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From: Director, CSIR-NPL
No. 14-VIII/RPA(752-GTE)22PB/T-61

Dated: 08.12.2022

CORRIGENDUM

With reference to NPL's Global Tender No. 14-VIII/RPA(752-GTE)22PB/T-61 for procurement of "Cryostat". Following amendments in specification may please be read as follows:

2K Closed Cycle Cryostat (Cryo-free) Top loading system for easy sample exchange and with a base temperature of ≤2 K			
Sl.No.	Parameter	Specifications	Remarks
1	Temperature range:	from 2 K to 300 K	
2	Sample temperature with DC, RF and Optical wiring	≤2.5 K	
3	Sample Cool down time	≤10 hours	please mention the cooldown timeupto 4 K and below 4 K to the lowest temperature
4	Sample Exchange time required for sample exchange at the lowest temperature	≤ 2 hours	
5	Cooling power requirements	≥40 watts @ 65 K (first stage) ≥ 1 watt @ 4.2 K (Second stage)	
6	Sample Environment	Vacuum or exchange gas	
7	The vibration at the sample stage should be minimized with vibration isolation: the cryostat should be configured with a suitable pulse tube refrigerator	The vibration on sample mount should be less than500 nm in the horizontal direction	
	Optical windows	two optical windows made of quartz, aligned 180degrees apart.	The optical windows are for shininglight on the samples from an outside source, accordingly the radiation shield also should have the optical windows which are in line of sight with the outer windows.
8	Sample tube (sample Insert) outer dimensions	2 inches	Sample tube should have provisions of RF/MW wiring termination/optical fibre termination and DC wiring termination near the samplestage, the detailed descriptions of sample insertare given in the following specifications

8.i	One Sample insert with DC, RF and optical fibre termination	24 DC wires (12 pairs in twisted pair combination) andtwo optical fiber coupling with single mode optical fiber and suitable coupling from top to the sample stage. Both RF and optical connections should be terminatednear the sample with proper connectors, for experimental purpose the mating connectors of both RF and optical fibres are to be provided to extent the connection to the sample. For DC ,25 pin matting connectors should be provided (preferably the microminiature D-type connectors). RF wiring should be capable of handling signals upto 20 GHz. 02 Nos of RF cables are required.	This insert should have its own temperature sensors and heaterconnections for accurate temperature monitoring and control: **the price of this sampleinsert should be mentioned separately**
8.ii	one sample insert with DC and RF wiring	24 DC wires (12 pairs in twisted pair combination) and4 RF wiring with suitable feedthrough for handling up to 40 GHz signal: a suitable sample holder to be provided for transport measurements for connecting three samples of size ~ 5 mm X 5 mm, this sample insert should have the provision of optical windows inline with the outer optical windows to allow us to do light shining experiments from an outside light source, with the samples aligned in line of sight to the light source. RF wires should be terminated on the sample holder and the mating connectors should be provided . to extent the wiring to the sample.	This insert should have its own temperature sensors and heaterconnections for accurate temperature monitoring and control: **the price of this sampleinsert should be mentioned separately**
8.iii	One sample insert with DC, RF and optical fibre coupling	For this sample insert, the sample mount should be configured with LCC socket (20 pin) along with suitableDC wiring (20 Nos) and single mode optical fibre cables with suitable terminations at the sample stage. Two single mode optical fibers are required. RF wires should be terminated on the sample holder and the mating connectors should be provided to extent the wiring to the sample. RF wiring should be capable of handling signals upto 20 GHz. 02 Nos of RF cables are required.	This insert should have its own temperature sensors and heaterconnections for accurate temperature monitoring and control: **the price of this sample insert should be mentioned separately**
9	Temperature control and stability at the sample stage	better than 50 mK	
10	Temperature controller specifications	4 independent input channels, two independent heater output loops with 100 W and 50 W output power, for complete temperature control and monitoring. Temperature controller should have USB and GPIB (IEEE-488) parallel computer interfaces; complete accessories and cables should be supplied to integrate with cryostat.	
11	Turbomolecular pump	with more than 40 litre/second capacity; with suitable backing pump; including all accessories and fittings to get a base pressure of less than 10E-7 mbar, there should be isolation valve at the backing side of the rotary pump	
12	Integrated Measurement Electronics and software requirements	A suitable measurement electronics with integrated measurement software for transport measurements should be supplied along with the system for monitoring of three samples simultaneously. Measurement electronics should have options of sourcing of current (two channels) and sourcing of voltage (one channel) and measure channels for	**the price of the measurement electronics should be given separately**

		voltage (two channels) measure channel for current (one no). Measurement electronics should also have the capability of operation in the lock-in mode for phase sensitive detection of signals either with an internal reference signal or external reference signal. Source channels should have bias functions such as DC and AC with a frequency of ~100 kHz (or higher). The software and hardware should have the provision of doing the normal transport measurements such as IV sweep, differential conductance and gate biased measurements etc.	
12.i	DC Voltage source resolution and accuracy	Resolution: ~10 µV or lesser, accuracy: +/-0.05% or better	
12.ii	DC Voltage measurement accuracy:	0.5% of reading or better	
12.iii	Voltage Measure Noise	200 nV RMS or better	
12.iv	Voltage measure input impedance:	>10 GΩ (DC coupled)	
12.v	DC current Sourcing Accuracy	0.8% or for DC as well as lock-in-configuration	
13	water chiller for the compressor	with a capacity of 5TR or more	**Price of this item should be given separately**
14	Warranty	02 years warranty (for the complete system)	

All other terms and conditions of said tender will remain same.

8/12/2021

Sr. Controller of Stores and Purchase