SPECTRAL IMAGING SYSTEM

CSDE-004A

Product Data
No. MPDCT0936EAE

APPLICATION

Canon's Deep Learning Spectral CT System combines the temporal resolution benefits of rapid kV switching with patient-specific mA modulation and a Deep Learning Neural Network trained for optimal Spectral Reconstruction.
The applicable CT systems are shown below.

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SYSTEM MODEL		MANDATORY OPTION
Aquilion ONE	TSX-308A/1-3	CCRS-003A*
	TSX-308A/4-6	CCRS-003C*
	TSX-306A/I-N	

*: Reconstruction processing unit (CCRS-003A or CCRS-003C)

Note: Some systems may not be available in your country or region. Please check with your sales representative.

FEATURES

Spectral Imaging System*1

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.

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

- 160 mm/rotation volume scan coverage and 500 mm full axial field of view
- Material differentiation and characterization
- Patient-specific mA modulation
- Spectral offers the ability to optimize iodinated contrast media usage*2
- Advanced visualization integrated into scan protocols, including
  – Iodine maps (color fusion*)
  – Virtual non-contrast images
  – Monochromatic images

  *: System software version must be V1.7 or later
- Additional advanced spectral applications*3, including
  – Iodine maps (color fusion)
  – Virtual non-contrast images
  – Interactive keV viewing
  – Monochromatic optimal CNR
  – Material characterization
  – Electron density
  – Effective atomic number characterization

COMPOSITION

- Media ..... 1 set
- Manuals ..... 1 set

*1: The Spectral Imaging System is not provided with a self-learning function that allows the CT system to modify its own programs. Therefore, training of the Spectral Imaging System algorithm is not performed at the end-user's site.
*2: Optimization of contrast usage is only recommended within the dosing ranges that appear in approved iodinated contrast drug labeling.
*3: Analysis is performed with the Vitrea.

PERFORMANCE SPECIFICATIONS FOR SPECTRAL

Scan parameters

- Spectral Scan: Combines rapid kV switching with patient specific mA modulation.
- Scan regions
  - Body
  - Chest
  - Cardiac*1
  - Extremities
- Scan types
  - Spectral volume scan
  - Spectral helical scan

  Note: Tilt volume scans and tilt helical scans are available.
- Rotation time: 0.275*2, 0.5, 0.75 and 1.0 s
- Slice thickness: 0.5 mm
- Acquisition
  - Spectral volume scan

    ( ) indicates the scan range

    0.5 mm slice: 320 (160 mm)*3, 280 (140 mm)*3, 240 (120 mm)*3, 160 (80 mm) and 80 (40 mm) rows
  - Spectral helical scan

    0.5 mm slice: 160 and 80 rows
- ECG-gated scan*4 (0.275 s/rot.*2, volume scan only)
  - Full reconstruction
  - Half reconstruction
- SURE Exposure: The X-ray tube current is continuously varied to ensure the optimal X-ray dose in the longitudinal direction during helical scanning.

Reconstruction

- Spectral Reconstruction: Deep Learning Spectral Reconstruction algorithm that operates on the raw projection data to maximize signal and reduce noise.
- Applicable anatomical regions (selectable Kernels)
  - Body (For body)
  - Lung (For chest)
  - Carciac (For cardiac)*1
  - Bone (For extremities)
- Reconstruction matrix: 512 × 512
- Image thickness: 0.5 mm
- Reconstruction interval: 0.25 and 0.5 mm
- Magnified reconstruction
  - Available magnification size: 100 mm (not dependent on cFOV)
- Image processing
  - SEMAR (Single Energy Metal Artifact Reduction)

X-ray generation

- X-ray tube voltage (kV switching): 80 to 135 kV
- X-ray tube current

  For TSX-308A

  0.275 s/rot.: 310 mA to 740 mA*2, 310 mA to 520 mA

  0.5, 0.75 and 1.0 s/rot.: 230 mA to 740 mA*2, 230 mA to 520 mA

  For TSX-306A

  0.275 s/rot.: 310 mA to 650 mA*2, 310 mA to 520 mA

  0.5, 0.75 and 1.0 s/rot.: 230 mA to 650 mA*2, 230 mA to 520 mA
- Focal spot size
  - IEC 60336: 2005, nominal: 1.6 mm × 1.5 mm (large)

*1: System software version must be V1.5 or later.
*2: Fast scan and X-ray power up kit is required for TSX-308A/2, /3, /5, /6, TSX-306A/J, /K, /M, /N.
*3: Dynamic volume CT upgrade kit is required for TSX-308A/3, /6, TSX-306A/K, /N.
*4: Option

PERFORMANCE SPECIFICATIONS FOR SPECTRAL BRAIN AND SOFT TISSUE MSK

Scan parameters

- Dual Energy scan: Two consecutive scans can be performed at two different tube voltages with a short tube voltage switching time.
- Scan regions
  – Brain
  – Soft Tissue MSK

  Note: System software version must be V2.0 or later
- Scan types
  – Dual Energy volume scan
- Rotation time: 0.275*1, 0.30*1, 0.32*1, 0.35, 0.375*2, 0.4, 0.45*2, 0.5, 0.6, 0.75, 1.0, 1.5 s
- Slice thickness: 0.5 mm
- Acquisition: 320 (160 mm)*3, 280 (140 mm)*3, 240 (120 mm)*3, 160 (80 mm) and 80 (40 mm) rows
- SUREExposure: The X-ray tube current is continuously varied to ensure the optimal X-ray dose in the longitudinal direction during helical scanning.

Reconstruction

- Applicable anatomical regions (selectable Kernels)
  – Brain
  – Soft Tissue MSK
- Reconstruction matrix: 512 × 512
- Image thickness: 0.5 mm and 1 mm
- Reconstruction interval: 0.25 mm, 0.5 mm and 1 mm
- Magnified reconstruction
  – Available magnification size: 100 mm (not dependent on cFOV)
- Image processing
  – Advanced intelligent Clear-IQ Engine (AiCE)

X-ray generation

- X-ray tube voltage: 80 to 135 kV
  100 to 135 kV
- X-ray tube current
  For TSX-308A: 10 mA to 1260 mA*1
  10 mA to 600 mA
  For TSX-306A: 10 mA to 900 mA*1
  10 mA to 600 mA
- Focal spot size
  – IEC 60336: 2005, nominal: 1.6 mm × 1.5 mm (large)

MASS

- Mass: 0.5 kg (1.1 lb)

POWER REQUIREMENTS

The ratings of the CT system have not been changed.

AMBIENT CONDITIONS

Same as those for the CT system.

*1: Fast scan and X-ray power up kit is required for TSX-308A/2, /3, /5, /6, TSX-306A/J, /K, /M, /N.
*2: Not applicable when Fast scan and X-ray power up kit is installed.
*3: Dynamic volume CT upgrade kit is required for TSX-308A/3, /6, TSX-306A/K, /N.

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