attoAFM I

1012528

Technical Specifications

General Specifications	
type of instrument	cantilever based AFM with interferometric deflection detection
sensor head specifics	attoAFM I+ head feat. alignment-free cantilever holder, tip exchange in less than 2 minutes
alignment-free cantilever holder (default)	compatible with PointProbe® Plus XY-Alignment Series by Nanosensors
conventional cantilever holder (optional)	compatible with standard commercial cantilevers
Modes of Operation	
imaging modes	contact mode, non-contact mode, constant height, constant force
slope compensation	2 axis scan plane correction
z feedback	PI feedback loop for amplitude modulation (AM), phase modulation (PM) or frequency modulation (FM) using included PLL, constant force
incl. standard techniques	AFM
optional upgrades	MFM, KPFM, PFM, conductive-tip AFM
Resolution	
measured RMS z-noise (constant force @ 4 K, 5 ms pixel time)	< 0.10 nm (expected for attoDRY), < 0.15 nm (guaranteed)
z deflection noise density	< 3 pm/vHz (dependent on laser system)
lateral magnetic resolution	< 50 nm (attoDRY)
z bit resolution @ 4 K	57 pm at 15 µm scan range
Sample Positioning	
total travel range	5 x 5 x 4.8 mm^3 (open loop)
step size	0.05..3 µm @ 300 K, 10..500 nm @ 4 K
fine scan range	50 x 50 x 24 $µm^3$ @ 300 K, 30 x 30 x 15 $µm^3$ @ 4 K (open loop)
closed loop scanning	optional
sample holder	ASH/QE/4CX quick-exchange sample holder with 8 electrical contacts, integrated heater with calibrated temperature sensor
Suitable Operating Conditions	
temperature range	1.5 K..300 K (dependent on cryostat); mK compatible setup available on request
magnetic field range	0..15 T+ (dependent on magnet)
operating pressure	designed for He exchange gas (vacuum compatible version down to 1E-6 mbar on request)
Suitable Cooling Systems	
titanium housing diameter	48 mm
bore size requirement	designed for a 2" (50.8 mm) cryostat/magnet bore
compatible cryostats	attoDRY1000/1100/2100
Compatibility with Electronics	
scan controller and software	ASC500 (for detailed specifications please see attoCONTROL section)
laser	LDM1300 laser/detector module (for detailed specifications please see attoCONTROL section)
Options and Upgrades	
closed loop scanning & global sample coordinates	interferometric encoders for scan linearization and closed loop sample navigation
ultra-large scan range upgrade	80 x 80 $µm^2$ @ 300 K, 125 x 125 $µm^2$ @ 4 K
in-situ inspection optics	tip/sample monitoring via in-situ LT-LED for illumination, mirrors, lenses and CCD camera (outside), field of view approx. 3 x 2 mm, resolution approx. 20 µm (depending on cryostat)
closed loop upgrade for coarse positioners	resistive encoder, range 5 mm, sensor resolution approx. 200 nm, repeatability 1-2 µm
additional AFM head with manual alignment	conventional cantilever holder, compatible with standard commercial cantilevers