

Aquilion ONE

PRISM Edition

APPLICATION

Aquilion ONE / PRISM Edition with New UX (User Experience) is a dynamic volume CT system that supports whole-body scanning. This 320 detector row system generates 640 slices per rotation. Intensive clinically focused research and breakthrough technological developments have culminated in a CT system with industry leading spatial resolution and reduced radiation dose requirements.

FEATURES

• Automatic scan planning

Aquilion ONE / PRISM Edition with New UX features automatic scan planning to automatically plan all routine scans including scan ranges and parameters using the highly innovative anatomical landmark detection technology.

– 3D Landmark Scan

An industry first, 3D Landmark Scan is an ultra-low-dose helical scan performed using the SilverBeam filter, at the same dose as traditional 2D scanograms. In addition, this function provides an axial image obtained by low dose imaging, there is no need to acquire an additional axial image as a reference image for ^{SURE}Start scan planning.

– Anatomical Landmark Detection (ALD)*1

Using data acquired via the 3D Landmark Scan, Canon's ALD can identify the anatomical structures with 97% accuracy required to perform automatic scan planning for all routine examinations. ALD, an AI technology, utilizes a machine learning technology to perform anatomical analysis and recognition of each 3D Landmark and obtain anatomical position information. ALD enables the scan range and field of view to be automatically set to the same position predefined in the scan protocol, thus saving time while ensuring consistent results for all CT technologists.



• PIQE Reconstruction System*1, *2

Aquilion ONE / PRISM Edition with New UX features super resolution deep learning reconstruction technology "Precise IQ Engine (PIQE)" designed to more fully utilize the maximum resolution of the detector, providing super resolution 1024 matrix images for Cardiac, Lung and Body examinations without compromising on image noise or dose. It's time to embrace the benefits of Area Detector CT for cardiac CTA and Body CT exams with improved spatial resolution and a new level of AI*3-enhanced performance.

- Higher definition with no dose or low contrast detectability penalty:*4
 - Twice the object definition in typical, clinical FOVs*5, *6, *7
 - 5 lp/cm greater in-plane resolution*5, *6
- Lower noise and clearer, more accurate cardiac imaging:*8
 - Improved visualization for common cardiac tasks
 - Improved CNR in all planes for improved visualization in Curved and oblique MPR views
 - Improved spatial resolution and simultaneously reduced noise without loss of noise texture
 - Better visualization of fine, high contrast structures
 - Improved object visualization for more diagnostic confidence

*1: The ALD and PIQE Reconstruction System are not provided with a self-learning function that allows the CT system to modify its own programs. Therefore, training of the ALD and PIQE algorithm are not performed at the end-user's site.

*2: Option

*3: The term Artificial Intelligence (AI) is defined here as technology using Deep Learning methods.

*4: Compared to AIDR 3D Enhanced soft tissue.

*5: 10% MTF, cylindrical Teflon test object in Catphan® 600

*6: In clinical practice, the use of PIQE may increase spatial resolution (super resolution), depending on the clinical task, patient size, anatomical location, and clinical practice.

*7: Object definition defined as contrast preserved at each spatial frequency for a high contrast object

*8: Compared to AIDR 3D Enhanced soft tissue.

• Advanced intelligent Clear-IQ Engine (AiCE)*¹

Aquilion ONE / PRISM Edition with New UX utilizes a next-generation approach to CT reconstruction which integrates a Deep Convolutional Neural Network trained to perform one task: to reconstruct CT images that are sharp and clear. AiCE is trained using thousands of Model-Based Iterative Reconstruction (MBIR) image patches to separate structure from noise. Validated for accuracy, AiCE uses thousands of features learned during training (Deep Learning) and applies its expansive knowledge to achieve fast, high-quality CT reconstruction.

- Is integrated into SURE Exposure 3D to ensure automatic dose reduction
- AiCE reconstruction employing multiple high-performance GPUs in the reconstruction unit
- Reconstruction performed in parallel with InstaView realtime reconstruction
- Reconstruction speed up to 40 fps
- 69.0 to 81.0% dose reduction*^{2, *3, *4}
- 18.4% better low contrast detectability than Adaptive Iterative Dose Reduction 3D (AIDR 3D)*⁵ for abdomen at same dose level*²
- More natural noise texture compared to Forward projected model-based Iterative Reconstruction Solution (FIRST).^{*6}
- Twice the high contrast spatial resolution of AIDR 3D while reducing noise.

• SilverBeam Filter

Designed to work with AiCE, this beam shaping energy filter can deliver high resolution, low noise, and low artifact images. This is a significant advancement in lung cancer screening.

• Spectral Imaging System*^{1, *7}

Canon's Deep Learning Spectral CT system has been designed to take your imaging capabilities to a whole new level. Not only does it harness the temporal benefits of rapid kV switching with patient-specific mA modulation, it combines them with a Deep Learning reconstruction that delivers energy separation for Spectral Images with low-noise properties. Its fully integrated end-to-end workflow is easy to use and can be conveniently incorporated into your routine protocols.

Aquilion ONE / PRISM Edition with New UX with Deep Learning Spectral automatically reconstructs monochromatic images, material-specific reconstructions and iodine maps, to ensure you get the images you need consistently for your staff. Images are delivered directly to your reading station for easy review, and with the wide range of new Vitrea applications, your team can further analyze comprehensive spectral data, including quantification and multi-layered images, for a more detailed and confident diagnosis.

Spectral Imaging System – Advantages

- Dose neutral as compared to single energy*⁸
- 160 mm/rotation volume scan coverage and 500 mm full axial field of view
- Material differentiation and characterization
- Low noise*^{9, *10}, fine grain texture monoenergetic images*⁹
- Patient-specific mA modulation
- Reduced beam hardening artifact
- 50% noise reduction compared to same dose single energy*¹⁰
- 150% CNR improvement vs single energy at the same dose*¹¹
- Spectral offers the ability to optimize iodinated contrast media usage*¹²
- Advanced visualization integrated into scan protocols, including
 - Iodine maps (color fusion)
 - Virtual non-contrast images
 - Monochromatic images

*1: The AiCE and Spectral Imaging System are not provided with a self-learning function that allows the CT system to modify its own programs. Therefore, training of the AiCE and Spectral Imaging System algorithm are not performed at the end-user's site.

*2: Based on the detectability index performance metric, a measure of signal to noise that takes into account the magnitude and texture of both the signal and the noise for a given LCD task.

*3: A model observer evaluation showed that equivalent low contrast detectability to FBP (range from 0.60 - 0.73) can be achieved with 69.0 to 81.0% less dose using AiCE at Standard setting for thin (0.5 mm) reconstruction slice thickness in simulated body phantom (MITA-FDA phantom with a body ellipse surrounding it).

*4: In clinical practice, use of AiCE may reduce the CT patient dose depending on the clinical task, patient size, anatomical location and clinical practice. Please consult with a radiologist and a medical physicist to determine the appropriate dose for obtaining diagnostic image quality in the particular clinical task. The Area Under the Curve (AUC) detectability metric is a way to define image quality based on how well an observer can detect a signal in the image. The AUC ranges from 0.5 to 1. The larger the value is, the better the image quality. An AUC of 0.5 can be interpreted as random guessing (50% correct), while a detectability of 1 corresponds to perfect detection (100% correct).

*5: AIDR 3D Standard at MTF 10%

*6: Natural defined as similar to filtered backprojection.

*7: Option

*8: Spectral 70 keV is dose neutral with single energy AIDR 3D for body acquired at 120 kVp with the reference protocol.

*9: In a water phantom comparing the Spectral reference protocol for Body at 70 keV to AIDR 3D at 120 kVp.

*10: 120 kVp equivalent monoenergetic images (70 keV) with 50% less noise than single energy with AIDR 3D.

*11: 136-168% CNR improvement for iodine at 70 keV relative to single energy with AIDR 3D 120 kVp. In a Gammex phantom, model 471, comparing the Spectral reference protocol for Body to AIDR 3D at 120 kVp.

*12: Optimization of contrast usage is only recommended within the dosing ranges that appear in approved iodinated contrast drug labeling.

- Additional advanced spectral applications^{*1}, including
 - Iodine maps (color fusion)
 - Virtual non-contrast images
 - Interactive keV viewing
 - Monochromatic optimal CNR
 - Material characterization
 - Electron density
 - Effective atomic number characterization

- **CLEAR Motion Reconstruction System^{*2, *3}**

CLEAR Motion is a Deep Learning Reconstruction (DLR) method designed to reduce motion artifacts.

A Deep Convolutional Neural Network (DCNN) is used to estimate the patient's motion. This information is used in the reconstruction process to obtain images with less motion artifacts.

- **Metal artifact reduction**

SEMAR (Single Energy Metal Artifact Reduction) technology employs a sophisticated reconstruction algorithm to reduce artifacts caused by metal while improving visualization of the implant, its supporting bone and adjacent soft tissues for accurate imaging.

SEMAR can be used in routine low-dose scans, and the combination with AIDR 3D provides the best possible image quality without the need for a dedicated scan procedure or additional radiation exposure. It can be used with Helical scan, Volume scan and Volume ECG-gated scan mode.

- **CT – guided intervention^{*2}**

Canon's Interventional CT solutions are designed for success and for safety. Featuring the flexibility of both 3D volumetric and real time interventional scan modes and a new table-side hybrid control interface, the Canon Interventional CT solution puts you in complete control.

- Realtime display to monitor needle placement as it happens
- Supports 6 slice display mode
- Dedicated pre-treatment planning toolkit
- Three dimensional needle tracking Oblique and double oblique needle tracking in 3D fluoroscopy
- Iterative Reconstruction (AIDR 3D) applied for extraordinary clear low dose images.

- **Couch lateral movement^{*2}**

Couch lateral movement ensures safety and comfort by providing a tool to mechanically move a patient in the correct position with the push of a button.

- **SURE Position**

SURE Position remotely adjusts the patient position to the iso-center during scan plan, without the need for repeating the scano image.

- **Gantry tilting**

Gantry tilting with maximum 30 degrees permits angled scanning at your desired reading plane and avoiding direct exposure to radiosensitive organs.

- **Laser collimation with Area Finder^{*2}**

Laser collimation allows the field of view and scan range to be set directly on the gantry. Examinations are performed faster and with reduced radiation dose.

- **Minimum installation space**

Aquilion ONE / PRISM Edition with New UX is designed for an installation space of just 19 m²^{*4} to fit into most existing CT rooms, avoiding costly renovations.

*1: Analysis is performed with the Vitrea.

*2: Option

*3: The CLEAR Motion is not provided with a self-learning function that allows the CT system to modify its own programs. Therefore, training of the CLEAR Motion algorithm are not performed at the end-user's site.

*4: With short couch

COMPOSITION

Standard composition (Model: TSX-306A/L)

Software version: V2.0

- Gantry..... 1
- Patient couch..... 1
- Console*¹..... 1 set
- Power distributor..... 1
- Accessories..... 1 set
 - Inter-unit cables
 - Manuals
 - Set of phantoms, phantom holder
 - Scan support accessories
- Reconstruction processing unit (CCRS-003C)*²..... 1

Optional items

- CT Fluoroscopy (^{SURE}Fluoro) (TSXF-004A*³/TSXF-006A*⁴)
- CT Fluoroscopy (^{SURE}Fluoro) (TSXF-011A)*⁵
- Diagnostic image display unit (LCD monitor for ^{SURE}Fluoro) (CMM-005A)
- Large-screen monitor connection kit (CMM-006A)
- ECG-gating system (CHEG-005A)
- Extended field of view (CSTC-005A)
- HANDY SNAP (CAXS-001A)
- Injector synchronization system (CKIS-003A)
- Injector synchronization system, CAN protocol Class 1 (CKIS-004B)
- Injector synchronization system, CAN protocol Class 4 (CKIS-005A)
- Orbital synchronized scan system (CKOS-001A)*⁶
- Respiratory-gated scan system (CKRS-004A/CKRS-005A)
- Respiratory-gating system (CKRS-004B)
- Spectral Imaging System (CSDE-004A)*⁶
- vHP (Variable Helical Pitch) (CHVH-001A)
- PIQE Reconstruction System (CSSR-001A)
- CLEAR Motion Reconstruction System (CSCM-001A)
- 4D Orthopedic analysis (CSOA-001A)
- Adaptive Motion Correction (CSMC-001A)
- Body organ perfusion (CSBP-002A)*⁶
- Colon view (CSCV-001A)
- Display system for dental application (CDP-07A)*⁶
- Fat index view (CSFM-001A)
- FlyThrough software (CFT-03A)
- Lung volume analysis (CSLV-001A)
- Neuro package (including ^{SURE}Subtraction) (CSNP-002A)*⁶
- ^{SURE}Cardio scoring (CSCS-001A)
- ^{SURE}Subtraction angio (CSSA-001A)
- ^{SURE}Subtraction iodine mapping (CSSI-001A)
- ^{SURE}Subtraction coronary (CSSC-001A)
- ^{SURE}Subtraction lung (CSSL-001A)
- ^{SURE}Subtraction ortho (CSSO-001A)
- Vessel view (CVV-001A)
- Additional connection kit for CRRS-020A (COT-54D)

- DICOM® MWM (COT-32D)
- DICOM PGP PROFILE (COT-44A)
- DICOM Q/R SCP (COT-34D)
- DICOM Q/R SCU (COT-35D)
- DICOM Storage Commitment SCU (COT-41D)
- DICOM Storage SCP (COT-30D)
- DICOM MPPS (COT-33D)
- Area Finder (CGAP-001A)
- Display console kit (CGS-93B)
- Fan filter kit (CGFF-002A)
- Rear operating panel kit (CAGP-003A)
- Couch lateral movement unit (CALU-001A)
- Flat couch top kit (CAFT-016A*⁷/CAFT-016B*⁸)
- Flat couch top kit (CAFT-021A)*⁷
- Flat overlay kit (Elekta™) (CAFT-025A)*⁷
- Flat overlay accessory kit (Qfix®) (CAFT-027A)*⁷
- Rear footswitches (CAFS-007A)
- Kit for widening the gap between the gantry and patient couch (CAZZ-005A)
- Connect Assistance (COCA-001A)
- Protocol management (CSPM-001A)
- QA phantom kit (CAQA-001A)
- UPS connection kit (CEUC-001A)
- Multi-language kit (CKKB-007A)

Note: Please check with your sales representative as some of these options may not be available in your country or region.

*1: Desk not included

*2: Mandatory option

*3: Includes CTF operating panel

*4: Firmware for CTF operating panel

*5: Not includes CTF operating panel, software only

*6: Available only some functions

*7: For the long patient couch version

*8: For the short patient couch version

PERFORMANCE SPECIFICATIONS

Scan parameters

- Gantry aperture: 780 mm in diameter
- Rotation: 360° continuous
- Tilt: $\pm 30^\circ$
Axial and helical scanning
Gantry and remote controlled

• Rotation times Unit: s

Half scan	0.18, 0.23
Axial scan	0.275, 0.3, 0.32, 0.35, 0.4, 0.5, 0.6, 0.75, 1.0, 1.5, 2.0, 3.0
Dynamic scan, Helical scan, SUREStart	0.275, 0.3, 0.32, 0.35, 0.4, 0.5, 0.6, 0.75, 1.0, 1.5

- Time between scans
 - Axial scan: Min. 1.5 s
- Continuous scan: Max. 100 s

• Acquisition modes

– Axial Unit: mm

4 row scan	0.5, 1, 2, 3, 4, 5, 8
1 row scan	1

– Volume scan, Dynamic volume scan Unit: mm

320, 280, 260, 240, 200, 160, 120, 80, 40 row scan	0.5
--	-----

– Helical scan Unit: mm

160, 100, 80 row scan	0.5
40 row scan	0.5, 1
20, 4 row scan	0.5

• Scan field

– CT scan Unit: mm

S	M	L
$\phi 240$	$\phi 320$	$\phi 500$

– Scanoscopy Unit: mm

Axial direction	Longitudinal direction
Up to 500	Adjustable from 200 to 1950* ¹ 200 to 1450* ²

- Tube position for scanoscopy: 0°, 90°, 180° and 270°
Any desired angle can be specified (in 5° increments).

Dynamic volume scan

- Programmable time: Max. 1 hour/scan protocol
 - Number of programmable scans: Max. 20
Max. 100 s/scan
 - Scan plan
 - Scan interval: Min. 1 s.
Setting is possible in increments of 0.1 s in a scan interval of more than 1 s.
- Note: When a scanning mode with patient couch movement is used, the minimum scan interval is limited by the time required for movement.
- Scan start delay time: Min. 0.5 s
Setting is possible in increments of 0.1 s.
 - Image reconstruction
 - Image interval: Reconstruction is possible in increments of 0.05 s.

Helical scan

- Continuous scan time: Max. 100 s
- Scan start time delay: Min. 3 s
Setting is possible in increments of 0.1 s.
- Active collimator: To reduce the exposure dose, the collimator operates asymmetrically at the start/end of scanning (except in the case of 4 row scanning).
- Scan length (with headrest): Max. 1950 mm/scan*¹
Max. 1450 mm/scan*²
- Couch-top speed: 0.8 mm/s to 300 mm/s
- Helical pitch (CT pitch factor display is possible): Setting is possible in increments of 0.1. (For 4 row scanning, setting is possible in increments of 0.5.)

*1: For the long patient couch version

*2: For the short patient couch version

For the 315 kg (694 lb) patient couch version

– For 160 row scanning (TCOT+, V-TCOT)

Rotation time	Helical pitch	CT pitch factor
0.275 s	91 to 165	0.569 to 1.031
0.3 s	91 to 180	0.569 to 1.125
0.32 s	91 to 192	0.569 to 1.2
0.35 s	91 to 210	0.569 to 1.313
0.4 s, 0.5 s	91 to 224	0.569 to 1.4
0.6 s, 0.75 s, 1.0 s, 1.5 s	91 to 159, 177 to 224	0.569 to 0.994, 1.106 to 1.4

– For 128 row scanning (TCOT+, V-TCOT)*¹

Rotation time	Helical pitch	CT pitch factor
0.275 s	71 to 165	0.555 to 1.289
0.3 s, 0.32 s, 0.35 s, 0.4 s	71 to 179	0.555 to 1.398
0.5 s, 0.6 s, 0.75 s, 1.0 s	71 to 124, 143 to 179	0.555 to 0.969, 1.117 to 1.398
1.5 s	71 to 179	0.555 to 1.398

– For 100 row scanning (TCOT+, V-TCOT)

Rotation time	Helical pitch	CT pitch factor
0.275 s, 0.3 s, 0.32 s	57 to 140	0.57 to 1.4
0.35 s, 0.4 s, 0.5 s, 0.6 s, 0.75 s, 1.0 s, 1.5 s	57 to 96, 111 to 140	0.57 to 1.4

– For 80 row scanning (TCOT+, V-TCOT)

Rotation time	Helical pitch	CT pitch factor
All	45 to 76, 88 to 112	0.563 to 1.4

– For 64 row scanning (TCOT+)*¹

Rotation time	Helical pitch	CT pitch factor
All	40 to 58, 71 to 96	0.625 to 0.906, 1.109 to 1.5

– For 40 row scanning (TCOT+)

Rotation time	Helical pitch	CT pitch factor
All	25 to 35.9, 46.1 to 63	0.625 to 0.898, 1.153 to 1.575

– For 20 row scanning (TCOT+)

Rotation time	Helical pitch	CT pitch factor
All	13 to 18.9, 23.1 to 31	0.650 to 0.945, 1.155 to 1.55

– For 4 row scanning (MUSCOT)

Rotation time	Helical pitch	CT pitch factor
All	2.5 to 3.5, 4.5 to 6	0.625 to 0.875, 1.125 to 1.5

Helical pitch = Couch-top movement (mm/rot.)/nominal scanning slice thickness (mm)

CT pitch factor = Helical pitch/number of slices per rotation

*1: Default setting: OFF

- **SURE Exposure 3D:** Function for continuously varying the X-ray tube current to ensure the optimal X-ray dose during helical scanning.
- **SURE kV:** The effective kV will be automatically selected based on patient size and **SURE Exposure** settings.
- **Exposure reduction mode:** SilverBeam Filter are used to perform helical scanning.

The following conditions are available

- **Acquisition**
 - 0.5 mm slice: 160, 100 and 80 rows
- **FOV:** L
- **Tube voltage:** 120 kV
- **Reconstruction functions**
 - Body
 - Body Sharp
 - Lung
 - Lung Sharp
 - Bone
 - Bone Sharp
 - Inner Ear
- **Dose reduction functions**
 - AIDR 3D
 - AIDR 3D Enhanced
 - AiCE*

*: Option, Body, Body Sharp, Lung, Bone, Inner Ear only

- **Image reconstruction time:** Up to 80 images/s with AIDR 3D (0.0125 s/image)
Up to 40 images/s with AiCE (0.025 s/image) (Option) (depending on the scan and reconstruction conditions)
- **Real-time helical reconstruction time:** 12 images/s (0.083 s/image) (1 slice, 512 × 512 matrix)
- **Reconstruction position setting:** In increments of a minimum of 0.1 mm by entering the couch-top position or using the scanogram.
- **Reconstruction interval setting:** In increments of a minimum of 0.1 mm.

SURE Start

- **Scan start mode:** Automatic
Manual
- **Continuous scan time:** Max. 100 s
- **Region of interest (ROI):** Max. 4
(1 ROI for VoiceLink)
- **CT number measurement interval:** 0.083 s
- **Scan start delay time:** Min. 3 s
- **Display function:** Mean CT number within the ROI, elapsed time

Voice-recorded instruction and scan system (VoiceLink)

Voice instructions to the patient can be recorded electronically by the operator and automatically played back during scan sequences as part of the scan protocol.

- **Number of messages:** Max. 200
- **Recording time:** Max. 30 s per message
- **Delay time setting:** The delay time between the end of the message and the start of scanning can be set up to 10 s in increments of 1 s.

Patient couch

Load (kg [lb])		Maximum	315* ¹ (694)	
Table type			Long	Short
Width (mm)			470	
Step feed (mm)	Range		0.5 - 600	
	Increments		0.5	
Height (mm)	Maximum		940	
	Minimum		332	
Stroke (mm)	Vertical		608	
	Horizontal		2390	1890
Scan range (with headrest) (mm)			2000	1500
Horizontal reproducibility (mm)			± 0.25* ²	
			± 1.0* ³	
Speed (mm/s)	Vertical		10 / 65	
	Horizontal		10 / 200	
System driver	Vertical		Motor	
	Horizontal		Motor / Manual	

*1: Patient weight Max. 300 kg (661 lb) + Accessories 15 kg (33 lb)

*2: For patient weight < 230 kg

*3: For patient weight > 230 kg and < 300 kg

X-ray generation

- X-ray beam shape
 - Fan beam
 - Channel-direction angle (fan angle): 49.2°
 - Slice-direction angle (cone angle): Max. 15.2°
- X-ray exposure: Continuous
- X-ray tube voltage: 80, 100, 120 and 135 kV
- X-ray tube current: 10 mA to 900 mA
(adjustable in 5 mA increments from 10 to 50 mA, and in 10 mA increments over 50 mA.)
- X-ray tube heat capacity: 7.5 MHU
14 MHU equivalent with AIDR 3D
- X-ray tube cooling rate: Max. 1386 kHU/min (16.5 kW)
Actual 873 kHU/min (10.4 kW)
- Focal spot size
 - IEC 60336: 2005, nominal: 0.9 mm × 0.8 mm (small)
1.6 mm × 1.5 mm (large)

X-ray detection

- Detection system: Solid-state detectors
- Main detector: 896 × 320 elements
- Data acquisition: 896 channels × 320 rows
- Reference detector: 1 set
- View rate: Max. 2910 views/s

Data processing

- Reconstruction matrix
 - Scanogram: 552 × 1950*¹ (max.)
552 × 1450*² (max.)
 - CT image: 512 × 512
1024 × 1024*
- *: Selectable when PIQE (option) and conditions that are not linked with scanning are used.
- Picture element (pixel) size
 - CT image Unit: mm

Scan field	S	M	L
Pixel size	* to 0.47	* to 0.63	* to 0.98
- *: Depending on the Vari-Area or Zoom factor
- Scanogram Unit: mm

Scan field	S	M	L	LL
Standard	0.5	1.0	1.0	1.0

- Dose reduction functions
 - AIDR 3D
 - AIDR 3D Enhanced

- Metal artifact reduction function
 - SEMAR
- Reconstruction filter functions*
 - PediatricBrain
 - Brain
 - Lung
 - Body
 - Bone
 - CTA
 - Cardiac
 - QC (for evaluation)
- * The function can be specified by selecting the body part name. High resolution, Sharp, etc. can be selected on each part. BHC On / Off can also be selected on each part.
- Number of reconstructed images: Max. 640 images/rot.
(for volume scanning and dynamic volume scanning)
- Reconstruction time: Min. 5 s/volume
(reconstruction cycle time)
[1 volume: (512 × 512 matrix) image × 320 slices]
(depending on the scan and reconstruction conditions)
- Real-time scanoscopy
- Data processor (scan console)
 - CPU: 64 bit
 - Memory size: 64 GB or more
 - Magnetic disk unit: Raw data, 3.3 TB or more
Image data, 500 GB or more

Data storage

- Magnetic disk
 - Raw data: 1700 rotations or more
(for volume scan with 320 rows and 0.5 s)
 - Image data: 800000 images or more
(when converting to 512 × 512 pixel image)
- DVD-R: 4.7 GB
 - DICOM images: 7500

*1: For the long patient couch version

*2: For the short patient couch version

Image display

- Display monitor: 68.5 cm (27 inch) color LCD
- Monitor matrix: 3840 × 2160
- Image matrix: 2428 × 1230 (max.)
- CT number
 - Display range: -32768 to +32767
- Window width/level: Can be changed by moving a mouse
- Preset windows: 1/image
- Window types: Linear
- Image retrieval
 - Method: On-screen menus
 - Mode: Image, series and patient
- Multi-frame display: Reduction/cut-off display, ROI processing
- Information display: User selectable
- Cine display: Variable speed
- Scanogram: Image position display, zoom
- Hanging layouts: The desired image display layout can be set in a scan protocol. When study data acquired using the scan protocol is displayed, images are displayed with the set layout.

Image processing

- Scanogram processing
 - Slice position display
(Planned slice, preset slice and last scanned slice)
 - Anatomical scale
(display of position, relative to selected zero position)
 - Slice position setting
 - Enlargement
- CT image processing
 - ROI
 - Shape: Point, circular
 - Processing: Mean value, standard deviation, area, number of pixels, maximum value, minimum value
 - Display: Max. 10/image
 - Control: Size, position, rotation
 - Measurement of distance and angle between two points
 - CT number display
 - Enlargement, reduction, panning
 - Addition/subtraction between images
 - Comment and arrow insertion
 - Top/bottom, right/left, black/white reversal of image
 - Image rotation (arbitrary rotation)
 - Screen save
 - MultiView (Auto MPR)

- Raw data processing
 - Zooming reconstruction
 - Protect/Unprotect
 - Stack reconstruction (Axial scan)
 - Cancellation of reconfiguration request
 - Half-view reconstruction of helical scan raw data
 - Reconstruction request from display console
 - Priority reassignment in reconstruction queue
 - Registration as volume data
 - ECG-gated half reconstruction, ECG-gated segmental reconstruction*¹
 - Respiratory-gated reconstruction*¹
 - AiCE reconstruction*¹
 - Spectral reconstruction*¹
 - PIQE reconstruction*¹
 - CLEAR Motion reconstruction*¹

System management

- Warm-up function
- Calibration data acquisition
- Patient data input
- Patient appointment function
- Examination summary
- Scan protocol editing
- Modification of related information
- Slice counter
- Gantry rotation counter
- Access control (NEMA XR-26)

Dose management

- CTDI_{vol}/DLP/Geometric efficiency in z-direction
- Dose check (NEMA XR-25)
- DICOM SC exposure summary
- DICOM SR compliant dose report
- Size Specific Dose Estimates (SSDE) functions

Clinical applications

- Dynamic study
- 3D color image processing (surface rendering, volume rendering, MPR, curved MPR, MIP, cine)
- Automatic MPR (MultiView)

Image transfer

- 1000BASE-T
- DICOM storage SCU
- Enhanced DICOM
- TIFF conversion

*1: Option

IMAGE QUALITY

Noise

Standard deviation	Less than 0.5%
Scan parameters	
Tube voltage	120 kV
Tube current	500 mA*
Scan time	1 s
Slice thickness	8 mm
	(4 mm × 4 rows : 2 stack)
Reconstruction function	QC
Scan field	S
Phantom	φ24 cm water

*: Corresponds to 400 mA at a 10 mm slice thickness.

Spatial resolution

Resolution	22.5 lp/cm at MTF 0%*
	17.5 lp/cm at MTF 2%
	12.0 lp/cm at MTF 50%
	*For reference
Scan parameters	
Tube voltage	120 kV
Tube current	200 mA
Scan time	1 s
Slice thickness	2 mm
	(0.5 mm × 4 rows : 4 stack)
Reconstruction function	QC Hi-Res
Scan field	S
Phantom	IRIS QA phantom

High-contrast detectability

X-Y plane	0.31 mm
Scan parameters	
Tube voltage	120 kV
Tube current	250 mA
Scan time	1.5 s
Slice thickness	0.5 mm
Reconstruction method	MUSCOT*
Reconstruction function	QC Hi-Res
Scan field	S
Phantom	Catphan® 500 phantom (CTP528 module)
Z-direction	0.31 mm
Scan parameters	
Tube voltage	120 kV
Tube current	250 mA
Scan time	1.5 s
Slice thickness	0.5 mm
Reconstruction method	TCOT** with 0.5 mm SR
Reconstruction function	QC
Scan field	S
Phantom	Catphan® 500 phantom (CTP528 module)

*: Multi-slice Cone-beam Tomography

** : True Cone-beam Tomography

Low contrast detectability

Object size (A)	2 mm at 0.3%
CTDI _{vol}	15.2 mGy
Object size (B)	3 mm at 0.3%
CTDI _{vol}	5.8 mGy
Scan parameters	10 mm (with AIDR 3D)
Phantom	φ20 cm Catphan®

- CTDI_{vol} (Volume CTDI_w, Unit: mGy/100 mAs)

– Head mode: 13.93 mGy*

– Body mode: 5.92 mGy*

*: Measured on Standard Head and Body CTDI phantoms.

SYSTEM ENERGY CONSUMPTION

Daily energy consumption by 20 abdomen scans*

- Scenario Off 84.9 kWh
(83.8 kWh with the overnight DAS timer turned on)
- Scenario Idle 112.7 kWh
- Scenario Low 103.7 kWh

*: Measurement according to "COCIR Self-Regulatory Initiative for medical imaging equipment- CT measurement of energy consumption – Revision V0"

SYSTEM COMPONENTS AND THEIR FUNCTIONS

Gantry

The gantry can be tilted forward and backward in order to perform tilted scanning.

Three-dimensional alignment lights are provided for setting slice positions. Gantry and patient couch operating controls are provided on the left and right sides of both the front and the rear of the gantry housing.

The monitor (① Station) indicates information, such as the patient name and the scan status to the operator and the patient.

X-ray generator

This unit supplies stable high voltage to the X-ray tube unit. The high-frequency inverter method is employed, resulting in a light and compact design. This unit is incorporated in the gantry.

- **Max. power:** **100 kW**
Effective 144 (180*¹) kW max.
equivalent with AIDR 3D

Note: Rated output may be limited.

X-ray tube

This is a large-capacity, high-cooling-rate X-ray tube that is able to withstand continuous operation as in helical scanning.

- **Heat capacity:** **7.5 MHU**
14 MHU equivalent with AIDR 3D
- **Cooling rate:** **Max. 1386 kHU/min**

Patient couch

The patient couch moves vertically and the top moves longitudinally. In an emergency, the couch top can be pulled out manually with very little effort. **The couch top can also be lowered to a minimum height of 332 mm** from the floor, facilitating transfer of the patient from a low bed or stretcher.

Console

The console is provided with a keyboard, a monitor, and a mouse.

- Functions of the console for scanning
 - Selection of scan parameters
 - Scanscope control
 - Scan control
 - Couch-top movement control
 - Gantry tilt control
- Functions of the console for image processing
 - Window level and window width adjustment
 - Other mouse-operated image processing functions

OPERATING FEATURES

Patient handling and positioning

- The couch top can be lowered to 332 mm from the floor, making it easier to transfer the patient to and from a bed or stretcher.
- **Alignment lights are provided in the gantry aperture for fast and accurate patient positioning.**
- High-precision couch-top positioning is possible from the integrated console or by manual operation from the control panel and clear digital readouts are provided on the gantry.
- The couch top can be pulled out manually in an emergency.

Scanning

- Scanscope function provides by projection image of the patient for high-precision advance planning of the scan areas.
- Within the scanogram the length of the scan area can be adjusted up to 1950*¹ and 1450*² mm.
Because the images are reconstructed in real time, the scan can be aborted at any time. This minimizes the patient exposure dose.
In addition, 3D Landmark Scan is applied to images obtained by low-dose scanning using SilverBeam Filter. The images can be used for axial images as a reference image for ^{SURE}Start scan planning.
- The auto index function allows automatic incremental couch-top movement based on the slice positions determined through the scanogram.
- The scan protocol function allows simple selection of pre-programmed scanning parameters for routine examinations, maximizing patient throughput.
- The Vari-area function allows the user to pre-select a region of interest for zooming using raw data, permitting immediate post-scan analysis. Zooming using raw data yields higher resolution than enlarging an image that has already been reconstructed.
- Dynamic and rapid sequence scan modes are provided.
- Multislice helical scan acquires raw data by rotating the X-ray tube continuously while moving the patient continuously through the scanner. The volume data acquired can be used to reconstruct axial slices at any desired positions. This scan mode is best used for rapid patient scanning during a single breath-hold and for high-definition three-dimensional and MPR imaging.

*1: For the long patient couch version

*2: For the short patient couch version

- InstaView technology provides near-instant display and review with full-matrix images. High-quality realtime image review is perfectly suited for emergency patients, where every second to diagnosis counts.
- The ^{SURE}Start function allows the operator to start volume scanning or helical scanning at the timing of maximum enhancement in contrast studies. ^{SURE}Start monitors the contrast appearance in CT number on the image being displayed in real time. When the contrast reaches the predefined threshold, dynamic volume scan or helical scan automatically starts. This technique ensures optimal contrast enhancement, independent of individual differences in blood flow speed, and at the same time minimizes the dose of contrast medium.

Data processing

- A variety of reconstruction algorithms are available and can be selected according to the anatomical region examined and the clinical objective of the study. These include algorithms for the abdomen, head, bone, lung, small structures, soft tissues, etc.

Image display and processing

- Reconstructed images are automatically displayed according to the window settings preset in the scan protocol.
- The window save function allows the user to store an image with different window settings from the ones set in the scan protocol.
- Filter parameters can be customized through simple on-screen menu selections. These parameters include the number of filtering passes, matrix size, and filter coefficients.
- Images can be rotated and reversed (right/left, top/bottom, or black/white).
- The Multi-frame feature allows up to 8 series to be displayed simultaneously on the screen.
- The three-dimensional image display function allows color three-dimensional and real-time MPR images to be generated from the volumetric scan data acquired by volume scanning, dynamic volume scanning, or helical scanning.

Image filming

- Filming of images can be performed manually or automatically from the console.
- Automatic filming sends an entire study to the laser printer. Filming is performed in background mode so that other scanner and image processing functions can be performed without interruption or delay.

- When T-mode is used, related information items displayed together with an image (surrounding the image, in a small font) are displayed in the footer area using a larger font, permitting not only easier reading but also simpler film management.

Note: To use T-mode, the laser imager must support 2048 pixels × 2404 pixels for a 1 × 1 frame.

Patient throughput

Patient throughput and cost effectiveness were major objectives in the design and production of the Aquilion ONE CT scanner.

- The system incorporates a 7.5 MHU X-ray tube with a very fast cooling rate of 873 kHU/min in actual use.
- High-speed scans can be performed in as little as 0.275 second per scan.
- In volume scanning, scanning can be performed at 0.5 mm × 320 detector rows per 0.275 second.
- Real-time scanoscopy.
- CT images can be reconstructed in min. 5 seconds per volume. [1 volume: (512 × 512 matrix) image × 320 detector rows]
- The routine scan cycle time is as short as 1.5 seconds (Axial)
- Ease of operation is ensured by incorporating use of a hybrid keyboard, mouse-driven menus, and large color LCD screens.

COMPLIANCE

Medical Devices Regulation (MDR), Regulation (EU) 2017/745

IEC 60601-1: 2005+Amd.1: 2012
IEC 60601-1: 2005+Amd.1: 2012+Amd.2: 2020
IEC 60601-1-2: 2007
IEC 60601-1-2: 2014
IEC 60601-1-2: 2014+Amd.1: 2020
IEC 60601-1-3: 2008+Amd.1: 2013
IEC 60601-1-3: 2008+Amd.1: 2013+Amd.2: 2021
IEC 60601-1-6: 2010+Amd.1: 2013
IEC 60601-1-6: 2010+Amd.1: 2013+Amd.2: 2020
IEC 60601-1-9: 2007+Amd.1: 2013
IEC 60601-1-9: 2007+Amd.1: 2013+Amd.2: 2020
IEC 60601-2-28: 2010
IEC 60601-2-28: 2017
IEC 60601-2-44: 2009+Amd.1: 2012+Amd.2: 2016
IEC 60825-1: 2007
IEC 60825-1: 2014
IEC 62304: 2006+Amd.1: 2015
IEC 62366: 2007+Amd.1: 2014
IEC 62366-1: 2015+Amd.1: 2020
IEC 62366-1: 2015+Amd.1: 2020
IEC 81001-5-1: 2021

DIMENSIONS AND MASS

Unit	Dimensions W × L × H mm (in)	Mass kg (lb)
Gantry	2270 × 960 × 1925 (89.4 × 37.8 × 75.8)	2340 (5159)
315 kg (694 lb) Long patient couch version	660 × 2890 × 470 (26.0 × 113.8 × 18.5)	700 (1543)
315 kg (694 lb) Short patient couch version	660 × 2390 × 470 (26.0 × 94.1 × 18.5)	655 (1444)
STNAVI BOX	200 × 310 × 350 (7.9 × 12.2 × 13.8)	12 (26)
CON BOX	590 × 965 × 1678 (23.2 × 38 × 66.1)	340 (750)
Power distributor	980* × 680 × 1315 (38.6* × 26.8 × 51.8)	650 (1433)

*: When the power distributor is secured using anchor bolts.

SITING REQUIREMENTS

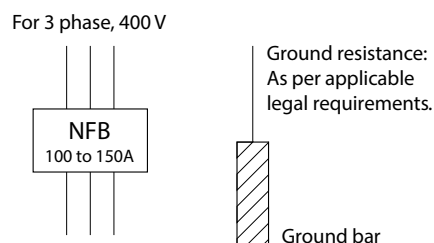
Power requirements

- Phase: Three-phase
 - Line voltage: 380, 400, 415, 440, 460 or 480 VAC
 - Frequency: 50 Hz or 60 Hz ±1 Hz
 - Power capacity: 125 kVA
 - Voltage fluctuation due to load variation: Less than 5%
 - Power voltage fluctuation: Less than 10%*
- *: Represents the total voltage fluctuation due to load and power variation.

Grounding

Grounding must be provided in accordance with local regulations for medically used electrical equipment.

Power distribution board



Ambient conditions

	Temperature	Humidity	Heat generation
Scan room			
Gantry (including Patient couch)	20°C to 26°C Tolerance: ±2°C	40% to 80% No condensation	Approx. 18017 kJ/h* 32431 kJ/h**
Control room			
Console (STNAVI BOX)	16°C to 28°C	40% to 80% No condensation	Approx. 721 kJ/h
Machine room			
Console (CON BOX)	16°C to 28°C	40% to 80% No condensation	Approx. 10090 kJ/h
Power distributor	16°C to 28°C	40% to 80% No condensation	Approx. 2522 kJ/h* 7567 kJ/h**

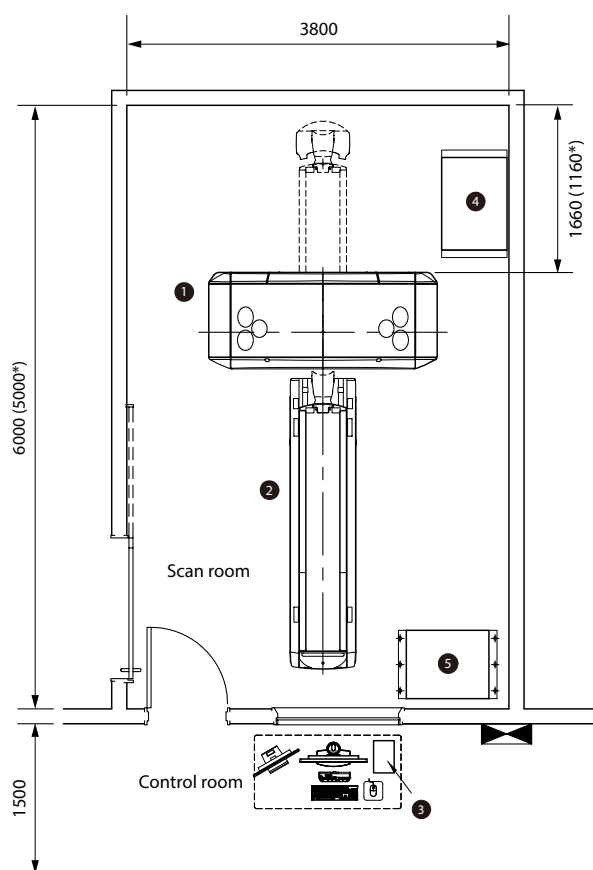
*: When scanning is not performed.

** : When scanning is performed continuously at maximum rated output of the system.

Installation site altitude

The installation site should be at an altitude of no more than 1000 m above sea level.

Room layout example (For the 315 kg (694 lb) patient couch version)



*: For the short patient couch version

Unit: mm

- ① Gantry
- ② Patient couch
- ③ Console (STNAVI BOX)
- ④ Console (CON BOX)
- ⑤ Power distributor

Minimum area for installation

Long patient couch version	28.5 m ²
Scan room area	22.8 m ²
Control room area	5.7 m ²
Short patient couch version	24.7 m ²
Scan room area	19 m ²
Control room area	5.7 m ²

Installation requirement

Scan room

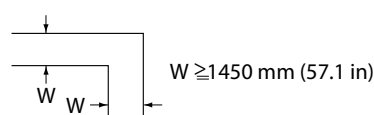
- Before installing the gantry, check the maximum permissible floor load.
- The scanner emits radiation. X-ray shielding must be provided around the scan room and the entrance in accordance with all local requirements and regulations.
- The ceiling should be at least 2500 mm when a ceiling mounted contrast injector is installed.
- Wiring pits and ducts are required for routing cables that connect the various units.

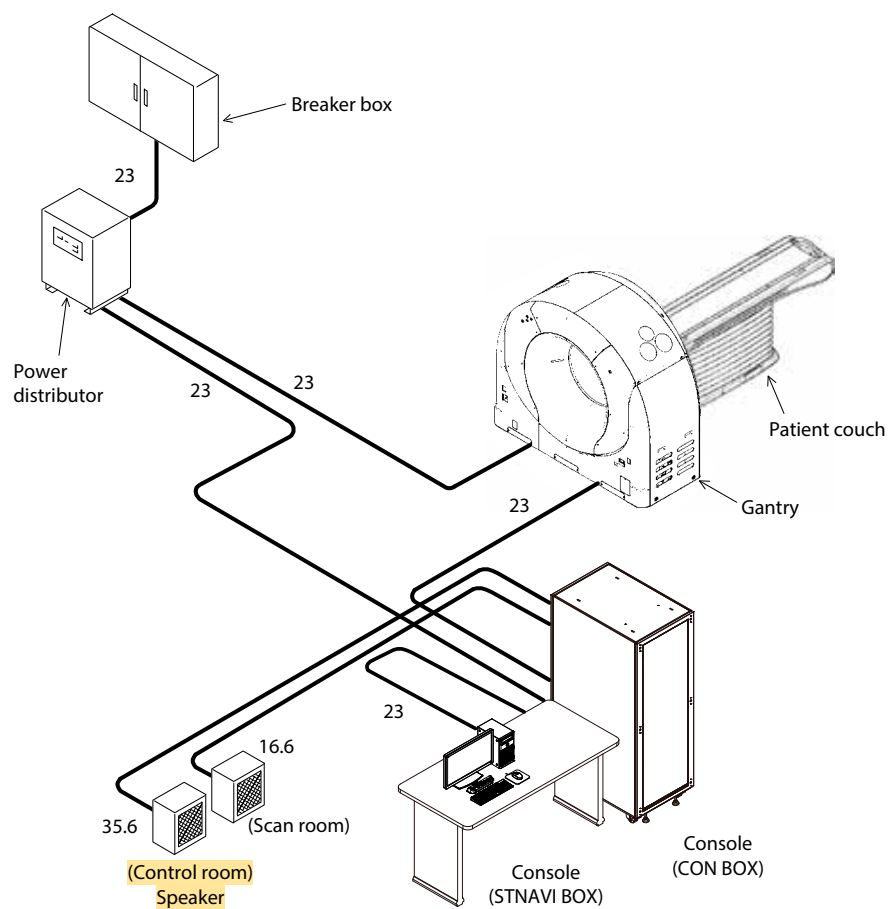
Control room

- An observation window is required for monitoring the scan room. X-ray shielding of the window glass must be provided in accordance with all local requirements and regulations.
- Wiring pits and ducts are required for routing cables that connect the various units.
- The control room should have entrances for access to the corridor and the scan room.

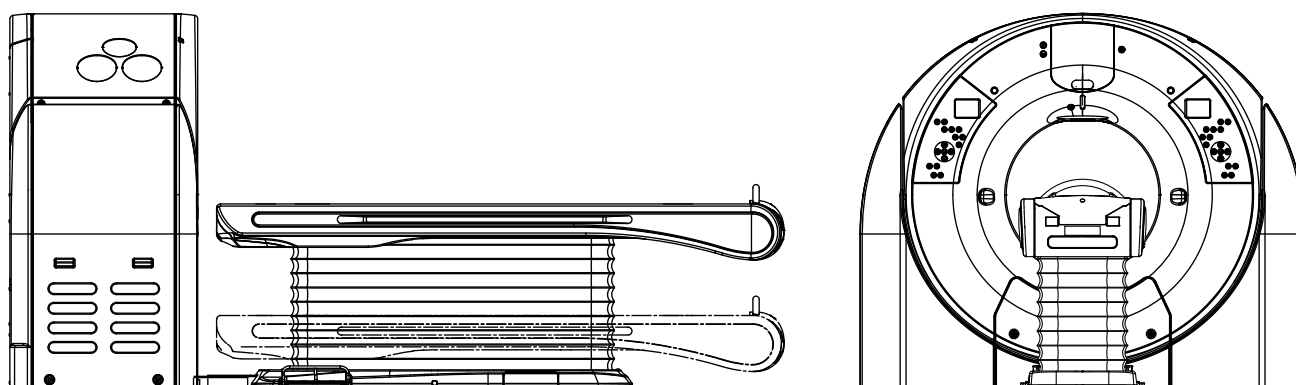
Checks before bringing in the unit

- Check in advance the width of the corridor, the dimensions of the entrance, and the dimensions and maximum allowable load of the stairs and elevators to ensure that it is possible to bring in the unit safely and without difficulty.
- Minimum external dimensions of the entrance used for bringing in the unit are as follows
 - Width: 990 mm (40 in)
 - Height: 1955 mm (77 in)
- The corners of corridors should be as illustrated below.
- Elevator minimum load: 3000 kg (6614 lb)



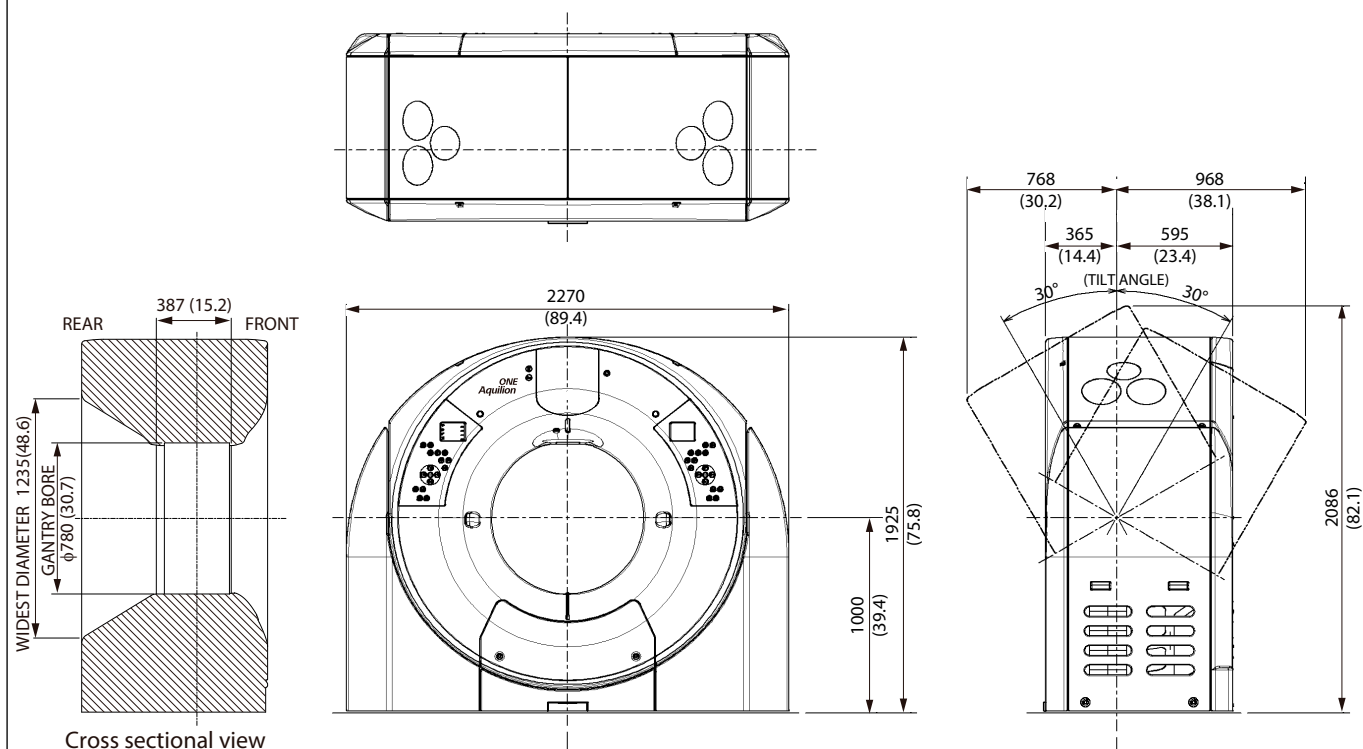
Cable length between units in meters

OUTLINE DRAWINGS



Gantry and patient couch

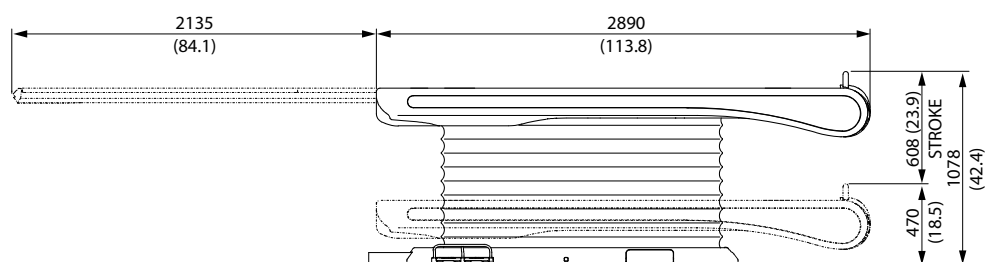
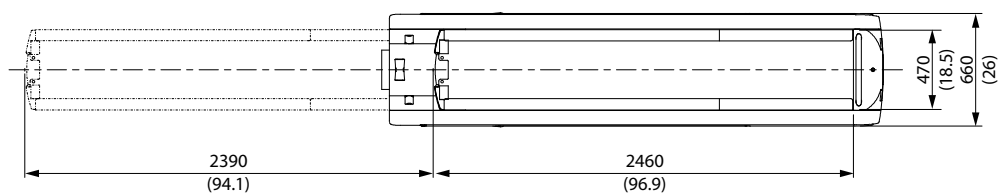
OUTLINE DRAWINGS



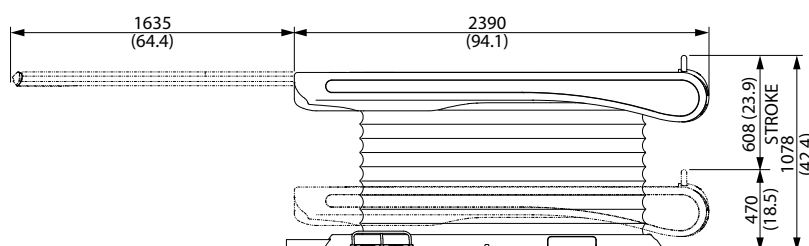
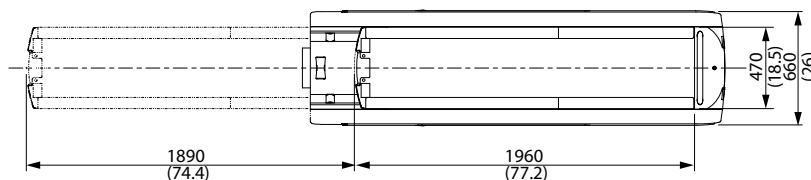
Gantry

Unit: mm (in)

OUTLINE DRAWINGS

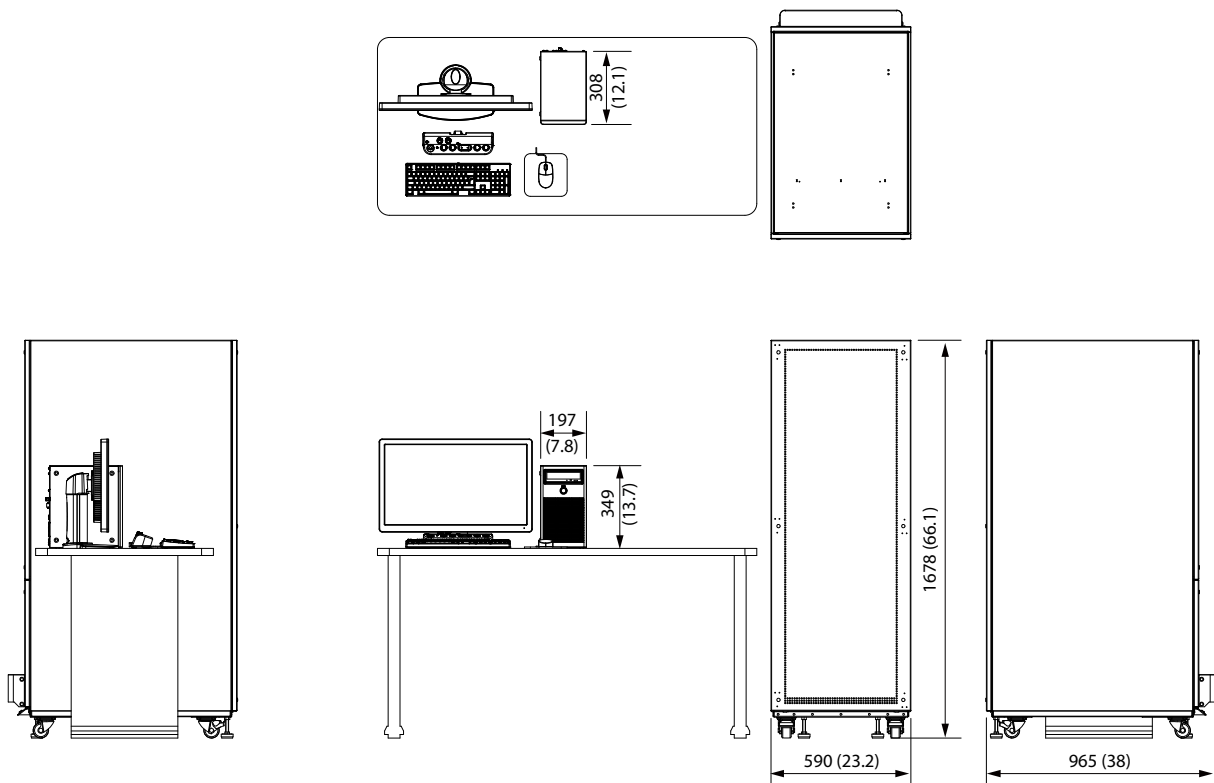


Patient couch (for the long patient couch version)



Patient couch (for the short patient couch version)

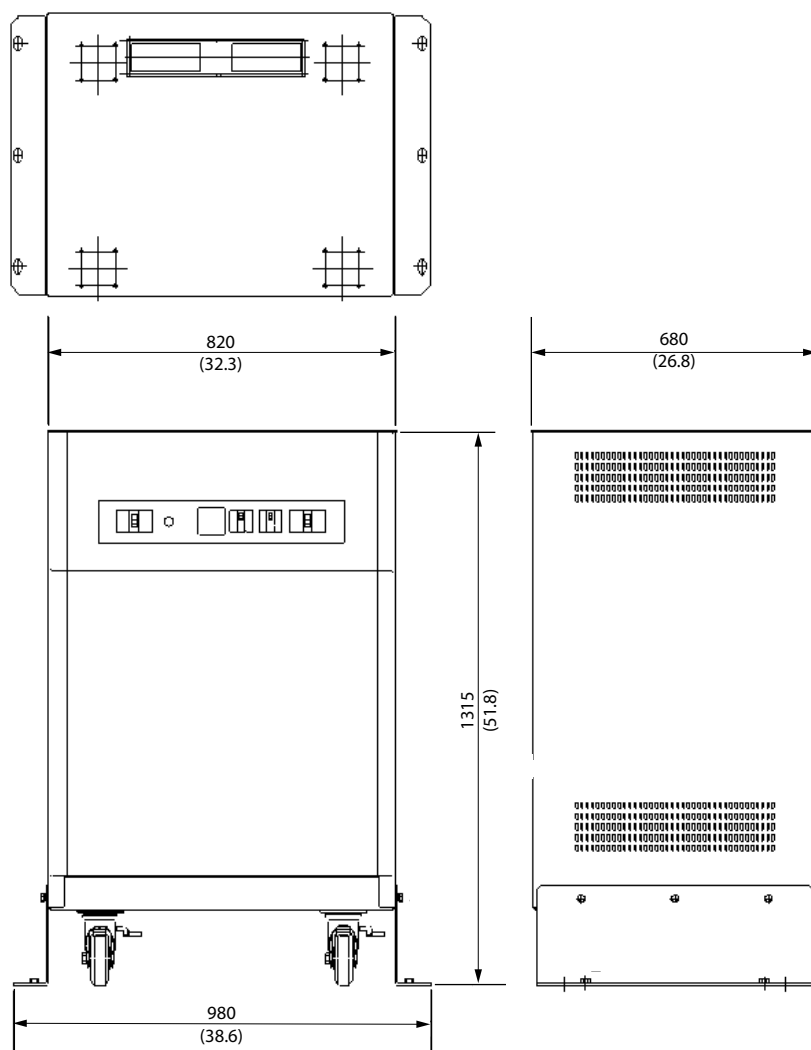
OUTLINE DRAWINGS



Console

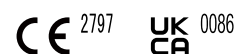
Note: The console desk is not included in the standard configuration.
Some of the units shown in the photograph on the front page differ from those shown in the drawings above.

OUTLINE DRAWINGS



Power distributor

Unit: mm (in)



Manufacturer:

CANON INC.

30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo 146-8501, Japan

Telephone: (81)-3-3758-2111

©CANON INC. 2025-2026. All rights reserved.

Design and specifications are subject to change without notice.

Model number: TSX-306A

MPDCT1038EAA 2026-04 Published in Japan

DICOM® is the registered trademark of the National Electrical Manufacturers Association for its Standards publications relating to digital communications of medical information.

Elekta is a trademark of Elekta AB (publ).

Qfix is a registered trademark of Qfix Systems, LLC.

Catphan is a registered trademark of The Phantom Laboratory.

This document may include trademarks or registered trademarks of their respective owners.