Indian Institute of Technology Hyderabad
Kandi 502 285, Telangana, India
Phone: 040-23016042: Fax: 040-, 23016032
E-Mail: pur_rd@iith.ac.in

Enquiry No. **IITH/CSE/VINEETHNB/2020/T309** **Date: 17-07-2020**

NOTICE INVITING TENDER (NIT)

To

Dear Sir/Madam,

Sub: Quotation for Supply of "DATA CENTER PRECISION AIR CONDITIONING SYSTEM"- Reg.
Ref: Our Enquiry No. **IITH/CSE/VINEETHNB/2020/T309 Date: 15-07-2020**
Last date & time for submission of offer: 31-07-2020 at 03:00 pm.
Date & Time of Tender Opening : 31-07-2020 by 03:30 pm.

This Institute is interested in purchase of the following **Indigenous / Imports material** as per the enclosed terms and conditions.

S.No	Description	Qty Nos.
1	**DATA CENTER PRECISION AIR CONDITIONING SYSTEM** **Detailed specification as per Annexure-I of NIT**	**01**

For any technical query related to enquiry you may feel free to contact
Dr Vineeth N Balasubramanian Dept. Of CSE
Email: vineethnb@cse.iith.ac.in

Kindly acknowledge receipt.

Yours faithfully,

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(JAGADESWARA RAO B)
Assistant Registrar

TERMS & CONDITIONS:

1.	We are interested in the material available from **Ready Stock / Within 0 weeks**.
2.	The rate quoted should be **free delivery at IITH Stores, Kandi 502285 / FOR Imports upto CIP Hyderabad Airport basis.**
3.	The complete offer should be typed in the letterhead of the tenderer. The offer should be signed & stamped by Company's authorized signatory.
4.	Rates quoted in the tender should be **inclusive** of GST, and should be valid for 90 days. Breakdown details of packing, forwarding, freight and insurance charges in percentages should be shown separately. The goods should be insured in our favor against all risks from Warehouse to warehouse.
5.	The rate of GST should be clearly indicated wherever chargeable. However, the concessional rate of Central Sales Tax admissible to research institutes on purchase of scientific equipments from certain States is applicable to this Institute.
6.	The Delivery period should clearly have indicated and strictly adhered to in the event of an order is placed against your offer. Late delivery will attract liquidated damages @1 % per week subject to a maximum of 10% of the total value of supply order.
7.	Incase any of the items mentioned on pre-page is on the current rate/running contract please quote the DGS&D rate contract reference and also send a copy of the latest R.C.
8.	**Payment** for the supply will be made by Cross Cheque/RTGS/NEFT through State Bank of India, IIT Hyderabad Branch, Hyderabad, 502 285 **within 30days from the date of receipt and** acceptance **of material** and your bill in triplicate original signed over a revenue stamp affixed. In case of Equipment/Instruments the payment will be made after installation of the material. No Payment in Advance will be done.
9.	Quotation erased & overwritten will be summarily rejected unless corrections are authenticated with the tenderer's signature.
10.	The Offer should be submitted strictly as per the terms and conditions failing which the offer will be liable for rejection. In the event of the tenderer remaining silent on any terms& conditions of the NIT, it will be presumed that the tenderer(s) have accepted such terms and conditions in the event of any order/contract on them.
11.	**No deviation of the terms and conditions is acceptable. Terms and conditions which are in deviation of the tender terms are liable for rejection without making back reference to the tenderer.**
12.	**Conditional tenders will not be accepted**.
13.	(a) Quotation should be sealed & addressed to The Director, Indian Institute of Technology Hyderabad, Kandi 502285, Telangana. India. The cover should be sealed with wax and super scribed as per subject and enquiry No. mentioned on pre page. Quotation delivered personally should be delivered to the Receipt &Dispatch Section of IIT Hyderabad. Late & Delayed tenders will not be considered
14.	IIT Hyderabad does not take any responsibility for loss of tender in transit.
15.	The tender(s) should enclose the list of similar item(s) if supplied to any of the IIT Laboratories for the past three years with complete address, telephone /Fax No. and the contact person to whom they have supplied and installed similar item(s)with their tenders along with the prices finally paid.
16.	**Warranty & Maintenance contract**: The supplier shall **warranty** equipment, system components for a minimum period of **One years** following satisfactory installation and commissioning. The defects, if any, during the guarantee/warrantee period are to be **rectified free of charge by arranging free replacement wherever necessary. Any expenditure including government levies on account of the replacement are to be borne by the supplier/agent.** The supplier shall offer an annual test & maintenance agreement for three years, consisting of the following: Regularly and systematically examine, test and adjust all system components. Submit test reports that certify all components have been tested and the system is in proper working order and functions in accordance with this specification.

17.	a) **Spares & service Support**: The instrument supplied shall be of latest technology and model, so that you would support with onsite service and spares. b) Complete system pre-installation requirements.
18.	**Installation & Testing:** The installation shall be completed **within a week** from the date of intimation regarding the arrival of the equipment in the institute. A Penalty equivalent to 1% of the value of the goods will be levied for every week's delay in installation. The installed system shall be performance tested at our premises in accordance with the manufacturer's/supplier's recommendation/specifications. Tests shall demonstrate the proper operation of the instrument and all components.
19.	**Commissioning & Training:** The supplier shall perform on site installation, commissioning & startup of all system components in order to provide fully functional; system. The supplier shall train onsite institute's personnel on the operation and maintenance of the system framework. The supplier shall perform system check-out /start-up and /or training functions **free of cost**.
20.	The Director, IIT Hyderabad reserves the right to reject or accept or withdraw the tender in full or part and to increase or decrease the quantity without assigning reason thereof.
21.	The quotations are liable to be rejected if any of the above conditions are not complied with. The quotations should be complete in all respects duly signed wherever required. Incomplete and unsigned offers will not be considered. Quotations that are unclear leave room for interpretation will be considered non-responsive and will not be evaluate.
22.	**ARBITRATION: a)** Unless otherwise specified, in all cases of disputes which cannot be settled by mutual negotiations, the disputes or differences shall finally be settled and binding on both parties by arbitration in conformity with the rules of Indian Arbitration Act, 1940. All disputes or differences what so ever arising between the parties out of relating to the construction, meaning and operation or effect of the general terms and conditions including the Purchase Order or the breach thereof shall be settled by Arbitration Act, 1940 and the award made in pursuance thereof shall be binding on the parties. **b)** Performance of the purchase order shall continue during arbitration and any subsequent proceedings. **c)** The Jurisdiction and Venue of arbitration shall be Hyderabad. The Arbitrator will be the Director, IIT Hyderabad, or his nominee.
23.	**RISK PURCHASE:** If you fail to deliver the ordered material within the maximum delivery period stipulated in the purchase order, we may procure the same items in such a manner as it deemed appropriate for us. And, if we happen to incur any additional cost in the process of our procurement of similar materials you are liable to pay the same.
24.	**FORCE MAJURE:** If the performance of the obligation of either party is rendered commercially impossible by any of the events herein-after mentioned, the same party shall notice of 15 days from the date of such an event in writing to the other party. **i)** Government regulation; **(ii)** Legislation; **(iii)** Natural disasters; **(iv)** Strikes; **(v)** Lockout; **(vi)** Act of God.

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ASSISTANT REGISTRAR

TECHNICAL SPECIFICATION OF DATA CENTER PRECISION AIR CONDITIONING SYSTEM

IIT-Hyderabad proposes to have a high-performance precision type DX air-cooled units, which is of floor discharge type. The air-conditioning system will be designed based on the following parameters:

- Outdoor design conditions: IIT-Hyderabad, Telangana

  Summer : 41 °C DB, 25.6 °C WB

- Inside design conditions (Return Air Conditions): Air-conditioning system shall be designed for 24 hours' operation with following inside design condition.

  Temperature : 22 °C +/- 1 °C
  Relative Humidity : 50% +/- 5%
  Dust Content : 10 Microns

- Other basis of design along with equipment schedule will be as under:

Sl. No.	Equipment Heat Load	People	Lighting (Watt)	Equipment Proposed (Actual Net Sensible Capacity)
A.	30KW	500W	1.5W/sft	10TR * 1

- The capacity of equipment, specified above, is actual cooling capacity at operating condition during peak summer. Bidder is requested to check and confirm the capacity, before submission of the quotation. Bidder is requested to select the air-cooled condenser for 41 °C ambient condition to avoid any degrading factor during peak summer condition.

- **Power supply**

Power will be made available at 415 V 3 ph / 230 V single ph, 4 wire, 50 HZ earthed neutral system and all equipment shall be suitable for the above power supply with variation of + / -10 %(or) stable input supply without fluctuations.

All equipment shall operate at this voltage and any equipment operating at other than this power supply shall be provided by customer.

Power will be provided at a point near indoor unit. Cable from the point to the indoor unit itself will have to be cabled by the PAC contractor.

Precision Air Conditioners Unit Construction specifications:

A. Compressor

The compressor shall be hermetically sealed **scroll type** medium speed, designed for R410 only.

The compressor shall have proper lubrication system. Safety devices viz. high-pressure switch, low-pressure switch, low oil pressure (if applicable) shall be provided and such devices shall be electronically operated. Manual reset on safety cut out shall be provided. The horsepower for the compressor motor shall be adequately sized or 110% of the rated power required for the unit including drive loss. Capacity control shall be devised by providing at least two compressors working in Tandem for high part load efficiency.

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B. Condenser

The Condenser shall be of Air Cooled type and shall be constructed of copper tube with aluminum fins. Tubes shall be designed for a minimum working pressure of 32 kg/ sq.cm. The condenser shall be

complete with fans with drive motors and shall be provided with charging connection, safety relief valve and standard accessories, all encased in a powder coated GI casing with built-in electrical items and supporting frame. The condenser shall have the matching capacity with the compressor. There shall be a provision of isolating switch for the fans. The condenser fan shall be propeller type driven directly by brushless direct current (BLDC) EC motor with multiple speed facility. One condenser shall be coupled to one compressor for high efficiency performance. This type of condenser is most suited for installation on terrace. Speed shall vary as per set pressure.

C. Evaporator Cooling Coil

The cooling coil shall be flat type direct expansion type with multi-row deoxidised copper tubes with aluminium fins, complete with a hydrophilic treatment to reduce the surface tension between the water and the metal surface, thus favouring film-wise condensation. Air velocity across the coil shall be limited to 2.5 m/sec. The coils shall be pressure tested and thoroughly dehydrated before assembling.

The coil shall be placed to make the system draw through type. Refrigerant feed control shall be by electronic expansion valve. Temperature control shall be through microprocessor based control panel. Insulated condensate drain pan of SS construction shall be provided within the unit. Liquid receiver with safety plug installed inside the unit

The unit shall be factory assembled, wired, with inter connecting refrigerant piping and built-in microprocessor based control console and tested as per the relevant code.

The cooling coil shall be to produce the capacity required under specified coil condition and air quantity.

D. Evaporator Fan

The fan shall be heavy backward curve blade, directly driven with EC motor designed for high efficiency and quiet operation. Fan with steel impeller for backward curve bladed fan, mounted on steel shaft. The bearings shall be ball bearing type mounted on vibration absorbing rubber mounts. The fan motor shall be mounted within the cabinet. Motor horsepower shall be sized for 120% of the rated power required including the drive loss.

The supply fan shall be sized to deliver the required air quantity against the total external static pressure required for the system application, after taking care of all internal static pressure requirements of the units.

E. High Efficiency Filter

A set of High efficiency filters will be located inside the PAC unit cabinet.

The filters shall be high efficiency of 99% down to 5 microns. The filters shall be of cleanable type construction of reinforced glass fiber or cotton fabric or fabric-like material sand witched in between two galvanized wire netting arrangement in an uniformly corrugated form to increase the surface area.

The filters shall have G.I. frames of adequate thickness suitable for long use in an industrial plant. The filters may be in panels of adequate size for easy handling them. . Low airflow and clogged filter alarm sensors consisting of two pressure switches for controlling the operating conditions of the fans and the build-up of dirt on the air filters inside the unit

The filter panels shall be mounted on the ladder type angle iron holding frames. The frames shall be designed strong enough to take the load of double the pressure drop in dirty condition of the filters. Face velocity of air across the filters shall not exceed 1.5 m/sec.

F. UNIT MICROPROCESSOR CONTROLS:

The microprocessor controller manages the unit operations autonomously. In direct expansion unit the algorithms permit integral management of the Electronic expansion valve (EEV) with consequent optimization of energy saving, constant air flow during dehumidification and absolute operating stability. Units have been designed and developed to interact with all the most widely used Building Management Systems, exchanging data via the most common communication protocols through serial connections.

The Uniguard UG40 user terminal is fitted with a backlit 11x15 pixel LCD display and 6 backlit keys to move between and change parameters. It can be situated on board the machine or, on request, with a kit for wall mounting for the remote control of the unit. By means of the user terminal, you can set the air-conditioners operating parameters, monitor the trend of the main working parameters and read any alarm messages.

The controls should have separate indications for

a. Various modes of operation (cooling, heating)
b. Alarm conditions (temperature high, wet floor and loss of air flow)
c. Date, time and unit identification display
d. Visual system alarm indication (along with mutable audio alarm as well)
e. Programmable services interval indication display
f. Inbuilt sequencing of machines.

The system is a menu driven interface with supporting help screens and shall use multi-protocol data communications. Access to the controller settings shall be protected with passwords to prevent against unauthorized access.

The unit is capable of communicating through an RS-232 communication support to link up to 99 units for monitoring and control purposes. The controller should also incorporate 2 additional spare alarm inputs for customer interface (e.g. Unauthorized entry alarm, building fire alarm etc) manual override switches & selectable alarms. Local & remote alarms will be triggered in case of any alarm conditions being reached

The microprocessor control system can be supplied with the following optional cards:

- RS485 serial adapter for data transfer to a central supervisor system with STD protocol or MODBUS protocol;
- Clock card for managing scheduling operations and for the operations counter functions
- WATER LEAK DETECTOR comprising a control module installed on the electric switchboard and an external sensor.
- Unit should start automatically functioning when power is restored after power failure.
- Fault and Alarm display for Single Phase / Phase reversal / HP – LP / TEMP sensor / Condenser fan MCB / Indoor fan overload

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Bill of Material

S.no	Item Description	Unit	Qty
1	**Supply of PAC Machines**		
	Capacity: 10 TR (1W+1S) Model: DX Based Bottom Discharge unit, without humidifier	No	2

S.no	Item Description	Unit	Qty
	Supply & Installation of Necessary Copper Piping between Indoor & Out Door for Suction & Discharge Line of Suitable Size including all fitting & accessories.		
1	Hot Line 5/8"	RMT	60
2	Cold Line 7/8"	RMT	60
3	CPVC Drain Pipe with necessary fittings	RMT	18
4	MS Stands for PAC Machines both Indoor & Outdoor	No	2
5	Refrigerant gas	Kg's	30
6	Thermal Insulation with 13mm thickness nitride rubber for entire DC area.	Sq.ft	550
7	Installation & Commissioning of PAC	No	2
8	Emobile Sockets for Server Connectivity (3pin or 5 pin as per PDU's in Rack)	Set	8
9	1Cx 16 Sq.mm Cu Green Cable for Earthing Connectivity.	RMT	100
10	3CX 1.5Sqmm for lighting & rodent etc	RMT	100
11	2X2 LED Lighting Fixtures	No's	10
12	Design, Drawings, Installation, testing & Commissioning including unloading, positioning and erection with necessary man power.	LS	1

Delivery and Installation:

- All the necessary tools & cables required for making the systems operational shall be provided by the bidder. Cabling should be neatly carried out during the installation, with appropriate labels on any cables used.
- **Training:** Appropriate training must be provided for all users on administration and usage of the system.
- **Testing:** Complete testing for proper functionality to be performed. All equipment provided by the bidder should be installed and configured to achieve the maximum possible performance.
- **Benchmarking:** Appropriate performance of the installed systems should be reported and demonstrated on site after installation.

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