

attoAFM I

low temperature atomic force microscope, interferometric sensor

Microscope Setup	
AFM sensor unit	ultra-stable AFM head, interferometric deflection detection
cantilever sensor adjustment	fixed, stable adjustment of the cantilever sensor
Operation Modes	
feedback	PI feedback loop with additional PLL
imaging modes	contact mode, 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	1 .. 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	compatible with standard commercial cantilevers
functional probes	compatible with coated and non-coated probes, magnetic probes, ...
Noise	
deflection noise density	< 0.7 pm/√Hz (40 kHz bandwidth)
measured force noise (bandwidth 1 kHz, 0.2 N/m)	< 100 pN
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 ASC500 section

