

SOMATOM go.Sim

IEC Acceptance

Serial Number: 129061

IEC Acceptance

Demographical Data					
Customer		System		Service	
Customer Name		Product Name	SOMATOM go.Sim	Service Center Name	
Customer ID		Material Number	11061668	Street	
Hospital Name		Serial Number	129061	Street Number	
Street		Equipment Number		Zip Code	
Street Number		Modality	CT	City	
Zip Code		Handed Over Date	01/01/0001	District	
City		Software Version	VA30A	Country	
District				Phone	
Country				Fax	
Customer Phone Number				E-Mail	

Summary		
Function	Start Time	Result
Slice (IEC)	08/01/2021 1:49:52 PM	 OK
Contrast (IEC)	08/01/2021 1:51:58 PM	 OK
Noise (IEC)	08/01/2021 1:53:29 PM	 OK
Homogeneity (IEC)	08/01/2021 1:56:56 PM	 OK
MTF (IEC)	08/01/2021 1:59:30 PM	 OK
Tube Voltage (IEC)	08/01/2021 2:03:03 PM	 OK
Tube Power Level (IEC)	08/01/2021 2:05:18 PM	 OK

Table of Contents

1	Slice (IEC)	5
1.1	Test Description	5
1.2	Common Parameters	5
1.3	Test Data	6
2	Contrast (IEC)	10
2.1	Test Description	10
2.2	Common Parameters	10
2.3	Test Data	10
3	Noise (IEC)	12
3.1	Test Description	12
3.2	Common Parameters	12
3.3	Test Data	13
4	Homogeneity (IEC)	17
4.1	Test Description	17
4.2	Common Parameters	17
4.3	Test Data	18
5	MTF (IEC)	24
5.1	Test Description	24
5.2	Common Parameters	24
5.3	Test Data	24
6	Tube Voltage (IEC)	30
6.1	Test Description	30
6.2	Common Parameters	30
6.3	Test Data	30
7	Tube Power Level (IEC)	31
7.1	Test Description	31
7.2	Common Parameters	31
7.3	Test Data	31

1 Slice (IEC)

1.1 Test Description

The tomographic section thickness is evaluated by measuring the width of the image of an inclined aluminium ramp at the intersection of the ramp with the slice. The width is defined as the Full Width at Half Maximum (FWHM) of the baseline-corrected CT value profile. The influence of the reconstruction kernel and the influence of the cone angle on the measured width are considered. The measurement is performed for a representative selection of collimations and reconstructed slice widths. The evaluation is performed for at least the outer slice of one edge, the outer slice of the other edge, and one of the central slices.

1.2 Common Parameters

Equipment	
Slice Phantom	-

Parameters	
Scan Type	Sequence
Voltage	120 kV
Current	345 mA
Scan Time	1.0 s
Rotation Time	1.0 s
UHR	false
Shaped Filter	Standard
Sn Filter	false
Body Region	Head
Window Width	500 HU
Window Center	50 HU

(continued)

Parameters	
FoV	120 mm
Kernel	Or40f

1.3 Test Data

1.3.1 5 mm total collimation, 5 mm slice

Parameters	
	System A
Slice Width Reconstructed	5.00 mm
Number of Images	1
Collimation	1x5.0 mm

Result		
Slice	System A [mm] Tolerance: 4.00 ... 6.00	Status
1	5.18	In Tol.

1.3.2 15 mm total collimation, 5 mm slice

Parameters	
	System A
Slice Width Reconstructed	5.00 mm

(continued)

Parameters	
	System A
Number of Images	3
Collimation	3x5.0 mm

Result		
Slice	System A [mm] Tolerance: 4.00 ... 6.00	Status
1	4.93	In Tol.
2	5.03	In Tol.
3	4.93	In Tol.

1.3.3 10 mm total collimation, 10 mm slices

Parameters	
	System A
Slice Width Reconstructed	10.00 mm
Number of Images	1
Collimation	1x10.0 mm

Result		
Slice	System A [mm] Tolerance: 9.00 ... 11.00	Status
1	9.78	In Tol.

1.3.4 9 mm total collimation, 3 mm slice

Parameters	
	System A
Slice Width Reconstructed	3.00 mm
Number of Images	3
Collimation	3x3.0 mm

Result		
Slice	System A [mm] Tolerance: 2.00 ... 4.00	Status
1	3.56	In Tol.
2	3.06	In Tol.
3	3.54	In Tol.

1.3.5 19.2 mm total collimation, 0.8 mm slices

Parameters	
	System A

(continued)

Slice Width Reconstructed	0.80 mm
Number of Images	21
Collimation	32x0.6 mm

Result		
Slice	System A [mm] Tolerance: 0.30 ... 1.30	Status
1	0.91	In Tol.
2	0.90	In Tol.
11	0.82	In Tol.
20	0.90	In Tol.
21	0.98	In Tol.

2 Contrast (IEC)

2.1 Test Description

Contrast Scale is evaluated from the mean CT numbers in a central Region of Interest (ROI), measured from a scan of a cylindrical water phantom of 20 cm diameter and a scan without phantom. Attenuation coefficients of 0 1/cm for air and 0.192 1/cm for water are taken for the evaluation. Evaluation is performed for a typical body mode.

2.2 Common Parameters

Equipment	
Water Phantom	-

2.3 Test Data

2.3.1 Typical body mode

Parameters	
	System A
Scan Type	Sequence
Voltage	120 kV
Current	286 mA
Slice Width Reconstructed	5.00 mm
Number of Images	3
Collimation	32x0.6 mm
Scan Time	0.5 s
Rotation Time	0.5 s
UHR	false

(continued)

Parameters	
	System A
Shaped Filter	Standard
Sn Filter	false
Body Region	Body
Window Width	500 HU
Window Center	0 HU
FoV	250 mm
Kernel	Br40f

2.3.1.1 Single Source

Results for System A				
Slice	Water [HU] Tolerance: -4.00 ... 4.00	CT Air [HU] Tolerance: -1,004.00 ... -996.00	Contrast Scale [1/HUcm] Tolerance: 0.0001890 ... 0.0001950	Status
1	-0.45	-1,000.63	0.0001920	In Tol.
2	-0.51	-1,000.56	0.0001920	In Tol.
3	-0.60	-1,000.58	0.0001920	In Tol.

3 Noise (IEC)

3.1 Test Description

The measurement is performed for four sets of scan parameters, representing a typical head mode, a typical body mode, a typical pediatric body mode, and a typical pediatric head mode. The image noise is evaluated measuring the standard deviation of CT numbers in a Region of Interest (ROI) in the image of a cylindrical water phantom with diameter 20 cm for the pediatric head mode, the adult head mode, and the pediatric body mode and 30 cm for the adult body mode. The ROI is located in the phantom center. To suppress the influence of image inhomogeneity and ring artifacts, the evaluation is performed for the difference between images of two succeeding scans.

3.2 Common Parameters

Equipment	
Water Phantom	-
Water Phantom Large	-

Parameters	
Scan Type	Sequence
Number of Images	3
Slice Width Reconstructed	5.00 mm
Collimation	32x0.6 mm
UHR	false
Shaped Filter	Standard
Sn Filter	false
Window Width	500 HU
Window Center	0 HU

3.3 Test Data

3.3.1 Typical body mode

Parameters	
	System A
Voltage	120 kV
Current	286 mA
Scan Time	0.5 s
Rotation Time	0.5 s
Body Region	Body
FoV	320 mm
Kernel	Br40f
Radius of ROIs	60 mm

Result		
Slice	Results for System A [HU] Tolerance: 11.09 ... 15.01	Status
1	14.13	In Tol.
2	13.94	In Tol.
3	13.47	In Tol.

3.3.2 Typical pediatric body mode

Parameters	
	System A
Voltage	100 kV
Current	192 mA
Scan Time	0.5 s
Rotation Time	0.5 s
Body Region	Body
FoV	250 mm
Kernel	Br40f
Radius of ROIs	40 mm

Result		
Slice	Results for System A [HU]	Status
	Tolerance: 6.39 ... 8.65	
1	7.81	In Tol.
2	7.70	In Tol.
3	7.76	In Tol.

3.3.3 Typical head mode

Parameters	
	System A
Voltage	120 kV
Current	345 mA

(continued)

Parameters	
	System A
Scan Time	1.0 s
Rotation Time	1.0 s
Body Region	Head
FoV	250 mm
Kernel	Hr40f
Radius of ROIs	40 mm

Result		
Slice	Results for System A [HU]	Status
	Tolerance: 2.78 ... 3.76	
1	3.45	In Tol.
2	3.40	In Tol.
3	3.37	In Tol.

3.3.4 Typical pediatric head mode

Parameters	
	System A
Voltage	100 kV
Current	256 mA

(continued)

Parameters	
	System A
Scan Time	1.0 s
Rotation Time	1.0 s
Body Region	Head
FoV	250 mm
Kernel	Hr40f
Radius of ROIs	40 mm

Result		
Slice	Results for System A [HU] Tolerance: 4.15 ... 5.61	Status
1	4.99	In Tol.
2	5.02	In Tol.
3	4.92	In Tol.

4 Homogeneity (IEC)

4.1 Test Description

The measurement is performed for four sets of scan parameters, representing a typical head mode, a typical body mode, a typical pediatric body mode, and a typical pediatric head mode. The water value and homogeneity are evaluated by measuring the mean CT number in five Regions of Interest (ROI) in the image of a cylindrical water phantom with diameter 20 cm for the pediatric head mode, the adult head mode, and the pediatric body mode and 30 cm for the adult body mode. The ROIs are located in the center and near the edge of the water phantom, at 12 o'clock, 3 o'clock, 6 o'clock, and 9 o'clock. The water value is the CT number of the central ROI. The homogeneity is the difference between each of the outer ROIs and the central ROI.

4.2 Common Parameters

Equipment	
Water Phantom	-
Water Phantom Large	-

Parameters	
Scan Type	Sequence
Number of Images	3
Slice Width Reconstructed	5.00 mm
Collimation	32x0.6 mm
UHR	false
Shaped Filter	Standard
Sn Filter	false
Window Width	500 HU
Window Center	0 HU

4.3 Test Data

4.3.1 Typical body mode

Parameters	
	System A
Voltage	120 kV
Current	286 mA
Scan Time	0.5 s
Rotation Time	0.5 s
Body Region	Body
FoV	320 mm
Kernel	Br40f

Radius of ROIs	
	[mm]
Radius of Central ROI	20.00
Radius of Peripheral ROI	15.00

Water Value Results	
Slice	Water Value Results for System A [HU] Tolerance: -4.00 ... 4.00
1	-0.85

(continued)

Water Value Results	
Slice	Water Value Results for System A [HU] Tolerance: -4.00 ... 4.00
2	-1.07
3	-0.65

Results for System A					
Slice	Center [HU] Tolerance: -4.00 ... 4.00	Diff.3 [HU] Tolerance: -4.00 ... 4.00	Diff.6 [HU] Tolerance: -4.00 ... 4.00	Diff.9 [HU] Tolerance: -4.00 ... 4.00	Diff.12 [HU] Tolerance: -4.00 ... 4.00
1	-0.85	0.84	0.47	1.13	0.87
2	-1.07	1.46	0.69	1.50	1.39
3	-0.65	0.86	0.37	0.52	0.93

4.3.2 Typical pediatric body mode

Parameters	
	System A
Voltage	100 kV
Current	192 mA
Scan Time	0.5 s
Rotation Time	0.5 s
Body Region	Body
FoV	250 mm
Kernel	Br40f

Radius of ROIs	
	[mm]
Radius of Central ROI	15.00
Radius of Peripheral ROI	10.00

Water Value Results	
Slice	Water Value Results for System A [HU] Tolerance: -4.00 ... 4.00
1	0.13
2	0.15
3	0.32

Results for System A					
Slice	Center [HU] Tolerance: -4.00 ... 4.00	Diff.3 [HU] Tolerance: -4.00 ... 4.00	Diff.6 [HU] Tolerance: -4.00 ... 4.00	Diff.9 [HU] Tolerance: -4.00 ... 4.00	Diff.12 [HU] Tolerance: -4.00 ... 4.00
1	0.13	-0.11	0.15	-0.19	-0.45
2	0.15	0.75	-0.10	0.15	-0.10
3	0.32	-0.31	-0.78	-0.28	-0.61

4.3.3 Typical head mode

Parameters	
	System A
Voltage	120 kV
Current	345 mA
Scan Time	1.0 s
Rotation Time	1.0 s
Body Region	Head
FoV	250 mm
Kernel	Hr40f

Radius of ROIs	
	[mm]
Radius of Central ROI	10.00
Radius of Peripheral ROI	10.00

Water Value Results	
Slice	Water Value Results for System A [HU] Tolerance: -4.00 ... 4.00
1	-1.71
2	-1.82
3	-1.83

Results for System A					
Slice	Center [HU] Tolerance: -4.00 ... 4.00	Diff.3 [HU] Tolerance: -4.00 ... 4.00	Diff.6 [HU] Tolerance: -4.00 ... 4.00	Diff.9 [HU] Tolerance: -4.00 ... 4.00	Diff.12 [HU] Tolerance: -4.00 ... 4.00
1	-1.71	0.81	0.75	0.83	0.63
2	-1.82	1.09	1.05	1.02	0.96
3	-1.83	0.87	0.80	0.96	0.81

4.3.4 Typical pediatric head mode

Parameters	
	System A
Voltage	100 kV
Current	256 mA
Scan Time	1.0 s
Rotation Time	1.0 s
Body Region	Head
FoV	250 mm
Kernel	Hr40f

Radius of ROIs	
	[mm]
Radius of Central ROI	10.00
Radius of Peripheral ROI	10.00

Water Value Results	
Slice	Water Value Results for System A [HU]
	Tolerance: -4.00 ... 4.00
1	-0.99
2	-1.62
3	-1.06

Results for System A					
Slice	Center [HU]	Diff.3 [HU]	Diff.6 [HU]	Diff.9 [HU]	Diff.12 [HU]
	Tolerance: -4.00 ... 4.00	Tolerance: -4.00 ... 4.00	Tolerance: -4.00 ... 4.00	Tolerance: -4.00 ... 4.00	Tolerance: -4.00 ... 4.00
1	-0.99	-0.14	-0.11	-0.16	-0.40
2	-1.62	0.42	0.52	0.53	0.72
3	-1.06	-0.03	-0.20	-0.43	-0.12

5 MTF (IEC)

5.1 Test Description

The High Contrast Resolution is determined by evaluating the image of a thin tungsten wire, which is slightly off-centered and aligned along the scanner axis. From the images of the wire, the point spread function is obtained and the Modulation Transfer Function (MTF) is calculated as the Fourier Transformation of the point spread function. The 50% and 10% value of the MTF are evaluated. The measurement is performed for five to six sets of scan parameters, representing a typical head mode, a typical body mode, a typical pediatric body mode, a typical pediatric head mode, and the sharpest mode.

5.2 Common Parameters

Equipment	
Wire Phantom	-
Wire Phantom Type	Wire in Air

Parameters	
Scan Type	Sequence
UHR	false
Shaped Filter	Standard
Sn Filter	false
Window Width	100 HU
Window Center	30 HU
FoV	50 mm

5.3 Test Data

5.3.1 Typical body mode

Parameters	
	System A
Voltage	120 kV
Current	286 mA
Slice Width Reconstructed	5.00 mm
Number of Images	3
Collimation	32x0.6 mm
Scan Time	0.5 s
Rotation Time	0.5 s
Body Region	Body
Kernel	Br40f

Results for System A		
Slice	50% [lp/cm] Tolerance: 3.42 ... 4.18	10% [lp/cm] Tolerance: 5.63 ... 6.89
2	3.83	6.28

5.3.2 Typical pediatric body mode

Parameters	
	System A
Voltage	100 kV
Current	192 mA
Slice Width Reconstructed	5.00 mm

(continued)

Parameters	
	System A
Number of Images	3
Collimation	32x0.6 mm
Scan Time	0.5 s
Rotation Time	0.5 s
Body Region	Body
Kernel	Br40f

Results for System A		
Slice	50% [lp/cm] Tolerance: 3.42 ... 4.18	10% [lp/cm] Tolerance: 5.63 ... 6.89
2	3.84	6.29

5.3.3 Typical head mode

Parameters	
	System A
Voltage	120 kV
Current	345 mA
Slice Width Reconstructed	5.00 mm
Number of Images	3

(continued)

Parameters	
	System A
Collimation	32x0.6 mm
Scan Time	1.0 s
Rotation Time	1.0 s
Body Region	Head
Kernel	Hr40f

Results for System A		
Slice	50% [lp/cm] Tolerance: 3.07 ... 3.75	10% [lp/cm] Tolerance: 5.57 ... 6.81
2	3.42	6.22

5.3.4 Typical pediatric head mode

Parameters	
	System A
Voltage	100 kV
Current	256 mA
Slice Width Reconstructed	5.00 mm
Number of Images	3
Collimation	32x0.6 mm

(continued)

Parameters	
	System A
Scan Time	1.0 s
Rotation Time	1.0 s
Body Region	Head
Kernel	Hr40f

Results for System A		
Slice	50% [lp/cm] Tolerance: 3.07 ... 3.75	10% [lp/cm] Tolerance: 5.57 ... 6.81
2	3.45	6.23

5.3.5 Sharpest mode

Parameters	
	System A
Voltage	120 kV
Current	286 mA
Slice Width Reconstructed	5.00 mm
Number of Images	1
Collimation	1x5.0 mm
Scan Time	1.0 s

(continued)

Parameters	
	System A
Rotation Time	1.0 s
Body Region	Body
Kernel	Hr68f

Results for System A		
Slice	50% [lp/cm] Tolerance: 10.31 ... 12.61	10% [lp/cm] Tolerance: 12.94 ... 15.82
1	11.66	14.43

6 Tube Voltage (IEC)

6.1 Test Description

Tube Voltage is measured with an internal voltage divider for scans with all nominal tube voltages.

6.2 Common Parameters

Parameters	
Scan Type	Sequence
Current	13 mA
Collimation	32x0.6 mm
Scan Time	0.5 s
Rotation Time	0.5 s
UHR	false
Shaped Filter	Standard
Sn Filter	false
Body Region	Body

6.3 Test Data

6.3.1 Single Source

System A			
Voltage [kV]	Current [mA]	Result [kV] Tolerance	Status
140	13	139.98 126.00 ... 154.00	In Tol.
120	13	119.98 108.00 ... 132.00	In Tol.
70	13	69.97 63.00 ... 77.00	In Tol.

7 Tube Power Level (IEC)

7.1 Test Description

Scans with minimum, midrange, and maximum selectable tube currents are performed at different tube voltages. The applied tube current, measured with the internal voltage divider, is compared with the selected value. In addition, the applied tube voltage is measured for each tube current and compared with the selected value.

7.2 Common Parameters

Parameters	
	[s]
Scan Type	Sequence
Collimation	32x0.6 mm
Scan Time	0.5
Rotation Time	0.5
UHR	false
Shaped Filter	Standard
Sn Filter	false
Body Region	Body

7.3 Test Data

Result				
Test [kV]	Current	Current (System A) [mA] Tolerance	Voltage (System A) [kV] Tolerance	Status
140	Current min.	13.0 10.4 ... 15.6	140.0 126.0 ... 154.0	OK
140	Current med.	196.0 156.8 ... 235.2	140.0 126.0 ... 154.0	OK

(continued)

Result					
Test [kV]	Current	Current (System A) [mA]		Voltage (System A) [kV]	
			Tolerance		Tolerance
140	Current max.	535.0	428.0 ... 642.0	140.0	126.0 ... 154.0
120	Current min.	12.0	10.4 ... 15.6	120.0	108.0 ... 132.0
120	Current med.	200.0	160.0 ... 240.0	120.0	108.0 ... 132.0
120	Current max.	625.0	500.0 ... 750.0	120.0	108.0 ... 132.0
70	Current min.	13.0	10.4 ... 15.6	70.0	63.0 ... 77.0
70	Current med.	200.0	160.0 ... 240.0	70.0	63.0 ... 77.0
70	Current max.	826.0	660.0 ... 990.0	70.0	63.0 ... 77.0

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