

April 15<sup>th</sup>, 2022; **Update on May 2<sup>nd</sup> 2022**

# Domestic Tender for supply and installation of UPS system

**The last date of the tender has been extended to 6<sup>th</sup> May 2022**

This is an RFQ (Request for Quote) for supply, installation, commissioning and testing of UPS system for cleanroom as part of a limited tender for the Centre for Nano Science and Engineering (CeNSE.) at IISc., Bangalore.

CeNSE is a multidisciplinary research department at IISc that houses a 14,000 sq. ft. cleanroom and characterization facility used by 50 faculty members from various disciplines at IISc. CeNSE also runs a program called Indian Nano electronics Users Program (INUP) which has allowed 6000 participants from more than 700 universities and institutes all over India to use the facilities at CeNSE. Consequently, any utility/facility at CeNSE receives significant exposure to scientific community at IISc and beyond. The vendors are requested to factor in the value of this exposure in to their quotes. Details of existing facilities can be gleaned from:

<http://nnfc.cense.iisc.ac.in/>

<http://www.mncf.cense.iisc.ac.in/>

1. Vendors will be required to submit a technical proposal and a commercial proposal in **two separate sealed envelopes**. Quotes in violation of this will be rejected.
2. The tender is being launched as per Government of India rules, specifically GFR 2017. Note that GFR has recently been amended. We shall follow the GFR rules as they stand on the date the tender has been released.
3. As per recent edits to the GFR, there are three classes of vendors distinguished by their “local content”. In the cover letter, vendors must mention which applies to them. This is a domestic tender that is open to Class 1 and Class 2 suppliers only. Quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor.
  - a. Class 1 supplier: Goods and services have a local content of equal to or more than 50%
  - b. Class 2 supplier: Goods and services have a local content more than 20% but less than 50%
  - c. Non-local supplier: Goods and services have a local content of equal to or less than 20%
4. **The deadline for submission of proposals is the ~~May 2<sup>nd</sup> 2022~~ 6<sup>th</sup> May 2022, 5:30 pm Indian Standard Time.** Proposals should arrive at the CeNSE office, GF-15, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India, by the above deadline.
  - a. Please mention **“Tender for supply and installation of UPS system”** on the envelopes.
5. The technical proposal should contain
  - a. Relevant technical datasheets. The committee reserves the right to cross-check the information in these datasheets with publicly available information.
  - b. A compliance table with 5 columns. The first column must list the technical requirement, in the order that they are given in the table 1 and 2 below. The second column should describe the capability of the tool for that specific requirement. Please be quantitative and consistent with the technical datasheets. In case the technical requirement is a text, second column must provide a technical answer. In case the requirement is a number, please provide a number. Third column must specify whether the technical requirement is met with a “Yes”, “No”, or “Partially”. If the response is “Partially” or “No” the third column, the fourth column must explain the extent of the deviation and, if possible, the reasons for the deviation. The fifth column is for other “Remarks”. You can use it to compare your tool with that of your competitors or provide more details/justifications.

- c. Technical capabilities of any *suggested* accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
  - d. Any additional capabilities or technical details, which you would like to bring to the attention of the purchase committee. Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors
6. If multiple systems fulfill the requirements, vendors can offer multiple bids.
  7. The technical proposal will be evaluated against the technical requirement. Only vendors who meet the technical requirement will be considered for the commercial comparison and negotiation.
  8. The commercial bids will be evaluated based on life-cycle cost of the tool. This includes the cost of purchase, maintenance, spares, etc. **For the calculation of L1 we shall use combined cost of 5 years of operation.** Part of this period will be covered by warranty, the rest with AMC. The methodology for the calculation is:
    - a. The cost of maintenance during the warranty period will be considered *zero unless* there are any mandatory replacements (mentioned in point #9.d.iv). Longer the warranty, lower the implied life cycle cost.
    - b. For the balance years, (5 – warranty), the cost of operation will be the quoted AMC charges (mentioned in point #9.e). Lower the AMC charges, lower the life cycle cost.
  9. The commercial bid must conform to the following:
    - a. Mention itemized cost of the system and *required* accessories, such as software, power supply, etc.
    - b. Mention itemized cost, as an option, for any *suggested* accessories/add-ons that may enhance the usability, capability, accuracy, or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
    - c. The quotes must be FOR IISc-Bangalore, India. So please include cost of shipping to Bangalore.
    - d. Mention the warranty provided with the tool.
      - i. Warranty of 3 years or more is preferred.
      - ii. Clearly indicate any part that is not included in the warranty.
      - iii. All electronics and instrumentation must be covered under the warranty.
      - iv. Mention the cost of any mandatory spares that must be replaced during regular maintenance, even in the warranty period. This number will be used to estimate the life cycle cost of the tool, as explained in point #8.a.
    - e. Provide yearly cost of AMC for 3 years beyond the warranty period. The AMC must satisfy the following:
      - i. Provide itemized cost for *required/expected* spares for operation during the AMC period. This number will be used to estimate the life cycle cost of the tool, as explained in point #8.b.
      - ii. Cover 4 scheduled preventive maintenance and 2 emergency visits per year.
      - iii. The emergency visit should be supported with a 24-hour response window.
      - iv. In case the OEM is foreign, clarify if maintenance will be done by a trained local engineer (OEM representative within India) or a specialist from abroad.
      - v. Cost of AMC must include an itemized list of spares (e.g. maintenance kits) that are essential for preventive maintenance.
    - f. Mention the length of time that the tools will be supported with service and spares from the date of installation. Our requirement is that the tools be supported for at least 5 years from the date of installation. To quote lowest price, vendors often quote for obsolete or soon-to-be obsolete equipment. This is **NOT** acceptable. For a user-facility like CeNSE, it is vital that the equipment be serviceable and supported for the foreseeable future. The length of guaranteed support will be used to estimate the life-cycles cost of the tool.

10. The decision of the purchase committee on the execution and evaluation of the tender, is absolute and final.
11. The RFQ must include references of 3 previous installations, preferably in India. Please provide the names and contact addresses of the referees, so that the committee can contact them independently.
12. We encourage vendors to give technical presentations, physically or online, so that we can better understand the technical capabilities of their tools and vendors can better understand the requirements. To schedule the presentations, the vendors can contact Mr. Gajendra M, GF-09, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. ([gajendram@iisc.ac.in](mailto:gajendram@iisc.ac.in)).
13. Any technical questions or request for site-visit/audit can be directed to Mr. Gajendra M, GF-09, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. ([gajendram@iisc.ac.in](mailto:gajendram@iisc.ac.in)).

**Table 1: General Requirements**

1.	Main application	<ol style="list-style-type: none"> <li>a) To supply uninterrupted power to cleanroom tools.</li> <li>b) Real-estate is very limited. System must have a low footprint.</li> <li>c) System should need minimal maintenance or upkeep. Systems that need regular replacements or spares will not be considered.</li> <li>d) The system should conform to established industrial safety standards. Mention the standard.</li> </ol>
2.	Facility type	<ol style="list-style-type: none"> <li>a) The system must be compatible with utility or maintenance facilities.</li> <li>b) Vendor MUST show evidence of at least 10 prior installations at similar (or larger) scale facilities.</li> </ol>
3.	Footprint & weight of the system including electronics, battery, storage, etc.	<ol style="list-style-type: none"> <li>a) Real estate is very constrained. Compact systems are preferred. Please specify the total foot print in cm x cm, volume, and weight.</li> </ol>
4.	System software	<ol style="list-style-type: none"> <li>a) Front panel displaying equipment and process status along with appropriate software to be supplied.</li> <li>b) System must interface with our building management software. Contact us for details</li> <li>c) Complete logs of all the process and system parameters to be available and stored for future trouble shooting</li> <li>d) Please specify the date the system was launched and the time the software will be supported. This is long-time investment. The system MUST have lifetime support.</li> </ol>
5.	Periodic Maintenance	<ol style="list-style-type: none"> <li>a) The system should require minimal maintenance. Mention the recommended preventive maintenance schedule for the system. Provide details of what constitutes preventive maintenance.</li> <li>b) Can the preventive maintenance be done by a trained on-site engineer (CeNSE employee) or requires a specialist from the OEM?</li> <li>c) Please note, that system should be supported by a trained local representative with a 24-hour window of response.</li> </ol>
6.	Installation and Training	<ol style="list-style-type: none"> <li>a) Installation and training at customer site, by the experts from OEM should be part of the package.</li> </ol>

		b) During the installation all the specifications of the processes should be verified for acceptance by the customer.
7.	Safety	a) Mention any special safety requirement of the system b) The system must come with a complement of interlocks to prevent common user errors. c) Flashing lights with the hooter during emergencies d) Mention the safety standards that you conform to. Our minimum requirements are given in Table 2.
8.	Recommendation	a) The system must submit references from at least 3 previous installations at similar or larger cleanrooms. b) The names and contact addresses of the referees must be submitted with the proposal, so the purchase committee can contact them independently.
9.	Acceptance tests	a) As per industry standards b) We reserve the right to test any of the specifications in Table 2.

**Table 2: Specific Requirements**

	DESCRIPTION	SPECIFICATION
<b>1</b>	<b>CAPACITY</b>	250 KVA/250 KW With Galvanic Isolation Transformer at Input
<b>2</b>	<b>INPUT</b>	
	Rectifier	IGBT - based PFC
	Input Voltage Range (Ph-Ph)	400 V AC, -20/+15%
	Input Frequency Range	50 / 60 Hz $\pm$ 10 %
	Input Current Harmonics (THDi)	<3% at 100% load
		<3% at 75% load
		<5% at 50% load
	Input Power Factor	> 0.99
	Input Phase sequence auto correction	Available
	Rectifier sequential start-up (hold-off-) (sec)	Settable from 1 to 300 Seconds
	Rectifier soft-start (Power walk-in) (sec)	Settable from 5 to 30 Seconds
<b>3</b>	<b>BATTERIES</b>	
	Temperature Compensated Battery Charging	Required
	Battery Backup	15 Min backup @ full load (250 KW) considered. Calculation shall be as per IEEE 485 Standard
	Battery Ah and quantity.	Vendors may provide quantity and capacity of batteries based on the DC voltage of the UPS and according to battery wattage Chart provided by the manufacturer and consider design margin of 10% and aging factor 25%, Pf 1
	Battery Make	AGM VRLA, Make Panasonic/Quanta/Exide Confirming to JISC :8702 ( Pt, I,II,III)
	Battery minimum VAH	230000 VAH
	DC Ripple	<1%
	Common Battery Bank option	Available
<b>4</b>	<b>OUTPUT</b>	

	DESCRIPTION	SPECIFICATION
	Inverter technology	3-Level IGBT (High Frequency PWM)
	Nominal Output Voltage (selectable) (Vac)	380-400-415
	Output Voltage Stability:	
	- Static (Balanced Load) (%)	± 1 %
	- Static (Unbalanced Load) (%)	± 2 %
	- Dynamic (Step Load 20%÷ 100% ÷20%) (%)	± 5 %
	- Output Volt. Recovery Time(after step load) (ms)	< 20 ms
	Output Frequency (selectable) (Hz)	50 / 60
	Output Frequency Stability	
	- Free Running Quartz Oscillator (Hz)	± 0.001 Hz
	- Inverter Sync. with Mains (Hz)	± 2 %
	- Slew rate (Hz/s)	<1
	Output Power Factor of UPS	Unity
	Over load capacity	125% for 5 minutes; 150% for 30 Seconds; >150% for 100 ms
	Output Harmonic Distortion (%)	< 1 %
	Linear Load	< 5 %
	Non-Linear Load	
	Crest Factor	3:1
	Output Waveform	Sine wave
<b>5</b>	<b>Bypass</b>	
	Inbuilt Automatic/Static Bypass	Available as standard
	Maintenance/Manual Bypass facility	Available as standard
<b>6</b>	<b>Overall Efficiency(AC-AC)</b>	
	at 50% load	>94%
	at 75% load	>95%
	at 100% load	>95%
<b>7</b>	<b>Parallel Configuration</b>	Upto 6 (Power parallel)
<b>8</b>	<b>Display Front Panel</b>	Touch -Screen
<b>9</b>	<b>Measurements</b>	
	<b>Input:</b>	
		Voltage (Vac), per phase
		Current (Aac), per phase
		Frequency (Hz)
		Power (kVA)
	<b>Output:</b>	
		Voltage (Vac), per phase
		Current (Aac), per phase
		Frequency (Hz)
		Power (kW), per phase
		Load (%), per phase
	<b>BYPASS:</b>	
		Voltage (Vac), per phase
		Frequency (Hz)
	<b>Battery:</b>	
		Voltage (Vdc), Current (Adc)
		Rated Capacity (Ah)
		Residual Autonomy (minute, %)

	DESCRIPTION	SPECIFICATION
<b>10</b>	<b>Audible Alarm for Following Conditions</b>	
		Mains Fault
		Battery Discharge
		Bypass fault
		Over temperature
		Overload
		Fault on UPS
<b>11</b>	<b>Communication interface /Network interface</b>	
	Required as Standard	Relay contact board,RS232, Mod-Bus RS485, SNMP-Ethernet For Remote Monitoring
	Sensor Manager	<ul style="list-style-type: none"> <li>• Sensor Manger/ Inbuilt (Smoking, Anti Fire System , Temperature/Humidity)</li> <li>• All Data / Logs Shall be read from the sensors and to be stored in an internal Device and should be downloadable file.</li> </ul>
	Remote Alarm Panel	Required
<b>12</b>	<b>Environmental</b>	
	UPS Ambient Temperature	0 - 40 Deg C
	UPS Storage Temperature	-10 to 70 Deg C
	Relative Humidity (non condensing)	<95%
	Audible Noise level	<65 dBA at full load from 1 meter distance
	Ventilation	Forced
	Protection	IP-20
<b>13</b>	<b>Reference Standards</b>	
	Electromagnetic Compatibility	IEC / EN 62040-2 (CE Marking)
	Safety	IEC / EN 62040-1
	Test and performance	IEC / EN 62040-3
	Certification	PEP ( LEED certification ) for Claim of Green Building Benefits
	Type Test Certificate/Report	To be Submitted
<b>14</b>	<b>Dimensions (mm) (W x D x H)</b>	To be Specified
	Weight	To be Specified
	Input/output terminals	Cables input from top/bottom
	UPS Manufacturer's own Service center	Should be available locally