Chest CT for Lung Cancer Screening		
Anatomical – Participant related		
Parameter	**Specification**	**Remarks**
Positioning	• Positioning the chest in the center of the gantry • Table height and centering adjusted so that the midaxillary line is at isocenter • Arms overhead – supine • Breathing instructions • Train patient and breathing instructions	Improper center should be avoided
Localizer (scout) image	Should be restricted to the chest	Image should be inspected for external objects
Anatomical Coverage	Entire lung volume Lung apex through the lung base	Should be attempted to limit coverage
Gantry Tilt	None	
Scan duration/acquisition time	≤ 10 seconds – single breath hold at maximal inspiration	Shorter scan duration is preferred
Display Field of View (FOV)	1 cm beyond the rib cage	• Entire chest wall thickness does not need to be included. • Smaller FOV means smaller voxel size and better volumetry.

Radiation Dose		
Radiation dose	CTDIvol depending on participant weight < 50 kg, 50-80 kg, > 80 kg 0.4 mGy, 0.8 mGy, 1.6 mGy	• CTDIvol for a standard size participant (170 cm 70 kg) using the 32cm diameter CTDI phantom
Acquisition protocol		
Scan Parameter	**Parameter Specification**	**Comments**
Scanner type	Multidetector CT with 32 or more detector rows	64- or more detector rows preferred
Contrast	No IV contrast	
kVp	100 to 120 acceptable for standard sized participant 140 for obese participant	Preferably reduc mAs first and then kVp Strong beam-hardening pre-filtering (e.g. Sn filter) is strongly advised
Tube Current (mA)	Should be set in combination with kVp and pitch	
Adjustment in scanner output for participant size	• No fixed mAs setting unless at verly low dose (w 0.5 mGy) • Tube current modulation is recommended • This should take into account the participant's body habitus and age, slice width, kVp, and unique attributes of the scanner and acquisition mode • Noise level should ensure diagnostic quality of lung parenchyma and accurate volumetric measurement	• Use of automatic exposure controls including tube current modulation and automated kV selection tools • Use of organ dose modulation, if available, is recommended

Maximum Tube Rotation Time	≤ 0.5 seconds	
Pitch (IEC Definition)	As suggested by vendor	Should be set with other technical parameters to achieve CTDIvol specifications
Reconstructed image width (nominal width of reconstructed image along z-axis)	≤ 1.00 mm	Preferably 0.75 mm or smaller In very obese 1.25 mm may be necessary
Slice Interval	≤ slice width maximum 0.7 mm	Overlapping reconstructions are not mandatory
Reconstruction kernel	Standard body kernel	Additional lung kernel suggested
Reconstruction algorithm	Iterative Reconstruction or deep learning reconstruction	Use of filtered back projection reconstruction algorithms is strongly discouraged
Image analysis		
Window width (WW)/ Window level (WL)	Lung and mediastinum	
Viewing	• Reading on a system that allows scrolling and reformats • Maximum Intensity Projections (MIP) and Multiplanar Reconstruction (MPR)	
Reading	• Qualified radiologist experienced in pulmonary nodule imaging • Use of CE/FDA approved Computer Aided Diagnostic System to allow lesion detection and volumetric measurement	Same CAD software version is mandatory for volumetry in follow-up studies. In case of change of software, nodule size from at least the previous study has to be re-evaluated to be able to compare with the current study.

Quality Assurance		
General	- Close collaboration with medical physicist is mandatory - Periodic quality controls as specified based on the national guidelines - Besides official/local regulations we suggest monitoring, registration and periodic optimization of scan procedure parameters, radiation dose, scanner performance, image quality and reader performance.	