Local Tender Notification from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributer for procuring "Liquid Nitrogen Generator" at the NMR Research Center, Indian Institute of Science, Bangalore

26th Jul 2021
IISc Bangalore

Dear Sir/Madam,

Subject: Liquid Nitrogen Generator

This is a local tender notification from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributer for procuring "Liquid Nitrogen Generator" with complete accessories towards the purpose of generating Liquid Nitrogen at the rate of minimum 120 liters / day. Your quotation should clearly indicate the terms and conditions of the quotation, delivery schedule, entry tax, payment terms, warranty coverage etc. The quotation should be submitted in two parts: Part I (Technical bid) and Part II (Commercial bid) and both must be submitted in separate sealed envelopes. The vendor should demonstrate the manufacture of the product within India. The technical bid should be exactly same as the commercial bid except that price should not be shown in the Technical bid. The Technical bid should have an item-wise compliance report of all specifications as indicated below. Prices quoted should be inclusive of all taxes and duties and should be inclusive of delivery of the items to the site and installation of the entire equipment. Prices must be in INR and should include appropriate GST. The last day for submitting the bid is August 10, 2021. The offer should be valid for at least 60 days from the last date of submission of quotes.

The bid should address the following technical specifications for the Liquid Nitrogen generator, accessories, and software, if any:

Technical Specifications:

S.No.	Parameters	Specifications
1	Liquid Nitrogen production capacity	minimum of 5 Liters/hour (i,e. minimum 120 Liters/day) at atmospheric pressure
2	LN2 production method	Cooling and liquefaction by Cold Head Heat Exchanger (by GM cycle based cryocooler)
3	Liquid Nitrogen delivery pressure	1 bar g
4	Functional at all External Atmospheric conditions at site of installation (IISc, Bangalore)	5° C to 40° C, 20% to 95% humidity in atmosphere
5	Purity of Liquid Nitrogen	≥ 99.9% at 1 bar g, lower nitrogen purity should be warned by audio/visual alarm
6	Operation and Control	Should be fully automatic, instrument should not require continuous physical attention of the operator, single-switch, PLC Controlled Operation, Provision for remote control and monitoring as an option, Should also include a master control for compete shut down in case of emergencies.

7	Nominal Operating Conditions and power consumption	Temperature 5-40° C; RH 20-95%, Voltage (3 phase): V and Hz should be compatible for use in Indian laboratories these details to be explicitly specified.
8	Power supply and compatibility	The working of the unit should be compatible to power supply which will be provided at IISc, Bangalore, India.
9	System Diagnostics	System should be integrated with visual display of all key parameters; loud alarms for warning signals; should be integrable with multiple external devices; upgradations of all current and future operating systems and interfacing software from time to time should be provided without any extra cost
10	Production Time (in Minutes)	From time of switching ON, (starting with an empty tank), to be mentioned
11	Performance at different volumes of liquid N_2 in tank	The plant performance should be independent of the volumes of liquid nitrogen in tanks
12	Restart after power failure	Auto-restart after any period of power cut and resumption, with startup time to full production
13	Automatic Stop/Start Function	Auto-Stop/Start function integrated with level of Liquid Nitrogen in the Tank
14	Cooling unit	System Integrated Chillers
15	Cooling Requirement	System Integrated Closed Loop Water cooling Systems
16	Accessories and spare parts –	Vendor(s) should provide the essential tools set for plant servicing and repairs; standard tools for day to day maintenance of liquid nitrogen generator system and storage tank; Complete Liquid nitrogen handling package for personal protection such as cryogenic gloves, goggles, flexible cryogen transfer siphon with handle, etc. must be included in the offer, must include any other equipment required for the proper functioning of the plant
17	Noise level	≤85 dB (A)
18	Servicing during warranty period	Periodicity of servicing should be specified in detail. All the spare parts needed should be supplied by the vendor on no charge basis.
19	Servicing beyond the warranty period	Periodicity of servicing should be specified in detail. The spare parts needed will be provided by the vendor on chargable basis.
20	Super Insulated Storage tank:	
	Capacity	Minimum Capacity of 300 Liters
	Material of construction	Appropriate quality Stainless Steel
	Liquid Level sensor for storage vessel	Level Sensor to be fitted with Liquid N2 Container Liquid Nitrogen storage tank should have auto level control. The Liquid Nitrogen generator must go into stand-by mode when the Liquid Nitrogen tank is full.

		The generator must re-start once the storage volume has dropped to pre-determined level.
	Liquid Level Display	Visual Display in percentage of total capacity
	Storage Vessel Pressure at normal operating conditions	Should be below 50 psi and should be classified under low pressure storage systems.
	Storage Vessel compatibility to ambient temperatures and humidity	Details to be furnished
21	Liquid nitrogen dispenser	Complete accessories for dispensing of Liquid Nitrogen from Tank – directly to NMR instrument and / or to an external liquid nitrogen storage vessel
22	Consumables and spares	For 5 years – attach detailed list with prices (in price bid)
23	Standard Warranty including on all parts (minimum 24 months)	Include in quote (the time period)
24	Additional Warranty (yearly) from original equipment manufacturer (OEM)	For 5 years (to be included in quotation)
25	Annual maintenance contract after warranty period	Maintenance Costs per annum should be mentioned along with the number of visits in an year. (A minimum of 3 visits / annum is mandatory).
26	Service Response time	6-48 hours
27	Onsite training	The vendor should provide complete onsite training of minimum two numbers of NMRC persons responsible for the operation of the nitrogen liquefier.
28	Software	Complete software for monitoring and control of plant functioning; free upgradation of software in future
28	User Manuals: (a) Operation Manual (b) Service Manual	Complete set – two sets of the operation and service manuals in English (hard copies) along with soft copy should be provided.
30	Real estate	Vendor must visit IISc to suggest the site for installation of the liquid nitrogen generation plant
31	Ready inventory of spares	Vendor must assure that they keep an inventory of critical spare parts and components to ensure round the clock service, and for continuous availability of liquid nitrogen
32	Specification match	The Liquid Nitrogen Generator system should match all the technical specifications listed above.
33	Quotation of prices	For the liquid Nitrogen generator, the participating firms must quote all-inclusive – inclusive of supply to the IISc and installation.
34	Insurance	The entire shipment must be insured from the manufacturer's warehouse to installation at the facility in IISc.
35	Vacuum Jacket line	Vendor should supply vacuum jacket connection line between liquefier storage tank to the NMR room with

		an end shut off valve for direct collection of liquid nitrogen.
36	Liquid nitrogen dispenser valves	Two numbers should be provided at the LN2 Tank outlet. One at the LN2 tank for supply to the vacuum jacket line leading to magnet room and the other for supply to any other LN2 storage containers.

The documents Part I (Technical bid) and Part II (Commercial bid) may be addressed to the Convenor, NMR Research Center, Indian Institute of Science, Bangalore 560012. Last date for receiving queries is 2nd **August 2021 (2/08/2021)**. Please email eprabhak@iisc.ac.in The last date for submission of bids is 10th **August 2021 (10/08/2021)**.

Thanking you,

Sincerely

Prof. E N Prabhakaran
Convener, Institute NMR Facility,
Indian Institute of Science,
Bangalore – 560012.