



ANASPEC C.C.

SUPPORT AND SUPPLY OF ANALYTICAL EQUIPMENT

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Carl Zeiss SMT 400 QEMSCAN Series Service Schedule

Company:	Tel. Number:
Contact Person:	Email:
Date:	Service Report No:
SEM Serial No:	SEM Software & Op Sys Version:
Detector Serial No:	Pulse Processor Serial No:
EDS Software & Op Sys Version:	Other Accessories:

System Performance

Discuss current performance with Customer

Initial System Checks

Current Configuration

Filament I = A	Beam I = μA
Probe I = nA	Specimen I = nA
Spot Size =	Does the Beam optimise using QS side = YES/NO
Gun Vacuum = torr	System Vacuum = torr
Stage Z = mm	WD = mm
Rotate Zero = ° Disabled	Tilt = ° Disabled
BSE Contrast = %	BSE Brightness = %

CHECK CONDITION OF	COMMENTS
SEM Log file	Note down error messages
Stage Initialisation – X, Y, Z, R, T	Rotate & Tilt Disabled?
Image Resolution on BSE image on WD above	NB: Image must be saved in Anaspec directory
Focus Wobble	
Note Astigmatism (Stigmator Values)	X = % Y = %
IGP condition	Is the IGP hot? IGP age = years
Red Turbo Dampeners	NB: The chamber must not touch the table top
BSD Signal on each quadrant	
BSD Preamp Peltier device working	
BSE Gain and Offset (Legacy Hardware)	Gain: Offset:
SE Detector condition (colour of coating)	
Confirm all Detector connections	SE, BSE, TV Mask 1 – DXP 1 – Det 1 Mask 2 – DXP 2 – Det 2 Mask 4 – DXP 4 – Det 3 Mask 8 – DXP 8 – Det 4
Column Isolation Valve Condition	Leaking Valve?
Filament Centre Position	Gun Shift - X= % Y= % Gun Tilt - X= % Y= %
Detector Signal A and B mixed or not	Mixing ON and both signals should be QBSD
Back Up SEM Config Files (emserver file to service directory)	
Back Up the QS Config Files (\\QemSem\sysdata\ directory and \\QemSem\ directory)	
SEM Magnification Calibration	<2% error allowed Mag Range 1
SEM Scan Speed Calibration	Minimal movement allowed when changing scan speeds
SEM Stage Centre Calibration	Using Stage test Macro move stage around using X Y and R and then return to original position. Does it return to exact same spot?

Final Aperture Positions	Pos 1	Pos 2	Pos 3	Pos 4
	X = Y =	X = Y =	X = Y =	X = Y =

Initial X-ray Detector Settings

	Mask 1	Mask 2	Mask 4	Mask 8
	<u>Gresham/e2V</u>			
Serial No				
Saved as	User 1	User 1	User 1	User 1

All Detectors

Bruker XFlash and Gresham/E2V

Serial No				
Count rate on Au				
Dead Time	%	%	%	%
Save Spectra in Service directory for				
Gold				
Quartz				
Copper				
Si to O ratio				

POLISHING & CLEANING OR REPLACEMENT

SYSTEM PARTS

COMMENTS

Cathode Assembly	Colour of the tungsten coating?
Emission Aperture	Still flat?
Anode	
Gun Alignment Coil Assembly	
Gun Alignment Coil O-Rings REPLACEMENT	O-RING 10.6mm x 2.4mm VITON
Anti-contaminator Aperture	Need Replacement?
Anti-contaminator	
Column Isolation Valve Condition	
Column Isolation Valve O-Ring REPLACEMENT	O-RING 7.6mm x 2.4mm VITON
Column Screw Condition (Grub screws in Cathode? Fastening screws in the gun align coil assembly? Tightening screws in the plate? Final aperture holder screws? Filament centering screws in the column?)	Need Replacement?
Spray Apertures	Quantity? Condition? Need Replacement?

Final Aperture Holder	Clean the holding plate for the apertures.
Final Apertures REPLACEMENT	Replacement of Used 50 μ apertures
Internal Column Condition	Vacuuming required?
Collimators on each Xray Detector	Check for Oil, CLEAN ONLY WITH ETHANOL NO ULTRASONIC BATH!!
Window condition on each Detector	Note amount of Oil, IF CLEANING USE ETHANOL ONLY
Electron Trap's Position	Re-secure loose trap
Condition of X-ray Detector	Ice contamination on Crystal? Resolution deterioration? Alien Body/Ice balls inside dewar?
Clean Chamber and Stage	Note the stage condition (shavings, bits of sample)?
Stage Levelling	
Penning Gauge & O-ring holder	
Chamber and Column height adjustment	
Pump Down Time	Minutes
Replace Blown Bulbs on SEM Front Panel	
Fans and Filters	Clean SEM PC, QS PC, All Pulse Processors, QS Box and cabinet/desk
Rotary Pump Oil	Replacement, Colouration.
Oil Mist Filter	Replacement
Fore line Trap	Alumina Replacement
Desiccator on SEM	
Clean both Mouse & Keyboard	Both PCs
Wipe down Desk and Plinth	
Brightness & Contrast of Monitors	If at max or burnt out, need replacement?
Scan Disk and Defragment	On both SEM PC and QS PC
Remove Temp Files	On both SEM PC and QS PC
Bake out IGP and Column overnight	Heat strap required/leave CCV(column Chamber Valve open over night)

OPERATIONAL CHECKS

CONFIRM CONDITION OF

COMMENTS

System Vacuum	torr
Gun Vacuum	torr
PC Date and Time	Reset in Bios on both SEM and QS PC
SEM Magnification Calibration	<2% error allowed at Mag Range 1
SEM Scan Speed Calibration	Minimal movement allowed when changing scan speeds
Image Resolution on BSE	Has image improved?
Signal A & B = QBSD & Mixing	
QBSD Range	
Upgrade QSMag.dat file (Perform QS side Magnification Calibration)	
Upgrade Samples.mdb file	
Upgrade System Magnification Calibration in iDiscover	
Beam Condition Improved	Fil I = A Bias= μA Spot Size = Probe I = nA
Correct Filament Centre Position	Gun Shift - X= % Y= % Gun Tilt - X= % Y= %
BSD Contrast and Brightness Improved	Brightness = % Contrast = %
X-ray Detector Resolution Improved?	
X-ray Detector Calibration Improved?	
X-ray Detector Ice contamination?	
X-ray Detector Oil Absorption reduced?	
Correct the Standards positions	On SEM and on QS sides
Activate Len Hysterisis for Magnetic Residue Reduction	Has the WD changed? WD = mm
Correct BSD Gain and Offset	Au = 232 Qtz = 42 Faraday = 5 Gain = Offset =
SEM Interlocks Partial Vent on Standby? Z Move on Vent? Shutdown @ Logoff?	
Cut SEM Log File (save cut portion in Anaspec Directory)	

Back Up SEM Config Files (emserver file to service directory)	
Back Up the QS Config Files (\\QemSem\sysdata\ directory and \\QemSem\ directory)	
Read Only on Load State File	State Name: Qemscan.mlc

Final Xray Detector Settings

	Mask 1	Mask 2	Mask 4	Mask 8
<u>Gresham/e2V</u>				
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All Detectors

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Si to O ratio				

COMMENTS or RECOMMENDATIONS

ENGINEER

CUSTOMER