attoSHPM

1008164

Technical Specifications

General Specifications	
type of instrument	Scanning Hall Probe Microscope with STM tip for tip-sample distance control
sensor head specifics	MBE grown hall cross sensor (GaAs/AlGaAs heterostructure) on a 2-axis tiltable sensor mount
Modes of Operation	
imaging modes	constant height
slope compensation	2 axis scan plane correction
z feedback	STM distance tracking (usually only for autoapproach)
Resolution	
size of Hall cross on sensor	400 nm (high resolution), 250 mm (ultra high resolution)
field sensitivity @ 4 K	1500 V/AT
noise-equivalent magnetic field (theoretical)	15 nT/vHz @ 4 K and 40 µA Hall current, 80 nT/vHz @ 77 K and 40 µA Hall current
typical attainable field detection limit (measured)	15 µT typ. (bandwith 10 Hz @ frequency 277 Hz)
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)
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

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