attoRAMAN

1008169

Technical Specifications

General Specifications	
type of instrument	free-beam based external optics head coupled to low temperature objective and ultra-high transmission spectrometer
sensor head specifics	unique low temperature compatible achromatic objectives with high numerical aperture, optimized for different wavelength ranges
Confocal Unit	
configuration	compact and modular design, two or more optical channels; standard configuration: one excitation and one detection channel
key benefits	quick and reliable alignment of each channel, steering mirror for combined beams long-term stability
quick-exchange of optical components	beamsplitters, filter mounts for up to 4 filters/polarizers, (1" diameter); optional piezoelectric rotator with filter mount
pinhole configuration	two pinholes (fiber apertures), different illumination and collection wavelength possible
pinhole size	dependent on fibers, typically 3 .. 9 µm mode field diameter
compatible LT-objective	LT-APO/VIS, LT-APO/VISIR, LT-APO/NIR (see accessory section for more information)
inspection unit	sample imaging with large field of view: ~54 µm (attoDRY)
Illumination	
excitation wavelength range	400 .. 1000 nm, default 532 nm (others on request)
illumination port specification	FC/ APC-connector for single mode fibers or free-beam configuration
light source	dedicated Raman laser, single mode fiber coupled
light power on the sample	typically 1 pW..10mW
optical filter	laser line filter
Detection	
detection mode	2D Raman images, time and single point Raman spectra
spectrometer	ultra-high transmission spectrometer, f=300 mm
total optical transmission	greater 60% at 532 nm
filters	dichroic mirror & edge filter for signal detection as close as 90 cm-1 to the laser line
gratings	typ. 600/mm and 1800/mm grating
spectral resolution	1 cm-1 at 1800/mm grating
CCD camera	back-illuminated CCD, peltier-cooled to -60 °C at 20 °C room temperature, 1024x127 pixels, 90% quantum efficiency at 532 nm, 100 kHz readout converter
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 $µm^2$ @ 300 K, 30 x 30 $µm^2$ @ 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..
Compatibility with Electronics	
scan controller and software	FPGA-based RAMAN controller providing coarse positioning and scanning signals for x, y, and z.
Options and Upgrades	
in-situ inspection optics	incl. with CFM I external optics head
sample holder upgrade	ASH/QE/4CX quick-exchange sample holder (8 electrical contacts, integrated heater & T-sensor)
closed loop upgrade for coarse positioners	resistive encoder, range 5 mm, sensor resolution approx. 200 nm, repeatability 1-2 µm
Voigt geometry upgrade	optional scanner for Voigt & Faraday geometry

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