GE Healthcare

INNOVA IGS 620-630

FINAL STUDY

Drawn by
Verified by
Concession
S.O. (GON)
PIM Manual
Rev

RET
TST
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5750182-1EN
3

Format
Scale
File Name
Date
Sheet

A3
1/4"=1'-0"
EN-VAS-TYP-IGS-6-WEB.DWG
16/Oct/2019
01/22

TYPICAL

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A
23/Sep/2019
Initial release per PIM revision 3

REV
DATE
MODIFICATIONS

A
1
Initial release per PIM revision 3

A2
23/Sep/2019

16. MI - HVAC
17. EI - Electrical Notes
18. EL - Electrical Layout
19. ES - Electrical Elevations
20. E4 - Power Requirements
21. ES - Power Distribution
22. E6 - Interconnections

GE does not take responsibility for any damages resulting from changes on drawings made by others. Errors may occur by not referring to the complete set of final issue drawings. GE cannot accept responsibility for any damage due to the partial use of GE final issue drawings, however caused. All dimensions are in millimeters unless otherwise specified. Do not scale from printed pdf files. GE accepts no responsibility or liability for defective work due to scaling from these drawings.

Pre Installation documents for GE Healthcare products can be accessed on the web at: www.gehealthcare.com/siteplanning

A mandatory component of this drawing set is the GE Healthcare Pre Installation manual. Failure to reference the Pre Installation manual will result in incomplete documentation required for site design and preparation.

Pre Installation documents for GE Healthcare products can be accessed on the web at: www.gehealthcare.com/siteplanning
DISCLAIMER

GENERAL SPECIFICATIONS

- GE is not responsible for the installation of developers and associated equipment, lighting, cassette trays and protective screens or derivatives not mentioned in the order.
- The final study contains recommendations for the location of GE equipment and associated devices, electrical wiring and room arrangements. When preparing the study, every effort has been made to consider every aspect of the actual equipment expected to be installed.
- The layout of the equipment offered by GE, the dimensions given for the premises, the details provided for the pre-installation work and electrical power supply are given according to the information noted during on-site study and the wishes expressed by the customer.
- The room dimensions used to create the equipment layout may originate from a previous layout and may not be accurate as they may not have been verified on site. GE cannot take any responsibility for errors due to lack of information.
- Dimensions apply to finished surfaces of the room.
- Actual configuration may differ from options presented in some typical views or tables.
- If this set of final drawings has been approved by the customer, any subsequent modification of the site must be subject to further investigation by GE about the feasibility of installing the equipment. Any reservations must be noted.
- The equipment layout indicates the placement and interconnection of the indicated equipment components. There may be local requirements that could impact the placement of these components. It remains the customer’s responsibility to ensure that the site and final equipment placement complies with all applicable local requirements.
- All work required to install GE equipment must be carried out in compliance with the building regulations and the safety standards of legal force in the country concerned.
- These drawings are not to be used for actual construction purposes. The company cannot take responsibility for any damage resulting therefrom.

CUSTOMER RESPONSIBILITIES

- It is the responsibility of the customer to prepare the site in accordance with the specifications stated in the final study. A detailed site readiness checklist is provided by GE. It is the responsibility of the customer to ensure all requirements are fulfilled and that the site conforms to all specifications defined in the checklist and final study. The GE Project Manager of Installation (PMI) will work in cooperation with the customer to follow up and ensure that actions in the checklist are complete, and if necessary, will aid in the rescheduling of the delivery and installation date.
- Prior to installation, a structural engineer of record must ensure that the floor and ceiling is designed in such a way that the loads of the installed system can be securely borne and transferred. The layout of additional structural elements, dimensioning and the selection of appropriate installation methods are the sole responsibility of the structural engineer. Execution of load bearing structures supporting equipment on the ceiling, floor or walls are the customer’s responsibility.

RADIO-PROTECTION

- Suitable radiological protection must be determined by a qualified radiological physicist in conformance with local regulations. GE does not take responsibility for the specification or provision of radio-protection.

| THE UNDERSIGNED, HEREBY CERTIFIES THAT I HAVE READ AND APPROVED THE PLANS IN THIS DOCUMENT. |
| DATE | NAME | SIGNATURE |

GLOBAL SITE READINESS CHECKLIST (DI)

<table>
<thead>
<tr>
<th>DOC1809666 Rev. 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Name:</td>
</tr>
<tr>
<td>DN/IS Number:</td>
</tr>
<tr>
<td>Equipment:</td>
</tr>
<tr>
<td>Site Visit Date for SRC:</td>
</tr>
<tr>
<td>SRC Status:</td>
</tr>
<tr>
<td>Site Ready Checks at Installation</td>
</tr>
<tr>
<td>Site Visit Date for SRC:</td>
</tr>
<tr>
<td>Room dimensions, including ceiling height, for all Exam, Equipment/Technical &amp; Control rooms meets GE specifications.</td>
</tr>
<tr>
<td>Ceiling support structure, if on the GE drawing, is at correct location and height according to the drawing specifications. Levelness and spacing has been measured. Overhead support Structure has been confirmed with contractor to meet GE criteria.</td>
</tr>
<tr>
<td>Rooms that will contain equipment, including staging areas if applicable, are construction debris free. Precautions must be taken to prevent debris from entering rooms containing equipment.</td>
</tr>
<tr>
<td>Delivery route from truck to installation space has been reviewed, all communications have occurred, arrangements made for special handling (if needed). Floors along delivery route will support weight of the equipment, reinforcements arranged if needed.</td>
</tr>
<tr>
<td>System power &amp; grounding (PDB/MDP) is available as per GE specifications, installed at point of final connection and ready to use. Lock Out Tag Out is available.</td>
</tr>
<tr>
<td>System power and grounded audit has been scheduled to be completed during installation of equipment. (If Required) GEHC PM to confirmed if needed.</td>
</tr>
<tr>
<td>Adequate room illumination installed and working.</td>
</tr>
<tr>
<td>Cableways (floor, wall, ceiling, etc.) ready for GE cables and are of correct length and diameter. Cableways routed per GE Final drawings and access openings installed as determined by GEHC PM. Surface floor duct installed at time of system installation.</td>
</tr>
<tr>
<td>HVAC systems Installed, and the site meets minimum environmental operational system requirements.</td>
</tr>
<tr>
<td>Network outlets installed and computer network available and working.</td>
</tr>
<tr>
<td>Hospital IT/Connectivity contacts have been engaged and information has been added to Project management tool. (If Required)</td>
</tr>
<tr>
<td>Floor levelness/flatness is measured and within tolerance, and there are no visible defects per GEHC specifications. Floor Strength and thickness have been discussed with customer/contractor and they have confirmed GE requirements are met.</td>
</tr>
<tr>
<td>Customer supplied countertops where GE equipment will be installed are in place.</td>
</tr>
<tr>
<td>Vascular baseplates preparation complete per GE requirements.</td>
</tr>
<tr>
<td>For IGS 730/740: Floor finish is according to the GE Specifications and protection is installed. Specifications for concrete substrate &amp; Monopur 7 mm flooring have been met. Table basplate installed and flush to the finished floor.</td>
</tr>
<tr>
<td>For IGS 730/740: Room Interventionsal Reference Point (RIRP) value has been defined with the customer. Either 1120mm, 1278 mm or 1508 mm.</td>
</tr>
<tr>
<td>Ensure that all third party suppliers are identified and have been informed about the project dates and how they need to proceed in accordance with their needs for interfacing to our equipment.</td>
</tr>
<tr>
<td>Doors and windows complete or scheduled to be installed. If applicable, radiation protection (shielding) finished &amp; radioprotection regulatory approval for installation obtained.</td>
</tr>
<tr>
<td>PMI Signature:</td>
</tr>
<tr>
<td>Customer Signature:</td>
</tr>
<tr>
<td>FS Signature: optional</td>
</tr>
</tbody>
</table>
**MAGNETIC INTERFERENCE SPECIFICATIONS**

- Image intensifiers must be located in ambient static magnetic fields of less than 1 gauss to guarantee specified imaging performance.
- X-ray tubes must be located in ambient static magnetic fields of less than 10 gauss to guarantee specified performance.
- System electronics must be located in ambient static magnetic fields of less than 10 gauss to guarantee data integrity.
- Operators console equipment must be located in ambient static magnetic fields of less than 10 gauss to obtain specified geometric linearity.

**CUSTOMER SITE READINESS REQUIREMENTS**

- Any deviation from these drawings must be communicated in writing to and reviewed by your local GE Healthcare Installation project manager prior to making changes.
- Make arrangements for any rigging, special handling, or facility modifications that must be made to deliver the equipment to the installation site. If desired, your local GE Healthcare Installation project manager can supply a reference list of rigging contractors.
- New construction requires the following:
  1. Secure area for equipment,
  2. Power for drills and other test equipment,
  3. Capability for image analysis,
  4. Restrooms.
- Provide for refuse removal and disposal (e.g. crates, cartons, packing)
- It is the customer’s responsibility to contract a vibration consultant/engineer to implement site design modifications to meet the GE vibration specification. Refer to the system preinstallation manual for the vibration specification.

**ELECTROMAGNETIC INTERFERENCE**

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

<table>
<thead>
<tr>
<th>EMISSIONS</th>
<th>TEST COMPLIANCE</th>
<th>ELECTROMAGNETIC ENVIRONMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio-Frequency Emissions</td>
<td>Group 1 Class A limits</td>
<td>The system is suitable for use in all establishments other than domestic and those directly connected to the low voltage power supply network that supplies buildings used for domestic purposes.</td>
</tr>
<tr>
<td>Harmonic emissions IEC 61000–3–2</td>
<td>Not applicable</td>
<td>The system uses RF energy only for its internal function. Therefore, the RF emission is very low and not likely to cause any interference in nearby electronic equipment.</td>
</tr>
<tr>
<td>Voltage fluctuations/flicker emissions IEC 61000–3–3</td>
<td>Not applicable</td>
<td>The system is suitable for use only in establishments not directly connected to a public low voltage power supply network.</td>
</tr>
</tbody>
</table>

It is the customer's responsibility to contract a vibration consultant/engineer to implement site design modifications to meet the GE vibration specification. Refer to the system preinstallation manual for the vibration specification.
The customer should:
- Provide an area adjacent to the vascular suite for delivery and unloading of the GE equipment.
- Ensure that the dimensions of all doors, corridors, ceiling heights are sufficient to accommodate the movement of GE equipment from the delivery area into the definitive installation room.
- Ensure that access routes for equipment will accommodate the weights of the equipment and any transportation, lifting and rigging equipment.
- Ensure that all necessary arrangements for stopping and unloading on public or private property not belonging to the customer have been made.

<table>
<thead>
<tr>
<th>LC GANTRY - SHIPPING DOLLY INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIMENSIONS</strong></td>
</tr>
<tr>
<td>Width</td>
</tr>
<tr>
<td>2790 mm [110 in]</td>
</tr>
<tr>
<td>Depth</td>
</tr>
<tr>
<td>1160 mm [45.5 in]</td>
</tr>
<tr>
<td>Height</td>
</tr>
<tr>
<td>1950 mm [77 in]</td>
</tr>
<tr>
<td><strong>WEIGHT</strong></td>
</tr>
<tr>
<td>1060 kg [2340 lb]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LP GANTRY - SHIPPING DOLLY (SHORTER) INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIMENSIONS</strong></td>
</tr>
<tr>
<td>Width</td>
</tr>
<tr>
<td>2790 mm [110 in]</td>
</tr>
<tr>
<td>Depth</td>
</tr>
<tr>
<td>1590 mm [62.5 in]</td>
</tr>
<tr>
<td>Height</td>
</tr>
<tr>
<td>2135 mm [84 in]</td>
</tr>
<tr>
<td><strong>WEIGHT</strong></td>
</tr>
<tr>
<td>1225 kg [2700 lb]</td>
</tr>
</tbody>
</table>

The minimum door width needed (to accommodate the IGS Lateral shipping dolly) is 1100 mm [43 in] with the cable inlet and the dolly stabilizers removed.

<table>
<thead>
<tr>
<th>LP GANTRY DELIVERY ROUTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LP GANTRY: 2762.5x1040 mm [108.8x41 in]</td>
</tr>
<tr>
<td>1100 [43 in]</td>
</tr>
<tr>
<td>1200 [47 in]</td>
</tr>
<tr>
<td>1590 [62.5 in]</td>
</tr>
</tbody>
</table>

Both ends of the dolly can be removed which will shorten the LC gantry dolly to 2190 mm [86 in], it is recommended that only one side should be removed when delivering through hospital.

<table>
<thead>
<tr>
<th>SHIPPING DOLLY FOR LP GANTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHIPPING WEIGHT:</strong> 1225 kg [2700 lb]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHIPPING DOLLY FOR LC GANTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHIPPING WEIGHT:</strong> 1060 kg [2337 lb]</td>
</tr>
</tbody>
</table>
STRUCTURAL NOTES

- All steel work and parts necessary to support ceiling mounted tube hanger or other equipment are to be supplied by the customer or his contractors. The unistrut or equivalent structure should run continuous with no fittings extending below face of unistrut channel, run wall to wall, be parallel, square and in the same horizontal plane flush with finished ceiling. The system is to be cross braced vertically, horizontally and diagonally to allow no movement and a maximum of 1,58mm (1/16") deflection. (10) 12,7mm (1/2") dia. x 38,1mm (1 1/2") long bolts with unistrut 12,7mm (1/2") nuts with springs are to be provided by customer or his contractors for each stationary and auxiliary support rail. Closure strips shall be provided for areas of unistrut exposed and without mounting units.

- Methods of support for the steelwork that will permit attachment to structural steel or through bolts in concrete construction should be favored. Do not use concrete or masonry anchors in direct tension.

- All units that are wall mounted or wall supported are to be provided with supports where necessary. Wall supports are to be supplied and installed by the customer or his contractors. See plan and detail sheets for suggested locations and mounting hole locations.

- All ceiling mounted fixtures, air vents, sprinklers, etc. To be flush mounted, or shall not extend more than 6,35mm (1/4") below the finished ceiling.

- Control walls with tube hanger passage above shall be constructed to 2130mm (7'-0") high.

- Floor slabs on which equipment is to be installed must be level to 3,17mm (1/8") in 3050mm (10'-0")

- Minimum floor thickness of 203mm (8")

- Dimensions are to finished surfaces of room.

- Customers contractor must provide all penetrations in post tension floors.

- Customers contractor must provide and install any non-standard anchoring. Documents for standard anchoring methods are included with GE equipment drawings for geographic areas that require such documentation.

- Customers contractor must provide and install hardware for "through the floor" anchoring and/or any bracing under access floors. This contractor must also provide floor drilling that cannot be completed because of an obstruction encountered while drilling by the GE installer such as rebar etc.

- It is the customer's responsibility to perform any floor or wall penetrations that may be required. The customer is also responsible for ensuring that no subsurface utilities (e.g., electrical or any other form of wiring, conduits, piping, duct work or structural supports (i.e. post tension cables or rebar)) will interfere or come in contact with subsurface penetration operations (e.g. drilling and installation of anchors/screws) performed during the installation process. To ensure worker safety, GE installers will perform surface penetration operations only after the customer's validation and completion of the "GE surface penetration permit"
IF ACCESS IS NOT READILY AVAILABLE IT IS RECOMMENDED TO PROVIDE A TRAPDOOR IN THE CEILING TO ALLOW SERVICE ACCESS FOR CABLE MANAGEMENT.

**Structural Layout Item List**

**Ge Supplied / Contractor Installed**

1. Area occupied by GE supplied positioner baseplate
2. Area occupied by GE supplied table baseplate
3. Mount X-Ray buzzer bracket on wall above ceiling

**Customer Supplied / Contractor Installed**

4. Support backing, locate as shown.
5. Structural support in ceiling for fastening ceiling supported equipment. Supports to run continuous with no fittings extending below face of channel, run wall to wall, be parallel, square, and in the same horizontal plane, flush with the finished ceiling. Rails are mounted to these supports every 2'-2" and require 350 lbs. (597 lbs. in seismic regions) per bolt load. Methods of support that permit attachment to structural steel or through bolts in concrete should be favored. Do not use screw anchors in direct tension.
6. Structural support in ceiling for fastening ceiling supported equipment. Supports to run continuous with no fittings extending below face of channel, run wall to wall, be parallel, square, and in the same horizontal plane, flush with the finished ceiling. Rails are mounted to these supports every 2'-2" and require 430 lbs. (597 lbs. in seismic regions) per bolt load. Methods of support that permit attachment to structural steel or through bolts in concrete should be favored. Do not use screw anchors in direct tension.
7. Structural support in ceiling for fastening cable drape rail. Supports to run continuous with no fittings extending below face of channel, run wall to wall, be parallel, square, and in the same horizontal plane, flush with the finished ceiling. Rails are mounted to these supports every 2'-2" and require 350 lbs. (597 lbs. in seismic regions) per bolt load. Methods of support that permit attachment to structural steel or through bolts in concrete should be favored. Do not use screw anchors in direct tension.

**Structural Support in Ceiling**

8. Structural supports for fastening the overhead counterpoised suspension. Support to be located as shown. Support should run continuous with no fittings extending below face of channel, be parallel, square, and in the same horizontal plane, flush with finished ceiling. Suspension requires 102 lbs/bolt support. Methods of support that will permit attachment to structural steel or through bolts in concrete construction should be favored. Do not use screw anchors in direct tension.
**LC GANTRY AND TABLE ANCHORING WITH NO BASEPLATE**

1. **LC gantry baseplate (supplied by GE)**
   - Ø550 [Ø21.62 in] cable inlet through concrete slab
   - Ø225 [Ø9.00 in] cable inlet through concrete slab

2. **Table mounting location : 4 bolts and 4 additional bolts for seismic zones**
   - Pullout strength on each bolt 4432 daN
   - M20 Through-Bolts recommended (supplied by GE)
   - Alternates:
     - M16 Mechanical anchors (supplied by GE)
     - Chemical anchors (not supplied by GE):
       - HILTIHVU adhesive capsule + HAS Anchor rod

**FLOOR REQUIREMENTS AND CABLE MANAGEMENT**

**FLOOR REQUIREMENTS**
- The maximum pullout force per GE supplied anchor was calculated assuming:
  - A concrete compression strength of 17.24 MPa at 28 days (which is the minimum required compression strength).
  - Anchors installed to the required hole depth of 165.1 mm [6.5 in] minimum.
  - Center of anchor hole to concrete edge distance 79.4 mm [3.1 in].
- Make sure to obtain data on compression strength of the concrete before using floor anchors.

- The floor slab on which the equipment is to be installed must be flat and level (1 mm [0.04 in]/1 m [40 in] where equipment is installed and 5 mm [0.2 in]/2 m [79 in] general levelness).
- Anchoring to the floor is intended to the structural elements and not to common screed.
- Do not glue the floor covering in the gantry zone.

**CABLEWAYS UNDER FLOOR SLAB**

**JUNCTION BOX BELOW FLOOR**

**NOT TO SCALE**

- **Opening through concrete floor**
- **Electrical cable trough or conduit**
- **Water lines**
- **Concrete floor**
- **Gantry baseplate**
- **Thru-floor fitting**
- **225 [9 in] dia. opening thru floor**

NOT TO SCALE

**NOTE:** PIPE, JUNCTION BOX AND DUCT OR CONDUIT ARE TO BE SUPPLIED AND IS TO BE INSTALLED BY CUSTOMER OR CUSTOMER’S CONTRACTOR

**TYPICAL**

**INNOVA IGS 620-630**

**EN-VAS-TYP-IGS-6-WEB.DWG**

**Rev A** Date 16/Oct/2019

**S3 - Structural Details (1)**
XT RADIOGRAPHIC SUSPENSION, INBOARD MOUNTING

Structural Support system is not supplied or installed by GE Healthcare

**DETAIL 1**
- Contractor supplied and installed structural supports flush with finished ceiling
- GE supplied spring nuts with bolts
- GE supplied longitudinal stationary rail

**DETAIL 2**
- Contractor supplied and installed structural supports flush with finished ceiling
- GE supplied cable drape support
- GE supplied self-tapping screws

Ceiling height as specified on installation drawings

Supports to slab as required

Reference Structural Layout for these dimensions
### MAVIG SUSPENSION MOUNTING METHOD

2.5m CEILING TRACK

- Weight up to: 94 kg (207 lb) (75 kg [165 lb] system + 19 kg [42 lb] track)
- The required factor of safety is "4" for attaching to Unistrut or equivalent rails and "6" for attaching to the concrete ceiling.

**CONSULT MAVIG INSTALLATION MANUAL REV: POR03001 TO DESIGN AND MOUNT THE CEILING SUPPORT.**

**SCALE 1:20**

### SUSPENSION COLUMN LENGTHS AND INSTALLATION DETAILS

**CEILING SUSPENSION DISCLAIMER**

**Safety and precautionary comments:**

Only qualified, licensed technicians can perform electrical connections, installation, removal and repair. It is strongly recommended that at least two persons perform the installation.

Installing the system: Prior to installation, a structural engineer must confirm that the mounting structure is strong enough to provide proper support for the entire system and any attached end devices. Installation must be completed according to local building codes.

Determination of required installation hardware and torque values for installation of the ceiling column and ceiling track is the sole responsibility of the structural engineer.

Ceiling mounted systems must be installed properly. Failure to follow the instructions provided may lead to a potentially dangerous and unstable condition of the system.

GE and/or MAVIG is not responsible for unauthorized modifications made to the system or use of the system for unintended purposes. GE and/or MAVIG cannot be held liable for improper operation and modifications. Since improper modifications may impair proper operation, safety or reliability of the system, product modifications require written authorization from MAVIG.

Under GE responsibility or under Customer responsibility, for all pre-installations, whatever is the structural company.

This certificate shall include the definition of fasteners and of their tightening torque, especially for the non-standard cases described in MAVIG PIM and for which the standard anchoring/screws delivered with product shall not be used but shall be defined (and implemented in most cases) by the structural company.

**WARNING:**

It is prohibited to alter the length of the ceiling column or remove any securing screws.

### CEILING SUSPENSION DISCLAIMER

- For rooms with higher mounting point than 3200 mm [126 in], a ceiling construction between structural ceiling and vertical column is suggested which needs to be designed by a structural engineer.
- All design and pre-installation activity must be done in accordance of the MAVIG Installation manual. Contact your GE Project Manager for OEM documentation. Installation of mounting plate performed by GE or a GE sub-contractor.

**NOT TO SCALE**

**TYPICAL | INNOVA IGS 620-630 | EN-VAS-TYP-IGS-6-WEB.DWG | Rev A/Date 16/Oct/2019 | 55 - Structural Details (3) | 14/22**
LATERAL POSITIONER RAIL MOUNTING SPECIFICATIONS

WARNING: STRUCTURE SHOULD NOT ALLOW VIBRATIONS TRANSMISSION EQUAL OR LOWER THAN 10Hz

When a 191.2 daN force is applied vertically downward or horizontally at any stationary rail mounting point, the attachment interface must not deflect more than 1.6 mm [0.06 in].

When a 222 daN force is applied vertically upward, vertically downward or horizontally at any support rail mounting point, the attachment interface must not deflect more than 1.6 mm [0.06 in].

Center-line of cable take-up support rail mounting points
Center-lines of lateral positioner stationary rail mounting point
Stationary rail mounting points must be parallel within -0,+3.2 mm [-0.13 in].

The difference between the highest and lowest mounting points must lie in the same horizontal plane within 2.4 mm [0.09 in].

CAUTION
- The maximum load per bolt will not exceed 191.2 daN.
- Each bolt must not “pull out” otherwise fail under a vertically downward “dead” load of 763.3 daN.

660.4 ± 1.6mm [26 ± 0.06 in]
648 ± 6 mm [25.5 ± 0.25 in]
495 ± 6mm [19.5 ± 0.25 in]
977.8 ± 1.6 mm -0mm [38.5 ±0.06 -0 in]

Diagonals length must be equal in length to within ± 5 mm [± 0.20 in].

The height of each mounting point must be within +1.6 mm [0.06 in] of the height of its neighbour but the difference between the highest and lowest must not exceed 2.4 mm [0.09 in].

MONITORS CENTERED
1 Monitor suspension axis
2 Monitor cable suspension axis
3 Lateral positioner rail axis
4 Lateral positioner cable suspension axis

Note: no mounting hardware can protrude below the finished ceiling height (top surface of lateral positioner stationary rails), such as Unistrut mounting bolts, support brackets, sprinklers, air vents etc. in between LP stationary rails.

WARNING : STRUCTURE SHOULD NOT ALLOW VIBRATIONS TRANSMISSION EQUAL OR LOWER THAN 10Hz

When a 22.2 daN [50 lb] force is applied vertically upward, downward or horizontally at any Auxiliary support rail mounting point, the attachment interface must not deflect more than 1.5 mm [0.06”]

When a 155.7 daN [350 lb] force is applied vertically downward or horizontally at any stationary rail mounting point, the attachment interface must not deflect more than 1.5 mm [0.06”]

All mounting point must be located on a common centerline (Tolerance ±1.5 mm ±0.06”) All mounting points must lie in the same horizontal plane within (Tolerance ±2.4mm ±0.09”)

Distance between holes axis 660.4 mm [26 in], Maximum load per screw is 155.7 daN [350 lb], however each mounting screw must not "PULL OUT" or otherwise fail under a vertically downward "dead" load of 622.8 daN [1400 lb]. Bolts for mounting stationary rails on structural supports supplied by GE (1/2" - 13 headed bolts).

DIAGRAM: LATERAL POSITIONER AND MONITOR SUSPENSION RAILS- SECTION

TYPICAL

INNOVA IGS 620-630

EN-VAS-TYP-IGS-6-WEB.DWG

Rev A/Date 16/Oct/2019

S6 - Structural Details (4)
### TEMPERATURE AND HUMIDITY SPECIFICATIONS

#### IN-USE CONDITIONS

<table>
<thead>
<tr>
<th></th>
<th>EXAM ROOM</th>
<th>CONTROL ROOM</th>
<th>TECHNICAL ROOM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td>Min: 15°C</td>
<td>Min: 15°C</td>
<td>Min: 18°C</td>
</tr>
<tr>
<td></td>
<td>Recommended: 22°C</td>
<td>Recommended: 22°C</td>
<td>Recommended: 18°C</td>
</tr>
<tr>
<td></td>
<td>Max: 32°C</td>
<td>Max: 35°C</td>
<td>Max: 32°C</td>
</tr>
<tr>
<td><strong>Temperature gradient</strong></td>
<td>≤ 10°C/h</td>
<td>≤ 10°C/h</td>
<td>≤ 10°C/h</td>
</tr>
<tr>
<td><strong>Relative humidity</strong></td>
<td>30% to 70%</td>
<td>30% to 75%</td>
<td>30% to 75%</td>
</tr>
<tr>
<td><strong>Humidity gradient</strong></td>
<td>≤ 10%/h</td>
<td>≤ 10%/h</td>
<td>≤ 10%/h</td>
</tr>
</tbody>
</table>

#### STORAGE CONDITIONS

- **Temperature**: +10°C (50°F) to +40°C (104°F) for overall storage time not more than 90 days.
- **Relative humidity (1)**: 10% to 80%

#### AIR RENEWAL

According to local standards.

#### NOTE

In case of using air conditioning systems that have a risk of water leakage it is recommended not to install it above electric equipment or to take measures to protect the equipment from dropping water.

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### HEAT DISSIPATION

#### TYPICAL USE

<table>
<thead>
<tr>
<th>ROOM</th>
<th>DESCRIPTION</th>
<th>HEAT OUTPUT (KW)</th>
<th>HEAT OUTPUT (BTU/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>STAND BY</td>
<td>MODERATE¹</td>
</tr>
<tr>
<td>Exam room</td>
<td>LC gantry and table</td>
<td>0.61</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>7 &amp; W TFT monitors</td>
<td>0.59</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>Large Display Monitor (LDM)</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>Typical injector</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>1.79</td>
<td>1.83</td>
</tr>
<tr>
<td>Control room</td>
<td>DL console and live monitor</td>
<td>0.16</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>3 M &amp; W flat monitors</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>AW Workstation</td>
<td>0.59</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>Reference monitor</td>
<td>0.12</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>1.12</td>
<td>1.60</td>
</tr>
<tr>
<td>Tech. room</td>
<td>C1 Frontal Cabinet</td>
<td>0.71</td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td>C1 Lateral Cabinet</td>
<td>0.31</td>
<td>0.56</td>
</tr>
<tr>
<td></td>
<td>C2 Cabinet</td>
<td>0.29</td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>Chiller</td>
<td>4.64</td>
<td>5.60</td>
</tr>
<tr>
<td></td>
<td>Detector</td>
<td>0.12</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>3 kVA UPS for LDM</td>
<td>0.15</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>10.59</td>
<td>12.89</td>
</tr>
</tbody>
</table>

**WARNING:** The list contains only the principal components of the system and doesn't contain any non-GE supplied equipment.

¹ Moderate Use corresponds to 8 cases in 10 hours.
² Typical Use corresponds to 11 cases in 10 hours.
³ Maximum Use is during the case.
CONNECTIVITY REQUIREMENTS

Broadband Connections are necessary during the installation process and going forward to ensure full support from the Engineering Teams for the customers' system. Maximum performance and availability for the customers' system is maintained and closely monitored during the lifetime of the system. Proactive and reactive maintenance is available utilising the wide range of digital tools using the connectivity solutions listed below:

- Site-to-Site VPN/GE Solution
- Site-to-Site VPN/Customer Solution
- Connection through Dedicated Service Network
- Internet Access - connectivity for InSite 2.0

The requirements for these connectivity solutions are explained in the broadband solutions catalogue (separate document).

ELECTRICAL NOTES

1. All wires specified shall be copper stranded, flexible, thermo-plastic, color coded, cut 10 foot long at outlet boxes, duct termination points or stubbed conduit ends. All conductors, power, signal and ground, must be run in a conduit or duct system. Electrical contractor shall ring out and tag all wires at both ends. Wire runs must be continuous copper stranded and free from splices.

   1.1. Aluminum or solid wires are not allowed.
   2. Wire sizes given are for use of equipment. Larger sizes may be required by local codes.
   3. It is recommended that all wires be color coded, as required in accordance with national and local electrical codes.
   4. Conduit sizes shall be verified by the architect, electrical engineer or contractor, in accordance with local or national codes.
   5. Convenience outlets are not illustrated. Their number and location are to be specified by others. Locate at least one convenience outlet close to the system control, the power distribution unit and one on each wall of the procedure room. Use hospital approved outlet or equivalent.

6. General room illumination is not illustrated. Caution should be taken to avoid excessive heat from overhead spotlights. Damage can occur to ceiling mounting components and wiring if high wattage bulbs are used. Recommend low wattage bulbs no higher than 75 watts and use dimmer controls (except mr). Do not mount lights directly above areas where ceiling mounted accessories will be parked.

7. Routing of cable ductwork, conduits, etc., must run direct as possible otherwise may result in the need for greater than standard cable lengths (refer to the interconnection diagram for maximum usable lengths point to point).

8. Conduit turns to have large, sweeping bends with minimum radius in accordance with national and local electrical codes.

9. A special grounding system is required in all procedure rooms by some national and local codes. It is recommended in areas where patients might be examined or treated under present, future, or emergency conditions. Consult the governing electrical code and confer with appropriate customer administrative personnel to determine the areas requiring this type of grounding system.

10. The maximum point to point distances illustrated on this drawing must not be exceeded.

11. Physical connection of primary power to GE equipment is to be made by customers electrical contractor with the supervision of a GE representative. The GE representative would be required to identify the physical connection location, and insure proper handling of GE equipment.

12. GEHC conducts power audits to verify quality of power being delivered to the system. The customer's electrical contractor is required to be available to support this activity.

- All junction boxes, conduit, duct, duct dividers, switches, circuit breakers, cable tray, etc., are to be supplied and installed by customers electrical contractor.
- Conduit and duct runs shall have sweep radius bends
- Conduits and duct above ceiling or below finished floor must be installed as near to ceiling or floor as possible to reduce run length.
- Ceiling mounted junction boxes illustrated on this plan must be installed flush with finished ceiling.
- All ductwork must meet the following requirements:
  1. Ductwork shall be metal with dividers and have removable, accessible covers.
  2. Ductwork shall be certified/rated for electrical power purposes.
  3. Ductwork shall be electrically and mechanically bonded together in an approved manner.
  4. PVC as a substitute must be used in accordance with all local and national codes.
- All openings in access flooring are to be cut out and finished off with grommet material by the customers contractor.
- General contractor to insert pull cords for all cable run conduits between the equipment room and the operators control room.
- 10 foot pigtails at all junction points.
- Grounding is critical to equipment function and patient safety. Site must conform to wiring specifications shown on this plan.
TYPICAL EQUIPOTENTIAL CONNECTIONS

ST1-ST2 OVERHEAT ALARM FOR THE TECHNICAL ROOM

28 °C [82.4 °F] to 30 °C [86 °F]: Warning lamps (lit or flashing) in the control room above 30 °C [86 °F]: Warning lamps (lit or flashing) and audible warning buzzers in the control room with transfer at the security post.

NOTE:
Installation of the above mentioned overheat alarm system belongs to customer responsibility.
**POWER DISTRIBUTION**

**POWER SUPPLY FOR MAIN SYSTEM**
- Main supply: 3 phases + N
- Diameter: Min 35 mm² (AWG2) or same size as feeder wire, whichever is larger
- EMI Filter
- 24V
- X-Ray room warning light control panel
- Located near access doors (1) (2)
- X-Ray ON light - 24V
- Located near access doors (1) (2)
- Emergency off switch, near access doors with double contacts for two independent circuits. Second circuit sized for 5A. (2)
- Injector wall outlet 10/16A+G
- (1) Refer to local standards
- (2) Location and/or quantity: refer to layout

**Technical Room**
- LOTO
- 230V 2A
- 24V
- Power Distribution Box (PDB)
- 3 x 1.5 mm² (AWG14)
- 3 x 1.5 mm² (AWG14)
- 150A

**POWER SUPPLY FOR LDM**
- Main supply: 3 phases + N
- Diameter: Min 35 mm² (AWG2)
- 2.5 mm² (AWG12)
- Automatically transformer
- Frontal tube chiller
- Lateral tube chiller
- X-Ray Generator
- C1
- Frontal cabinet
- Lateral cabinet
- C2 cabinet
- Fluoro UPS cabinet
- X-Ray ON light
- 24V
- Room light circuit: room lights off during X-Ray generation
- (Room light)

**Technical Room**
- UPS 3kVA
- Cable SUPPLIED BY GE
- Large Display Monitor (LDM) Cabinet
- Ground 2.5 mm² (AWG12)
- 480V 16A
- 480V 16A
- 480V 80A
- 480V 80A
- 480V 80A
- 3 x 15 mm² (AWG14)
- 2 x 15 mm² (AWG14)
- 1 x 15 mm² (AWG14)

**Power Distribution Box (PDB)**
- 230V 2A
- 24V
- 3 x 1.5 mm² (AWG14)
- 3 x 1.5 mm² (AWG14)
- 3 x 2.5 mm² (AWG12)
- 240V 16A
- 240V 16A
- 240V 80A
- 240V 80A
- 480V 80A
- 480V 80A
- 480V 80A
- 150A

**NOTES:**
- A wall circuit breaker or equivalent device with LOTO (Log-Out/Tag-Out) capability must be installed on the main power.
- All the cables entrances to the PDB are at the bottom of the cabinet.
- Max size of terminal block for PDB input cables: 4x95 (AWG000) mm²

Following cables shall be furnished locally:
- Power cable between PDB and CF1F X-Ray generator (max 24 m [78']]): 4 x 35 mm² (AWG2)
- Power cable between PDB and CF1L X-Ray generator (max 24 m [78']): 4 x 35 mm² (AWG2)
- Power cable between PDB and C2 cabinet (max 24 m [78']): 4 x 6 mm² (AWG8)
- Power cable between PDB and Frontal X-Ray tube Chiller (max 24 m [78']): 4 x 6 mm² (AWG8)
- Power cable between PDB and Lateral X-Ray tube Chiller (max 24 m [78']): 4 x 6 mm² (AWG8)
- Ground cable between C1 cabinet and PDB (3 x 2.5 mm² (AWG12))

Additional cables with FLUORO option:
- Power cables between PDB and Fluoro UPS: 5 x 10 mm² (AWG6)x2

Additional cables with LDM option:
- Power cable for the 3kVA UPS
- Ground cable between hospital and LDM Cabinet

**Cable SUPPLIED BY CUSTOMER**
- Red

**Equipment SUPPLIED BY CUSTOMER**
- Black

**Equipment SUPPLIED BY GE**
- Blue
**FEEDER TABLE**

<table>
<thead>
<tr>
<th>MIN. FEEDER WIRE SIZE, AWG OR MCM (sq. mm)/VAC</th>
<th>MINIMUM FEEDER WIRE LENGTH - ft (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 (15)</td>
<td>100 (30)</td>
</tr>
<tr>
<td>150 (46)</td>
<td>200 (61)</td>
</tr>
<tr>
<td>250 (76)</td>
<td>300 (91)</td>
</tr>
<tr>
<td>350 (107)</td>
<td>400 (122)</td>
</tr>
<tr>
<td>480 VAC</td>
<td>1/0 (55)</td>
</tr>
<tr>
<td>*1/0 (55)</td>
<td>*1/0 (55)</td>
</tr>
<tr>
<td>*1/0 (55)</td>
<td>1/0 (55)</td>
</tr>
<tr>
<td>1/0 (55)</td>
<td>4/0 (107)</td>
</tr>
<tr>
<td>4/0 (107)</td>
<td>4/0 (107)</td>
</tr>
<tr>
<td>300M (150)</td>
<td></td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

IN ALL CASES QUALIFIED PERSONNEL MUST VERIFY THAT THE FEEDER (AT THE POINT OF TAKE-OFF) AND THE RUN TO THE GE SYSTEM MEET ALL THE REQUIREMENTS STATED IN THE PIM. FOR A SINGLE UNIT INSTALLATION, THE MINIMUM TRANSFORMER SIZE IS 225KVA, WITH 2.4% RATED REGULATION AT UNITY POWER FACTOR. RESULTANT MAXIMUM ALLOWABLE FEEDER REGULATION IS 3.6%. THE GROUND WIRE TO EARTH SHALL BE A MINIMUM OF AWG 2/0 (UL) OR 35 MM² (CE) OR THE SAME SIZE (100%) AS FEEDER WIRES, WHICH EVER IS LARGER. WHEN A FLUORO UPS IS OR WILL BE INSTALLED, A NEUTRAL LINE IS MANDATORY. IF IT SCHEME AS EARTHING SYSTEM IS USED, AN ISOLATION TRANSFORMER IS REQUIRED WITH DELTA-WYE OR DELTA-STAR CONNECTION. * MINIMUM WIRE SIZE FOR CIRCUIT BREAKER, BASED ON RECOMMENDED OVERCURRENT PROTECTION.