CTportable 180.130 Short Instruction







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<u>Remark</u>: the mentioned values for different parameters in this manual are only for illustration and may differ for your application



PC Connection - Use the marked ports to connect the CTportable with the PC





Connection panel

- Use the marked ports to connect the CTportable





How to start the CTPortable

- Turn the key switch and the rotary switch clockwise to switch the CTportable on





How to start the CTPortable

- Push yellow button to confirm the start process





Hardware 8

How to start the CTPortable - Yellow LED is off → System is ready to use





Hardware 9

How to open the door - Push green button and open door





How to start the CTPortable

- If door is closed, push yellow button to confirm the safety interlock





Hardware 11

Collimator

Caution! Collimator contains lead, wash your hands after touching Do not remove the collimator





Pre-filter

- If you want to use a filter place it on the collimator





Hardware 13

Positioning of the specimen

- Place the specimen on the rotation table
- Move the magnification stage to the desired position
- Fix the screw after your adjustment





Start Volex

- before starting Volex, wait until the detector is connected









Please wait!









Press "Reference move" for manipulation system

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Press "Warmup" for warming up the source

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Choose your exposure time and click the black offset button

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Maximum output	Small focus mode	8	
	Middle focus mode	16	W
	Large focus mode	39	
X-ray focal spot size (Nominal value)	Small focus mode	8 (5 μm at 4 W)	
	Middle focus mode	20	μm
	Large focus mode	40	

Adjust the lower limit according to the lowest possible current





Choose your voltage and current for the measurement; Make sure to adjust the lower limit; Press the grey Multigain button





Measurement Setup

Place specimen onto the elevation stage, close the door and switch X-ray on





Check if the magnification is satisfying



Volex 25

Measurement Setup

- Read out the positon of your specimen from the measuring tape
- This is the focus-object-distance (FOD)



White arrow shows the reading position



An object like a ruler may help to read off the position



Measurement Setup

- Read out the positon of your specimen from the measuring tape
- This is the focus-object-distance (FOD)





Measurement Setup

- Be careful, if you change the position of the magnification axis to a FOD < 65mm

- If you use a scanning position with a FOD < 65mm make sure NOT to crash the source, when you move the lifting axis upwards













System alignment procedure

- Mount the calibration stick on the specimen table depending on your focus-object-distance





System alignment procedure

- Mount the calibration stick on the specimen table depending on your focus-object-distance

Calibration stick position 1: Measurement close to x-ray source

specimen table

calibration stick

Calibration stick position 4: Measurement close to detector





Before you do a new geometric calibration delete all the previous entries by clicking "Delete all"









System overview Fill in the mean value of the histogram and the number of spheres you see (without the Histogram!) and press start to do the geometric calibration Volex 10 - Fraunhofer Development Center X-Ray Technology (EZRT) - 6 × File Extras Info 🛓 📩 🖘 🕨 🔳 51 55 X-Ray on Interlock 90.000 kV (L)00:07:59 Ry by CT o: 0.002 [rad] SOD: 202.001 lmm 400 Online C 90.000 90 0.080 mA Averaging 34.479 [um] 0.080 0.16 Detector settings Image container collection 3600 🛟 ABS - 360 🔝 🎞 BPM ₽A 200 🔂 ABS * 153 🛄 💷 Offset correction: Activ Q Multigain corre Median: Active 280 🖾 ABS - 202 💷 🛛 Ð Offset acquisition 30x Skip count 0 0 0 40 30x Lower limit [mA] 0.01 Procedure controller Number of step Procedure parameter 10 value Total number of projections Scan range for rotation manipulator [deg Root folder C:\Users\CT\Measurements\Projections Geometric calibration: Active Histogram Gray Scale Profile 14131 Mean: 13788.60116 StdDev: 75.8 SNR: 181.6810 Min: 13396 ¢ 5000 و $\overline{\mathbb{N}}$ 5000 30000 35000 40000 65000 Gray Value 2304 x 1300 , unsigned 16-Bit Log Copy Date and time Level Message B 6/28/2021 12:23:22 PM Debug OnMeasure mantEinished or B 6/28/2021 12:23:22 PM Debug OnMeasurementFinished move started 6/28/2021 12:23:09 PM Info Gain image acquisition. Index: 3/3. Voltage: 90 [kv], Current: 0.01 [mA] 6/28/2021 12:22:55 PM Info Gain image acquisition. Index: 2/3 Voltage: 90 Ikv1 Current: 0.04 ImA1 Move status: TargetReached 360.002 Positio 6/28/2021 12: 29: 11 PM







Set the tracker by clicking the left mouse button once for the left corner and one more time for the right corner





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System overview

Volex 10 - Fraunhofer Development Center X-Ray Technology (EZRT)

Check how many pixels of the detector the object is covering; Fill in that number for the parameter "Total number of projections"













Volex 40























Manual reconstruction of volume data - Open first projection





- Press "Reconstruction Preview" to see a preview of the 3D-reconstruction of the middle slice





- If you want to use different min and max attenuation coefficients for the reconstructed volume, go back to the start page





Manual reconstruction of volume data - Press the "Volume"-button





- Choose the min (1) and max value (2) you want to use for the reconstruction
- Check the quality by pressing "Reconstruction Preview" (3)





- Switch back to the start page to parametrize the reconstruction





- Press the start button (1), choose a file name (2) and press "Save" (3)





Visualize volume data





VolumePlayerPlus 54

– 0 ×

Visualize volume data

- Open the .rek-file



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Ready

Visualize volume data - Wait until the .rek-file is loaded

- VolumePlayerPlus 8.1.9 – 0 × File Modules Help □ 📽 🖬 🕹 📽 💼 💡 - → Ⅱ + ⊙ 🖂 🖉 💷 🖽 🖼 🐺 👿 Progress Х Current operation: Elapsed time: Remaining time: Load Volume Measurementname.rek 00:00:01 00:00:01 Estimated duration: Ending 00:00:02 Cancel NUM Ready g^R へ 臣 (3)) DEU 10:06 DE 19.09.2019 A 🗄 📜 🔽 💻 畼



Visualize volume data - Double left mouse click on the title bar





Visualize volume data

- Press the right mouse button somewhere in the upper left view and select "Fit to Window"

- Repeat this step for every view





Visualize volume data - Activate the "A"-Button for automatic contrast of the views





Checklist

	To-do	How often?
	Wait for the detector to connect	Whenever you start the system and before you start Volex
\checkmark	Start Volex	Whenever you start Volex
	Warmup the source	Daily before you do the very first measurement
\checkmark	Reference move for the axes	Whenever you start Volex
	Set the position of TY_SPECIMEN and TZ_SPECIMEN	After referencing the axes
	Offset acquisition	Weekly or whenever you change the exposure time
	Multigain acquisition	Weekly or whenever you change the exposure time and/or current and/or voltage
	Geometric calibration	Whenever the position of the lifting axis or the magnification axis was changed



Quality assurance with frequent calibration

- Acquire new correction images (offset and multigain) at least once a week



- Do a geometric calibration
 - Whenever you moved the magnification axis
 - Whenever you moved the lifting axis
 - After every relocation and transport of the system





Errors

Bad image quality

Acquire new offset and multigain images as described



Delete existing offset and multigain images



Delete the old gemetric calibration, do a new geometric calibration and redo the measurement



