



National Institute of Immunology

New Delhi-110067, INDIA

Ph.: +91-011-26703757/26703838

Email: stores@nii.ac.in

Website: - WWW.NII.RES.IN

Notice for Inviting proprietary purchase

Dated: 14.06.2024

Proprietary Purchase Document for procurement of

“Replacement of the electronic console for the 300 MHz Nuclear Magnetic Resonance (NMR) Spectrometer”

Interested manufactures or their authorized agents may kindly quote as per attached specification on or before 27.06.2024

Specification for the replacement of the electronic console for the 300 MHz Nuclear Magnetic Resonance (NMR) Spectrometer

1. The vendor should quote for a state-of-the-art two-channel based electronic console for the existing 300 MHz NMR Bruker magnet as per the specification given below.
2. Vendor should quote for all the required electronic components and shims for the solution-state NMR compatible with the existing Bruker 300 MHz magnet and probe for a fully functional system and best quality of data output.
3. NMR console for 300 MHz NMR spectrometer with ethernet router providing required number of TCP/IP (transmission control protocol/internet protocol) based ethernet ports to connect internal and external spectrometer devices like new sample changers, monitoring equipment, solution state NMR accessories, etc.
4. In case where the vendor's console is not the same as the manufacturer of the magnet, the onus on provision of frequency conversion of the magnet, compatible consoles, along with existing solution probes, for the fully functional system, rests solely with the vendor.
5. The system should be equipped with a power distribution unit to enable software-controlled console power-up and power-down for the console.
6. The system should have 80 MHz system clock, 12.5 ns timing resolution with synchronicity, up to trigger inputs, up to 2 real time output controls on all channels within 12.5 ns.
7. The system should have gradient control on gradient amplifiers with at least 50 G/cm gradient strength with a gradient recovery of < 100 micro sec for solution state NMR.
8. The system should support ultra-stable, ultra-low noise B₀ current source, 2G digital NMR lock for ²H and/or ¹⁹F nuclei, shim current sources, smart VT control for independent VT (Variable Temperature) channels, high temperature equipment, high resolution gradient amplifiers and RT (room temperature) shim systems and ST (sample transport) upper parts.
9. The system should support fully multi-receive, no extra wiring/components, accurate tuning and matching with factory calibrated preamplifiers, fully integrated automatic tuning and matching with ATM (automatic tuning matching) probes and probe identification interface.
10. The system should come with a nitrogen refill kit with PFA (perfluoro alkoxy alkane) tube.
11. The system should contain a shim system for optimum homogeneity at low current and low heat dissipation with at least 30 matrix shim gradients, B₀ coil and temperature sensor
12. The system should come with magnet system sample transfer for NMR sample insertion and ejection with built-in sample up-sensor and spinning/sample-down sensor and prepared for shim system cooling.
13. The system should contain a shim current board with high-precision and ultra-stable current board.
14. The system should contain a fast single channel gradient amplifier board suitable for pulsed field gradient shimming and single axis gradient enhanced spectroscopy with 10A min for solution state NMR

15. The system should contain a VT control unit that has an integrated gas flow system to control NMR sample inject/eject and VT temperatures within the probe. VT control unit should be capable of controlling from +150 deg C to -150 deg C.
16. It should be capable of 2H frequency RF generation, fast and accurate gradient shimming on 2H with easy and reliable locking with complex deuterated solvents.
17. The system should be a have 2 RF channel NMR RF with built-in pulse program engine (like shapes, sequencer, etc.)
18. The system should have a high RF power amplifier for X-nuclei and 1H (and 19F), with a 2H lock switch to enable fast switching between 2H decoupling and 2H lock operations.
19. The system should have a 1H channel RF power amplifier with minimum 50W or better and one 140W or better for X-nuclei.
20. The system should have 1H, 2H and Multinuclear preamplifier for solution and liquid samples.
21. All the preamplifiers should have active transmit/receive switch and factory calibrated for accurate tuning and matching.
22. The system should come with a VT adaptor for existing room temperature probes with thermocouple type T temperature sensors and existing BCU unit.
23. Sensitivity and signal to noise ratio (S/N) for 1H: 135:1 and 13C of 100:1 should be demonstrated with the existing probe, during installation.
24. Latest high-performance state of the art LINUX/Windows based workstations for operation of NMR spectrometer complete with pre-loaded software/data cards for data acquisition, processing and analyses including tools/software for complete automation of data acquisition and peripherals including one 24-inch LCD monitor should be quoted.
25. The software should be capable of all up-to-date heteronuclear multi-dimensional NMR experiments including latest experiments for acquisition and reconstruction from sparse data and multi-dimensional NMR spectroscopy. It should be capable of handling/executing multi receiver experiments under simultaneous acquisition in dual/multi receiver mode.
26. Package should include all the latest pulse sequences for multi-dimensional NMR experiments available with the vendor. Please provide list of pulse sequences available for ready use.
27. Two authentic licenses (one on acquisition workstation and one on another for processing, for the software for data acquisition and analysis should be provided. The vendor should provide automatic free upgrades of the new versions of the software for five years.
28. Warranty: Three years warranty on all the supplied items, including electronic console and hardware items, from the date of installation. Software licenses should be perpetual with automatic upgrades and patches.

Optional items:

29. Comprehensive maintenance contract (CMC) rates should be quoted for the existing 300 MHz magnet and existing probe for the 1st, 2nd, and 3rd years.

30. CMC for 4th and 5th year for the magnet, probe, electronic console, and supplied items should be quoted.
31. Quote for one 5.0 mm multinuclear solution state probe having acquisition facility of ¹H and ¹⁹F/BB. It also has a multinuclear option that includes automatic tuning, matching, and magic angle adjustment.
32. Additional licenses for NMR data analysis should be provided.
33. Quote for one desktop computer (all-in-one) workstation for data analysis and modeling, and one LaserJet color printer.
34. Buy-back options for the supply of new probe, if any, should be quoted.
35. NMR tubes and 5.0 mm and 3.0 mm spinners with high sensitivity for analysis of limiting samples, along with appropriate spinners, should be quoted.
36. NMR-tube autosampler capable of handling 24-samples, along with necessary accessories for complete automated performance, should be quoted.