

**Government of India**  
**Bhabha Atomic Research Centre**  
**Electromagnetic Applications & Instrumentation Division**

Ref:EmA&ID /EMAS/<sup>22</sup>21/01/24878

Date: 18/01/2022

Supply, fabrication, integration of rotatable mounting stands for NMR camera system

Dear Sir/Madam,

1. Quotations are invited for the Supply, fabrication, integration of rotatable mounting stands for NMR camera system as per specifications: SCM/NMR/21/01 dated 14/01/2022.
2. Bidder shall quote for fabrication of these components with material as per the enclosed tender technical specification.
3. Taxes and Excise Duties shall be quoted separately. Form AF / H whichever is applicable shall be provided, if required.
4. **The quotation must reach The Head, Electromagnetic Applications Section by 31<sup>st</sup> Jan, 2022 and must be sent in a sealed envelope super scribed with the reference number & the due date given above.**
5. **The quotations must be send via speed post or registered post only.**
6. The address on the envelop should read:

**The Head, Electromagnetic Applications & Instrumentation Division,  
RCnD Bldg., North Site  
BARC, Trombay,  
Mumbai - 400 085.  
(Kind Attn: Shri Udai Giri Pratap Singh Sachan)**
7. Necessary inspection facilities should be provided to our engineer during fabrication at bidder's premises.
8. The bidder shall deliver the finished components after approval by our engineer within 12 weeks from the date of firm work order issued to the bidder. The finished components along with the left over material shall be delivered by the bidder at **Electromagnetic Applications & Instrumentation Division, BARC, Trombay, Mumbai - 400 085.**
9. Head, Electromagnetic Applications & Instrumentation Division reserves the rights to accept/ reject any or all quotations without assigning any reason.
10. Delivery charges if any must be clearly mentioned in the offer.
11. Quotation must also indicate the validity of offer.
12. Quotation must also indicate the GST no and PAN no of the party.
13. The quotation has to be signed by authorized person along with company seal.

Encl.: Specification Sheet no.-SCM/NMR/21/01 dated 14/01/2022

*Udai Giri*  
(Udai Giri Pratap Singh Sachan)  
SO/D, EmA&ID

Copy to:

1. BARC website for uploading

**Annexure-C**

<b>Tender Specification no.</b>	<b>Revision no.</b>	<b>Date of Issue</b>	<b>No of pages</b>
SCM/NMR/01	01	14/01/2022	3

**Supply, fabrication, integration of rotatable mounting stands for NMR camera system**

**1.0 Scope**

Tender is invited for Supply, fabrication, integration of rotatable mounting stands for NMR camera system. In this specification, the seller shall be referred to as the "Supplier" and Bhabha Atomic Research Centre shall be referred to as the "Buyer".

Supplier shall arrange required raw material, facilities, infrastructure for manufacturing, welding of the vacuum vessel, support structure, leak detection testing etc. The description of the vacuum vessel along with thermal shield are mentioned in Para 4.0 of this tender specification. The fabrication shall be carried out strictly based on the drawings and specifications provided in this tender specification. Any modifications, if required, during the fabrication shall be approved by the buyer before fabrication.

Supplier shall quote lump sum for the above-mentioned job. No Free Issue Material (FIM) is involved in this job. Only overall cost will be compared.

The brief description of contents of the tender specification document is as described below.

Para 2.0 gives the details of deliverables.

Para 3.0 gives statement of purpose.

Para 4.0 gives the general description and technical requirements.

Para 5.0 gives the raw material requirements.

Para 6.0 gives the welding specification and requirements.

Para 7.0 gives the testing and factory acceptance requirements.

Para 8.0 gives the quality assurance requirements.

Para 9.0 gives the price and delivery schedule requirements.

**2.0 Details of deliverables**

<b>S.No</b>	<b>Component</b>	<b>Nos</b>
1.	Rotatable Mounting stands for NMR camera system	01Set

**3.0 Statement of purpose**

A large warm bore 1.5 Tesla superconducting magnet shall be cooled by two stage Pulse Tube cryo cooler. The superconducting magnet shall be used for high uniformity magnetic field applications. It is a horizontal superconducting magnet housed inside a vacuum vessel. To reduce the radiation losses, intermediate thermal shields are required. The magnet shall have a warm bore of 300 mm and which is accessible from both the sides.

**4.0 General description and technical requirements**

4.1 Warm bore 1.5 Tesla superconducting magnet is required for high uniformity applications. The electromagnet is a split coil magnet for better field uniformity. The magnet is a warm bore magnet for carrying out measurements and experiments. The heat load is reduced by operating the magnet under cold bore condition.

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- 4.2 The supplier has to understand the complete system and offer various suitable options for cold bore conversion.
- 4.3 Magnetic field mapping of the magnet needs to be carried out. The NMR sensors are arranged in the half moon array of the mapper. The mapper consists of FRP nonmagnetic boards whose radius is 80 mm only. There are total number of 14 NMR sensors mounted on the circular periphery.
- 4.4 A rotatable system has to be developed for the uniformity measurements. The MOC of the system shall be nonmagnetic preferably Aluminum T-6061. The supporting stands shall be nonmagnetic as well as light in nature.
- 4.5 The complete system shall be coaxially placed with reference to the bore axis.
- 4.6 The mounts shall be constructed in such a way so that they are supported from the vacuum vessel flanges.
- 4.7 The system shall have slotted plate on the front operating side. The plates have three set of holes of three different PCD. Reference PCD1 shall be 100 mm, Reference PCD2 shall be 180 mm and Reference PCD3 shall be 260 mm. PCD1 shall have holes having angular distances 15 degrees. PCD shall have holes having angular distances 18 degrees. PCD three shall have holes at 22.5 degrees.
- 4.8 There should be a provision of locking pin such that NMR camera system position can be locked during measurements. Locking pin MOC shall be strictly brass.
- 4.9 The complete system shall be anodized preferably in black color.

#### **5.0 Raw Material requirements**

- 5.1 Stainless steel 316L nut bolts shall be used for construction of rotatable mounting stands.
- 5.2 The slotted plates, locking pin shall be made of brass only. Linear hinges, front and rear mounting arms shall be made of Aluminum T-6061. Nuts and bolts shall be strictly of brass.

#### **6.0 Welding specification and requirements**

- 6.1 All the joints shall be TIG welded by purging 99.9% pure Argon gas.
- 6.2 The fillet material used shall be Aluminum T-6061 only.

#### **7.0 Testing and factory acceptance requirements**

- 7.1 After fabrication of flanges following acceptance test shall be carried out:
  - a) CMM measurements shall be carried out on the rotatable mounts.

#### **8.0 Quality assurance requirements**

8.1 The supplier shall maintain a documented quality assurance program that will insure that each item offered for acceptance or approval conforms to the requirements.

8.2 Quality surveillance and expediting, relating to all the aspects of the contract will be carried out by the buyer or his authorized representative for which purpose the supplier and his subcontractor shall

8.2.1 Allow access at all reasonable times during manufacture, assembly and testing to the premises in which the work is being carried out.

8.2.2 Furnish the latest drawings and/or tooling, gauges, instruments, testing equipment etc. required for inspecting the jobs. Prints of all the latest required drawings and approved procedures shall be made available for inspection and retention, if so desired.

#### **9.0 Price and delivery schedule requirements**

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Does the supplier have previous experience in carrying out similar such electronic systems development for BARC, IGCAR any recognized government research Labs and has the supplier enclosed copy /proof of the purchase orders and photo copies of the developed systems	Yes/No
Has the supplier enclosed the list of employees, design engineers, assistants, CAD/EDA software, CMM, CNC facilities, available with them to carry out the present job?	Yes/No
Does the supplier agree to carry out acceptance testing for the system to be developed?	Yes/No
Has the supplier sub-contracted the part of job? If yes, they should also produce the list of sub-contractors and their infrastructures and facilities.	Yes/No

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