UGC-DAE Consortium for Scientific Research
(An Autonomous Institution under University Grants Commission)
University Campus, Khandwa Road, Indore- 452001 (India)
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Item No.*1- Four-circle X-ray Diffractometer System

GTE No. 03/2025-26 dated 20-08-2025 due on 22-09-2025.

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Item No. 1

Technical specifications for a 'four-circle X-ray diffractometer system'

All the items/specifications listed below must be included in the offer.

	Scope of the supply: 1. A four-circle X-ray diffractometer system 2. Microscope for sample selection **3.** UPS Description and detailed specifications of the above items are as follows:
1.	**A four-circle x-ray diffractometer system** equipped with a compact high brightness microfocus Mo X-ray source and a latest generation 2D pixel detector should be capable of followings; i) diffraction data collection in transmission for small molecule crystallography, ii) high quality powder ring measurements suitable for pair distribution function analysis from polycrystalline samples in capillaries. iii) individual and coupled q scans from in-plane and out of plane scattering vectors in reflective geometry, from small single crystals and epitaxial thin film samples
(i)	**X-ray source, generator and optics**: A water/air cooled microfocus X-ray source should have following specifications: a) Anode material: Molybdenum b) Anode focus spot size ≤ 60 µm c) Max. power: 50W d) Beam size at focus ≤ 150 µm e) Divergence ≤ 5 mrad f) Flux ≥ 10^7 ph/sec g) Kβ suppression > 95% h) Beam delivery: Through cross-slit screen/pinhole i) Generator voltage ≥ 50 kV j) Generator should have integrated interlock system for X-ray safety and should provide computer control of all parameters and monitoring. k) X-ray source should be housed in a radiation shielding, and contain warning lights. l) Must include a suitable vacuum pump for micro-focus x-ray source to prevent radiation damages of the mirrors and to give long term stability. m) Must include (if water cooled) a suitable closed cycle chiller for micro-focus x-ray source (19" rackable version) to dissipate the heat emission from the source.
(ii)	**Goniometer**: A horizontal goniometer with a Eulerian cradle for providing four independent degrees of rotational freedom for sample manipulation (omega/ω, chi/χ, phi/ϕ) and detector placement (2θ). Definition of the angles can be seen in below figure, Fig. 1.

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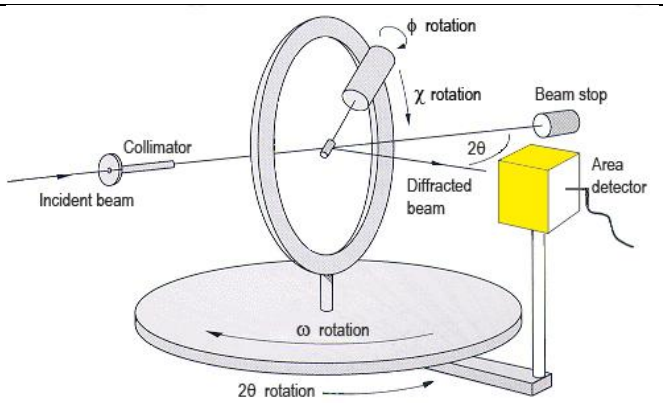

Fig. 1: A schematic of horizontal four-circle diffractometer along with angle descriptions.

a) 2θ/ω stage: position accuracy of 2θ/ω ≤ 0.001 degree; utilizable angular range: 200^0 or more.
b) Eulerian cradle: χ and ϕ position accuracy ≤ 0.001 degree; utilizable angular range: χ ≥ 95^0, ϕ: 360^0.
c) A motorized Z-adjustment with at least 5 mm travel range should be integrated with the ϕ-circle.
d) Sphere of confusion radius ≤ 0.01 mm.
e) On goniometer, an optical microscope with a CCD-camera must be integrated for sample adjustment with reading resolution < 1 micrometer.
f) Goniometer should include collimator holder, adjusting collimator, entrance collimators.
g) Goniometer should include detector mount with adjustable detector distance (40-140 mm or longer).
h) Goniometer must include a beam stop.
i) Must include one (1 no.) manual goniometer head (χ & ϕ arcs with ± 20° range and reading accuracy 0.1°); and ± 4mm X & Y translations)
j) Must include one (1 no.) magnetic goniometer head
k) Must include capillary mount adopter.
l) Goniometer should allow mounting of high-resolution monochromator and another X-ray source, in future.

(iii) **Detector system**:

A 2D pixel detector system with high dynamic range, and no electronic noise.

a) Pixel size ≤ 0.172 x 0.172 mm^2
b) Sensor thickness ≥ 1000 micrometre
c) Active area ≥ 77 x 70 mm^2
d) Quantum efficiency ≥ 75% quantum efficiency (in energy range 8-25 keV)
e) Point spread function ≤ 1 pixel
f) Max count rate: ≥ 10^6 ph/s/pixel or continuous read out
g) Frame rate ≥ 20 Hz
h) Detector system should be supplied with control and analysis PC.
i) Cooling: air cooled or Peltier cooling

(iv) **Diffractometer control and data acquisition software**:

A PC should be provided with pre-loaded software for diffractometer control, data acquisition and data analysis.

	a) Diffractometer control software should allow individual and coupled motor scans for different diffraction geometries and should support distributed real-time instrument control systems i.e. all the motors, x-ray shutter, counters, and temperature control system should be communicating with diffractometer control software for fully automated measurements through the macros. b) The instrument should also be able to be controlled by third-party and self-programmed software such as spec, python etc. c) Software should be provided for automatic peak search, indexing of reflection, refinement of cell constants and orientation matrix, Kα1/2-splitting option for integration process, representation of peaks in reciprocal space, determination of q vectors, integration of reflection, creation of powder diagrams, space group determination etc.
(v)	**Safety enclosure**: The diffractometer system should be enclosed in a suitable radiation protected cabinet. a) Doors of safety enclosure must be interlocked with X-ray shutter. b) Safety enclosure should meet high level of safety standards i.e. total radiation count at any point of time should not exceed 0.9 microSv/Hr so that x-ray worker/user is not exposed beyond radiation exposure limits (20 mSv/year).
(vi)	**Test samples**: Test single crystal and powder sample for calibration to be included in the basic system e. g. single crystals of Nickel Salen Complex (NiSa), YLID, and LaB6 powder etc.
(vii)	**Installation and training:** Installation, personnel training and test measurements of the system must be done at the institute by engineers from supplier's side. Training has to be given to at least two persons for at least two days.
(viii)	**Spares and accessories**: Necessary accessories such as standard spacers & thread rings for goniometer heads, standard specimen carrier, head key, suitable adhesives e.g. wax, cryoprotectant oil (100ml x 5), glass fibers etc for sample mounting, alignment pins, capillary mounts, standard capillaries, and x-ray fluorescence/burn papers. Supplier should confirm the availability of spares for next 10 years from the date of installation.
(ix)	**Variable sample temperature (optional)**: A portable open flow cryostat system for temperature dependent X-ray diffraction studies. a) Must include temperature controller, N2 gas pump and dry-air units b) Temperature range: 80-400 K or higher range c) Temperature stability: +/- 0.1 K or better d) Cool down time from room temperature to 100K < 25 min e) Liquid N2 consumption ≤ 1.2 ltr/hr f) Data logging and monitoring: Ethernet/USB/RS232 ports g) Nitrogen transfer line length ≥ 1.5 m h) N2 dewar capacity ≥ 60 ltrs i) Must have compatibility of operation with radiation safety procedure in place Accessories: Nozzle alignment tool, maintenance toolkit, Nylon dewar neck fitting, condensate bottle, regeneration heater, pump out port adopter, holder for the coldhead to adjust the nozzle of the cooler onto the sample.
2.	**Microscope for sample selection:** A trinocular stereo-zoom (> 50x) optical microscope with polarizer along with USB camera (for saving the pictures of the crystals) for crystal mounting from a reputed company must be included.
3.	**UPS**:

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	Suitable reputed make 3- phase input, 3-phase output on-line UPS with built-in isolation transformer and event logging facility should be provided. **a)** UPS must be compatible to run the above complete system and in no circumstances should be < 10kVA. **b)** Backup > 1 hour. **c)** After sales service should be provided by the Vendor. d) It should be under comprehensive warranty for three (03) years from the date of installation.
	Warranty: ≥ 3 years for all the above items excluding detector system and consumables. ≥ 2 years or more for detector system. Date of installation has to be considered as warranty start date.
	Acceptance conditions: A. Test results of the following factory tests has to be provided prior to dispatch of the diffractometer system, and confirmation of the same should be demonstrated at UGC-DAE CSR, Indore. i. Measurements of angular resolution of individual circles and sphere of confusion radius. ii. Confirmation of x-ray flux value, ≥ 10^7 ph/sec. iii. Confirmation of stability (> 98% for couple of hours) of the x-ray source with flux monitoring. iv. Structure solution data from single crystal diffraction data of a standard compound/molecule e.g. NiSa. v. X-ray powder diffraction measurements of standard powder samples e.g. LaB_6 in capillary up to a high 2theta range (≥ 140^0). FWHM of peak (110) from LaB6 should be < 0.3^0. B. Additional tests to be performed at the UGC-DAE CSR, Indore. i. Demonstration of functioning of encoders and hard limits of goniometer motions. ii. Assurance of safety interlock performance iii. Demonstration of vacuum pump and chiller's performance. iv. Demonstration of single crystal x-ray diffraction measurement in transmission with the setting of the resolution ≥ 1.17 Å^-1. v. Demonstration of structure solution of user supplied single crystal. vi. Demonstration of individual & coupled Q-scans from an epitaxial thin film or single crystal in reflective geometry up to ≥ 15 Å^-1. Demonstration of temperature stability+/- 0.1 K or better and temperature range.
	Bidder criteria: a) The bidder must be a globally recognized manufacturer of diffractometer equipment with a minimum of 10 years of experience in the field. b) The bidder should have demonstrated a high level of technical expertise and innovation in diffractometer technology. c) The bidder should be capable of and experienced with customizing diffractometer systems to meet specific research and application requirements. d) Detailed list of at least ten (10) installed X-ray diffractometers within the last 10 years, globally including at least two or more in India, with contacts details of indenter, installation certificates must be provided.
	Service facility and down-time call attendance: Supplier should clearly mention about their service set up in India for prompt service support along with contact details of service engineers specially trained on the offered system. Service should be provided within 2

	working days from the report of technical problem so that machine down time is minimized. Service should be provided at earliest and 24 X 7 online support should be available. In case the Equipment / System remains non-operational for more than 7 working days then warranty period will be extended for the equivalent period for which Equipment / System remained non-operational. Warranty extension in such case shall be done without prejudice to any other Term & condition of the contract.

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NOTICE INVITING GLOBAL TENDER No. 03/2025-26 dt 20-08-2025 due on 22-09-2025 at 15:00 hrs.

Director, UGC-DAE Consortium for Scientific Research, Indore invites separately sealed bids from eligible bidders for supply of the following:

Sl. No.	Description of Item Two Parts Tender Item
1.	Four-circle X-ray Diffractometer System.
2.	Back reflection Laue XRD System.
a.	Detailed tender document can be obtained in person, by post from Administrative Officer-I (Purchase & Stores Section), UGC-DAE CSR, Indore (address given above). The details of the tenders are also available on our website **www.csr.res.in**. Tender document will be available from **22-08-2025 to 22-09-2025 upto 15:00 hrs.**
b.	The Tender Document can be downloaded from our website **www.csr.res.in**.
c.	Overseas suppliers can participate in the tender directly, provided they do not have Branch Office in India.
d.	The item can be shifted in any laboratory of the consortium in the country.
e.	Amendments if any, will only be published on our website:www.csr.res.in
	Administrative Officer-I (Purchase & Stores Section)

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Item No.*1- Four-circle X-ray Diffractometer System

GTE No. 03/2025-26 dated 20-08-2025 due on 22-09-2025.

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Terms and Conditions

1.	Tender in sealed cover duly superscribed "Tender No. …. dt…. due on …..for …….. item …….. "Complete with all details, otherwise tender may not be opened/considered. If you are interested to quote more than one items, you shall submit the quotations in sealed cover separately. (*) items as mentioned in the Tender No NOTICE INVITING TENDER No. 03/2025-26 dt 20-08-2025 due on 22-09-2025 at 15:00 hrs must be quoted in two parts (Part A-Technical and Part B-Financial). The two parts show separate sealed covers.
2.	Price should be quoted CIP Mumbai & Insurance up to Indore separately (As per INCOTERMS 2010). In case of local firms they should quote for delivery in premises of this office.
3.	Director, UGC-DAE CSR, Indore, reserves the rights of accepting in full or part /not accepting the tenders without assigning any reasons.
4.	The acceptance of tender, will rest with the Director, UGC-DAE CSR, Indore, who does not bind himself to accept the lowest tender and reserves to himself the authority to reject any or all of the tenders received without assignment of any reason.
5.	Delivery and Installation period must be mentioned. (if Installation required)
6.	Liquidated Damages: The penalty for late delivery will be imposed @ 2% per month or a part there of, subject to a maximum of 10% of the total value of the order.
7.	The tender shall remain open for acceptance for a period of 90 days from the date of receipt.
8.	The decision of the Director, UGC-DAE CSR, Indore, shall be final in all the cases.
9.	Director, UGC-DAE CSR, Indore, shall not be liable for postal delays. The incomplete tenders or the tenders received after due date will not be considered.
10.	Quote your offer along with literatures/catalogues, if any.
11.	We are exempted from the custom duty. The custom duty exemption certificate is issued by Department of Scientific & Industrial Research (DSIR), Govt. of India, New Delhi. Customs duty exemption is in terms of Government Notifications No. 51/96-Customs dated 23.07.1996; No. 24/2007-Customs dated 01.03.2007; No. 43/2017-Customs dated 30.06.2017; No. *42/2022- Customs dated 13.07.2022; No. 07/2024- Customs dated 29.01.2024; No. 38/2024 – Customs dated 23.07.2024.*
12.	**GST must be quoted separately, if applicable.**
13.	No claim for any tax or duty, not stipulated in the tender will be admitted at any stage.
14.	The tenderer should furnish the users list where similar equipment has been supplied recently.
15.	Special care should be taken to write the rates in figures as well as in words. No overwriting be done on the rates and units.
16.	**Arbitration:** "in connection with the present contract shall be finally settled under the Rules of conciliation and arbitration of the International Chamber of Commerce" should be replaced by "between both parties in connection with the CONTRACT which cannot be settled amicably shall be exclusively & finally settled by Arbitration under the rules of conciliation and arbitration of the **"International Chamber of Commerce, Mumbai"** by one or more Arbitrators appointed in accordance with the said Rules.
17.	No deviation from the stipulated terms and conditions will be allowed. Tenders should be unconditional.
18.	The warranty of the equipment should be for 12 months from the date of commissioning / installation.
19.	It will be obligatory on the part of the tenderer to sign on your offer.
20.	Subject to Indore Jurisdiction.
21.	***The bidder should fully comply with the OM no. F.No. 6/18/2019-PPD dated 23-07-2020 inserting rule 144 (xi) in GFR 2017 by the Ministry of Finance, Department of Expenditure, Public Procurement Division. (fill Annexure-I)***
22.	N**o advance payment will be made**.
23.	The Performance bank guarantee as per policy of the Government time to time, must be provided till the warranty period.
24.	***The last date for submission of the tender documents is 22-09-2025 up to 15:00 hrs. Tender will be opened on 22-09-2025 at 16.30 hrs. Tenderer (s) / authorized representative(s) may attend on the opening of the tender bids.***
25.	***For Pre-bid: Email : iucstores@csr.res.in till 29-08-2025. AT 11:30 am . UGC-DAE CSR , INDORE***
*26.	**Benefits to MSME :** **As prescribed by MSME policy of the Government of India shall be provided to MSME vendors registered as manufacturer for the goods procured or for the service providers for services to this Department. The procuring Entity reserves its option to give price preference to Micro and small industries in comparison to the large-scale industries as per policies of the Government from time to time.**
27.	**Make in India :** ***(fill Annexure-II)*** 27.1 As defined under the Public Procurement (Preference to Make in India), order 2017, Revised order dated: 16/09/2020 or as being revised from time to time, in procurement of goods or services in respect of which the Nodal Ministry/Department has communicated, that there is sufficient local capacity and local competition, only "Class-I local supplier', as defined under the said order, shall be eligible to bid irrespective of purchase value. 27.2 Only "Class-I local supplier" and "Class-II local supplier', as defined under the above said order, shall be eligible to bid in procurements under taken by this Directorate, except where the mode of procurement is by issue of Global Tender Enquiry. The bidding supplier shall indicate the percentage of local content for the item being offered in their bid. 27.3. Where the procurement is by issue of Global Tender enquiry, Non local suppliers, shall also be eligible to bid along with "Class-I local suppliers and Class-II local suppliers". Suppliers/bidders offering imported products will fall under the category of Non-local suppliers.

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	27.4. Subject to the provisions of the above said order, and to any specific instructions issued by the Nodal Ministry or in pursuance of the said order, purchase preference shall be given to "Class-I local Suppliers" in procurements under taken by this Directorate, in the manner specified there in the order. 27.5. The bidders along with their bid/tender shall be required to provide a self-declaration certificate of the local content (where the procurement value is Rs.10 crore or less) for the item offered and their status as Class-I/Class-II/Non-Local supplier and their eligibility to participate in the tender as per Annexure-XI failing which bid will be rejected. In cases of procurement for a value in excess of Rs.10 crores, the "Class-I local supplier/Class-II local supplier' shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of Contractors other than companies) giving the percentage of local content. 27.6. Self-declaration certificate should quantify the percentage of local content of the offered product only. It should also indicate the location. However, claiming the services such as transportation, insurance, installation & commissioning, training and after sale service support like AMC/CMC etc., shall not be considered as local content as per OM N.P-45021/102/2019-BE-II-Part(1)(E-50310) dated:4/03/2021 issued by Ministry of Commerce and Industry, DPIIT. 27.7. False declarations/violation of this order terms shall be deemed to be breach of code of integrity resulting in debarment of the firm for a period up to 2 years. Under such circumstances, the supplier shall not be considered for any preferences as proposed in the order. 27.8. Wherever the bids are received without accompanying the above said requisite certificate such offers shall be treated as incomplete and not considered. 27.9. Bidders/contractor are divided into three categories based on Local Content (The total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent): 27.10. Class-I local supplier is with local content equal to or more than as prescribed by the Nodal Ministry/ NIT, if prescribed, for the item being procured or 50% whichever is higher. 27.11. Class-II Local supplier is with local content more than as prescribed by the Nodal Ministry/NIT, if prescribed, for the item being procured or 20% whichever is higher, but less than that applicable for class-I local supplier. 27.12. Non-local supplier is with local content less than that applicable to class-II local supplier, as stated above. ***Note: Where the estimated value of the procurement is less than Rs.5 Lakhs (or as being amended by the competent authority from time to time) is exempted from the provisions of the above Make in India policy as stated therein the order.***

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Appendix–II

Annexure to Bid Form: Eligibility Declarations

(To be submitted as part of tender/Technical Bid)

(on company letter head)

(Along with supporting documents, if any)

Tender Document No. DPS/XXXX

Tender Tile: Goods

Bidder's Name:----------

(Address and contact details)

Bidder's Reference No. ---------- Date : ----------

Restrictions on procurement form Bidders from a country or countries, or a class of countries under Ruler 144(xi) of the General Financial Rules 2017.

"We have read the clause regarding restrictions on procurement form a Bidder of a country which shares a land border with India; and solemnly certify that we are not form such a country or, if from such a country, we are registered with the Competent Authority (copy enclosed). We hereby certify that we fulfil all requirements in this regard and are eligible to be considered."

Penalties for false or misleading declarations:

We hereby confirm that the particulars given above are factually correct and nothing is concealed and also undertake to advise any future changes to the above details. We understood that any wrong or misleading self-declaration by us would be violation Code of integrity and would attract penalties as mentioned in this tender document, including debarment.

(Signature with date)

(Name and designation)

Duly authorized to sign Bid for and on behalf of

(Name & address of the Bidder and Seal of Company)