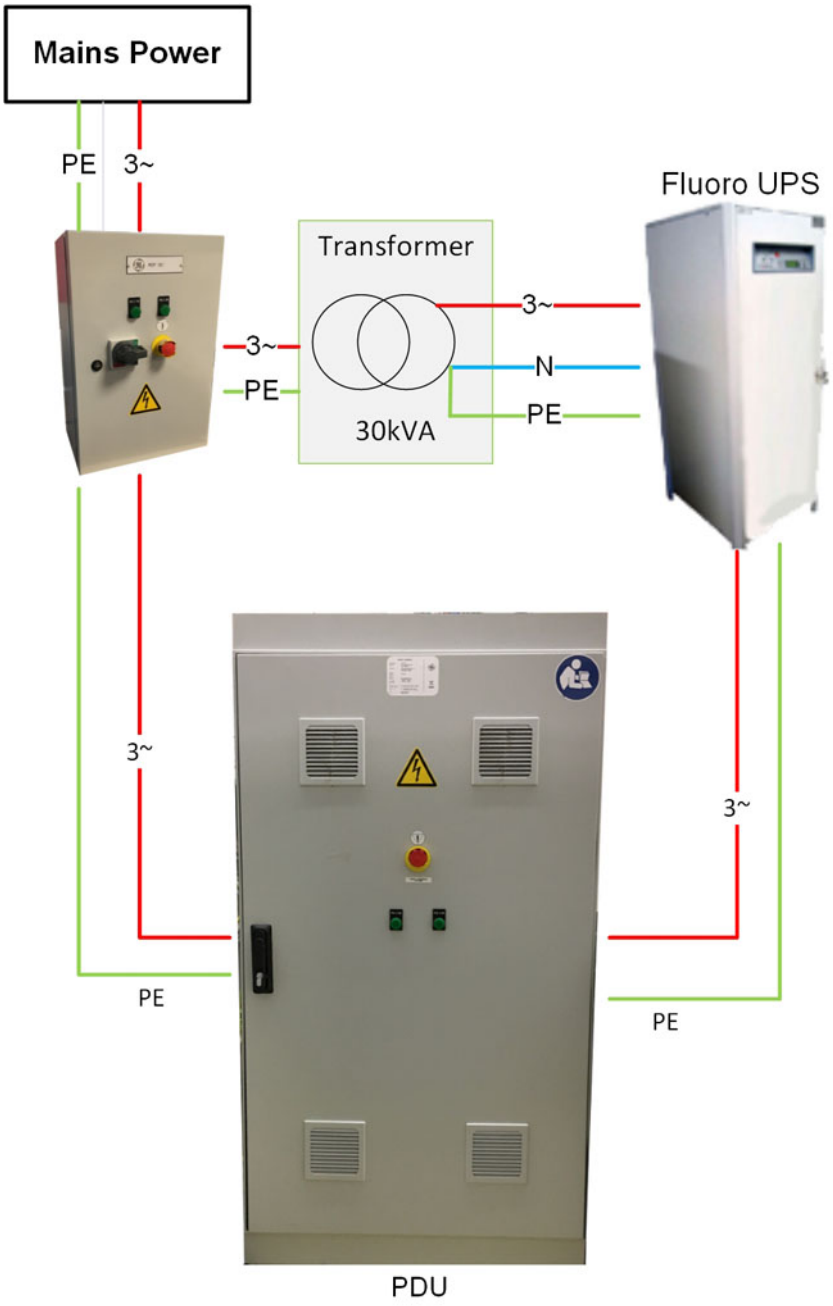
This transformer shall be provided by the customer; its characteristics shall be:

- 30 kVA minimum.
- Secondary star 3 Ph+N.
- The power distribution shall be of TNS type with the Neutral grounded.
- The transformer impedance shall be 4.5% or less (this parameter is also called %Z or short circuit voltage).

It is also the responsibility of the customer to provide:

- The box of the transformer to avoid access to live parts according to local regulations.
- The current protections at the output of the transformer, fuses or breaker, as per local regulations. The suggested rating is 50A.

Figure 128 Power Distribution with Fluoro UPS and IT Electrical Network



5.3 Mains Disconnect Panel

5.3.1 General Information

5.3.1.1 Introduction

The Mains Disconnect Panel (MDP) is the electric panel which is the interface between the Hospital mains and the System. It allows the power connections from the hospital power to the input of the PDU of the system and to the Fluoro UPS if present. It provides the LOTO (lock out – tag out) functions that allows safe service operation, and is part of the EPO (Emergency Power Off) function.

As the requirements applicable to electric panels vary from a country to another, information below lists the GE mandatory requirements to provide safe system operation and the installation precautions, in addition to the local regulatory requirements.

Information given shall allow the Customer to build the MDP in compliance with GE's rules. In addition, the following MDP can be ordered through the GE accessory catalog:

- MDP CE (P/N 5779988), certified IEC 61439-1 and CCC,
- MDP UL (P/N 5779987), certified UL508A for USA.

The Customer MDP is not covered by the GEHC product certification. The association of the Discovery™ IGS System and the Customer MDP is not covered by the GEHC product certification.

GE specifically disclaims any and all liability arising out of or relating to the use or performance of the MDP and the cables in the scope of Discovery™ IGS 7 Pre-Installation Manual, including, and without limitation, any liability or claims relating to patient injury, death, or the reliability of such MDP.

The mechanical and electrical installation of the MDP is fully under the customer and the installer responsibility.

The customer is responsible for ensuring that all requirements from the Discovery™ IGS 7 Pre-Installation Manual are met.

5.3.1.2 Pre-Installation

It is the customer responsibility to ensure that the MDP and its input and output cables are installed prior to the GE equipment (PDU, other cabinets, FUPS option, etc.) to ensure that standard GE Service Process can be followed during the System installation. The connection of the MDP to the GE equipment shall only be made in presence of a GE Service representative.

It is recommended that the vendor contacts GE Service representative and reviews the site planning details before the MDP is installed.

NOTE

GE will not be responsible for any delay in installation if the MDP is not mounted and its cables not routed before GE parts arrive on site.

5.3.1.3 Spare Parts

The customer is responsible for providing and replacing any part of MDP.

5.3.2 Mandatory Construction Requirements

5.3.2.1 Input Power

The MDP shall be functional within one the following input voltage and frequency ranges from the Hospital mains:

- Voltage range for systems without the Fluoro UPS:
  - 380 V +/-10% 3~, 50 Hz or 60 Hz +/-3 Hz
  - 400 V +/-10% 3~, 50 Hz or 60 Hz +/-3 Hz
  - 415 V +/-10% 3~, 50 Hz or 60 Hz +/-3 Hz
  - 480 V +/-10% 3~, 60 Hz +/-3 Hz
- Voltage range for systems with the Fluoro UPS:
  - 380 V +/-10% 3N~, 50 Hz or 60 Hz +/-3 Hz
  - 400 V +/-10% 3N~, 50 Hz or 60 Hz +/-3 Hz
  - 415 V +/-10% 3N~, 50 Hz or 60 Hz +/-3 Hz
  - 480 V +/-10% 3N~, 60 Hz +/-3 Hz

5.3.2.2 Breakers

The MDP shall provide a main breaker at its input, its specifications shall be:

- Current Rating: 100 A.
- It shall be capable of withstanding an inrush current of 2000 A for 10 ms.
- The voltage rating shall be the MDP nominal input line voltage +10%: i.e., 380 V + 10%, 400 V + 10%, 415 V + 10% or 480 V +10%.
- The frequency range shall be adapted to the input line frequency i.e., 50 Hz+/-3 Hz or 60 Hz +/-3 Hz.
- The Short Circuit Current Rating (SCCR) shall be adapted to the input line source short circuit capacity.

This command of this breaker shall be accessible from the outside of the MDP, in order to be able to rearm it without opening the MDP after an emergency power off.

For systems with the FUPS, the MDP shall provide a second breaker for protection of the FUPS input. Its specifications shall be:

- 3 poles type
- Voltage rating: same as the MDP main breaker
- Frequency range: same as the MDP main breaker
- Current Rating: 50 A
- Short Circuit Current Rating (SCCR): 50 kA.

For systems with the Fluoro UPS, the breaker for the FUPS input protection shall be powered by the MDP main breaker.

5.3.2.3 Terminal Blocks

The MDP shall have an input mains terminal block rated in accordance with the hospital input voltage. It shall be capable of holding minimum 35 mm^2 cable for the 3 phases, protective Earth and neutral (only for systems with the Fluoro UPS).

The MDP shall provide an output terminal block rated in accordance with the MDP input voltage to connect the output from the MDP main breaker to the system. This terminal block shall be capable of holding minimum 35 mm^2 cable for the 3 phases.

For systems with the Fluoro UPS, the MDP shall have a terminal block to connect an input neutral from the mains and an output neutral to the Fluoro UPS, and it shall have an output terminal block rated to the hospital input voltage to connect the mains input power from the MDP to the FUPS. This terminal block shall be capable of holding minimum 10 mm^2 cable for the 3 phases and neutral.

5.3.2.4 Protective Earth

The MDP shall have a ground bar / ground terminal to connect the protective Earth cables:

- from the hospital mains,
- to the system,
- to the FUPS (if present).

5.3.2.5 Indicators

The MDP shall have lights to indicate the presence of voltage. The presence of voltage on each input line shall be indicated by at least having lamps between Line1-Line2 and Line2-Line3. The recommended color for these lamps is green.

5.3.3 Mandatory EPO Requirements

The MDP shall provide an emergency power off (EPO) button on its front.

The EPO button shall not be of momentary type.

The EPO button shall have 2 NC contacts:

- one NC contact is to trip the MDP input breaker,
- the other NC contact is to activate the UPS EPO input (8 kVA or FUPS) to turn off the UPS output (this connection is done inside the PDU).

The MDP shall provide a terminal block to connect external cables to the 2 NC contacts of the MDP EPO.

When the MDP EPO or the PDU EPO is pressed, the MDP shall not provide any output voltage without any additional action on the EPO buttons and on the MDP input breaker.

The EPO button shall be protected against accidental activation, in order to prevent from accidental power OFF as shown below or equivalent.

Figure 129 EPO Button

5.3.4 Mandatory LOTO Requirements

The MDP shall provide means of disconnecting the mains power from the system, with LOTO capability to ensure safe service operation. It can be done by the input breaker if it has disconnecting capability, or by a separate disconnection device.

An operator should be able to apply LOTO without opening the MDP box. When a LOTO device is installed on the MDP input breaker or on the disconnecting device, there shall be no voltage at the output of the MDP.

5.3.5 Cabling Requirements

It is the customer's responsibility to ensure that the electrical installation is compliant with local regulations, such as NFPA99 (Health Care Facilities Code) or 60364-7-710 (Requirements for special installations or locations - Medical locations).

The 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 other room System cables and must be connected to the same distribution panel. They must run near one to the other.

The power cables, ground cables and EPO cables provided by the customer shall be compliant with local regulations (e.g. UL, NFPA 70, CSA, IEC, CCC).

5.3.5.1 Power Cables

The minimum gauge of the power cables at the MDP input and between the MDP and the PDU shall be 35 mm^2 / AWG2: cables # 1 and # 2 on:

- Figure 124 on page 160.
- Figure 126 on page 162.
- Figure 127 on page 163.

The length of the cable between MDP and PDU (cable # 2) shall not be more than 6 meters. This cable shall be copper cable and cable insulation temperature shall be 90°C.

Refer to the impedance definition in 5.1 System Electrical Ratings on page 159.

The minimum gauge of the power cables from the MDP to the FUPS and from the FUPS to the PDU shall be 10 mm^2 / AWG6 (cables # 3 and # 4 on Figure 126 on page 162 or Figure 127 on page 163.

The insulation temperature of these power cables shall be 90ºC minimum.

5.3.5.2 Protective Earth Cables

To avoid risk of electric shock, this equipment must only be connected to a mains power supply with Protective Earth.

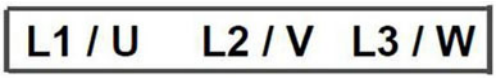
The gauge and type of the protective Earth cables (cables #1, #2, #3 and #4) shall be the same as the MDP's input power cables.

5.3.5.3 EPO Cable

The hospital shall provide an EPO cable between the MDP and the PDU; its minimum gauge shall be 1 mm^2 and shall be in accordance with the rating of the fuse F2 of the MDP.

5.3.6 Mandatory Labeling Requirements

The input mains terminal block and the output terminal blocks of the MDP shall be labeled to indicate the 3 lines as shown below or equivalent:



For systems with the Fluoro UPS, the MDP input neutral terminal block and the neutral output terminal block to the Fluoro UPS shall be labelled with the IEC 60445 symbol as shown below or equivalent:

The ground bar shall be marked with the IEC 60417-5019 symbol as shown below:

5.3.7 Other Mandatory Requirements

The MDP and the external cables shall be compliant to all applicable local regulations, in particular to the standards applicable to Industrial Control Panels or Low-voltage switch gear and control gear assemblies, such as UL508A for USA or IEC 61439-1 for Europe.

The MDP enclosure shall be grounded if its enclosure is metallic, and there shall be no access to hazardous voltages. The enclosure shall provide enough rigidity to avoid hazardous situations in case of shock or impact and shall be designed in accordance with the local regulations.

Local regulation may require the MDP to have a door interlock mechanism to prevent from opening the door when the main breaker is on.

The MDP shall be provided with a LOTO procedure.

5.3.8 Preferred Schematics and Components

5.3.8.1 Recommended CE Schematics

Figure 130 CE MDP - Power and Control

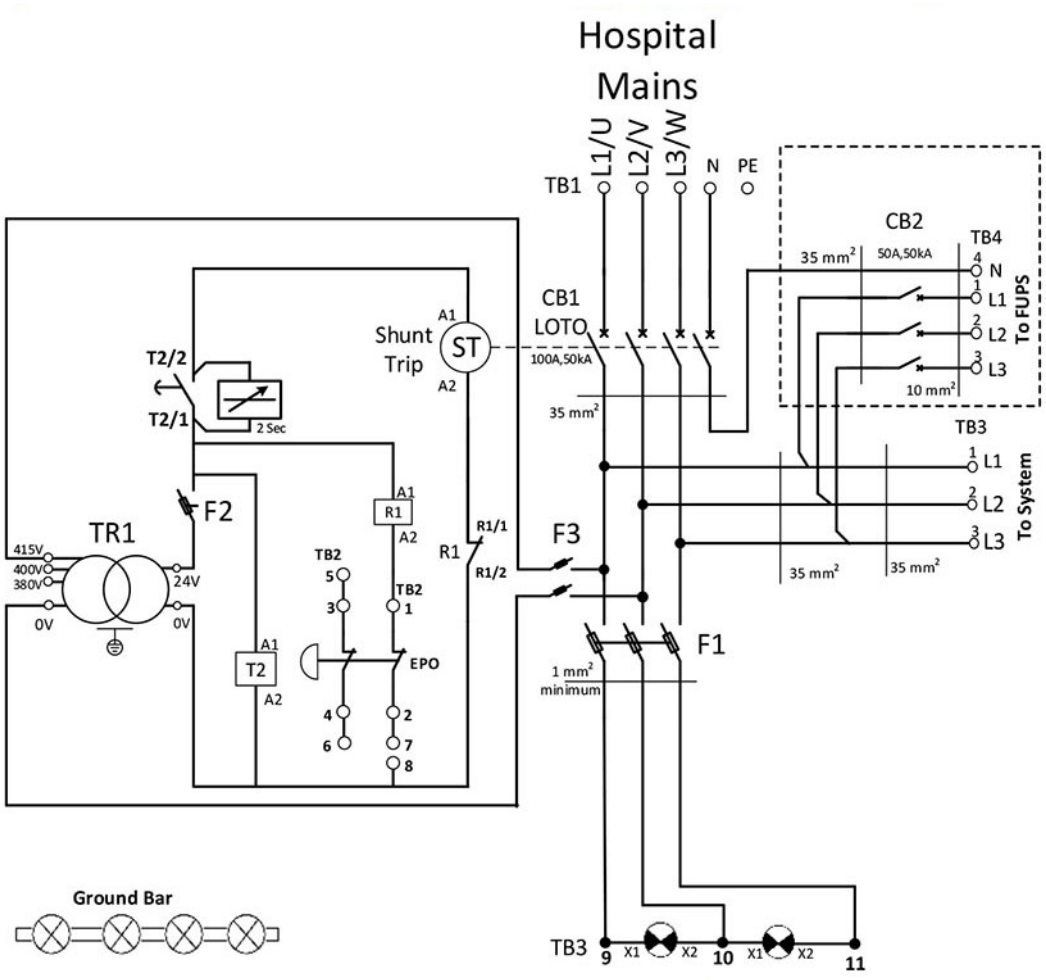
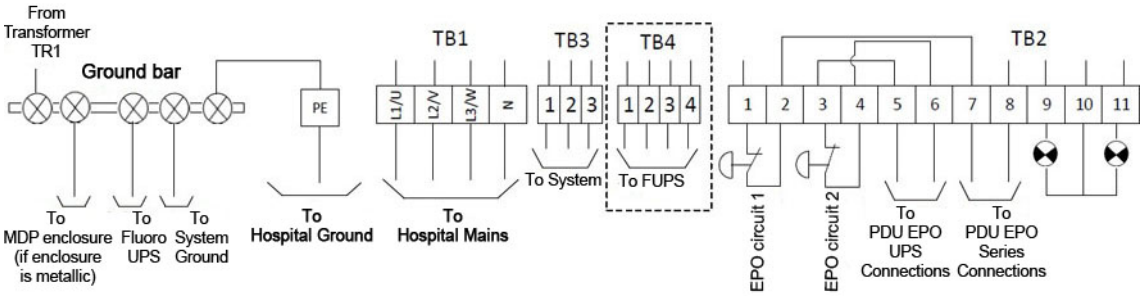


Figure 131 CE MDP - I/O Interfaces



5.3.8.2 Minimum Components Specifications for the CE MDP

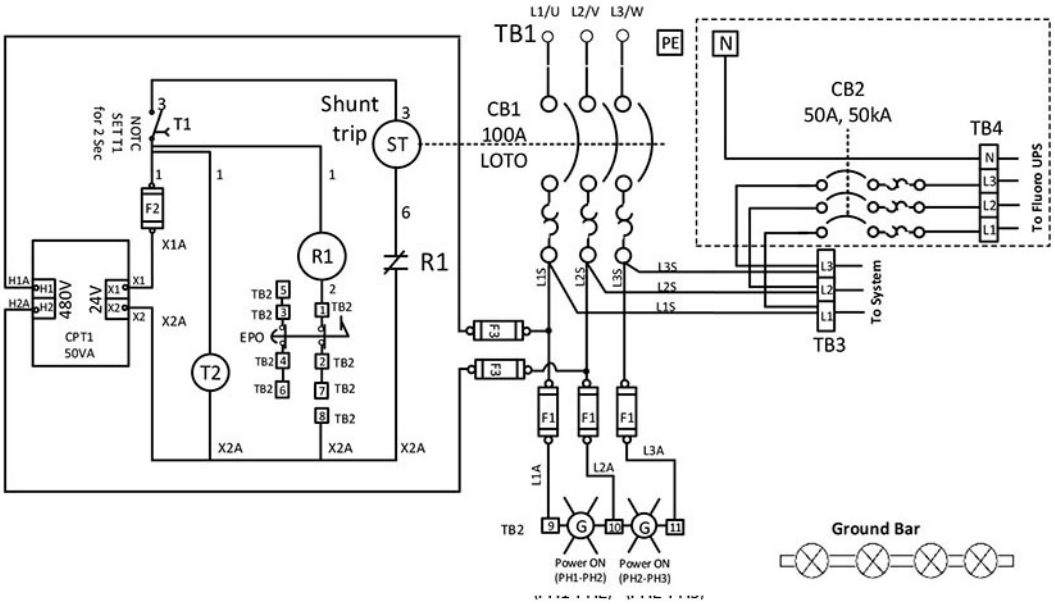
Table 37

Component	Label (refer to Figure 130 on page 171)	Rating
Input Circuit Breaker	CB1	4 Pole, 100A, 50 kA, Vin + 10% 50 Hz or 60 Hz 2000 A inrush current withstand capability for at least 10 ms
Circuit Breaker	CB2	50 A, 50 kA, Vin+ 10%, 50 Hz or 60 Hz
Fuse	F1	2A Time delay, Vin+10% Based on Green indicator lights power ratings
Fuse	F2	2A, 24 VAC+10% Based on transformer power rating and transformer load current rating
Fuse	F3	1A Time delay, Vin+10% Based on transformer power rating and transformer input current
Time delay relay	T2	24 VAC+10% Shall have 1 NO contact Time delay setting shall be min 2 Sec
Auxiliary relay	R1	24 VAC+10% Shall have 1 NC contact
Shunt Trip	ST	24 VAC+10% Shunt trip opens the MDP input main breaker when the shunt trip is energized
2 Pilot lights Green	-	Vin+10%, 50 Hz or 60 Hz
Transformer	TR1	Power rating: 50 VA or Based on power ratings of components used at transformer output Input: 380 VAC or 400 VAC or 415 VAC Output: 24V Frequency: 50 or 60 Hz Double insulation as per standard IEC61558 Sum of power ratings of R1, shunt trip and timer shall be less than transformer power rating

continued		
Component	**Label (refer to Figure 130 on page 171)**	**Rating**
EPO	-	Mushroom button with 2 NC contacts Rated for 24 VAC, 50 mA
Cable for MDP internal Control circuitry	-	Min 1 mm^2 and in accordance with the fuses rating

5.3.8.3 Recommended UL Schematics

Figure 132 UL MDP - Power and Control

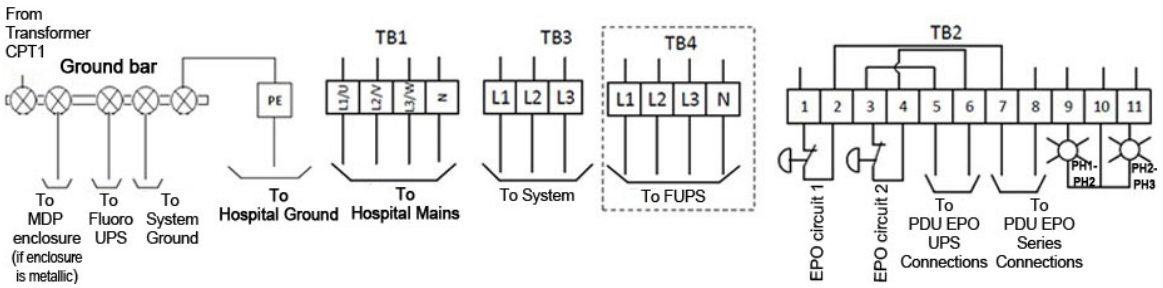


NOTE

Neutral is not required by Imaging system.

Neutral is required when Fluoro UPS is used.

Figure 133 UL MDP - I/O Interfaces



5.3.8.4 Minimum Components Specifications for the UL MDP

Table 38

Component	Label (refer to Figure 132 on page 173)	Rating
Input Circuit Breaker	CB1	3 Pole, 100 A, 50 kA, 480 VAC+10% 60 Hz 2000 A inrush current withstand capability for at least 10 ms
Circuit Breaker	CB2	50 A, 50 kA, 480 VAC+10% 60 Hz
Fuse	F1	2A Time delay, 480 VAC+10% Based on Green indicator lights power ratings
Fuse	F2	2A, 24 VAC+10% Based on transformer power rating and transformer load current rating
Fuse	F3	1A Time delay, 480 VAC+10% Based on transformer power rating and transformer input current
Time delay relay	T2	24 VAC+10% Shall have 1 NO contact Time delay setting shall be min 2 s
Auxiliary relay	R1	24 VAC+10% Shall have 1 NC contact

continued		
Component	**Label (refer to Figure 132 on page 173)**	**Rating**
Shunt Trip	ST	24 VAC+10% Shunt trip shall open the MDP input breaker when shunt trip is energized
2 Pilot lights Green	PH1–PH2 PH2–PH3	480 VAC +10%
Transformer	CP T1	Power rating: 50 VA or Based on power ratings of components used at transformer output Input: 480 VAC Output: 24 VAC Frequency: 60 Hz +/-3 Hz Double insulation as per UL 5085-1 standard Sum of power ratings of R1, shunt trip and timer shall be less than transformer power rating
EPO	-	Mushroom button with 2 NC contacts Rated for 24 VAC, 50 mA
Cable for MDP internal Control circuitry	-	Min AWG16 and in accordance with the fuses rating

5.3.9 Checklist

The following checklist shall be filled and given to the Field Engineer before connecting the MDP to the system.

Table 39

Test	Expected Result	OK / NOK
Functional Tests		
Initial state: the MDP main breaker is off, power is available at its input. A jumper is installed between TB2 7 & 8 Turn on the MDP main breaker.	The indicator lights on MDP front panel are ON.	
	The voltage at TB3 is the same as the MDP input voltage.	
	For systems with the FUPS, the voltage at TB4 is the same as the MDP input voltage.	
Press the EPO push button on MDP front panel.	The indicator lights on the MDP front panel are turned off.	
	The MDP main breaker is opened.	

continued		
Test	**Expected Result**	**OK / NOK**
	There is no voltage at TB3.	
	For systems with the FUPS, there is no voltage at TB4.	
	The dry contact between TB2 5 & 6 is open.	
Check it is possible to apply the LOTO on the MDP input breaker or on the disconnecting device.	It is possible to apply the LOTO on the MDP input breaker or on the disconnecting device.	
Documentation		
Check a LOTO procedure is provided with the MDP.	The LOTO procedure is present.	
Components Ratings		
Check that the components ratings are compliant with the requirements of Minimum Components Specifications for the CE MDP on page 172 or Minimum Components Specifications for the UL MDP on page 174.	The components ratings are compliant with the requirements of Minimum Components Specifications for the CE MDP on page 172 or Minimum Components Specifications for the UL MDP on page 174.	

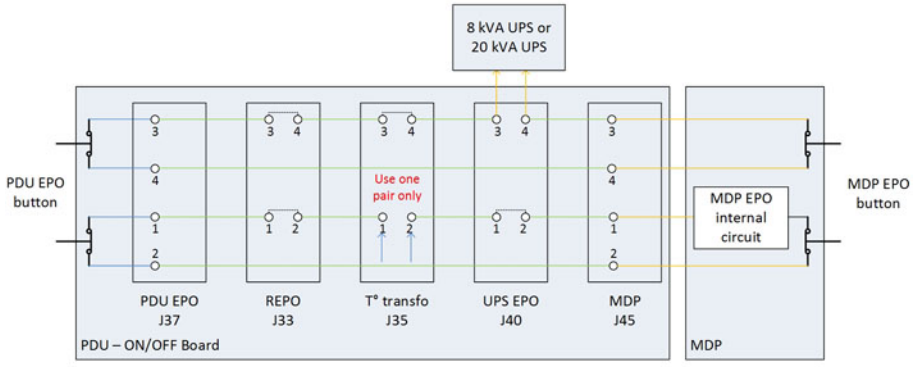
5.4 External Interfaces

5.4.1 Emergency Power Off (EPO)

The PDU is provided with an EPO button on its front panel and provides the connection for additional EPO buttons (in Exam Room or Control Room).

The customer is responsible for the procurement, delivery and installation of the cables and EPO buttons. The EPO buttons shall be "Push to activate - Push to release" type, 2 contacts Normally Closed, compatible with 24 V AC and in accordance with the MDP transformer rating. The maximum length of the cables shall be 24 m, the recommended diameter is AWG14/2 mm^2.

The EPO buttons shall be protected from accidental activation.



NOTE

J35 connection:

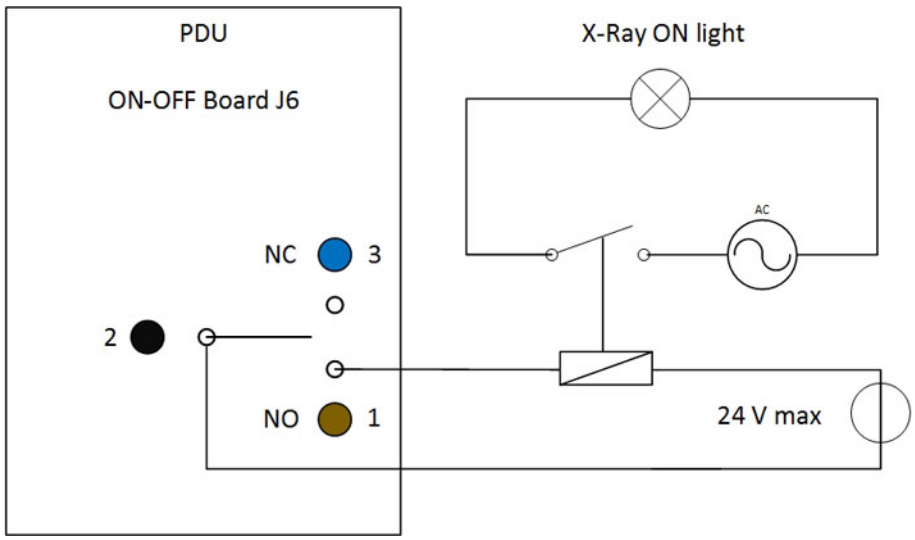
- UPS 8 kVA: pair 1, 2 connected to Transformer EPO output, pair 3, 4 is shorted.
- UPS 20 kVA (Fluoro UPS): pair 3, 4 connected to Transformer EPO output, pair 1, 2 is shorted.

5.4.2 X-Ray ON lights

NOTICE

The X-Ray ON lamp must be installed in the Exam Room in conformity to the standard IEC/EN 60601-2-43. The X-Ray ON lamp shall be visible by the operator in all the locations defined for the personnel who may receive scattered radiation.

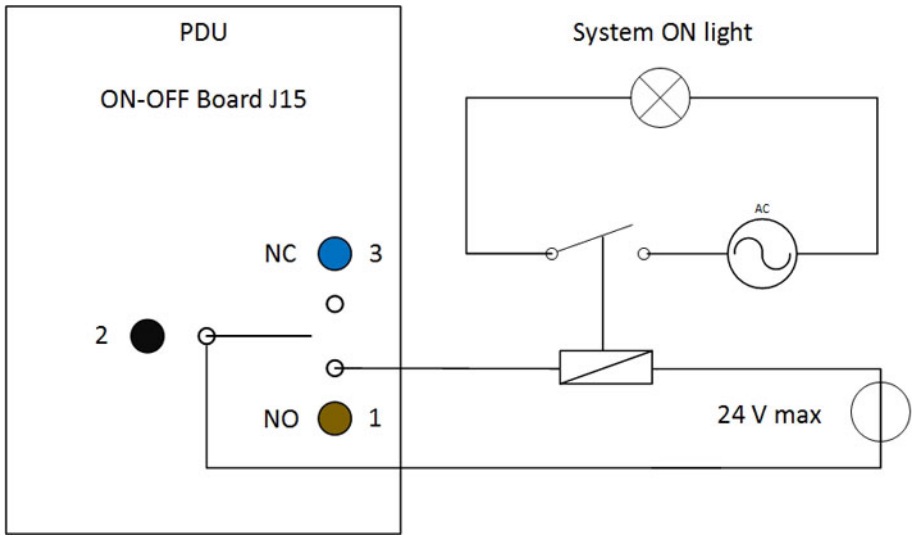
The System provides a dry contact to trigger a low voltage relay (24 V max) that drives the X-Ray ON lights. The Customer is responsible for the procurement, delivery and installation of the power supplies, relay, cables and the X-Ray ON lights.



The cables are connected to the PDU on an open contact. The diameter of the cables shall be 2 mm^2 maximum.

5.4.3 System ON light

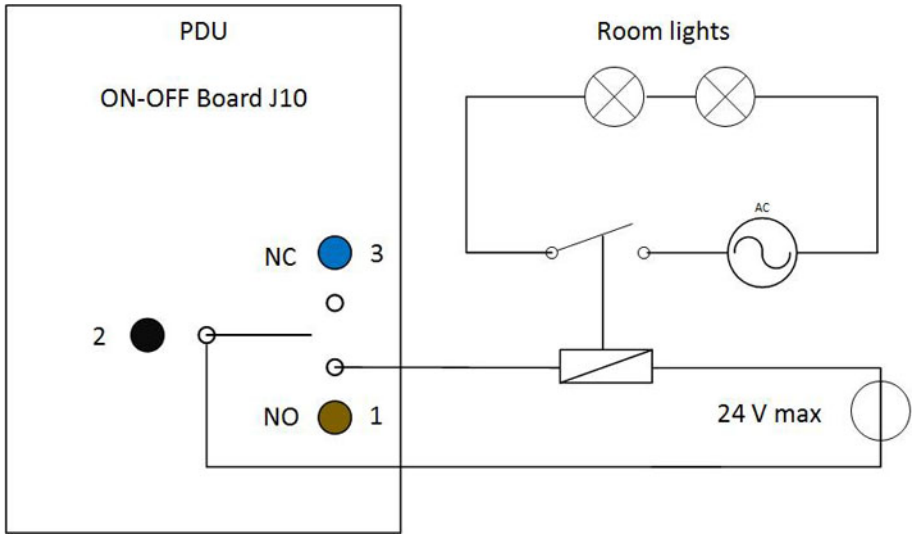
The System provides a dry contact to trigger a low voltage relay (24 V max) that can drive a System ON light. The Customer is responsible for the procurement, delivery and installation of the power supplies, relay, cables and the System ON light.



The cables are connected to the PDU on an open contact. The diameter of the cables shall be 2 mm^2 maximum.

5.4.4 Room lights

The System provides a dry contact to trigger a low voltage relay (24 V max) that can drive the Exam Room lights. The Customer is responsible for the procurement, delivery and installation of the power supplies, relay, cables and the room lights.

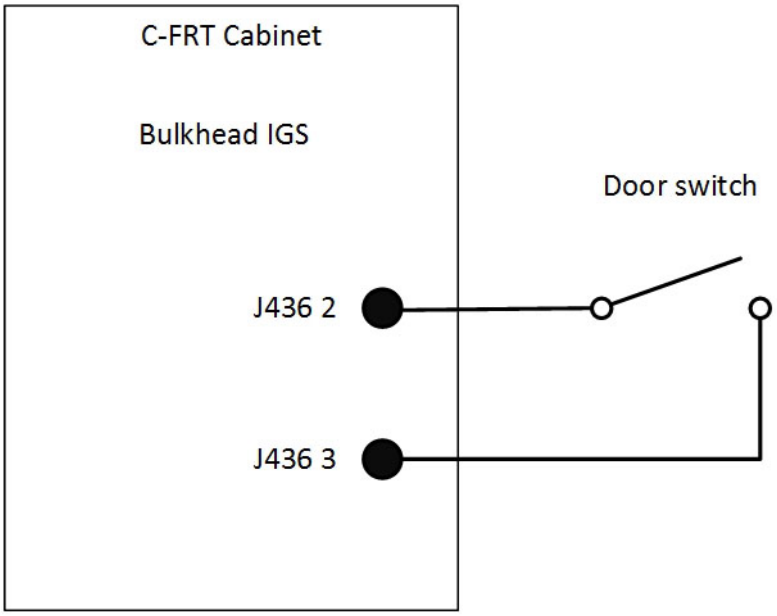


The cables are connected to the PDU on an open contact. The diameter of the cables shall be 2 mm^2 maximum.

5.4.5 Room door interlock

The system provides a room door interlock that can prevent X-Ray emission when the door is open. The IEC 60601-2-43 requires not to install door interlocks. It is the responsibility of the installer to verify that the connection of this interlock is not in contradiction with local regulation. In case of conflict, the local regulation shall prevail.

This switch shall be closed when the door is closed, it shall be compatible with 24 V DC.



To disable the door interlock: the pins 2 and 3 from J436 shall be shorted. The diameter of the cables connected to the cabinet shall be 2 mm^2 maximum.

5.4.6 Video distribution

The system can provide a DVI output (1280 x 1024, 60 Hz) of its 3 displays (live, roadmap and review). Only 4 streams of each display can be provided (included the images displayed on the LDM).

With the LDM option, a 2MP copy of the LDM image (DVI 1920 x 1080, 60 Hz) can be provided as an option.

These video links are optical cables and their length is 36 m.

5.4.7 Other options

(For USA only) A purchasable option I-sense (catalog number E4504B) allows the monitoring of the hospital main power line. It is recommended to install this option everywhere RMS and waveform variation events can impact the standard behavior of the system. I-sense is connected to each phase conductor and the ground. An analog telephone line also needs to be line to I-sense.

5.5 System Cable Information

5.5.1 Physical Runs

5.5.1.1 Physical Run Synoptic

5.5.1.1.1 System with Innova^{IQ} Table or Innova^{IQ} OR Table

Figure 134 (For Innova^{IQ} Table) Interconnection Length - System with 8 kVA UPS

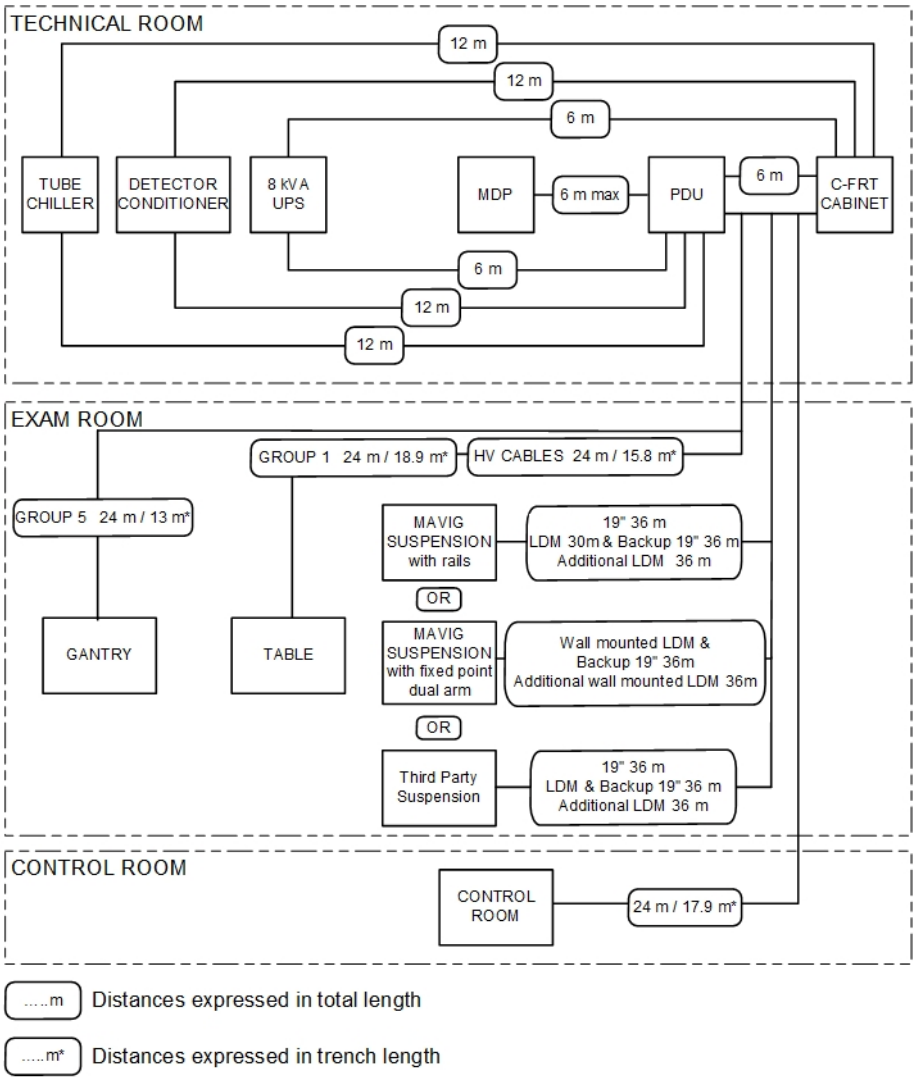
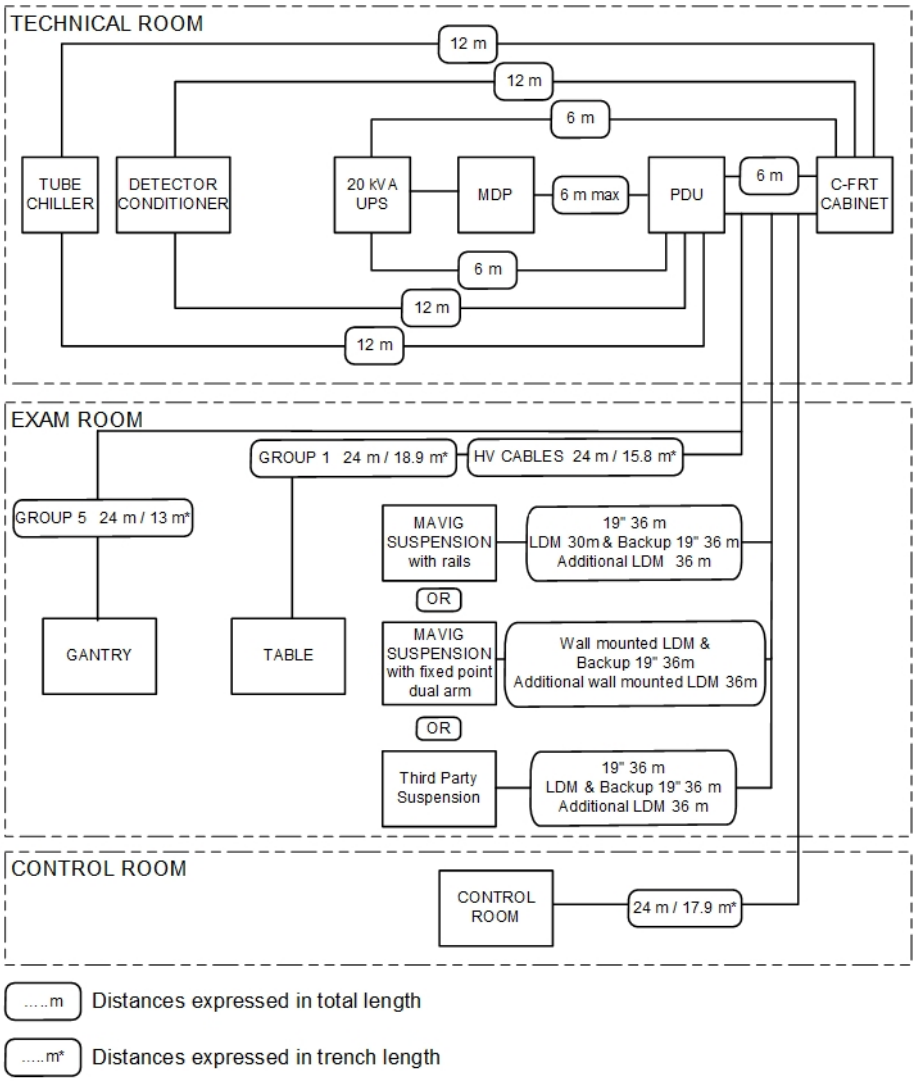


Figure 135 (For Innova^{IQ} Table and Innova^{IQ} OR Table) Interconnection Length - System with 20 kVA UPS (Fluoro UPS)



5.5.1.1.2 System with Magnus Maquet OR Table

Figure 136 Interconnection Length - System with 8 kVA UPS

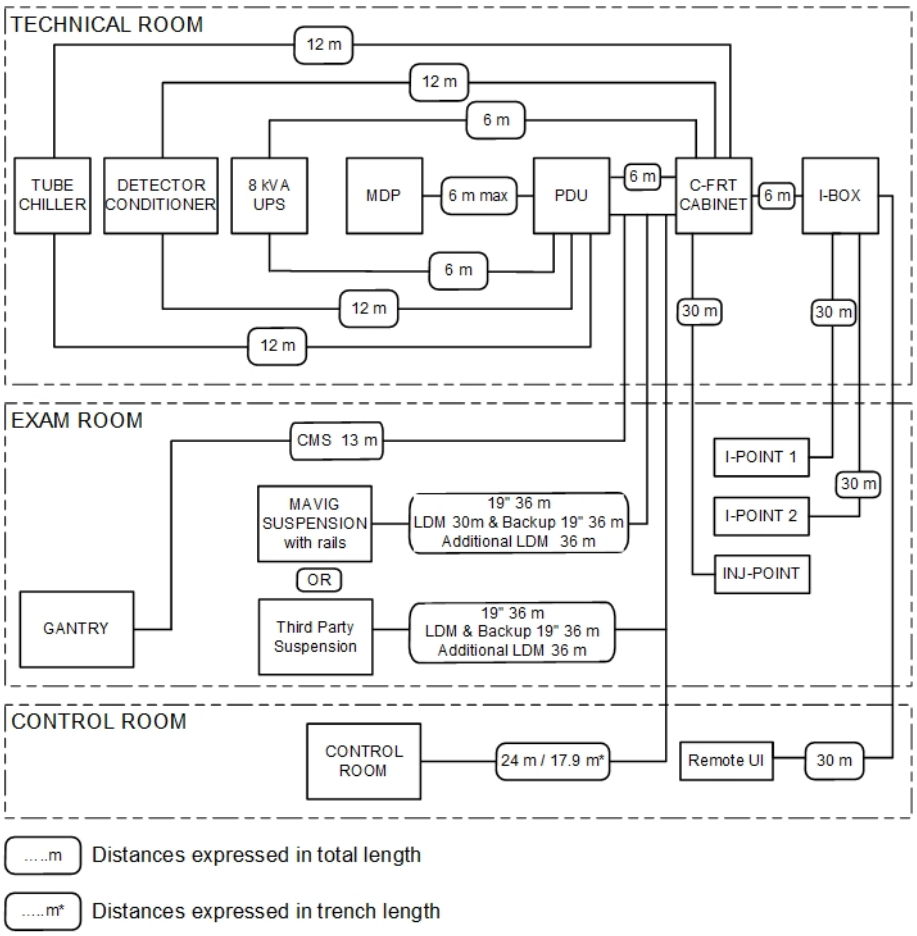
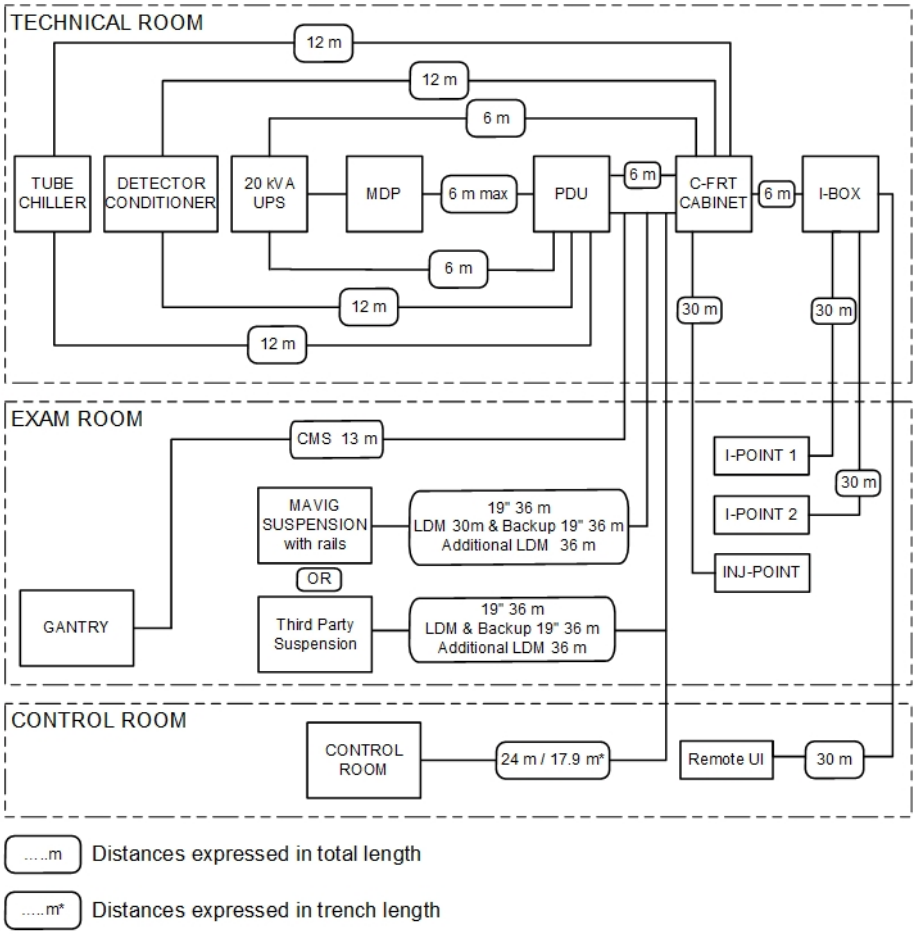


Figure 137 Interconnection Length - System with 20 kVA UPS (Fluoro UPS)



5.5.1.2 MIS (Master Interconnect System)

The 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

- *Discovery™ IGS 7 - MIS Map*
- *Discovery™ IGS 7 - MIS Charts.*

General Guidelines

The System introduces 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.

5.5.1.3 System Core Matrix

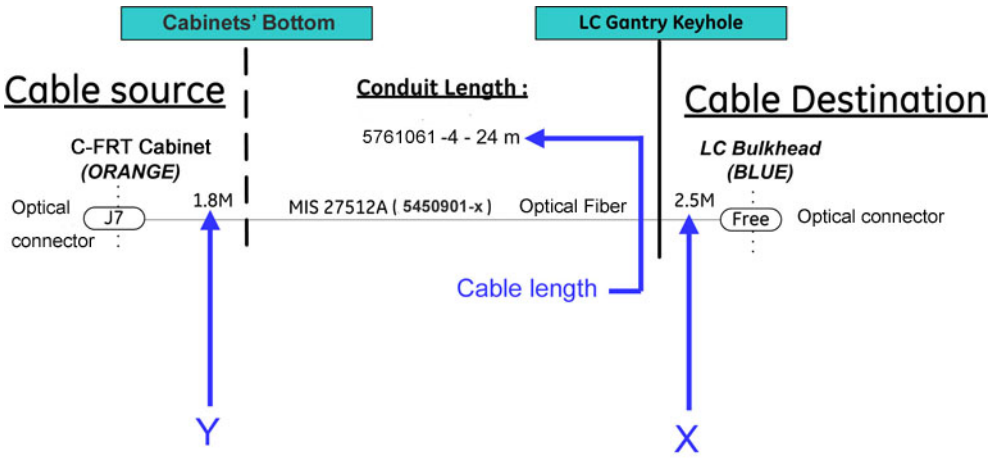
NOTICE

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:

Figure 138 Example of cable group schematic



Cable length data is as follows:

- ***Cable Length*** = the total cable length, connector to connector (example above is 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 19.7 meters).

Figure 139 (For Innova^{IQ} Table and Innova^{IQ} OR Table) Cable Group 1 - From Technical Room to Exam Room

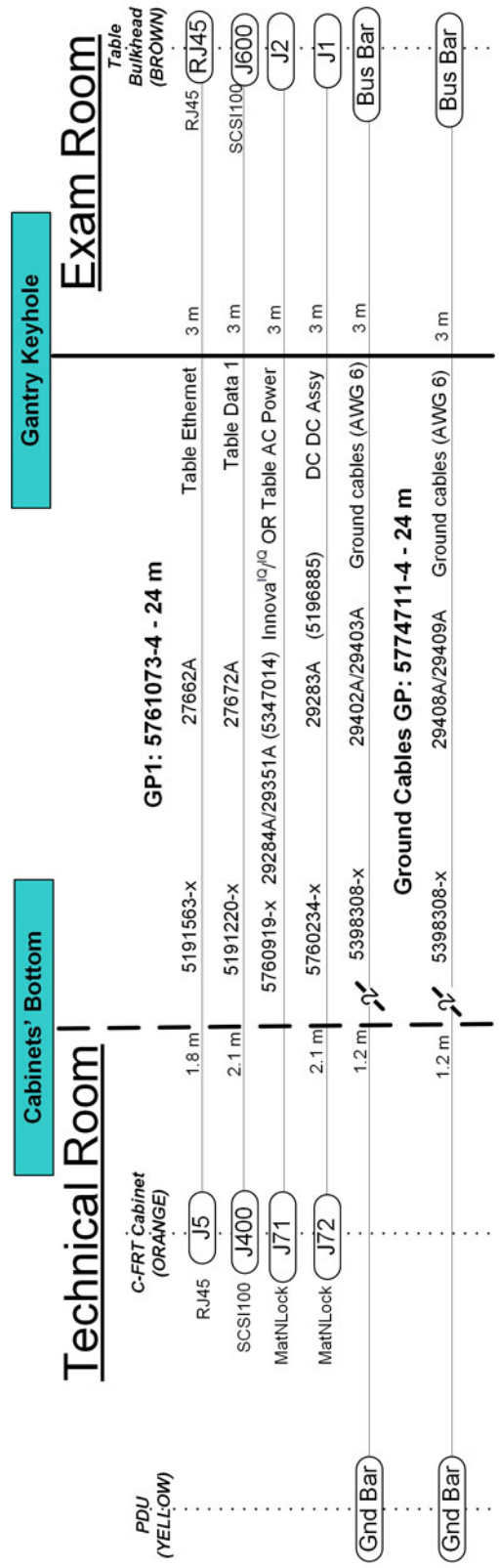


Figure 140 (For Magnus Maquet OR Table) Cable Group1M - From Technical Room to Exam Room

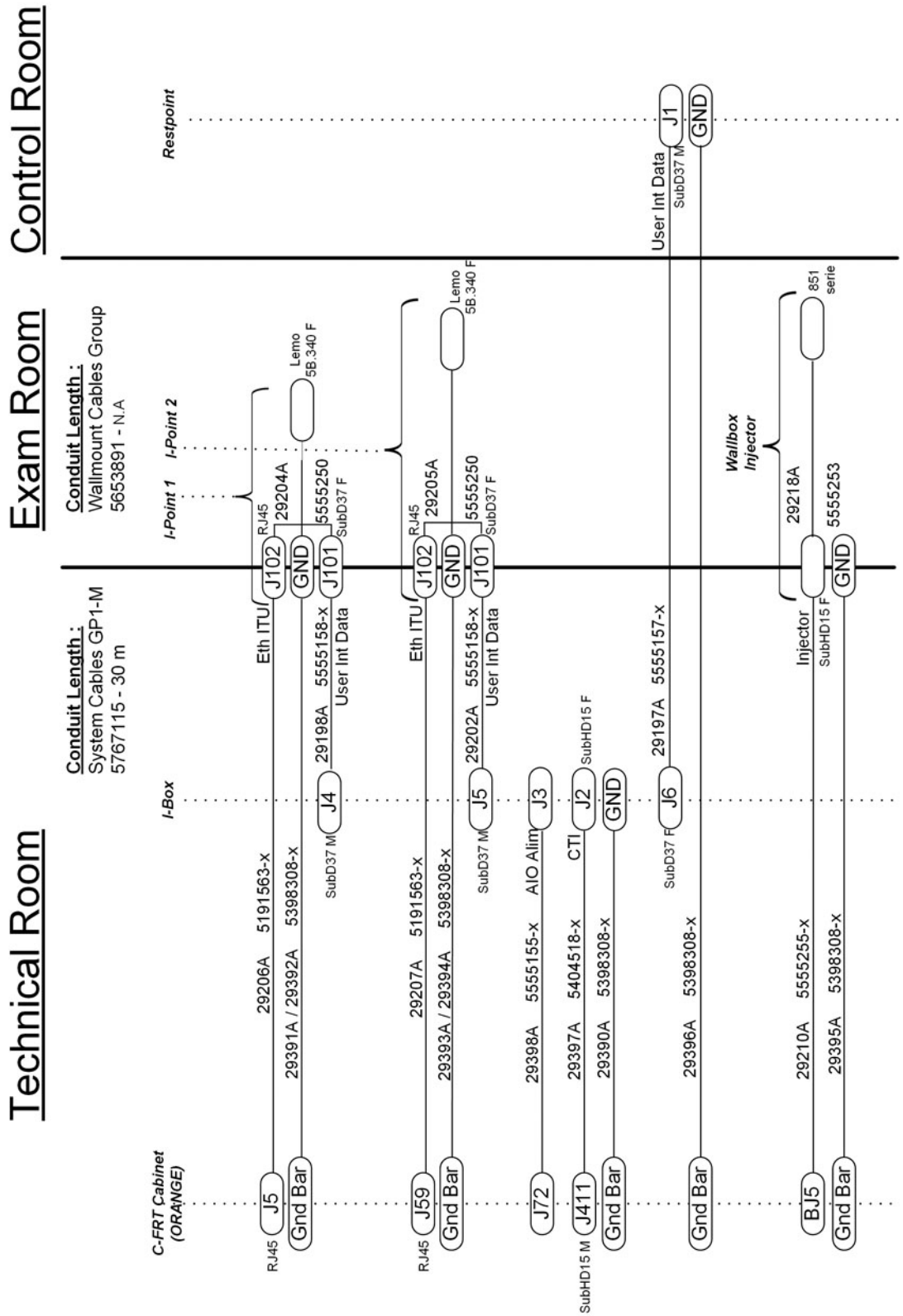


Figure 141 Cable Group 2 – From Technical Room to Control Room

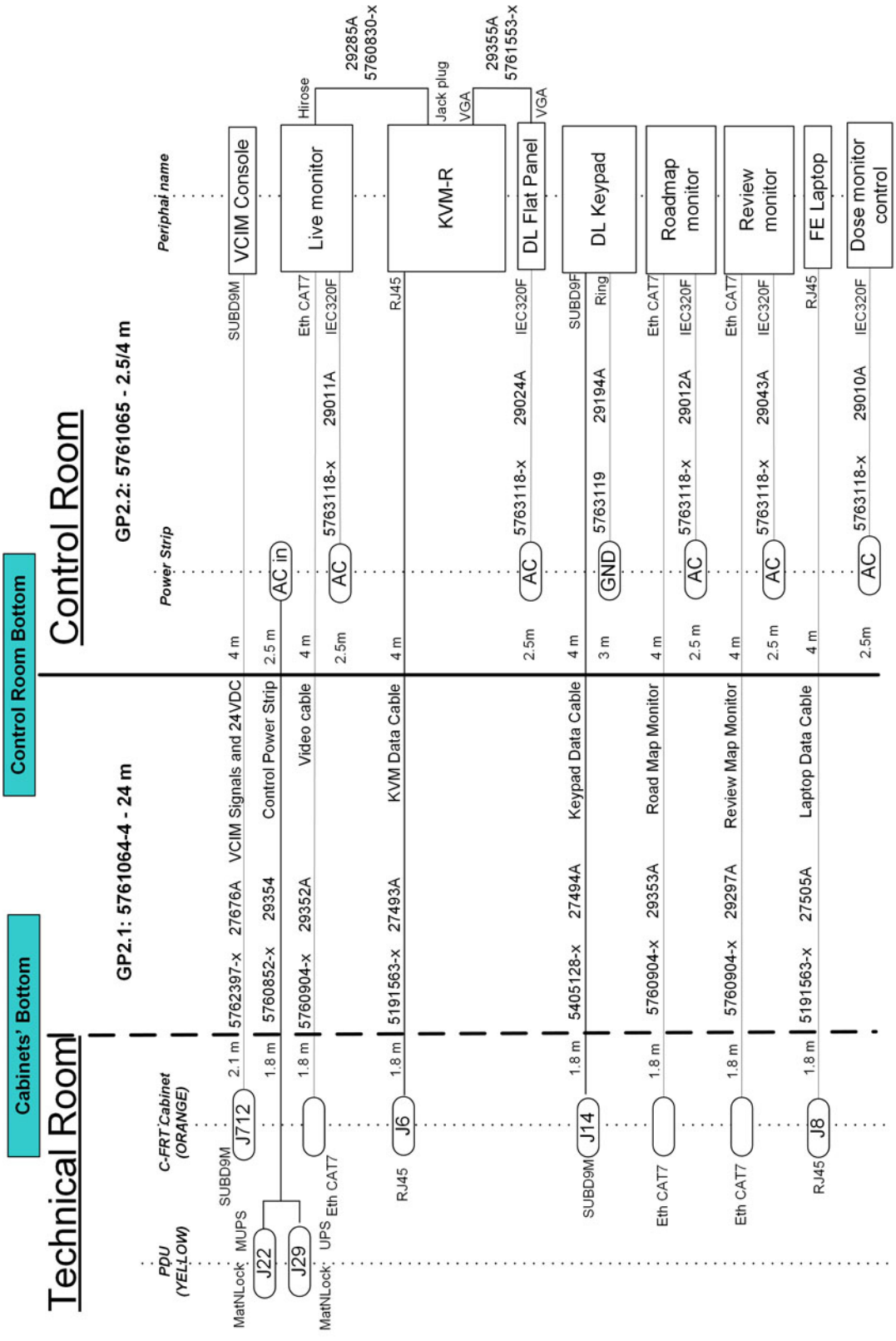


Figure 142 Cable Group - Fast Link Option

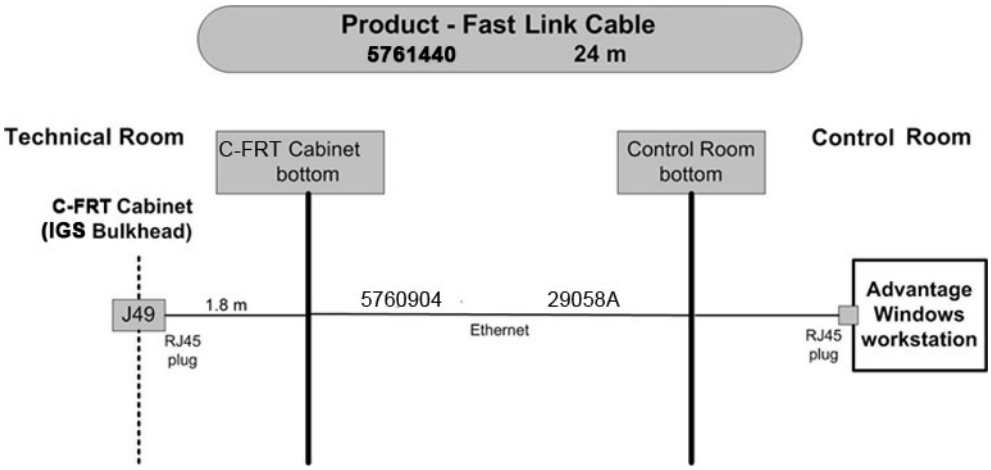


Figure 143 Cable Group 3 – From Technical Room to Technical Room

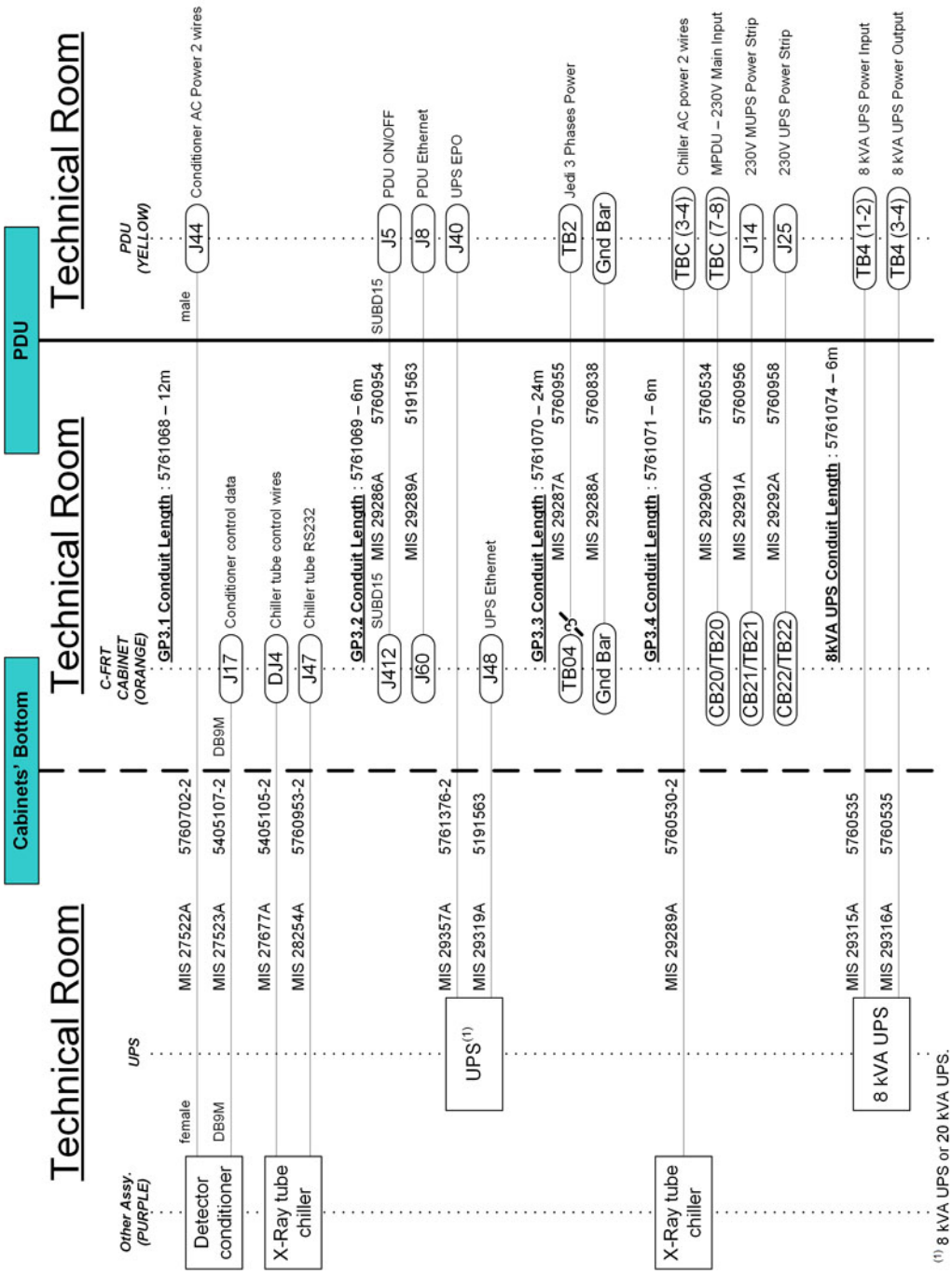


Figure 144 Cable Group 4 – From Technical Room to optional Monitors

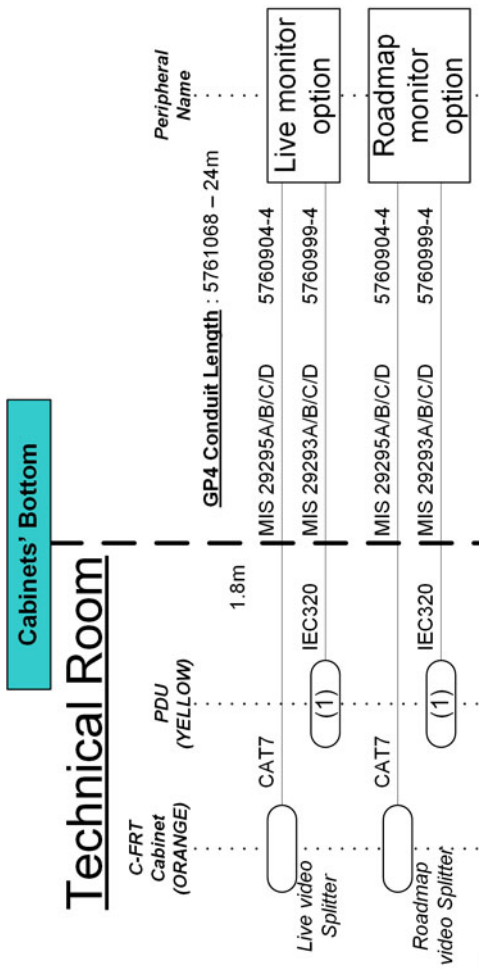


Figure 145 Cable Group 5 – From Technical Room to Exam Room

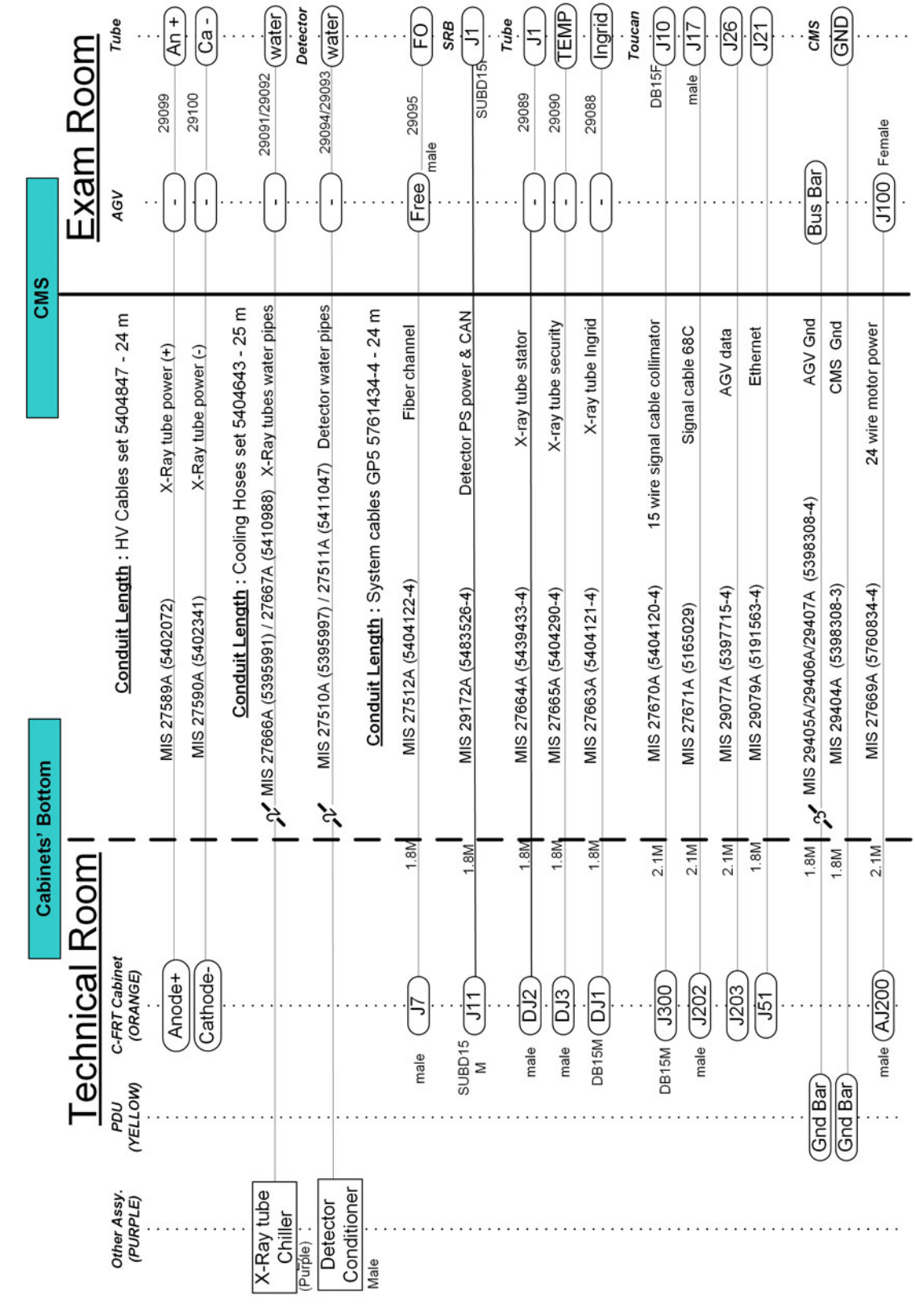


Figure 146 Cable Group – From Technical Room to LCD Monitor Suspension

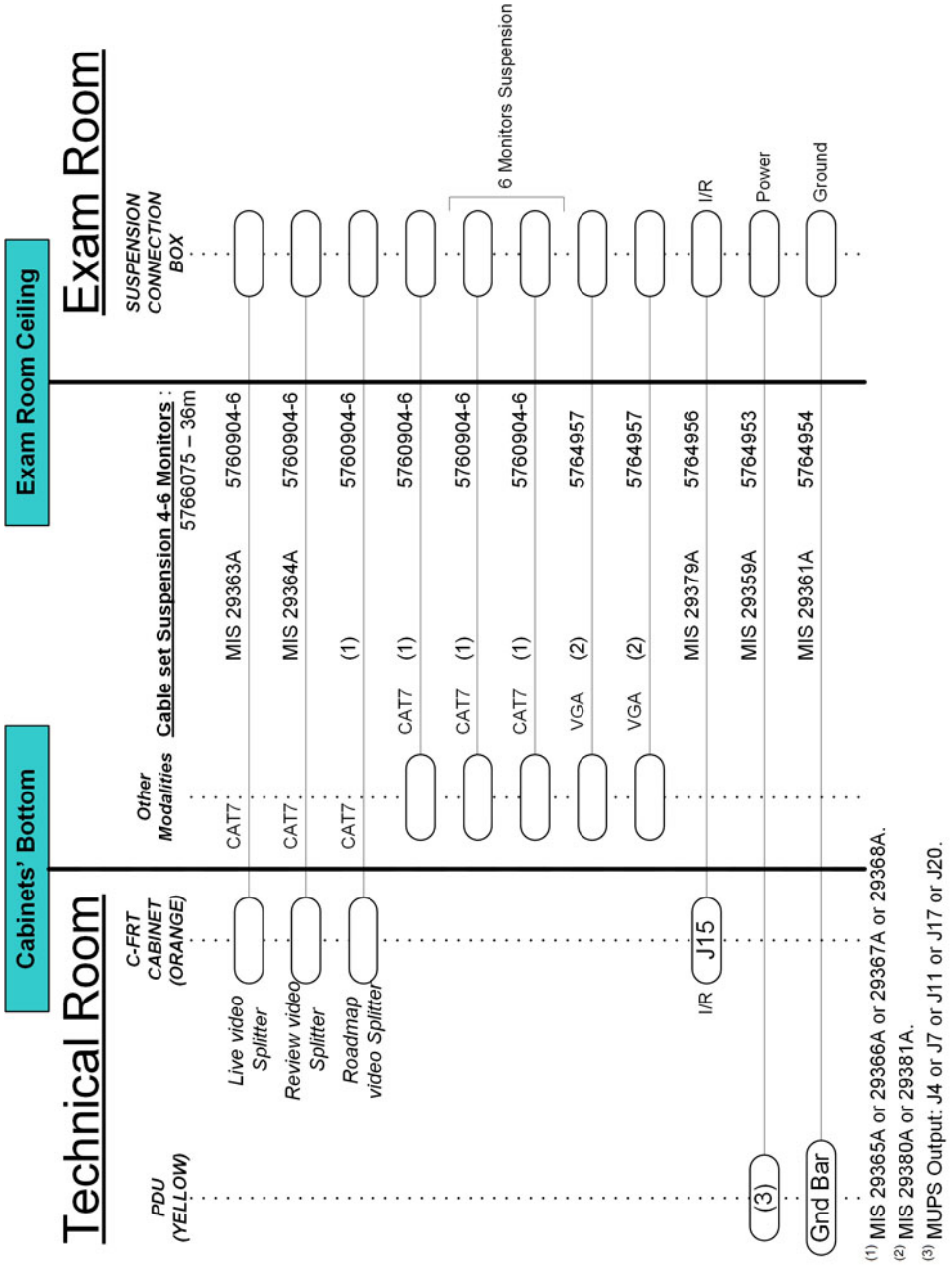


Figure 147 Cable Group – From Technical Room to LDM Mavig Suspension

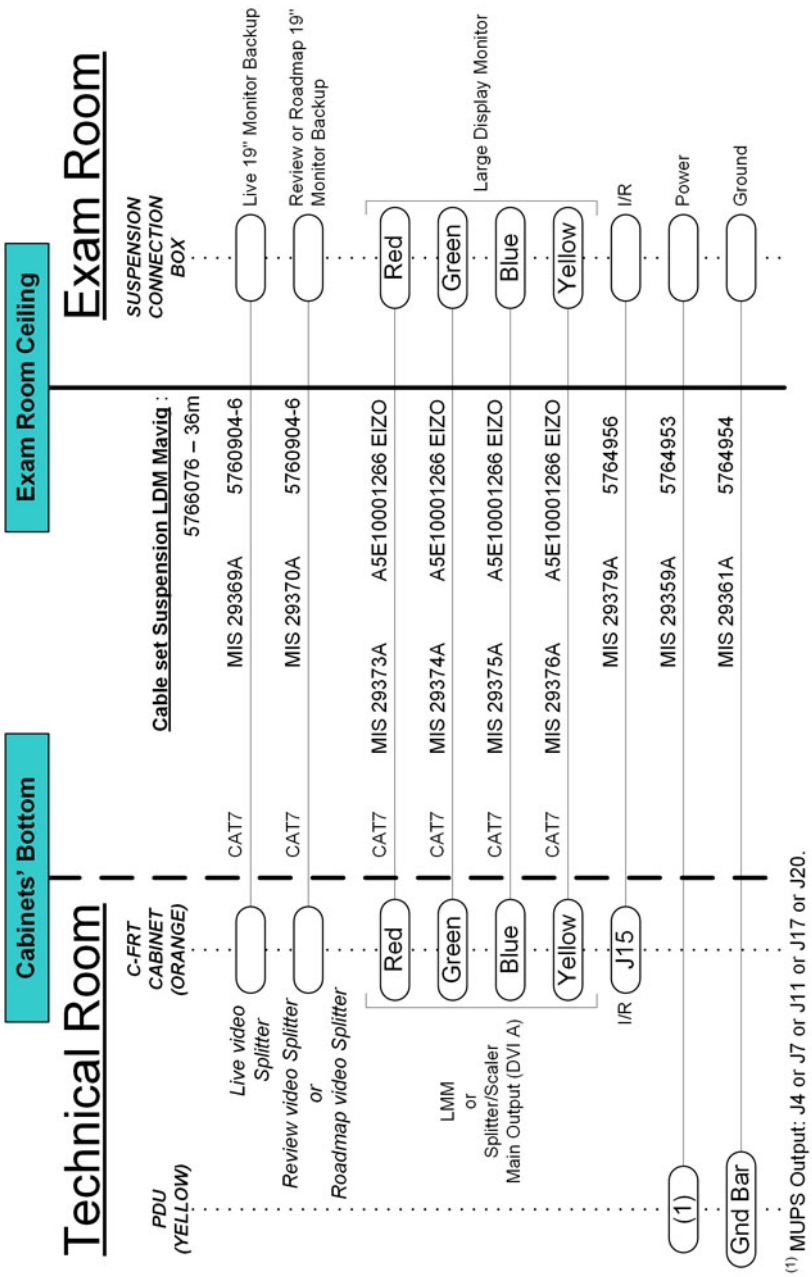


Figure 148 Cable Group – From Technical Room to LDM 3rd Party Suspension

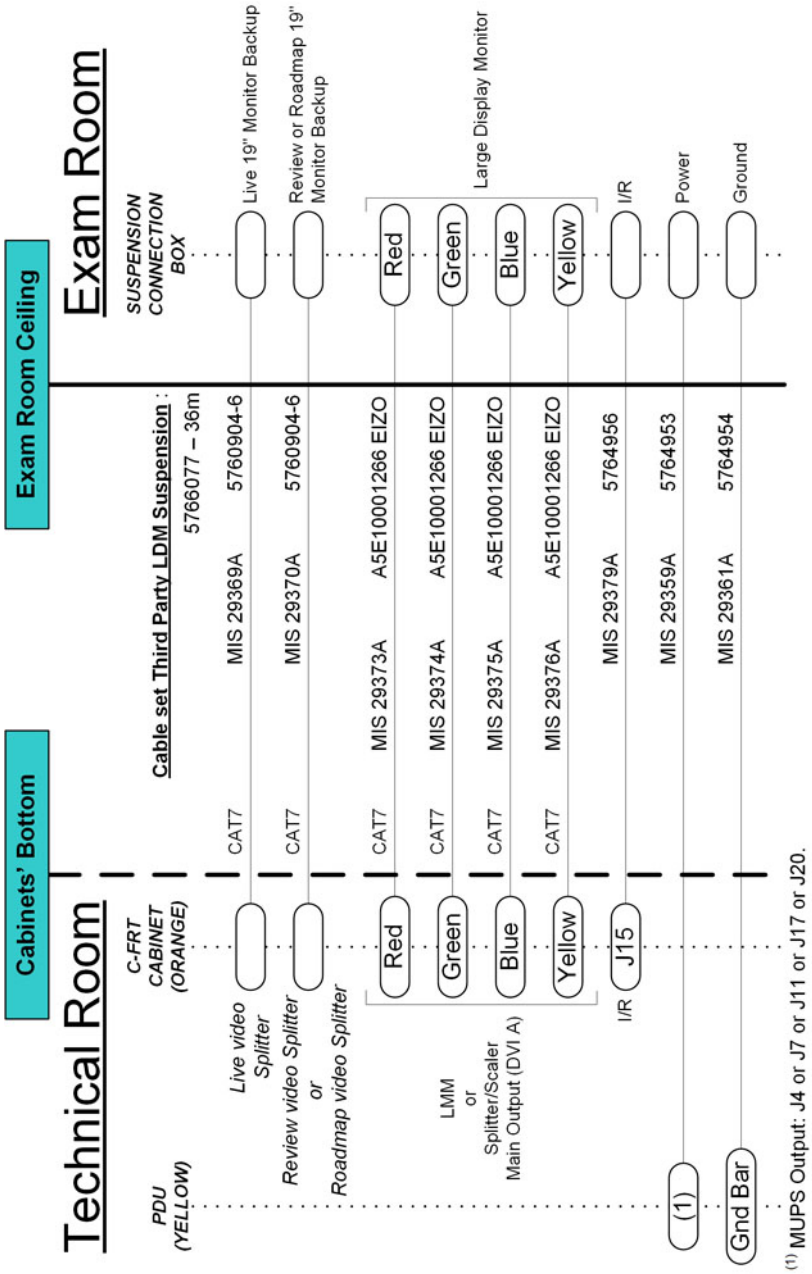
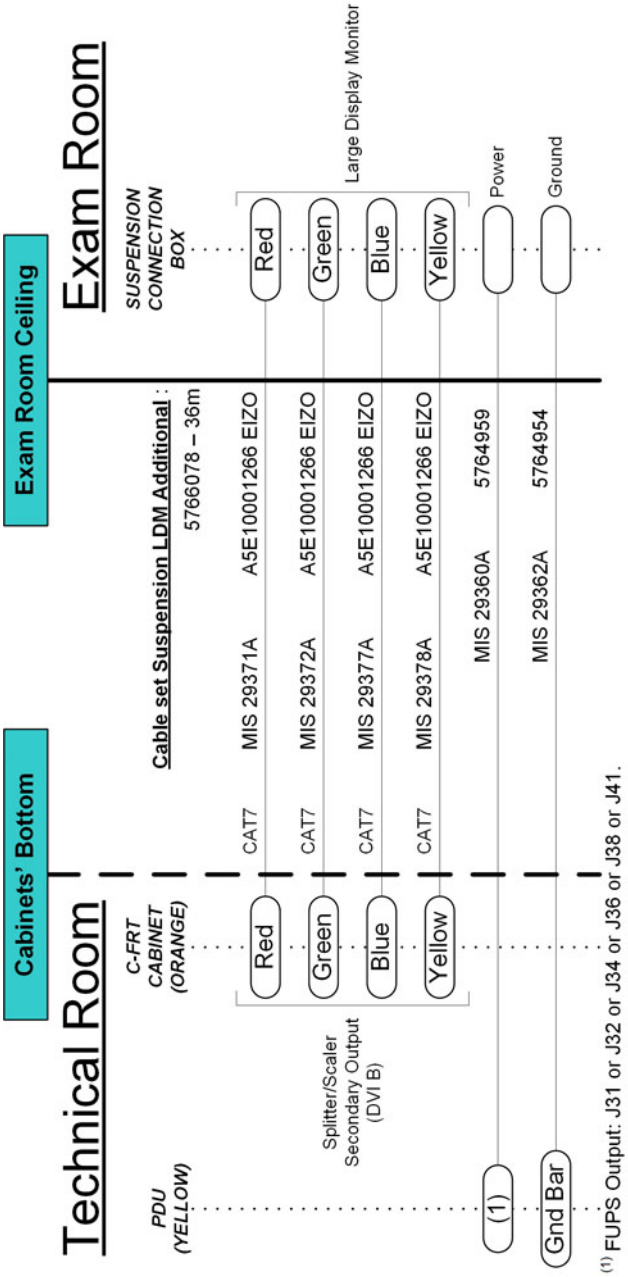


Figure 149 Cable Group – From Technical Room to additional LDM



5.5.1.4 Physical Run - System Core Detail

Table 40

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 Technical Room to Exam Room)							
27662A	5191563		30		7	AMP 8 pin RJ45	
27672A	5191220	2789	30		10.9	Amplimite 100 pin	84.6
29283A	5760234						
29351A	5760919						
29402A	5398308						
29403A	5398308						
Group n°1-M (From Technical Room to Exam Room)							
29197A	5555157						
29198A	5555158						
29202A	5555158						
29204A	5555250						
29205A	5555250						
29206A	5191563						
29207A	5191563						
29218A	5555253						
29390A	5398308						
29391A	5398308						
29392A	5398308						
29393A	5398308						
29394A	5398308						
29395A	5398308						
29396A	5398308						
29397A	5404518						
29398A	5767005						

continued							
MIS number	**Cable Assembly**	**UL Style**	**Voltage rating (V)**	**Max Voltage carried (V)**	**Cable diameter (mm)**	**Connector type**	**Bigger Plug size (mm)**
29399A	5555255						
Group n°2 (From Technical Room to Control Room)							
27493A	5191563						
27494A	5405128	2464	300		6	DB 9 pin	30.9
27505A	5191563						
27676A	5762397						
29010A	5763118						
29011A	5763118						
29012A	5763118						
29024A	5763118		1				
29043A	5763118						
29194A	5763119						
29285A	5760830						
29297A	5760904						
29352A	5760904						
29353A	5760904						
29354A	5760852					I	
29355A	5761553						
Group n°3 (From Technical Room to Technical Room)							
27523A	5405107						
27677A	5405105	2463	600		8.3	Metrimate 6 pin	29.8
28254A	5760953						
29286A	5760954						
29287A	5760955						
29288A	5760838						
29289A	5760530						
29290A	5760534						

continued							
MIS number	**Cable Assembly**	**UL Style**	**Voltage rating (V)**	**Max Voltage carried (V)**	**Cable diameter (mm)**	**Connector type**	**Bigger Plug size (mm)**
29291A	5760956						
29292A	5760958						
29298A	5191563					RJ45	
29319A	5191563					RJ45	
29356A	5760702						
29357A	5761376						
Group n°4 (From Technical Room to optional Monitor)							
29293A /B/C/D	5760999	2343					
29295A /B/C/D	5760904						
Group n°5 (From Technical Room to Exam Room)							
27512A	5404122	OPTICAL FIBER					
27663A	5404121	2789	600		13.8	DB 11 pin	34.4
27664A	5439433						
27665A	5404290	2463	300		9.2	Metrimate 6 pin	29
27669A	5760834						
27670A	5404120	2789	300			HES 15 pin	
27671A	5165029	2789	30		10.9	Amplimite 100 pin	84.6
29077A	5397715						
29079A	5191563						
29172A	5483526	2464	300		12.7		
29404A	5398308						
29405A	5398308						
29406A	5398308						
29407A	5398308						
Ground cable group							

continued							
MIS number	**Cable Assembly**	**UL Style**	**Voltage rating (V)**	**Max Voltage carried (V)**	**Cable diameter (mm)**	**Connector type**	**Bigger Plug size (mm)**
29408A	5398308	1019	600		9.1	Pre-stripping, ring terminal (only with Innova^{IQ} and Innova^{IQ} OR table (P/N 5142213-001)	12
29409A	5398308	1019	600		9.1	Pre-stripping, ring terminal (only with Innova^{IQ} and Innova^{IQ} OR table (P/N 5142213-001)	12
8 kVA UPS cable group							
29315A	5760535						
29316A	5760535						
Cable Set Suspension LDM Additional							
29360A	5764859						
29362A	5764954						
29371A	A5E1000 1266 EI-ZO						
29372A	A5E1000 1266 EI-ZO						
29377A	A5E1000 1266 EI-ZO						
29378A	A5E1000 1266 EI-ZO						
Cable Set Suspension 4–6 Monitors							
29358A	5764955						
29358B	5764955						
29359A	5764953						
29361A	5398308						
29363A	5760904						
29364A	5760904						

continued							
MIS number	**Cable Assembly**	**UL Style**	**Voltage rating (V)**	**Max Voltage carried (V)**	**Cable diameter (mm)**	**Connector type**	**Bigger Plug size (mm)**
29365A	5760904						
29366A	5760904						
29367A	5760904						
29368A	5760904						
29379A	5764956						
29380A	5764957						
29381A	5764957						
Cable Set LDM Mavig Suspension							
29320A	5760829						
29358A	5764955						
29358B	5764955						
29359A	5764953						
29361A	5398308						
29369A	5760904						
29370A	5760904						
29373A	A5E1000 1266 EI-ZO						
29374A	A5E1000 1266 EI-ZO						
29375A	A5E1000 1266 EI-ZO						
29376A	A5E1000 1266 EI-ZO						
29379A	5764956						
Cable Set LDM 3rd Party Suspension							
29358A	5764955						

continued

MIS number	Cable Assembly	UL Style	Voltage rating (V)	Max Voltage carried (V)	Cable diameter (mm)	Connector type	Bigger Plug size (mm)
29358B	5764955						
29359A	5764953						
29361A	5398308						
29369A	5760904						
29370A	5760904						
29373A	A5E1000 1266 EI-ZO						
29374A	A5E1000 1266 EI-ZO						
29375A	A5E1000 1266 EI-ZO						
29376A	A5E1000 1266 EI-ZO						
29379A	5764956						
29380A	5764957						
29381A	5764957						
100 Cond DATA Cable							
27672A	5191220	2789	30		10.9	Amplimite 100 pin	84.6
Fiber Optic Cable with Shield Length 24 m							
27512A	5450901						
Cooling Hoses Set							
27510A	5395997	WATER HOSE					
27511A	5411047	WATER HOSE					
27666A	5395991	WATER HOSE					
27667A	5410988	WATER HOSE					
High Voltage Cable Set							

continued							
MIS number	**Cable Assembly**	**UL Style**	**Voltage rating (V)**	**Max Voltage carried (V)**	**Cable diameter (mm)**	**Connector type**	**Bigger Plug size (mm)**
27589A	5402072						
27590A	5402341						

5.5.2 Cable Channeling

5.5.2.1 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 MDP and the PDU to reduce voltage regulation problems and wiring costs.

For information about the cables supplied with your system, please refer to 5.5.1 Physical Runs on page 180.

5.5.2.2 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

5.5.2.3 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 Exam Room.

NOTE

For **Fast Link** cable (C-FRT Cabinet - AW station), the static operation bending radius must be at least 4 times the outer cable diameter.

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

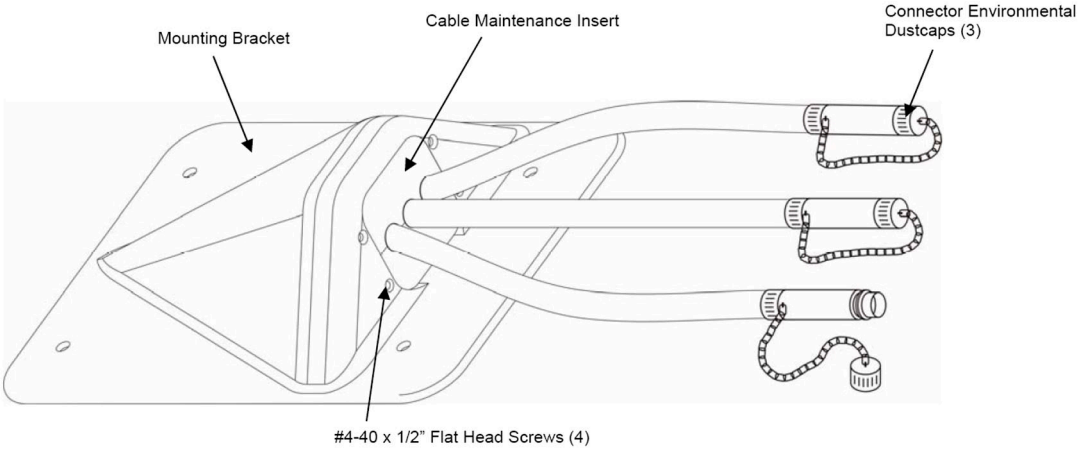
Specific Recommendations for installation with GE ECG Device such as MacLab, CardioLab or ComboLab:

- TRAM RAC in Exam Room with cable 2016134-106 routed back to Control Room where the other modules & PC are installed
- If no GE Maclab cable 2016134-106 installed between the TRAM (Exam Room) and the Control Room, need to route it so that installation/connection of Physio module can be made in Control Room.

NOTE

MEDRAD Avanta Table mount: A 76.2 mm (3 in) and max 25 m (984 in) length conduit between Technical Room and Exam 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 Exam Room if there is no Ulility box.

Figure 150 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)

Figure 151 MEDRAD Avanta floor mounting methods

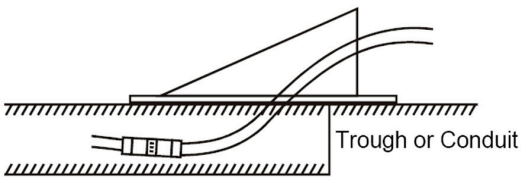


Figure 1

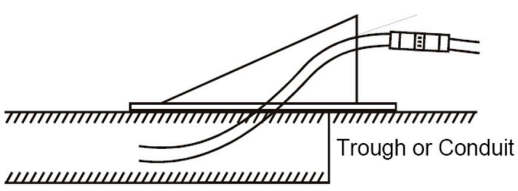


Figure 2

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

Figure 152 (For Innova^{IQ} Table and Innova^{IQ} OR Table) Cable Channeling Layout

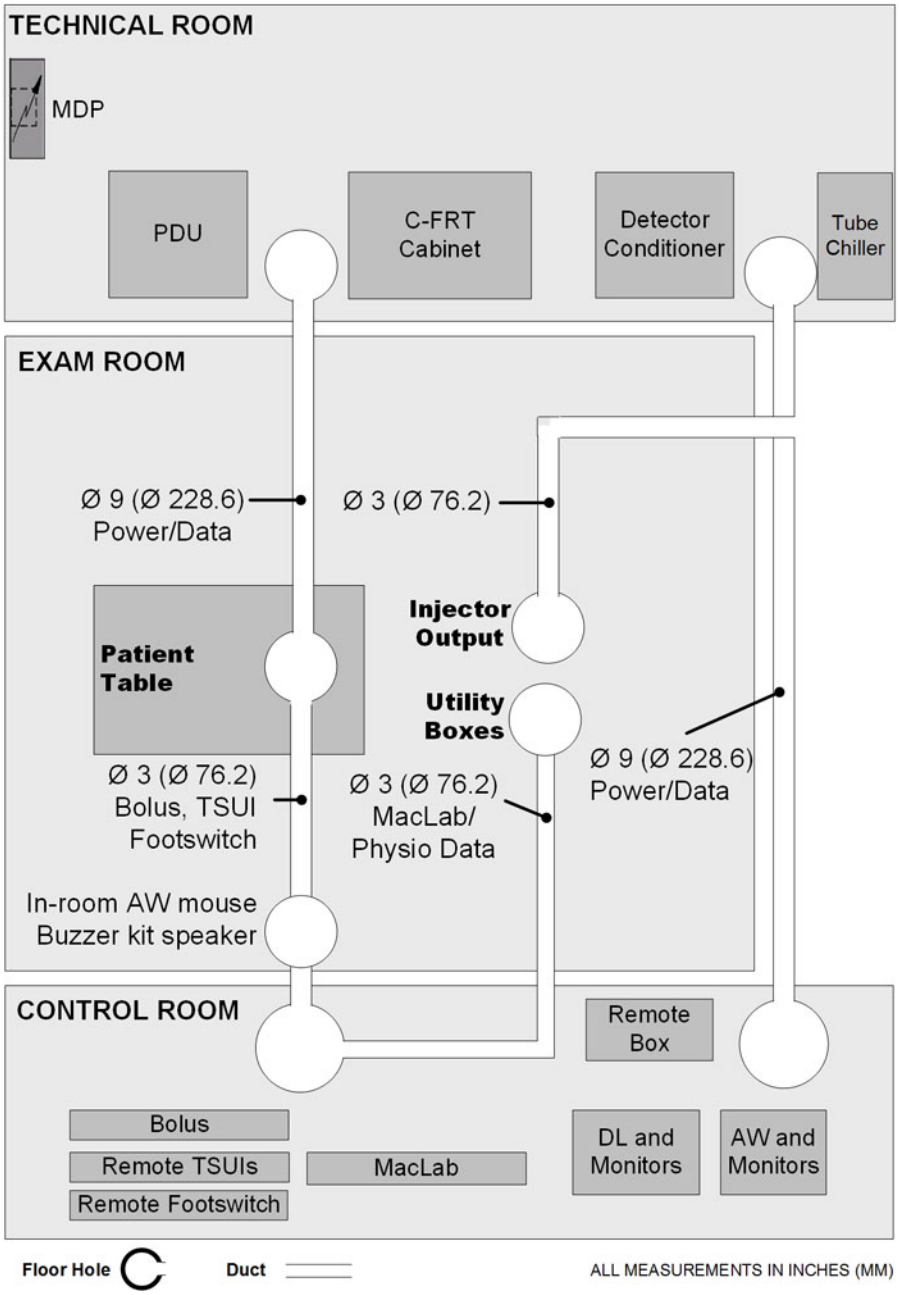
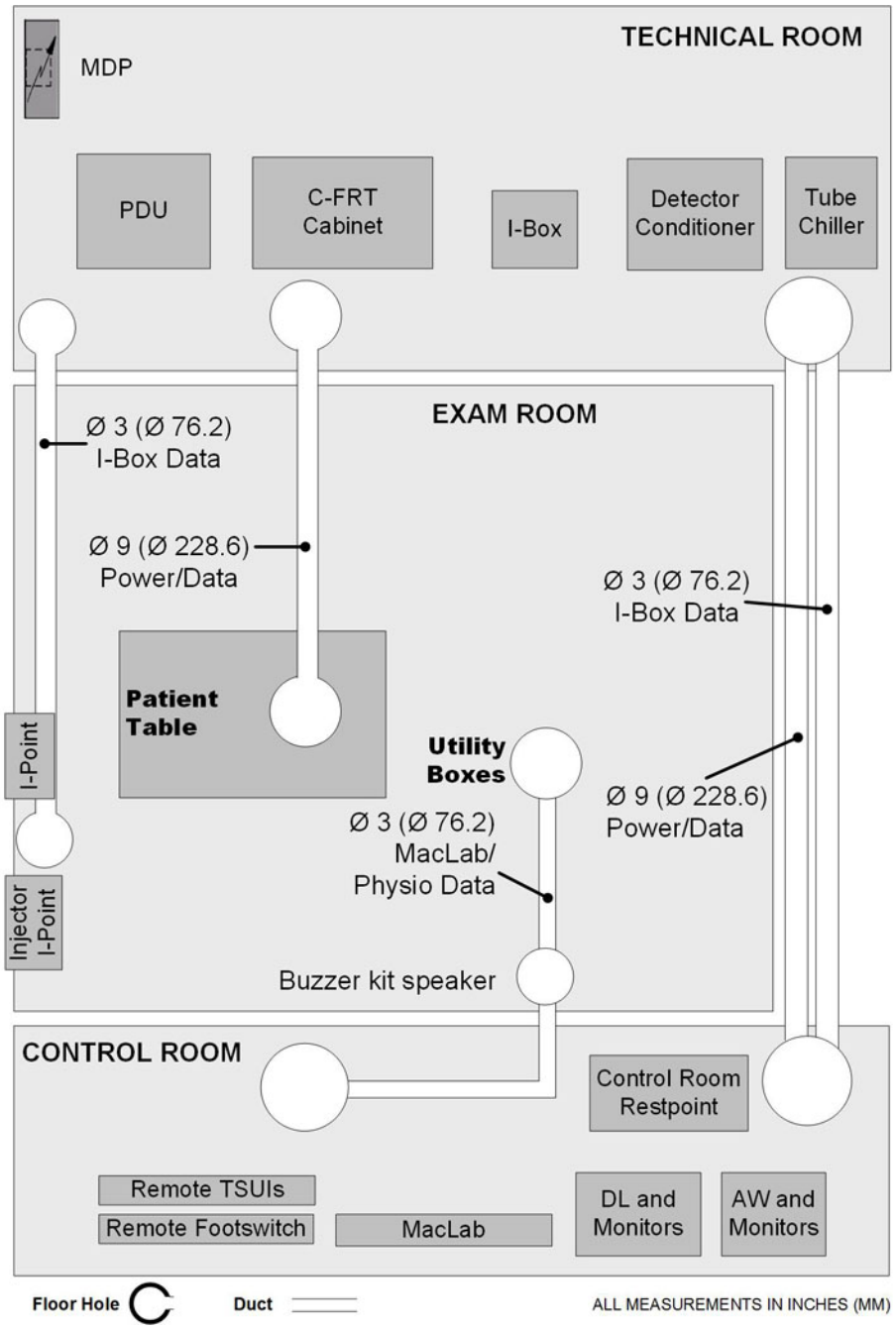


Figure 153 (For Magnus Maquet OR Table) Cable Channeling Layout



NOTICE

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.

NOTICE

Raceways or cable trays containing electrical conductors shall not contain any pipe, tube or equal for steam, water, air, gas, drainage or any service other that electrical.

NOTE

The length of the cable between the Table and the Remote Box is 18 m. The length of the cables between the Remote Box and the Control Room TSUI is 4 m.

NOTE

Only the MEDRAD Mark 7 injector with extension cable and the MEDRAD Avanta injector with extension cable require a separate duct.

NOTE

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.

Chapter 6 Communications Requirements

6.1 Network Requirements

6.1.1 General Information

The system is provided with a firewall unit, that allows connection to the hospital network for pushing the DICOM images or for service remote access (InSite). This firewall is compatible with 10/100/1000 (Gigabit Ethernet) networks.

The C-FRT Cabinet provides an Ethernet RJ45 plug, the hospital is responsible for providing the Ethernet cable between the system and the hospital network.

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.

6.1.2 InSite Connection

InSite requires a VPN connection to the system. To create this connection, the system IP and site IT contact information, should be given to your local GEHC sale and service representative before the system installation begins. Once submitted, a member of the GEHC Broadband Solutions team will contact the site IT to set up the VPN connection.

The SupportCentral links where information from the InSite Connectivity Team or Insite Request Form can be found are:

- **Americas:** http://supportcentral.ge.com/products/sup_products.asp?prod_id=73661
- **Asia:** http://supportcentral.ge.com/products/sup_products.asp?prod_id=19181
- **Europe:** http://supportcentral.ge.com/products/sup_products.asp?prod_id=24026

6.1.3 IP Adresses

IP addresses for DL and AW PCs have to be requested to the Hospital IT at the time of pre-install to not delay the installation.

New requirements related to the Privacy and Security configurations also apply with the new system software generation. Refer to 6.2 Privacy and Security Configuration on page 207.

6.2 Privacy and Security Configuration

The new Privacy and Security features available with the System require to be configured according to the security policy requested by the hospital.

To ensure the installation is successful and is not delayed because of missing information, it is required to gather all needed information as part of the pre-install process.

The typical parameters are the one listed below. The complete list is provided in Tab "Security Configuration" of the document *IGS System Installation Prerequisites - DOC2024755*. See also Important Notice below.

- **Machine Account**
- **User Authentication**
- **Authorization**
- **Audit Trail**
- **Malware protection**
- **Network Security**
- **Data Transmission**
- **Other Requirements**

NOTICE

- Always refer to the detailed Checklist provided in the document *IGS System Installation Prerequisites - DOC2024755* available from MyWorkshop. Always use the last revision which will contain all mandatory updates.
- For details on the new Privacy and Security features available with this machine, refer to the document *Privacy and Security Guide - DOC1972949* available from MyWorkshop.
- Support on Privacy and Security can also be found here (USCAN only): http://supportcentral.ge.com/products/sup_products.asp?prod_id=259836.