

## IISc/INF (NMR)/2022

*Request for quote (RFQ) from domestic (India-based) manufacturers, Indian OEM or its authorized Indian distributor for a 600 MHz Liquid-State NMR spectrometer*

*Tender Opening Date: 25<sup>th</sup> July 2022*

*Date for Pre-Bid Clarifications: 1<sup>st</sup> August 2022*

*Date for Posting for Final Revised Tender: 3<sup>rd</sup> August 2022*

*Date for Final Bid Submission: 15<sup>th</sup> August 2022*

This is an RFQ for procurement of a 600 MHz Liquid-State NMR Spectrometer System. The spectrometer will be installed at the Institute NMR Facility (INF) at the Indian Institute of Science, Bangalore.

The quotation should clearly indicate the terms of delivery and installation schedule, the estimated date for commissioning and validation, and payment terms. **The tender should be submitted in two separate sealed envelopes - one containing the technical bid and the other containing the commercial bid, both of which should reach us, duly signed on or before 5 pm, 15<sup>th</sup> August 2022.**

*Note: The Bidder should belong to either class 1, class 2 or MSME supplier distinguished by their "local content declaration" as defined by recent edits to GFR. They should mention clearly which class they belong to in a cover letter*

- a) *Class 1 supplier: Goods and services should have local content of equal to or more than 50%.*
- b) *Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.*

*Purchase preference as defined by the recent edits to GFR (within the "margin of purchase preference") will be given to Class-1 supplier.*

***The quotations should be on FOR-IISc Bangalore basis in INR only.***

The bids should be addressed and sent to:

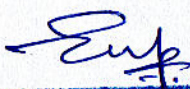
*The Convener*

*Institute NMR Facility (INF)*

*Indian Institute of Science (IISc)*

*Bengaluru, India - 560012.*

*Ph: +91-80-2293-3302*

  
**Convener**  
**Institute NMR Facility (INF)**  
**Indian Institute of Science**  
**Bangalore - 560 012**

*Emails regarding any technical clarifications/queries should be sent to: [eprahak@iisc.ac.in](mailto:eprahak@iisc.ac.in) and CC to [sunitar@iisc.ac.in](mailto:sunitar@iisc.ac.in)*

<b>Table of Contents</b>		
<b>S.No.</b>	<b>Section Title</b>	<b>Page Number</b>
1.	Technical Specifications and Requirements	3-5
2.	Terms and Conditions	6-7
3.	Check List to be Submitted along with Technical Bid	8
4.	Check List to be Submitted along with Commercial Bid	9
5.	Annexure-1: Details of the Bidder	10
6.	Annexure-2: Declaration regarding experience	11
7.	Annexure-3: Declaration regarding track record	12
8.	Annexure-4: Declaration for acceptance of terms and conditions	13

158  
Convenor  
Indian Institute of Science  
Bangalore - 560 012  
Institute NMR Facility (INF)

## Technical Specifications and Requirements

### High field high resolution liquid-state NMR spectrometer

Please provide a detailed technical quote of your NMR system on the following points.

#### 1. Magnet System (standard bore)

14.1 Tesla actively shielded super-conducting magnet with an operational frequency of 600 MHz for  $^1\text{H}$  nucleus in liquid-state NMR with following specifications.

- i. Shortest possible radial and axial distance for 5 Gauss stray field from the center of the magnet. Please specify overall Magnet dimensions and ceiling height requirements.
- ii. Drift rate of Magnetic field less than 10 Hz/hour
- iii. Liquid Helium hold time of at least 150 days.
- iv. Please specify the total liquid Helium and  $\text{N}_2$  hold volume, refill interval and refill volume.
- v. All support equipment for cryostat (e.g., Liquid Helium and liquid nitrogen transfer lines).
- vi. Digital monitors for liquid Helium and liquid nitrogen levels.
- vii. Anti-vibration legs (please specify the lowest frequency damped).
- viii. Built-in cryo-shims and room temperature (ultra) shims; gradient shimming capability and its associated accessory (software/hardware)
- ix. Pneumatic sample load / spin / eject system

#### 2. Console

Four independent RF channels (specify the frequency range of operation) with best frequency and phase resolution; fast switching time for all parameter without hidden delays. Please specify the configuration and bandwidth of each channel.

The console should include:

- i. Waveform generators for all channels for pulse shaping
- ii. Amplitude, phase and composite pulse decoupling generator
- iii. Pre-amplifiers and filters for noise reduction
- iv. High-power linear amplifier broadband amplifier 100 W or better for  $^1\text{H}$  channel. 400 W or better for  $^{13}\text{C}/^{15}\text{N}$  and 100 W or better for  $^2\text{H}$  to provide the shortest possible pulse-widths. Please specify all relevant parameters including power (wattage), frequency range, duty cycle, maximum pulse duration, etc.
- v. Frequency synthesizers for each channel
- vi. Digital quadrature detector for complete elimination of artefacts in the center of the spectrum.
- vii. Transmitter controllers for each channel (event duration < 25 ns)
- viii. Digital  $^2\text{H}$  lock channel consisting of a  $^2\text{H}$  pre-amplifier. Lock system should have high precision phase and field corrections (please provide documental evidence)
- ix. ADC with high dynamic range and sampling rate. Please specify the resolution of the ADC (in bits) and the maximum sample rate
- x. Gradient unit with amplifier and accessories for pulse field gradient

#### 3. Variable temperature unit having

- i. Broad temperature range capability (desired -150°C to 200°C)
- ii. High resolution / accuracy / stability of temperature setting (at least +/- 0.1°C)
- iii. Accessories for running experiments below ambient temperature

#### 4. Probes

- i. An inverse triple resonance (HCN) or Quadruple resonance (HCNP) high-resolution cryoprobe (preferably  $\leq 25$  K) with 5 mm sample diameter, Z-shielded gradient, automatic tuning and matching and  $^2\text{H}$  lock.
- ii. Highest sensitivity triple resonance 5 mm broadband direct/observe room temperature probe covering nuclei from  $^{31}\text{P}$  to  $^{15}\text{N}$  and preferably up to  $^{109}\text{Ag}$  with automatic tuning and matching and  $^2\text{H}$  lock.
- iii. Highest sensitivity triple resonance 5 mm broadband inverse room temperature probe covering nuclei from  $^{31}\text{P}$  to  $^{15}\text{N}$  and preferably up to  $^{109}\text{Ag}$  with automatic tuning and matching and  $^2\text{H}$  lock.

The vendor should provide three probes as follows – one of the cryoprobes (mandatory), in addition to this, either, (a) two of the probes # (ii/iii), or (b) one each of the probes # (ii) and (iii).

Please provide the following information.

- a. Pulse-widths for  $^1\text{H}$ ,  $^{13}\text{C}$  and  $^2\text{H}$  and  $^{15}\text{N}$  using standard samples. Please specify the sample used.
- b. Specify the linewidths and resolutions achievable.
- c. Best signal-to-noise (S/N) ratios for each nuclei measured using standard samples. (Please provide data and mention the sample used).
- d. Salt tolerance: Please provide S/N and pulse width for all nuclei at low ( $< 20$  nM) and high ( $> 150$  mM) salt concentrations. Please provide any accessory required for performing experiments with high salt concentration samples.
- e. Pulse field gradients with amplifiers and accessories capable of generating pulsed field strengths of at least 50 G/cm.
- f. Gradient recovery times (not more than 100  $\mu\text{s}$ )
- g. Decoupling pulse width, power, bandwidth, duty cycle capacity on each RF channel.
- h. Temperature range over which the probe can be used.
- i. Tuning accessory for auto tuning capacity.

#### 4. Auto sampler

An automatic sample handling system with capacity of loading at least 24 samples from front of the magnet at the user level.

#### 5. Data storage / software / peripherals comprising

- i. High speed / memory computer with complete pre-loaded software / data cards for data acquisition, processing and analyses including tools / software for complete automation of data acquisition and peripherals including a 24-inch LCD monitor, printers (one Laser color and one B/W)
- ii. Unlimited multi-user licenses for the complete software package required for data acquisition, processing and analysis.
- iii. All relevant hardware and software manuals, installation CDs / DVDs etc.

#### 6. Warranty

Five-year comprehensive on-site warranty on all items mentioned above from the date of complete and satisfactory installation of the spectrometer including:

- i. All parts and labor
- ii. Free maintenance and service
- iii. Regular upgrades to all software during warranty period
- iv. The manufacturer has to take all responsibilities (including financial, insurance, etc.) for shipping and installation during this period.

**7. Please quote the shortest possible delivery time of the complete system.**

A delivery / installation time of less than six months from the time of placing the order is desirable.

**8. Initial supply of cryogen for installation**

The liquid helium required for installation should be provided by the NMR supplier. All responsibility / costs should be taken / covered by the manufacturer in case of quenching of magnet during installation, including all costs for re-charging, cryogenics, and if required complete replacement of magnet.

**9. Consumables and Accessories:**

- i. A compatible online UPS of necessary wattage, with one hour backup, three phase output for NMR electronics.
- ii. One set of reference standards (including doubly enriched ubiquitin protein) should be provided for full operational qualification and instrument performance verification.
- iii. All items for preventive maintenance kit should be provided by the engineer during installation.
- iv. 1000 of 5 mm NMR tubes for 600 MHz spectrometer should be provided.
- v. Essential spare parts for magnet / spectrometer.
- vi. One liquid N<sub>2</sub> Dewars 250 L (or above) for refilling of cryogens in the magnet.
- vii. One liquid He Dewar 250 L (or above) for refilling of cryogens in the magnet.
- viii. At least 16 numbers of 5 mm spinners (regular temperature), 4 numbers of 5 mm spinners (low temperature) and 4 numbers of 5 mm spinners (high temperature)

**10. Onsite training**

Initial on-site training to the staff for 2-3 weeks or as long as required to do all possible representative experiments and for routine maintenance. This can include advanced training for setting up biological NMR experiments/special applications using software installed pulse sequences from the manufacturer.

## **I. Terms and conditions**

- I.1. The electrical system installation shall be carried out by qualified electricians either employed or contracted by the vendor.
- I.2. The price quotation should include the cost of installation, validation, and training of potential users.
- I.3. The system should be provided with at least **5-years of warranty**, on all parts and labor, from the date of installation.
- I.4. The vendor must provide routine maintenance of the associated equipment that is part of this tender.
- I.5. The vendor should have qualified technical service personnel for the equipment based in India and should assure a response time of less than 48 hours.
- I.6. Vendor must provide a user list (with contact details including emails and phone numbers) of at least 5 customers from Indian Institutes/Labs where similar systems have been installed.
- I.7. The lead-time for the delivery of the equipment should not be more than 6 months from the date of receipt of our purchase order.
- I.8. The indenter reserves the right to withhold placement of final order. The right to reject all or any of the quotations and to split up the requirements or relax any or all the above conditions without assigning any reason is reserved.
- I.9. Wherever requested data must be supplied along with technical compliance documents. Technical bids without supporting data will be deemed as technically non-compliant.
- I.10. All guaranteed specifications will have to be demonstrated at the time of installation. Any necessary standard samples for that purpose should be brought by the service engineers.
- I.11. Printed literature and published papers in support of all compliance to the prescribed specifications may be provided.
- I.12. Technical evaluation by the institute may include demonstration to verify functionalities and capabilities of the system quoted. Any discrepancy between the promised specifications and measurements will be deemed as technical non-compliance.
- I.13. The Bidder's firm should have existence for a minimum of 3 years. Enclose Company Registration Certificate and balance sheet of last three years.
- I.14. The Bidder should belong to either class 1, class 2 supplier or MSME distinguished by their "local content" as defined by recent edits to GFR. They should mention clearly which class they belong to in the cover letter
  - c) Class 1 supplier: Goods and services should have local content of equal to or more than 50%.
  - d) Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.

Purchase preference as defined by the recent edits to GFR (within the “margin of purchase preference”) will be given to Class-1 supplier.

- I.15. The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per -Annexure 4.
- I.16. The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect has to be given as per Annexure 3.

### Check List to Be Submitted Along with Technical Bid

Please Attach Documents in the order given below.

S.No.	Section Title	Document Provided (Yes/No).	Document Page Number(s)
1.	Signed Check List for Technical Bid (this page)		
2.	Annexure-1: Details of the Bidder		
3.	Annexure-2: Declaration regarding experience		
4.	Annexure-3: Declaration regarding track record		
5.	Annexure -4: Declaration for acceptance of terms and conditions		
6.	Annexure-5: Technical Compliance Sheet		
7.	Annexure-6: Make and Manufacturer Details		
8.	Masked Price Bid (Note that the pricing information should be masked)		
9.	Technical specifications, Brochures and additional certifications where required		

I hereby declare all the above requested documents are appended along with the technical bid. I understand that the bid will be considered unresponsive if any of the above requested information is missing. I also understand that any bid with pricing information in the technical bid documents will be considered unresponsive.

(Signature of the Bidder)

Printed Name

Designation, Seal Date:



### Check List to Be Submitted Along with Commercial Bid

Please Attach Documents in the order given below.

S.No.	Section Title	Document Provided (Yes/No).	Document Page Number(s)
1.	Signed Check List for Commercial Bid (this page)		
2.	Commercial Bid		
3.	Costing Sheet for AMC for 2 years beyond the mandatory 5-Year warranty Period		

I hereby declare all the above requested documents are appended along with the commercial bid. I understand that the bid will be considered unresponsive if any of the above requested information is missing.

(Signature of the Bidder)

Printed Name

Designation, Seal Date:

**Annexure-1: Details of the Bidder**

The bidder must provide the following mandatory information & attach supporting documents wherever mentioned:

**Details of the Bidder**

Sl. No	Items	Details
1.	Name of the Bidder	
2.	Nature of Bidder (Attach attested copy of Certificate of Incorporation/ Partnership Deed)	
3.	Registration No/ Trade License, (attach attested copy)	
4.	Registered Office Address	
5.	Address for communication	
6.	Contact person- Name and Designation	
7.	Telephone No	
8.	Email ID	
9.	Website	
10.	PAN No. (attach copy)	
11.	GST No. (attach copy)	

Signature of the Bidder

Name  
Designation, Seal

Date:

**Annexure-2: Declaration regarding experience**

To,  
The Convener,  
Institute NMR Facility,  
Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: .....

Dated: .....

Sir,

I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company / firm has ..... years of experience in supplying and installing NMR spectrometers.

(Signature of the Bidder)

Printed Name

Designation, Seal Date:

**Annexure-3: Declaration regarding track record**

To,  
The Convener,  
Institute NMR Facility,  
Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: .....  
Dated: .....

Sir,  
I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company/ firm is not currently debarred / blacklisted by any Government / Semi Government organizations / institutions in India or abroad. I further certify that I'm competent officer in my company / firm to make this declaration.

Or

I declare the following

Sl.No	Country in which the company is Debarred /blacklisted / case is Pending	Blacklisted / debarred by Government / Semi Government/Organizations /Institutions	Reason	Since when and for how long
-------	---	--	--------	-----------------------------

(NOTE: In case the company / firm was blacklisted previously, please provide the details regarding period for which the company / firm was blacklisted and the reason/s for the same).

Yours faithfully  
(Signature of the Bidder)

Name  
Designation, Seal

Date:

**Annexure – 4: Declaration for acceptance of terms and conditions**

To,  
The Convener,  
Institute NMR Facility,  
Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: .....

Dated: .....

Sir,

I've carefully gone through the Terms & Conditions as mentioned in the above referred tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I'm an authorized signatory of my company and am, therefore, competent to make this declaration.

Yours faithfully,

(Signature of the Bidder)

Name

Designation, Seal

Date:

