

Comparative specifications

64 slice CT scanners

CEP08027

March 2009



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Purpose of this document

This supplementary report to the CEP buyers' guide to multislice CT scanners [\[1\]](#) provides comparative specifications of CT scanners that are capable of acquiring 64 slices of data per tube rotation. 64 slice scanners provide an added degree of flexibility and are currently the most commonly purchased type of scanner in the UK. They are particularly recommended if cardiac studies are to be performed in a general CT department.

Comparative specifications are also available for other categories of scanner, as shown below.

Report number	Report title
CEP08024	CT clinical applications software [6]
CEP08025	16 slice CT scanners [2]
CEP08026	32 to 40 slice CT scanners [3]
CEP08027	64 slice CT scanners (this report)
CEP08028	128 to 320 slice CT scanners [4]
CEP08029	Wide bore CT scanners [5]

Scanners covered in this report

At the time of writing, there are four manufacturers of medical CT scanners selling systems in the UK. Seven scanners are available in this category.

Manufacturer	Scanner model
GE	LightSpeed VCT
GE	LightSpeed VCT XT
Philips	Brilliance CT 64
Siemens	Somatom Sensation 64
Siemens	Somatom Definition AS 64
Siemens	Somatom Definition
Toshiba	Aquilion 64

The data given in this report are representative of the scanners as of August 2008, and are liable to change. Features such as workstations and software packages may be listed as cost options here, but such additional costs are generally negotiable.

Specifications are presented side-by-side to facilitate comparison, and grouped into a series of topics relating to different aspects of the scanner, such as gantry, tube and detectors etc. The data are presented in 28 tables, one for each aspect. Index numbers are provided for each question to aid referencing.

Whilst every effort has been made to ensure the accuracy of this report, we have not verified the data provided. Specific responses should be confirmed with the manufacturers.

Technical specifications

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Technical specification comparison: 64 slice CT scanners

Table 1. Gantry

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
1.1	Scanner type	3rd generation	3rd generation	3rd generation	3rd generation	3rd generation	3rd generation, Dual Source	3rd generation
1.2	Aperture [cm]	70	70	70	70	78	78	72
1.3	Focus-isocentre distance [mm]	541	541	570	570	595	595	600
1.4	Focus-detector distance [mm]	949	949	1040	1040	1085	1085	1072
1.5	Slip ring for power supply	Low voltage	Low voltage	Low voltage	Low voltage	Low voltage	Low voltage	Low voltage
1.6	Slip ring for data transmission	Contact	Contact	Yes	RF	RF	RF	RF
1.7	Tilt range [degrees]	± 30 (0.5° increment)	± 30 (0.5° increment)	± 30	± 30 (0.5° increment)	± 30 (0.5° increment)	± 30 (0.5° increment)	± 30
1.8	Tilt for helical scanning	No	No	No	No	No	No	± 30
1.9	Positioning lights - planes	Transaxial (internal and external), sagittal & coronal	Transaxial (internal and external), sagittal & coronal	Transaxial (internal and external), sagittal & coronal	Transaxial, sagittal, coronal	Transaxial, sagittal, coronal	Transaxial, sagittal, coronal	Transaxial, sagittal, coronal

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
1.10	Positioning lights - type	Laser	Laser	Laser	Laser	Laser	Laser	Laser
1.11	Positioning lights - accuracy (at centre of gantry) [mm]	± 1	± 1	± 0.5	± 1	± 1	± 1	± 1

Table 2. X-ray generator

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
2.1	Type	High frequency	High frequency	High frequency	High frequency	High frequency	High frequency	High frequency
2.2	Location	Rotation assembly	Rotation assembly	Rotating frame	Gantry	Gantry	Gantry	In gantry
2.3	Method of generator cooling	Air cooled	Air cooled	Air cooled	Water	Air or Water	Water	Air
2.4	Power rating [kW]	85 (100 option - Std on cardiac system)	100	60	80	80	2 x 80	60 (72 option)
2.5	kV settings	80, 100, 120, 140	80, 100, 120, 140	80, 120, 140	80, 100, 120, 140	80, 100, 120, 140	80, 100, 120, 140	80, 100, 120, 135

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
2.6	mA range (and step size)	10 - 700 (800 on 100 kW generator) (5 mA steps)	10 - 800 (5 mA steps)	20 - 500 (1 mA steps)	28 - 665 (1 mA steps)	20 - 666 (1 mA steps)	20 - 666 (1 mA steps)	10 - 500 (10 - 600 option)
2.7	Maximum mA for each kV	80kV: 675mA 100kV: 700mA (770mA) 120kV: 700mA (800mA) 140kV: 700mA (715mA)	80kV: 675mA 100kV: 770mA 120kV: 800mA 140kV: 715mA	80 kV: 500 mA 120 kV: 500 mA 140 kV: 430 mA	80 kV: 500 mA 100 kV: 500 mA 120 kV: 665 mA 140 kV: 500 mA	80 kV: 550 mA 100 kV: 650 mA 120 kV: 666 mA 140 kV: 571 mA	80 kV: 500 mA 100 kV: 500 mA 120 kV: 666 mA 140 kV: 571 mA	80 kV: 500 mA (600 option) 100 kV: 500 mA (600 option) 120 kV: 500 mA (600 option) 135 kV: 440 mA (530 option)

Table 3. X-ray tube

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
3.1	Type and make	GE Performix Pro VCT 100	GE Performix Pro VCT 100	MRC-800	Siemens Straton	Siemens Straton MXP	Siemens Straton	CXB-750D
3.2	Focal spot size(s) [mm], quoted to IEC 336/93 standard	0.6 x 0.7 0.9 x 0.9	0.6 x 0.7 0.9 x 0.9	0.5 x 1.0 1.0 x 1.0	0.6 x 0.7 0.7 x 0.7 0.8 x 1.1	0.7 x 0.7 0.9 x 1.1	0.6 x 0.6 0.8 x 0.9	0.9 x 0.8 1.6 x 1.4

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
3.3	Moving (dynamic / flying) focal spot, xy-plane	No	No	Yes	Yes	Yes	Yes	No
3.4	Moving (dynamic / flying) focal spot, z- axis	No	No	No	Yes	Yes	Yes	No
3.5	Settings at which focal spot changes	'80 kV : >24kW (300 mA) 100 kV : >31kW (310 mA) 120 kV : >40kW (335 mA) 140 kV : >47kW (335 mA)	'80 kV : >24kW (300 mA) 100 kV : >31kW (310 mA) 120 kV : >40kW (335 mA) 140 kV : >47kW (335 mA)	Small focal spot in HR/UHR mode; Not kW limited	Not power dependant	Not power dependant	Not power dependant	80 kV: 450 mA (520 option) 100 kV: 350 mA (420 option) 120 kV: 300 mA (350 option) 135 kV: 260 mA (300 option)
3.6	Total filtration at max kV (inherent + beam shaping filter) on central axis [mm Al equivalent @120 kV]	6.8 (70kV, head) 9.5 (70kV, body)	6.8 (70kV, head) 9.5 (70kV, body)	7.95 @ 80kV	6.8	6.8	6.8	2.5 (L wedge filter) 4.0 (M wedge filter) 11.0 (DR wedge filter)

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
3.7	Half value layer of x-ray beam at 120 kV (or nearest) [mm Al]	7.5 [body] 6.3 [head]	7.5 [body] 6.3 [head]	6.9 ± 0.5 @ 120 KV	9.1	8.7	8.7	5.2 (L wedge filter) 6.2 (M wedge filter) 8.8 (DR wedge filter)
3.8	Anode heat capacity [MHU]	8	8	8	30 equivalent	30 equivalent	30 equivalent	7.5
3.9	Maximum anode cooling rate [kHU / min]	2100	2100	1608	5000	7300	7300	1386
3.10	Method of tube cooling	Oil to air	Oil to air	Oil to air	Direct oil	Direct oil	Direct oil	Liquid
3.11	Expected tube life [amp-hours]	6,000 exams	6,000 exams	1 year unlimited guarantee	3 years (see note 1)	3 years (see note 1)	3 years (see note 1)	300000 rotations

Table 4. Detection system

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
4.1	Detector type	Solid state array	Solid state array	Solid state array	Solid state array	Solid state array	Solid state array	Solid state array

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
4.2	Detector material	HiLight Scintillator	HiLight Scintillator	Gadolinium oxysulphide (GOS)	Siemens UFC	Siemens UFC	Siemens UFC	Gadolinium oxysulphide (GOS)
4.3	Decay constant [μ s]	Info. not available	Info. not available	Info. not available	3	3	3	3
4.4	Maximum number of simultaneously acquired data sets (number of 'slices')	64	64	64	64	64	2 x 64	64
4.5	Sampling frequency for 0.5 s scan [Hz]	2460	2460	9,280 (Up to 4,640 samples/rev)	4640	4608	4608	1800
4.6	Sampling frequency for fastest scan [Hz]	2460	2460	11,050 (Up to 4,640 samples/rev)	4640	4608	4608	1800
4.7	Data transmission rate [Mbps]	5000	5000	5280	2500	4250	2 x 2500	4800
4.8	Number of detector elements per row (excluding reference detectors)	888	888	672	672	736	672	896
4.9	Number of reference detector elements per row	24	24	1	n.a. (reference detector is in tube collimator)	n.a. (reference detector is in tube collimator)	n.a. (reference detector is in tube collimator)	1 (total)

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
4.10	Number of detector elements along z-axis	64	64	64	40	32	40	64
4.11	Effective length of detector elements in z-axis (at isocentre) [mm]	64 x 0.625 mm	64 x 0.625 mm	64 x 0.625 mm	32 x 0.6 mm 8 x 1.2 mm	32 x 0.6	32 x 0.6 mm 8 x 1.2 mm	64 x 0.5
4.12	Total effective length of detector array at isocentre [mm]	40	40	40	28.8	19.2	28.8	32
4.13	Quarter detector shift	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4.14	Hardware features to improve xy-plane resolution	Yes, GE Proprietary	Yes, GE Proprietary	Dynamic Focal Spot (DFS) Attenuating comb (UHR)	Flying Focal Spot (xy)	Flying Focal Spot (xy)	Flying Focal Spot (xy)	No
4.15	Hardware features to improve z-axis resolution	Yes, GE Proprietary	Yes, GE Proprietary	Spiral Groove Bearing and Smart Focal Spot	z-sharp / z-UHR comb	z-sharp / z-UHR comb	z-sharp / z-UHR comb	No
4.16	Option for slice upgrade ('Forklift' essentially meaning scanner replacement)	No	No	No	Yes (Forklift)	Yes (Forklift)	No	No

Table 5. Couch

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
5.1	Couch top material	Carbon fibre	Carbon fibre	Carbon fibre composite	Carbon fibre	Carbon fibre	Carbon fibre	Carbon fibre
5.2	Couch top length and width [cm]	285 x 42	285 x 42	243 x 41	240 x 40	Standard: 240 x 45 (MultiPurpose Table option: 240 x 53)	Standard: 240 x 45 (MultiPurpose Table option: 240 x 53)	219 (std) or 189 (short) x 47
5.3	Horizontal movement range [cm]	200/170	200/170	190	160	Standard: 160 (Multipurpose Table option: 200)	Standard: 160 (Multipurpose Table option: 200)	219 (std) 189 (short)
5.4	Couch controls - on gantry	Yes (Front & back); Left/right Std	Yes (Front & back); Left/right Std	Yes	Left & Right and Back (Standard)	Left & Right (Standard) Back (Option)	Left & Right (Standard) Back (Option)	Front, Left & Right
5.5	Couch controls - in room	Footswitch	Footswitch	Yes	Elevation control pedals on both sides of the couch. Additional controls (joystick) at the table if CT Fluro option installed	Elevation control pedals on both sides of the couch. Additional controls (i-Control panel) at the table if CT Fluro option installed	Elevation control pedals on both sides of the couch. Additional controls (i-Control panel) at the table if CT Fluro option installed	Foot switch

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aqilion 64
5.6	Couch controls - on console	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5.7	Accuracy/reproducibility of table positioning [mm]	± 0.25	± 0.25	± 0.25	± 0.25	± 0.25	± 0.25	± 0.25
5.8	Horizontal range (without extensions) [cm]	203	203	130	160	Standard: 160 (Multipurpose Table option: 200)	Standard: 160 (Multipurpose Table option: 200)	180 (std) 150 (short)
5.9	Scannable horizontal range with table top extension(s) [cm]	170 (axial), 160 (helical & scout) with 1.7 m table or 200 (axial), 190 (helical & scout) with 2 m table	170 (axial), 160 (helical & scout) with 1.7 m table or 200 (axial), 190 (helical & scout) with 2 m table	175	157	Standard: 160 (Multipurpose Table option: 200)	Standard: 160 (Multipurpose Table option: 200)	175 (std) 145 (short)
5.10	Vertical movement range out of gantry [cm]	43 - 99.1	43 - 99.1	57.8 - 102.8	53 - 102	Standard: 48 - 92 Multipurpose Table: 55 - 92	Standard: 48 - 92 Multipurpose Table: 55 - 92	31 - 95.4
5.11	Vertical movement range in gantry [cm]	78 - 99.1	78 - 99.1	85.0 - 102.8	82 - 98	72 - 92	72 - 92	77.9 - 95.4
5.12	Maximum clearance in gantry [cm]	21	21	17.8	61	69	69	58

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
5.13	Minimum couch top height outside gantry [cm]	43	43	57.8	53	Standard & 300 kg option: 48 MPT option: 53	Standard & 300 kg option: 48 MPT option: 53	31
5.14	Maximum weight allowed on couch [kg]	227	227	204 (295 option)	200 (standard) or 280 (option)	220 (standard) or 300 (option)	220 (standard) or 300 (option)	205
5.15	Maximum weight [kg] on standard couch which still achieves stated performance specifications eg.accuracy (mm)	227 (±0.25mm)	227 (±0.25mm)	204 (295 option)	200 (standard) or 280 (option)	220 (standard) or 300 (option)	220 (standard) or 300 (option)	205

Table 6. Scanning capabilities

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
6.1	Maximum continuous scan time [s]	60	60	100	100	100	100	100

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
6.2	Maximum number of rotations in one helical run at standard abdomen parameters	150	150	Info. not available	75	142	95	200 (250 option)
6.3	Maximum helical scan coverage using a 1 mm imaged slice thickness and a pitch of 1.5 [mm]	2000	2000	1750	1500	2000	2000	1750 (std) 1450 (short)
6.4	Overscan required for sequential scanning [degrees].	Not required	Not required	60 degree fan angle	No	No	No	Max 35
6.5	Overbeaming required for helical scanning [rotations]	Yes (Number not specified)	Yes (Number not specified)	Up to 10%	Yes (up to 3/4 rotation at either end)	Siemens Adaptive Dose Shield utilised	Yes (up to 3/4 rotation at either end)	2 (1 at each end)

Table 7. Scanned projection radiography (SPR)

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
7.1	Proprietary SPR name	Scout	Scout	Survew	Topogram	Topogram	Topogram	Scanogram

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
7.2	Maximum SPR length [mm]	1600 or 1900	1600 or 1900	1750	1536	1574 (1974 option)	1974	1750 (Std) 1450 (Short)
7.3	SPR dimensions [mm x mm]	Adjustable	Adjustable	500 x 1750	500 x 1536 Freely selectable	1574 (1974 option) Freely selectable	512 x 1974 Freely selectable	width: 240, 400, 500 length: 200 - 1750 (Std), 1450 (Short)
7.4	Angular positions of X-ray tube available for SPR [degrees]	0-359 deg (1 deg step)	0-359 deg (1 deg step)	90° (Lateral) 180° (AP)	a.p., p.a., lateral	a.p., p.a., lateral	a.p., p.a., lateral	0, 90, 180, 270 5 degree steps
7.5	Maximum number of SPR views available for scan planning	2	2	2	2	2	2	2
7.6	Real time image display	No	No	Less than 5 s after scan	Yes	Yes	Yes	Yes
7.7	Accuracy of slice prescription from SPR [mm]	± 0.25	± 0.25	± 0.5	± 0.5	± 0.5	± 0.5	± 2
7.8	Accuracy of distance measurements from SPR, at isocentre [mm]	z- axis :< 2 x image pixel size x/y axis: < 5% measured distance + 2.0 mm	z- axis :< 2 x image pixel size x/y axis: < 5% measured distance + 2.0 mm	± 0.25	± 0.5	± 0.5	± 0.5	± 2

Table 8. Acquisition parameters

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
8a	Key settings							
8.1	kV steps	80, 100, 120, 140	80, 100, 120, 140	80, 120, 140	80, 100, 120, 140	80, 100, 120, 140	80, 100, 120, 140	80, 100, 120, 135
8.2	mA range and step size	10 - 700 (800 with 100 kW optional generator) (5mA steps)	10 - 800 (5mA steps)	20 - 500 (1 mA steps)	28 - 665 (1 mA steps)	20 - 666 (1 mA steps)	20 - 666 (1 mA steps)	10 - 500 (10 - 600 option)
8.3	Max. mA (for each kV)	80kV: 675mA 100kV: 700mA (770mA) 120kV: 700mA (800mA) 140kV: 700mA (715mA)	80kV: 675mA 100kV: 770mA 120kV: 800mA 140kV: 715mA	80 kV: 500 mA 120 kV: 500 mA 140 kV: 430 mA	80 kV: 500 mA 100 kV: 500 mA 120 kV: 665 mA 140 kV: 500 mA	80 kV: 550 mA 100 kV: 650 mA 120 kV: 666 mA 140 kV: 571 mA	80 kV: 500 mA 100 kV: 500 mA 120 kV: 666 mA 140 kV: 571 mA	80 kV: 500 mA (600 option) 100 kV: 500 mA (600 option) 120 kV: 500 mA (600 option) 135 kV: 430 mA (530 option)
8.4	Scan fields of view [cm]	32, 36 & 50 (adult and paediatric)	32, 36 & 50 (adult and paediatric)	25, 50	5 - 50	5 - 50	5 - 50	18, 24, 32, 40, 50

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
8b	Sequential mode							
8.5	Rotation times for sequential scanning [s]	0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 2 0.35, 0.37, 0.42s, 0.45, 0.47 option	0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 2 0.35, 0.37, 0.42s, 0.45, 0.47 option	0.4 (opt), 0.5, 0.75, 1.0, 1.5, 2.0	0.33, 0.37, 0.5, 1	0.3, 0.33, 0.5, 1	0.33, 0.5, 1	0.35, 0.375, 0.4, 0.45 (options) 0.5, 0.75, 1.0, 1.5 (standard)
8.6	Partial rotation scan times [s]	Info. not available	Info. not available	0.28 (option), 0.34	0.24, 0.27	0.22, 0.24	0.12, 0.24	0.28 (option), 0.32
8.7	Nominal z-axis x-ray beam collimations, sequential scanning [mm]	1.25, 2.5, 5, 10, 20, 40	1.25, 2.5, 5, 10, 20, 40	1.0, 1.25, 10, 20, 40	2, 3.6, 4.8, 5, 10, 19.2, 28.8	2, 4.8, 5, 10, 18	2, 4.8, 5, 10, 19.2, 28.8	1, 2, 4, 6, 8, 12, 16, 24, 32
8.8	Maximum z-axis x-ray beam collimation with sub-millimetre slices [mm]	40	40	40	19.2	19.2	19.2	32
8.9	Thinnest acquisition width available at full z-axis x-ray beam collimation [mm]	0.625	0.625	0.625	1.2	0.6	1.2	0.5

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
8.10	Sequential acquisition options (beam collimation: available data acquisition widths)	40: 0.625, 1.25; 2.5; 5.0 20: 0.625; 1.25; 2.5; 5.0 10: 0.625; 1.25; 2.5; 5.0 5: 0.625; 1.25; 2.5; 5.0 2.5: 0.625; 1.25; 2.5 1.25: 0.625; 1.25	40: 0.625, 1.25; 2.5; 5.0 20: 0.625; 1.25; 2.5; 5.0 10: 0.625; 1.25; 2.5; 5.0 5: 0.625; 1.25; 2.5; 5.0 2.5: 0.625; 1.25; 2.5 1.25: 0.625; 1.25	40: 0.625, 1.25, 2.5 25: 0.625 15: 0.625, 1.25 12.5: 0.625 10: 0.625 1.25: 0.625 1.0: 0.5	28.8: 1.2 19.2: 0.6 10: 10 5: 5 4.8: 0.6 3.6: 0.6 2: 1	19.2: 0.6, 1.2 10: 10 5: 5 4.8: 0.6 2: 1	28.8: 1.2 19.2: 0.6 10: 10 5: 5 4.8: 0.6 2: 1	32: 4 24: 6 16: 4 12: 3 8: 2, 8 6: 6 4: 1, 4 2: 0.5, 2 1: 1
8c Helical mode								
8.11	Rotation times for helical scanning [s]	0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 2 (0.35, 0.375, 0.425, 0.45 option)	0.35, 0.375, 0.4, 0.425, 0.45, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 2	0.4 (option), 0.5, 0.75, 1.0, 1.5, 2.0	0.33, 0.37, 0.5, 1	0.3, 0.33, 0.5, 1	0.33, 0.5, 1	0.35, 0.375, 0.4, 0.45 (options) 0.5, 0.75, 1.0, 1.5 (standard)
8.12	Nominal z-axis x- ray beam collimations, helical scanning [mm]	20, 40	20, 40	1.0, 1.25, 10, 20, 40	3.6, 6, 19.2, 28.8	4.8, 6, 12, 19.2	4.8, 6, 19.2, 28.8	32, 24, 16, 12, 8, 4, 2
8.13	Maximum z-axis x- ray beam collimation with sub-millimetre slices [mm]	40	40	40	19.2	19.2	19.2	32

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
8.14	Thinnest acquisition width available at full z-axis x-ray beam collimation [mm]	0.625	0.625	0.625	1.2	0.6	1.2	0.5
8.15	Helical acquisition options (beam collimation: available data acquisition widths)	40: 0.625 20: 0.625 10: 0.625 5: 0.625 2.5: 0.625 1.25: 0.625	40: 0.625 20: 0.625 10: 0.625 5: 0.625 2.5: 0.625 1.25: 0.625	40: 0.625, 1.25, 2.5 25: 0.625 15: 0.625, 1.25 12.5: 0.625 10: 0.625 1.25: 0.625 1.0: 0.5	28.8: 1.2 19.2: 0.6 6: 0.6 3.6: 0.3, 0.6	19.2: 0.6, 1.2 12: 0.6 6: 0.6 4.8: 0.3, 0.6	28.8: 1.2 19.2: 0.6 6: 0.6 4.8: 0.3, 0.6	32: 0.5, 1, 2, 4 24: 6 16: 0.5, 1, 4 12: 3 8: 0.5, 2 4: 1 2: 0.5
8.16	Pitches available for routine scanning	0.516, 0.531, 0.984, 0.969, 1.375	0.516, 0.531, 0.984, 0.969, 1.375	0.13 - 1.5, User selectable	0.45 - 2.0 freely selectable	Not applicable due to SureView algorithms	0.35 - 1.5 freely selectable	64-slice: 0.625-0.906 & 1.109-1.5 32-slice: 0.625-0.906 & 1.125-1.5 16-slice: 0.625-1.0 & 1.125-1.5 4-slice: 0.625-0.875 & 1.125-1.5
8.17	Recommended pitches for optimal image quality	0.516, 0.984, 1.375	0.516, 0.984, 1.375	0.13 -1.5, Optimal values recommended based on protocol	Not applicable due to SureView algorithms	Not applicable due to SureView algorithms	Not applicable due to SureView algorithms	0.641 0.828 1.484

Table 9. Automatic exposure control

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
9.1	Automatic mA control (AEC / mA modulation) software	Yes (3D Dose Modulation)	Yes (3D Dose Modulation)	DoseRight	CARE Dose 4D	CARE Dose 4D	CARE Dose 4D	SUREExposure 3D
9.2	- mA adjustment for patient size	Yes	Yes	Yes, ACS	Yes	Yes	Yes	Yes
9.3	- mA adjustment along the z-axis	Yes	Yes	Yes, Z-DOM	Yes	Yes	Yes	Yes
9.4	- mA modulation during rotation	Yes	Yes	Yes, D-DOM	Yes	Yes	Yes	Yes
9.5	Can z-axis and rotational modulation be employed concurrently?	Yes	Yes	No	Yes	Yes	Yes	Yes
9.6	Method for prescribing AEC image quality	Noise Index	Noise Index	Reference image	Noise index (Reference mAs set by user)	Noise index (Reference mAs set by user)	Noise index (Reference mAs set by user)	Standard deviation (SD)
9.7	Method for system control of mA	Single scout	Single scout	Single or dual Surview	SPR & online control	SPR & online control	SPR & online control	Using single or dual scanogram

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
9.8	Operator review of AEC	mA table	mA table	Yes, display of min, mean, max mAs	No	No	No	Yes
9.9	AEC manual adjustment	Yes. Max and min mA adjustable	Yes. Max and min mA adjustable	Yes	Yes - max / min mA	Yes - max / min mA	Yes - max / min mA	Yes

Table 10. Image reconstruction

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
10a	Parameters							
10.1	Minimum reconstruction field of view [cm]	9.6	9.6	Std & high res: 5 UHR: 2.5	5	5	5	5
10.2	Maximum reconstruction field of view at full image quality [cm]	50	50	Std & high res: 50 UHR: 25	50	50	50	50
10.3	Extended scan field of view [cm]	No	No	No	Option 70	Option 78	Option 78	Not available

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
10.4	Reconstruction matrices	512 x 512	512 x 512	512 ² , 768 ² , 1024 ²	512 x 512	512 x 512	512 x 512	512 x 512
10.5	Sequential image slice options (beam collimation : slice widths) [mm]	40: 1.25, 2.5, 5.0 20: 0.625, 1.25, 2.5, 5.0 10: 0.625, 1.25, 2.5, 5.0 5: 0.625, 1.25, 2.5, 5.0 2.5: 0.625, 1.25, 2.5 1.25: 0.625, 1.25	40: 1.25, 2.5, 5.0 20: 0.625, 1.25, 2.5, 5.0 10: 0.625, 1.25, 2.5, 5.0 5: 0.625, 1.25, 2.5, 5.0 2.5: 0.625, 1.25, 2.5 1.25: 0.625, 1.25	0.5 - 12.5	28.8: 1.5, 2, 3, 4.5, 6, 7, 8, 10 19.2: 0.6, 0.75, 1, 1.5, 2, 3, 4.5, 6, 7, 8, 10 10: 5: 4.8: 3.6:0.6, 0.75, 1, 1.5, 2, 3, 4.5, 6, 7, 8, 10 2:	18: 3, 3.6, 6, 9, 12 10: 5: 4.8: 2:	28.8: 1.5, 2, 3, 4.5, 6, 7, 8, 10 (3D recon) 19.2: 0.6, 0.75, 1, 1.5, 2, 3, 4.5, 6, 7, 8, 10 (3D recon) 19.2: 2, 2.4, 4.8, 7.2, 9.6, 14.4 6: 4.8:	32: 4 24: 6 16: 4 12: 3 8: 2, 8 6: 6 4: 1, 4 2: 0.5, 2 1: 1

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
10.6	Helical image slice options (beam collimation: slice widths) [mm]	40: 0.625, 1.25, 2.5, 3.75, 5.0 20: 0.625, 1.25, 2.5, 3.75, 5.0	40: 0.625, 1.25, 2.5, 3.75, 5.0 20: 0.625, 1.25, 2.5, 3.75, 5.0	Slice width: 0.55 - 7.5	28.8: 1.5, 2, 3, 4.5, 6, 7, 8, 10 19.2: 0.6, 0.75, 1, 1.5, 2, 3, 4.5, 6, 7, 8, 10 6: 0.6, 0.75, 1, 1.5, 2, 3, 4.5, 6, 7, 8, 10 3.6: 0.6, 0.75, 1, 1.5, 2, 3, 4.5, 6, 7, 8, 10	19.2 (64x0.6*): 0.6, 0.75, 1, 1.5, 2, 3, 4.5, 6, 7, 8, 10 19.2 (16x1.2): 1.5, 2, 3, 4.5, 6, 7, 8, 10 12: 6: 4.8: * double sampled	28.8: 1.5, 2, 3, 4.5, 6, 7, 8, 10 19.2: 0.6, 0.75, 1, 1.5, 2, 3, 4.5, 6, 7, 8, 10 6: 4.8:	Equal or thicker than scan thickness (max 10 mm)
10.7	Minimum reconstruction interval of images, helical scanning [mm]	0.1	0.1	0.1	0.1	0.1	0.1	0.1
10 b Functionality								
10.8	Number of prospective reconstructions that can be set up in protocol	3	3	Filter, Matrix Size, Slice Thickness, Slice Increment, X/Y Offset, Zoom	8	8	8	20

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
10.9	Any delay in either scanning or reconstruction when performed concurrently	No	No	No	No	No	No	No
10.10	Simultaneous scanning and routine analysis	Yes	Yes	Yes	Yes, with 2nd monitor option	Yes, with 2nd monitor option	Yes, with 2nd monitor option	Yes
10.11	Simultaneous scanning and archiving and/or hard copying	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10.12	Simultaneous scanning and transfer to second console/workstation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10 c	Performance							
10.13	Standard reconstruction rate for 512 x 512 images - head [images per second (ips)]	Up to 6 (16 option)	16	Approx. 18	20	40	40	16

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
10.14	Standard reconstruction rate for 512 x 512 images - body[ips]	Up to 6 (16 option) (Up to 16 standard on Cardiac scanner option)	Up to 16	Approx. 15	20	40	40	16
10.15	Reconstruction upgrade options	Up to 16 ips	Not applicable	RapidView 20 is standard	Not applicable	Not applicable	Not applicable	Yes
10.16	Fastest reconstruction rate [ips]	6 (16 option)	16	Up to 20	20	40	40	28

Table 11. Data processing

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
11.1	Reconstruction algorithm - sequential scanning	Filtered Back Projection	Filtered Back Projection	Filtered Back Projection	Filtered Back Projection	Filtered Back Projection	Filtered Back Projection	MUSCOT (multislice cone beam tomography)

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
11.2	Reconstruction approach - sequential scanning	2D/3D	2D/3D	2D	2D	2D/3D	2D/3D	2D Back projection
11.3	Cone beam reconstruction - sequential scanning	Yes, on apertures > 10 mm	Yes, on apertures > 10 mm	Yes, with Step & Shoot Cardiac option	No	For 3D recon modes	For 3D recon modes	No
11.4	Reconstruction algorithm - helical scanning	GE proprietary Volume Recon	GE proprietary Volume Recon	Cone Beam Reconstruction Algorithm (COBRA)	Adaptive Multiple Plane Reconstruction (AMPR)	WFBP (Weighted Filtered Back Projection)	WFBP (Weighted Filtered Back Projection)	MUSCOT T-COT (true cone beam tomography)
11.5	Reconstruction approach - helical scanning	3D Back Projection	3D Back Projection	3D Back Projection	2D Filtered Backprojection	3D WFPB	3D WFPB	2D Back projection Volume
11.6	Cone beam reconstruction - helical scanning	Yes	Yes	Yes	Yes, always	Yes, always	Yes, always	Yes
11.7	Low signal correction	Yes	Yes	Yes, Adaptive Filtering	Yes	Yes	Yes	Yes
11.8	Motion correction	Yes	Yes	Yes, with overscan	No	No	No	No

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
11.9	Beam hardening algorithms	Yes, IBO (iterative bone option)	Yes, IBO (iterative bone option)	Yes, IBC (iterative bone correction)	Standard beam hardening algorithm (water correction) in all modes, PFO (iterative bone correction) in selected modes	Standard beam hardening algorithm (water correction) in all modes, PFO (iterative bone correction) in selected modes	Standard beam hardening algorithm (water correction) in all modes, PFO (iterative bone correction) in selected modes	Yes
11.10	Beam hardening trigger	All head protocols	All head protocols	Yes, Protocol dependent	PFO is on in all soft-tissue head modes	PFO is on in all soft-tissue head modes	PFO is on in all soft-tissue head modes	Kernel
11.11	Noise reduction techniques - raw data based	Yes, GE proprietary	Yes, GE proprietary	Yes, Adaptive Filtering	3D adaptive filter	3D adaptive filter	3D adaptive filter	Yes
11.12	Noise reduction techniques - image based	Yes, GE proprietary	Yes, GE proprietary	Yes, Image Enhancement	2D advanced smoothing algorithm	3D advanced smoothing algorithm	3D advanced smoothing algorithm	Yes
11.13	Other artefact reduction methods	Yes, GE proprietary	Yes, GE proprietary	Info. not available	Z-sharp technology	Z-sharp technology	Z-sharp technology	No

Table 12. System start-up and calibration

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
12.1	Total time from stand-by mode to scanning [mins]	~ 30 mins (fast cal 1x every 24 hours + tube warm-up if system has been in stand-by for over 2 hours)	~ 30 mins (fast cal 1x every 24 hours + tube warm-up if system has been in stand-by for over 2 hours)	<1	0	0	0	2
12.2	Total time from stand-by mode to scanning in an emergency [mins]	1 minute (tube warm-up if system has been in stand-by for over 2 hours)	1 minute (tube warm-up if system has been in stand-by for over 2 hours)	<1	0	0	0	0
12.3	Power-on to ready to warm-up [mins]	≤ 10 min	≤ 10 min	Info. not available	5	3	3	2
12.4	Standby to ready to warm-up [mins]	≤ 1 min	≤ 1 min	<1	0	0	0	0
12.5	Tube warm-up time [mins]	~ 1 min	~ 1 min	3	0	0	0	5
12.6	Warm-up frequency	After 2 hours of non-use	After 2 hours of non-use	Daily	Daily	Daily	Daily	After 3 hours of non-use No warm up in emergency

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
12.7	Detector calibration at warm-up	Air cal recommended	Air cal recommended	Yes, air cals	Part of warm up	Part of warm up	Part of warm up	Automatic
12.8	Time to perform detector calibrations [mins]	≤30	≤30	25	7	6	7	2
12.9	Recommended frequency for detector calibration	Once every 24 hours	Once every 24 hours	Weekly	Daily	Daily	Daily	Daily
12.10	Automated QC tests	No	No	Std QA Protocols	Yes	Yes	Yes	No
12.11	Self-check frequency	Not applicable	Not applicable	Daily	Daily	Daily	Daily	Not applicable
12.12	Any additional calibration by the radiographer	No	No	Info. not provided	Not required	Not required	Not required	Not required
12.13	Time to perform these additional calibrations [mins]	Not applicable	Not applicable	Info. not provided	Not required	Not required	Not required	Not applicable

Table 13. Manufacturer's performance data

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
13.1	In plane spatial resolution for sharpest clinical algorithm [lp/cm]	MTF0: 15.4 MTF4: 14.2 MTF10: 13.5 MTF50: 10.1 (10cm DFOV, Edge alg, Small Focus)	MTF0: 15.4 MTF4: 14.2 MTF10: 13.5 MTF50: 10.1 (10cm DFOV, Edge alg, Small Focus)	MTF0: 24 MTF2: 23 MTF10:16 MTF50: 8 [0.75s, 2.5mm, UHR, 25cm FOV, E]	MTF2: 23.7 (120 kV, 160 mA, 1.0 s, 6x0.6 mm, UHR- Comb, U95u)	MTF2: 24.0 (120 kV, 160 mA, 0.5 s, 8x0.6 mm, UHR-Comb, U95u)	MTF2: 24.3 (120 kV, 160 mA, 1.0 s, 6x0.6 mm, UHR- Comb, U95u)	MTF2: 21.4 (120 kV, 300mA, 2 mm slice width, 0.5s, 240 mm FOV, FC90 alg, (small focus)
13.2	Longitudinal (z- axis) spatial resolution for sharpest clinical algorithm [lp/cm]	MTF4: 14.2 MTF10: 12.2 MTF50: 7.3 (0.625mm, 0.562 pitch, 0.06mm interval, Detail alg., small focus)	MTF4: 14.2 MTF10: 12.2 MTF50: 7.3 (0.625mm, 0.562 pitch, 0.06mm interval, Detail alg., small focus)	15 lp/cm @ cut off	MTF2: 21	MTF2: 21	MTF2: 21	Info not available
13.3	Contrast resolution: smallest rod size discernable (in plane) [mm]	3 mm @ 0.3% at 22.2 mGy CTDIvol: 120 kV, 10mm	3 mm @ 0.3% at 22.2 mGy CTDIvol: 120 kV, 10mm	2mm @ 0.3 % contrast 4mm @ 0.3% contrast 5mm @ 0.3% contrast	5 mm @ 0.3% at 17 mGy (120 kV, 180 mAs, 1.0 s, 10mm slice, Sequence scan, B31s)	5 mm @ 0.3% at 16 mGy (120 kV, 180 mAs, 1.0 s, 10mm slice, Sequence scan, B31s)	5 mm @ 0.3% at 17 mGy (120 kV, 180 mAs, 1.0 s, 10mm slice, Sequence scan, B31s)	4 mm @ 0.3% @ 10.0 mGy: 120kV, 90 mAs, 10 mm, FC41 with adaptive filter

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
13.4	Method for contrast resolution determination	Statistical	Statistical	2 mm: 120 kVp, 350 mAs, 10 mm, 40 mGy 4 mm: 120 kVp, 250 mAs, 10 mm, 27 mGy 5 mm: 120 kVp, 200 mAs, 10 mm, 19 mGy	Observer method	Observer method	Observer method	Observer method
13.5	CT number accuracy (water) [±HU]	<u>+3</u>	<u>+3</u>	±4	2	2	2	3
13.6	CT number uniformity [HU]	Small SFOV: 0 ±/ 3.0 Large SFOV: 0 ±/ 10.0 GE QA Phantom (20 cm)	Small SFOV: 0 ±/ 3.0 Large SFOV: 0 ±/ 10.0 GE QA Phantom (20 cm)	±3	± 2 (20 cm Water phantom)	± 2 (20 cm Water phantom)	± 2 (20 cm Water phantom)	± 3
13.7	CT number accuracy (air) [±HU]	Not Specified	Not Specified	Info. not available	10	10	10	3
13.8	CT number accuracy (bone) [±HU]	Not Specified	Not Specified	Acrylic (120 kV) = 140±15	HU of non-water materials depends on kV	HU of non-water materials depends on kV	HU of non-water materials depends on kV	Info not available

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
13.9	Scanner settings for std head scan, used for quoting CTDI100 values	120 kVp, 40 mm; 260 mAs; 0.4 to 1.0 sec scan 64 x 0.625 or 32 x 0.625; 5 mm nominal image thick	120 kVp, 40 mm; 260 mAs; 0.4 to 1.0 sec scan 64 x 0.625 or 32 x 0.625; 5 mm nominal image thick	120 kV, 200 mAs, 16x1.5mm, 6mm ST, 250 cm FOV, EB Filter	120 kV, 330 mA, 1.0s, 4.8 mm slice (coll. 24x1.2 mm), Small Focal Spot	120 kV, 350 mA, 1.0 s, 4.8 mm slice (coll. 12x1.2 mm), Standard Shaped Beam Filter	120 kV, 400 mA, 1.0 s, 6 mm slice (coll. 6x3 mm), Narrow Shaped Beam Filter	120 kV 300 mA 1 s/rot 16 mm
13.10	CTDI100 at isocentre in air [mGy / 100mAs]	Info not available	Info not available	Info. not available	18.1	22.3	19.4	Info not available
13.11	CTDI100 at centre of head phantom [mGy / 100mAs]	Small Head: 16.9: Head: 17.8	Small Head: 16.9: Head: 17.8	10.36	13.4	16.4	14	18.4 (Bow-tie filter) 10.0 (Flat filter)
13.12	CTDI100 at periphery of head phantom [mGy / 100mAs]	Small Head: 17.0 Head: 20.0	Small Head: 17.0 Head: 20.0	11.24	13.6	16.7	13.3	21.5 (Bow-tie filter) 11.1 (Flat filter)

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
13.13	Scanner settings for std body scan, used for quoting CTDI100 values	120 kVp, 40 mm; 260 mAs; 0.4 to 1.0 sec scan 64 x 0.625 or 32 x 0.625; 5 mm nominal image thick	121 kVp, 40 mm; 260 mAs; 0.4 to 1.0 sec scan 64 x 0.625 or 32 x 0.625; 5 mm nominal image thick	120 kV, 250 mAs, 16x2.5mm, 5mm ST, 350 cm FOV, B Filter	120 kV, 440 mA, 0.5 s, 4.8 mm slice (coll. 24x1.2 mm), Large Focal Spot	120 kV, 420 mA, 0.5 s, 4.8 mm slice (coll. 16x1.2 mm), Standard Shaped Beam Filter	120 kV, 160 mA, 1.0 s, 6 mm slice (coll. 6x3 mm), Standard Shaped Beam Filter	120 kV 300 mA 1 s/rot 16 mm
13.14	CTDI100 at isocentre in air [mGy / 100mAs]	Info not available	Info. not available	Info. not available	18.1	21.3	20.7	Info not available
13.15	CTDI100 at centre of body phantom [mGy/100mAs]	Small Body: 4.6 Medium Body: 5.1 Large Body: 4.8	Small Body: 4.6 Medium Body: 5.1 Large Body: 4.9	3.36	4.5	4.9	4.8	6.6 (Bow-tie filter) 3.5 (Flat filter)
13.16	CTDI100 periphery of body phantom [mGy/100mAs]	Small Body: 8.7 Medium Body: 10.4 Large Body: 10.1	Small Body: 8.7 Medium Body: 10.4 Large Body: 10.1	6.76	7.6	8.8	8.5	14.8 (Bow-tie filter) 7.3 (Flat filter)

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
13.17	Dose profile FWHM, measured at isocentre [mm]	1.25 mm: Small FS 2.3 ; Large FS 4.0 2.5 mm; SFS 3.8 ; LFS 4.0 5.0 mm: SFS 7.2 ; LFS 8.4 10.0 mm: SFS 12.4 ; LFS 13.4 20.0 mm: SFS 22.0 ; LFS 22.8 40.0 mm: SFS 42.6; LFS 42.9 * Deviations exist depending on measurement method used	1.25 mm: Small FS 2.3 ; Large FS 4.0 2.5 mm; SFS 3.8 ; LFS 4.0 5.0 mm: SFS 7.2 ; LFS 8.4 10.0 mm: SFS 12.4 ; LFS 13.4 20.0 mm: SFS 22.0 ; LFS 22.8 40.0 mm: SFS 42.6; LFS 42.9 * Deviations exist depending on measurement method used	±10% for all collimation in air	Std. Body Collimation (Small Focal Spot): Nominal FWHM: 32.2 mm <i>Nominal Base Width (Film Measureme nt of Acceptance -Test): 33.5 mm</i>	Std Body Collimation: Nominal FWHM: 23.6 mm <i>Nominal Base Width (Film measurement of Acceptance Test): 25.0 mm</i>	Std. Body Collimation (Small Focal Spot): Nominal FWHM: 33.1 mm <i>Nominal Base Width (Film Measureme nt of Acceptance -Test): 33.8 mm</i>	32 : 38 ± 9.5 24 : 28 ± 6.0 16 : 20 ± 5.0 12 : 17 ± 4.3 8 : 12 ± 3.6 4 : 8 ± 2.4 2 : 5 ± 2.0

Table 14. Operator console

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
14.1	Dimensions of desktop [mm x mm]	1238 mm wide x (1022 - 1228 mm) deep	1238 mm wide x (1022 - 1228 mm) deep	330 x 900 (W x L)	Site dependant	Site dependant	Site dependant	450 x 700 x 815
14.2	Input devices	2 monitors, keyboard , 3- button mouse, trackball assembly	2 monitors, keyboard , 3- button mouse, trackball assembly	KB, Mouse, Bar code reader	Keyboard / Mouse	Keyboard / Mouse	Keyboard / Mouse	Keyboard / Mouse
14.3	Scan controls	Custom key board, mouse	Custom key board, mouse	Separate control device	Keyboard / Mouse / Scan controller	Keyboard / Mouse / Scan controller	Keyboard / Mouse / Scan controller	Keyboard / Mouse
14.4	Recorded instruction system options	9 Languages; Option to record up to 17 Personalized messages	10 Languages; Option to record up to 17 Personalized messages	Yes, 9 pre- recorded languages, also user programmable.	Customisable recording	Customisable recording	Customisable recording	Custom definable
14.5	Visual breath-hold indicator	Yes (lights)	Yes (lights)	Yes, scan timing bar on console	No	No	No	Yes
14.6	Number of monitors at console	2	2	2	1 (standard) 2 (option)	1 (standard) 2 (option)	1 (standard) 2 (option)	2

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
14.7	Function of each monitor (state if any function is restricted to only one monitor)	Scan/Recon Monitor: For scan and recon control with no image display Image Monitor: For image display, analysis, processing, and management	Scan/Recon Monitor: For scan and recon control with no image display Image Monitor: For image display, analysis, processing, and management	Scanning on left monitor Advanced Processing on right monitor	Acquisition control, patient data base, image viewing, clinical software evaluation packages, filming	Acquisition control, patient data base, image viewing, clinical software evaluation packages, filming	Acquisition control, patient data base, image viewing, clinical software evaluation packages, filming	Scan and Display console (Reconstruction from both)
14.8	Display type (LCD/CRT)	LCD	LCD	LCD	LCD	LCD	LCD	LCD
14.9	Diagonal dimension of image screen [cm]	48.2 (19 inches)	48.2 (19 inches)	48	48	48	48	48.3
14.10	Image area matrix dimensions	512 x 512, 768 x 768, 1024 x 1024	512 x 512, 768 x 768, 1024 x 1024	1280 x 1024	1024 x 1024	1024 x 1024	1024 x 1024	1024x1024
14.11	Usual range of CT Number displayed [HU]	-1024 to 3071	-1024 to 3071	Dependent on application and anatomy	-1024 to +3071	-1,024 to +3,071	-1,024 to +3,071	-1024 to 8191
14.12	Extended range of CT number display [HU]	+/- 31743	+/- 31743	-1024 to +3072	-10240 to +30710	-10,240 to +30,710	-10,240 to +30,710	-32768 to 32767

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
14.13	Accuracy of distance measurements in xy-plane [mm]	<5% of measured distance plus 2mm	<5% of measured distance plus 2mm	Info. not available	2 x pixel size	2 x pixel size	2 x pixel size	0.01 to 0.98
14.14	CTDI displayed on console	Yes Predicted & Actual	Yes Predicted & Actual	Yes	CTDIvol	CTDIvol	CTDIvol	CTDIw or CTDIvol (User definable)
14.15	Dose Length Product (DLP) displayed on console	Yes Predicted & Actual	Yes Predicted & Actual	Yes	Yes predicted before scan / actual after scan	Yes predicted before scan / actual after scan	Yes predicted before scan / actual after scan	Planned Actual After Scan
14.16	Geometric Efficiency displayed on console	Not shown	Not shown	No	Yes - if < 70%	Yes - if < 70%	Yes - if < 70%	Yes - if < 70%

Table 15. Main computers

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
15 a	Console computer							
15.1	Location	In console	In console	Info. not available	In console / under desk	In console / under desk	In console / under desk	Under desk

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
15.2	Make and model	HP XW8000 (standard) (8200 option)	HP XW8000 (standard) (8200 option)	Dell, Precision 690	Siemens Fujitsu	Siemens Fujitsu	Siemens Fujitsu	TOSHIBA
15.3	Operating system	Linux	Linux	Windows XP	Windows XP	Windows XP	Windows XP	Windows
15.4	Number and type of CPU	2 Xeon (3 Xeon on cardiac scanner option)	3 Xeon	One Dual Core	Dual Xeon	2 x Intel Xeon	Dual Xeon	Dual
15.5	CPU speed [GHz]	2 x 2.66 GHz (standard) (3 x 3.2 GHz option)	2 x 2.66 GHz (standard) (3 x 3.2 GHz option)	2 x 2.66 GHz	2 x 3.6 GHz	2 x 3.0 GHz	2 x 3.6 GHz	2 x 3.06 GHz
15.6	Standard amount of computer RAM [GB]	4	4	4	2	2	2	3.0 (scan console) 3.0 (display console)
15.7	Maximum amount of computer RAM [GB]	4	4	4	Not applicable	Not applicable	Not applicable	3.0 (scan console) 3.0 (display console)
15 b	Reconstructor							
15.8	Location	In console	In console	Stand-alone server	Location dependant	Location dependant	Location dependant	In scan room

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
15.9	Make and model	GE Design	GE Design	Info. not available	Siemens	Siemens	Siemens	TOSHIBA
15.10	Operating system	Linux	Linux	Windows	Windows XP	Windows XP	Windows XP	Confidential
15.11	Number and type of CPU	2 Xeon (3 Xeon on cardiac scanner option)	3 Xeon	2 Xeon Quad Core	4 x Dual Xeon	4 x Dual Xeon	4 x Dual Xeon	Confidential
15.12	CPU speed [GHz]	2 x 2.8 GHz (standard) (2 x 3.2 GHz option)	3 x 2.8 GHz (standard) (3 x 3.2 GHz option)	8 x 2 GHz	8 x 3 GHz	8 x 3 GHz	8 x 3 GHz	Confidential
15.13	Standard amount of computer RAM [GB]	6	6	8	4 x 4	4 x 4	4 x 4	15
15.14	Maximum amount of computer RAM [GB]	6	6	8	Not applicable	Not applicable	Not applicable	15

Table 16. Data management

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
16 a	Storage (at scanner)							
16.1	Standard total hard disc capacity [GB]	584	584	146	1022	1241	1825	1245
16.2	Max total hard disc capacity [GB]	584	584	292	1022	1241	1825	1245
16.3	Hard disc capacity for image storage [GB]	146	146	292	146	292	292	365
16.4	Hard disc capacity for image storage [# images]	250000	250000	500000	260000	520000	520000	160000
16.5	Capacity for raw data storage [GB]	584	584	882	730	730	1314	720 (3600 rotations)
16.6	Local compression	No	No	User selectable	No	No	No	No
16.7	Image compression algorithms and rates	No	No	Info. not available	Not applicable	Not applicable	Not applicable	Not applicable

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
16 b	Image Archive							
16.8	External media options	DVD (standard), CD-R (standard), MOD (Standard)	DVD (standard), CD-R (standard), MOD (Standard)	CD-R, DVD-RAM	DVD, CD, USB-HDD, Memory-Stick	DVD, CD, USB-HDD, Memory-Stick	DVD, CD, USB-HDD, Memory-Stick	CD-R DVD
16.9	Disc burning facility	Standard	Standard	Yes, standard	Dicom part 10 standard	Dicom part 10 standard	Dicom part 10 standard	Standard
16.10	Data archive options	Raw Data, Recons	Raw Data, Recons	Info. not available	Images, Recons, Raw Data, Dose records, Dicom Structured Reports (e.g. MS Word, Adobe pdf)	Images, Recons, Raw Data, Dose records, Dicom Structured Reports (e.g. MS Word, Adobe pdf)	Images, Recons, Raw Data, Dose records, Dicom Structured Reports (e.g. MS Word, Adobe pdf)	Raw Data Images
16.11	Protocol archive options	Protocols, SaveState, Calibrations, Logs, Etc.	Protocols, SaveState, Calibrations, Logs, Etc.	Info. not available	Scan Protocols, Utilisation Data, Dicom Structured reports	Scan Protocols, Utilisation Data, Dicom Structured reports	Scan Protocols, Utilisation Data, Dicom Structured reports	Protocols

Table 17. Workstation

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
17 a Standard workstation								
17.1	Workstation(s) provided as standard	AW VolumeShare2	AW VolumeShare2	No	Optional	Optional	Optional	MC (Standard) 3D WS (Option)
17.2	Workstation software upgrade options	Whole range of clinical options for CT in oncology, cardiology, vascular imaging and neurology - Software upgrade path to further versions with a 18 months compatibility	Whole range of clinical options for CT in oncology, cardiology, vascular imaging and neurology - Software upgrade path to further versions with a 18 months compatibility.VC T Access to pre processing functionality	All clinical applications	Details on application	Details on application	Details on application	Cerebral Blood Perfusion Calcium Scoring Cardiac Functional Analysis Dental SUREPlaque Lung CAD (3D WS only) Fusion (3D WS Only) EP Electrophysiolog y (3D WS only) Vessel Probe

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
17.3	Workstation hardware upgrade options	Comes by default with 4 GB RAM, expandable to 16 GB	VCT-XT: 12 GB RAM (AW CV) default expandable to 16GB	Additional RAM, Hard Disk	Upgrade PC / RAM	Upgrade PC / RAM	Upgrade PC / RAM	3D WS
17.4	Computer make and model	Hewlett Packard xw8400	Hewlett Packard xw8400	Dell Precision 690	Siemens Fujitsu	Siemens Fujitsu	Siemens Fujitsu	TOSHIBA (MC) HP (3D WS)
17.5	Operating system	Linux	Linux	Windows XP	Windows XP	Windows XP	Windows XP	Windows
17.6	Number and type of CPU	Two 3.0GHz Intel Dual Core Xeon CPU's with 4MB L2 cache	Two 3.0GHz Intel Dual Core Xeon CPU's with 4MB L2 cache	Two Dual Core	Intel Xeon	Intel Xeon	Intel Xeon	Dual Xeon (MC) Dual Xeon (3D WS)
17.7	CPU speed [GHz]	4 x 3 GHz	4 x 3 GHz	2 x 2.66 GHz	2 x 3.0 GHz	2 x 3.0 GHz	2 x 3.0 GHz	Confidential
17.8	Amount of computer RAM supplied as standard [GB]	4	12	4	6	6	6	3 (MC) 8 (3D WS)
17.9	Maximum amount of computer RAM [GB]	16	16	4	8	8	8	3 (MC) 8 (3D WS)
17.10	Disc storage capacity supplied as standard [GB]	300	300	292	220	220	220	1254 (MC) 500 (3D WS)

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
17.11	Maximum total hard disc storage capacity [GB]	300	300	438 (optional)	220	220	220	1254 (MC) 500 (3D WS)
17.12	Speed of connections to networks [Mbps/s]	1000	1000	10 / 100 / 1000	1000	1000	1000	1000 (MC) 1000 (3D WS)
17.13	External media options	CD-R, DVD+R(W)	CD-R, DVD+R(W)	DVD-RAM, CD	DVD	DVD	DVD	CD-R DVD
17.14	Disc burning facility	Standard Dicom Part 10 burning on CD-DVD Driver	Standard Dicom Part 10 burning on CD-DVD Driver	Yes	DICOM "part 10" standard	DICOM "part 10" standard	DICOM "part 10" standard	Standard
17.15	Data archive options	Dicom Part 10 on CD-DVD, jpeg/mpegs on CD-DVD-USB Key	Dicom Part 10 on CD-DVD, jpeg/mpegs on CD-DVD-USB Key	Survival, Axial images, MPRs, VR, SSD, MIP, clinical applications, save states	Raw / Image	Raw / Image	Raw / Image	Reconstruction (Raw Data Option)
17.16	Other archive options	All review protocols and configuration parameters	All review protocols and configuration parameters	Info. not available	Not applicable	Not applicable	Not applicable	Report (3D WS)
17 b Image display								
17.17	Number of monitors	2	2	1 standard 2 (option)	1 (2 option)	1 (2 option)	1 (2 option)	1 (MC) 1 (3D WS)

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
17.18	Display type (LCD/CRT)	LCD	LCD	LCD	LCD	LCD	LCD	LCD
17.19	Screen size [cm]	48.2 cm (19 inches)	48.2 cm (19 inches)	48	48.3 cm (19 inches)	48.3 cm (19 inches)	48.3 cm (19 inches)	48.2 (MC) 50.8 (3D WS)
17.20	Colour or greyscale	Colour	Colour	Colour	Colour	Colour	Colour	Colour
17.21	Monitor orientation	Landscape	Landscape	Landscape	Landscape	Landscape	Landscape	Landscape
17.22	Resolution [megapixels]	1.3	1.3	1.27	1.3	1.3	1.3	1.3, 1280 x 1024 (MC) 1.9, 1600 x 1200 (3D WS)
17.23	Luminance [cd/m2] Contrast [nnn:1]	Luminance: 270 Contrast 600:1	Luminance: 270 Contrast 600:1	Luminance: 250	Clinical Setting: Luminance:137 Contrast: 450:1	Clinical Setting: Luminance:137 Contrast: 450:1	Clinical Setting: Luminance:137 Contrast: 450:1	Luminance: 270 (MC); 250 (3D WS) Contrast: 450:1 (MC); 550:1 (3D WS)
17.24	Calibrated display contrast	Not specified	Not specified	No	CIE / DICOM	CIE / DICOM	CIE / DICOM	160 (MC) 150 (3D WS)
17.25	Image area matrix dimensions	1280 x 1024	1280 x 1024	1280 x 1024	1024 x 1024	1024 x 1024	1024 x 1024	1024 x 1024 (MC) 1200 x 1200 (3D WS)
17.26	Standard CT number range [HU]	-1024 to 3072	-1024 to 3072	Dependent on protocol	-1024 to +3071	-1024 to +3071	-1024 to +3071	-1024 to 8191

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
17.27	Extended CT number range [HU]	-32738 to 32767	-32738 to 32767	-1024 to +3072	-10240 to +30710 standard	-10240 to +30710 standard	-10240 to +30710 standard	-32768 to 32767
17.28	Accuracy of distance measurements in xy-plane [mm]	0.2	0.2	Info. not available	2 x pixel size	2 x pixel size	2 x pixel size	0.01 to 0.98
17 c Multi-user facilitation				Brilliance Portal				
17.29	Shared image database	Ultrafast connection (Directconnect) that allow several workstations to share hard disk	Ultrafast connection (Directconnect) that allow several workstations to share hard disk	Yes, images reside on server	Optional : Satellite console (CTWP)	Optional : Satellite console (CTWP)	Optional : Satellite console (CTWP)	Yes (3D WS) Functionality based on configuration
17.30	Thin client access	YES with Remote Access option (java running IE) - 2 access modes: Full access to workstation capabilities or basic MIP/MPR	YES with Remote Access option (java running IE) - 2 access modes: Full access to workstation capabilities or basic MIP/MPR	Yes, via thin client software	Expert i	Expert i	Expert i	Yes (3D WS)

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
17.31	Remote access to workstation	Yes in Two modes (full access to all workstation capabilities or basic MIP/MPR)	Yes in Two modes (full access to all workstation capabilities or basic MIP/MPR)	Yes, via thin client software	Expert i : configurable access	Expert i : configurable access	Expert i : configurable access	Yes (3D WS)
17.32	External access to workstation	YES with a VPN connection (2 GB minimum BW) and Remote Access option - 2 access modes: Full access to workstation capabilities or basic MIP/MPR	YES with a VPN connection (2 GB minimum BW) and Remote Access option - 2 access modes: Full access to workstation capabilities or basic MIP/MPR	Yes, via VPN connection	Expert i : configurable access	Expert i : configurable access	Expert i : configurable access	Yes (3D WS)
17.33	Additional system requirements	PC with 256 MB RAM, 1024*768 minimum screen resolution, Internet Explorer 6.0 or later, Mozilla	PC with 256 MB RAM, 1024*768 minimum screen resolution, Internet Explorer 6.0 or later, Mozilla	Yes, minimum hardware requirements	Expert i : Network	Expert i : Network	Expert i : Network	Optional licenses

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
17.34	Multi-use licensing	"Per seat" licence basis - special financial offer for multilicence	"Per seat" licence basis - special financial offer for multilicence	Unlimited licenses - up to the capacity of the server 10k, 30k, 60k slices simultaneously	Per seat	Per seat	Per seat	Concurrent

Table 18. Workflow / connectivity

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
18 a	Image transfer							
18.1	Scanner to workstation	Yes (autopush customizable)	Yes (Automatic or Triggered option)	Yes - preset in protocol, edit during planning or manual	Automated as part of protocol or operator triggered	Automated as part of protocol or operator triggered	Automated as part of protocol or operator triggered	Automatic and Manual

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
18.2	Rate of image transfer scanner to workstation [ips]	Up to 16, 512 x 512 per sec (GB network)	Up to 16, 512 x 512 per sec (GB network)	Info. not available	Background function during reconstruction from scanner to Siemens workstation - otherwise 25 ips with no compression applied	Background function during reconstruction from scanner to Siemens workstation - otherwise 25 ips with no compression applied	Background function during reconstruction from scanner to Siemens workstation - otherwise 25 ips with no compression applied	12 ips Maximum 50 ips (enhanced DICOM, optional)
18.3	Scanner to PACS	Yes (autopush customizable)	Yes (Automatic or Triggered option)	Yes - preset in protocol, edit during planning or manual	Automated as part of protocol or operator triggered	Automated as part of protocol or operator triggered	Automated as part of protocol or operator triggered	Automatic and Manual
18.4	Rate of image transfer scanner to PACS [ips]	Up to 16, 512 x 512 per sec (GB network)	Up to 16, 512 x 512 per sec (GB network)	Info. not available	Background function during reconstruction from scanner to Siemens PACS - otherwise 25 ips with no compression applied	Background function during reconstruction from scanner to Siemens PACS - otherwise 25 ips with no compression applied	Background function during reconstruction from scanner to Siemens PACS - otherwise 25 ips with no compression applied	12 ips Maximum 50 ips (enhanced DICOM, optional)
18.5	Workstation to PACS	Yes	Yes	Yes - manual	Operator triggered	Operator triggered	Operator triggered	Manual
18.6	Rate of image transfer workstation to PACS [ips]	6 std (up to 16 option) 512 x 512 images (GB network)	6 std (up to 16 option) 512 x 512 images (GB network)	Info. not available	25 ips uncompressed	25 ips uncompressed	25 ips uncompressed	12 ips

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
18.7	PACS to workstation	Yes (customizable prefetching)	Yes (customizable prefetching)	Yes - manual	Operator triggered	Operator triggered	Operator triggered	Manual
18.8	Rate of image transfer PACS to workstation [ips]	10, 512 x 512 images	10, 512 x 512 images	Info. not available	25 ips if Siemens PACS and Workstation are used. This rate may vary considerably if other PACS systems or workstations are used.	25 ips if Siemens PACS and Workstation are used. This rate may vary considerably if other PACS systems or workstations are used.	25 ips if Siemens PACS and Workstation are used. This rate may vary considerably if other PACS systems or workstations are used.	12 ips
18 b Interoperability								
18.9	Scanner with RIS	Not Available	Yes	Standard	Standard assuming Dicom WORKLIST on RIS	Standard assuming Dicom WORKLIST on RIS	Standard assuming Dicom WORKLIST on RIS	Option
18.10	Scanner with PACS	Standard	Standard	Standard	Standard	Standard	Standard	Option
18.11	Workstation with RIS	Option (RIS Connectivity)	Option (RIS Connectivity)	Not available	No	No	No	Standard
18.12	Workstation with PACS	Standard	Standard	Standard	Standard	Standard	Standard	Standard

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
18.13	Reporting tools	Can report directly from the system with the RIS connectivity option	Can report directly from the system with the RIS connectivity option	Yes, as DICOM encapsulated PDF	No	No	No	Yes (3D WS)
18.14	Structured reports available	No	No	Not available	Clinical Software dependant	Clinical Software dependant	Clinical Software dependant	Not available

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
18 c	IHE							
18.15	Which IHE profiles supported	Scheduled Workflow Patient Information Reconciliation Consistent Presentation of Images(CT) Presentation of Grouped Procedures(CT) Evidence Documents Portable Data for Imaging	Scheduled Workflow, Presentation of Grouped Procedures, Patient Information Reconciliation, Consistent Time	Scheduled Workflow Portable Data for Imaging Access to Radiology Information	SCANNER: Scheduled Workflow, Patient Information Reconciliation, Access to Radiology Information, and Consistent Presentation of Images WORKSTATION: Image Display, Evidence Creator, Print Composer, Report Creator, Report Reader, image Display, Portable Media Creator, Report Reader	SCANNER: Scheduled Workflow, Patient Information Reconciliation, Access to Radiology Information, and Consistent Presentation of Images WORKSTATION: Image Display, Evidence Creator, Print Composer, Report Creator, Report Reader, image Display, Portable Media Creator, Report Reader	SCANNER: Scheduled Workflow, Patient Information Reconciliation, Access to Radiology Information, and Consistent Presentation of Images WORKSTATION: Image Display, Evidence Creator, Print Composer, Report Creator, Report Reader, image Display, Portable Media Creator, Report Reader	Scheduled Workflow Patient Information Reconciliation Portable Data for Imaging Evidence Documents Consistent Presentation of Images Presentation of Grouped Procedures Charge Position

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
18.16	Actors implemented - scanner	Broad Worklist Patient Based Worklist Query Modality Group Case	Acquisition Modality, Time Client	1) Acquisition Modality + options: - Assisted Acquisition Protocol Setting - PPS Exception Management - Patient Based Worklist Query - Broad Worklist Query 2) Image Display 3) Portable Media Creator and Reader	Acquisition Modality (Patient Based Worklist Query, Broad Worklist Query, Modality Group Case), Image Display,Evidenc e Creator,Acquisit ion Modality, Image Display,Print Composer	Acquisition Modality (Patient Based Worklist Query, Broad Worklist Query, Modality Group Case), Image Display,Evidence Creator,Acquisiti on Modality, Image Display,Print Composer	Acquisition Modality (Patient Based Worklist Query, Broad Worklist Query, Modality Group Case), Image Display,Evidenc e Creator,Acquisit ion Modality, Image Display,Print Composer	Acquisition
18.17	Actors implemented - workstation	Image Display Image Creator Portable Media Creator Client Authentication Agent Personnel White Pages Consumer	Image Display Image Creator Portable Media Creator Client Authentication Agent Personnel White Pages Consumer	1) Image Display 2) Portable Media Creator and Reader	Image Display, Evidence Creator, Print Composer, Report Creator, Report Reader, image Display, Portable Media Creator, Report Reader	Image Display, Evidence Creator, Print Composer, Report Creator, Report Reader, image Display, Portable Media Creator, Report Reader	Image Display, Evidence Creator, Print Composer, Report Creator, Report Reader, image Display, Portable Media Creator, Report Reader	Image Display

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
18 d	DICOM objects							
18.18	CT image object (1993) supported	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18.19	CT 'enhanced' multiframe object (2005) supported	No	No	No	Standard	Standard	Standard	Standard
18.20	CT object supported as standard	Image Object (1993)	Image Object (1993)	Image Object (1993)	CT image object (1993)	CT image object (1993)	CT image object (1993)	1993
18 e	DICOM services on scanner / main console							
18.21	Storage	SCU, SCP	SCU, SCP	Yes	Yes	Yes	Yes	SCU, SCP
18.22	Print	SCU	SCU	Yes	Yes	Yes	Yes	SCU
18.23	Query / retrieve	SCU, SCP	SCU, SCP	Yes	Yes	Yes	Yes	SCU, SCP
18.24	Modality worklist	SCU (Connect Pro)	SCU (Connect Pro)	Yes	Yes	Yes	Yes	SCU
18.25	Performed procedure step	SCU (Connect Pro)	SCU (Connect Pro)	Yes	Yes	Yes	Yes	SCP
18.26	Storage commitment	Yes	Yes	Yes	Yes	Yes	Yes	SCU
18 f	DICOM services on workstation							
18.27	Storage	SCU, SCP	SCU, SCP	Yes	Yes	Yes	Yes	SCU/SCP

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
18.28	Print	SCU	SCU	Yes	Yes	Yes	Yes	SCU
18.29	Query / retrieve	SCU, SCP	SCU, SCP	Yes	Yes	Yes	Yes	SCU
18.30	Modality worklist management	Yes	Yes	No	No	No	No	Not available
18.31	Performed procedure step	Yes	Yes	No	MPPS service as SCU	MPPS service as SCU	MPPS service as SCU	Not available
18.32	Storage commitment	Yes	Yes	Yes	Yes	Yes	Yes	SCU

Table 19. Ancillary equipment

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
19.1	Contrast injector	Option	Option	Info. not available	Single or dual headed (option)	Single or dual headed (option)	Single or dual headed (option)	Local Purchase
19.2	Insufflators	Option, Carbon Dioxide	Option, Carbon Dioxide	Info. not available	CO2 (option)	CO2 (option)	CO2 (option)	Local Purchase

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
19.3	Head Rest	Standard	Standard	Elevated and Reclined (standard); Flat (option)	Straight head rest (standard), coronal headrest (option)	Straight head rest (standard), coronal headrest (option)	Straight head rest (standard), coronal headrest (option)	Straight (standard) Tilt (option) Tilt & Pivot (option) Coronal (option, 2 types) Ratchet (option) Infant (option)
19.4	Stereotactic head restraint	No	No	Info. not available	Option	Option	Option	Local Purchase
19.5	Restraining straps	Option	Option	Velcro	Velcro (standard)	Velcro (standard)	Velcro (standard)	Velcro (standard)
19.6	Slicker mattress cover	Option	Option	Standard	Standard	Standard	Standard	Standard
19.7	Bariatric couch option?	Available May 09	Available May 09	Yes (optional)	Yes	Yes	Yes	No
19.8	Bariatric couch weight limit [kg]	295	295	295	280	330	330	Not applicable
19.9	CT fluoroscopy hardware	SmartStep Option only	SmartStep Option only	Monitor, Exposure Control, Couch Control	Option	Option	Option	Monitor Exposure Control Couch Movement

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
19.10	Hard-copy imaging device	Option	Option	Info. not available	Option	Option	Option	Local Purchase
19.11	Gantry mounted ECG	Option	Option	ECG Monitor	Option	Option	Option	No

Table 20. Advanced reconstruction & display

		GE Lightspeed VCT	GE Lightspeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
20 a	Operator console							
20.1	Maximum and minimum intensity projections (MIP, MINIP)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20.2	Multi-planar reconstruction (MPR)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20.3	Planes available in MPR	User Defined	User Defined	Any	Yes	Yes	Yes	Yes
20.4	Shaded surface display (SSD)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

		GE Lightspeed VCT	GE Lightspeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
20.5	Volume rendering software	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20.6	Segmentation and sculpting	Option	Option	Manual and Automatic	Manual (standard), Automated (option)	Manual (standard), Automated (option)	Manual (standard), Automated (option)	Yes
20 b	Standard workstation							
20.7	Maximum and minimum intensity projections (MIP, MINIP)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20.8	Multi-planar reconstruction (MPR)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20.9	Planes available in MPR	Yes	Yes	Any	Yes	Yes	Yes	Yes
20.10	Shaded surface display (SSD)	Yes (Option on Cardiac scanner)	Option	Yes	Yes	Yes	Yes	Yes
20.11	Volume rendering software	Yes	Yes	Yes	Yes	Yes	Yes	Yes

		GE Lightspeed VCT	GE Lightspeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
20.12	Segmentation and sculpting	Option	Option	Manual and Automatic	Manual (standard), Automated (option)	Manual (standard), Automated (option)	Manual (standard), Automated (option)	Yes

Table 21. Clinical applications software

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
(OC - operator console, WS - workstation)								
21.1	CT angiography: Basic package	VesselIQ Xpress	VesselIQ Xpress	Yes - CT Viewer	3D (OC & WS)	3D (OC & WS)	3D (OC & WS)	SUREFluoro (Option)
21.2	CT angiography: Advanced package	Advanced Vessel Analysis; AutoBone Xpress	Advanced Vessel Analysis; AutoBone Xpress	Yes - AVA	InSpace & InSpace AVA (OC & WS)	InSpace & InSpace AVA (OC & WS)	InSpace & InSpace AVA (OC & WS)	SUREFluoro (Option)
21.3	Virtual endoscopy: Basic package	Navigator OC/WS	Navigator OC/WS	Yes - CT Viewer	Fly Through (OC, & WS)	Fly Through (OC, & WS)	Fly Through (OC, & WS)	Fly-Through (MC option) Colon (3D WS standard)

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
21.4	Virtual colonoscopy: Advanced package	WS Advantage CTC Plus or Pro 3D OC/WS	WS Advantage CTC Plus or Pro 3D OC/WS	Yes - Virtual Colnoscopy	Syngo Colonography CT (OC & WS)	Syngo Colonography CT (OC & WS)	Syngo Colonography CT (OC & WS)	Colon CAR (3D WS Option)
21.5	Brain perfusion software	Perfusion 4 Neuro	Perfusion 4 Neuro	Yes - Advanced Brain Perfusion	Syngo Neuro Perfusion CT (OC, & WS)	Syngo Neuro Perfusion CT (OC, & WS)	Syngo Neuro Perfusion CT (OC, & WS)	CBP (MC Option) CBP (3D WS Option)
21.6	Body perfusion software	Perfusion 4 Whole Body perfusion	Perfusion 4 Whole Body perfusion	Yes - Functional CT	Syngo Body CT Perfusion (OC & WS)	Syngo Body CT Perfusion (OC & WS)	Syngo Body CT Perfusion (OC & WS)	Not available
21.7	Computer assisted reading: Lung	OC: n/a, WS: Option (LungVCAR)	OC: n/a, WS: Option (LungVCAR)	Yes - Lung Nodule Assesement	Syngo Lung CAD (OC & WS)	Syngo Lung CAD (OC & WS)	Syngo Lung CAD (OC & WS)	Lung CAD (3D WS Option)
21.8	Computer assisted reading: Colon	OC: n/a, WS: Option (ColonVCAR)	OC: n/a, WS: Option (ColonVCAR)	Yes - Polyp CAD	Syngo Colonography PEV (OC & WS)	Syngo Colonography PEV (OC & WS)	Syngo Colonography PEV (OC & WS)	Colon CAR (3D WS Option)
21.9	Bone mineral densitometry	WS: ADW BMD/Mindways BMD	WS: ADW BMD/Mindways BMD	Yes - Bone Mineral Analysis	Syngo Osteo (OC & WS)	Syngo Osteo (OC & WS)	Syngo Osteo (OC & WS)	BMS (MC Option)
21.10	Dental	WS/OC: Dentascan	WS/OC: Dentascan	Yes - Dental CT	Syngo Dental (OC & WS)	Syngo Dental (OC & WS)	Syngo Dental (OC & WS)	Dental (MC Option)
21.11	Image fusion	CT/MR Fusion; CT/PET Fusion	CT/MR Fusion; CT/PET Fusion	Yes - Master Match	Syngo Image Fusion (OC & WS)	Syngo Image Fusion (OC & WS)	Syngo Image Fusion (OC & WS)	Fusion 7D (3D WS Option)

Table 22. Cardiac applications

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
22.1	Prospective ECG-triggered cardiac scanning for calcium scoring	Smartscore 4/ VCAR Option	Smartscore 4/ VCAR Option	Yes, Heartbeat-CS Pro	HeartView option	HeartView option	HeartView option	Yes
22.2	Calcium scoring software	Smartscore 4/ VCAR Option	Smartscore 4/ VCAR Option	Yes, Heartbeat-CS, Agatston, Mass, Average	Syngo Calcium Scoring	Syngo Calcium Scoring	Syngo Calcium Scoring	Option
22.3	Prospective ECG-triggered cardiac scanning for coronary angiography	No	Yes, Snapshot Pulse	Not available	HeartView	HeartView	HeartView	Option
22.4	Retrospective ECG-gated cardiac scanning for coronary angiography	CardIQ Pro/Plus, SnapShot Segment; SnapShot Burst; SnapShot Burst Plus	CardIQ Pro/Plus, SnapShot Segment; SnapShot Burst; SnapShot Burst Plus	Yes, Rate Responsive CV Toolkit	HeartView option	HeartView option	HeartView option	Yes
22.5	Coronary angiography vessel analysis software	Advanced Vessel Analysis	Advanced Vessel Analysis	Yes, Comprehensive Cardiac Analysis	Syngo Circulation option	Syngo Circulation option	Syngo Circulation option	Option (3D WS)
22.6	Temporal resolution for single sector reconstruction [ms]	SnapShot Segment [200 ms]	SnapShot Segment [200 ms]	210	185 standard / 165 option	165	83	(175, 200option) 250

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
22.7	Rotation times for cardiac scanning [sec]	(0.35, 0.375 options), 0.4, 0.425, 0.45, 0.475, 0.5	0.35, 0.375, 0.4, 0.425, 0.45, 0.475, 0.5	0.4	0.37 standard / 0.33 option	0.33	0.33	(0.35 , 0.375, 0.4, 0.45 option) 0.5, 0.6, 0.75
22.8	Automatic adapted selection of rotation time?	No	No	Always use 0.4	No	No	No	Yes
22.9	Maximum mA available for cardiac scanning	700 (800 with 100kW generator option)	800 with 100kW generator as standard	500	665	666	666	500 (580 option)
22.10	ECG-gated mA modulation (max reduction from peak mA) [%]	80	80	80	80	96	96	80
22.11	Pitches available for cardiac scanning	0.16 - 0.325	0.16 - 0.325	0.2 - 0.3	0.18, 0.2, 0.24, 0.34	0.18 - 1.5	0.2 - 1.5	>0.125
22.12	Automatic adapted selection of pitch?	Yes, according to heart rate	Yes, according to heart rate	Yes, based on heart rate	No	Yes - Heart Rate	Yes - Heart Rate	Yes
22.13	Multi-sector reconstruction	4	4	Yes, up to 5 sectors	Yes - 2	Yes - 2	Yes - 2	5

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
22.14	Automatic adapted selection of multi-sector reconstruction	No	No	Yes, MaxCycle - system automatically uses the maximum number of the sectors for each voxel.	No	Yes	Yes	Yes Heart Rate Dependent
22.15	ECG editing	R-peak Trigger Points	R-peak Trigger Points	Yes, R-Tag can be added, removed and moved.	Delete, Disable, Insert, RR interval reconstruction (time and %)	Delete, Disable, Insert, RR interval reconstruction (time and %)	Delete, Disable, Insert, RR interval reconstruction (time and %)	Yes

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
22.16	For 70 kg patient, 60 bpm give typical scan parameters and (a) effective dose without ECG modulation (b) effective dose with ECG modulation	a) 120 kV, 500 mA, Pitch 0.22 12cm heart: DLP = 919 mGy.cm 14 cm heart: DLP = 1038 mGy.cm, E = 17.6 mSv b) Min mA 200, Max mA 550 (70-80%), 14 cm heart: DLP = 763 mGy.cm, E = 12.97 mSv	Not Specified	kV = 120 kV Rotation Time = 0.4s mAs = 800 mAs Pitch = 0.2 Scan Length = 120 mm Effective Dose = 14 mSv Effective Dose = 8 mSv (with modulation)	70%-70% window for ECG pulsing Retrospective gating (helical): 19.8 mSv w/o ECG-gated current modulation 8.5 mSv with ECG-gated current modulation (to 20% max)	Info not available	70%-70% window for ECG pulsing Retrospective gating (helical): 20 mSv w/o ECG-gated current modulation 7.2 mSv with ECG-gated current modulation (to 20% max) 3.6 mSv with ECG-gated current modulation (to 4% max) Prospective gating (sequential): 3.2 mSv	120 kV, 300 mA, 0.35 s/rot, Pitch 0.197 64 * 0.5 mm, scan lenght 120 mm Effective dose 12.9 mSv Modulated Effective dose 10.8 mSv Prospective Effective Dose 5.7 mSv

Table 23. Radiotherapy applications

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
23.1	Radiotherapy planning table top	Yes (option)	Yes (option)	Info. not available	Option	Option	Option	Option
23.2	Carbon fibre breast board	Yes (option)	Yes (option)	Info. not available	Option	Option	Option	Not available
23.3	External positioning lasers	Yes (Option - Dorado or A2J SV laser systems)	Yes (Option - Dorado or A2J SV laser systems)	Info. not available	Option	Option	Option	Option
23.4	External positioning laser options	Dorado: 1 Sagittal (moving); 2 Lateral (fixed or moving); [1 transverse (fixed or moving)] A2J: 1 Sagittal (moving); 2 Lateral (fixed or moving); 2 frontal (moving)	Dorado: 1 Sagittal (moving); 2 Lateral (fixed or moving); [1 transverse (fixed or moving)] A2J: 1 Sagittal (moving); 2 Lateral (fixed or moving); 2 frontal (moving)	Info. not available	Option	Option	Option	Not available
23.5	Respiratory gating software	GE Advantage 4D Option	GE Advantage 4D Option	Info. not available	Option	Option	Option	Option
23.6	Respiratory gating hardware	Varian, 3rd party vendor Optical (option)	Varian, 3rd party vendor Optical (option)	Info. not available	Pressure Sensor	Pressure Sensor	Pressure Sensor	Varian RPM

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
23.7	Radiotherapy CT simulation software	AW Sim MD (option)	AW Sim MD (option)	Info. not available	Option	Option	Option	Option on WS

Table 24. Advanced scanning facilities

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
24.1	Dual-energy / multi-energy capabilities	N/A	N/A	Info. not available	No	No	Yes - option	No
24.2	Dual-energy method used	N/A	N/A	Info. not available	No	No	Dual x-ray tube	Not applicable

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
24.3	Dual-energy analysis software	No	No	Info. not available	No	No	Direct Angio, Virtual Unenhanced, Hard Plaque Display, Calculli Characterisation, Musculoskeletal, Lung PBV. (SC / WS), [Heart PBV, Brain Haemorrhage, Lung Vessels and Gout - WIP] (SC / WS)	Not applicable
24.4	Contrast media bolus tracking software	Smart prep (Std)	Smart prep (Std)	Info. not available	CARE Bolus - standard	CARE Bolus - standard	CARE Bolus - standard	SUREStart
24.5	Contrast media bolus tracking; scan timing	Info. not available	Info. not available	Info. not available	Region of interest set by the user	Region of interest set by the user	Region of interest set by the user	1 fps - 12 fps User definable
24.6	Contrast media bolus tracking; trigger mechanism	Manual	Manual	Info. not available	Region of interest threshold set by the user	Region of interest threshold set by the user	Region of interest threshold set by the user	HU

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
24.7	Contrast media bolus tracking; user monitoring	4 images: Top left - plan slice Top right - enhancing image Bottom left - real time enhancement graph Bottom right - real time scan times, elapsed time clock	4 images: Top left - plan slice Top right - enhancing image Bottom left - real time enhancement graph Bottom right - real time scan times, elapsed time clock	Info. not available	Region of interest graph	Region of interest graph	Region of interest graph	Image and graph display
24.8	Contrast media bolus tracking; manual override	Yes, to stop & start scan	Yes, to stop & start scan	Info. not available	Yes, to force the scan	Yes, to force the scan	Yes, to force the scan	Abort or Start
24.9	CT fluoroscopy: out-of-room capability	Cine mode, out of room	Cine mode, out of room	Info. not available	Yes, provided Fluoro option has been purchased	Yes, provided Fluoro option has been purchased	Yes, provided Fluoro option has been purchased	Yes
24.10	CT fluoroscopy: in- room capability	WIP	WIP	Info. not available	Yes, provided Fluoro option has been purchased	Yes, provided Fluoro option has been purchased	Yes, provided Fluoro option has been purchased	Yes (Option)
24.11	CT fluoroscopy, image rate [fps]	WIP	WIP	8	CARE Vision option 10 fps	i-fluro option 10 fps	i-fluro option 10 fps	12 fps

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
24.12	CT fluoroscopy; beam collimations [mm]	WIP	WIP	Info. not available	12 x 0.6, 10 x 1.2, 30 x 0.6, 12 x 1.2, 24 x 1.2	6 x 1.2, 12 x 1.2, 1 x 5, 1 x 10	6 x 1.2, 12 x 1.2, 1 x 5, 1 x 10	32 24 16 12 8 4 2
24.13	CT fluoroscopy; slice thicknesses [mm]	WIP	WIP	Info. not available	12 x 0.6, 10 x 1.2, 30 x 0.6, 12 x 1.2, 24 x 1.2, 3 x 6	6 x 1.2, 3 x 2.4, 6 x 2.4, 3 x 4.8, 1 x 5, 2 x 7.2, 1 x 10	6 x 1.2, 3 x 2.4, 6 x 2.4, 3 x 4.8, 1 x 5, 2 x 7.2, 1 x 10	(32) 8, 16, 8 (24) 6, 12, 6 or 8, 8, 8 (16) 4, 8, 4 (12) 3, 6, 3 or 4, 4, 4 (8) 2, 4, 2 (4) 1, 2, 1 (2) 0.5, 1, 0.5
24.14	CT fluoroscopy; other viewing options	WIP	WIP	Info. not available	no	Full 2D and 3D Volume imaging available (option)	Full 2D and 3D Volume imaging available (option)	No
24.15	CT fluoroscopy; in- room scan controls	WIP	WIP	Info. not available	Foot switch	Foot switch and button on the gantry	Foot switch and button on the gantry	Extension Operating Panel

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
24.16	CT fluoroscopy; in-room couch control	WIP	WIP	Info. not available	Joy stick gantry controls and floating top control	Joy stick gantry controls, floating top control and I control (option)	Joy stick gantry controls, floating top control and I control (option)	Extension Operating Panel
24.17	CT fluoroscopy; scan alarms	WIP	WIP	Info. not available	Visual display on the monitor	Visual display on the monitor	Visual display on the monitor	Maximum total mAs Buzzer alarm User definable
24.18	CT fluoroscopy, additional hardware	WIP	WIP	Info. not available	In room monitor single or dual, ceiling or floor mounted, Joy stick and foot pedal	In room monitor single or dual, ceiling or floor mounted, Joy stick, foot pedal, I control wired or wireless	In room monitor single or dual, ceiling or floor mounted, Joy stick, foot pedal, I control wired or wireless	Local
24.19	CT fluoroscopy, dose control	WIP	WIP	Info. not available	Hand CARE: switch off dose for 100°	Hand CARE: switch off dose for 100°	Hand CARE: switch off dose for 100°	Not available
24.20	CT perfusion capability	Option: Multiorgan Perfusion (head, body and liver)	Option: Multiorgan Perfusion (head, body and liver)	Info. not available	Yes, syngo Neuro Perfusion and syngo Body perfusion options	Yes, syngo Neuro Perfusion, syngo Body perfusion and Adaptive 4D spiral options	Yes, syngo Neuro Perfusion, syngo Body perfusion and Adaptive 4D spiral options	CBP (Cerebral Brain Perfusion)

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
24.21	Maximum scan coverage for perfusion scans - sequential scanning [mm]	40 (80 with Axial Volume Shuttle XT upgrade)	80 Axial with Volume Shuttle (standard on VCT XT), (option on cardiac model)	80 (with Jog Scan)	28.8 (Head & Body)	19.2 (Head & Body)	28.8 (Head & Body)	32
24.22	Maximum scan coverage for perfusion scans - helical scanning [mm]	Helical shuttle WIP	Helical shuttle WIP	Info. not available	28.8 (Head & Body)	67 (Head & Body Adaptive 4D Spiral Option)	6 (Head)/15 (Body) Adaptive 4D Spiral Option	Not applicable
24.23	CT perfusion analysis	Neuro, Body or Multiorgan Perfusion , W/S & OC	Neuro, Body or Multiorgan Perfusion , W/S & OC	Info. not available	Yes, syngo Neuro Perfusion and syngo Body perfusion options	Yes, syngo Neuro Perfusion, syngo Body perfusion and Adaptive 4D spiral options	Yes, syngo Neuro Perfusion, syngo Body perfusion and Adaptive 4D spiral options	CBP (Cerebral Brain Perfusion)

Table 25. Installation requirements

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
25.1	Power supply requirements (gantry)	3 phase 380-480V 140kVA/150kVA	3 phase 380-480V 140kVA/150kVA	200 - 500 V AC 50/60 Hz 100 kVA Three-phase distribution source	380 - 440 V, 3Phase, N & E 50Hz 104 kVA Supplied from Siemens Line Connection Cabinet	380 - 440 V, 3Phase, N & E 50Hz 125 kVA Supplied from Siemens Line Connection Cabinet	380 - 440 V, 3Phase, N & E 50Hz 240 kVA Supplied from Siemens Line Connection Cabinet	3 phase 380-440V, 100kVA
25.2	Power supply requirements (other)	3 phase 380-480V 140kVA/150kVA	3 phase 380-480V 140kVA/150kVA	Info. not available	380 - 440 V , 3Phase, N & E 50Hz	380 - 440 V , 3Phase, N & E 50Hz	380 - 440 V , 3Phase, N & E 50Hz	Not applicable
25.3	Plumbing requirements	Not applicable	Not applicable	None	Yes	Site dependant	Site dependant	Not applicable
25.4	Minimum floor load-bearing [kg/m2]	1448	1448	Info. not available	293.7 ±10%	Up to 333.33 ±10%	Up to 517.2 ±10%	732
25.5	Minimum floor area required for gantry & couch [m²]	26m² for GT1700 table 28.6m² for GT2000 table	26m² for GT1700 table 28.6m² for GT2000 table	19.95	17.5	18	14.5	Info not available
25.6	Minimum floor area required for other in-room system [m²]	Not applicable	Not applicable	Info. not available	~ 4.9	1.48	4.17	Info not available

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
25.7	Recommended floor area required for scanner [m ²]	21.7 (1700 couch) 23.9 (2000 couch)	21.7 (1700 couch) 23.9 (2000 couch)	35.69	Site dependant ≥17.5	Site dependant ≥18	Site dependant ≥14.5	27 (std) 25 (short)
25.8	Minimum floor area required for the control console [m ²]	12.1	12.1	5	Site Dependant - PC towers 0.28m ²	Site Dependant - PC towers 0.28m ²	Site Dependant - PC tower 0.28m ²	Info not available
25.9	Gantry dimensions (H x W x D [mm]) and weight [kg]	1881 x 2230 x 1001; 1850	1881 x 2230 x 1001; 1850	2030 x 2390 x 940; 1941	1990 x 2280 x 940; 2000	1980 x 2380 x 935; 2300	1980 x 2314 x 1170; 2700	1950x2330x960 ; 1750
25.10	Couch dimensions (H x W x L [mm]) and weight [kg]	990 x 660 x 5300; 430	990 x 660 x 5300; 430	1010 x 690 x 2490; 385	1022 x 690 x 2430; 500	1000 x 750 x 2445; 500	1020 x 750 x 2432; 500	450x630x2690; 450 (std) 450x630x2390; 420 (short)
25.11	Control console dimensions (H x W x L [mm]) and weight [kg]	680 - 883 x 1238 x 1020 - 1228 (Keyboard Table) 680 - 807 x 1238 x 1020 - 1228 (Monitor Table)	680 - 883 x 1238 x 1020 - 1228 (Keyboard Table) 680 - 807 x 1238 x 1020 - 1228 (Monitor Table)	760 x 1190 x 910; 56	Site Dependant - 2 x PC towers 450 x 620 x 220	Site Dependant - PC tower 450 x 620 x 220	Site Dependant - PC tower 450 x 620 x 220	700 x 450 x 815; 140 1470 x 650 x 870; 260

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
25.12	Power unit dimensions (H x W x D [mm]) and weight [kg]	1067 x 711 x 559; 335	1067 x 711 x 559; 335	1120 x 560 x 530; 27 (optional)	Not applicable	Not applicable	Not applicable	870 x 669 x 800
25.13	Cooling unit dimensions (H x W x D [mm]) and weight [kg]	Not required	Not required	None	Site Dependant 1300 x 1140 x 770; 360	Not applicable	Site Dependant 1300 x 1140 x 770; 360	Not applicable
25.14	Supplementary plant	Not required	Not required	None	Not applicable	Not applicable	Not applicable	Not applicable
25.15	Supplementary plant unit dimensions (H x W x D [mm]) and weight [kg]	Not required	Not required	None	Not applicable	Not applicable	Not applicable	Not applicable
25.16	Supplementary plant locations	Not applicable	Not applicable	None	Not applicable	Not applicable	Not applicable	Not applicable
25.17	Peak heat output from system during scanning [kW]	Info. not available	Info. not available	18,000 BTU/hr	6.5	17.4	15	Info. not available
25.18	System cooling method	Info. not available	Patient throughput is limited by the tube cooling algorithm	Air cooled	Water	Air	Water	Air

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
25.19	Air conditioning for scanner room	Yes	Yes	Info. not available	Only comfort cooling needed	Only comfort cooling needed	Only comfort cooling needed	Recommended
25.20	Environmental requirements (max/min temperature, humidity) in scanner control room	21 - 26° C 30 - 60% relative humidity	21 - 26° C 30 - 60% relative humidity	18 to 24 C, 35 to 70%	15 - 28 °C , 15 - 75%	18 - 28 °C, 20 - 75 %	18 - 28 °C, 20 - 75 %	20 - 26 °C, 40 - 80% relative humidity
25.21	Environmental requirements (max/min temperature, humidity) for control computer	18 - 26° C 30 - 60% relative humidity	18 - 26° C 30 - 60% relative humidity	15 to 24 C, 35 to 70%	15 - 28 °C , 15 - 75%	18 - 28 °C, 20 - 75 %	18 - 28 °C, 20 - 75 %	20 - 26 °C, 40 - 80% relative humidity
25.22	Environmental requirements (max/min temperature, humidity) for reconstructor	18 - 26° C 30 - 60% relative humidity	18 - 26° C 30 - 60% relative humidity	15 to 24 C, 35 to 70%	15 - 28 °C , 15 - 75%	18 - 28 °C, 20 - 75 %	18 - 28 °C, 20 - 75 %	20 - 26 °C, 40 - 80% relative humidity
25.23	Environmental requirements (max/min temperature, humidity) for workstation	18 - 26° C 30 - 60% relative humidity	18 - 26° C 30 - 60% relative humidity	15 to 24 C, 35 to 70%	15 - 28 °C , 15 - 75%	18 - 28 °C, 20 - 75 %	18 - 28 °C, 20 - 75 %	20 - 26 °C, 40 - 80% relative humidity

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
25.24	Connection to networks [Mbits/s]	Info not available	Info not available	1000 MPS / 1000 Base T	1000	1000	1000	1000
25.25	Network connections required	3 x RJ45 CAT5	3 x RJ45 CAT5	10 MPS / 10 Base T	1 per PC	1 per PC	1 per PC	RJ45 CAT5E or CAT6
25.26	Network requirements	LAN	LAN	LAN	LAN	LAN	LAN	LAN
25.27	Static network addresses required	Optional	Optional	Yes	Yes - one per PC	Yes - one per PC	Yes - one per PC	Yes

Table 26. Maintenance & support

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
26 a	Service level options							
26.1	Standard hours engineer call-out	8:30 - 17:00	8:30 - 17:00	Info. not available	09:00 - 17:00	09:00 - 17:00	09:00 - 17:00	Info not available
26.2	24 hour engineer call-out	Available/ Not on standard contract	Available/ Not on standard contract	Info. not available	Available as a costed option	Available as a costed option	Available as a costed option	Info not available

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
26.3	Weekend engineer call-out	Available/ Not on standard contract	Available/ Not on standard contract	Info. not available	Available as a costed option	Available as a costed option	Available as a costed option	Info not available
26.4	Out of hours planned servicing	Available / Not on standard contract	Available / Not on standard contract	Info. not available	Available as a costed option	Available as a costed option	Available as a costed option	Info not available
26.5	Dial-in diagnostics	Available on standard contract	Available on standard contract	Info. not available	Secure remote access available (see note 2)	Secure remote access available (see note 2)	Secure remote access available (see note 2)	Info not available
26.6	Tube replacement	Available/ Not on standard contract	Available/ Not on standard contract	Info. not available	Available as a contract option	Available as a contract option	Available as a contract option	Info not available
26.7	Detector replacement	Available on standard contract	Available on standard contract	Info. not available	Included in a Performance TOP contract	Included in a Performance TOP contract	Included in a Performance TOP contract	Info not available
26.8	Main computers	Available on standard contract	Available on standard contract	Info. not available	Included in a Performance TOP contract	Included in a Performance TOP contract	Included in a Performance TOP contract	Info not available
26.9	Monitors and display devices	Available on standard contract	Available on standard contract	Info. not available	Included in a Performance TOP contract	Included in a Performance TOP contract	Included in a Performance TOP contract	Info not available
26.10	Workstations	Separate contract for workstation	Separate contract for workstation	Info. not available	Included in a Performance TOP contract	Included in a Performance TOP contract	Included in a Performance TOP contract	Info not available

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
26.11	User / application support	Available on standard contract	Available on standard contract	Info. not available	Included in a Performance TOP contract	Included in a Performance TOP contract	Included in a Performance TOP contract	Info not available
26.12	Parts	Available on standard contract	Available on standard contract	Info. not available	Included in a Performance TOP contract	Included in a Performance TOP contract	Included in a Performance TOP contract	Info not available
26 b Standard service level								
26.13	Median call-out response time	Phone < 30 Minutes, on site within 4 hours	Phone < 30 Minutes, on site within 4 hours	Info. not available	On site within 4 hours (see note 3)	On site within 4 hours (see note 3)	On site within 4 hours (see note 3)	Info not available
26.14	Median resolution time	Info not available	Info not available	Info. not available	If no parts are required, the mean time to repair is typically within 2 hours of the engineer gaining access to the system.	If no parts are required, the mean time to repair is typically within 2 hours of the engineer gaining access to the system.	If no parts are required, the mean time to repair is typically within 2 hours of the engineer gaining access to the system.	Info not available
26.15	Median parts delivery time	Same or next day	Same or next day	Info. not available	Same day or next day (see note 4)	Same day or next day (see note 4)	Same day or next day (see note 4)	Info not available
26.16	Frequency of service	Quarterly	Quarterly	Info. not available	2 per annum	2 per annum	2 per annum	Info not available
26.17	Duration of service [+/- 0.5 day]	1 Day	1 Day	Info. not available	0.5 day	0.5 day	0.5 day	Info not available

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
26.18	Warranty duration	12 months	12 months	Info. not available	1 year from handover of system	1 year from handover of system	1 year from handover of system	Info not available
26.19	What is the tube replacement policy?	Dependant on contract	Dependant on contract	Info. not available	One year (see note 5)	One year (see note 5)	One year (see note 5)	Info not available
26.20	What elements of scanner / plant are not covered in standard support?	Air conditioning	Air conditioning	Info. not available	As listed (see Notes 6 and 7)	As listed (see Notes 6 and 7)	As listed (see Notes 6 and 7)	Info not available
26 c Reliability								
26.21	What is the expected life span of the product ? (for five 8 hour days per week)	10 yrs	10 yrs	Info. not available	Not less than 7 years (see Note 8)	Not less than 7 years (see Note 8)	Not less than 7 years (see Note 8)	Info not available
26.22	What is average tube life ?	1 year +	1 year +	Info. not available	Data to date shows that the average life expectancy of Straton x-ray tubes life is between 2-3 years (see Note 9).	Data to date shows that the average life expectancy of Straton x-ray tubes life is between 2-3 years (see Note 9).	Data to date shows that the average life expectancy of Straton x-ray tubes life is between 2-3 years (see Note 9).	Info not available

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
26.23	Guaranteed tube life	Warranty 1st Year	Warranty 1st Year	Info. not available	One full year (see note 5)	One full year (see note 5)	One full year (see note 5)	Info not available
26.24	What is the expected detector life ?	Life of system	Life of system	Info. not available	Detectors should typically have a life span of 7 years (see Note 10)	Detectors should typically have a life span of 7 years (see Note 10)	Detectors should typically have a life span of 7 years (see Note 10)	Info not available
26.25	How long are component supplies maintained ?	10 yrs	10 yrs	Info. not available	10 years as per CRACOE	10 years as per CRACOE	10 years as per CRACOE	Info not available

Table 27. Supplementary information

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
27.1	When first installed in UK ?	2006	2007	2005	38292	Not applicable	39083	Info not available
27.2	How many units installed ?	38 (35 with cardiac packages)	5 (all with cardiac packages)	20	32	7 orders	5	Info not available

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
27.3	Any adverse incident reports issued on this model ?	None	None	Info. not available	No	No	No	No
27.4	What is the audible noise output of the product under normal operating conditions? [dB(A)]	Meets IEC 60601	Meets IEC 60601	Info. not available	70 @ 1m	68 @ 1m	70 @ 1m	61
27.5	What is the audible noise output of the product under standby or idle conditions? [dB(A)]	Meets IEC 60601	Meets IEC 60601	Info. not available	67 @ 1m	65 @ 1m	67 @ 1m	61
27.6	Is vibration generated by the product under normal operating conditions?	0.5 to 20 Hz; no hazard warning	0.5 to 20 Hz; no hazard warning	Info. not available	No	No	No	No
27.7	What are the levels of waste output under normal operating conditions?	None	None	Info. not available	None	None	None	None

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		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
27.8	Do the waste outputs from product under normal operating conditions require any regulatory permits, consents or licences?	Not applicable	Not applicable	Info. not available	No	No	No	No
27.9	Any water consumption?	No	No	Info. not available	No	No	No	No
27.10	What levels, and sizes of particulate matter are emitted from the product under normal operating conditions?	None	None	Info. not available	None	None	None	None
27.11	What features are designed in to the product to mitigate emissions to air	Not specified	Not specified	Info. not available	Air Filters	Air Filters	Air Filters	Covers prevent the emission of Graphite dust from slip rings. Any dust gathered is removed during regular maintenance.

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
27.12	To what extent is the product designed for use in developing health economies?	Not specified	Not specified	Info. not available	Complies	Complies	Complies	Not specifically designed
27.13	What colours are available	One Color (off-white/blue)	One Color (off-white/blue)	Info. not available	White	White or Zebra	White, Zebra, or Wood	

Table 28. Sustainability

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
28.1	What is the peak power consumption when scanning? [kVA]	150 kVA @ 0.85 PF	150 kVA @ 0.85 PF	Info. not available	≤111kVA	≤125 kVA	≤250kVA	70 (82 with 72 kW generator) (PF > 0.9)
28.2	What is the typical power consumption when not scanning? [kVA]	20 kVA	20 kVA	Info. not available	8 - 10 kVA	4 kVA	6 kVA	10 (PF > 0.9)

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
28.3	What is the power consumption when in 'Stand-By' mode ? [kVA]	15 kVA	15 kVA	Info. not available	8 - 10kVA	4 kVA	6 kVA	10 (PF > 0.9)
28.4	What power saving features are designed in to the product ?	Not specified	Not specified	Info. not available	Standby mode	Standby mode	Standby mode	By design features (mainly hardware) such as a High light output solid state detector and a High efficiency generator.
28.5	Does the product design incorporate features to reduce overall energy demand?	Yes, always complies with internal ecology policy	Yes, always complies with internal ecology policy	Info. not available	Yes	Yes	Yes	Various (software) solutions : e.g. Dose reduction features (Image recon algorithm and processing such as QDS, Boost 3D and TCOT recon and Exposure control functions) realise a reduced energy demand

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
28.6	What percentage of the packaging used is derived from recycle as opposed to virgin materials?	Not specified	Not specified	Info. not available	As per European Union regulations	As per European Union regulations	As per European Union regulations	0.03
28.7	What percentage of the packaging can be recycled ? (under normal circumstances)	Not specified	Not specified	Info. not available	1	1	1	1
28.8	Are there any known toxic components used in this scanner ?	Lead: Lead salts in X-ray tube assembly are toxic	Lead: Lead salts in X-ray tube assembly are toxic	Info. not available	Mercury, Lead	Mercury, Lead	Mercury, Lead	Pb (X-ray shielding) Hg (LCD monitor)
28.9	Does the system use any gases classed as hazardous or operating under pressure ?	No	No	Info. not available	No	No	No	No
28.10	Does the product utilise and refrigerants?	No	No	Info. not available	No	No	No	No

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
28.11	What is the percentage of recyclate utilised in the product manufacture?	Not specified	Not specified	Info. not available				Info. not available
28.12	What is the environmental impact of operating this scanner ?	Not specified	Not specified	Info. not available	Energy consumption / heat output	Energy consumption / heat output	Energy consumption / heat output	Use of electricity
28.13	What is the carbon footprint of the manufacturing processes ? [Equivalent tonnes of CO ₂ emissions]	Not specified	Not specified	Info. not available	Unknown	Unknown	Unknown	0.05
28.14	What is the carbon footprint of operating the scanner? [Equivalent tonnes of CO ₂ emissions per annum]	Not specified	Not specified	Info. not available	Unknown	Unknown	Unknown	15.2

		GE LightSpeed VCT	GE LightSpeed VCT XT	Philips Brilliance CT 64	Siemens SOMATOM Sensation 64	Siemens SOMATOM Definition AS 64	Siemens SOMATOM Definition Dual Source	Toshiba Aquilion 64
28.15	How does the scanner address the needs of the WEEE directives?	Environmental warnings in Operator's Manual	Environmental warnings in Operator's Manual	Info. not available	EMAS registered & WEEE Registered Nr. DE 23691322	EMAS registered & WEEE Registered Nr. DE 23691322	EMAS registered & WEEE Registered Nr. DE 23691322	Use of recyclable materials; information for treatment facilities is available; systems to ensure compliance with WEEE directive. TMS UK are member of B2B compliance Ltd.
28.16	Do you recycle / refurbish existing scanners?	Yes	Yes	Yes	Yes	Yes	Yes	The ratio of recyclable material is approximately 80% in total weight. All relevant products are either refurbished or treated in accordance with the WEEE requirements

Additional notes

GE

The following statement was received in response to the questionnaire in relation to the sustainability questions (table 28).

The GE Healthcare Renewable Resources team in Oak Creek, Wisconsin ensures that nearly 15 million pounds of old medical equipment and parts are reused, redeployed or recycled each year.

GE Healthcare Renewable Resources in Oak Creek, Wisconsin earned the Governor's Award for Excellence in Environmental Performance for reprocessing nearly 15 million pounds of old medical equipment and parts each year.

As part of Global Parts & Repair Solutions in the service organization of the Diagnostic Imaging business, Renewable Resources is an example of our ecomagination commitment to improve the energy efficiency of our business operations while also increasing company revenue.

The Oak Creek facility receives a wide variety of devices and parts, including:

- *Diagnostic imaging and biomedical equipment that customers have retired.*
- *Obsolete or excess parts from the GE Healthcare supply chain.*
- *Batteries, circuit boards and other parts returned by Field Engineers.*
- *Scrap materials from GE Healthcare facilities in the United States.*

The Renewable Resources team sees that 94 percent of that material is reused, redeployed or recycled. It's a major achievement in environmental responsibility that also produces more than \$3 million in annual revenue by reusing and recycling parts.

"We receive more than 4,000 truckloads of material per year," says Geoff Hunt, global repair manager. "That includes up to 500 CT and X-ray systems and 800 diagnostic imaging system cabinets."

"We send some imaging systems to repair suppliers for use as test beds for repair parts. Others we take apart. We harvest the usable components to be placed into inventory or added to our repair pools. This is especially valuable for older components that no longer have a supply chain. The remainder we separate into material streams for recycling."

Of all material received:

- *About 30 percent is redeployed or reused in some manner.*
- *About 64 percent (batteries, circuit boards, metals, fluids, glass and other items) goes to GE-approved processors and salvage dealers for recycling.*
- *Just 6 percent (such as fiberglass and plastics) is landfilled.*

"The proper handling of used electronic equipment has become a major issue worldwide," Hunt observes. "We've created a way to deal with retired medical devices that demonstrates both sound business practice and excellent corporate citizenship."

Siemens

The following notes are additional comments that were received in response to the questionnaire, that have been placed here in order to keep the responses in the comparison tables concise.

Table 29. Notes to Siemens replies

Note 1: with reference to question 3.11	It is not possible to accurately predict "The lifespan" of some components such as X-ray tubes as there are too many variables governing their usage, for example - the number, type and frequency of examination procedures carried out, the number of exposures made, the parameters selected for those exposures, the intervals between exposures, etc. all factors which are clearly unknown at this time. However based on average usage and historical data X-ray tube should typically have a life span of 3 years.
Note 2: Q26.5	Siemens Remote Services utilises a secure broadband internet connection, such as N3, such that systems can benefit from real-time, pro-active monitoring which detects and reports parameter deviations and potential system malfunctions to our specialists in the Uptime Support Centre. In addition your systems can receive software updates, can be protected against viruses and can even support you as a user with clinical information and e-training.
Note 3: Q26.13	When a call is received at the UPTIME Support Centre, there is immediate call clarification with all resources to assist problem resolution available within the team: immediate access to remote clarification information provided via Siemens Remote Services, the call history on SAP, technical as well as application experts, and spare parts logistics. However, if required, we would aim to have an engineer to site within 4 working hours.
Note 4: Q26.15	Our logistics operation is as effective as it can be; parts ordered by 6.00 pm can be delivered to site before 8.00 am the following day. In some cases it may even be possible to get spare parts delivered on the same day. Our network of spare-part drop boxes, strategically placed at hospital sites throughout the country makes parts delivery to site as transparent and efficient as possible. This is complemented by our 'Assisted-Fit' programme where a larger part can be delivered by appointment with all the necessary manpower to install it.

Note 5:
Q26.19 and Q26.23

The STRATON X-ray tube is delivered with one year full warranty. There are no restrictions in terms of scan seconds or patient limits. This offer is not restricted to a pro rata bases, the warranty is delivered for one full year. If the tube should fail during the warranty period, Siemens will replace every tube during these 12 months free of charge. e.g. If a tube fails in month 10 a new tube will be supplied free of charge, which will come with a 2 month warranty thus fulfilling a total warranty period of 12 months.

Note 6
Q26.20

Contract Exclusions:

All Systems: The following items are not included within the Maintenance Contract (MC) and will be charged for at the then current rates, unless covered by special warranty terms and/or explicitly included within the MC.

1. Network configuration work including -

- a. Changing IP addresses
- b. Network modifications
- c. Making changes or adding items to networks, e.g. moving or adding workstations
- d. All Dicom changes including adding peripheral items, e.g. printers etc
- e. Any additional hardware/software which may be required to assist networking compatibility will be charged on 'if required basis' in addition to the fixed charge.

2. UPS Batteries

- 3. Any Non-Siemens badged system components supplied with the system
- 4. Accessories, consumable items and positioning aids
- 5. Accidental and/or wilful damage caused through mishandling or neglect.

In addition to the items listed under "All systems" the following modality specific items, are not included within the Maintenance Contract (MC) and w

		X- Ray Tubes
		Where failure occurs due to faulty design, materials or workmanship, within the first 12 months from the date of installation of the system or of a replacement tube, the tube will be replaced and charged on a pro rata basis according to the number of months passed other than as detailed below:
Note 7:	CT X Ray Tubes excluding Straton.	
Q26.20	Where failure occurs due to faulty design, materials or workmanship, within the first 12 months from the date of installation of the system or of a replacement tube, the tube will be replaced and charged on a pro rata basis according to the number of scan - seconds utilised up to the warranted value.	
		Straton CT X-Ray tube.
		12 months full warranty, no scan-seconds limits and no patient limits.
Note 8:	This is very new technology which is being developed and refined continuously. Siemens Medical Solutions systems are supported in line with the provisions in CRACOE - The contractor shall make available for purchase by the authority, or its agents, any necessary spare parts and components to ensure that the goods can be maintained in safe working operation for a period of not less than 7 years from acceptance and, thereafter, shall use all reasonable endeavors to provide the said spare parts and components for a further period of 3 years.	
Q26.21		
Note 9:	Data to date shows that the average life expectancy of Straton x-ray tubes life is between 2-3 years. Please note that it is difficult to determine life expectancy for these items since it is heavily dependent on the number, type and frequency of examination procedures carried out, the number of exposures made, the parameters selected for these exposures, the intervals between exposures, as well as whether servicing has been requested and carried out at appropriate intervals - factors which are clearly unknown at this time.	
Q26.22		
Note 10:	It is not possible to accurately predict "The lifespan" of some components such as detectors as there are too many variables governing their usage, for example - the number, type and frequency of examination procedures carried out, the number of exposures made, the parameters selected for those exposures, the intervals between exposures, etc. all factors which are clearly unknown at this time.	
Q26.24	Detectors technology is very new and therefore usage data is limited, however our expectations are that detectors should typically have a life span of 7 years. Detector cover can be included within a Performance TOP maintenance contract.	

We should like to thank the following for their contribution to this report.

GE Healthcare

Philips Medical Systems

Siemens Healthcare

Toshiba Medical Systems

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website: www.toshiba-medical.co.uk

Comparative specifications: 64 slice CT scanners

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The Centre for Evidence-based Purchasing (CEP) is part of the Policy and Innovation Directorate of the NHS Purchasing and Supply Agency. We underpin purchasing decisions by providing objective evidence to support the uptake of useful, safe and innovative products and related procedures in health and social care.

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