

attoAFM III

low temperature atomic force microscope, tuning fork sensor

Microscope Setup	
AFM sensor unit	very compact AFM head, also for constrained geometries, tuning fork shear force detection (non-contact mode)
Operation Modes	
feedback	PI feedback loop with additional PLL
imaging modes	non-contact mode, MFM, EFM, SGM
Sample Positioning	
positioners and scanners	coarse positioners ANPxyz101 with piezo scanner ANSxyz100
coarse range	5 x 5 x 5 mm ³
step size	0.05 .. 3 μm @ 300 K, 10 .. 500 nm @ 4 K
fine scan range	40 x 40 μm ² @ 300 K, 30 x 30 μm ² @ 4 K
sample monitoring	sample / tip monitoring via CCD camera and mirror
Operating Conditions	
temperature range	0.3 .. 300 K (dependent on cryostat)
magnetic field range	0 .. 15 T+ (dependent on magnet)
operating pressure range	1E-6 mbar .. 1 bar (designed for exchange gas atmosphere)
Cooling Specifications	
bore size	designed for a 2" (50.8 mm) cryostat/magnet bore
cryostat	LTSYS -He4, LTSYS -He3
Probes	
probe design	etched metal wires, etched or pulled optical fiber probes
functional probes	conductive probes, magnetic probes, ...
Noise	
shearforce detection noise density	< 1 pN/√Hz
measured z-noise density	< 0.5 nm/√Hz
z bit resolution full range mode	7.6 pm
z bit resolution small range mode	0.12 pm
Scan Controller and Software	
ASC500 SPM controller	for detailed specifications please see the ASC500 section

