GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
DIRECTORATE OF PURCHASE & STORES

Separate item wise sealed tenders are invited from the reputed manufacturers/dealers/also from firms registered with DPS/DGS&D/NSIC or any other Central Government Department, BY THE REGIONAL DIRECTOR, MADRAS REGIONAL PURCHASE UNIT, DIRECTORATE OF PURCHASE AND STORES, DEPARTMENT OF ATOMIC ENERGY, VI FLOOR, SHASTRI BHAVAN, 4 HADDOWS ROAD, CHENNAI- 600 006, for the supply at Central Stores, HWP, Tuticorin/Indira Gandhi Centre for Atomic Research, Kalpakkam- 603102, as detailed below.

TENDER NO	COST OF TENDER (INCLUSIVE OF TAX)	LAST DATE FOR SALE OF TENDER SET	LAST DATE FOR RECEIPT OF TENDER (1300 HRS)	DATE OF OPENING OF TENDER (1100 HRS)	EMD (INR)	SPECIFICATION AND QUANTITY
DPS/ MRPU/ IGCAR/ CAP/ 8290/ PT-1695	**525**	**09/07/ 15**	**23/07/ 15**	**24/07/ 15**	**193000**	Liquid helium based cryostat (Detailed specification and quantity are given in the tender document which can be purchased from Deputy Controller of Accounts, Madras Regional Accounts Unit, Department of Atomic Energy, VI Floor, Shastri Bhavan, 4 Haddows Road, Chennai 600 006 by paying the cost of the tender)

The Documents priced as above can be obtained in person from the above address between 10.00 a.m. And 1.00 p.m. on all working days on submission of a written request in the firm's letter head along with an account payee DEMAND DRAFT or Banker's cheque drawn in favour of Deputy Controller of Accounts, Madras Regional Accounts Unit (no MO, cash or postal order acceptable), payable at Chennai. Wherever the tender documents are required to be sent by Post at Vendor's risk, a written request for the same along with an Account Payee Demand Draft towards the tender fee, shall be sent to the Deputy Controller of Accounts, Madras Regional Accounts Unit at the above address indicating the details of the tender No., Name and address of the firm on whose favor the tender documents are to be issued. It must be

ensured that such request should be sent in advance to reach this Directorate at least 10 days prior to the last date for sale of tender.

The envelope should be super scribed with the wordings “Request for issue of tender document against Tender No._____”.

Alternatively prospective bidders can download the set of Technical Specifications along with the, instructions, terms and conditions, from the web link mentioned below and submit the completed format along with applicable tender fee, EMD and all applicable documents much before the due date of tender opening. However in the case of two part tenders, bidders can submit their Part-I and Part-II offers in separate covers (size: S-8) in different colors, in sealed envelopes/wrappers, by clearly and legibly super-scribing the appropriate Part Number of their offers in bold letters and the covers have to be kept in a single cover which is also to be super-scribed with TENDER REF No. & DUE DATE, and submitted accordingly.
Link for downloading Standard Tender Annexure:
http://www.igcar.gov.in/tenders
For all indigenous contracts FORM DPS-P 11 and for all Imported contracts FORM DPS-P.12 may be downloaded as the case may be from http://www.dpsdae.gov.in/StdTenderForms.asp

The tenderer shall submit along with the tender, Earnest Money Deposit (EMD) as mentioned above in the form of Demand Draft or Banker’s Cheque from any Nationalized / Scheduled Banks drawn in favor of Deputy Controller of Accounts, Madras Regional Accounts Unit, Chennai. Any offer not accompanied with the EMD shall be rejected summarily as non-responsive. The EMD of the unsuccessful bidders shall be returned within 30 days of the end of the bid validity period. The same shall be forfeited if the tenderers withdraw their offer after the tender opening during the bid validity period. The Government shall not be liable for payment of any interest on EMD or any depreciation thereof.

However, those who have valid registration with DGS&D, NSIC or DPS as on the date of submission of bids are exempted from payment of EMD.

Brief information about our public tender is also available at http://www.igcar.gov.in/tenders and http://tenders.gov.in/department.asp?id=256.
For terms and conditions, instructions please visit http://www.dpsdae.gov.in

REGIONAL DIRECTOR, MADRAS REGIONAL PURCHASE UNIT HAS THE RIGHT TO REJECT ANY OFFER IN PART OR IN FULL WITHOUT ASSIGNING ANY REASON.

REGIONAL DIRECTOR

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ANNEXURE TO TENDER NO: DPS/MRPU/IGCAR/CAP/8290/PT-1695

1. Description of the ITEM:

Liquid helium based cryostat for measuring dielectric properties/capacitance measurements of solid sample in the temperature interval 5 to 300 K and in the presence of magnetic field up to 8 Tesla, complete with variable temperature sample insert along with sample holder suitable for operation in the frequency range 10 Hz to 10 MHz, superconducting magnet with power supply, digital programmable PID temperature controller, liquid helium transfer tube and liquid helium and nitrogen level probes with digital readout systems along with associated electronics. **– 1 SET**

2. Detailed SPECIFICATIONS and Quantity:

A. Cryostat – ONE

I. Type: Liquid helium bath type
II. Primary radiation shield cooled by liquid nitrogen
III. Aluminium based outer vacuum vessel fitted with bellows sealed evacuation valve and over pressure relief valve
IV. Liquid helium reservoir capacity: minimum of 70 litres
V. Liquid nitrogen reservoir capacity: minimum of 40 litres
VI. Liquid helium consumption: Less than 300 cc/hr.
VII. Liquid nitrogen consumption: Less than 300 cc/hr.
VIII. External diameter: Less than 800 mm
IX. Top plate should be fitted with necessary and suitable electrical terminals for electrical connections for thermometers, heaters etc., pressure relief valves, evacuation ports etc.
X. Liquid nitrogen and helium level probes are to be integrated with cryostat.
XI. A dimensioned schematic drawing of the cryostat including top plate and superconducting magnet should necessarily be supplied as **annexure I** along with OFFER for evaluation

B. Variable temperature sample insert – ONE

I. Temperature range: 1.6 to 300 K
II. Temperature stability should be at least ±0.1 K.
III. Mode of cooling: Flow of helium gas controlled by auto needle valve mechanism.
IV. Sample space diameter: 30mm
V. Ramp rate: ~ 10 C/min.
VI. A dimensioned schematic drawing of the variable temperature insert should necessarily be supplied as **annexure II** along with OFFER for evaluation

C. Sample insert along with sample cell for dielectric studies – ONE

I. Sample insert should terminate with a copper block with suitable tapping to mount the dielectric sample holder.
II. Dielectric sample cell for capacitance/dielectric measurements on solid samples in parallel plate mode from 5 to 300 K and over a frequency range 10 Hz to 10 MHz.
III. Dielectric sample cell should be fabricated out of OFHC.
IV. Top of the sample cell should have a threaded termination so that thread that the sample cell snuggly mounts at the bottom the sample insert AND in good thermal contact with copper block (mounted at the bottom of the sample holder).

V. Sample cell should be able to accommodate samples with a maximum diameter of 10 mm and a thickness of 4 mm.
VI. Suitable spring loading arrangements should be provided to establish good electrical contacts between the sample surfaces and the electrodes over the entire temperature range.
VII. Sample cell should be fully wired with two pairs of ultra miniature multicore stainless steel coaxial cables for capacitance/dielectric measurements. The wires are to be thermally anchored to minimize the heat leak.
VIII. These electrical connections should terminate with individual BNC or SMB connectors (4 numbers) at the top of sample holder.
IX. One unwired 10 pin terminal should be provided above the sample cell. All the wiring to the sample cell should be through this terminal for ease of sample cell switch-over.
X. A dimensioned schematic drawing of the sample holder indicating the details should necessarily be attached as **annexure III** for evaluation.
XI. A dimensioned schematic drawing of sample cell indicating the details should necessarily be attached as **annexure IV** for evaluation.

D. Temperature controller – ONE.

I. Programmable digital temperature controller to achieve desired temperature, ramp value and/ or soaking temperature schedule using CERNOX sensor.
II. Inputs: Minimum of 2 sensors (CERNOX) and 2 heaters with control loops.
III. Auto/self tuning of the PID values.
IV. Built-in calibration curve for the CERNOX sensor in use.
V. Display: Auto ranging 4½ digits display.
VI. Software for data logging and handling, data acquisition software and LabView driver for the temperature controller should be supplied.
VII. Instrument control: USB and / or GPIB.
VIII. Suitable cables to connect the sensor outputs and heater inputs to the sample holder.

E. Superconducting magnet – ONE

I. Suitable superconducting magnet complete with HTSC current leads. The magnet should be integrated with the cryostat and designed to minimize the liquid helium boil-off.
II. Should produce a maximum of ± 8 Tesla field at the centre of the magnet at an operating current of less than ±130A.
III. Magnetic field should have homogeneity of 0.1% within sample region of 10 mm DSV. Magnetic field values at selected points along and off the axis should be provided.
IV. The magnet should be fitted with a superconducting switch across all the sections to operate the magnet in the persistent current mode, if required.
V. Magnetic field stability in persistent mode: ≤ 1.0^{-4} relative/h measured at 8 T.
VI. The magnet should be fully protected against damage from accidental quench due to exhaustion of cryogens and / or exceeding the critical current of the assembly**.**

F. Superconducting magnet power supply – ONE

I. It should have bi-polar operation.
II. Maximum output current should be ±130A and should be adequate to generate a field of ± 8 Tesla.
III. Should be equipped with IEEE – 488 interface and USB port support for setting and controlling parameters of power supply through computer.
IV. Alpha-numeric display to indicate current and magnetic field.

V. Should have a current supply with appropriate rating to heat the persistent current switch as desired by the user.
VI. Automatic detection of quench and protection of superconducting magnet assembly, with energy absorber located outside.
VII. Should have auto run-down facility. It should be possible to ramp the current at user defined rate. Maximum allowed ramp rate to be specified in the quote.
VIII. A pair of current leads of suitable current rating and lengths should be supplied.

G. Low loss liquid helium transfer tube – ONE

I. System should be supplied with a flexible liquid helium transfer tube with 3/8" or ½" diameter and 1 meter long leg on the system side.
II. The flexible liquid helium transfer tube should necessarily be 3/8" or ½" in diameter and 1.5 meter long leg on the storage Dewar side.
III. Flexible horizontal section should be about 1.5 meters long.
IV. Transfer tube should be fitted with an evacuation port for pumping the inter space

H. Pumping system for variable temperature insert – ONE

I. Oil filled rotary vane pump with pumping capacity of minimum 40 m^3/h
II. 3.5 meters long flexible metallic bellow with suitable end fitting should be supplied.
III. All required valves and fittings should be supplied for the operation of the pump and vacuum meters and gauges to monitor the vacuum.

NOTE: A dimensioned schematic drawing of the cryostat including top plate, superconducting magnet and variable temperature insert should be supplied along with OFFER for evaluation.

I. Software:

I. All the software modules required for PC based control of the instruments, data acquisition and display of the data should be supplied.
II. The scope of supply should include all the drivers required for the operation of the system.
III. Data acquisition and display should be based on a LabView platform and the LabView base package for windows should be supplied.
IV. Both executable and source code (project files) for LabView also should be supplied.

J. General

I. All accessories, such as cables, connectors required for the assembly, testing and operation of the system should be included in the scope of supply.
II. Set of dimensioned drawing of cryostat including top plate, superconducting magnet and variable temperature insert are to be supplied.
III. Input power supply
   a) single phase 240 V (±10%) ac, 50 Hz, if the instrument/module draws less than 12 amps
   b) three phase 415 (±10%) ac, 50 Hz mains power if the instrument/module draws more than 12 amps.
IV. All utilities such as space, electrical power, compressed air, cooling water etc required for the installation and operation of the system should be clearly indicated in the technical specification of the quote.
V. Illustrated technical catalogues of all the item should be attached with the quote.
VI. Overall dimensions, foot print and weight of the systems should be indicated in the quote.
VII. Supplier should supply two copies of user's manual in English along with the instrument.

K. Acceptance criteria

i. Temperature range of measurement: 1.6 to 300 K

ii. Thermal stability ± 0.1 K
iii. Seamless variation of magnetic field: from -8 T to +8T through 0T
iv. Variable temperature sample insert cell for capacitance/dielectric measurements in parallel plate mode on solid samples over a frequency range 10 Hz to 10 MHz.
v. Dielectric measurements on solid samples over a frequency range 10 Hz to 10 MHz and in the presence of variable magnetic field with maximum of ± 8 T.
vi. Liquid helium consumption: Less than 300 CC/hr.
vii. Liquid nitrogen consumption: less than 300 CC/hr.
viii. LabView based executable and source (project files) codes program for automation.
ix. Complete automation of the cryostat, variable temperature sample insert and superconducting magnet with its power supply for fixed or continuously variable temperature and / or magnetic field operation and data logging.