



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

Material Management Department

Powai, Mumbai 400076.

Ref No. (PR No.1000055666)

Rfx No. 6100003047

Technical Specifications
Cryostat (Qty: 01)

Sr. No	Item Description	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1	Cryostat	Cryofree Close Cycle Optical cryostat having ultra-low vibrations 5 nm peak to peak in z direction 1500 Hz for quantum optics & quantum opto-mechanics at 320 K to 3.8K (depending upon configuration) Following are technical specifications:		
1.1	Closed Cycle Cryostat & Helium Compressor & vacuum pump:	a. Close cycle cryo-free optical cryostat with cryocooler for continuous operation. Vendor must provide model number of cryocoolers while submitting compliance sheet. b. 2 X2 thermalized high frequency lines =4 RF cables (DC to 18 GHz, thermalized at the cold shield) c. Cool-down time should not be more than 5 hrs. from Room temperature to base i.e. 5K (Inclusive of pumping time) d. Base pressure in sample chamber: < 5e-6 mbar		

		e. Water cooled compressor Single phase He compressor f. Super flex Helium hoses of at least 6 meters and kit for installation of hoses. g. Fully Automated temperature control (vacuum , cooldown/warmup , T control) h. Cryostat should be included with automated turbo pump to ensure clean sample space preparation and to avoid sample contaminations.		
1. 2	Optical table:	a. Optical table with significant less magnetic top face sheet made of less magnet 316 series steel of Size (Width x Length) 900 x 1800 mm with table thickness of 305mm, b. Mounting holes of metric M6-1.0 holes on 25mm grid, 12.5mm borders c. 4 std vibration isolators, height 597mm with automatic re-leveling features		
2	Wiring:			
	RF Wiring (operation frequency DC to 18 GHz)	2x Semirigid cable with frequency operation of DC to 18 GHz assemblies with SMA connectors on both ends. Damping at 300K: 2 dB/m 1 Ghz, damping at 4K: 3.1 dB/m @20 Ghz Lines should be heat sunk at the cold shield for thermalization, customized vacuum feedthrough for 2 optical fibers, connector type: FC/APC or FC/PC (wavelength: single mode or multimode) Optional)		
3	Optical window chamber and Low vibration interface	a. Vacuum shroud to fit Scanners, closed loop nano positioner, electrical wiring & thermometry (i.e. thermal link) and low temperature objective assembly inside the vacuum shroud and thus		

		allowing the maximum drift rate of less than 53.5nm within 40 hours, the drift during the temperature range between 3.8K & 40 K was below resolution limit, range upto 60K the drift rate was 9nm/K , above 60 K it should be 55-58 nm/K b. Sample Platform (diameter) : 75mm, inclusive of 36 electric contacts into the sample area included (heat sunk @ 4K) , c. Optical windows: 1. One optical access port from top so that room temperature beam can be coupled via cold objective to sample directly. Top window should be AR coated for operation between 400-1000 nm. 2. One optical vacuum window at the top with 25 mm x 1.5 mm and cold window (top)of 12.7 mm x 0.5 mm, vacuum window (side): 40mm X 40mm , cold window (side) : 25mm x 4mm d. Nano positioners, controllers, stages and operation: 1. The vendor must provide two numbers of closed loop positioners with Resistive encoder with travel range of 5.8 mm for movement in x and y direction. 2. The vendor must provide one number closed loop positioner with resistive encoder with travel range of 5.8 mm for objective in z direction. 3. Necessary electronics to drive the closed loop positioners with resistive encoder for XYZ directions.		
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		4. Scanners with Scan range : 50-micron X 50 micron (RT) , 30 micron X 30 micron (LT) 5. Base module with necessary electronics to drive the scanning module (i.e. X-Y scanners to be offered) 6. Vendor must include all cable assemblies, cryo-compatible wiring, mounting adapters, and mechanical interfaces, ensuring seamless integration inside a cryostat or lowtemperature setup. 7. The complete system (nanopositioner + scanner + accessories) must be compatible with operation across a temperature range from room temperature (~300 K) down to 4 K or below and 8. Vendor must provide Cryogenic Compatible Apochromatic Objectives with following specifications a. Temperature range 4K - 300K b. Apochromatic objective for RAMAN measurements with excitation at 532 nm, c. A Clear aperture 4.7 mm, Focal length $f = 2.88$ mm, Numerical Aperture $NA = 0.82$ d. Working distance $WD = 0.64$ mm (1.40 mm on axis) e. monochromatic range (total transmission > 80%) 400-1000 nm f. Apochromatic range (chromatic focal shift < +/- depth of focus) 520....695 nm		
4	Computer with necessary software and flat screen monitor-24" for operation of the system.			
5	Thermometry	fully automated temperature control (vacuum, cooldown, T control, warmup), all pumps integrated, USB interface for remote control		

6	Installation, delivery and other:	The vendor should specify clearly the power requirements including cables and electrical socket requirements, back-up power capacity required, water line for chiller and all other relevant information for smooth installation at site.		
7	Terms and conditions:	A. Vendor should provide list of at least 5 customers globally where they have supplied similar kind of equipment in past 5 years. B. Warranty: 01 year from date of Installation.		