attoAFM III

1008498

Technical Specifications

General Specifications	
type of instrument	tuning-fork based AFM with shear-force or standard detection
sensor head specifics	etched metal wires, etched or pulled optical fiber probes, STM tips, Akiyama probes (also compatible with NaugaNeedles commercial tips)
Modes of Operation	
imaging modes	non-contact mode AFM, EFM, SGM
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
optional upgrades	AFM/STM mode
Resolution	
measured z-noise density	< 16 pm/√Hz
z bit resolution @ 4 K	7.6 pm at 2 µm scan range
Sample Positioning	
total travel range	5 x 5 x 5 mm^3 (open loop)
step size	0.05..3 µm @ 300 K, 10..500 nm @ 4 K
fine scan range	50 x 50 x 4.2 $µm^3$ @ 300 K, 30 x 30 x 2 $µm^3$ @ 4 K (open loop)
sample holder	ASH/QE/0 quick exchange sample holder and 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, attoLIQUID1000/2000/3000/5000
Compatibility with Electronics	
scan controller and software	ASC500 (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
sample holder upgrade	ASH/QE/4CX quick-exchange sample holder (8 electrical contacts, integrated heater & T-sensor)