



GE Healthcare

# Technical Publications

**5192967-100**

Revision 8

**Definium™ 5000**

**Pre-Installation Manual**

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## **LEGAL NOTES**

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## **TRADEMARKS**

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## IMPORTANT PRECAUTIONS

### LANGUAGE

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**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 or from mechanical or other hazards.

**Предупреждение**

(BG)

- ТОВА УПЪТВАНЕ ЗА РАБОТА Е НАЛИЧНОСАМО НА АНГЛИЙСКИ ЕЗИК
- АКО ДОСТАВЧИКЪТ НА УСЛУГАТА НА КЛИЕНТА ИЗИСКА ЕЗИК, РАЗЛИЧЕН ОТ АНГЛИЙСКИ 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 ДОВЕДЕДО НАРАНЯВАНЕ НА ДОСТАВЧИКА НА УСЛУГАТА, ОПЕРАТОРА ИЛИ ПАЦИЕНТ В РЕЗУЛТАТ НА ТОКОВ УДАР ИЛИ МЕХАНИЧНА ИЛИ ДРУГА ОПАСНОСТ.

**警告  
(ZH-CN)**

- 本维修手册仅提供英文版本。
- 如果维修服务提供商需要非英文版本，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人员，操作员或患者造成触电、机械伤害或其他形式的伤害。

**VÝSTRAHA  
(CS)**

- Tento provozní návod existuje pouze v anglickém jazyce.
- 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 medmindre denne servicemanual har været konsulteret og er forstået.
- Manglende overholdelse af denne advarsel kan medføre skade på grund af elektrisk, mekanisk eller anden fare for teknikeren, operatøren eller patienten.

WAARSCHUWING (NL)	<ul style="list-style-type: none"><li>Deze onderhoudshandleiding is enkel in het Engels verkrijbaar.</li><li>Als het onderhoudspersoneel een andere taal vereist, dan is de klant verantwoordelijk voor de vertaling ervan.</li><li>Probeer de apparatuur niet te onderhouden voordat deze onderhoudshandleiding werd geraadpleegd en begrepen is.</li><li>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.</li></ul>
HOIATUS (ET)	<ul style="list-style-type: none"><li>Käesolev teenindusjuhend on saadaval ainult inglise keeles.</li><li>Kui klienditeeninduse osutaja nõuab juhendit inglise keelest erinevas keeles, vastutab klient tõlketeenuse osutamise eest.</li><li>Ärge üritage seadmeid teenindada enne eelnevalt käesoleva teenindusjuhendiga tutvumist ja sellest aru saamist.</li><li>Käesoleva hoiatuse eiramise võib põhjustada teenuseosutaja, operaatori või patsiendi vigastamist elektrilöögi, mehaanilise või muu ohu tagajärvel.</li></ul>
VAROITUS (FI)	<ul style="list-style-type: none"><li>Tämä huolto-ohje on saatavilla vain englanniksi.</li><li>Jos asiakkaan huoltohenkilöstö vaatii muuta kuin englanninkielistä materiaalia, tarvittavan käännyksen hankkiminen on asiakkaan vastuulla.</li><li>Älä yritä korjata laitteistoa ennen kuin olet varmasti lukunut ja ymmärtänyt tämän huolto-ohjeen.</li><li>Mikäli tästä varoitusta ei noudateta, seurausena voi olla huoltohenkilöstön, laitteiston käyttäjän tai potilaan vahingoittuminen sähköiskun, mekaanisen vian tai muun vaaratilanteen vuoksi.</li></ul>
ATTENTION (FR)	<ul style="list-style-type: none"><li>Ce manuel de service n'est disponible qu'en anglais.</li><li>Si le technicien du client a besoin de ce manuel dans une autre langue que l'anglais, c'est au client qu'il incombe de le faire traduire.</li><li>Ne pas tenter d'intervenir sur les équipements tant que le manuel service n'a pas été consulté et compris</li><li>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.</li></ul>
WARNUNG (DE)	<ul style="list-style-type: none"><li>Diese Serviceanleitung existiert nur in Englischer Sprache.</li><li>Falls ein fremder Kundendienst eine andere Sprache benötigt, ist es aufgabe des Kunden für eine Entsprechende Übersetzung zu sorgen.</li><li>Versuchen Sie nicht diese Anlage zu warten, ohne diese Serviceanleitung gelesen und verstanden zu haben.</li><li>Wird diese Warnung nicht beachtet, so kann es zu Verletzungen des Kundendiensttechnikers, des Bedieners oder des Patienten durch stromschläge, Mechanische oder Sonstige gefahren kommen.</li></ul>
ΠΡΟΕΙΔΟΠΟΙΗΣΗ (EL)	<ul style="list-style-type: none"><li>Το παρόν εγχειρίδιο σέρβις διατίθεται στα αγγλικά μόνο.</li><li>Εάν το άτομο παροχής σέρβις ενός πελάτη απαιτεί το παρόν εγχειρίδιο σε γλώσσα εκτός των αγγλικών, αποτελεί ευθύνη του πελάτη να παρέχει υπηρεσίες μετάφρασης.</li><li>Μην επιχειρήσετε την εκτέλεση εργασιών σέρβις στον εξοπλισμό εκτός εαν έχετε συμβουλευτεί και έχετε κατανοήσει το παρόν εγχειρίδιο σέρβις.</li><li>Εαν δε λάβετε υπόψη την προειδοποίηση αυτή, ενδέχεται να προκληθεί τραυματισμός στο άτομο παροχής σέρβις, στο χειριστή ή στον ασθενή από ηλεκτροπληξία, μηχανικούς ή άλλους κινδύνους.</li></ul>

**FIGYELMEZTETÉS  
(HU)**

- Ezen karbantartási kézikönyv kizárolag angol nyelven érhető el.
- Ha a vevő szolgáltatója angoltól eltérő nyelvre tart igényt, akkor a vevő felelőssége a fordítás elkészítetése.
- 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 eingöngu fáanleg á ensku.
- Ef að þjónustuveitandi viðskiptamanns þarfnað 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, stjórnda eða sjúklings frá raflosti, vélrænu eða öðrum áhættum.

**AVVERTENZA  
(IT)**

- Il presente manuale di manutenzione è disponibile soltanto in inglese.
- Se un addetto alla manutenzione richiede il manuale in una lingua diversa, il cliente è tenuto a provvedere direttamente alla traduzione.
- Si proceda alla manutenzione dell'apparecchiatura solo dopo aver consultato il presente manuale ed averne compreso il contenuto
- Il non rispetto della presente avvertenza potrebbe far compiere operazioni da cui derivino lesioni all'addetto, alla manutenzione, all'utilizzatore ed al paziente per folgorazione elettrica, per urti meccanici od 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 지침서는 영어로만 이용하실 수 있습니다 .
- 고객의 서비스 제공자가 영어 이외의 언어를 요구할 경우 , 번역 서비스를 제공하는 것은 고객의 책임입니다 .
- 본 서비스 지침서를 참고했고 이해하지 않는 한은 해당 장비를 수리하려고 시도하지 마십시오 .
- 이 경고에 유의하지 않으면 전기 쇼크 , 기계상의 혹은 다른 위험으로부터 서비스 제공자 , 운영자 혹은 환자에게 위해를 가할 수 있습니다 .

**BRDINJUMS  
(LV)**

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

ISPĖJIMAS (LT)	<ul style="list-style-type: none"><li>Šis eksploatavimo vadovas yra prieinamas tik anglų kalba.</li><li>Jei kliento paslaugų tiekėjas reikalauja vadovo kita kalba – ne anglų, numatyti vertimo paslaugas yra kliento atsakomybė.</li><li>Neméginkite atlikti įrangos techninės priežiūros, nebent atsižvelgėte į šį eksploatavimo vadovą ir jį supratote.</li><li>Jei neatkreipsite dėmesio į šį perspėjimą, galimi sužalojimai dėl elektros šoko, mechaninių ar kitų pavojų paslaugų tiekėjui, operatoriui ar pacientui.</li></ul>
ADVARSEL (NO)	<ul style="list-style-type: none"><li>Denne servicehåndboken finnes bare på engelsk.</li><li>Hvis kundens serviceleverandør trenger et annet språk, er det kundens ansvar å sørge for oversettelse.</li><li>Ikke forsøk å reparere utstyrer uten at denne servicehåndboken er lest og forstått.</li><li>Manglende hensyn til denne advarselen kan føre til at serviceleverandøren, operatøren eller pasienten skades på grunn av elektrisk støt, mekaniske eller andre farer.</li></ul>
OSTRZEŻENIE (PL)	<ul style="list-style-type: none"><li>Niniejszy podręcznik serwisowy dostępny jest jedynie w języku angielskim.</li><li>Jeśli dostawca usług klienta wymaga języka innego niż angielski, zapewnienie usługi tłumaczenia jest obowiązkiem klienta.</li><li>Nie próbować serwisować wyposażenia bez zapoznania się i zrozumienia niniejszego podręcznika serwisowego.</li><li>Niezastosowanie się do tego ostrzeżenia może spowodować urazy dostawcy usług, operatora lub pacjenta w wyniku porażenia elektrycznego, zagrożenia mechanicznego bądź innego.</li></ul>
ATENÇÃO (PT)	<ul style="list-style-type: none"><li>Este manual de assistência técnica só se encontra disponível em inglês.</li><li>Se qualquer outro serviço de assistência técnica solicitar estes manuais noutro idioma, é da responsabilidade do cliente fornecer os serviços de tradução.</li><li>Não tente consertar o equipamento sem ter consultado e compreendido este manual de assistência técnica.</li><li>O não cumprimento deste aviso pode pôr em perigo a segurança do técnico, do operador ou do paciente devido a choques elétricos, mecânicos ou outros.</li></ul>
ATENȚIE (RO)	<ul style="list-style-type: none"><li>Acest manual de service este disponibil numai în limba engleză.</li><li>Dacă un furnizor de servicii pentru clienți necesită o altă limbă decât cea engleză, este de datoria clientului să furnizeze o traducere.</li><li>Nu încercați să reparați echipamentul decât ulterior consultării și înțelegerei acestui manual de service.</li><li>Ignorarea acestui avertisment ar putea duce la rănirea depanatorului, operatorului sau pacientului în urma pericolelor de electrocutare, mecanice sau de altă natură.</li></ul>

**ОСТОРОЖНО!**

(RU)

- Данное руководство по обслуживанию предлагается 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 обслуживанием оборудования обязательно обратитесь к данному руководству и поймите изложенные в нем сведения.
- Несоблюдение требований данного предупреждения может привести к тому, что специалист по обслуживанию, оператор или пациент получат удар электрическим током, механическую травму или другое повреждение.

**UPOZORNENIE**

(SK)

- Tento návod na obsluhu je k dispozícii len v angličtine.
- Ak zákazníkov poskytovateľ služieb vyžaduje iný jazyk ako angličtinu, poskytnutie prekladateľských služieb je zodpovednosťou zákazníka.
- Nepokúšajte sa o obsluhu zariadenia skôr, ako si neprečítate návod na obľuhu a nepoznáte mu.
- Zanedbanie tohto upozornenia môže vyústiť do zranenia poskytovateľa služieb, obsluhujúcej osoby alebo pacienta elektrickým prúdom, do mechanického alebo iného nebezpečenstva.

**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 förstått 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.

**DIKKAT**

(TR)

- Bu servis kilavuzunun sadece İngilizcesi mevcuttur.
- Eğer müşteri teknisyeni bu kilavuzu İngilizce dışında bir başka lisandan talep ederse, bunu tercüme ettmek müşteriye düşer.
- Servis kilavuzunu okuyup anlamadan ekipmanlara müdahale etmeyiniz.
- Bu uyarıya uyulmaması, elektrik, mekanik veya diğer tehlikelerden dolayı teknisyen, operatör veya hastanın yaralanmasına yol açabilir.

## DAMAGE IN TRANSPORTATION

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

To file a report:

- Call 1-800-548-3366 and use option 8.
- Fill out a report on <http://us44hdd21/sctq/InstallFulfill/InstalFulfillment.htm>
- Contact your local service coordinator for more information on this process.

Rev. Jan. 5, 2005

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## CERTIFIED ELECTRICAL CONTRACTOR STATEMENT

All electrical Installations that are preliminary to the positioning of the equipment at the site prepared for the equipment shall be performed by licensed electrical contractors. In addition, electrical feeds into the Power Distribution Unit shall be performed by licensed electrical contractors. Other connections between pieces of electrical equipment, calibrations and testing shall be performed by qualified GE Healthcare personnel. The products involved (and the accompanying electrical installations) are highly sophisticated, and special engineering competence is required. In performing all electrical work on these products, GE will use its own specially trained field engineers. All of GE's electrical work on these products will comply with the requirements of the applicable electrical codes.

The purchaser of GE equipment shall only utilize qualified personnel (i.e., GE's field engineers, personnel of third-party service companies with equivalent training, or licensed electricians) to perform electrical servicing on the equipment.

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## IMPORTANT...X-RAY PROTECTION

X-ray equipment if not properly used may cause injury. Accordingly, the instructions herein contained should be thoroughly read and understood by everyone who will use the equipment before you attempt to place this equipment in operation. The General Electric Company, Healthcare Group, will be glad to assist and cooperate in placing this equipment in use.

Although this apparatus incorporates a high degree of protection against x-radiation other than the useful beam, no practical design of equipment can provide complete protection. Nor can any practical design compel the operator to take adequate precautions to prevent the possibility of any persons carelessly exposing themselves or others to radiation.

It is important that anyone having anything to do with X-radiation be properly trained and fully acquainted with the recommendations of the National Council on Radiation Protection and Measurements as published in NCRP Reports available from NCRP Publications, 7910 Woodmont Avenue, Room 1016, Bethesda, Maryland 20814, and of the International Commission on Radiation Protection, and take adequate steps to protect against injury.

The equipment is sold with the understanding that the General Electric Company, Healthcare Group, its agents, and representatives have no responsibility for injury or damage which may result from improper use of the equipment.

Various protective materials and devices are available. It is urged that such materials or devices be used.

## OMISSIONS & ERRORS

Customers, please contact your GE Sales or Service representatives.

GE personnel, please use the GEHC iTrak (issue tracking) process to report all omissions, errors, and defects in this publication.

### WARNING

**THIS EQUIPMENT IS DANGEROUS TO BOTH PATIENT AND OPERATOR  
UNLESS MEASURES OF PROTECTION ARE STRICTLY OBSERVED**

Though this equipment is built to the highest standards of electrical and mechanical safety, the useful radiation beam becomes a source of danger in the hands of the unauthorized or unqualified operator. Excessive exposure to radiation causes damage to human tissue.

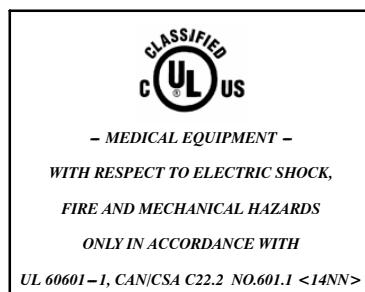
Therefore, adequate precautions must be taken to prevent unauthorized or unqualified persons from operating this equipment or exposing themselves or others to its radiation.

Before operation, persons qualified and authorized to operate this equipment should be familiar with the Recommendations of the International Commission on Radiological Protection, contained in Annals Number 60 of the ICRP, with applicable National Standards, and should have been trained in use of the equipment.

## ENVIRONMENTAL STATEMENT ON THE LIFE CYCLE OF THE EQUIPMENT OR SYSTEM

This equipment or system contains environmentally dangerous components and materials (such as PCB's, electronic components, used dielectric oil, lead, batteries, etc.) which, once the life-cycle of the equipment or system comes to an end, becomes dangerous and needs to be considered as harmful waste according to the international, domestic and local regulations.

The manufacturer recommends to contact an authorized representative of the manufacturer or an authorized waste management company once the life-cycle of the equipment or system comes to an end to remove this equipment or system.



## REVISION HISTORY

REV	DATE	REASON FOR CHANGE
1	MAY 03, 2007	First edition.
4	NOV 15, 2007	Specifications of optional ceiling support and recommended wire sizes.
5	JAN 15, 2008	Product characteristics (Section 5).
6	AUG 07, 2008	New schematic revision (Section 4.6.2).
7	NOV 10, 2010	Installation procedures with foldable crane.
8	FEB 07, 2012	New Magic PC.

This Document is the English original version, edited and supplied by the manufacturer.

## ADVISORY SYMBOLS

The following advisory symbols will be used throughout this manual. Their application and meaning are described below.



**DANGERS ADVISE OF CONDITIONS OR SITUATIONS THAT, IF NOT HEeded OR AVOIDed, WILL CAUSE SERIOUS PERSONAL INJURY OR DEATH.**



**WARNINGS ADVISE OF CONDITIONS OR SITUATIONS THAT, IF NOT HEeded OR AVOIDed, COULD CAUSE SERIOUS PERSONAL INJURY, OR CATASTROPHIC DAMAGE OF EQUIPMENT OR DATA.**



**Cautions advise of conditions or situations that, if not heeded or avoided, could cause personal injury or damage to equipment or data.**

**Note**

*Notes alert readers to pertinent facts and conditions. Notes represent information that is important to know but which do not necessarily relate to possible injury or damage to equipment.*

## SAFETY SYMBOLS

The following safety symbols will be used in the equipment.



**Attention, consult accompanying documents.**



**Ionizing radiation.**



**Type B equipment.**



**Dangerous voltage.**



**Ground.**



This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer or an authorized waste management company for information concerning the decommissioning of your equipment.

## TABLE OF CONTENTS

<b>Section</b>		<b>Page</b>
<b>1</b>	<b>INTRODUCTION .....</b>	<b>17</b>
1.1	Objective and Scope of this Manual .....	17
1.2	Avoiding Unnecessary Expenses and Delays .....	17
1.3	An Overview of the Pre-Installation Process .....	17
1.4	Responsibility of Purchaser / Customer .....	19
1.5	Contract Changes .....	19
1.6	Responsibilities of the Purchaser .....	20
1.7	What You Will Receive (System Components) .....	21
1.8	HHS Compliance Compatibility List .....	27
<b>2</b>	<b>ROOM REQUIREMENTS .....</b>	<b>29</b>
2.1	Environmental Requirements .....	29
2.1.1	Relative Humidity and Temperature .....	29
2.1.2	Atmospheric Pressure .....	30
2.1.3	Heat Output .....	31
2.1.4	Light Specification .....	31
2.1.5	Radiation Protection .....	31
2.2	Structural Requirements .....	32
2.2.1	Rigger Requirements .....	32
2.2.2	Door Size Requirements .....	33
2.2.3	Floor and Wall Requirements .....	37
2.2.4	Ceiling Requirements of Positioner Installation (Optional) .....	40
2.2.5	Seismic Requirements .....	43
<b>3</b>	<b>PLANNING ELECTRICAL CONNECTIONS .....</b>	<b>45</b>
3.1	Routing Cables .....	45
3.1.1	General .....	45
3.1.2	Conduit .....	45
3.1.3	Electrical Ducts .....	45
3.1.4	Power Distribution .....	46

<b>Section</b>		<b>Page</b>
3.2	Hospital Network and Phone Connections .....	46
3.2.1	Broadband Network Connection .....	46
3.2.2	Phone Voice Line .....	47
<b>4</b>	<b>ELECTRICAL REQUIREMENTS .....</b>	<b>49</b>
4.1	Magic PC and Flat Panel Display .....	50
4.2	Positioner - Power Line Requirements .....	50
4.3	Generator - Power Line Requirements .....	50
4.4	Generator - Recommended Wire Size .....	52
4.5	Safety Devices .....	54
4.6	System Cable Information .....	56
4.6.1	Cable Routing and Connections .....	56
4.6.2	System Master Interconnection Schematic (MIS) .....	58
<b>5</b>	<b>PRODUCT CHARACTERISTICS .....</b>	<b>67</b>
<b>6</b>	<b>ROOM LAYOUT .....</b>	<b>79</b>
6.1	Radiation Production .....	79
6.2	Clinical Access .....	79
6.3	Service Access .....	80
6.4	Room Layouts .....	81
6.4.1	Ceiling Height Limitations .....	81
6.4.2	Possible Room Layouts .....	83

<b>Section</b>	<b>Page</b>
<b>7 PLANNING AIDS .....</b>	<b>89</b>
7.1 Shipping Dimensions and Weights .....	89
7.2 Tools and Equipment Checklist .....	90
7.3 Preparing the Delivery Route .....	91
7.4 Pre-installation Checklist .....	92
7.5 Customer Network Flow Audit .....	93
7.5.1 Definium 5000 Network Audit Checklist .....	93
7.5.2 What is the Networkflow Audit? .....	93
7.5.3 Workflow Analysis .....	94
7.5.4 The Physical Network .....	95
7.5.5 Definium 5000 System Parameters .....	96
7.5.6 Remote Hosts .....	97
7.5.7 Devices & Services Audit .....	98
7.5.8 Printers .....	99
7.5.9 RIS Systems .....	100
7.5.10 Dataflow Analysis .....	101
7.5.11 Completed Audit .....	103
<b>APPENDIX A REQUIREMENTS FOR SEISMIC AREAS .....</b>	<b>A-1</b>

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## **SECTION 1            INTRODUCTION**

### **1.1    OBJECTIVE AND SCOPE OF THIS MANUAL**

This document is intended as a guide and informational resource for planning and properly preparing a location for the installation of a Definium™ 5000 System.

### **1.2    AVOIDING UNNECESSARY EXPENSES AND DELAYS**

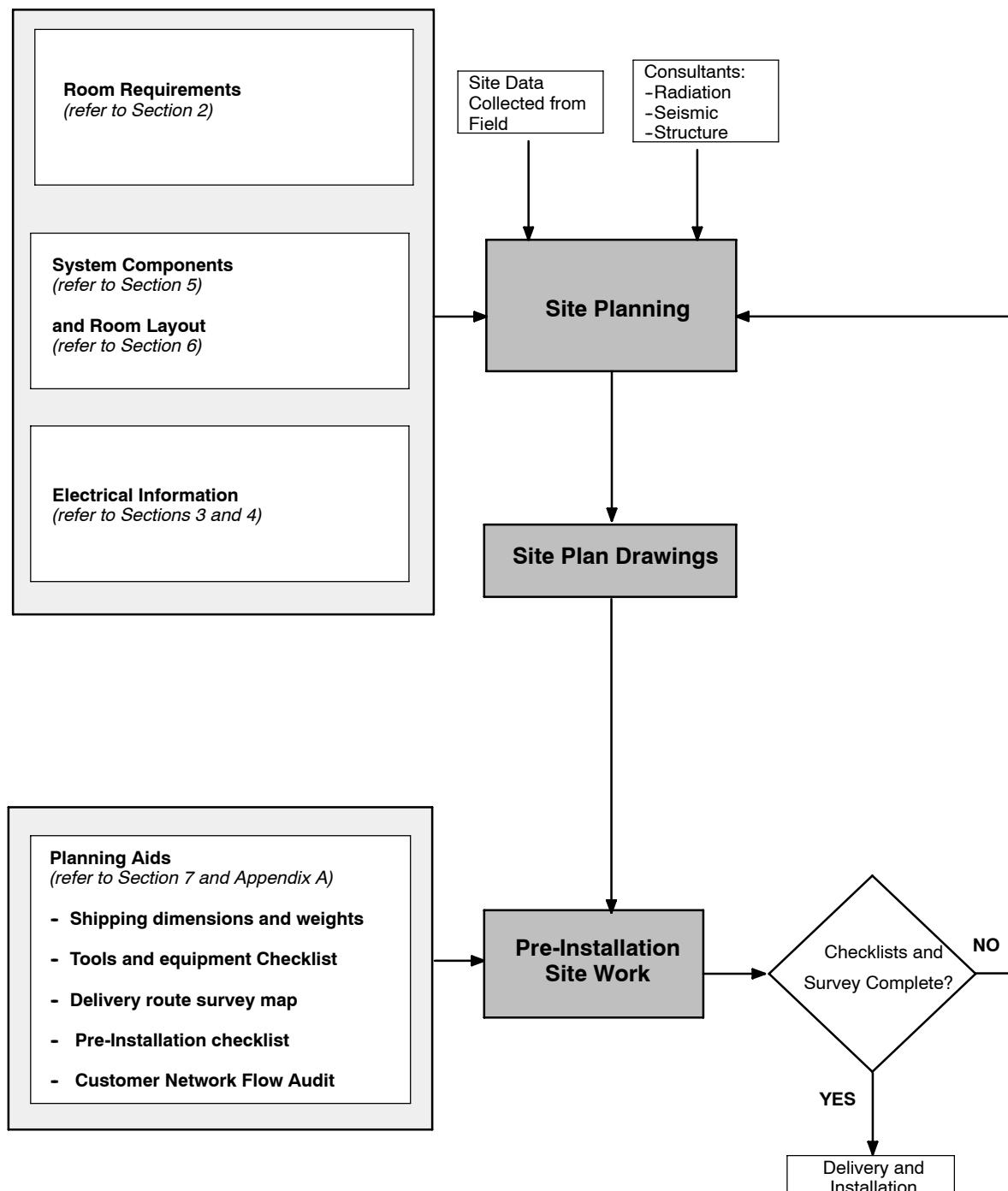
To avoid unnecessary expenses and delays use the “Pre-installation Checklist,” located in Section 7.4, to determine if you are ready for the installation to begin. Once you believe that the room/location is ready for installation to begin, complete the “Pre-installation Checklist.” The checklist is an important tool that helps verify that nothing has been missed. The checklist summarizes the preparations and allows you to permanently record the activities that have taken place.

Section 7.5, “Customer Network Flow Audit,” aids in understanding the customer environment into which the Definium 5000 X-ray system will be installed.

### **1.3    AN OVERVIEW OF THE PRE-INSTALLATION PROCESS**

Pre-Installation is a co-operative effort between the customer/purchaser and GE Healthcare (GEHC). Complete the checklists contained in this manual. They are an important part of the Pre-Installation process. The checklists summarize the required preparations and verify the completion of the Pre-Installation procedures.

Illustration 1 outlines the information in this document and its place in the Pre-Installation process.

**Illustration 1**  
**Pre-Installation Overview**

## 1.4 RESPONSIBILITY OF PURCHASER / CUSTOMER

To ensure that the installation of a Definium 5000 System meets the Purchaser or Customer expectations, it is important to determine who will take responsibility for various items in the course of the system installation process.

To determine these responsibilities, review the following checklists with the customer and assign responsibilities as appropriate:

- Tools and Equipment Checklist (refer to Section 7.2)
- Pre-Installation Checklist (refer to Section 7.4)
- Customer Network Flow Audit (refer to Section 7.5)

## 1.5 CONTRACT CHANGES

**Be sure to inform the customer that the cost of any alterations or modifications not specified in the sales contract are the responsibility of the customer.**

## 1.6 RESPONSIBILITIES OF THE PURCHASER

The purchaser is responsible for the completion of “Pre-Installation.” This includes the procurement and installation of all required materials and services to get the room ready for the installation of the product. This responsibility includes providing:

- A clean and safe work environment for the installation of the product (finished floor, ceiling, walls, and proper room lighting).
- A location suitable for the installation of the product. Refer to Section 2, “Room Requirements.”
  - Suitable support structures in the floor, walls, or ceiling necessary for the mounting of the product and/or its components. (Refer to Section 2.2.)
  - Installation of conduit, ducts, and/or raceways necessary to route cables safely. Refer to Section 4, “Electrical Requirements,” and Section 5, “Product Characteristics.”
  - Electrical power and grounds of specified quality and reliability. Refer to Section 4, “Electrical Requirements.”
    - Electrical power of the required voltage output and adequate kVA rating, including the emergency-off safety switch(es) in the room. Power and ground cables to the Room Electrical Cabinet (Main Disconnect).

Install all safety devices according to this document and Local Codes.

**For installations in the USA,** the Electrical Room Cabinet (Main Disconnect) must be UL and cUL listed, and must be an under voltage trip device and be capable of Lock-Out/Tag-Out (LOTO).

- Properly installed and sized junction boxes, including covers and fittings, at locations required and called out in architectural drawings.
- A location suitable for operation of the product. Refer to Section 6, “Room Layout.”
- Installation of non-electric services (if required).
- Provide current room dimensions, including hall way and entry door sizes. (Refer to Section 2.2.2, “Door Size Requirements.”)

## 1.7 WHAT YOU WILL RECEIVE (SYSTEM COMPONENTS)

The Definium 5000 System consists of the following main components:  
(refer to Illustration 2)

ITEM	COMPONENT	MODEL NUMBER
1	<b>Operator Console:</b>	
	1A • Magic PC and Mouse	5198015-2
	1B • Flat Panel Display (FPD)	5178667
	1C • CRIB	5199826
	1D • Keyboard – One of the following:	5143798-7: English 5143798-8: French 5143798-9: German 5143798-10: Spanish 5143798-11: Italian
2	<b>System Cabinet:</b>	
	2A • X-Ray Generator 65 kW – 3 Phase, 400 VAC	5215282
	2A • X-Ray Generator 65 kW – 3 Phase, 480 VAC	5215282-2
	2B • Generator Support with 3 kVA Transformer (Positioner Power Supply)	5229595
3	<b>Positioner:</b>	
	3A • Column with Arm	5229597
	3B • Detector Assembly	2393824
	3C • Detector Power Supply	2375101
	3D • Digital Detector	5147707
	3E • Ion Chamber: AID INX247	5198964
	3F • Grid: Mitaya 40" (100 cm)	5229598
	3G • Grid: Mitaya 72" (180 cm)	5229600
	3H • X-ray Tube: Toshiba E7254FX	5220077
	- • HV Cables of 9 m (30 ft) (pair)	5231935

**Illustration 2****Definium 5000 System Component Identification****1 Operator Console**

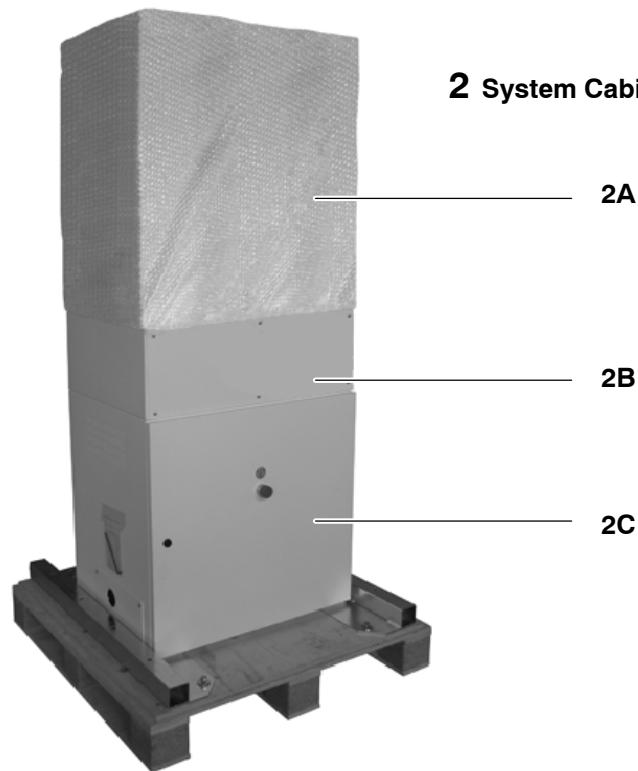
1A

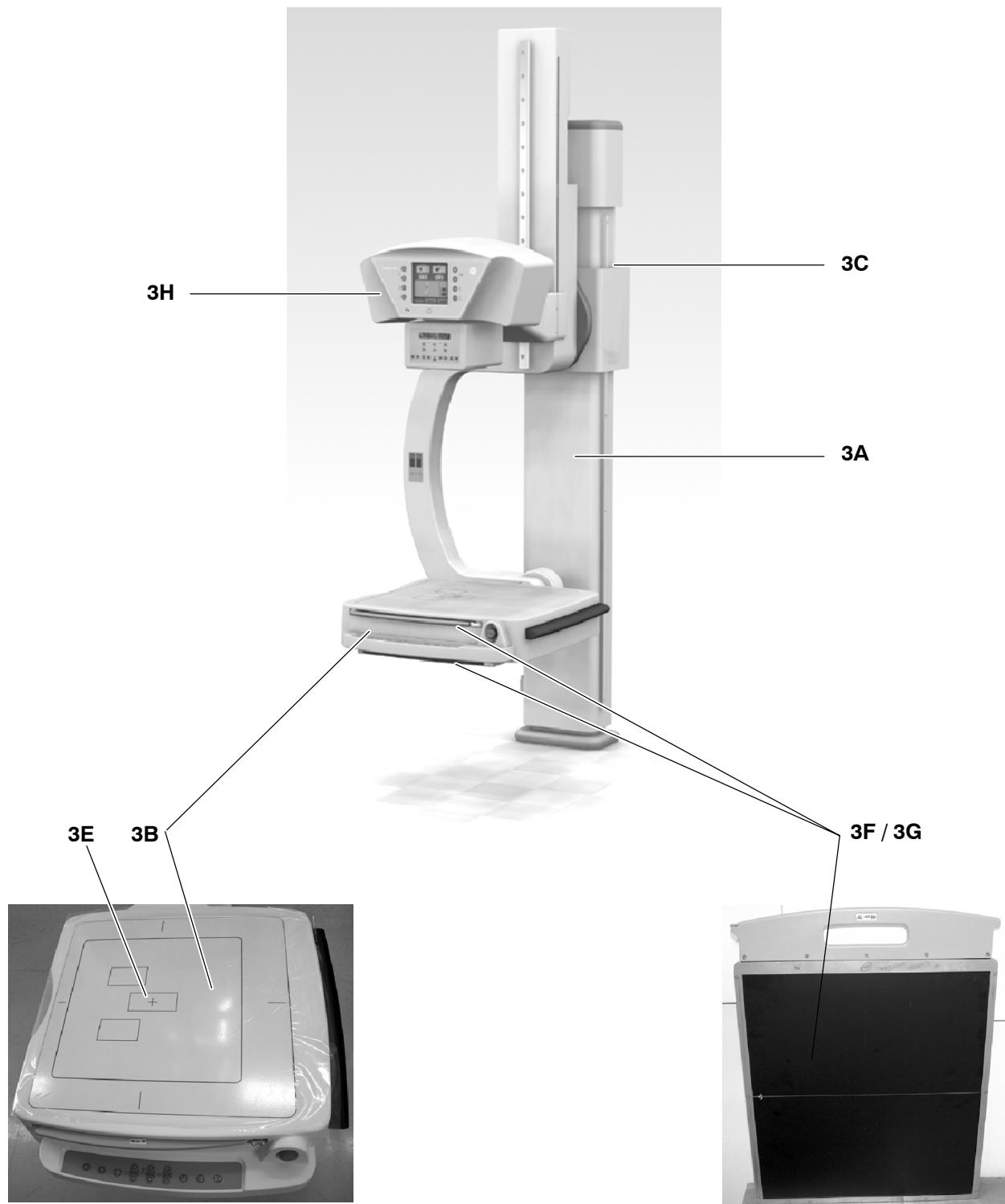
**2 System Cabinet**

2A

2B

2C



**Illustration 2 (cont.)****Definium 5000 System Component Identification****3 Positioner**

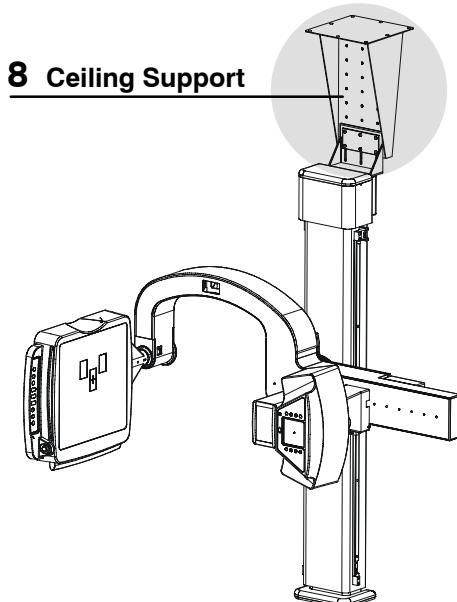
The Definium 5000 System can include the following options:  
(refer to Illustration 3)

ITEM	COMPONENT	MODEL NUMBER
4	<b>Mobile Table</b> (one of them):	
	• Laminated Mobile Table	5220725
	• Carbon Fiber Mobile Table	5220726
	• Elevating Mobile Table	5220724
5	Infrared Remote Control	5220722
6	<b>Automatic Collimator</b> (one of them):	
	• Automatic Collimator with Laser Light: Huestis CM-32012	5212898
	• Automatic Collimator with Laser Light and Manual Spectral Filters: Huestis CM-32012-008 (w/ spectral filters)	5220504
7	DAP Meter (Dose Area Product Meter)	5220728
8	Ceiling Support	5220723
9	Image Pasting Barrier	5134183-20
10	Weight Bearing Stand	5220729

**Illustration 3**  
**Definium 5000 System Component Identification - Options**

**4 Mobile Tables**



**Illustration 3 (cont.)****Definium 5000 System Component Identification - Options****5 Remote Control****6 Automatic Collimator****7 DAP Meter****8 Ceiling Support****9 Image Pasting Barrier****10 Weight Bearing Stand**

## 1.8 HHS COMPLIANCE COMPATIBILITY LIST

PRODUCT CATEGORY	PRODUCT DESCRIPTION	MODEL NUMBER
X-Ray Control	X-Ray Generator 65 kW - 3 Phase, 400 VAC	5215282
	X-Ray Generator 65 kW - 3 Phase, 480 VAC	5215282-2
Digital Detector	Digital Rad. Detector	2393824
Ion Chamber	Ion Chamber: AID INX247	5198964
X-Ray Tube	X-ray Tube: Toshiba E7254FX	5220077
Beam Limiting Device (Collimator)	Automatic Collimator: Huestis CM-3201	5212898
	Automatic Collimator: Huestis CM-32012-008 (w/ spectral filters)	5220504
Mobile Table	Laminated Mobile Table	5220725
	Carbon Fiber Mobile Table	5220726
	Elevating Mobile Table	5220724

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## SECTION 2      ROOM REQUIREMENTS

### 2.1 ENVIRONMENTAL REQUIREMENTS

#### 2.1.1 RELATIVE HUMIDITY AND TEMPERATURE

PRODUCT OR COMPONENT	RELATIVE HUMIDITY (Non-Condensing)				TEMPERATURE			
	IN USE		STORAGE		IN USE		STORAGE	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
<b>Operator Console:</b>								
PC Tower	8%	85%	8%	90%	5° C (41° F)	35° C (95° F)	-40° C (-40° F)	60° C (140° F)
Flat Panel Display	30%	75%	10%	95%	10° C (50° F)	40° C (104° F)	-10° C (14° F)	60° C (140° F)
<b>System Cabinet:</b>								
X-Ray Generator	30%	75%	10%	100%	10° C (50° F)	40° C (104° F)	5° C (41° F)	60°C (140° F)
Control Box	30%	75%	10%	100%	10° C (50° F)	40° C (104° F)	5° C (41° F)	60°C (140° F)
<b>Positioner:</b>								
Column with Arm	45%	75%	10%	100%	15° C (59° F)	35° C (95° F)	5° C (41° F)	60°C (140° F)
Digital Detector	10%	80%	10%	95%	10° C (50° F)	40° C (104° F)	5° C (41° F)	45°C (113° F)
X-ray Tube: Toshiba E7254FX	30%	85%	20%	90%	10° C (50° F)	40° C (104 °F)	-20° C (-4° F)	60°C (140° F)
<b>Options:</b>								
Laminated Mobile Table	30%	75%	10%	100%	10° C (50° F)	40° C (104 °F)	-20° C (-4° F)	60°C (140° F)
Carbon Fiber Mobile Table	30%	75%	10%	100%	10° C (50° F)	40° C (104 °F)	-20° C (-4° F)	60°C (140° F)
Elevating Mobile Table	10%	80%	10%	85%	10° C (50° F)	40° C (104 °F)	-10° C (14° F)	60° C (140° F)
Image Pasting Barrier	30%	75%	10%	100%	10° C (50° F)	40° C (104 °F)	-40° C (-40° F)	70°C (158° F)

**Note** 

*STORAGE values only refer to equipment that is still in shipping containers. If the equipment is partially or completely installed, refer to IN USE values.*

## 2.1.2 ATMOSPHERIC PRESSURE

PRODUCT OR COMPONENT	ATMOSPHERIC PRESSURE			
	IN USE		STORAGE	
	MIN.	MAX.	MIN.	MAX.
<b>Operator Console:</b>				
PC Tower	710 hPa	1013 hPa	350 hPa	1013 hPa
Flat Panel Display	500 hPa	1060 hPa	500 hPa	1060 hPa
<b>System Cabinet:</b>				
X-Ray Generator	700 hPa	1060 hPa	500 hPa	1060 hPa
Control Box	700 hPa	1060 hPa	500 hPa	1060 hPa
<b>Positioner:</b>				
Column with Arm	700 hPa	1060 hPa	500 hPa	1060 hPa
Digital Detector	700 hPa	1025 hPa	700 hPa	1025 hPa
X-ray Tube: Toshiba E7254FX	700 hPa	1060 hPa	500 hPa	1060 hPa
<b>Options:</b>				
Laminated Mobile Table	700 hPa	1060 hPa	500 hPa	1060 hPa
Carbon Fiber Mobile Table	700 hPa	1060 hPa	500 hPa	1060 hPa
Elevating Mobile Table	700 hPa	1100 hPa	700 hPa	1100 hPa
Image Pasting Barrier	700 hPa	1060 hPa	500 hPa	1060 hPa

**Note** 

*STORAGE values only refer to equipment that is still in shipping containers. If the equipment is partially or completely installed, refer to IN USE values.*

### 2.1.3 HEAT OUTPUT

In normal environmental circumstances the maximum heat output of the equipment can reach:

PRODUCT OR COMPONENT	HEAT OUTPUT
<b>Operator Console:</b>	
PC Tower	699 BTU/h (204.8 W) typical 2804 BTU/h (821.6 W) maximum
Flat Panel Display	7 BTU/h (2 W) in stand-by 195 BTU/h (57.1 W) in-use
<b>System Cabinet:</b>	
X-Ray Generator + Control Box <i>(for a working cycle of one [1] patient every two [2] minutes during one [1] hour)</i>	810 BTU/h (237.4 W)
<b>Positioner:</b>	
Column with Arm <i>(for a working cycle of one [1] patient every two [2] minutes during one [1] hour)</i>	425 BTU/h (124.6 W)
Digital Detector <i>(including Power Supply)</i>	Maximum 137 BTU/h (40W) Average at 45 images per hour is about 45 BTU/h (13W).
X-ray Tube: Toshiba E7254FX	X-ray tube heat output 450.7 BTU/h (132 W)

### 2.1.4 LIGHT SPECIFICATION

The system screens are adjusted for an optimum ambient light level of 50 lux.

### 2.1.5 RADIATION PROTECTION

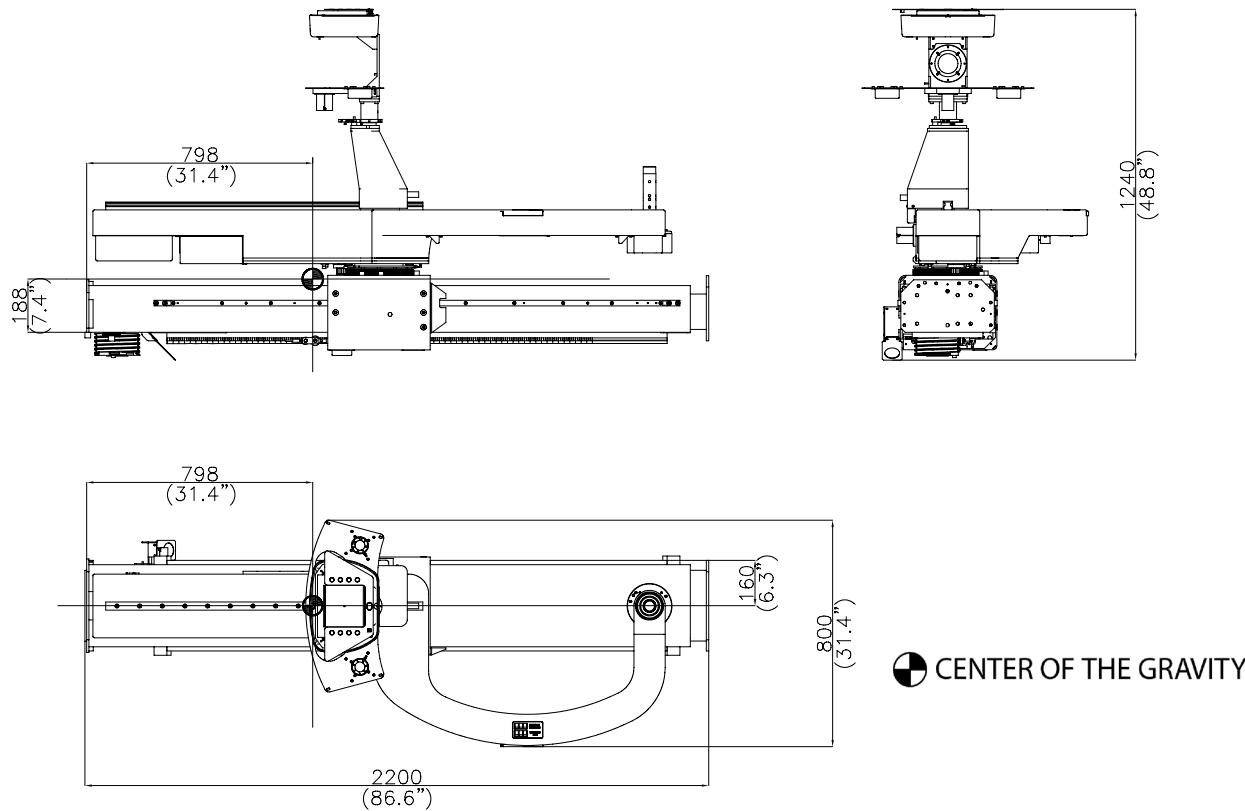
Because X-ray equipment produces radiation, special precautions may need to be taken or special site modifications may be required. The manufacturer does not make recommendations regarding radiation protection. It is the purchasers responsibility to consult a radiation physicist for advice on radiation protection in X-ray rooms.

## 2.2 STRUCTURAL REQUIREMENTS

### 2.2.1 RIGGER REQUIREMENTS

**Note** 

If the dolly / crane is not used to transport and lift the positioner, please refer to the drawing below for weight and the center of gravity.



## 2.2.2 DOOR SIZE REQUIREMENTS

Minimum door sizes also apply to the hallway and elevator.

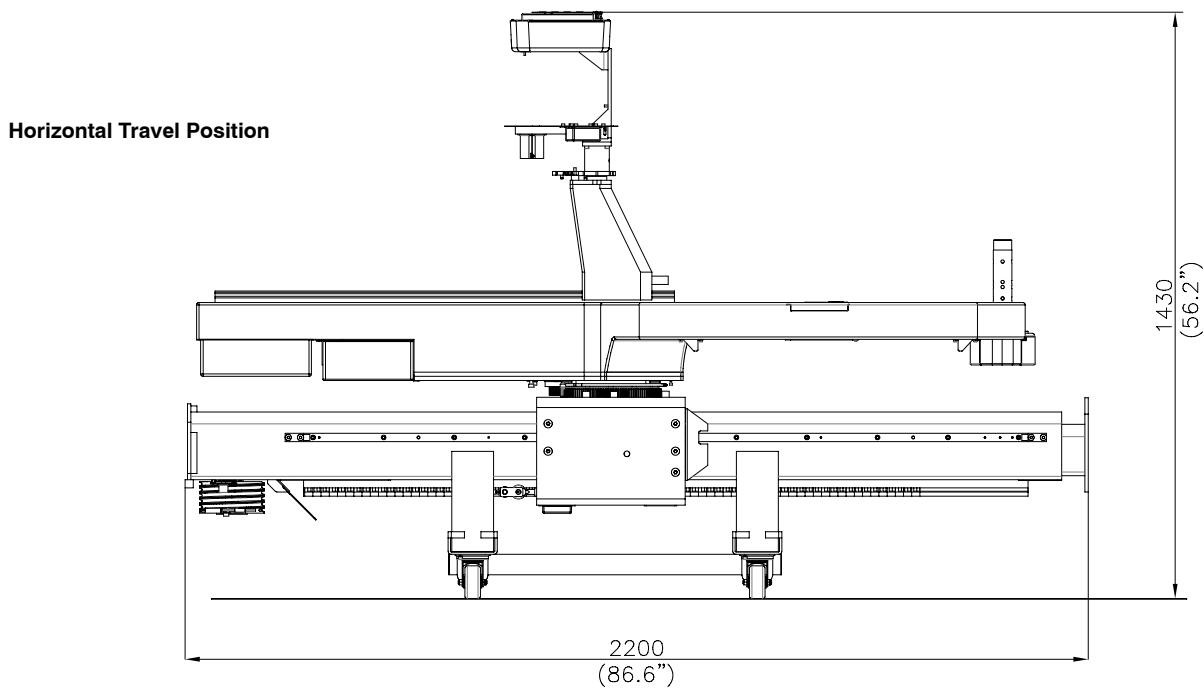
The Positioner is the biggest component in the system. The minimum door height must be 203 cm (80") and door width must be 101.6 cm (40") to take delivery and install system based on a 240 cm (94.5") corridor.

The elevator door must meet with the above door requirements and the minimum depth of the elevator measured from the back wall to the elevator door must be 240 cm (94.5").

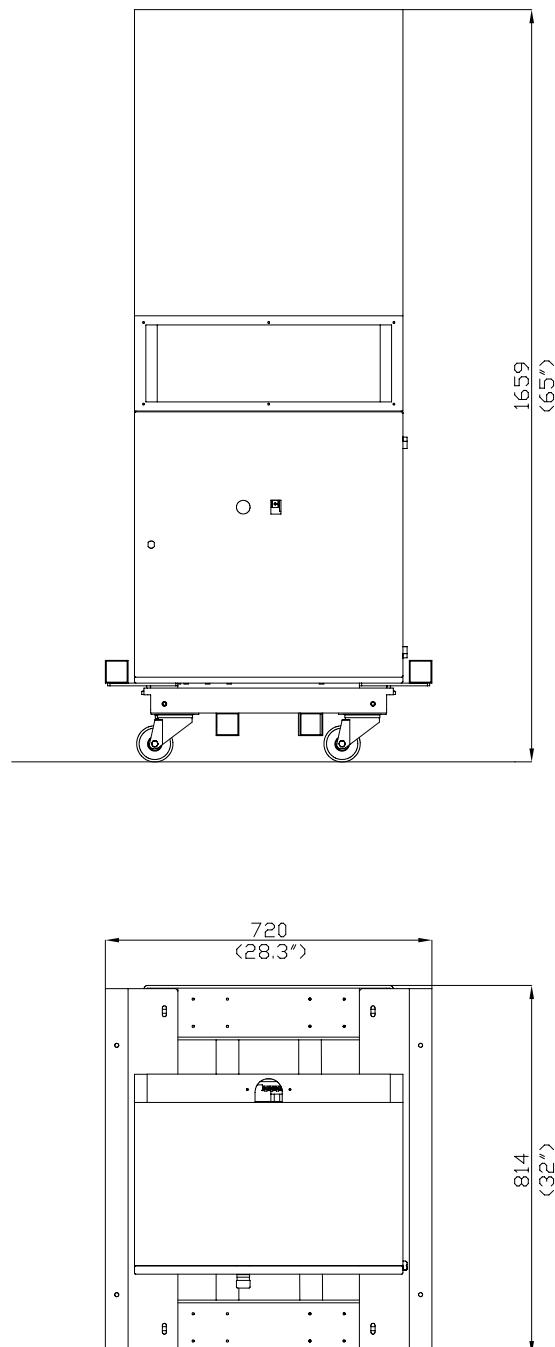
*Note* 

*The above dimensions are calculated as per dimensions of the Positioner on the Transportation Dolly.*

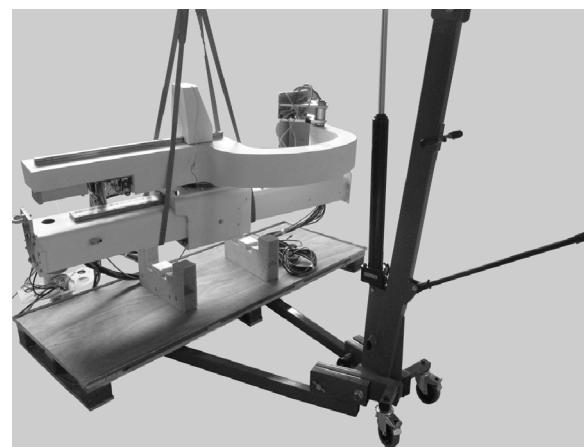
**Illustration 4**  
**Dimensions of Positioner with Transportation Dolly**



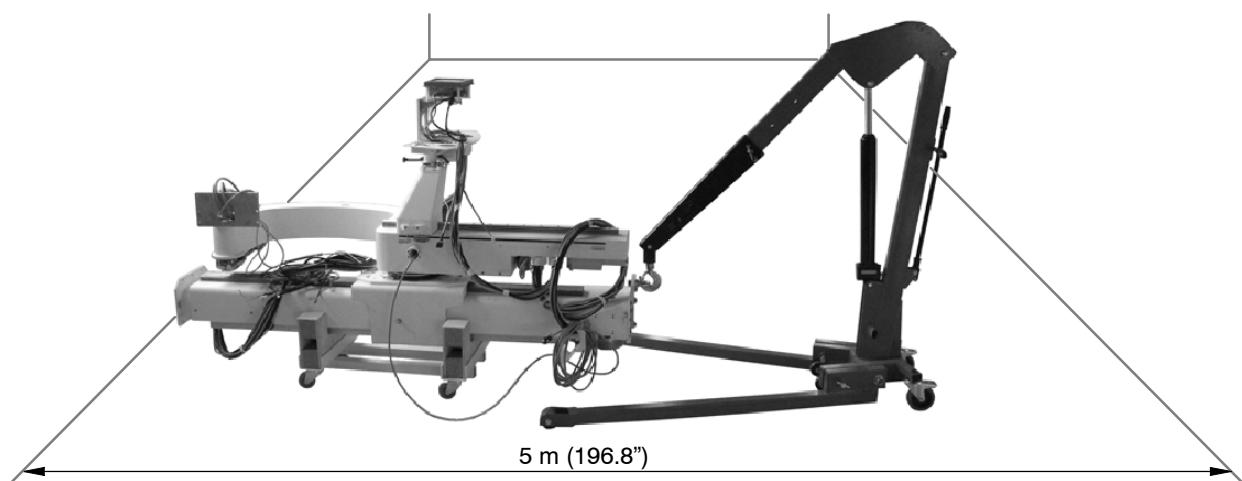
**Illustration 5**  
**Dimensions of System Cabinet with Transport**



To remove the System Cabinet and Positioner from their respective crates, it is necessary to use the installation crane.



Keep in mind when the positioner is going to be hooked to the crane, it will need a free space of at least 5 m (197") long.



For dimensions and weights of the crated and uncrated components refer to Table 1.

**Table 1**  
**Component Crated and Uncrated**

COMPONENT CRATED	HEIGHT	LENGTH	WIDTH	WEIGHT
Positioner, X-Ray Tube, Detector Assembly and other components (Crate 1)	105 cm (41")	230 cm (90.5")	87 cm (34")	584 kg (1287 lb)
System Cabinet (Crate 2)	190 cm (75")	112 cm (44")	82 cm (32")	239 kg (526.9 lb)
Laminated Mobile Table (optional) (Crate 3)	13 cm (5.1")	228.5 cm (90.")	88.5 cm (34.6")	74.5 kg (164 lb)
Carbon Fiber Mobile Table (optional) (Crate 3)	23 cm (9")	230 cm (90.5")	77 cm (30")	70 kg (154 lb)
Elevating Mobile Table (optional) (Crate 3)	97 cm (38.2")	241 cm (94.9")	86 cm (33.8")	240 kg (540 lb)
Image Pasting Barrier (optional)	127 cm (50")	244 cm (96")	94 cm (37")	282 kg (625 lb)
Weight Bearing Stand (optional)	109 cm (43")	208 cm (82")	91 cm (36")	104 kg (231 lb)
Digital Detector (Box)	91.5 cm (36")	119.4 cm (47")	63.5 cm (25")	22.7 kg (50 lb)

COMPONENT UNCRATED	HEIGHT	LENGTH	WIDTH	WEIGHT
Positioner with Transportation Dolly (horizontal travel position)	143 cm (56.2")	220 cm (86.6")	78.5 cm (30.9")	342.5 kg (755 lb)
System Cabinet with Transportation Dolly	166 cm (65")	81.4 cm (32")	72 cm (28.3")	172.5 kg (380.2 lb)
Laminated Mobile Table (optional)	70 cm (27.5")	200 cm (79")	65 cm (25.5")	40 kg (88 lb)
Carbon Fiber Mobile Table (optional)	70 cm (27.5")	220 cm (87")	65 cm (25.5")	32 kg (70.5 lb)
Elevating Mobile Table (optional)	max 87.6 cm (34.5")	227.1 cm (89.4")	67.3 cm (26.5")	129 kg (284.4 lb)
Image Pasting Barrier (optional)	206 cm (81.1")	108.4 cm (42.7")	73.7 cm (29")	90.7 kg (200 lb)
Weight Bearing Stand (optional)	153.4 cm (60.4")	137.2 cm (54")	81.9 cm (32.25")	55.8 kg (123 lb)
Digital Detector	2.54 cm (1")	58.4 cm (23")	47 cm (18.5")	7.1 kg (15.6 lb)

## 2.2.3 FLOOR AND WALL REQUIREMENTS

The method of installing the System Cabinet and Positioner is:

COMPONENT	NORMAL METHOD OF MOUNTING
SYSTEM CABINET	Free standing or anchor to floor with 4 x M8 (5/16") bolts
POSITIONER	Anchor to floor with 4 x 1/2" bolts and anchor to wall with 6 x M8 (5/16") bolts

**NOTE:** For seismic areas Local Standards should be applied. (Also refer to Appendix A, "Requirements for Seismic Areas.")

The Drill Template of the anchoring holes is shown in Illustration 6. Additional information about anchoring bolts and gravity center is indicated in Illustration 7.



**Potential for Injury and/or Equipment Damage: Floor anchors must be a minimum of 150 mm from any concrete edge including ducts and cracks. In addition, the general condition of the concrete in the immediate mounting area should be inspected to ensure that anchors will be set in good quality concrete.**

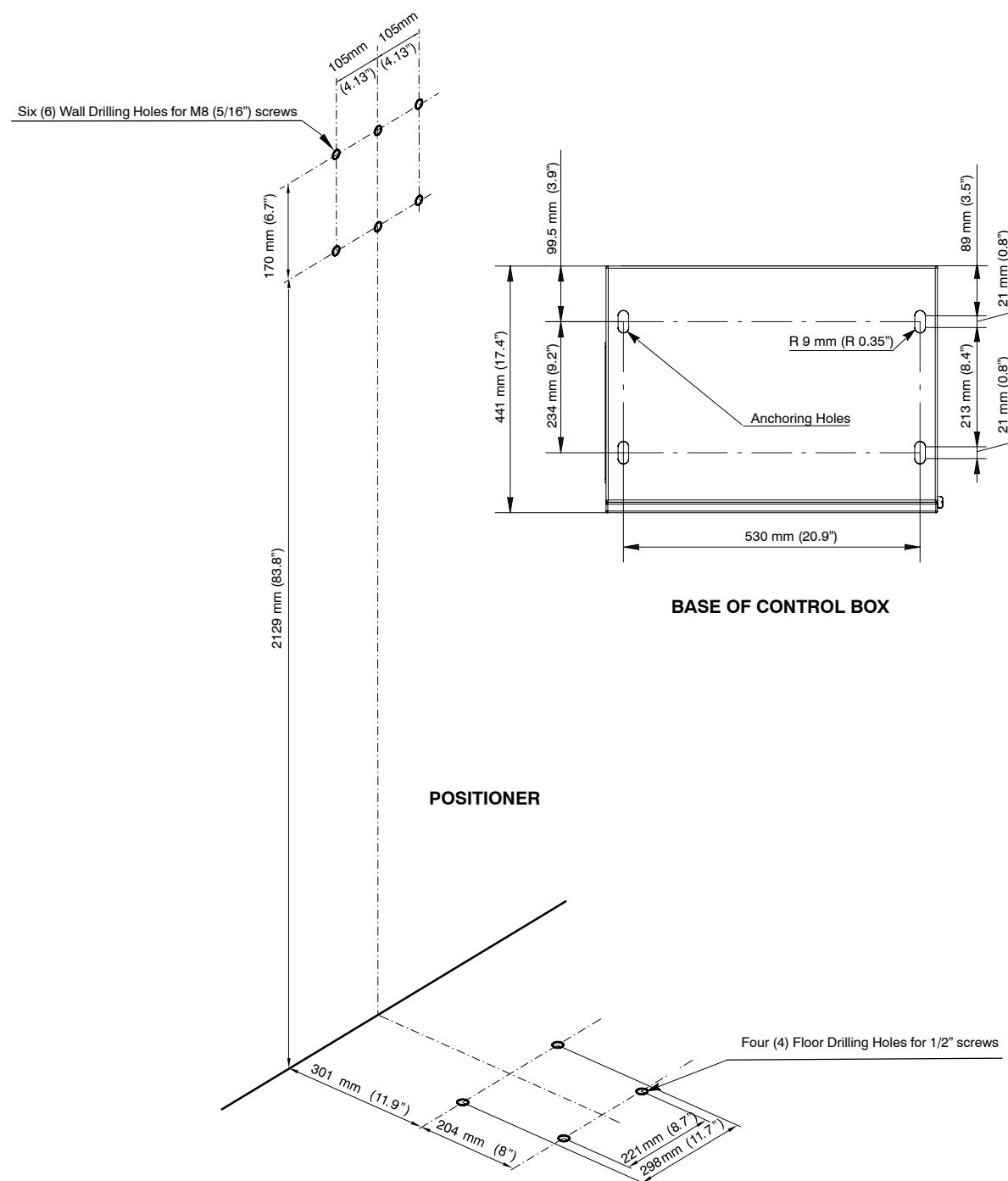
The System Cabinet and Positioner are placed on the floor, which must accept the following weight and the weight/area:

COMPONENT	WEIGHT	LOAD BEARING AREA	WEIGHT / OCCUPIED AREA
SYSTEM CABINET	154 kg (339 lb)	0.26 m <sup>2</sup> (2.81 ft. <sup>2</sup> )	592.3 kg/m <sup>2</sup> (120.6 lb/ft <sup>2</sup> )
POSITIONER	324 kg (713 lb)	0.08 m <sup>2</sup> (0.86 ft. <sup>2</sup> )	4050 kg/m <sup>2</sup> (829 lb/ft <sup>2</sup> )

The floor bearing the Positioner must be concrete and the thickness to be determined by a Structural Engineer to properly support the equipment loads. The anchors require a minimum embedment of 57.2 mm (2 1/4") into the concrete. If the floor thickness is less than 101.6 mm (4"), it is recommended that the unit be secured using a through-bolt method with a reinforcement plate on the back side.

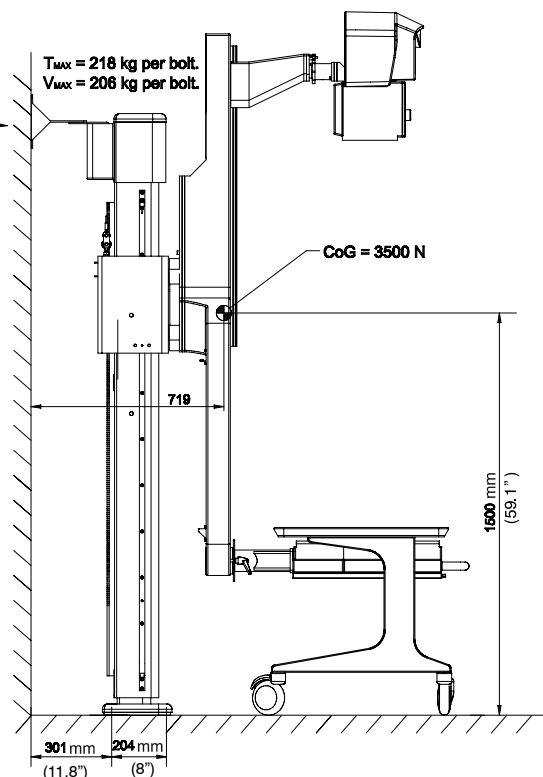
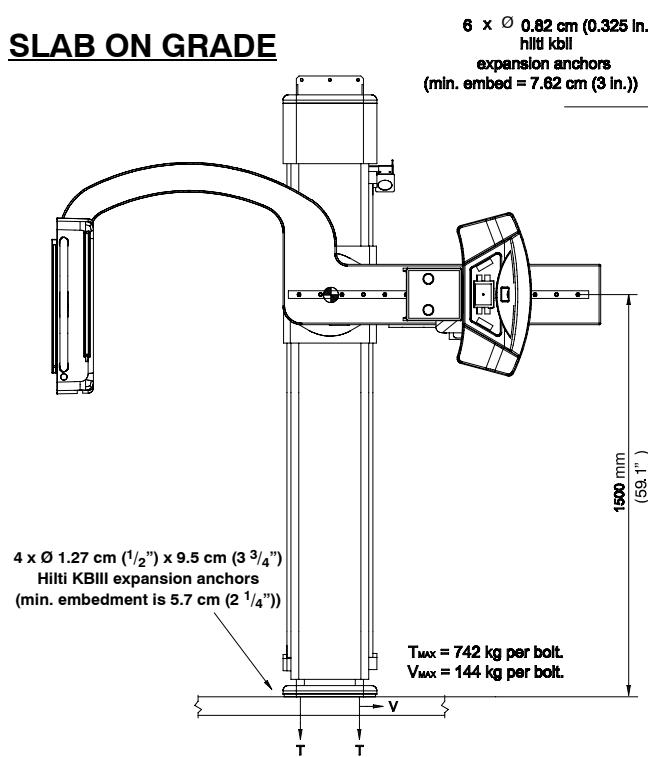


**The wall and the anchoring system for the Positioner have to be strong enough to ensure a safe installation. (Refer to Illustration 7.) Some non-brick walls may require additional anchorage installation.**

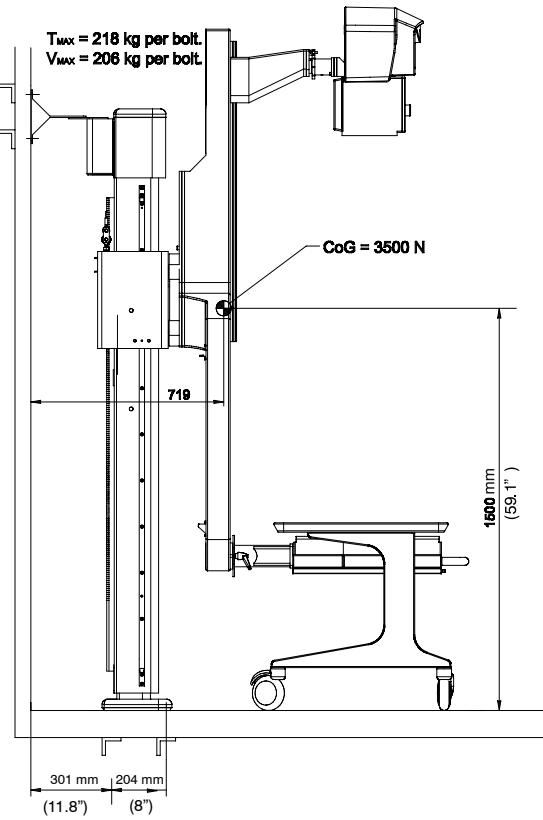
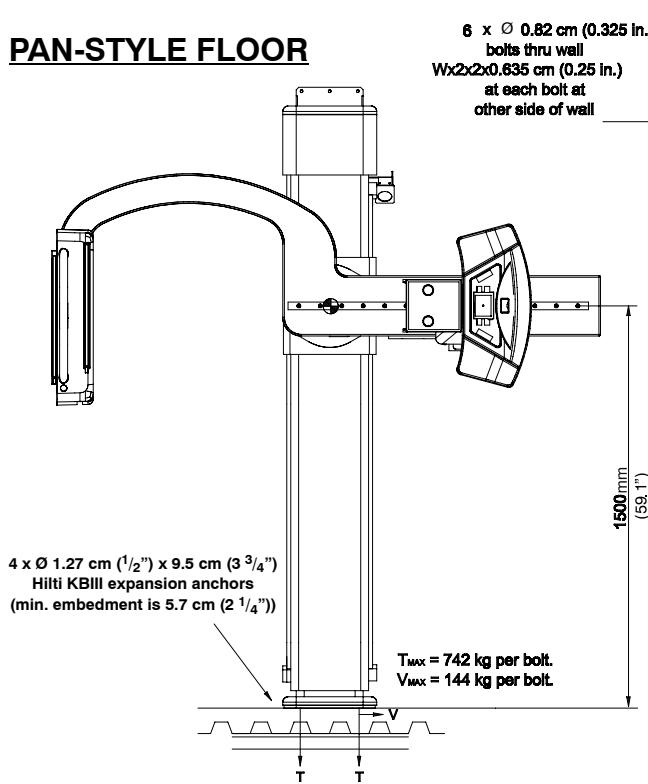
**Illustration 6**  
**Drill Template of the Anchoring Holes**

**Illustration 7**  
**Anchoring bolts**

**SLAB ON GRADE**



**PAN-STYLE FLOOR**



## **2.2.4 CEILING REQUIREMENTS OF POSITIONER INSTALLATION (OPTIONAL)**

The method of installing the System Cabinet and Positioner is:

COMPONENT	NORMAL METHOD OF MOUNTING
POSITIONER	Anchor to floor with 4 x 1/2" bolts and anchor to the ceiling support with 6 x M8 (5/16") bolts
CEILING SUPPORT	Anchor to ceiling with 8 x M12 (1/2") bolts <i>(Refer to Illustration 8 for dimensions and parts of the Ceiling Support)</i>

**Note** 

*The bolts provided with the Ceiling Support option are for concrete applications only. If an Unistrut system is used, obtain appropriate anchors (bolts or another system) locally.*

The ceiling height parameters are:

CEILING HEIGHT SPECIFICATIONS	
MINIMUM	2750 mm (108.27")
MAXIMUM	2950 mm (116.14")

**Note** 

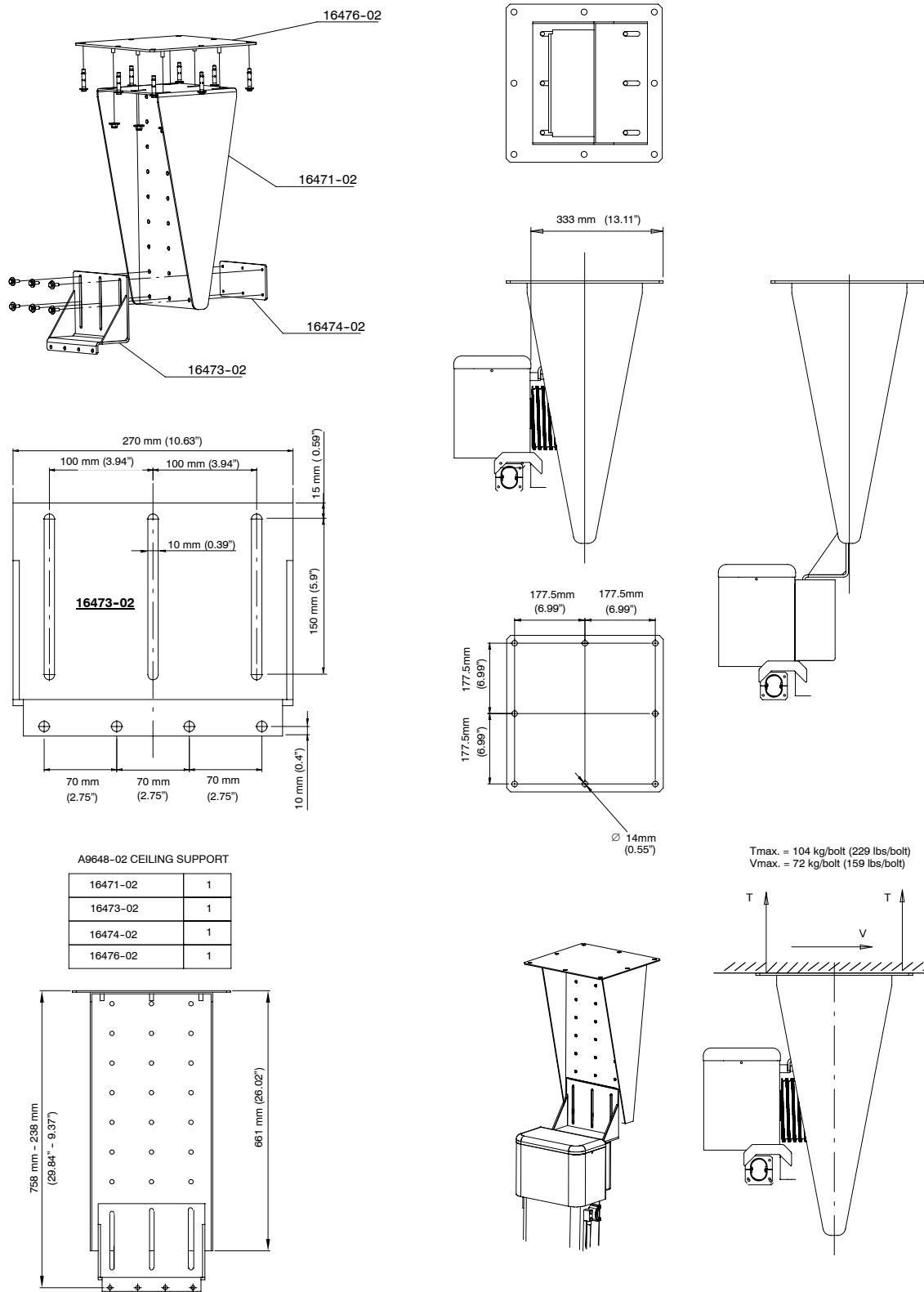
*Refer to Section 2.2.3 about floor requirements for installation of the System Cabinet and the Positioner.*

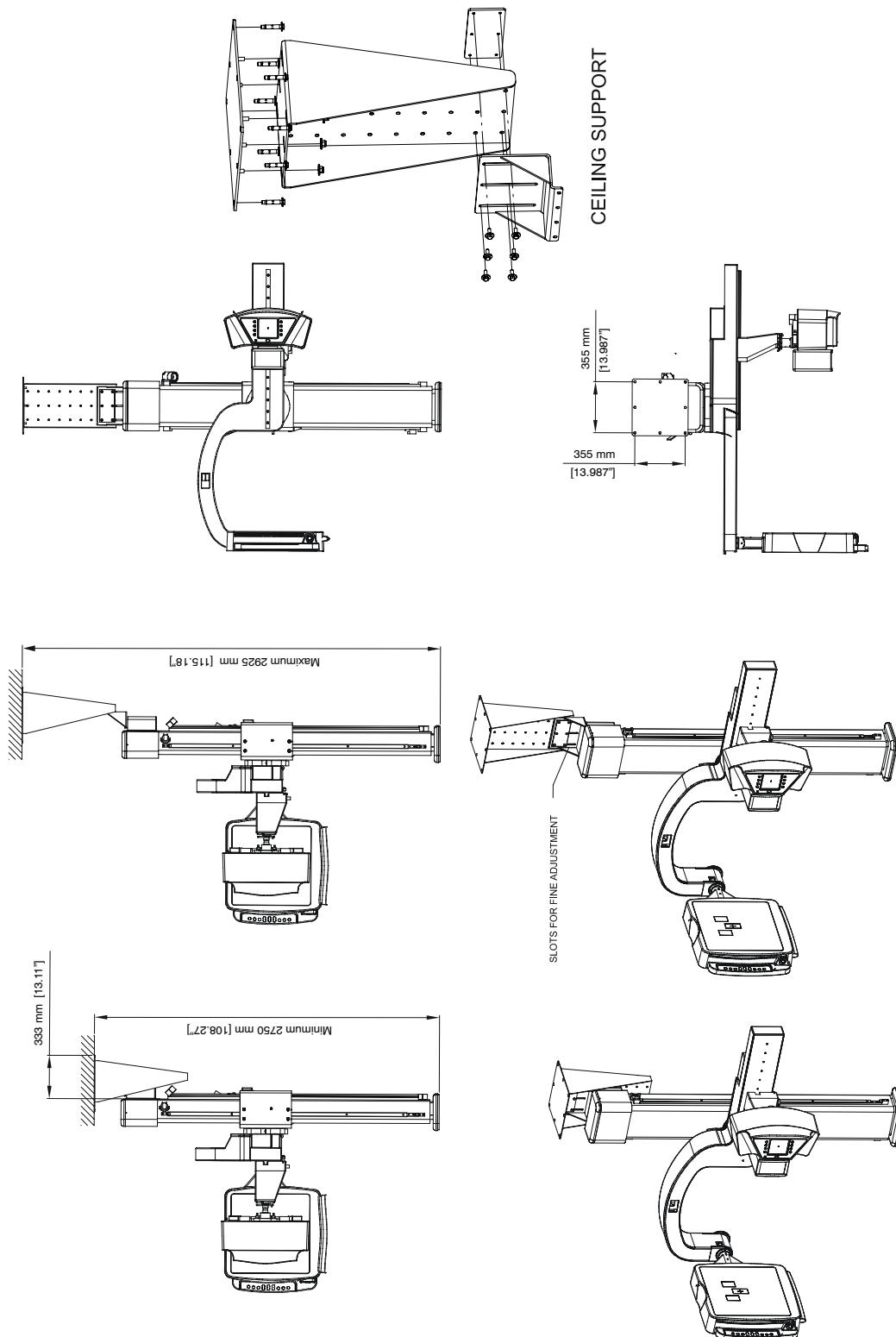
**Note** 

*The Floor-Ceiling installation requires two (2) people and two (2) ladders to complete.*

**Note** 

*The floor-ceiling mounting option is not approved for use in areas covered by seismic regulations. Consult local regulations before using the floor-ceiling mounting option.*

**Illustration 8**  
**Ceiling Support**


**Illustration 9**  
**Ceiling Installation Option**

## 2.2.5 SEISMIC REQUIREMENTS

**Note** 

*Refer to Appendix A, "Requirements for Seismic Areas."*

**Note** 

*The floor-ceiling mounting option is not approved for use in areas covered by seismic regulations. Consult local regulations before using the floor-ceiling mounting option.*

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## **SECTION 3        PLANNING ELECTRICAL CONNECTIONS**

### **3.1     ROUTING CABLES**

#### **3.1.1    GENERAL**

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

For information about the cables supplied with your system, please refer to Section 4, "Electrical Requirements."

#### **3.1.2    CONDUIT**

Separate conduits must be used for power and signal wires. These wires must be kept separate 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 the 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.

#### **3.1.3    ELECTRICAL DUCTS**

It is 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 (2) adjacent rooms. Electrical ducts combine cabling in a neat and functional appearance, with accessibility and room for expansion.

### 3.1.4 POWER DISTRIBUTION

The power distribution consists of two (2) major components that must either be customer supplied or GEHC supplied. These are:

- Feeder power from Hospital Distribution Center to the Room Electrical Cabinet (Main Disconnect).
- Power distribution from the Room Electrical Cabinet (Main Disconnect) to the Definium 5000 System Cabinet.

Usually the feeder power from the Hospital Distribution Center is customer supplied and the power distribution within the Definium 5000 System Cabinet is supplied by GEHC.

**Note** 

*For Hospital facility feeder power and ground requirements to the Room Electrical Cabinet (Main Disconnect) refer to Chapter 4, "Electrical Requirements."*

*For system power distribution from Room Electrical Cabinet, refer to the schematic section in the Definium 5000 Installation Manual. Also refer to Chapter 4, "Electrical Requirements."*

## 3.2 HOSPITAL NETWORK AND PHONE CONNECTIONS

### 3.2.1 BROADBAND NETWORK CONNECTION

To enable an easier installation and to benefit from remote support (service and engineering teams), the equipment should be InSite connected at installation.

Thus the connectivity solution to implement should be decided during pre installation and all related data should be available before installation starts.

For all installations make sure that you have at least one (1) RJ45 dedicated to connect the new equipment on the LAN. In the case of Broadband, this connection will also be used for the remote service of the equipment.

GEHC offers a wide range of connectivity solutions, from the full GEHC package (GEHC supplies Router and customer buys the line) to customized solutions (GEHC adapts to the customer's infrastructure).

Network devices (like CISCO Routers for instance) can be shipped with the equipment **only** if the Sales Representative has added the connectivity item in the order.

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

For each solution selected by the customer the pre-installation checklist must be fulfilled by site IT manager in order to get connectivity information (site IT manager contacts, IP address) available at installation. Refer to Section 7.5, "Customer Network Flow Audit."

### 3.2.2 PHONE VOICE LINE

Phone voice line(s) must be installed within 1m (3 ft.) from the Operator Console and be operational prior to installation.

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## SECTION 4

## ELECTRICAL REQUIREMENTS

The product contains advanced circuitry which will maintain the selected X-ray techniques during adverse line conditions. However, there is a limit to the Generator's ability to correct for inadequate line power.

To ensure proper operation:

- Do not under-size the Distribution Transformer. The secondary of the Distribution Transformer can be a "WYE" ("Star") or "DELTA" wire configuration.
- Size feeder and ground wires per this document.
- Ensure and maintain input mains voltage to specification. **Ensure that the earth ground resistance of the installation (hospital/clinic) is lower than 10 Ω.**

With the exception of high current carrying conductors and grounds, low voltage connections are made with preterminated wires.



**ACCORDING TO THE MDD/93/42/EEC, THIS UNIT IS EQUIPPED WITH EMC FILTERS. THE LACK OF THE PROPER GROUNDING MAY PRODUCE ELECTRICAL SHOCK TO THE USER.**



*The installation should comply with all the electrical requirements indicated in this document. These requirements should be upgraded if Local Standards were more stringent.*

## 4.1 MAGIC PC AND FLAT PANEL DISPLAY

### MAGIC PC

POWER LINE	MINIMUM INPUT POWER REQUIRED	POWER CONSUMPTION IN STAND-BY
100 - 240 V~ ±10% Single-Phase, 50 / 60 Hz	1.44 kVA	245 W

### FLAT PANEL

POWER LINE	MINIMUM INPUT POWER REQUIRED	POWER CONSUMPTION IN STAND-BY
100 - 240 V~ ±10% Single-Phase, 50 / 60 Hz	0.18 kVA	55 W

## 4.2 POSITIONER - POWER LINE REQUIREMENTS

POWER LINE	MINIMUM INPUT POWER REQUIRED	POWER CONSUMPTION IN STAND-BY
230 / 240 V~ ±10% Single-Phase, 50 / 60 Hz	2.6 kVA (including Detector)	113 W (including Detector)

## 4.3 GENERATOR - POWER LINE REQUIREMENTS

- Operation:

GENERATOR MODEL	65 kW, 3 Phase	
Maximum Power kW	65 kW	
Maximum mA	650 mA	
Maximum kVp	150 kVp	
Power Line	400 VAC, Three-Phase, 50 / 60 Hz	480 VAC, Three-Phase, 50 / 60 Hz
	Line voltage automatic compensation: ±10%.	
	Maximum line regulation for maximum kVA demand: 5%.	

- $I_{RMS}$  line current during an X-ray exposure, circuit breaker type, differential sensitivity (mA), minimum line power required (kVA), Generator stand-by consumption (W), should be:

THREE-PHASE GENERATOR POWER				
65 kW				
LINE VOLTAGE	$I_{RMS}^{(1)}$	CIRCUIT BREAKER TYPE (2)		
		B	C	D
400 VAC	115 A	50 A	32 A	20 A
480 VAC	96 A	40 A	20 A	20 A
Differential Sensitivity (Earth Leakage / Ground Fault)		30 mA		
Minimum kVA required		81.25 kVA (Maximum kW x 1.25)		
Stand-by Consumption		500 W		

**Notes:**

- (1)  $I_{RMS}$  (for three-phase) =  $(0.72 \times P) / VAC$  ( $I_{RMS}$  = maximum instantaneous current based on 100 ms X-ray exposure).
- (2) Circuit Breaker (Differential, Thermomagnetic, Fuses and/or Contactor).  
The selected circuit breaker type must have a minimum tripping current of  $1.1 \times I_{RMS}$  @ 0.1 seconds.  
For example:  
Type "B" breaker:  $M_B = (I_{RMS} \times 1.1) / 3$   
Type "C" breaker:  $M_C = (I_{RMS} \times 1.1) / 5$   
Type "D" breaker:  $M_D = (I_{RMS} \times 1.1) / 10$

The selected circuit breaker should be equal or bigger than the calculated value. Minimum value should be 20 A.

- The Maximum Impedance must be lower than the value indicated below:

LINE VOLTAGE	THREE-PHASE GENERATOR POWER		
	65 kW		
	$Z_L \Omega$	$Z_C \Omega$	$Z_T \Omega$
400 VAC	0.110 $\Omega$	0.036 $\Omega$	0.174 $\Omega$
480 VAC	0.158 $\Omega$	0.052 $\Omega$	0.251 $\Omega$

$Z_L \Omega$  = maximum impedance of the distribution transformer.  
 $Z_C \Omega$  = maximum impedance of every feeder cable.  
 $Z_T \Omega$  = maximum impedance at the generator's input terminals.  
**NOTE:** The above values comply with the Standard IEC-60601.2.7.

#### 4.4 GENERATOR - RECOMMENDED WIRE SIZE

Correct sizing of the feeder wires is critical to proper Generator operation. Wire size is dependent on the Generator power, the line voltage and the distance from the Distribution Transformer to the Generator Cabinet. The maximum voltage drop during an exposure must not exceed 5% of the nominal mains value.

It is recommended that the Distribution Transformer (Customer provided) used as the power source have at least 25% more power than the maximum power of the X-ray Generator.

The recommended wire sizing is indicated in Table 2 and the wire size guide conversion in Table 3. These lengths are measured from the Distribution Transformer to the Room Electrical Cabinet (Main Disconnect). **From the Room Electrical Cabinet to the Generator Cabinet, wire sizes should be consistent with those shown in table 2 below and sized based on the length of wires required to complete the run. The maximum wire size that can be connected to the Generator Cabinet (Input Line Fuse Holder) is 35 mm<sup>2</sup> (AWG 2).**

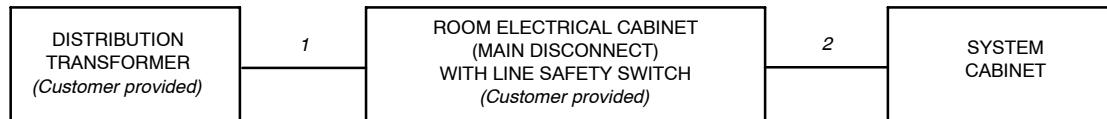
**Table 2**

**Minimum Wire Size from Distribution Transformer to Room Electrical Cabinet**

GENERATOR	LINE VOLTAGE	WIRE SIZE AT:							
		15 m (50 ft)		30 m (100 ft)		45 m (150 ft)		60 m (200 ft)	
65 kW, 3φ	400 VAC	25 mm <sup>2</sup>	AWG 4	25 mm <sup>2</sup>	AWG 4	35 mm <sup>2</sup>	AWG 2	50 mm <sup>2</sup>	AWG 1
	480 VAC	25 mm <sup>2</sup>	AWG 4	25 mm <sup>2</sup>	AWG 4	25 mm <sup>2</sup>	AWG 4	35 mm <sup>2</sup>	AWG 2

**Illustration 10**

**Block Diagram for Power Line Connection**



CABLE RUN	FUNCTION	REMARKS
1	Three Phase Power. (3φ : 400 / 480 VAC)	Connect to Room Electrical Cabinet (Main Disconnect) according to the indicated electrical requirements. <i>Customer supplied.</i>
	Ground.	
2	Three Phase Power. (3φ : 400 / 480 VAC)	Connect to Generator according to the indicated electrical requirements. Install an Auxiliar Boost Transformer when it is required. <i>Customer supplied.</i>
	Ground.	

**NOTE:** The system power ground point is located in the Generator Cabinet.

**Table 3**  
**Wire Size Conversion Table and Ampacity**

Cross Section (mm <sup>2</sup> )	AWG	Ampacity (A)
3.31	<b>12</b>	20
<b>4</b>		24
5.26	<b>10</b>	30
<b>6</b>		39
8.37	<b>8</b>	47
<b>10</b>		55
13.3	<b>6</b>	61
<b>16</b>		70
21.15	<b>4</b>	80
<b>25</b>		90
33.6	<b>2</b>	108
<b>35</b>		115
42.4	<b>1</b>	122
<b>50</b>		132
53.5	<b>0 (1/0)</b>	141
67.4	<b>00 (2/0)</b>	164
<b>70</b>		170
85	<b>000 (3/0)</b>	188
<b>95</b>		200
107.2	<b>0000 (4/0)</b>	216
<b>120</b>		240

*The selected cable must have an Ampacity equal or greater than the breaker.  
The smallest size is 4 mm<sup>2</sup> or AWG 12.*

## 4.5 SAFETY DEVICES

Every installation must be provided with a main line disconnect device (thermomagnetic breaker) and the remote disconnect devices required at all Consoles that are not located next to the line safety switch.

Devices such as a Safety Switch / Emergency Switch, Warning Lights, and a Door Interlock Switch should be supplied and installed by the customer. (Refer to Illustration 11.)

### **SAFETY SWITCH / EMERGENCY SWITCH**

The main Safety Switch should be installed in the Room Electrical Cabinet (Main Disconnect) (close to the Generator Cabinet) and provided with light indicators for "Power On / Off." It should be used for main disconnection of the whole System and located in an accessible place where it can be seen and controlled during operation and service.

Other Emergency Switches should be installed in accessible locations in the room (near the main entrance door or the Control Console) for use in an emergency. They should be connected to the Room Electrical Cabinet (Main Disconnect) so that they cut power to the whole System when they are activated.

The rating of these switches should be: 10 A, 500 VAC, NC.

### **DOOR INTERLOCK SWITCH**

The Door Interlock Switch indicates to the operator when Doorways to the X-ray room are open. This switch may inhibit X-ray generation, according to Local Standards and customer preferences.

This switch should be installed in the entrance door(s) and its connecting cable should be routed to the Generator Cabinet.

### **WARNING LIGHT**

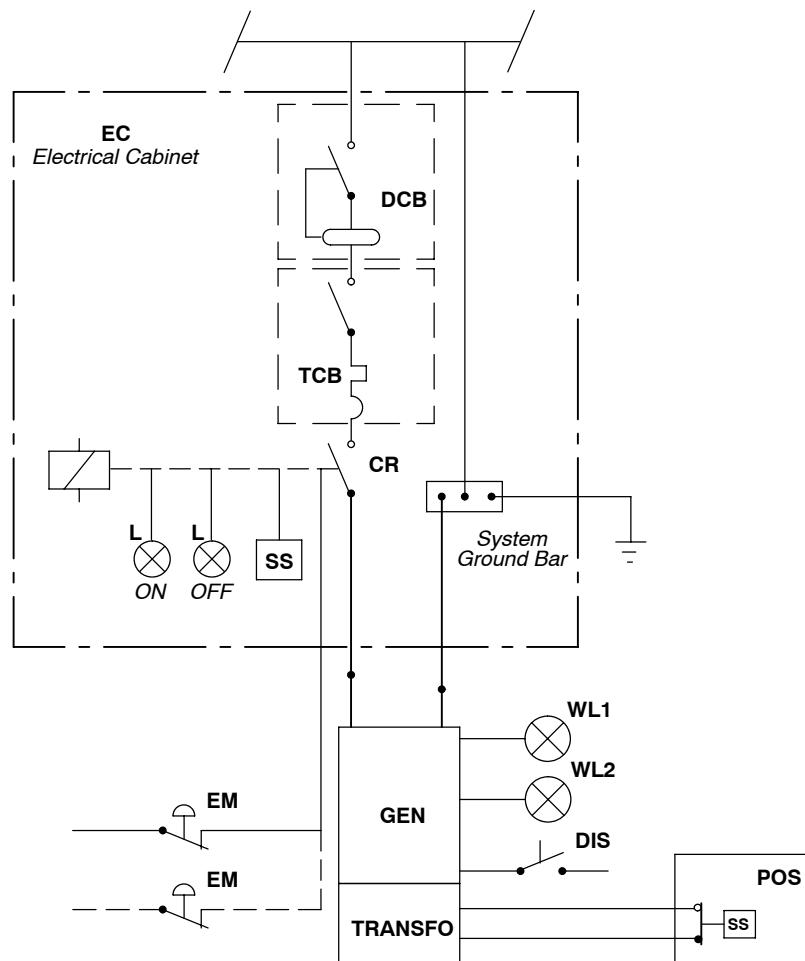
The Warning Lights are signal lamps installed outside of the X-ray room (near of the main entrance) that indicate:

1. The system is under voltage (red lamp "ON").
2. X-ray exposure in process (yellow lamp "ON"). (For connection refer to the Installation document.)

The Warning Lights connection cables should be routed to the Generator.

*Note* 

*The installation must be in compliance with all local regulations.*

**Illustration 11****Room Electrical Cabinet and Mains Connection****LEGEND**

- EC:** Electrical Cabinet (Room Disconnect) for powering X-ray equipment. (*Customer supplied*)
- DCB:** Differential Circuit Breaker according to the Generator rating (refer to Section 4.3).
- TCB:** Thermomagnetic (or Fuses) Circuit Breaker according to the Generator rating (refer to Section 4.3).
- CR:** Contactor controlled by a Safety Switch (**SS**).
- SS:** Safety Switch used for Generator main disconnection, with ON / OFF positions.
- L:** ON / OFF Indicator Lamps located on the Electrical Cabinet.
- EM:** Emergency Switch near to Control Console and/or to the Room main entrance.
- GEN:** Generator Cabinet.
- POS:** Positioner with a Safety Switch (**SS**)
- WL1:** X-ray Emission Indicator Lamp (yellow lamp) connected to the Generator Cabinet, located outside of the X-ray Room (above the exam room entrance).
- WL2:** Warning Light (red lamp) located outside of the X-ray Room (above the exam room entrance).
- DIS:** Door Interlock Switch located on the main entrance(s).

## 4.6 SYSTEM CABLE INFORMATION

### 4.6.1 CABLE ROUTING AND CONNECTIONS

**Table 4**  
**Cable Data and Routing**

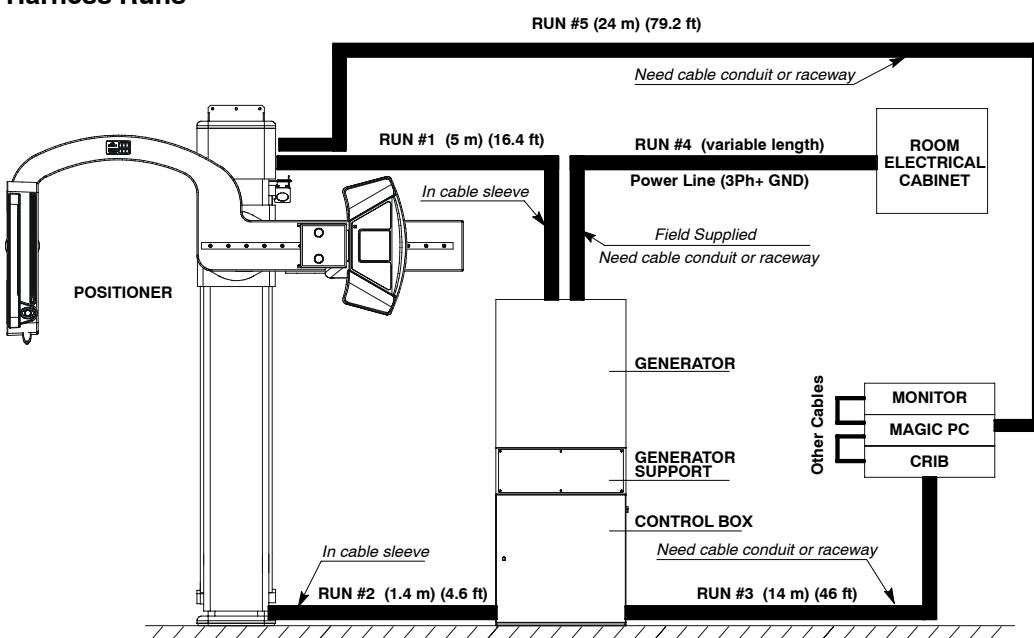
RUN #	CABLE CODE (Mfg. Ref.)	TOTAL CABLE LENGTH	USABLE CABLE LENGTH	CABLE DIAM	DESCRIPTION	FROM	TO	CONNECTOR TYPE *
1	A7659-02	12 m (39.4 ft)	5 m (16.4 ft) between components	8 mm	Cable AEC	AEC Preamplifier	IC J1 AEC Adaptation	Sub D 9V
	6680-09	9 m (29.5 ft)		17 mm	Anode Cable	X-ray Tube	HV Transformer	Federal Connector
	6680-09	9 m (29.5 ft)		17 mm	Cathode Cable	X-ray Tube	HV Transformer	Federal Connector
	A7014-03	12 m (39.4 ft)		12 mm	Stator Cable	X-ray Tube	11TS2 in Generator	Faston
	55902024	15 m (49.2 ft)		5.5 mm	DAP Cable	DAP in Positioner	DAP RS232 IC1	Sub D 9V
2	A8131-04	6.7 m (22 ft)	1.4 m (4.6 ft) between components	10 mm	Rot Motor Cable	J6 Motor	J1 Panel (Control Box)	Molex 6V
	A8129-04	7 m (23 ft)		10 mm	SID Motor Cable	J1 Motor	J2 Panel (Control Box)	Molex 6V
	A8160-05	3.7 m (12 ft)		10 mm	Brake-H Motor Cable	J7 Motor	J3 Panel (Control Box)	Molex 6V
	A8199-01	8.9 m (29.2 ft)		6 mm	Detector Motor Cable	J5 Detector Rotation Motor	J3 Interface (Control Box)	Weidmuller Zepo 4V
	A8168-03	8.5 m (27.9 ft)		5 mm	Fan Cable	TS10 Tube Cover	J11 Interface Board (Control Box)	Weidmuller Zepo 4V
	A8188-03	6.75 m (22.2 ft)		6 mm	I/F Can Cable	J11 Control Board	J8 Interface Board (Control Box)	Weidmuller Zepo-P 3V
	A8190-03	6.8 m (22.3 ft)		10 mm	Supply Cable	J4 Control Board	J6 Interface Board (Control Box)	Sub D 25V
	A9608-03	9.6 m (31.5 ft)		6 mm	PC Supply Cable	PW Touch Console	PW Power PC (Control Box)	Molex P 4V
	55001084	10 m (32.8 ft)		8 mm	VGA Cable	VGA Touch Console	VGA PC (Control Box)	Sub D 15V
	A9610-01	10 m (32.8 ft)		6 mm	TS R232 Cable	COM Touch Console	COM2 PC (Control Box)	RJ 45
	A9689-01	10 m (32.8 ft)		6 mm	Collimator RS232 Cable	PC Control	Collimator	RJ 45
	A9688-04	8.8 m (28.9 ft)		8 mm	Collimator Power Cable	TS3 Control Box	Collimator	Faston
	A6383-05	4 m (13.1 ft)		4 mm	GND Cable TDI Detector	Control Box	TDI GND	Round Terminal
	A9684-04	4 m (13.1 ft)		7 mm	Power Cable TDI Detector	TB2 PDU Control Cabinet	PW TDI	Female Connector
	A6383-42	2.7 m (8.86 ft)		4 mm	GND Cable	Column Chassis	GND Tab in Control Box	Round Terminal

**Table 4 (cont.)**  
**Cable Data and Routing**

RUN #	CABLE CODE (Mfg. Ref.)	TOTAL CABLE LENGTH	USABLE CABLE LENGTH	CABLE DIAM	DESCRIPTION	FROM	TO	CONNECTOR TYPE *
3	A9681-02	15 m (49.2 ft)	14 m (46 ft) between components	9 mm	CRIB Cable	J2 CRIB	J2 Panel (Control Box)	Sub D 25V
	A9684-02	15 m (49.2 ft)		7 mm	Power Cable Magic PC	TB3 PDU Control Cabinet	PW Magic PC	Female Connector
	A9684-02	15 m (49.2 ft)		7 mm	Power Cable, Monitor	TB4 PDU Control Cabinet	PW Monitor PC	Female Connector
	A9679-03	15 m (49.2 ft)		5 mm	Cross-over Ethernet Cable	Control Cabinet PC	Magic PC	RJ45
4	-	Cables length and size depends on the position of the Room Electrical Cabinet (Main Disconnect) in the Room (refer to Section 4.4)			Power Line (3 Ph + GND)	Room Electrical Cabinet (Main Disconnect)	Input Line Fuses at Generator	-
5	A9685-05	25 m (82 ft)	24 m (78.8 ft) between components	10 mm	CAN Cable	CAN Open TDI Detector	CAN Open Magic PC	Sub D 9V
	A9686-05	25 m (82 ft)		5 mm	Ethernet Cable	Tether (TRAD Detector)	Ethernet Magic PC	RJ 45
other	A9682-01	2 m (6.6 ft)	-	8 mm	CRIB RS232 Cable	J3 CRIB	RS232 Magic PC	Sub D 9V
		2 m (6.6 ft)	-	7 mm	DVI-A Video Cable	Video - Monitor	Video - Magic PC	VGA / Video
		2 m (6.6 ft)	-	6 mm	USB Cable	USB - Monitor	USB - Magic PC	USB
<p>* <b>NOTE:</b> Refer to Illustration 13, "Harness Runs."</p> <p>- Refer to Table 5 for dimensions of the Connector Type.</p> <p>- Refer to Section 4.6.2 for System Master Interconnection Schematics (MIS).</p>								

## Illustration 12

### Harness Runs



**Table 5**  
**Dimensions of the Connector Type**

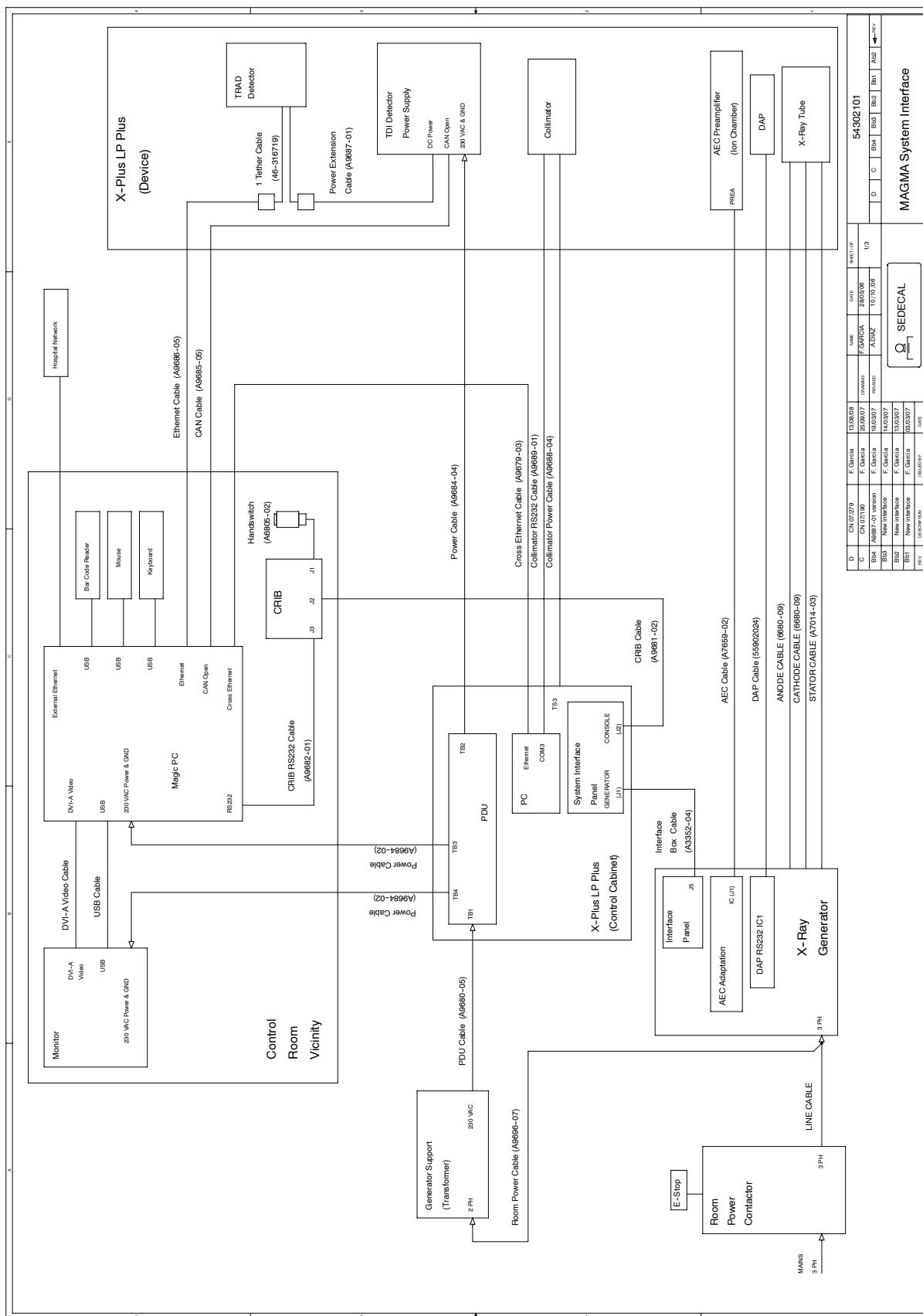
CONNECTOR TYPE	DIMENSIONS (mm)
Faston	7 x 10 x 3
Female Connector	30 x 60 x 15
Molex 6V	15 x 10 x 35
Molex P 4V	15 x 10 x 25
Round Terminal	10 x 15 x 6
RJ 45	10 x 15 x 20
Sub D 9V	30 x 50 x 15
Sub D 15V	35 x 60 x 15
Sub D 25V	55 x 60 x 15
USB	12 x 22 x 8
VGA / Video	30 x 45 x 12
Weidmuller Zepo 4V	20 x 30 x 15
Weidmuller Zepo P 3V	10 x 20 x 15

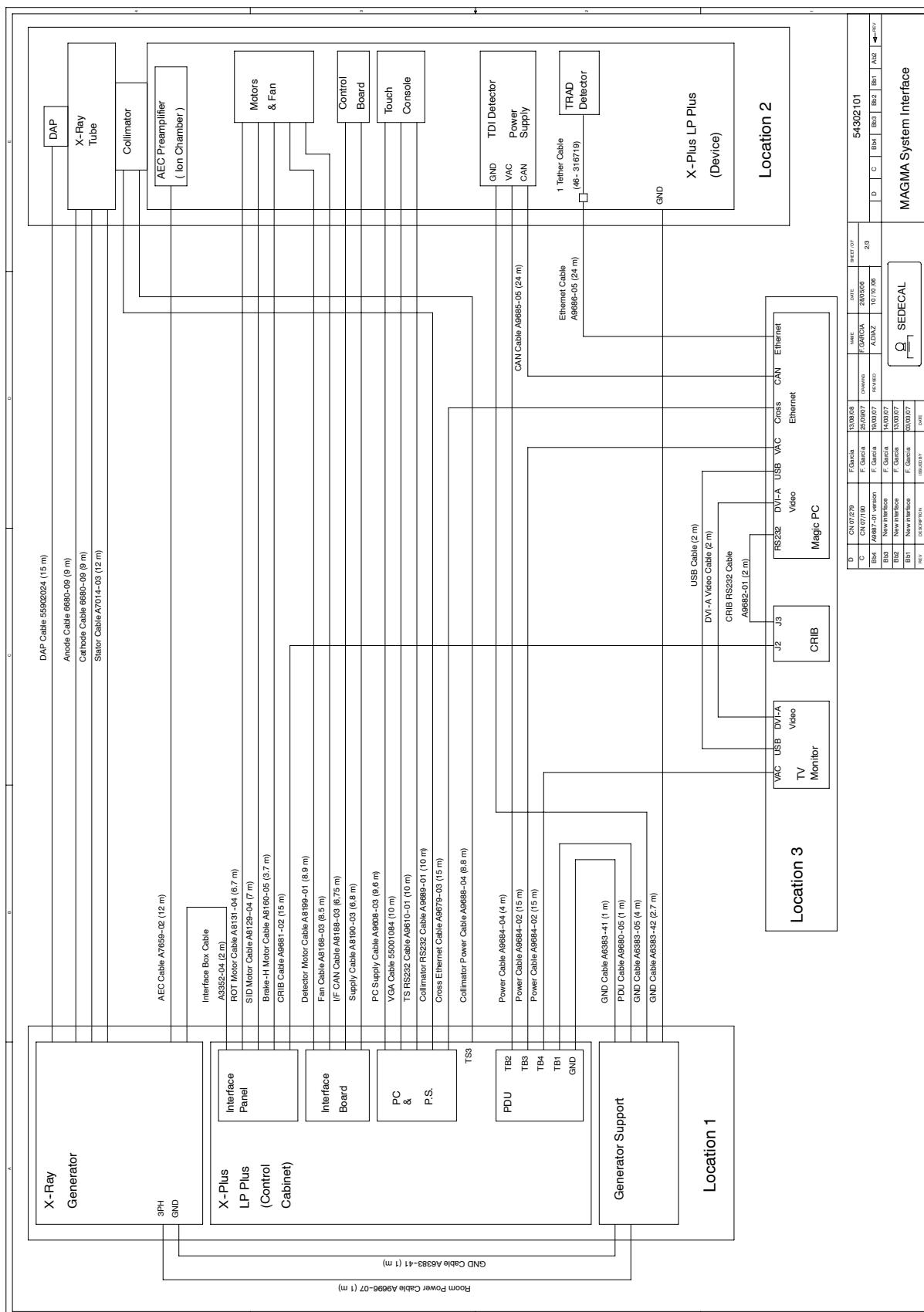
#### 4.6.2 SYSTEM MASTER INTERCONNECTION SCHEMATIC (MIS)

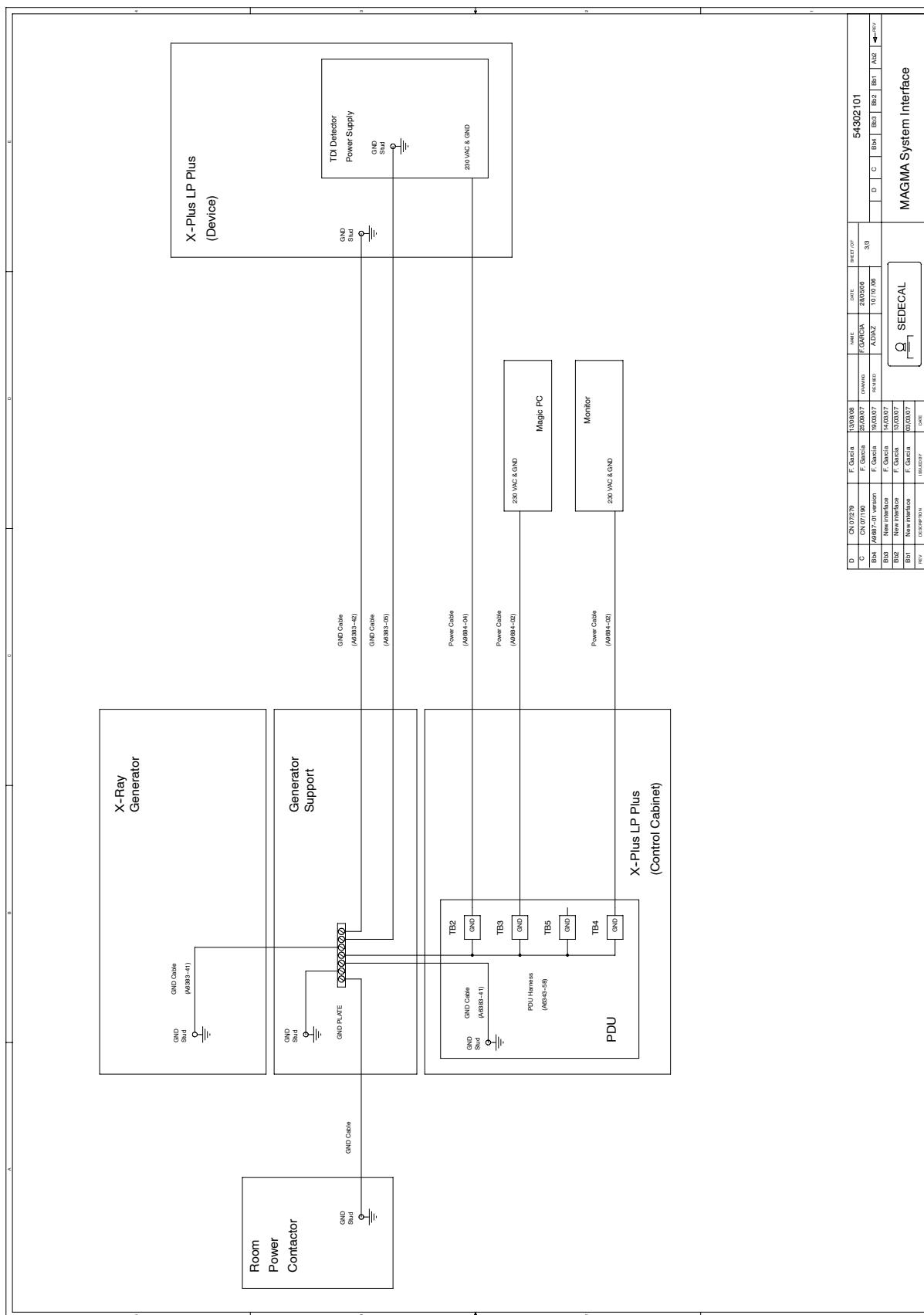
Refer to the following MIS Maps for details of the cable runs and connections.

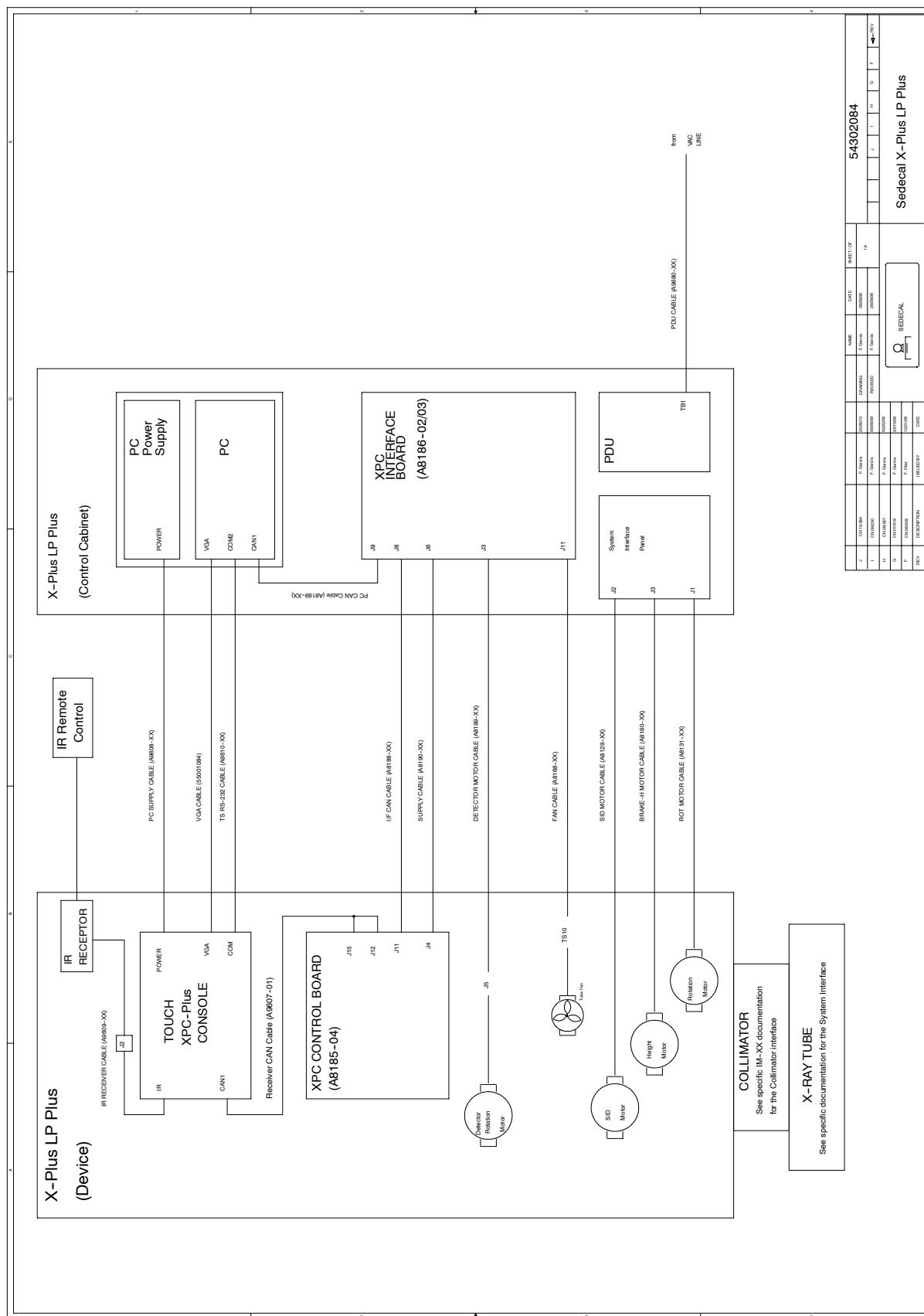
##### SYSTEM INTERCONNECTION TO POSITIONER / CONTROL CABINET

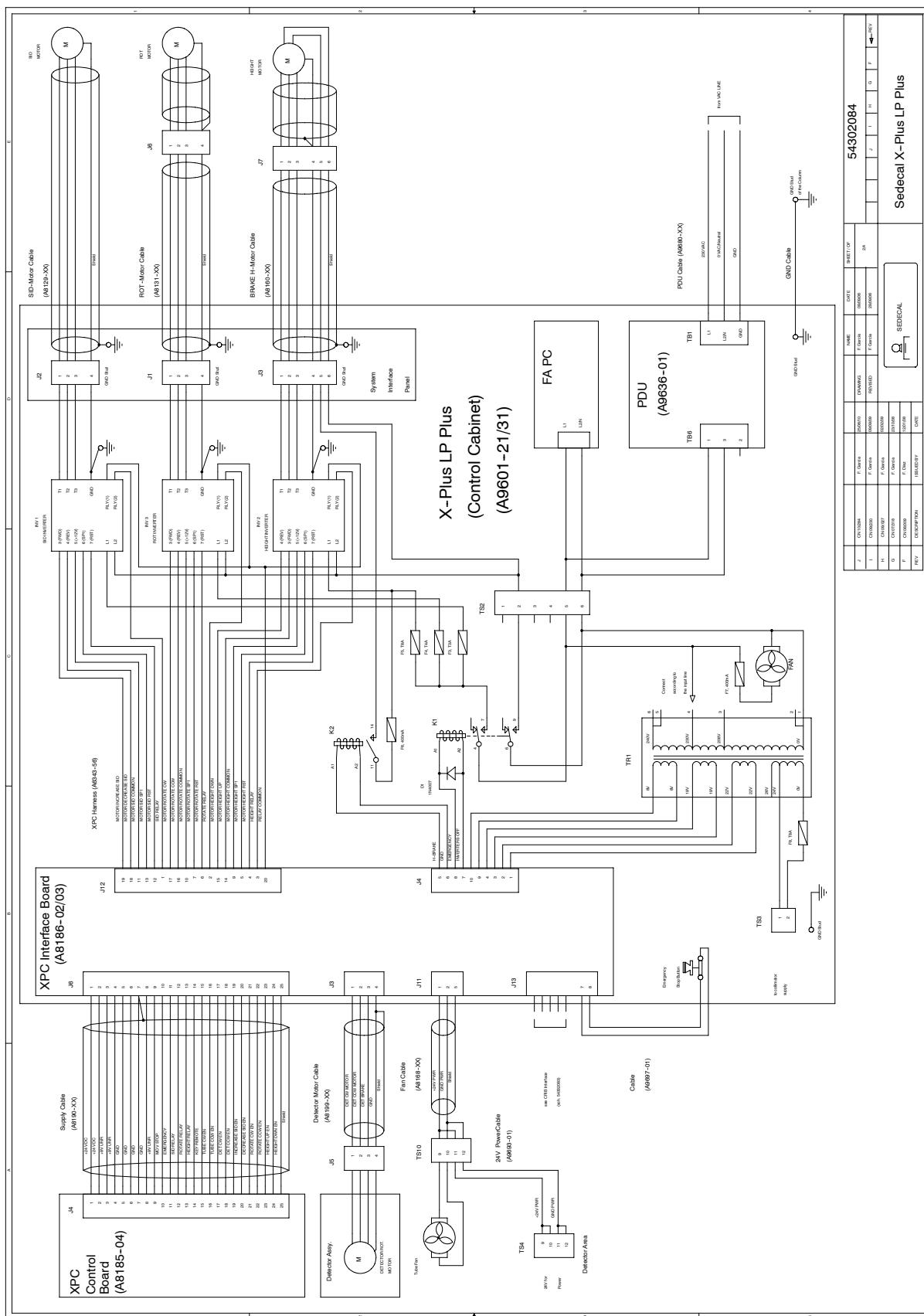
- System Interface ..... 54302101
- X-Plus LP Plus ..... 54302084

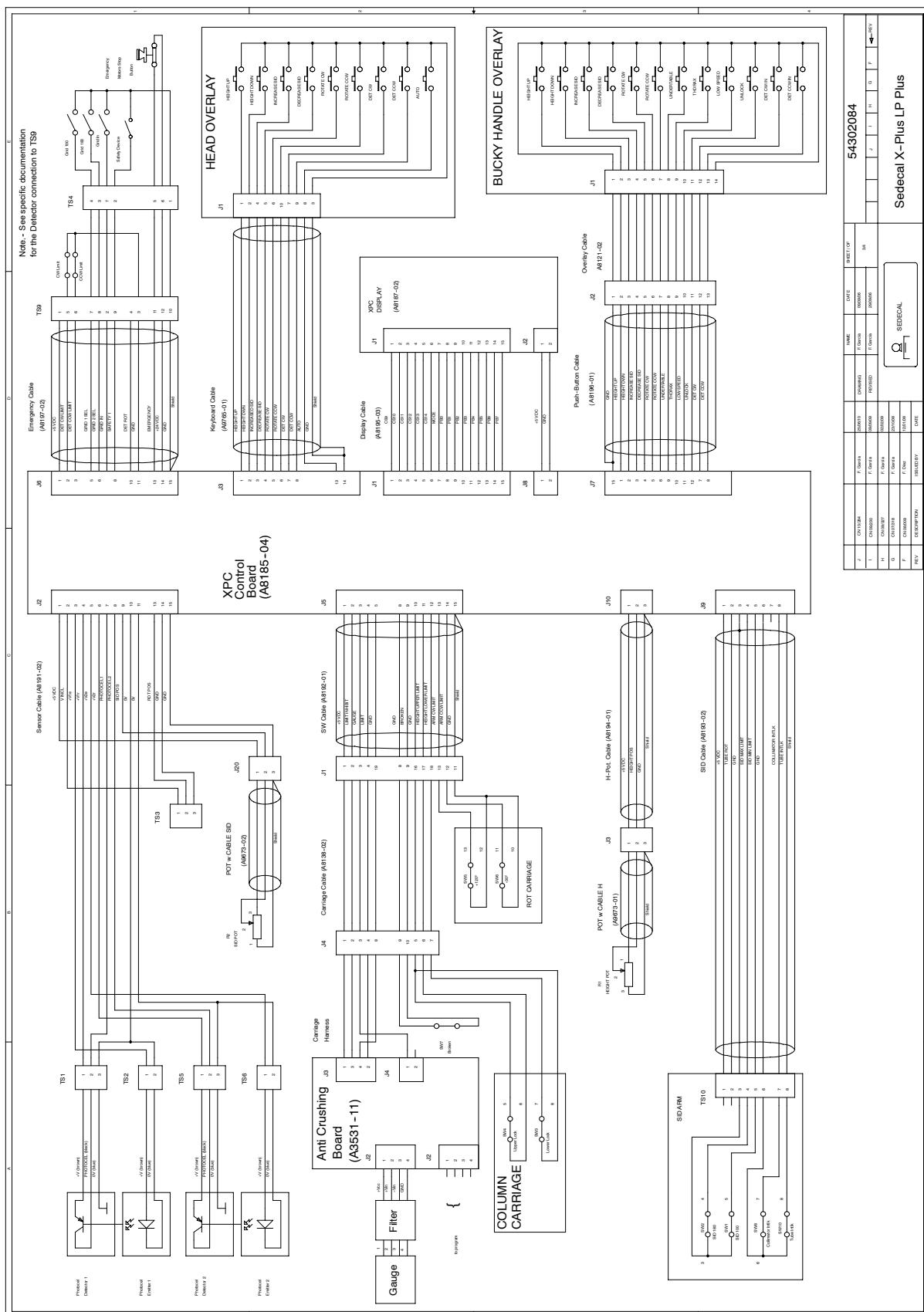


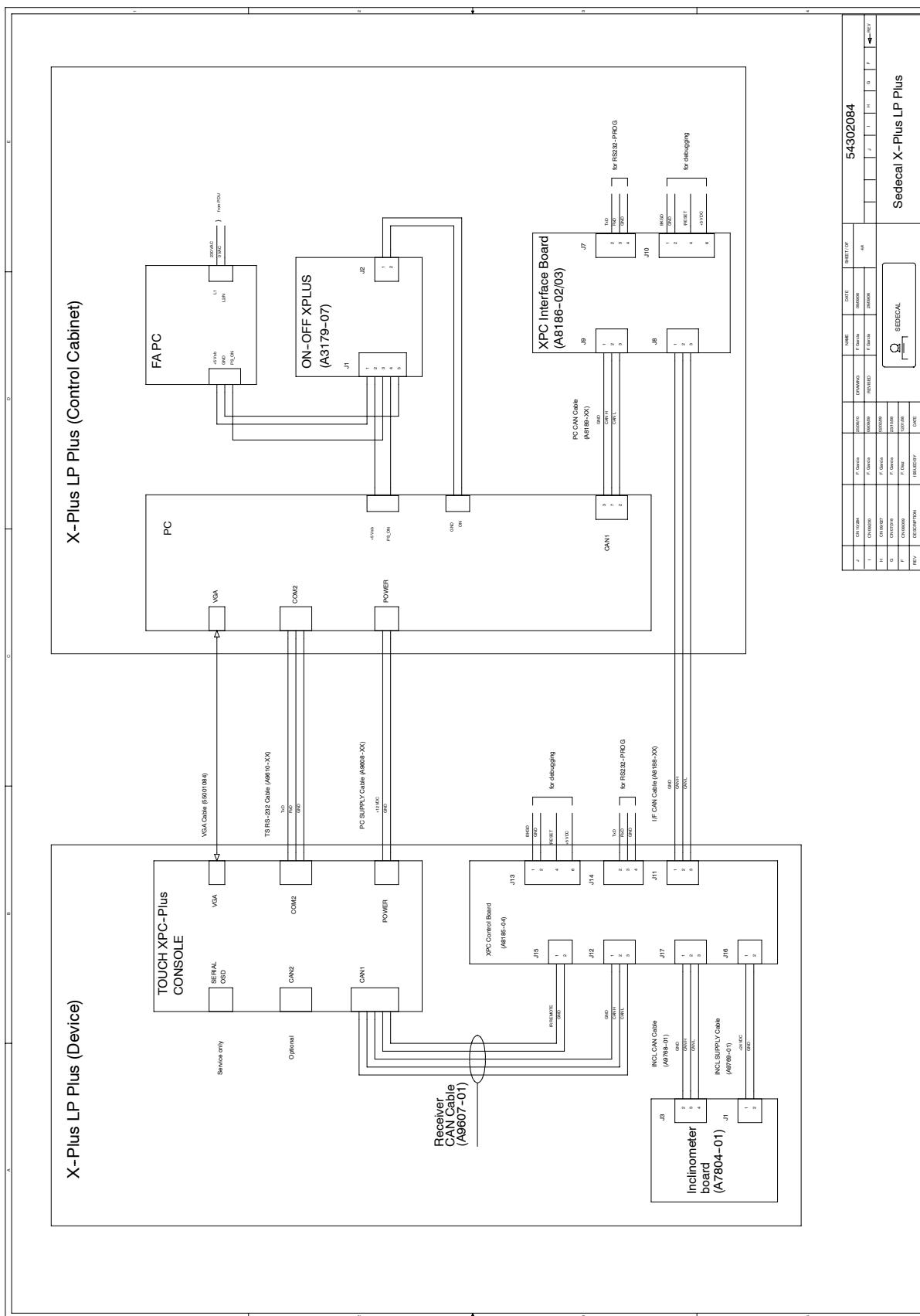












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## **SECTION 5**

## **PRODUCT CHARACTERISTICS**

This section provides information and illustrations showing physical dimensions and weight of the system components.

- Dimensions and weight of the PC
  - Height x Width x Length ..... 455.3 x 167.9 x 450.2 mm  
(17.9 x 6.6 x 17.7 ")
  - Weight ..... 19.6 kg (43.2 lb)
- Dimensions and weight of the Flat Panel Display
  - Height x Width x Length ..... 424 x 418 x 226 mm  
(16.7 x 16.5 x 9 ")
  - Weight ..... 9.7 kg (21 lb)
- Dimensions and weight of the Keyboard
  - Height x Width x Length ..... 50 x 460 x 165 mm  
(2 x 18.1 x 6.5 ")
- Dimensions and weight of the System Cabinet
  - Height x Width x Length ..... 1485 x 592 x 441 mm  
(58.5 x 23.3 x 17.3 ")
  - Weight ..... 154 kg (339 lb)
- Dimensions and weight of the Digital Detector
  - Height x Length x Width ..... 25.4 x 584 x 470 mm  
(1 x 23 x 18.5")
  - Weight ..... 7.1 kg (15.6 lb)

- Dimensions and weight of the Positioner

Maximum Height (Undertable position)	2750 mm (108.2") (includes a 145 mm [5.7"] ceiling safety margin)
Maximum Length .....	2135 mm (84")
Maximum Width .....	1680 mm (66")
Weight .....	324 kg (713 lb)

- Positioner Data

Vertical Travel of Central Carriage ...	1190 mm (46.8")
Minimum Source-Image Distance (SID)	1000 mm (40")
Maximum Source-Image Distance (SID)	1800 mm (72")
SID adjustment speed .....	87 mm/s (3.4"/s)
Rotation of Swivel Arm .....	+120° / -30° <i>(rotation may be limited by cables)</i>
Rotation of Tube-Collimator Assembly	±180° <i>(rotation may be limited by cables)</i>
Motorized Rotation of Receptor .....	±45°
Interchangeable Grids .....	100 cm (40") and 180 cm (72") 13:1 – 70 lines/cm
X-ray Absorption Factor .....	< 0.85 mm Al. equivalent

- Dimensions and weight of the Laminated Mobile Table (optional)

Height x Length x Width .....	700 x 2000 x 650 mm (27.5 x 78.7 x 25.5 ")
Weight .....	40 kg (70.5 lb)
Maximum Patient weight .....	200 kg (440 lb)
X-ray Transparency Area (L x W) ...	1880 x 528 mm (74 x 20.8 ")
X-ray Absorption Factor .....	< 1.05 mm Al. equivalent
  
- Dimensions and weight of the Carbon Fiber Mobile Table (optional)

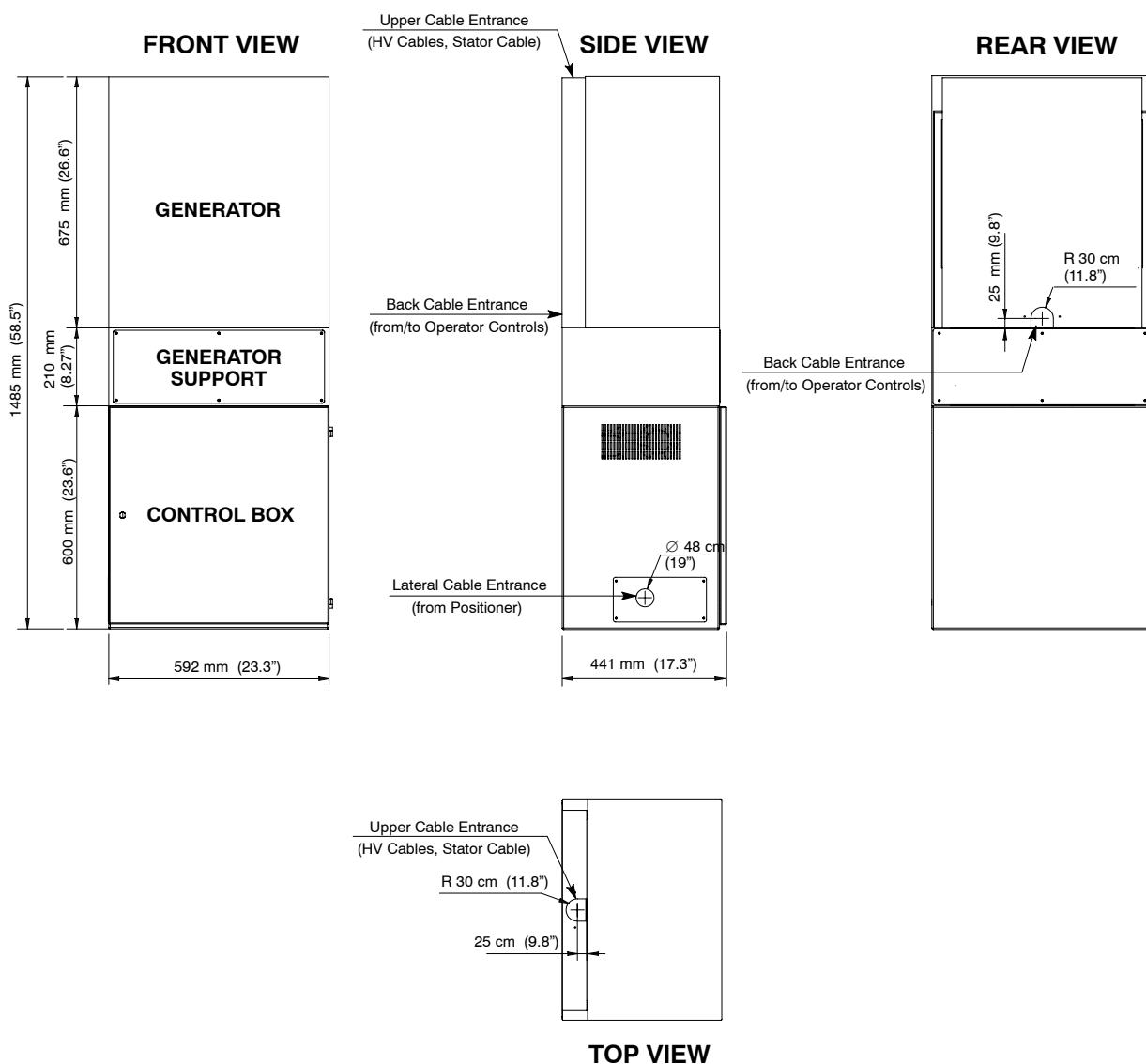
Height x Length x Width .....	700 x 2200 x 650 mm (27.5 x 86.6 x 25.5 ")
Weight .....	32 kg (70.5 lb)
Maximum Patient weight .....	200 kg (440 lb)
X-ray Transparency Area (L x W) ...	1940 x 650 mm (76.4 x 25.5 ")
X-ray Absorption Factor .....	< 1 mm Al. equivalent
  
- Dimensions and weight of the Elevating Mobile Table (optional)

Maximum Height x Length x Width ..	865 x 2265 x 620 mm (34.1 x 89.1 x 24.4 ")
Minimum Height .....	600 mm (23.6 ")
Weight .....	126 kg (277.8 lb)
Maximum Patient weight .....	225 kg (500 lb)
X-ray Transparency Area (L x W) ...	1730 x 620 mm (68.1 x 24.4 ")
X-ray Absorption Factor .....	< 1.2 mm Al. equivalent

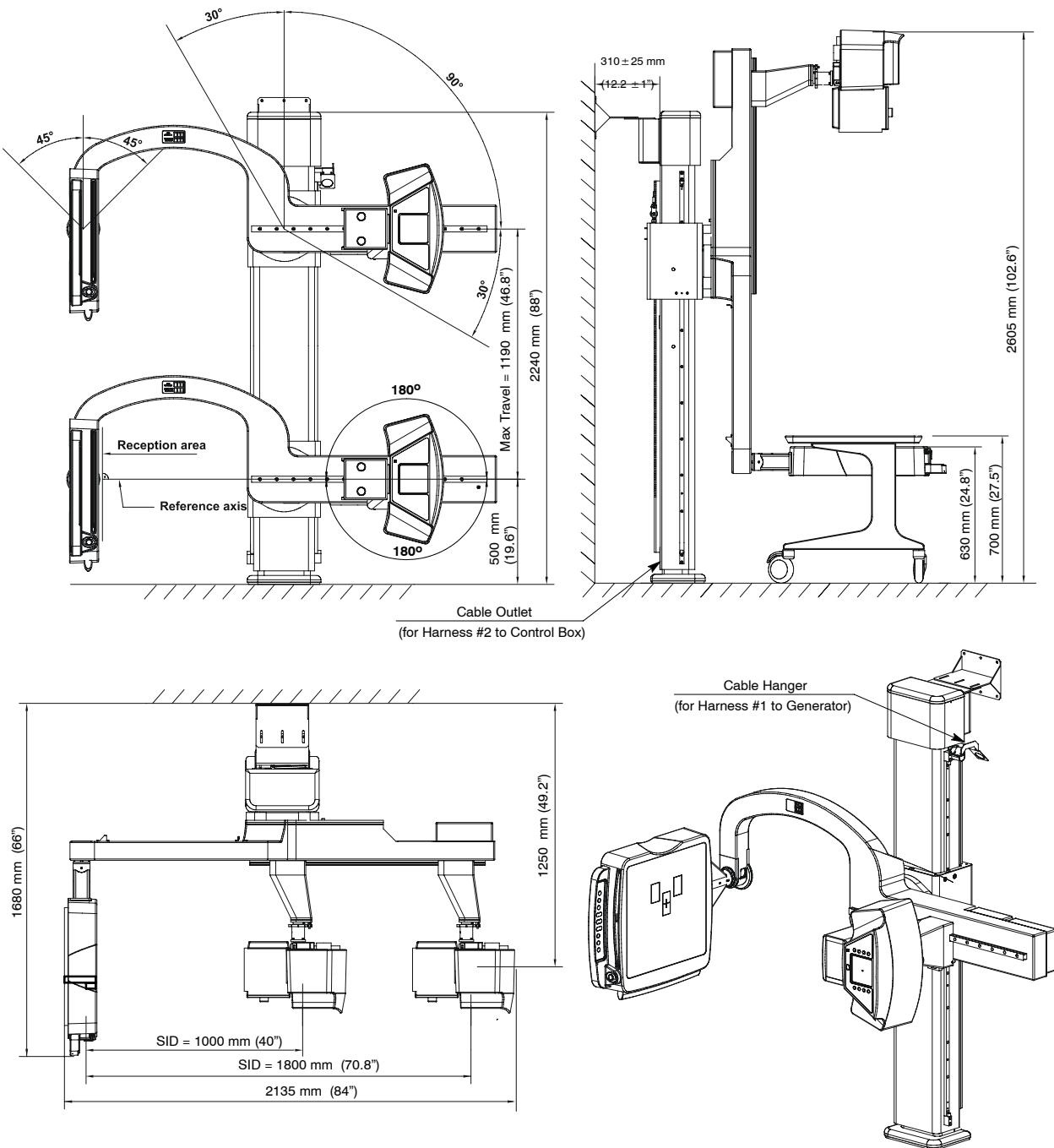
- Dimensions and weight of the Image Pasting Barrier (optional)

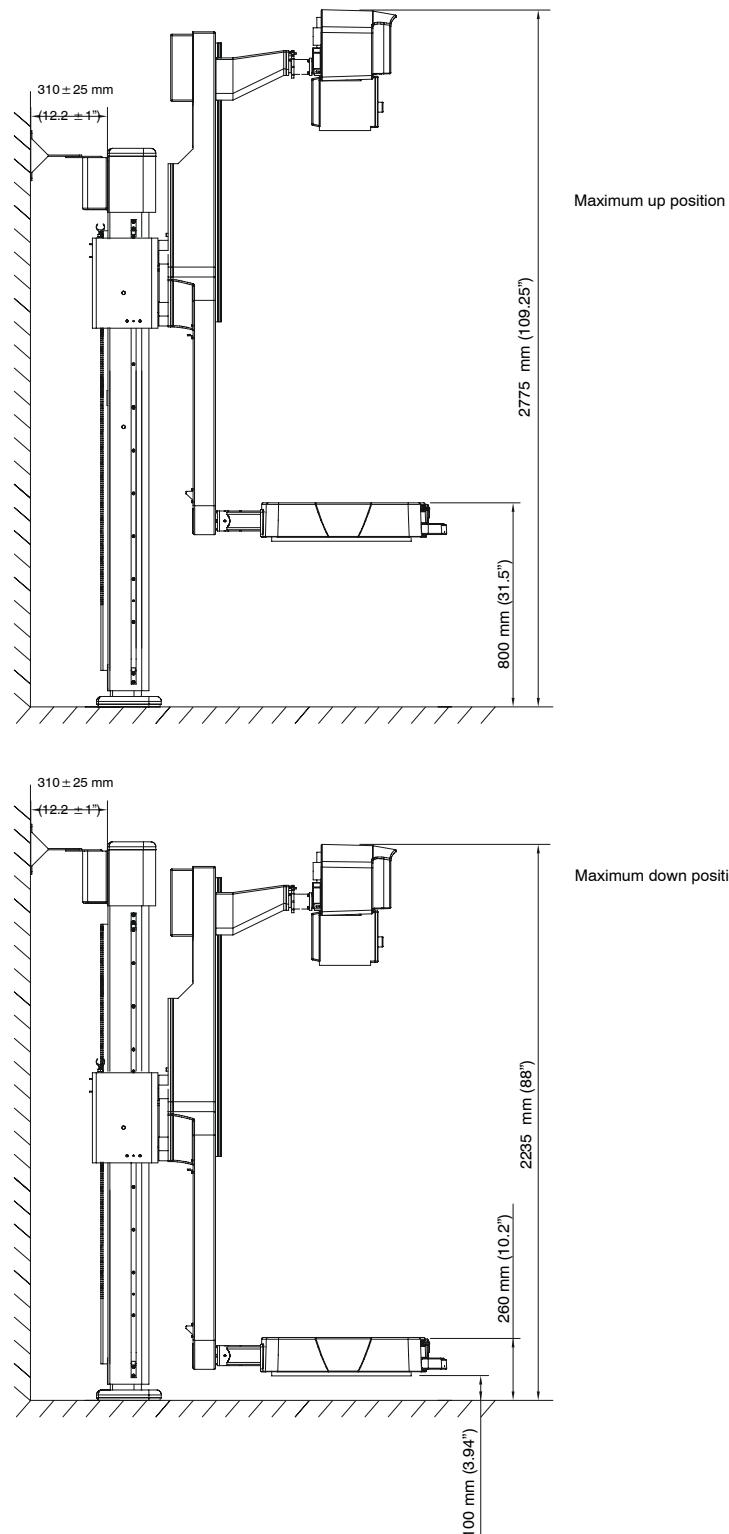
Height x Length x Width .....	2060 x 1084 x 737 mm (81.1 x 42.7 x 29 ")
Weight .....	90.7 kg (200 lb)
  
- Dimensions and weight of the Weight Bearing Stand (optional)

Height x Length x Width .....	1534 x 1372 x 819 mm (60.4 x 54 x 32.25 ")
Weight .....	55.8 kg (123 lb)

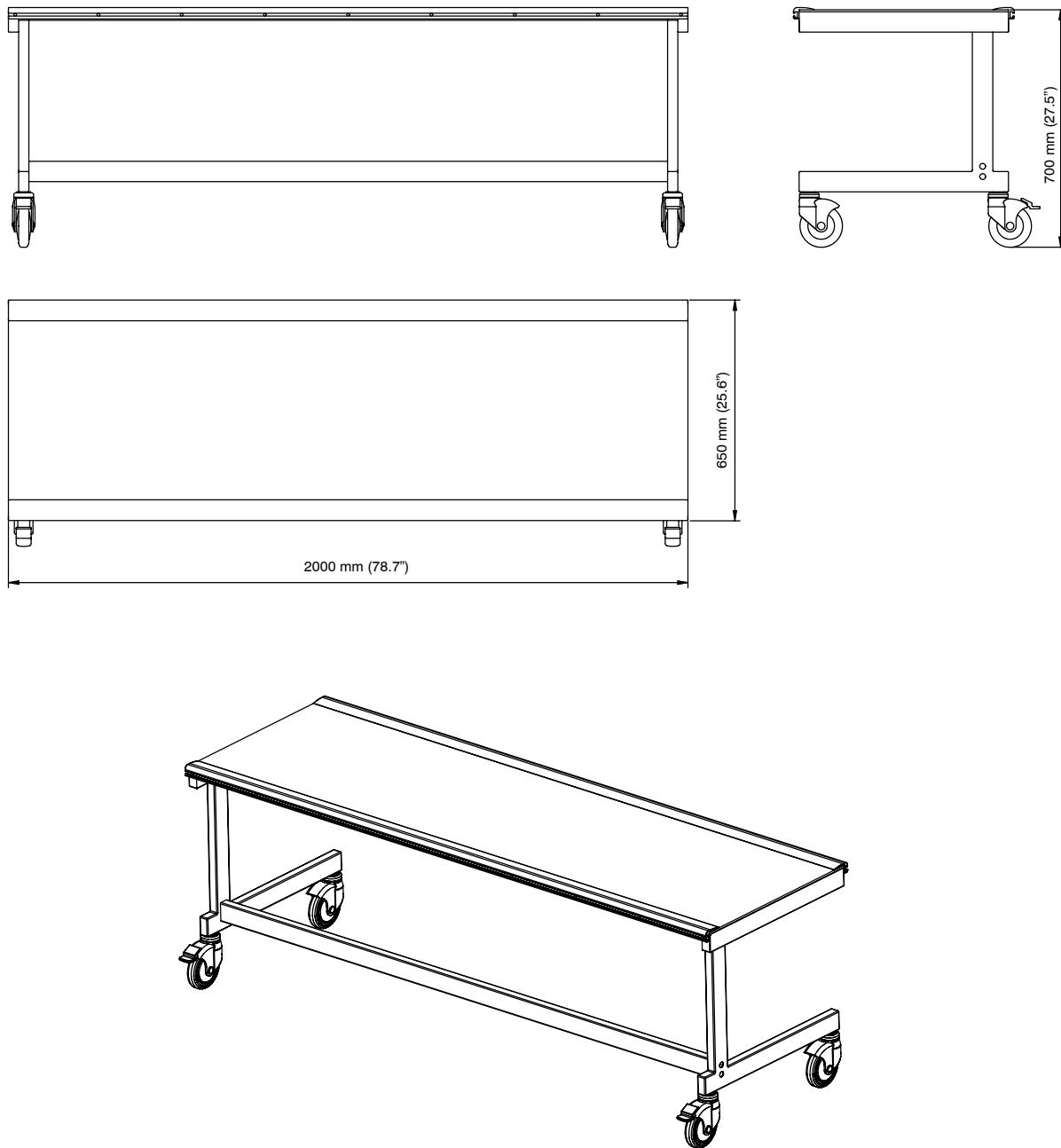
**Illustration 13**  
**Dimensions of System Cabinet**

**Illustration 14**  
**Dimensions of Positioner**

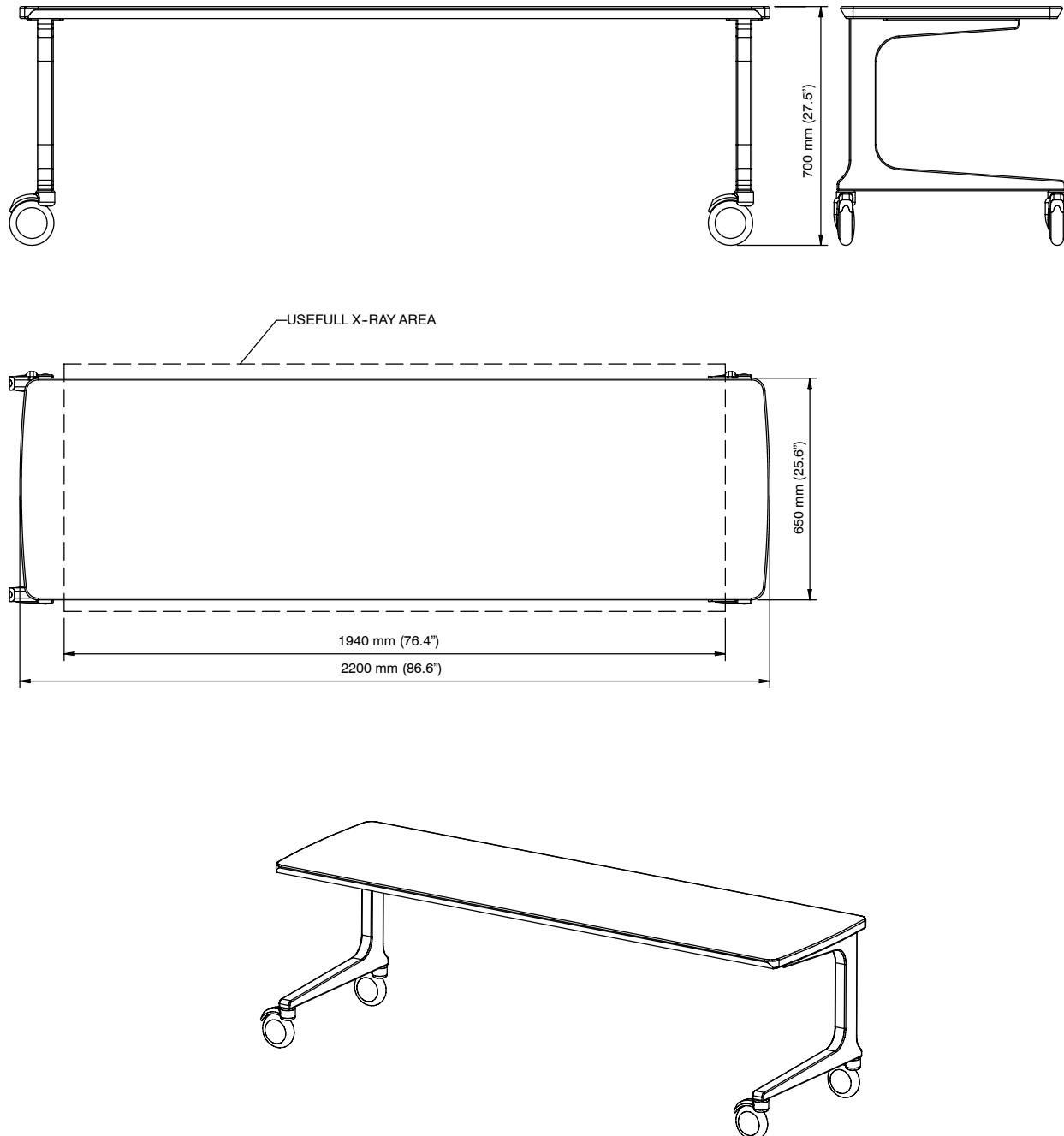


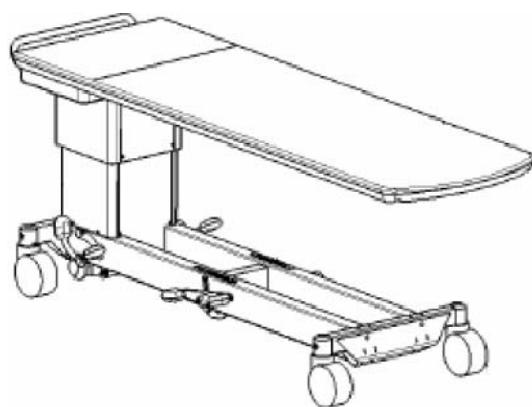
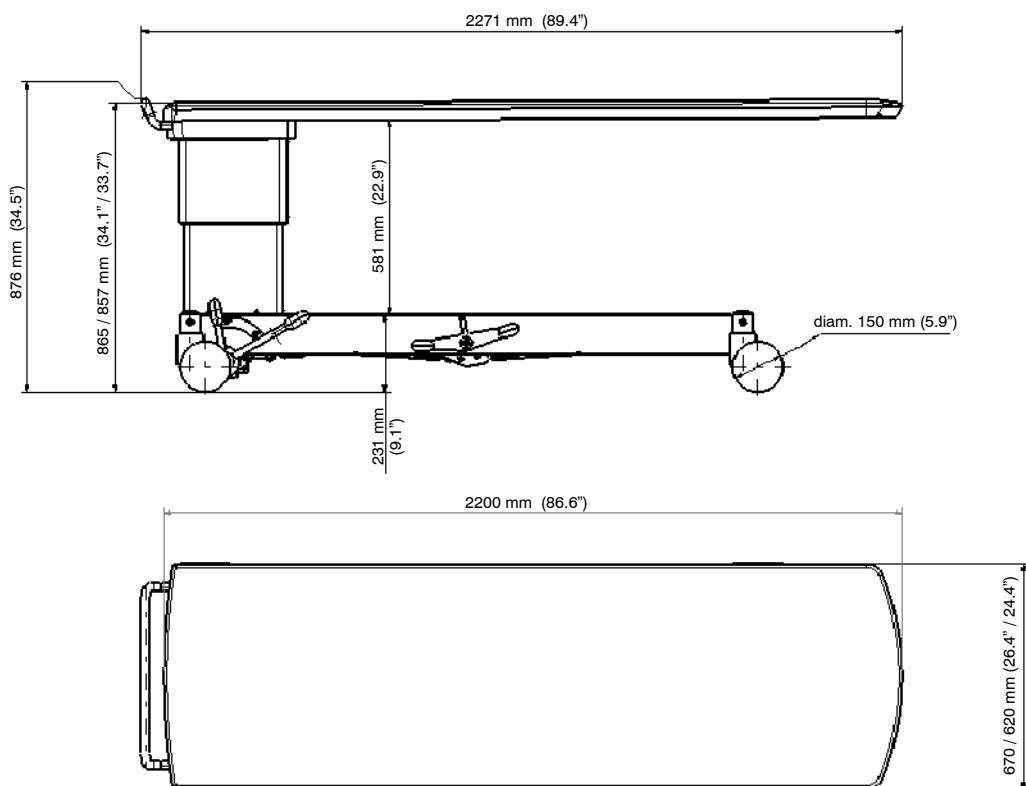
**Illustration 14 (cont.)****Dimensions of Positioner**

**Illustration 15**  
**Dimensions of Laminated Mobile Table**

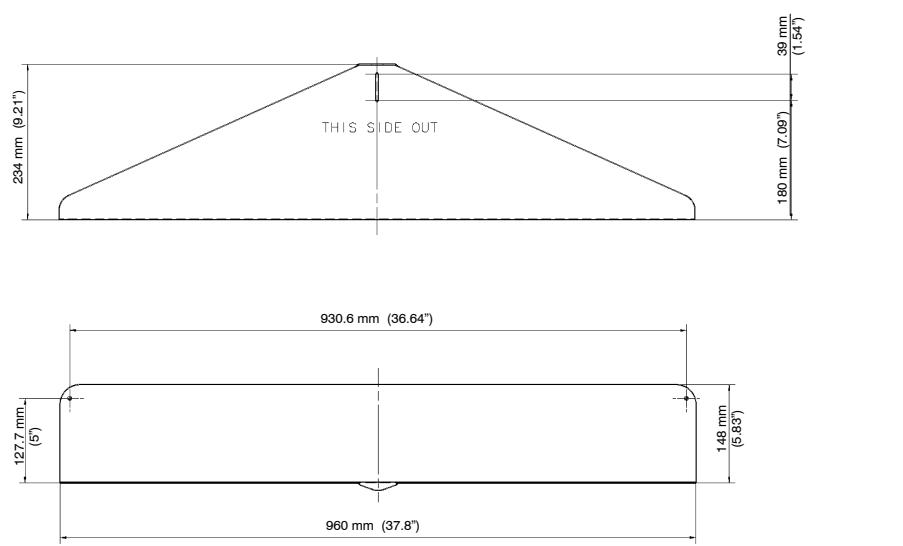
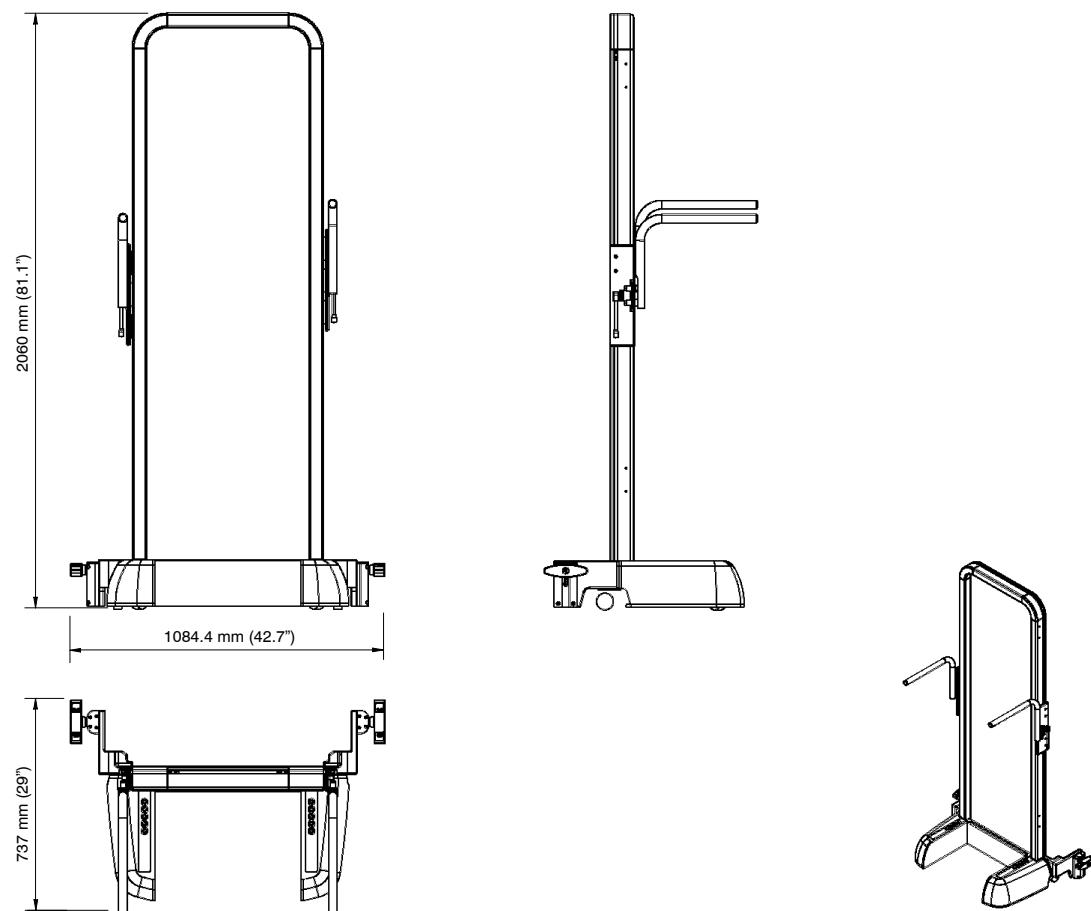


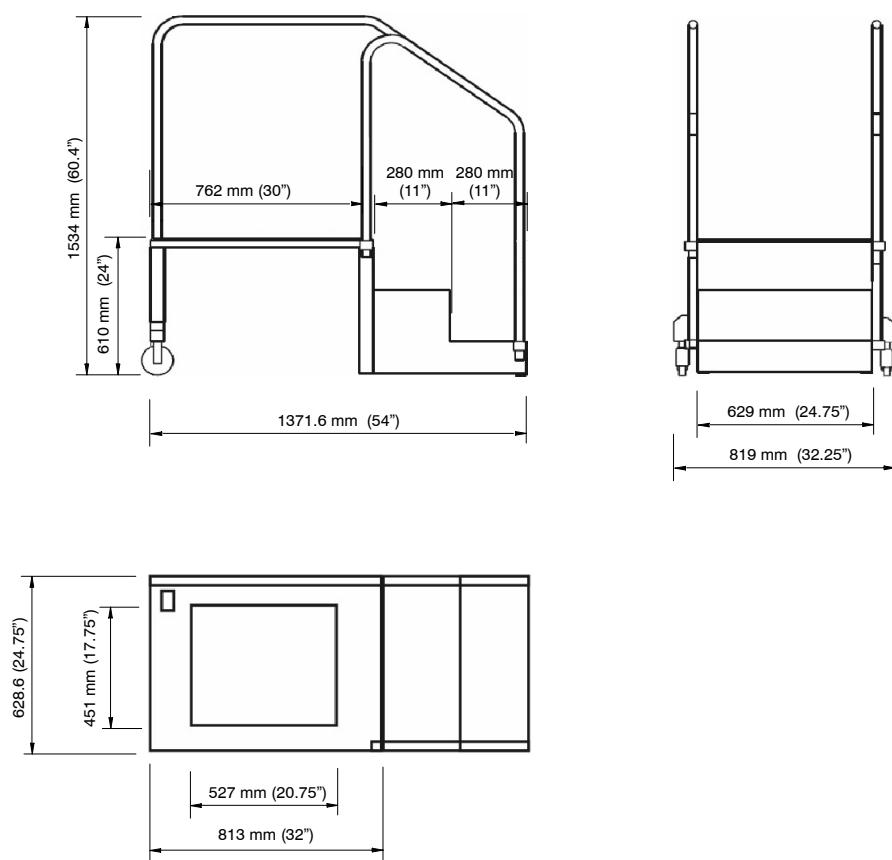
**Illustration 16**  
**Dimensions of Carbon Fiber Mobile Table**



**Illustration 17**  
**Dimensions of Elevating Mobile Table**

**Illustration 18**  
**Dimensions of Image Pasting Barrier**



**Illustration 19**  
**Dimensions of Weight Bearing Stand**

## **SECTION 6            ROOM LAYOUT**

### **6.1 RADIATION PRODUCTION**

Because X-ray equipment produces radiation, you may need to take special precautions or make special site modifications. The General Electric Healthcare Company (GEHC) does not make recommendations regarding radiation protection. It is the purchaser's responsibility to consult a radiation physicist for advisement on radiation protection in X-ray rooms.

### **6.2 CLINICAL ACCESS**

Make sure that the room is planned with the following clinical access requirements:

- Provide easy access to the Positioner. Mobile Tables and Stretchers must reach the Positioner quickly.
- Clinicians at the patient table must be able to communicate with assistants in the control area.
- Operators in the control area must have easy access to the Operator Console. However, position the controls (including handswitches) so the operator cannot take exposures while looking around or standing outside the control booth's lead glass window.
- Consult customer on the number and location of nonelectrical lines (air, oxygen, vacuum, water, etc.) in the radiographic room.

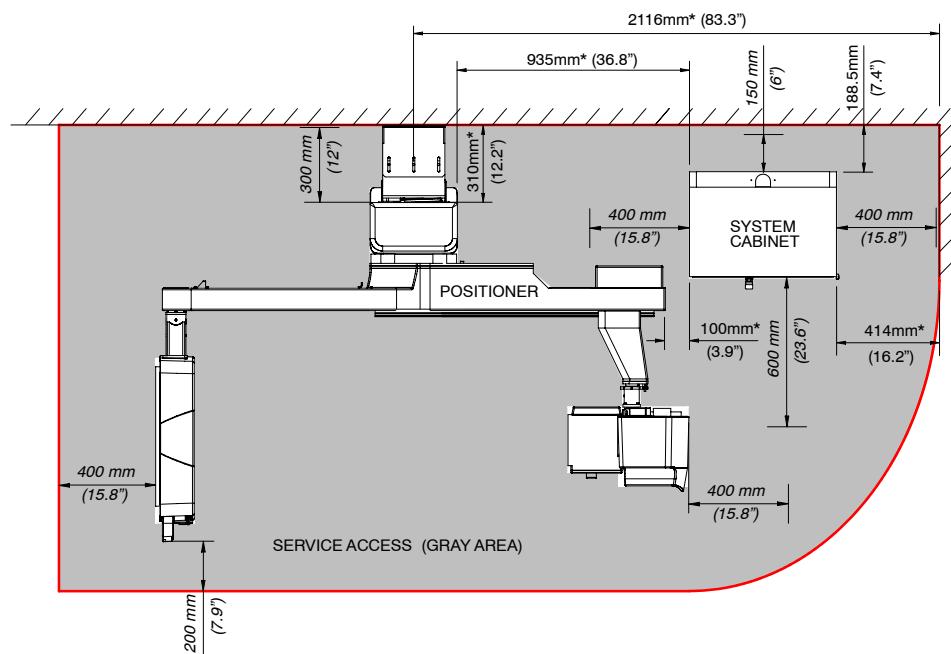
## 6.3 SERVICE ACCESS

Allow appropriate space for service access of the equipment. The minimum recommended free area for service access is:

COMPONENT	SURFACE					
	Left Side	Right Side	Front	Rear	Top	Bottom
GENERATOR - CONTROL BOX	40 cm (15.8")	40 cm (15.8")	60 cm (23.6")	- (see note)	Completely free	-
POSITIONER	40 cm (15.8")	40 cm (15.8")	20 cm (7.9")	30 cm (12")	Completely free	-
<b>NOTE:</b> Ventilation conditions require to keep a minimum free distance of 15 cm (6").						

**Illustration 20**  
**Service Access**

\* **NOTE:** Minimum distances from walls to System Cabinet and Positioner.  
The System Cabinet only can be installed at the right side of the Positioner.



## 6.4 ROOM LAYOUTS

### 6.4.1 CEILING HEIGHT LIMITATIONS

While the Definium 5000 is designed to fit into smaller rooms than an OTS digital system, the ceiling height can impact the clinical use of the system.

To ensure that the U-arm assembly will not hit the ceiling in any room, the system is calibrated with both under-table height and ceiling height information. This data limits the vertical column travel to prevent a collision with the ceiling or table.

In the event that the ceiling height is less than 2750 mm (9 ft) this calibration will prevent the full use of the vertical adjustment relative to the table resulting in an air gap between the patient barrier and the bottom of the table. The size of the air gap varies by type of table (fixed or elevating).

In any case, such an air gap is **not** clinically acceptable. See Figure, below.



2440 mm (8') room ceiling



2690 mm (8'10") room ceiling

*Examples of the air gap in a 2440 mm (8') (left) and 2690 mm (8'10") (right) ceiling room.*

*The photo on the right shows little air gap, but the vertical column height adjustment is 76 mm (3") short of maximum. This in turn means that seated patients will still be slightly uncomfortable and mal-positioned.*

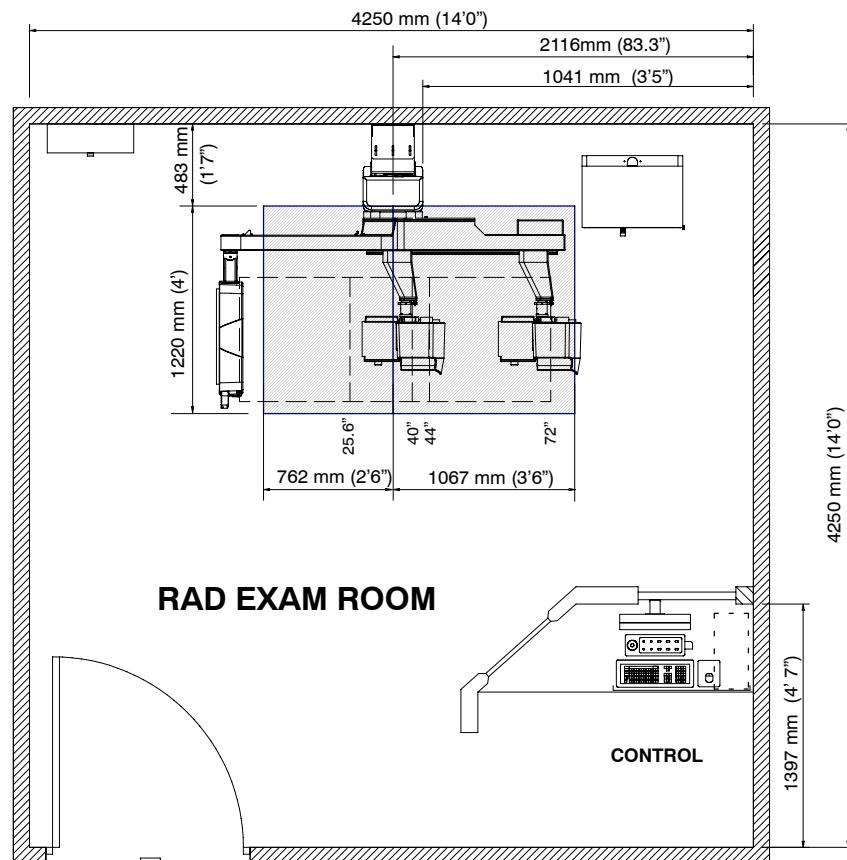
Additionally, the maximum height from the floor to the detector can be low for extremity imaging. A seated patient may find it too low to be comfortable for an exam.

**The minimum height of the ceiling over the U-arm is 2750 mm (9 ft).**

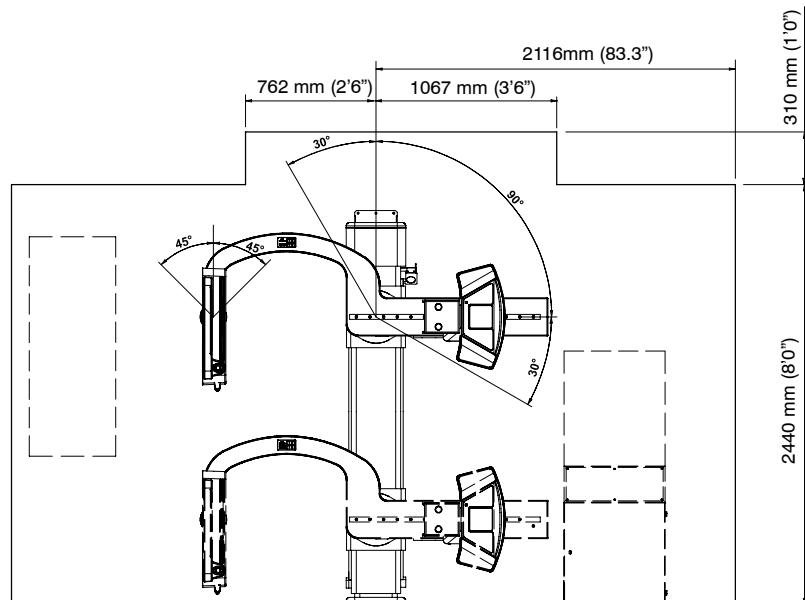
This means that either the entire room ceiling height is 2750 mm (9 ft), or, as shown in Illustration 21, the section of the ceiling directly over the planned positioner location can be raised to meet this requirement. Even an existing room with a ceiling height of 2440 mm (8 ft) or less could be used, so long as a 1830 mm x 1220 mm (6 ft x 4 ft) section of the ceiling, as dimensioned in Illustration 21, is raised to 2750 mm (9 ft) thus allowing the unit to fit in the room and perform all movements as designed.

Contact Site Planning for a review of your customer's room layout to determine if this solution, or one similar, is feasible.

**Illustration 21**  
**Room Layout**



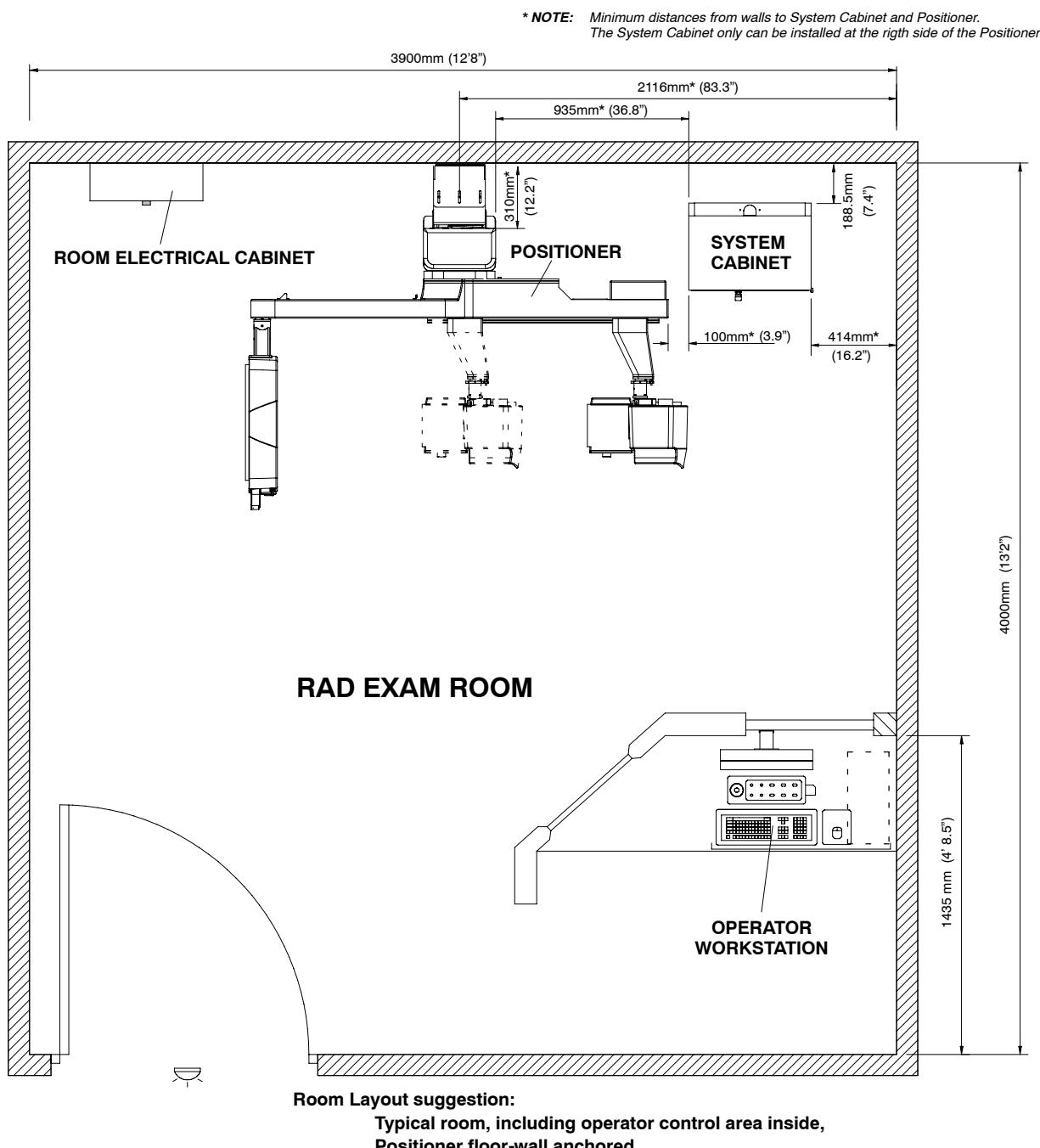
TOP VIEW: ABSOLUTE MINIMUM HEIGHT OF 2750 mm (9'0") IS REQUIRED ABOVE POSITIONER, AS SHOWN IN THE HATCHED SECTION.

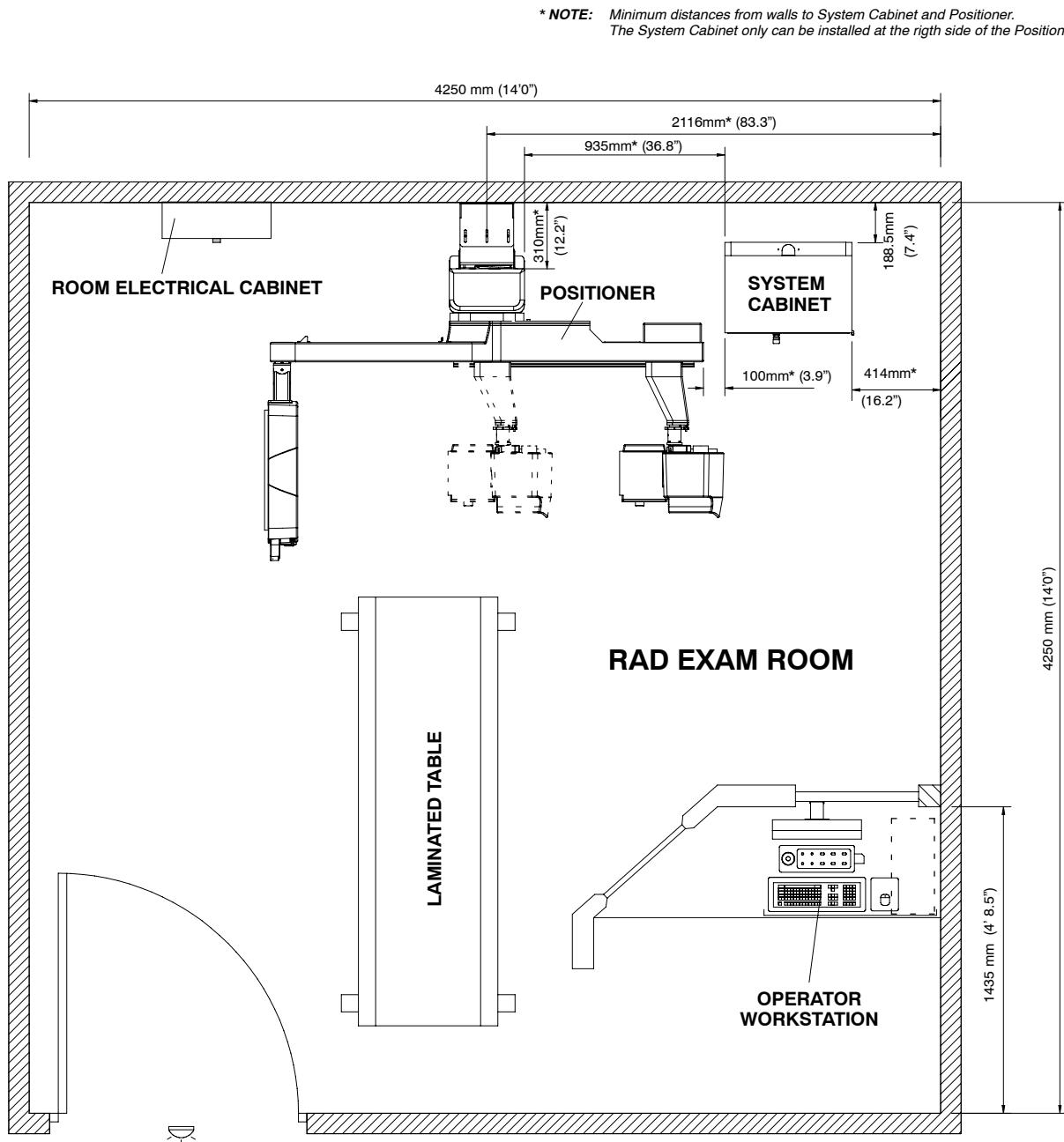


ELEVATION VIEW: ABSOLUTE MINIMUM HEIGHT OF 2750 mm (9'0") IS REQUIRED ABOVE POSITIONER, AS SHOWN.

## 6.4.2 POSSIBLE ROOM LAYOUTS

**Illustration 22**  
**Room Layout**



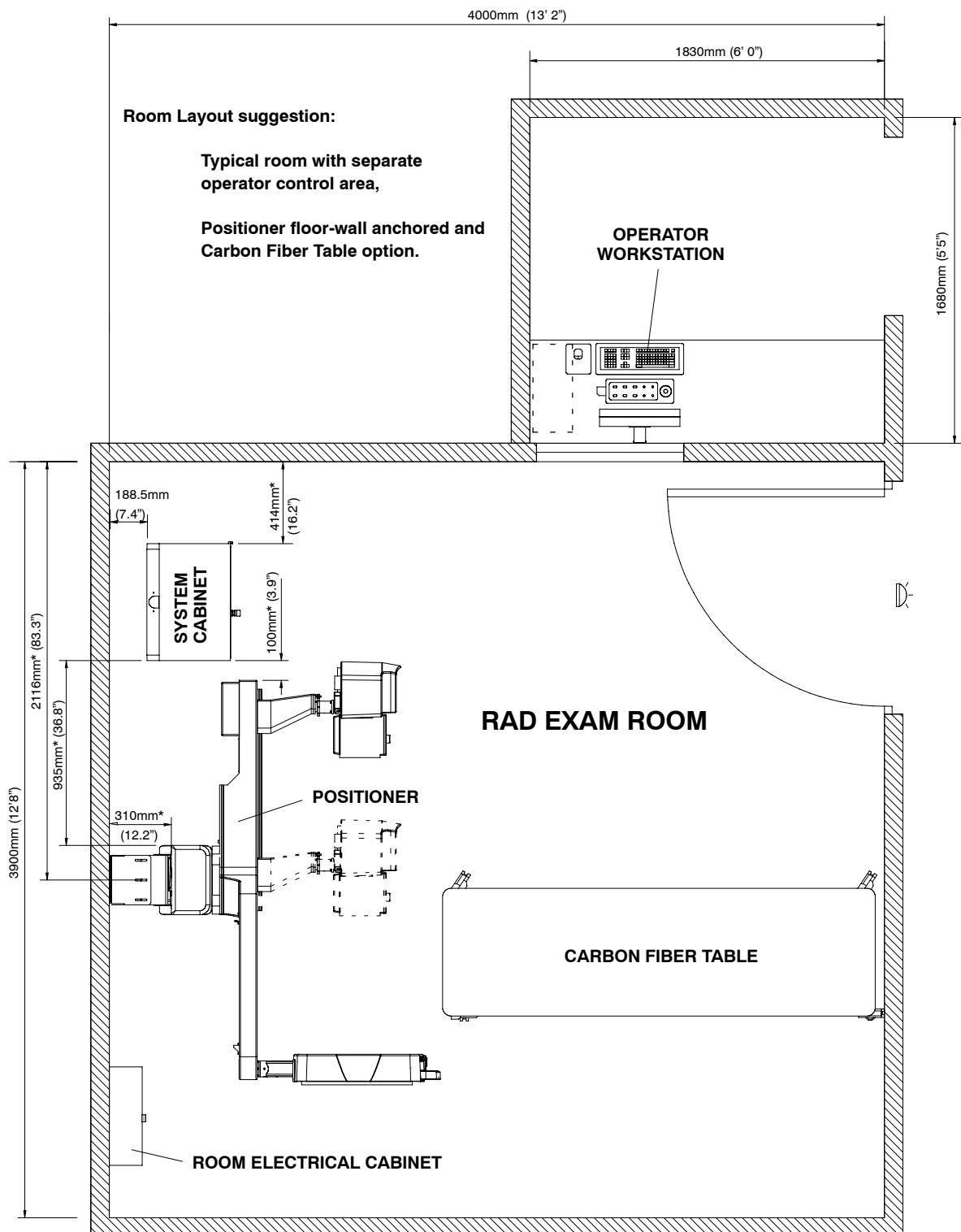
**Illustration 23**  
**Room Layout****Room Layout suggestion:**

Typical room including operator control area inside,  
Positioner floor-wall anchored and Laminated Table option.

## Illustration 24

### Room Layout

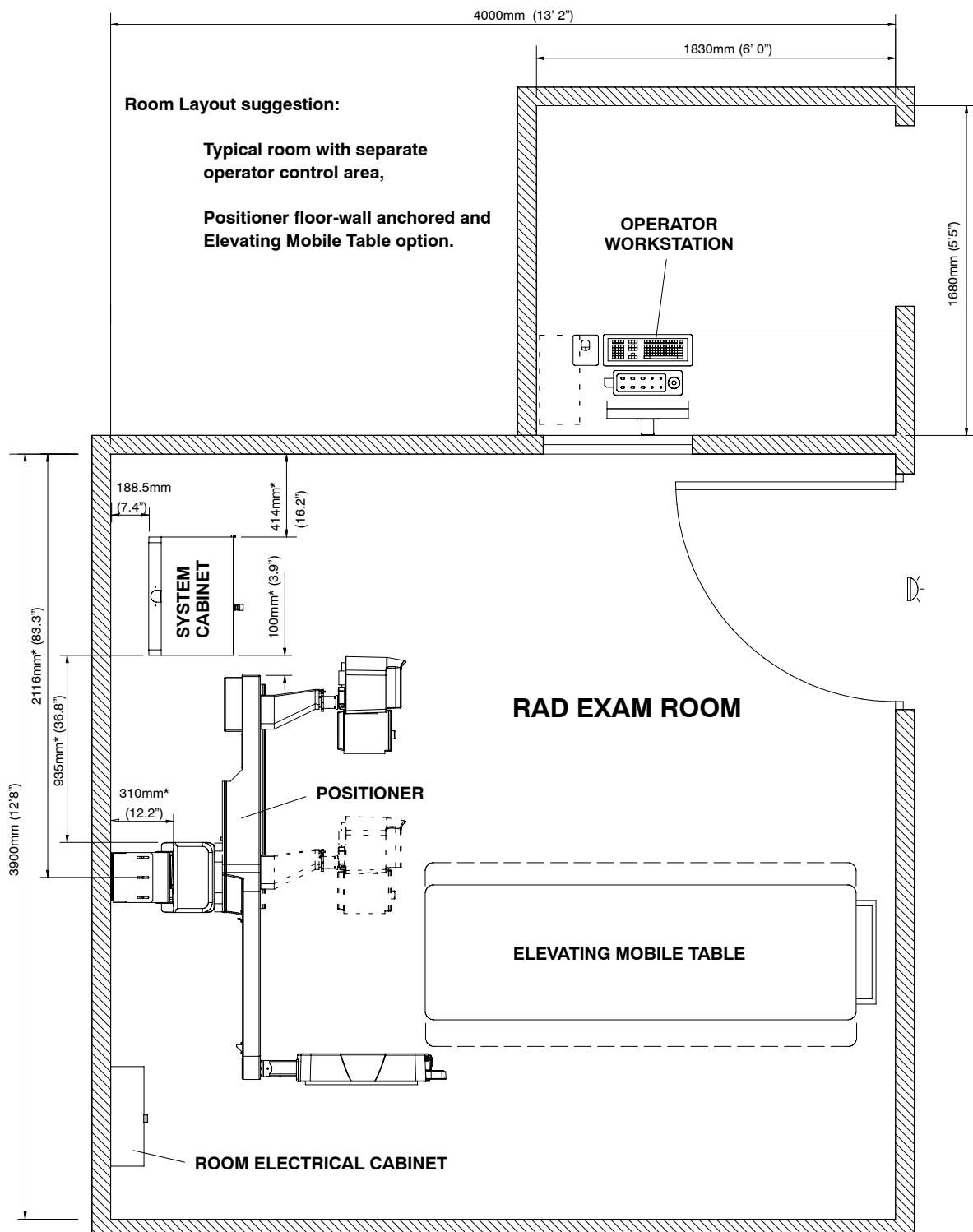
\* NOTE: Minimum distances from walls to System Cabinet and Positioner.  
The System Cabinet only can be installed at the right side of the Positioner.

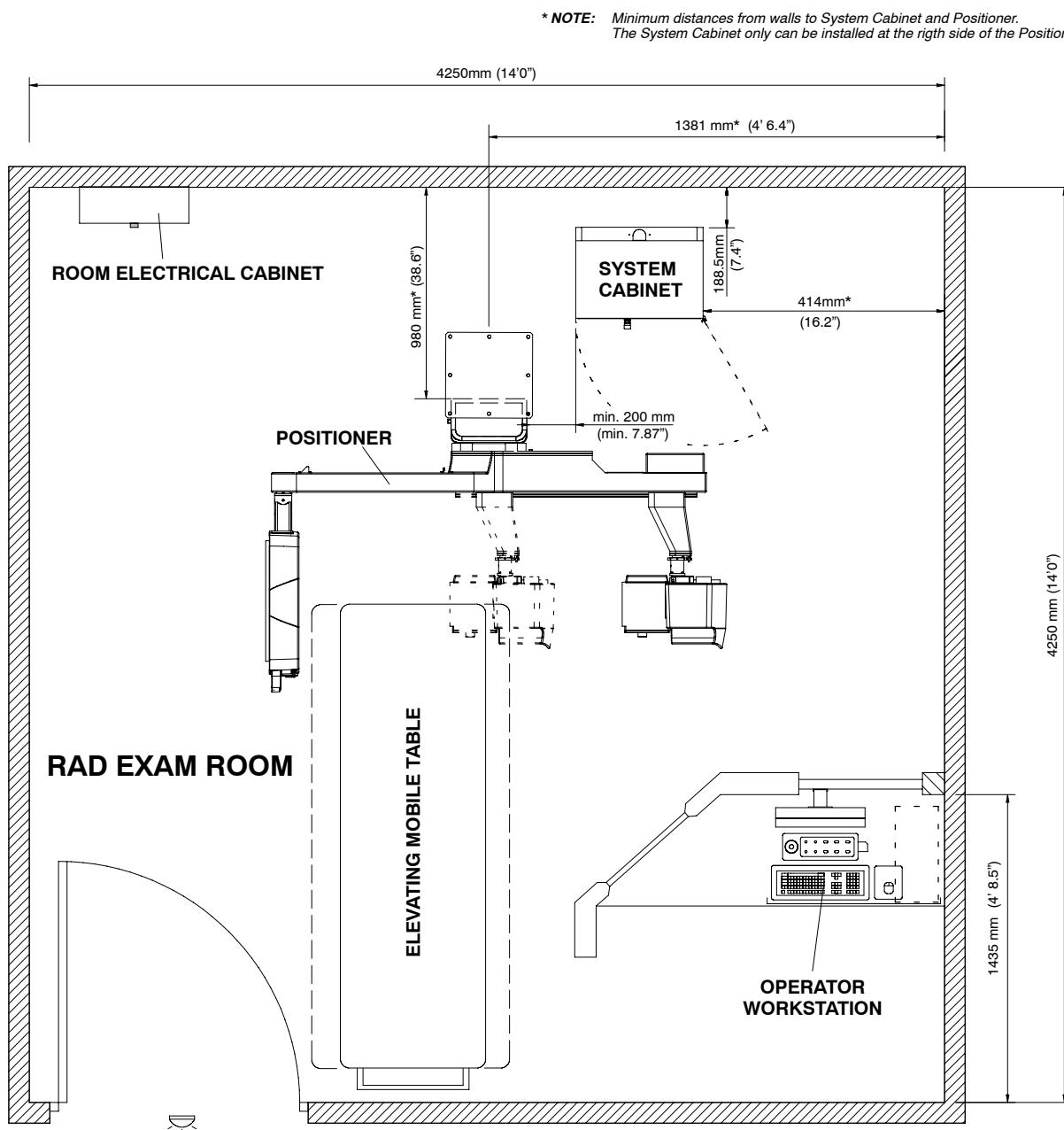


## Illustration 25

### Room Layout

\* NOTE: Minimum distances from walls to System Cabinet and Positioner.  
The System Cabinet only can be installed at the right side of the Positioner.



**Illustration 26**  
**Room Layout****Room Layout suggestion:**

Typical room including operator control area inside,  
Positioner floor-ceiling anchored and Elevating Table option.

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## SECTION 7 PLANNING AIDS

### 7.1 SHIPPING DIMENSIONS AND WEIGHTS

PRODUCT OR COMPONENT (CRATE #)	HEIGHT	LENGTH	WIDTH	GROSS WEIGHT	NET WEIGHT
Positioner, X-Ray Tube, Detector Assembly and other components (Crate 1)	105 cm (41")	230 cm (90.5")	87 cm (34")	584 kg (1287 lb)	501 Kg (1104 lb)
System Cabinet (Crate 2)	190 cm (75")	112 cm (44")	82 cm (32")	239 kg (526.9 lb)	172.5 Kg (380.2 lb)
Laminated Mobile Table (optional) (Crate 3)	13 cm (5.1")	228.5 cm (90")	88.5 cm (34.6")	74.5 kg (164 lb)	40 kg (88 lb)
Carbon Fiber Mobile Table (optional) (Crate 3)	23 cm (9")	230 cm (90.5")	77 cm (30")	70 kg (154 lb)	32 kg (70.5 lb)
Elevating Mobile Table (optional) (Crate 3)	97 cm (38.2")	241 cm (94.9")	86 cm (33.8")	240 kg (540 lb)	129 kg (284.4 lb)
Image Pasting Barrier (optional)	127 cm (50")	244 cm (96")	94 cm (37")	282 kg (625 lb)	90.7 kg (200 lb)
Weight Bearing Stand (optional)	109 cm (43")	208 cm (82")	91 cm (36")	104 kg (231 lb)	55.8 kg (123 lb)
Digital Detector (Box)	91.5 cm (36")	119.4 cm (47")	63.5 cm (25")	22.7 kg (50 lb)	7.1 kg (15.6 lb)

### 7.2 TOOLS AND EQUIPMENT CHECKLIST

TOOLS AND EQUIPMENT CHECKLIST	COMPLETED
<i>The following tools and materials are needed for installation but are not shipped with the product.</i>	
Standard service engineer's tool kit.	
Assorted 12-point sockets (SAE and metric), drives, wrenches, and torque wrench (Nm and ft.-lbs), including a reversible ratchet with socket set.	
Electric and hammer drill. Assorted masonry and high-speed bits in both metric and SAE sizes	
Assorted sizes of tongue and grove pliers, hammers, hex wrenches (metric and SAE), screw drivers, and metal files	
Wall / Ceiling and Floor anchoring hardware ( <i>Hilti KB-III</i> )	
Assorted hardware for termination of electrical connections	
Assorted sizes of wire cutters and strippers, ratchet and standard crimpers, and a 75-watt soldering iron	
Tie wraps, heat and electrical tape, and wire markers	
Tags for labeling incomplete work according to regulatory requirements	
Lock-Out and Tag-Out equipment	
Movers, dollies, ladders, shop vacuum, and push-broom	

## 7.3 PREPARING THE DELIVERY ROUTE

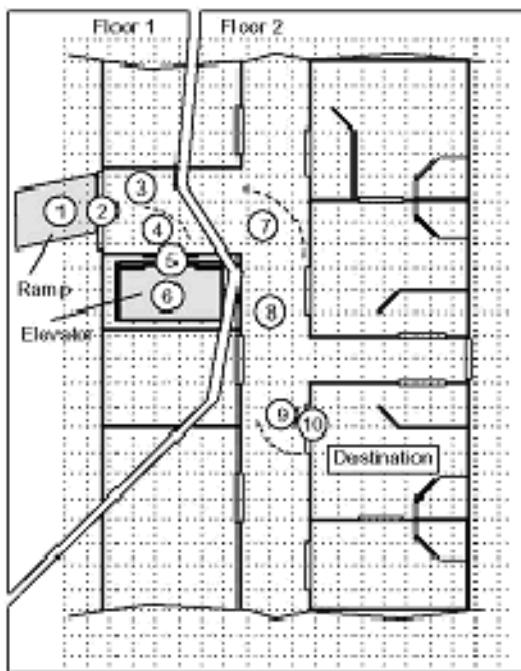
**Note** 

Refer to Section 2.2.2, "Door Size Requirements," for more information about the crated / uncrated dimensions and weights of the Components.

### 1. Sketch out the Route.

Begin preparing a Route Survey by sketching the area of the hospital or clinic which will receive the equipment. Include all areas on the delivery route from outside of the building to destination. See the sample sketch below.

**Illustration 27**  
**Sample Route**



*Reference Numbers:*

*Numbers in circles refer to the Route Survey data.*

*The Route Survey is a form on which site data is listed (step 2).*

### 2. Survey the Route.

Record all loading capacities, corridor widths, door openings, turning radii, flooring materials, elevator sizes, obstructions, and so on for reference.

### 3. Check the Route.

Verify that the equipment can actually be transported via the route determined in step 1.

## 7.4 PRE-INSTALLATION CHECKLIST

**Delivery Date:****Sales Person:****Customer:****GNO / FDO No.:****Room #****Equipment:****PHYSICAL REQUIREMENTS OF SITE****COMPLETED**

1. Room size adequate for intended equipment configuration?
2. Floor, wall, and ceiling are strong enough for intended equipment and mounting methods approved - seismic regulatory codes considered?
3. Delivery route accommodates all intended equipment?
4. Radiation physicist consulted?
5. Necessary alterations made to circumvent obstructions?
6. Modifications to room finished?
7. Supports, platforms, wall - ceiling materials have been provided?
8. Support structures installed for floor, ceiling, and wall mounted equipment?
9. Wall - ceiling supports leveled?
10. Has floor been modified for cable ducts?
11. Electrical service in place - at the ratings specified in Pre-Installation documentation?
12. Power available to operate power tools?
13. All non-electrical lines (air, water, oxygen, vacuum) installed?

**INTERCONNECTIONS****COMPLETED**

1. Signal cable, power, and grounding plans produced?
2. Necessary interconnection hardware, such as junction boxes, conduit or raceways, and fittings, provided?
3. Interconnection hardware installed?
4. Flexible, stranded wire provided for System input power connection?
5. System "feeder" power cables pulled and sufficient length available at disconnect box for connections?
6. Interconnecting cables continuity checked, and labeled?
7. All high voltage cable lengths verified?
8. Interface information available for equipment?

**GENERAL****COMPLETED**

- |  |                          |
|--|--------------------------|
| 1. Ceiling, walls, and floor clear of all obstructions?  | <input type="checkbox"/> |
| 2. Walls finished?   | <input type="checkbox"/> |
| 3. Finished floor installed?   | <input type="checkbox"/> |
| 4. Room lights installed?  | <input type="checkbox"/> |
| 5. Dust-creating work completed?   | <input type="checkbox"/> |
| 6. Old equipment within room removed?  | <input type="checkbox"/> |
| 7. Component positions clearly marked on floor?  | <input type="checkbox"/> |
| 8. Space available to store equipment?   | <input type="checkbox"/> |
| 9. Lock on door, or locked room available?   | <input type="checkbox"/> |
| 10. Room IP Addresses for DICOM and Broadband identified?  | <input type="checkbox"/> |
| 11. Broadband connection provided for InSite connection?<br>OR<br>If Broadband connection will not be used, is dedicated inbound "dialup" phone line provided for InSite connection? | <input type="checkbox"/> |
| 12. Voice phone line connection provided?  | <input type="checkbox"/> |
| 13. Have all fire/safety inspections for occupancy been completed?   | <input type="checkbox"/> |
| 14. Send completed checklist to the GE Healthcare installation team.   | <input type="checkbox"/> |

**COMMENTS**

---

**INSPECTION DATE(S)**

---

**INSTALLATION PROJECT MANAGER SIGNATURE**

---

## 7.5 CUSTOMER NETWORK FLOW AUDIT

### 7.5.1 DEFINIUM 5000 NETWORK AUDIT CHECKLIST

**Who:** Sales Manager/Rep and Installation Project Leader (IS).

**What:** Networking and workflow assessment of the customer's Printers, PACS, and HIS/RIS. All networking configuration information to be documented in the survey.

**When:** Pre-Installation.  
Completed checklist to be sent to the Application Specialist and the Primary FE at least seven (7) days prior to the start of Installation.

Understanding how your facility leverages its network investment through our Network flow process will help better integrate the Definium 5000 system into your operations. The following is intended to identify the various ways the Definium 5000 system can fit into your workflow and the ramifications of selecting one path or another. We would like to start at the beginning, with the patient arriving at your facility, going through registration/admittance/patient scheduling, and proceed all the way to the read images being archived.

### 7.5.2 WHAT IS THE NETWORK FLOW AUDIT?

This audit was designed to collect information on your network, your DICOM equipment, your workflow, and your data flow. Once this information is collected, it will be used to ease and speed the Installation of the system into your facility.

You should fill this out with the GE Healthcare representative. The representative will be able to answer any questions you may have.

#### Facility Information

Facility Information			
Name of facility:		Room #:	
Workflow contact:		Phone:	
Network Infrastructure contact:		Phone:	
DICOM Device contact:		Phone:	
Other contact:		Phone:	
GEMS Sales Representative:			
GEMS Auditor:			

### 7.5.3 WORKFLOW ANALYSIS

1. When the patient arrives in the Definium 5000 system room for the exam, how is the patient data entered into the system?  
 Manually typed  
 Entered via barcode reader  
Barcode format: \_\_\_\_\_  
 Downloaded from HIS/RIS
2. If the patient information was downloaded from a HIS/RIS system, how would the query be structured? (Pick all that apply)  
 By date  
 By modality  
 By patient information  
 By procedure  
 By product (AE Title)  
 Other method – Please explain:  
\_\_\_\_\_
3. In retrieving patient schedule information, do you query  
 Once at the start of the shift  
 Several times during a shift  
 Before each patient
4. What percent of the images acquired are reviewed via softcopy? \_\_\_\_ %
5. What percent of the images acquired are printed? \_\_\_\_ %
6. Once the digital diagnostic images are acquired, what is your facility's default workflow? (Pick one [1])  
 Manually send  
 Automatically push  
  
(Pick all that apply)  
 Review station(s)  
 Archive system(s)  
 Printer(s)
7. When images are configured for automatic push, what would you like to be sent to PACS/archive/review stations?  
 Raw  
 Processed  
 Raw and Processed

8. When images are printed, on what device is the print command originated? (Pick all that apply)  
 The Definium 5000 system  
 A review workstation  
 A PACS system
9. How soon after the images are acquired is the first image quality check done?  
 Before the next image is shot  
 Before the patient leaves  
 After the patient leaves
10. When it comes to image quality, would you prefer to;  
 Consider all images good unless marked bad  
 Consider all images bad unless marked good

#### **7.5.4 THE PHYSICAL NETWORK**

Physical infrastructures vary widely from institution to institution. GE Healthcare tried to pick the most popular networking connection to ease integration into your facility's network.

1. In the Definium 5000 system room, this facility;  
 Has 100baseT installed  
 Has 10baseT installed  
 Has a different network installed  
 Will have 100baseT installed  
 Will have 10baseT installed  
 We don't have a network installed
2. Do you segment your network using subnets?  
 Yes       No
3. Our equipment's IP addresses are:  
 Static  
 Acquired via DHCP  
 A combination of both methods

### 7.5.5 DEFINIUM 5000 SYSTEM PARAMETERS

Definium 5000 System	
Host Name:	
Network (IP) Address:	----- . ----- . ----- . -----
Subnet Mask:	----- . ----- . ----- . -----
Router IP:	----- . ----- . ----- . -----
Scheduled Station AE Title:	

**Host Name:** The Host Name is the network's name for the Definium 5000 system.

**IP address** IP addresses uniquely identify a device on a network. IP addresses are constructed of 32 bits, usually displayed as four (4) numbers separated by a period. Please indicate the Network (IP) Address that will be assigned to the Definium 5000 system.

**Subnets** Subnets are a method of logically dividing a network into smaller blocks. This is usually done based upon locality, functionality, or security requirements. If your facility will place the Definium 5000 system on a subnet, please list the Subnet Mask and Router IP.

**Scheduled Station** The Scheduled Station AE (Application Entity) Title is the name your HIS/RIS system will use to send worklist information to the Definium 5000 system.

## 7.5.6 REMOTE HOSTS

<b>Remote Hosts</b>		<i>Include a DICOM Compliance Statement for each device</i>			
This remote Host is a:	<input type="checkbox"/> Review Work Station <input type="checkbox"/> Archival Device <input type="checkbox"/> PACS System <input type="checkbox"/> MPPS Server	<input type="checkbox"/> Review Work Station <input type="checkbox"/> Archival Device <input type="checkbox"/> PACS System <input type="checkbox"/> MPPS Server	<input type="checkbox"/> Review Work Station <input type="checkbox"/> Archival Device <input type="checkbox"/> PACS System <input type="checkbox"/> MPPS Server	<b>Information on Definium 5000</b>  The system allows you to configure only one (1) HIS/RIS server.  The system allows you to configure only one (1) MPPS server.  The system allows configuration of multiple printers and multiple PACS/archive/review stations.  The Host Name of all the nodes configured on the system should be unique within the system.	
Manufacturer/Model:					
Software/Firmware version:					
Network (IP) Address:	-----	-----	-----		
DICOM Compliance Level:	<input type="checkbox"/> 1.0 <input type="checkbox"/> 2.0 <input type="checkbox"/> 3.0 <input type="checkbox"/> Not DICOM Compliant	<input type="checkbox"/> 1.0 <input type="checkbox"/> 2.0 <input type="checkbox"/> 3.0 <input type="checkbox"/> Not DICOM Compliant	<input type="checkbox"/> 1.0 <input type="checkbox"/> 2.0 <input type="checkbox"/> 3.0 <input type="checkbox"/> Not DICOM Compliant		
Image Types Supported:	<input type="checkbox"/> DX <input type="checkbox"/> CR <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> DX <input type="checkbox"/> CR <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> DX <input type="checkbox"/> CR <input type="checkbox"/> Yes <input type="checkbox"/> No		
Supports Multi-framing:					
Host Name:	-----	-----	-----		
Do you plan to use this device as a:					
<b>Remote Host Server?</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: AE Title: Port Number:	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: AE Title: Port Number:	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: AE Title: Port Number:		
<b>Query/Retrieve?</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: Query/Retrieve AE Title: Port Number:	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: Query/Retrieve AE Title: Port Number:	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: Query/Retrieve AE Title: Port Number:		
Query/Retrieve by:	<input type="checkbox"/> Study <input type="checkbox"/> Patient	<input type="checkbox"/> Study <input type="checkbox"/> Patient	<input type="checkbox"/> Study <input type="checkbox"/> Patient		
<b>Storage Commitment?</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: Storage Commitment AE Title: Port Number:	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: Storage Commitment AE Title: Port Number:	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: Storage Commitment AE Title: Port Number:		
Network (IP) Address:	-----	-----	-----		
<b>MPPS Server?</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: AE Title: Port Number:	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: AE Title: Port Number:	<input type="checkbox"/> Yes <input type="checkbox"/> No; If "yes" provide: AE Title: Port Number:		
Network (IP) Address:	-----	-----	-----		

### 7.5.7 DEVICES & SERVICES AUDIT

Use the following narrative to complete the form on the previous page.

<p><b>REMOTE HOSTS:</b> Remote hosts are DICOM devices to which the Definium 5000 system can push an image. Remote hosts can be review workstations, archival devices, or PACS systems. Please indicate the type of remote host.</p> <p>Now indicate the manufacturer and model name or number.</p> <p>Compatibility can vary with software versions, please indicate the version of device firmware/software the device will be running.</p> <p>List the device's <b>IP address</b>. (IP = Internet Protocol)</p> <p>The answers to the next several items can be found in the device's DCS (DICOM Conformance Statement).</p> <p>Please indicate the highest level of <b>DICOM conformance</b> for this device. If the device is not DICOM compliant, please indicate so and move on to the next device.</p> <p><b>If the device does have some level of DICOM conformance please return a copy of the DICOM Conformance Statement with this completed form.</b></p> <p>DICOM supports a number of <b>image types</b>. Please indicate if this device supports the DX and/or the CR image types.</p> <p>The <b>host name</b> is the name that will appear on the screen and users will use to indicate this device. Please list the host name.</p> <p>The next four (4) sections address the four (4) services that remote host devices may offer. Each of the services will have its own AE (application entity) title and port number. The AE title is the name given to a service or application provided by a DICOM device. The port number is a logical designation within the device. These pieces of information are available in the device's DCS.</p>	<p>Being a <b>remote host server</b> allows the Definium 5000 system to push images to other devices. If you want the device to accept this service, check "Yes" and provide the AE title and port number.</p> <p>Being a <b>query/retrieve</b> service class provider allows the Definium 5000 system to query this device and retrieve images stored there. If you want this device to provide these services to the Definium 5000 system check "Yes" and fill in the requested items.</p> <p>The <b>query/retrieve by study</b> or patient controls how much the user is able to retrieve at one (1) time. For study, the user may retrieve studies, series, and/or images. For patient, the user may retrieve all of the study attributes plus a patient's entire image collection.</p> <p>A <b>storage commitment</b> provider confirms that images sent by the Definium 5000 system to an archival system were received and stored.</p> <p><b>NOTE:</b> This option is only available when the Definium 5000 system is sending DX type images. If your device supports both DX image types and storage commitment, check "Yes" and provide the AE title, the port number, and the network (IP) address.</p> <p>The <b>MPPS server</b> receives the messages sent by the Definium 5000 system. These messages consist of information such as when the exam started and closed, how many images were acquired, dose information, etc. This information is then updated on the Hospital Scheduling system. If the site has an MPPS server, provide the AE Title, IP address, and port number.</p>
--	--

## 7.5.8 PRINTERS

<b>Printers</b>		Include a DICOM Compliance Statement for each printer			
Manufacturer/Model:					
Software/Firmware Version:					
Prints via Spooler:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Network (IP) Address:	-----			-----	
DICOM Compliance Level:	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0
				<input type="checkbox"/> Not DICOM Compliant	
Host Name:					
Printer AE Title:					
Port Number:					

**Printers:** As with the remote hosts, please list the manufacturer and the model name/number. The software/firmware version should also be entered. Next, supply the IP address of the printer.

Indicate the DICOM compliance level of the printer. If it is not DICOM compatible, please indicate so.

DICOM compatibility does not guarantee all functions will work properly. **Include every unique printer's DICOM Compliance Statement.**

Supply the Host name for the printer.

Look in the DCS for the printer's AE title and port number.

**7.5.9 RIS SYSTEMS**

<b>RIS Systems</b>		Include a DICOM Compliance Statement for each device
Manufacturer/Model:		
Software/Firmware Version:		
Network (IP) Address:	----- . ----- . ----- . -----	----- . ----- . ----- . -----
DICOM Compliance Level:	<input type="checkbox"/> 1.0 <input type="checkbox"/> 2.0 <input type="checkbox"/> 3.0 <input type="checkbox"/> Not DICOM Compliant	<input type="checkbox"/> 1.0 <input type="checkbox"/> 2.0 <input type="checkbox"/> 3.0 <input type="checkbox"/> Not DICOM Compliant
Host Name:		
HIS/RIS AE Title:		
Port Number:		
Modality used for Scheduling:	<input type="checkbox"/> DX <input type="checkbox"/> CR	<input type="checkbox"/> DX <input type="checkbox"/> CR

**RIS Systems:** As with the remote hosts please list the manufacturer and the model name/number. The software/firmware version should also be entered.

Indicate the IP address the device is using as well as the DICOM compliance level. **Please include the DCS for the RIS with this completed form.**

Fill in the Host name.

Look in the DCS for the AE title and port number.

Please indicate if this device supports the DX and/or the CR image types. This information should also be in the device's DCS.

### 7.5.10 DATAFLOW ANALYSIS

Now that we have outlined the way your facility works and the devices you work with, we would like to define how the images flow through your network.

The Definium 5000 system is an acquisition-only device. Because of that fact you will need to move acquired images off the Definium 5000 system and into your work/data flow. Please use the chart below to describe your data flow. As an example, if your facility reviewed images as the first step after acquisition, the review box would be checked in the first column of the Task row and the review workstation would be checked in the first column of the Device row. You should use each of the functions once.

	<b>1st step after acquisition</b>	<b>2nd step after acquisition</b>	<b>3rd step after acquisition</b>
<b>Task</b>	<input type="checkbox"/> Archive <input type="checkbox"/> Print <input type="checkbox"/> Review	<input type="checkbox"/> Archive <input type="checkbox"/> Print <input type="checkbox"/> Review	<input type="checkbox"/> Archive <input type="checkbox"/> Print <input type="checkbox"/> Review
<b>Device</b>	<input type="checkbox"/> Archive device <input type="checkbox"/> PACS <input type="checkbox"/> Printer <input type="checkbox"/> Review Workstation <input type="checkbox"/> Spooler -> Printer(s) <input type="checkbox"/> Spooler -> Review Workstation(s)	<input type="checkbox"/> Archive device <input type="checkbox"/> PACS <input type="checkbox"/> Printer <input type="checkbox"/> Review Workstation <input type="checkbox"/> Spooler -> Printer(s) <input type="checkbox"/> Spooler -> Review Workstation(s)	<input type="checkbox"/> Archive device <input type="checkbox"/> PACS <input type="checkbox"/> Printer <input type="checkbox"/> Review Workstation <input type="checkbox"/> Spooler -> Printer(s) <input type="checkbox"/> Spooler -> Review Workstation(s)

**Printing:** It is important to us to understand the path your images follow before they are printed. We are now looking to answer the question of what road an image most typically travels on its way to be printed regardless if that is the first step in your process or not. Please try to find in the list below the path that best describes the path the image takes from acquisition to printing.

- Definium 5000 System ➡ Printer
- Definium 5000 System ➡ Spooler ➡ Printer(s)
- Definium 5000 System ➡ Archive Device ➡ Printer
- Definium 5000 System ➡ Archive Device ➡ Spooler ➡ Printer(s)
- Definium 5000 System ➡ Archive Device ➡ Review Workstation ➡ Printer
- Definium 5000 System ➡ Archive Device ➡ Review Workstation ➡ Spooler ➡ Printer
- Definium 5000 System ➡ PACS ➡ Printer
- Definium 5000 System ➡ PACS ➡ Spooler ➡ Printer
- Definium 5000 System ➡ Review Workstation ➡ Printer
- Definium 5000 System ➡ Review Workstation ➡ Spooler ➡ Printer(s)
- Definium 5000 System ➡ Other: \_\_\_\_\_ ➡ Printer(s)

**Image Review:** Now let's trace the path from acquisition to image review. Again, pick the item below that best describes how the image flows from the Definium 5000 system to the radiologist.

- Definium 5000 System ➡ Printer ➡ Printed Film ➡ Radiologist
- Definium 5000 System ➡ Review Workstation ➡ Radiologist
- Definium 5000 System ➡ Archive Device ➡ Review Workstation ➡ Radiologist
- Definium 5000 System ➡ PACS ➡ Radiologist
- Definium 5000 System ➡ PACS ➡ Review Workstation ➡ Radiologist
- Definium 5000 System ➡ Other: \_\_\_\_\_ ➡ Radiologist

**Archive:** The final part of this triad is archiving images. Pick the item below that best describes the flow of images to be archived.

- Definium 5000 System => Archive Device
- Definium 5000 System => PACS
- Definium 5000 System => Printer => Printed Film => Filing System
- Definium 5000 System => Review Workstation => Archive Device
- Definium 5000 System => Review Workstation => PACS
- Definium 5000 System => Other: \_\_\_\_\_ => Archive Device

#### 7.5.11 COMPLETED AUDIT

When the Network Audit has been completed it is to be sent to the following people:

- Primary X-Ray FE for the Definium 5000 system

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## **APPENDIX A      REQUIREMENTS FOR SEISMIC AREAS**

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

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

**Note** 

*Seismic calculations included in this appendix are per California Building Code.*

**Note** 

*The floor-ceiling mounting option is not approved for use in areas covered by seismic regulations. Consult local regulations before using the floor-ceiling mounting option.*

Documentation included in this Appendix (refer to the following pages):

- Anchorage Pre-approval for Definium 5000 Positioner (OPA-1663).
- Seismic Anchorage Calculation for Definium 5000 Positioner.
- Anchorage Pre-approval for the Definium 5000 System Cabinet (OPA-1664).
- Seismic Anchorage Calculation for the Definium 5000 System Cabinet (Slab on Grade).
- Seismic Anchorage Calculation for the Definium 5000 System Cabinet (Upper Floor).

## ANCHORAGE PRE-APPROVAL for DEFINIUM 5000 POSITIONER (OPA-1663)

Sheet 1 of 4



**EASE**  
EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING  
2801 Conner Way Ste B  
Missoula, MT. 59808  
Phn: (406) 541-3273 Fax: (406) 541-3274

Sheet 1 of 4

**Office of Statewide Health Planning and Development**  
**ANCHORAGE PRE-APPROVAL**

**OPA-1663**

Equipment Manufacturer: G.E. HealthCare

Equipment Type: Definium 5000 Positioner

**GENERAL NOTES**

**1. EXPANSION ANCHORS:**

- (a) ATTACHMENT IS TO BE MADE WITH THE ANCHORS LISTED BELOW AND INSTALLED AS DESCRIBED IN THE CORRESPONDING ICBO REPORT.

Anchor Diameter	Concrete Type	Min. f'c (psi)	Anchor Type	ICBO Report No.	Min. Embedment (inches)	Test Loads	
1/4"	Hardrock	2500	Hilti Kwik Bolt III	ESR-1385	2	Direct Pull Tension - 800 lbs	Torque 10 Ft-Lbs
	Lightweight	3000					

**2. TESTING OF EXPANSION ANCHORS:**

- (a) AFTER AT LEAST 24 HOURS HAVE ELAPSED SINCE INSTALLATION, DIRECT PULL TENSION TEST OR TORQUE TEST AT LEAST 50% OF THE ANCHORS.

(b) ACCEPTANCE CRITERIA:

- (1) DIRECT PULL TENSION TEST:  
THE ANCHOR SHOULD HAVE NO OBSERVABLE MOVEMENT AT THE TEST LOAD. A PRACTICAL WAY TO DETERMINE OBSERVABLE MOVEMENT IS THAT THE WASHER BECOMES LOOSE.  
(2) TORQUE TEST: THE SPECIFIED TORQUE MUST BE REACHED WITHIN ONE-HALF (1/2) TURN OF THE NUT.  
(3) IF ANY ANCHOR FAILS, TEST ALL ANCHORS.



## ANCHORAGE PRE-APPROVAL for DEFINIUM 5000 POSITIONER (OPA-1663)

Sheet 2 of 4



**EASE**  
EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING  
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Missoula, MT. 59808  
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Sheet 2 of 4

**Office of Statewide Health Planning and Development**  
**ANCHORAGE PRE-APPROVAL**

**OPA-1663**

Equipment Manufacturer: G.E. HealthCare

Equipment Type: Definium 5000 Positioner

**GENERAL NOTES (CONTINUED)**

3. FORCES ARE DETERMINED PER 2001 CBC 1632A.2, EQUATIONS 32-A1, A2 & A3, WHERE  $C_a = .66$ ,  $a_p = 1.0$ ,  $I_p = 1.5$ .  
 $R_p = 3.0$  FOR UPPER FLOOR AND  $R_p = 1.5$  FOR SLAB ON GRADE.  
 PLEASE NOTE THAT THE RESULT FROM EQUATIONS 32-A1, A2 & A3  
 HAVE BEEN REDUCED BY A FACTOR OF 1.4 FOR ALLOWABLE STRESS DESIGN.
4. THIS PRE-APPROVAL CONFORMS TO THE 2001 CALIFORNIA BUILDING CODE.
5. THE DETAILS IN THIS PRE-APPROVAL MAY BE USED AT ANY LOCATION AND AT ANY HEIGHT IN THE STATE OF CALIFORNIA.
6. THE ENGINEER OF RECORD SHALL DESIGN BACKING BARS, STUDS, FRAMES ABOVE THE CEILING, ETC.  
 WHICH THE UNITS ARE ATTACHED TO AS NOTED ON THE DRAWINGS. THE ENGINEER OF RECORD  
 SHALL ALSO VERIFY THE ADEQUACY OF THE STRUCTURES (SUCH AS WALLS AND FLOORS)  
 WHICH SUPPORT THE UNITS FOR THE LOADS IMPOSED ON THEM BY THE UNITS AS WELL AS ALL OTHER LOADS.
7. ALL ANCHOR FORCES SHOWN ON THE DRAWINGS ARE WORKING LOADS (AS OPPOSED TO ULTIMATE LOADS)

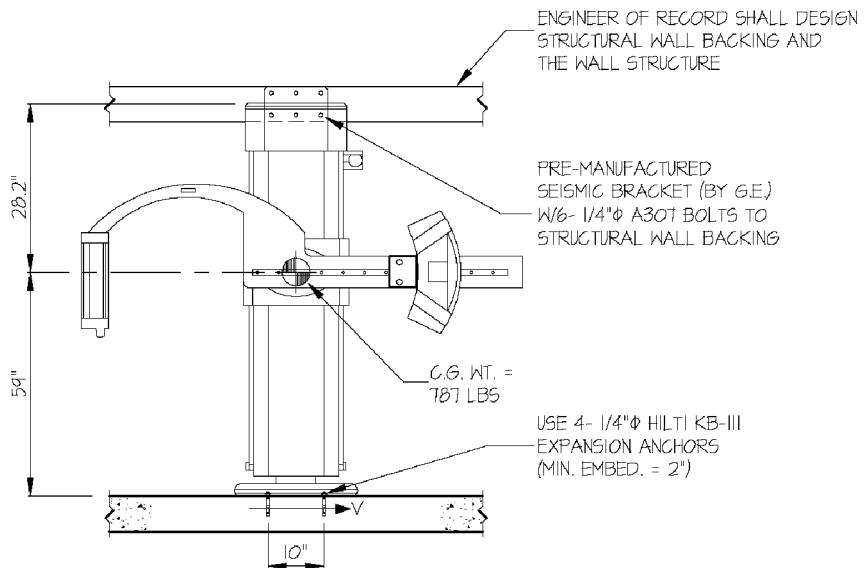


## ANCHORAGE PRE-APPROVAL for DEFINIUM 5000 POSITIONER (OPA-1663)

Sheet 3 of 4

<b>EASE EQUIPMENT ANCHORAGE &amp; SEISMIC ENGINEERING</b>	
<b>GEHC PIM 5192967</b>	DES. R. LA BRE
JOB NO. 12-0724	
DATE 3/8/07	
SHEET 3 OF 4 SHEET	

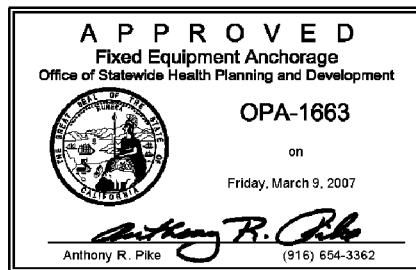
**DEFINIUM 5000 POSITIONER**

SEISMIC ANCHORAGE PRE-APPROVALFRONT ELEVATION

T<sub>WALL</sub> = 673 LBS/BOLT  
V<sub>WALL</sub> = 63 LBS/BOLT  
V<sub>FLOOR</sub> = 185 LBS/BOLT

NOTES:

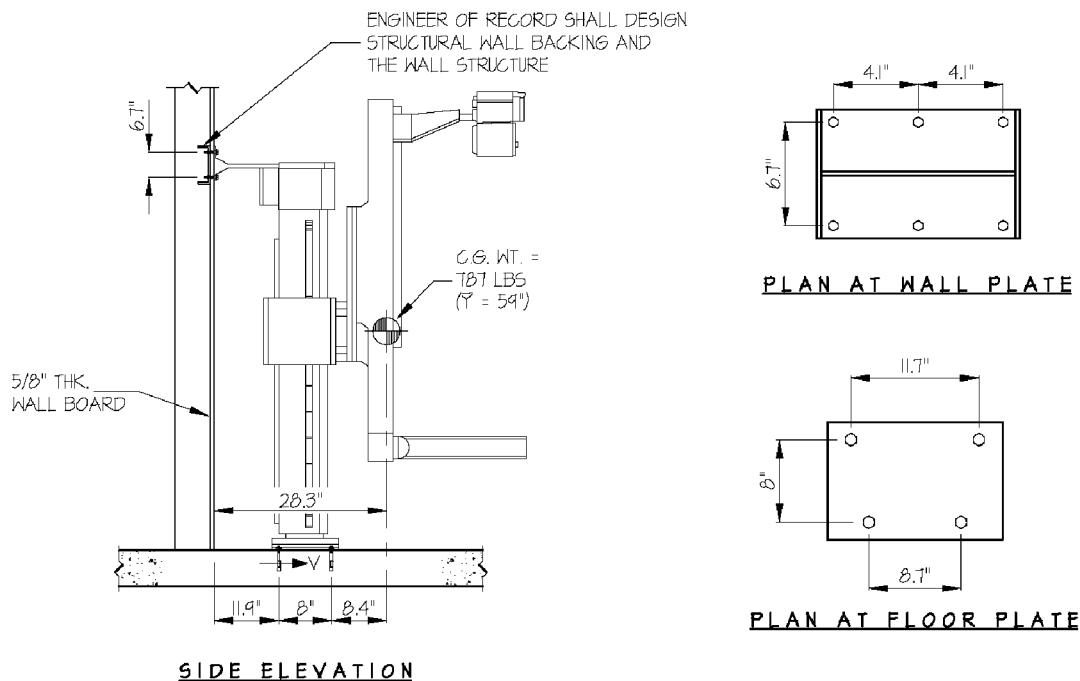
1. ANCHORAGE DESIGN PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.  
 $M_H = 0.71W$  ( $C_a = .66$ ,  $I_p = 1.5$ ,  $a_p = 1.0$ ,  $R_p = 1.5$ )  
 $V_H = 0.35W$
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL OTHER LOADS.
4. SEE GENERAL NOTES: SHEETS 1-2



## ANCHORAGE PRE-APPROVAL for DEFINIUM 5000 POSITIONER (OPA-1663)

Sheet 4 of 4

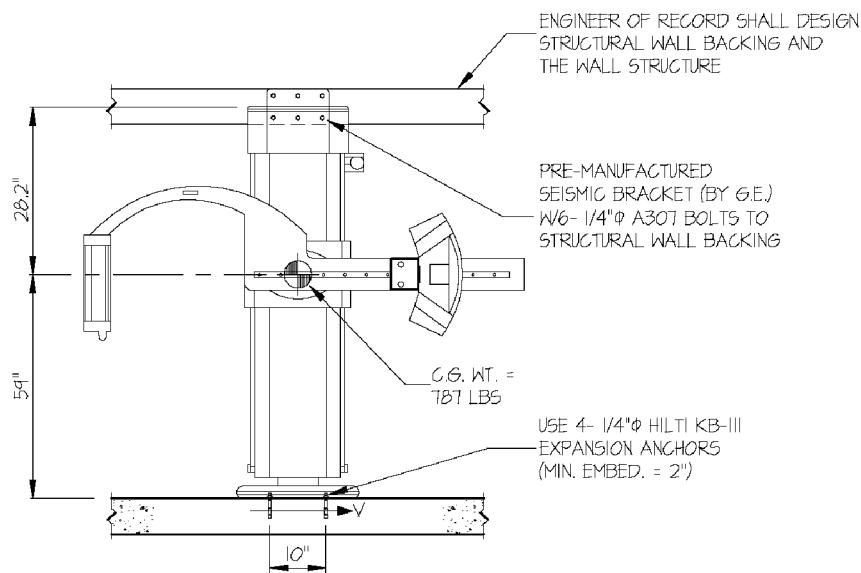
<b>EASE EQUIPMENT ANCHORAGE &amp; SEISMIC ENGINEERING</b>	
<b>GEHC PIM 5192967</b>	DES. <b>R. LA BRIE</b>
JOB NO. <b>12-0724</b>	
DATE <b>3/8/07</b>	
SHEET <b>4</b> OF <b>4</b> SHEET	

SEISMIC ANCHORAGE PRE-APPROVAL

## SEISMIC ANCHORAGE CALCULATION for DEFINIUM 5000 POSITIONER

Sheet 1 of 2

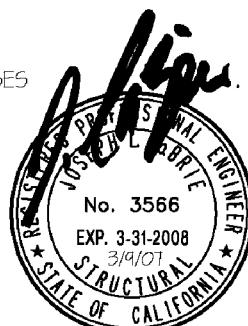
<b>EASE EQUIPMENT ANCHORAGE &amp; SEISMIC ENGINEERING</b>	
<b>GEHC PIM 5192967</b>	
<b>DEFINIUM 5000 POSITIONER</b>	DES. R. LA BRIE
	JOB NO. 12-0724
	DATE 3/9/07
	SHEET 1 OF 2 SHEET

SEISMIC ANCHORAGE CALCULATIONFRONT ELEVATION

$T_{WALL} = 673 \text{ LBS/BOLT}$   
 $V_{WALL} = 63 \text{ LBS/BOLT}$   
 $V_{FLOOR} = 185 \text{ LBS/BOLT}$

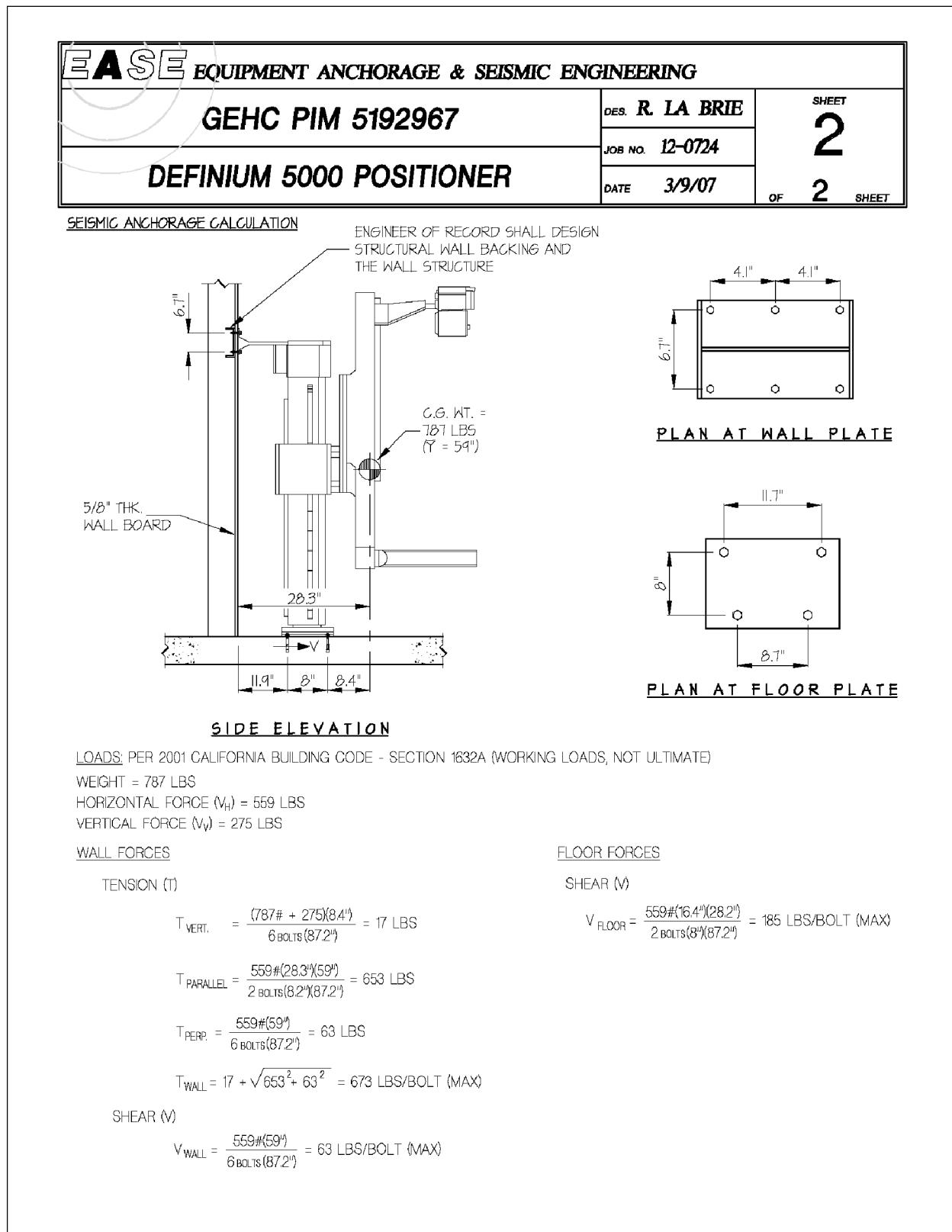
NOTES:

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



## SEISMIC ANCHORAGE CALCULATION for DEFINIUM 5000 POSITIONER

Sheet 2 of 2



## ANCHORAGE PRE-APPROVAL for DEFINIUM 5000 SYSTEM CABINET (OPA-1664)

Sheet 1 of 4



EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING  
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Sheet 1 of 4

**Office of Statewide Health Planning and Development**  
**ANCHORAGE PRE-APPROVAL**

**OPA-1664**

Equipment Manufacturer: G.E. HealthCare

Equipment Type: Definium 5000 Generator

**GENERAL NOTES**

**1. EXPANSION ANCHORS:**

- (a) ATTACHMENT IS TO BE MADE WITH THE ANCHORS LISTED BELOW AND INSTALLED AS DESCRIBED IN THE CORRESPONDING ICBO REPORT.

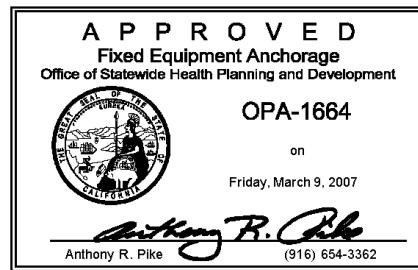
Anchor Diameter	Concrete Type	Min. f'c (psi)	Anchor Type	ICBO Report No.	Min. Embedment (inches)	Test Loads
1/4"	Hardrock	2500	Hilti Kwik Bolt III	ESR-1385	2	Direct Pull Tension - 800 lbs
	Lightweight	3000				Torque 10 Ft-Lbs

**2. TESTING OF EXPANSION ANCHORS:**

- (a) AFTER AT LEAST 24 HOURS HAVE ELAPSED SINCE INSTALLATION, DIRECT PULL TENSION TEST OR TORQUE TEST AT LEAST 50% OF THE ANCHORS.

(b) ACCEPTANCE CRITERIA:

- (1) DIRECT PULL TENSION TEST:  
THE ANCHOR SHOULD HAVE NO OBSERVABLE MOVEMENT AT THE TEST LOAD. A PRACTICAL WAY TO DETERMINE OBSERVABLE MOVEMENT IS THAT THE WASHER BECOMES LOOSE.
- (2) TORQUE TEST: THE SPECIFIED TORQUE MUST BE REACHED WITHIN ONE-HALF (1/2) TURN OF THE NUT.
- (3) IF ANY ANCHOR FAILS, TEST ALL ANCHORS.



## ANCHORAGE PRE-APPROVAL for DEFINIUM 5000 SYSTEM CABINET (OPA-1664)

Sheet 2 of 4



EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING  
2801 Connery Way Ste. B  
Missoula, MT. 59808  
Phn: (406) 541-3273 Fax: (406) 541-3274

Sheet 2 of 4

**Office of Statewide Health Planning and Development**  
**ANCHORAGE PRE-APPROVAL**

**OPA-1664**

Equipment Manufacturer: G.E. HealthCare

Equipment Type: Definium 5000 Generator

**GENERAL NOTES (CONTINUED)**

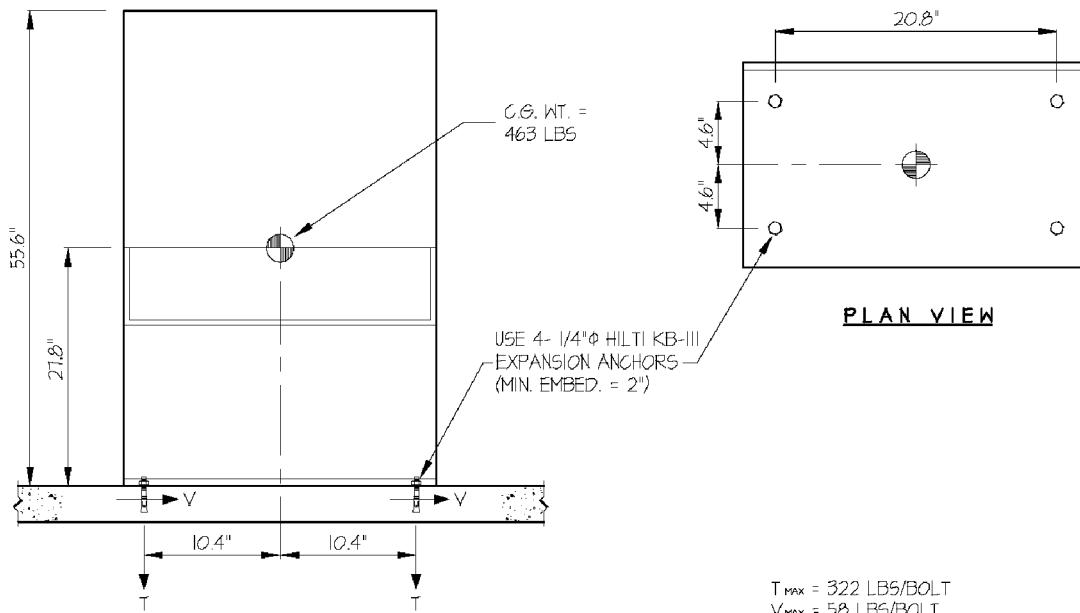
3. FORCES ARE DETERMINED PER 2001 CBC 1632A.2, EQUATIONS 32-A1, A2 & A3, WHERE  $C_a = .66$ ,  $a_p = 1.0$ ,  $I_p = 1.5$   
 $R_p = 3.0$  FOR UPPER FLOOR AND  $R_p = 1.5$  FOR SLAB ON GRADE.  
PLEASE NOTE THAT THE RESULT FROM EQUATIONS 32-A1, A2 & A3  
HAVE BEEN REDUCED BY A FACTOR OF 1.4 FOR ALLOWABLE STRESS DESIGN.
4. THIS PRE-APPROVAL CONFORMS TO THE 2001 CALIFORNIA BUILDING CODE.
5. THE DETAILS IN THIS PRE-APPROVAL MAY BE USED AT ANY LOCATION AND AT ANY HEIGHT IN THE STATE OF CALIFORNIA.
6. THE ENGINEER OF RECORD SHALL DESIGN BACKING BARS, STUDS, FRAMES ABOVE THE CEILING, ETC.  
WHICH THE UNITS ARE ATTACHED TO AS NOTED ON THE DRAWINGS. THE ENGINEER OF RECORD  
SHALL ALSO VERIFY THE ADEQUACY OF THE STRUCTURES (SUCH AS WALLS AND FLOORS)  
WHICH SUPPORT THE UNITS FOR THE LOADS IMPOSED ON THEM BY THE UNITS AS WELL AS ALL OTHER LOADS.
7. ALL ANCHOR FORCES SHOWN ON THE DRAWINGS ARE WORKING LOADS (AS OPPOSED TO ULTIMATE LOADS)



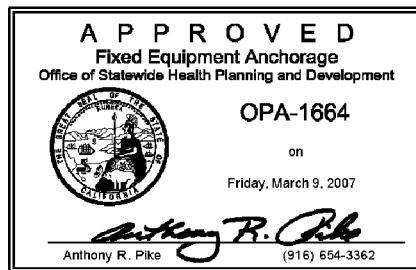
## ANCHORAGE PRE-APPROVAL for DEFINIUM 5000 SYSTEM CABINET (OPA-1664)

Sheet 3 of 4

<b>EASE EQUIPMENT ANCHORAGE &amp; SEISMIC ENGINEERING</b>	
<b>GEHC PIM 5192967</b>	DES. R. LA BRE
<b>DEFINIUM 5000 GENERATOR</b>	JOB NO. 12-0724
	DATE 3/9/07
	SHEET 3 OF 4 SHEETS

SEISMIC ANCHORAGE PRE-APPROVALSLAB ON GRADEFRONT ELEVATIONNOTES:

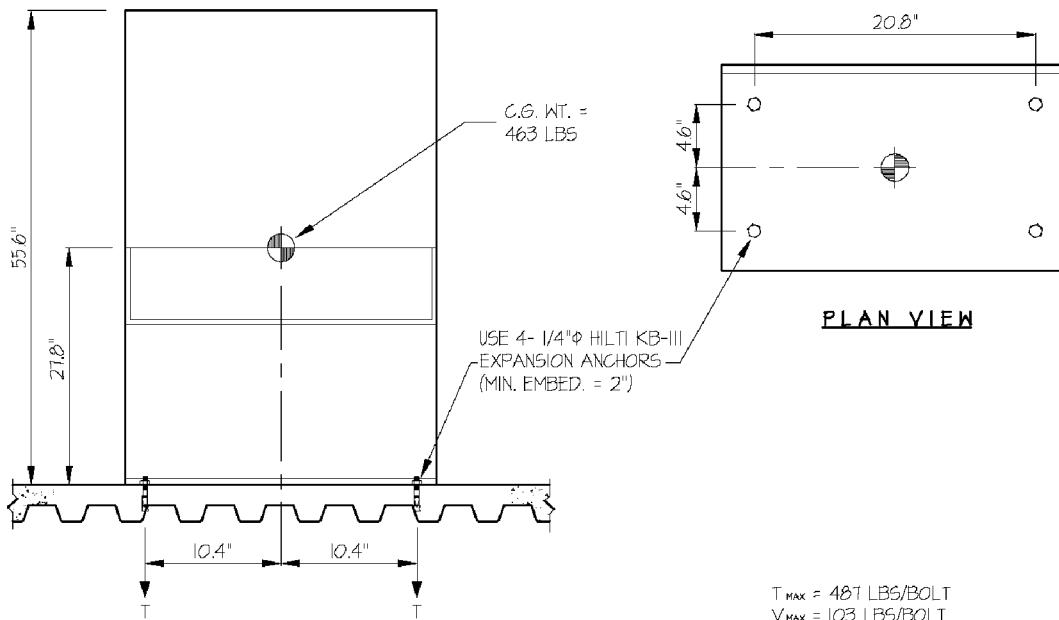
1. ANCHORAGE DESIGN PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.  
HORIZONTAL FORCE ( $M_H$ ) = 0.50W ( $C_a = .66$ ,  $I_p = 1.5$ ,  $a_p = 1.0$ ,  $R_p = 1.5$ )  
VERTICAL FORCE ( $M_V$ ) = 0.35W
2. CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
3. ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL OTHER LOADS.
4. SEE GENERAL NOTES: SHEETS 1-2



## ANCHORAGE PRE-APPROVAL for DEFINIUM 5000 SYSTEM CABINET (OPA-1664)

Sheet 4 of 4

<b>EASE EQUIPMENT ANCHORAGE &amp; SEISMIC ENGINEERING</b>	
<b>GEHC PIM 5192967</b>	DES. R. LA BRIE
JOB NO. 12-0724	
<b>DEFINIUM 5000 GENERATOR</b>	DATE 3/9/07
SHEET 4 OF 4 SHEETS	

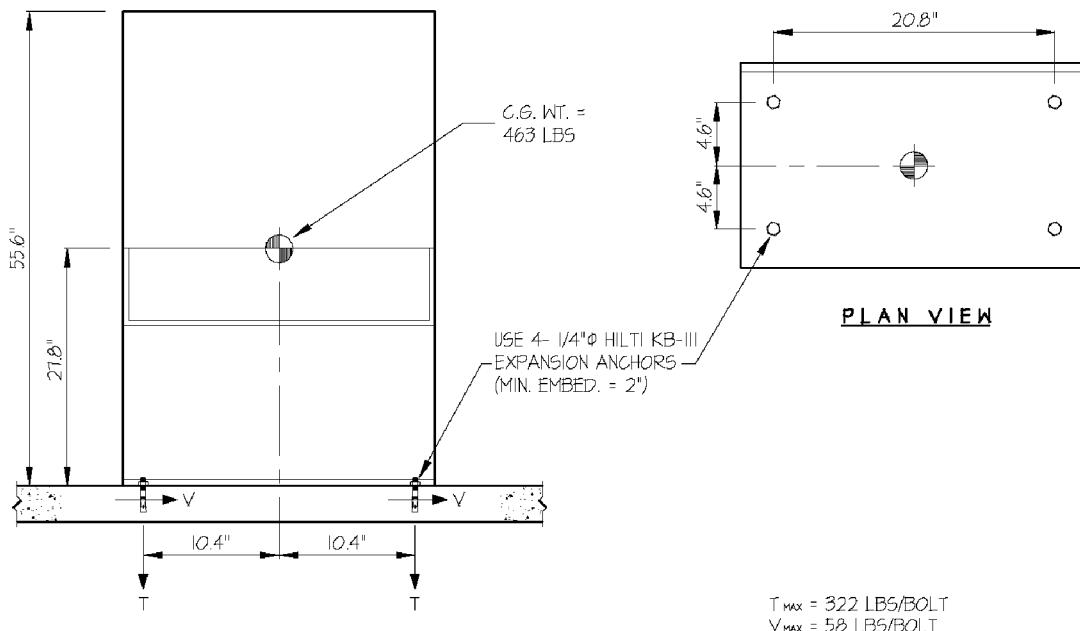
SEISMIC ANCHORAGE PRE-APPROVALFRONT ELEVATIONNOTES:

- ANCHORAGE DESIGN PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A AND HAVE BEEN FACTORED TO REPRESENT WORKING DESIGN LOADS, NOT ULTIMATE.  
HORIZONTAL FORCE ( $V_H$ ) =  $0.71W$  ( $C_a = .66$ ,  $I_p = 1.5$ ,  $a_p = 1.0$ ,  $R_p = 1.5$ )  
VERTICAL FORCE ( $V_V$ ) =  $0.35W$
- CENTER OF GRAVITY (C.G.) WEIGHT IS A MAXIMUM. THIS PRE-APPROVAL ENCOMPASSES ALL WEIGHTS UP TO THE MAXIMUM WEIGHT SHOWN.
- ENGINEER OF RECORD FOR THE BUILDING SHALL PROVIDE SUPPORT STRUCTURE DESIGNED TO SUPPORT WEIGHTS AND FORCES SHOWN, IN ADDITION TO ALL OTHER LOADS.
- SEE GENERAL NOTES: SHEETS I-2



## SEISMIC ANCHORAGE CALCULATION for DEFINIUM 5000 SYSTEM CABINET (Slab on Grade)

<b>EASE</b> EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING		
<b>GEHC PIM 5192967</b>	DES. R. LA BRIE	SHEET
<b>DEFINIUM 5000 GENERATOR</b>	JOB NO. 12-0724	1
	DATE 3/9/07	OF 1 SHEETS

SEISMIC ANCHORAGE CALCULATIONSLAB ON GRADEFRONT ELEVATION

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

WEIGHT = 463 LBS

HORIZONTAL FORCE (V<sub>H</sub>) = 232 LBS

VERTICAL FORCE (V<sub>V</sub>) = 162 LBS

BOLT FORCES:TENSION (T)

$$T_{MAX} = \left[ \frac{232\#(27.8)}{2 \text{ BOLTS}(20.9)} \times (0.3) \right] + \frac{232\#(27.8)}{2 \text{ BOLTS}(9.2)} - \frac{463\# - 162\#}{4 \text{ BOLTS}} = 322 \text{ LBS/BOLT (MAX)}$$

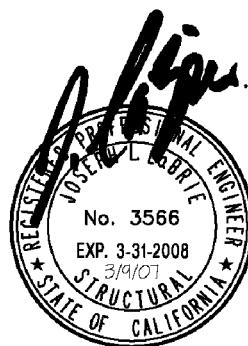
{ HORIZ - SIDE TO SIDE } { HORIZ - FRONT TO BACK } { WEIGHT - V<sub>V</sub> }

SHEAR (V)

$$V = \frac{232\#}{4 \text{ BOLTS}} = 58 \text{ LBS/BOLT (MAX)}$$

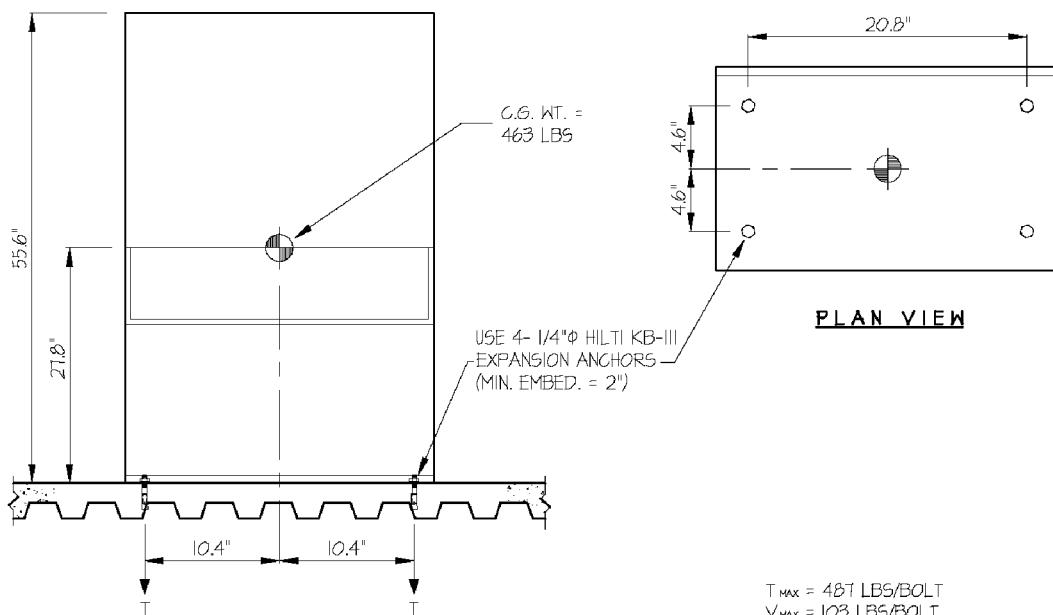
NOTE:

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



## SEISMIC ANCHORAGE CALCULATION for DEFINIUM 5000 SYSTEM CABINET (Upper Floor)

<b>EASE</b>	EQUIPMENT ANCHORAGE & SEISMIC ENGINEERING
<b>GEHC PIM 5192967</b>	
<b>DEFINIUM 5000 GENERATOR</b>	
DES. R. LA BRIE	SHEET <b>1</b>
JOB NO. 12-0724	OF 1 SHEETS
DATE 3/9/07	

SEISMIC ANCHORAGE CALCULATIONUPPER FLOORFRONT ELEVATIONLOADS: PER 2001 CALIFORNIA BUILDING CODE - SECTION 1632A (WORKING LOADS, NOT ULTIMATE)

WEIGHT = 463 LBS

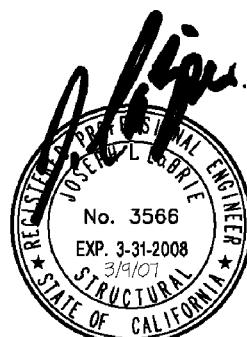
HORIZONTAL FORCE (V<sub>H</sub>) = 329 LBSVERTICAL FORCE (V<sub>V</sub>) = 162 LBSBOLT FORCESTENSION (T)

$$T_{MAX} = \left[ \frac{329\#(27.8\text{")}}{2\text{ BOLTS}(20.9\text{")}} \times (0.3) \right] + \left[ \frac{329\#(27.8\text{")}}{2\text{ BOLTS}(9.2\text{")}} \right] - \frac{463\# - 162\#}{4\text{ BOLTS}} = 487 \text{ LBS/BOLT (MAX)}$$

(HORZ - SIDE TO SIDE)    (HORZ - FRONT TO BACK)    (WEIGHT - V<sub>V</sub>)

SHEAR (V)

$$V = \frac{329\#}{4\text{ BOLTS}} = 103 \text{ LBS/BOLT (MAX)}$$

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

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