



AMX™ Navigate

Mobile Digital Radiographic System
powered by Helix™

Datasheet



AMX Navigate – a new generation of AMX Performance. GE's advanced mobile digital radiographic system, powered by Helix 2.1 advanced image processing helps you achieve clinical excellence with ease and efficiency.

Available in collapsible and fixed column configurations, it combines the power of on-device, AI-driven image processing and clinical decision support with high-resolution 100 micron FlashPad™ HD digital detectors, enabling you to consistently see fine details with exceptional contrast regardless of dose.

The AMX Navigate was designed for complex care areas in mind, built with exceptional maneuverability and for rugged reliability. The system also helps simplify imaging with Free Motion power-assisted collapsible column to reduce the stress and strain of tube positioning, a streamlined user interface, and workflow-redefining Zero Click Exam.



Introduction

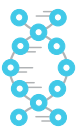
A highlight of differentiating technology that helps redefine portable X-ray:



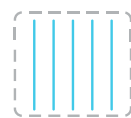
Free Motion power assisted collapsible column reduces effort required to complete an exam with only 2.0 kg (4.5 lb) lift force.



21.5" Monitor introduces a large, high-resolution on-device viewing area with improved touch sensitivity and a flush mounted design for cleanability.



Helix 2.1 delivers extraordinary anatomical detail and AI-based brightness and contrast adjustment (AIBC) for consistent image presentation despite variation in patient size, exposure technique, collimation, and metal implants.



AutoGrid helps optimize the in-room workflow by helping improve image contrast and reduce the effects of scatter radiation in lieu of using a physical grid.



Critical Care Suite 2.0 is a suite of AI algorithms for the automated image analysis of frontal chest X-rays for the presence of critical findings, quality checks and/or measurements.



FlashPad HD high resolution wireless digital detectors provide 75% DQE and 100 um, 5.0 lp/mm resolution.



Zero Click Exam leverages RFID badge login, barcode patient verification, automated protocol selection, and AI processing to eliminate the need for touchscreen interaction prior to annotation.



QuickCharge offers in-bin charging for two FlashPad HD detectors without having to remove the batteries.

Artificial Intelligence

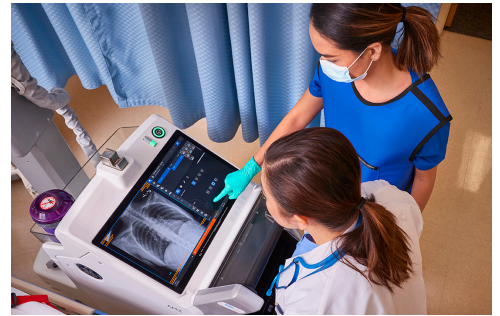
Clinical Excellence with AI decision support and quality checks helps improve operational efficiency throughout the radiology department. Coupled with powerful analytics and advanced service technologies, the AMX Navigate redefines mobile X-ray.

Critical Care Suite (CCS) is the world's first collection of on-device AI algorithms for automated measurements, case prioritization and quality control.

Pneumothorax Triage and Notification



On-device AI algorithm identifies and helps prioritize critical cases such as Pneumothorax.



Endotracheal Tube Positioning



Automatically detects ET tube in chest images, enabling an on-device AI viewer and immediate access to AI-derived measurements in PACS worklist. Displays AI-generated measurements with an image overlay in PACS.

Quality Care Suite (QCS)



Intelligent Protocol Check detects if the image is a frontal chest X-ray (AP/PA). The user receives a notification if a mismatch exists between the image acquisition protocol and the acquired image.



Intelligent Auto Rotate determines the rotation angle of a chest image and auto-rotates the image for proper display (heads-up).



Intelligent Field of View detects whether the lung field is complete in the image. If the model identifies that the lung field is incomplete, a notification is provided to the user.

Fleet Analytics



GE's X-ray Quality Application featuring Repeat Reject Analytics provides on-premise, web-based dashboards to manage quality assurance, uncover the root cause of rejected X-ray exams, plan targeted training and help reduce unnecessary radiation dose, featuring multivendor compatibility with 13 GE systems and 5 additional vendors.

iCenter asset management software platform is designed to help optimize utilization of X-ray equipment and balance workload using the full power of healthcare data analytics.

InSite™ remote service support enables remote diagnostics and troubleshooting for fast resolution, often without a field engineer visit.

FlashPad HD Detectors

Digital image acquisition supports fast and efficient exam procedures, eliminating time spent handling film and cassettes, helping reduce overall exam times and improving patient satisfaction.

FlashPad HD wireless flat panel detectors are designed for high resolution 5 lp/mm imaging and provide outstanding image quality with exceptional dose efficiency.



| | HD 3543 (14"x17") | HD 2530 (10"x12") |
|-------------------------|--|---|
| Detector technology | Single panel (non-tiled) amorphous silicon with a Cesium Iodide (CSI) scintillator | |
| Dimensions | ISO 4090 cassette size 384 x 460 x 15.5 mm | ISO 4090 cassette size 282 x 332 x 15.5 mm |
| Pixel matrix | 3524 x 4288 | 2508 x 3004 |
| Weight (w/ battery) | 3.2 kg (7 lbs) | 1.8 kg (4 lbs) |
| Battery information | Lithium ion battery with battery status indicator on the detector | |
| Battery operating time* | 4 hours | 2 hours |
| Battery charging time | 2.5 hours | |

| Detector Imaging Performance | |
|------------------------------|---|
| Pixel size | 100 µm |
| Limiting resolution | 5 lp/mm |
| DQE (typical, RQA5) | 75% @ 0lp/mm 60% @ 1lp/mm 40% @ 3lp/mm |
| MTF (typical, RQA5) | 70% @ 1lp/mm 40% @ 2lp/mm 15% @ 4lp/mm |
| Image depth | 16 bit |
| Dynamic range (RQA5) | 6 uR -9 mR |
| Load capacity (max) | 150 kg distributed weight, 100 kg concentrated weight (45 mm diam area) |
| Ingress protection | IPX4 (splashing water) |

| Communication | |
|-----------------------------|----------------------|
| Wireless interface | 802.11n, 5 Ghz |
| Ethernet interface | 1000 Mbps |
| Wired connection (Optional) | 4 m (13.1 ft) tether |

QuickCharge allows dual detector in-bin charging. This gives you peace of mind knowing that the detectors will be ready when you need them.

QuickConnect adaptive wireless technology enables automatic channel switching to improve image transfer and avoid wireless interference with other equipment on the hospital network.

QuickShare allows registered detectors to work across multiple compatible GE systems with no additional configuration required. Pairing enables registered detectors to connect wirelessly within seconds.

Quality Assurance Procedure (QAP) enables easy image quality checks by the customer. A phantom optimized for Digital Image Quality testing is included with the system. Changes are highlighted and can be corrected before they become a problem.

*Number of exposure on a single charge does not impact the operating time.

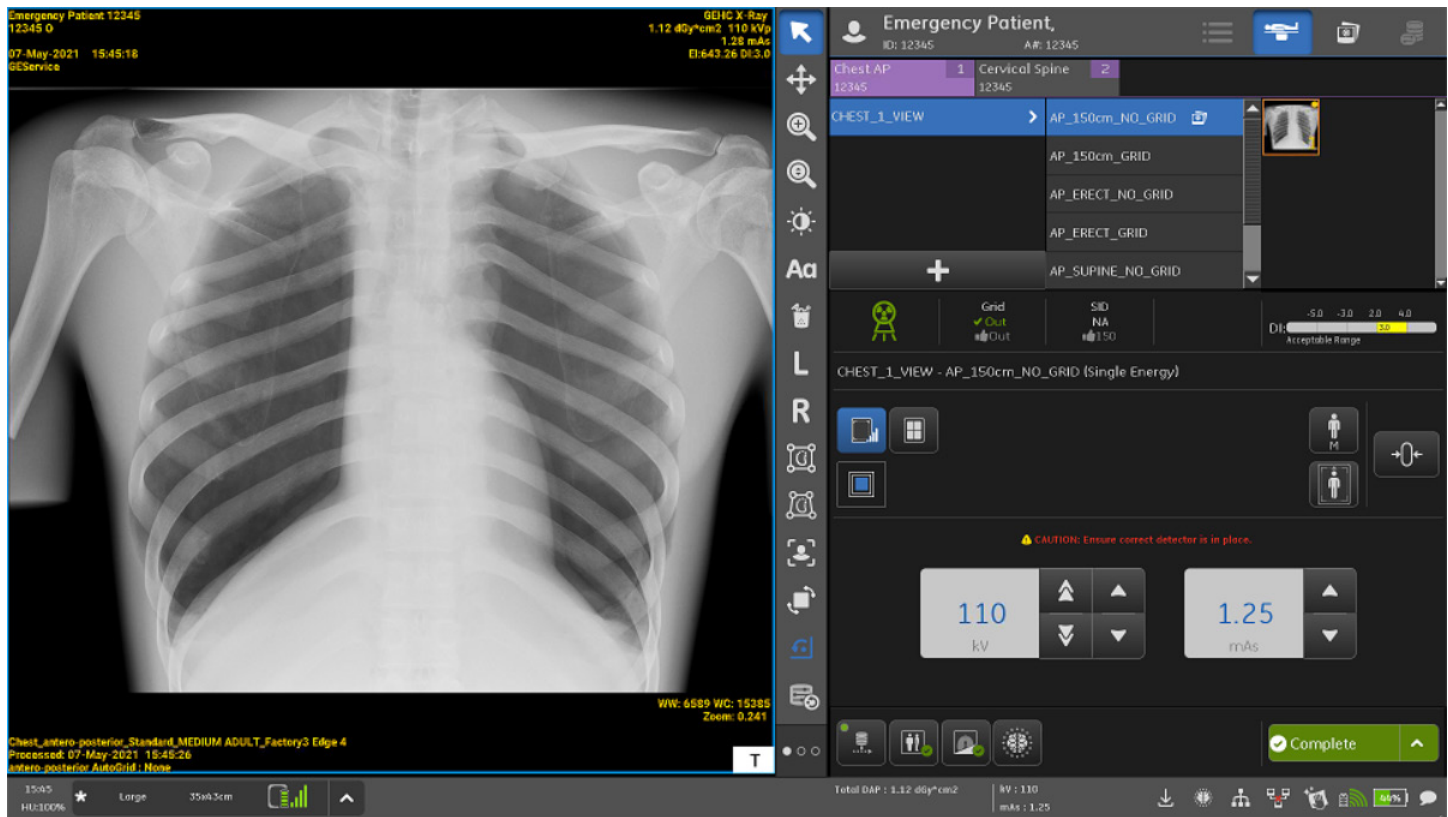
Helix Advanced Image Processing

Helix 2.1 algorithms are designed to deliver outstanding resolution, excellent edge presentation, consistency and noise handling. Preview images are processed to deliver image looks that are equivalent to those of the final processed image.

| Helix Algorithms and Features | |
|-----------------------------------|---|
| AI Brightness & Contrast (AIBC) | AI-based algorithm delivers improved brightness and contrast presentation consistency even with changes in dose or patient positioning. Available in 59 anatomies/views. The remaining anatomies/views are handled by the smart window/level algorithm. |
| Auto Shuttering | Automatically adjusts to the selected FOV through intelligent collimation and edge detection. |
| Raw Radiation Rejection | Identifies and removes raw radiation pixels to help improve image processing, image display and DI estimation. |
| Grid Line Reduction | Suppresses grid lines on the image without impacting anatomical details. |
| Detail Preserving Noise Reduction | Reduces the mottle noise in denser areas of the anatomy while preserving detail in the rest of the image. |
| Localized Contrast Enhancement | Enhances local contrast in the lung region of chest images. |
| Multi-Resolution Processing | Enhances edges at different resolutions to provide exquisite bone detail, differentiation of soft tissues and improved visualization of metal. |
| Tissue Equalization | Provides enhanced visualization in thick and thin regions of the anatomy. |
| Image Processing Looks | Optimizes anatomical views with four pre-set image processing selections, or “factory looks,” per view. Users can define up to five additional custom looks for each anatomical view and patient size combination. Redesigned user interface and algorithms allow for near real-time image updates as image look adjustments are performed by the user. |
| Image Processing Time | ≤3 seconds for image preview. ≤10 seconds for final processed image. |

User Interface Key Features

The AMX Navigate features a redesigned user interface that is now shared with some GE fixed radiography products. Amongst many improvements, the new software includes a Quick Toolbar which provides convenient access while reviewing images to three pages of commonly used functions that can be tailored to best fit the typical workflow, new options for image annotation and display, and an improved copy exam workflow.



Worklist

- Column-customized worklist
- Auto-refresh
- Emergency patient imaging
- Barcode reader for input, verification and Zero Click Exam

Protocol Management

- 10 adult and pediatric patient sizes
- Protocol adjustment for IQ or dose reduction
- Compatible with Auto Protocol Assist

Image Management

- Copy images into a second patient entry
- De-identify makes an anonymous exam copy removing patient identifying information
- PACS Test Images to test IQ
- TG18 test images that are used to calibrate the display monitor
- Image exchange via USB or Read/Write (Write once, multiple access) CD/DVD-ROM
- DICOM® viewer provided on CD/DVD

Advanced Workflow Solutions

Zero Click Exam



Incorporates RFID badge reader login, barcode patient verification, Auto Protocol Assist, Helix 2.1 AIBC, and Quality Care Suite to help automate the image acquisition workflow and eliminate any required touchscreen interaction prior to annotation.

RFID Badge Reader



A convenient, secure tool utilizes an RFID badge scan to login or logout of the system. The Badge Reader is installed inside the side panel of the mobile system, allowing for easy access.

QuickEnhance



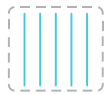
One-touch toolbar function reprocesses images with a different custom look—with no additional dose to the patient and no additional clicks for the user. It is customizable by anatomy for multiple uses including instrument check, implant visualization, or line placement.

Quality Care Suite



Includes a suite of AI-powered quality check algorithms to assist with common chest imaging positioning, field of view, and protocol mistakes, and to help to streamline the exam workflow.

AutoGrid



Improves image contrast by reducing the effects of scatter radiation. It provides equivalent image contrast to the use of a physical grid and can help optimize the in-room workflow by eliminating the need to apply physical grids or repeat images due to grid and tube misalignment.

Auto Protocol Assist



Automates patient exam type selection by transitioning directly to the acquisition screen when the protocol code downloaded from the HIS/RIS matches the exam code contained in the protocol database.

Repeat/Reject Analysis



Allows for repeat or reject images to be captured and categorized by technologist. Reports from this automated quality assurance tool can be exported to USB, DVD or CD.

HIS/RIS Link



Provides access to a facility's HIS/RIS, EMR, and/or PACS software directly from the mobile system user interface. This feature enables a technologist to complete actions in those hospital applications, such as remotely start, close, and complete HIS/RIS exams from the portable.

Barcode Reader



Enables efficient exam selection by automatically filtering the user worklist from a QR/barcode scan, including a preference setting to automatically enter the matching exam. By scanning a patient wristband, this provides the additional confidence of patient verification. When positioned in a text field on any screen, the barcode scan will populate the QR/barcode data as text.

Remote TechSwitch



Cordless handswitch enables procedural flexibility and radiation protection to the technologist.

System Monitor and Computer

The 21.5" capacitive touchscreen helps improve sensitivity both with or without gloves and has an anti-glare coating which enables viewing in both brightly lit rooms (OR, ER) and dark rooms (NICU, ICU). The monitor is designed for ease of cleaning with a flush-mounted profile and QuickClean™ to temporarily disable touch sensitivity. It is powered by a new computer with GPU for faster AI computation and image processing.



System Monitor Specifications

| | |
|----------------|---|
| Size | 61 cm (21.5 in) diagonal measurement |
| Resolution | 1920 x 1080 pixels (full HD) |
| Technology | Capacitive touch |
| Color Depth | 16.7 M colors |
| Contrast Ratio | 1000:1 |
| QuickClean | One-touch screen lockout for disinfecting |

Computer Specifications

| | |
|--|---|
| Operating system | Linux SLES 15 |
| CPU | Intel Core i5-7500T (4 cores) |
| Hard disk storage | 1 TB SATA SSD |
| Image storage | 5100 uncompressed images Programmable auto delete function |
| RAM | 32 GB DDR4 |
| GPU | Nvidia Quadro P1000 |
| HIS/RIS Link Virtual Machine Operating System | Windows 10 |
| Time to boot the system after normal shutdown | ≤180 seconds |

DICOM Connectivity

Images may be transmitted manually or automatically via the DICOM interface to 10- or 12-bit printers, archival devices, servers, or review workstations. System Access and Authorization Control support HIPAA Compliance.

Refer to the DICOM Conformance Statement for complete definition of supported DICOM services.

| DICOM 3.0 Services | |
|----------------------------------|--|
| Modality Worklist (SCU) | Interface with HIS/RIS with programmable auto refresh |
| MPPS (SCU) | Feedback the status of exams to the HIS/RIS |
| Storage (SCU) | Manual and auto send image (DX or CR IOD) to multiple PACS |
| Storage commitment (SCU) | Send commitment state |
| Media exchange | CD/DVD/USB DICOM image export and import |
| Grayscale print | Manual & Auto print with print layout options |
| Verification services | C-Echo as SCU and SCP |
| Dose Structure Report (optional) | Send dose values for each study to an archiving system |

| Communication | |
|--------------------|---|
| Wireless interface | 802.11n, 2.4 and 5 Ghz |
| Connectivity | Static IP or DHCP networking profiles supported |

Network Connectivity, Remote Service, & Security

IPv4 and IPv6 are supported and configurable.

InSite remote system tool supports communications between customer and GE. Problems may be diagnosed, resolution expedited, or fixed remotely without the need for a field service engineer be onsite.

System Security*

| IT Security Pack Features | |
|---|--|
| Anti-Virus and Intrusion Detection | McAfee anti-virus software monitors files (read or execute) and report errors to user. |
| Anti-Virus scanning | Real-time or on-demand |
| Virus Signature Update | Updates via local USB or site ePO server |
| FIPS Compliance | Complies with FIPS 140-2 for data encryption or hashing |
| TLS | Encrypted data transmission using Transport Layer Security |
| Hard Drive encryption | PHI/PII encrypted data at rest |
| Audit logging | Collect usage logs for security auditing with DICOM Conformance format |
| HIS/RIS Link Virtual Machine Anti-Virus | Windows Defender Other third party anti-virus offerings configurable by site |

*Refer to MDS2 and Privacy and Security manual for more information.

Telescoping Column and Tube Head Assembly

Refer to system diagrams page for focal spot range, column rotation, and tube head height.

- 2.0 kg (4.5 lb) tube head lift force
- LED Status indicator at top of column with 5 states to identify system readiness and exposure status
- Tube angle display and SID measuring tool
- Emergency stop button for immediate shut down of column motion

Generator

Super-resonant inverter with varying frequency.

| X-ray Generator | |
|----------------------|--|
| Nominal output | 30 kW |
| Tube current | 300 mA Max |
| kVp controls | 50 – 125 ±1 kVp increments |
| mAs controls | 0.2 – 630 1 Renard (25% up – 20% down) |
| Frequency | >100 kHz |
| Low frequency ripple | <2% |

X-ray Source

| Tube | |
|--|--|
| Focal spot | 0.6 mm / 1.2 mm (IEC60366, nominal) |
| Anode rotation speed (min) | 3,200 rpm |
| X-ray tube current (Max) | Large focus: 500 mA Small focus: 200 mA |
| Tube Voltage Nominal | 40 – 150 kV |
| Permanent filtration | 0.9 mm AL/75 kV |
| Continuous heat dissipation without air circulator (Max) | 170 W (238 HU/s) |
| Anode heat units (Max) | 140 kHU |
| Exposure time | 4.0 msec – 6.0 sec |

Collimator

The collimator consists of 2 sets of blades which are controlled via lateral and longitudinal knobs.

| Collimator | |
|-------------------------------|--|
| Coverage | 43 cm x 43 cm (17 in x 17 in) at 100 cm (40 in) SID |
| Light field | LED lamp Automatic shut-off configurable from 0 to 90 seconds |
| Light brightness (100 cm SID) | 280 Lux without DAP meter 180 Lux with DAP meter |
| Centering indication | Shadow crosshair |
| Rotation | ±90 degrees with detents at -90, 0, and +90 degrees |
| Collimation control | Manual |

Dose Monitoring

DAP (Dose Area Product) Meter – included

Detector Exposure Indicator (DEI) is a tool for tracking patient over/under-exposure by estimating radiation exposure behind the patient and is a relative measure of exposure to the detector.

Exposure Index (EI) is proportional to detector exposure assuming that the X-ray technique used is the same as that of the calibration technique.

Deviation Index (DI) estimates the deviation of actual detector exposure from target detector exposure.

Dose Area Product (DAP) is automatically annotated onto the digital image for the exposure and is displayed on the acquisition screen post exposure.

The Dose Reporting Tool allows a user to export dose relevant data within a specific time frame. The dose data can also be included as an annotation on the image.

Radiation Dose Structured Reports feature generates patient dose data for each exam and exports using DICOM defined objects with the following details:

- Patient information
- Study UID
- Accumulated DAP / Dose
- EI, Target EI, DI
- Image specific technique parameters
- Basic acquisition equipment information

Power Management

- The battery operated system can be charged and take exposures using facility power. Automatic algorithms allow charged at any charge level—even during exposure—enabling 24/7 availability
- A battery charge indicator on the system is visible even when the user interface screen is off

| System Battery | |
|------------------|---|
| Battery type | Lead Acid |
| Charging time | 4.5 hours to go from 0% to 100% |
| Battery capacity | Up to 350 images or 28 km of continuous driving or some combination thereof in a single charge over 4.6 hours |
| Power input | 100-240 V nominal, 50/60 Hz |

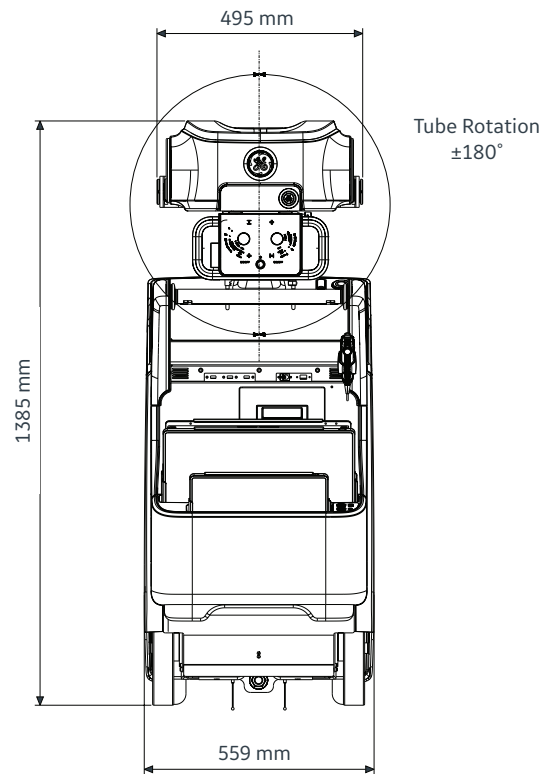
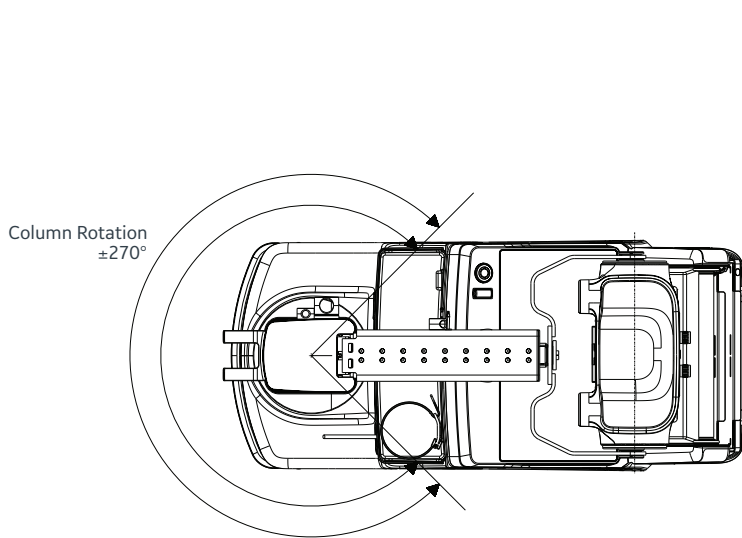
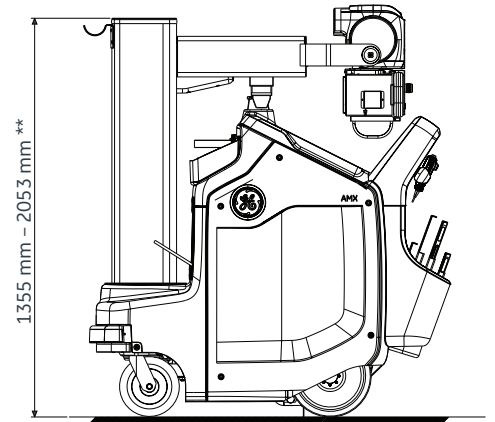
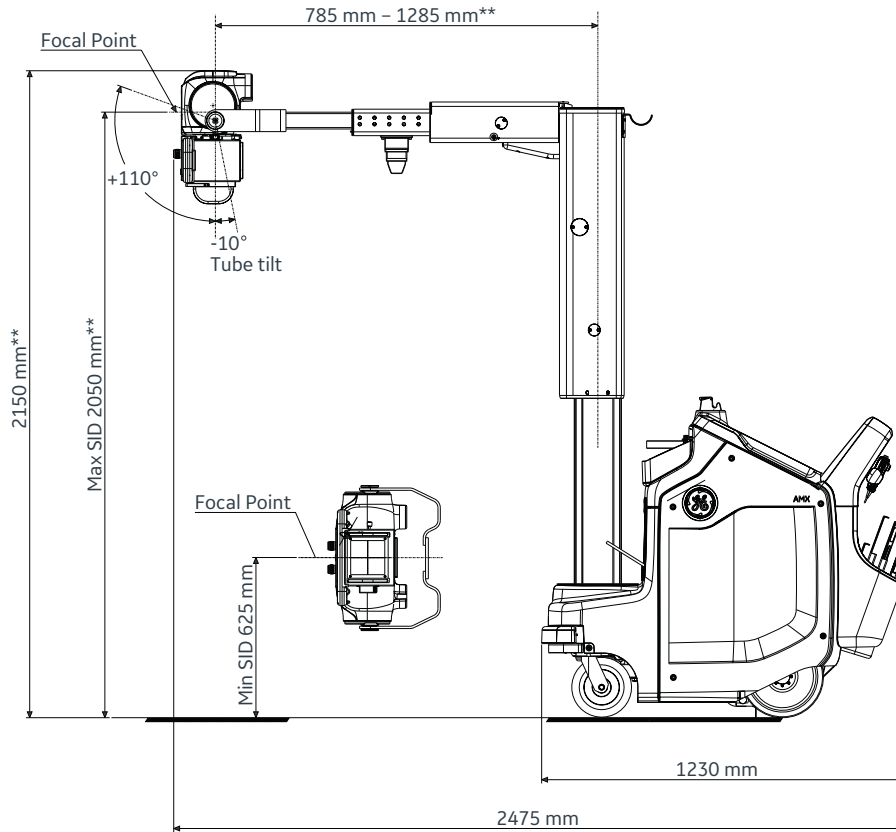
Drive Characteristics

- Self-propelled single handle drive control
- Variable speed automatically adjusts to the operator's pace, up to 5 km/hr (3.1 mph) forward or 2.5 km/hr (1.5 mph) in reverse or with tube unparked
- Capable of climbing an incline of 7°
- System automatically applies brakes upon release of drive handle
- Brake release button for manual movement
- Keypad access to enable or disable system drive

Environmental Conditions

| Environmental Conditions | Operating | Non-Operating |
|--------------------------|---|--|
| Altitude | -382 m to 3,000 m relative to sea level | -382 m to 5,575 m relative to sea level and support nonpressurized air transport |
| Temperature | 10°C to 35°C | -10°C to 45°C |
| Humidity | 30% to 75% RH, noncondensing | 25% to 85% RH, noncondensing |
| Atmosphere Pressure | 106 kPa to 70 kPa | |

System Drawings



**Fixed Column Configuration Differences

| | |
|----------------------|------------------|
| Tube Head Reach | 713 mm – 1114 mm |
| Column Height | 1940 mm |
| Max SID | 2011 mm |
| Max Tube Head Height | 2111 mm |

Compliance to Standards

The AMX Navigate digital radiographic imaging system is designed to meet applicable performance standards for diagnostic X-ray equipment enunciated by the U.S. Department of Health and Human Services pursuant to the Radiation Control for Health and Safety Act. In addition, the system complies with UL, IEC requirements.

Warranty

The published company warranty in effect on date of shipment shall apply. Right reserved to make changes.

About GE Healthcare:

GE Healthcare is the \$18 billion healthcare business of GE (NYSE: GE). As a leading global medical technology and digital solutions innovator, GE Healthcare enables clinicians to make faster, more informed decisions through intelligent devices, data analytics, applications and services, supported by its Edison intelligence platform. With over 100 years of healthcare industry experience and around 50,000 employees globally, the company operates at the center of an ecosystem working toward precision health, digitizing healthcare, helping drive productivity and improve outcomes for patients, providers, health systems and researchers around the world.

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Some features described are product options. Not all products or features are available in all geographies. Check with your local GE Healthcare representative for availability in your country.

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