

CSIR- NATIONAL PHYSICAL LABORATORY

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From: Director, CSIR-NPL
Tender No. 14-VI/AG(1111)22PB/T-78

Dated: 28.08.2023

CORRIGENDUM

With reference to NPL's Global Tender ID: **2023_CSIR_722727_1**, Pre-Bid Conference (PBC) was concluded on 16.08.2023 for "**FT NMR**". Consequent upon the outcome of PBC, **some changes have been made in the technical specification of captioned tender. Revised specifications are as follows:**

Technical Specifications for 400 MHz high-resolution FT-NMR Spectrometer

Vendor must confirm the technical feature of the system with documentary proof and send compliance statement of each and every feature. Vendor must highlight the best features other than the tendered features of the system. Vendor must be quoted the optimal items.

Magnet:

1. Latest Technology based stable and actively shielded superconducting magnet (9.4 Telsa) with an operational frequency of 400 MHz for ^1H . Vendor should quote their latest model.
2. Shortest possible 5G [radial from the centre of the magnet (< 0.5 m) and axial from the centre of the magnet (< 1.0 m)] fringe field with advanced shielding technology.
3. Magnet should be standard room temperature bore and Bore diameter should be ~ 54 mm.
4. Expected field drift < 4 Hz/hr.
5. Liquid helium hold time should 365 days or better.
6. Liquid Nitrogen hold time should be between 14 days or more. The exact refill volume should be mentioned.
7. All support equipment for cryostats with all accessories for liquid helium and liquid nitrogen transfer line and controls.
8. Number of cryo-shims (minimum of five cryo-shims).
9. Minimum of 20 or more room-temperature shim coils for best possible resolution.
10. Anti-vibration feet pad for dampening the floor vibrations (please specify the lower limit on the frequency of vibrations damped).
11. Please specify the overall Magnet dimensions/ceiling height necessary.
12. Level meters for both liquid Nitrogen and liquid Helium level and alarm (better if digital).
13. Standard test samples for multinuclear studies

Spectrometer Console:

1. Advanced feature-based two broadband frequency generation independent RF channels (full frequency range generation) with the highest frequency and phase resolution; fast switching time for all parameters, without any hidden delays along with its importance in the quality of the spectra. It should include wave form generators for pulse shaping, amplitude, phase, and composite pulse decoupling generator, preamplifiers with standard filters and digital receiver control with oversampling and quadrature detection with digitizer's facility for complete elimination of quadrature spikes.
2. Amplitude, phase and composite pulse decoupling generator, amplifiers, 100 W proton and 300 W or better multinuclear preamplifiers, ^2H preamplifier for lock and ^2H experiment, filters and receiver controls may please be specified with representative spectra.
3. Digital lock channel. Lock system with high precision phase- and field-correction, corrections for short-term disturbances.
4. Receiver system with high dynamic range and minimal quadrature images and artifacts.
5. 2-Channel Amplifier System: Two high-performance linear amplifiers for observation- or decoupling of ^1H or ^{19}F , in the range of ^{31}P to ^{15}N or better. All relevant parameters including power, frequency range, duty cycle, maximum pulse duration, etc. must be explicitly specified.
6. Built-in tune/match display
7. Add-on filters for noise reduction
8. Automated gradient shimming for 1D and 3D. Automation of lock, spin, insert/eject, and shim.
9. Low and high-temperature accessories: Variable temperature unit include: Controller should be for long-term temperature stability, High and Low-temperature range: (Ambient to approx. $+150^\circ\text{C}$ to -100°C)
10. Should be solid state ready.

Probes:

1. 5mm Multinuclear Broad Band Direct/observe Z-gradient Probe capable of covering maximum possible nuclei range ^1H , ^{19}F , ^{31}P , ^{15}N , ^{39}K , and ^{109}Ag with computer-controlled automatic tuning and matching (ATM). It should be capable of performing a ^{19}F experiment with ^1H decoupling and vice versa.
2. Sensitivity values: ^1H : 500 or more, ^{19}F : 500 or more, ^{13}C : 200 and more, ^{31}P : 100 or more, and ^{15}N : 25 or more. Please provide the technical printed specifications for the probe- heads e. g. Sensitivity, resolution, and line-shape, etc.
3. Sample tube diameter: 5 mm.
4. Variable temperature operation: -90°C to $+140^\circ\text{C}$, Built-in Z-Gradient coil for PFG and Digital lock. All required accessories should be included in the offer configurations.

User Interface:

1. High performance state-of-the-art workstation (Windows/Linux operating system) for acquisition and processing that can be easily serviced in India in case of any fault: 24" LED/TFT monitor, one terabyte Hard Disk, 3 GHz Processor, 16 GB RAM etc. CD-DVD read-write drives. USB Ports, High performance printers, 1no.s (Laser color and B/W)
2. Licensed Software Modules include:
 - a) Acquisition, Processing, Plotting, Structure Verification and Analysis-1D and 2D (HSQC, TOCSY, COSY, HETCOR, NOESY, HMBC, DOSY etc.) Multiplet Analysis, Deconvolution, Automation, Projection Reconstruction Spectroscopy.

- b) The vendor should provide two floating licenses along for off-line processing (Processing, Plotting, Structure Verification, Multiplet Analysis, Deconvolution, Automation, Projection Reconstruction Spectroscopy). The software should be able to overlay and compare multiple spectra along with capacity of binning (if possible)
- c) qNMR software for quantification of chemical substance (measurement of purity & concentration) should be included the configuration

All required hardware and software documents, manuals, installation CDs/DVDs etc. to be provided.

Accessories:

1. 2000 NMR tubes with caps.
2. An ISO-9001 certified imported 3HP oil-free scroll air-compressor complete with dryer with proper ratings and specifications capable of catering all the needs, with at least 90 liters buffer tank along with the system. N₂ gas cylinder with two regulators.

Power backup:

1. A suitable ISO-9001 certified Indian-make online UPS (10 KVA) for the whole system with a minimum backup of 1 hour.

Installation:

1. Liquid helium and Liquid Nitrogen required for installation should be provided by the NMR supplier at their expense. The vendor must also top up the helium level to 100% level after the magnet charging.
2. It is also the responsibility of the vendor to refill the liquid Helium for five years from the date of installation.

Warranty:

1. Comprehensive on-site warranty for five years for the entire instrument and accessories excluding consumables from the date of satisfactory installation of the spectrometer.
 - (a) All parts including accessories and labor.
 - (b) Free maintenance and service
 - (c) Regular upgrades to all software during the entire warranty period
 - (d) As the instrument will be installed in our campus, NPL.
 - (e) Vendor should provide a certificate that they will provide the spares in future for at least ten years.
 - (f) Vendor should provide insurance up to the delivery point (on-site not up to the nearer international airport) and until the time of installation.

Training:

1. Initial on-site training of the staff (3-5 months), update every six months (1-2 days) for the first two years.
2. Delivery period should be nine months from the date of LC.

General information required:

1. The technical specifications should be quoted in the same manner as described in the technical specifications desired in the tender.
2. Detailed specifications as well as prices for various items should be mentioned in the quotation (price bid).

3. The vendor should provide a total number of 400 MHz NMR instruments installed by the vendor in India.
4. Indicate other accessories such as power requirements, air conditioning, N₂ gas requirements etc. that need to be acquired from other sources.

Therefore, following extension in due date of submission & date of opening of the said tender may be read exactly as follows:

Due date & time of tender submission

For : 05.09.2023 up to 3:00 PM (IST)

Read as: 19.09.2023 up to 3:00 PM (IST)

Date & Time of Tender Opening

For : 06.09.2023 at 3:00 PM (IST)

Read as: 20.09.2023 at 3:00 PM (IST)

All other terms & conditions of said tender will remain the same.



Sr. Controller of Stores & Purchase

भारतीय संदर्भ सामग्री विभाग
Indian Reference Material Division # 5.01

Date: 16.08.2023

Subject: Minutes of the Pre-Bid Conference regarding FT-NMR held on dated 16.08.2023

A Pre-bid conference was held on dated 16thAug 2023 through offline/virtual mode to discuss FT-NMR specifications. The TSC members and external experts were invited to attend the meeting–

1. Dr. H.K. Singh (Chief Scientist)	Chairman
2. Dr. Chandan Singh (Assistant Prof. BHU)	External Expert
3. Dr. JC Biswas (Chief Scientist)	Member
4. Dr. T. K. Mandal (Chief Sci.)	Member
5. Dr. Sachchidanand Singh (Chief Scientist)	Member
6. Dr. Asit Patra (Pr. Sci.)	Internal-expert
7. Arvind Gautam(Sr. Sci.)	Indenter

The following vendors (OEM) attended the meeting-

1. M/s Joel India- Mr. Rahul Grover
2. M/s Bruker India- Dr. Bhawani Joshi

Due to their official engagement, the following members did not attend the meeting -

- Dr. JC Biswas (Chief Scientist)
- Dr. T. K. Mandal (Chief Sci.)
- Dr. Anjana Dogra (Sr. Pr. Sci)

The TSC Chairman welcomed all the committee members and vendors(representatives from M/s. Joel India, and M/s Bruker India) and briefed them about the objective of the meeting. The indenter briefed about the general specifications of the FT-NMR and had a thorough discussion with vendors about the suitability for their participation in the tender. The TSC chairman, an External expert, and vendors gave the valuables suggestions. All the suggestions of TSC members, external expert, and the vendors were incorporated. The revised specifications sheet for FT-NMR is attached herewith for your kind consideration as Annexure-1.

CSIR-National Physical Laboratory, New Delhi-110012

Pointwise changes/revision/addition/removal in Technical Specifications for 400 MHz high-resolution FT-NMR Spectrometer after Pre-Bid

S. No.	Technical Specifications	Before pre-bid	Changes After Pre-bid	Suggestion/advised by
1-13	Magnet	No changes	No changes	No Changes
1-10	Spectrometer Console	Sr. No. 2 : Amplitude, phase and composite pulse decoupling generator, amplifiers, 100 W proton and 300 Wmultinuclear preamplifiers, ² H preamplifier for lock and ² H experiment, filters and receiver controls may please be specified with representative spectra.	Sr. No. 2 : Amplitude, phase and composite pulse decoupling generator, amplifiers, 100 W proton and 300 W or better multinuclear preamplifiers, ² H preamplifier for lock and ² H experiment, filters and receiver controls may please be specified with representative spectra.	M/s. Bruker India- Accepted by the committee members and external expert
1-4	Probes	Sr. No. 1: 5 mm multinuclear broadband observe probe head (s) with Z-shielded gradient, capable of performing ¹⁹ F NMR using the same probe head. Automatic tuning and matching (ATM). Broadband observe with ¹ H, ¹³ C, ¹⁹ F and ³¹ P to ¹⁵ N that is capable of decoupling both ¹ H / ¹⁹ F.	Sr.No. 1: 5mm Multinuclear Broad Band Direct/observe Z-gradient Probe capable of covering maximum possible nuclei range ¹H, ¹⁹F, ³¹P, ¹⁵N, ³⁹K, and ¹⁰⁹Ag with computer-controlled automatic tuning and matching (ATM). It should be capable of performing a ¹⁹ F experiment with ¹ H decoupling and vice versa.	M/s. Bruker India, And M/s. Zoel India- Accepted by the committee members and external expert
		Sr. No. 4: Variable temperature operation: –90°C to +140°C, Built in Z-Gradient coil for PFG and Digital lock	Sr. No. 4: Variable temperature operation: –90°C to +140°C, Built in Z-Gradient coil for PFG and Digital lock. All required accessories should be included in the offer configurations.	M/s. Bruker India And M/s. Zoel India- Accepted by the committee members and external expert
1-2(1-b)	User Interface	Licensed Software Modules include: (a) No Change (b) No Change	Licensed Software Modules include: (a) No Change (b) No Change (c) qNMR software for quantification of chemical substance(measurement of purity & concertation) should be included the configuration	M/s. Zoel India and external expert for quantification of matrix- Accepted by the committee members and external expert
1-5	Accessories:	Sr. No. 1: containers of ~ 50 litres and one containers of ~ 10 litres capacity along with liquid Nitrogen transfer line required for regular filling of liquid	Sr. No. 1: Removed Sr. No. 2: Removed. Sr. No. 3: 2000 NMR tubes with caps. Sr. No. 4: An ISO-9001 certified	Chairman TSC recommended to remove the sr. No.1 and 2 and advised

		<p>Nitrogen in the magnet.</p> <p>Sr. No. 2:One trolley for transporting for ~ 50 litresCryocans.</p> <p>Sr. No. 3:2000 NMR tubes with caps.</p> <p>Sr. No. 4:An ISO-9001 certified imported 3HP oil-free scroll air-compressor complete with dryer with proper ratings and specification capable of catering all the needs, with t-least 90 liters buffer tank along with the system.</p> <p>Sr. No. 5:N₂ gas cylinder with two regulators</p>	<p>imported 3HP oil-free scroll air-compressor complete with dryer with proper ratings and specification capable of catering all the needs, with t-least 90 liters buffer tank along with the system.N₂ gas cylinder with two regulators</p> <p>Sr. No. 5: Merge with serial No. 4</p>	<p>for separate purchase of this. - Accepted by the committee members and external expert</p>
1	Power Backup	No Change	No Change	Accepted by the committee members and external expert
1-2	Installation:	No Change	No Change	Accepted by the committee members and external expert
1(a-f)	Warranty:	No Change	No Change	Accepted by the committee members and external expert
1	Training	Sr. No. 1 : No Change	<p>Sr. No. 1 : No Change</p> <p>Sr. No 2: Delivery period should be nine months from the date of LC.</p>	Accepted by the committee members and external expert
1-4	General information required:	No Change	No Change	Accepted by the committee members and external expert