



Indian Institute of Technology Kanpur National Center for Flexible Electronics

Enquiry number: SCDT/FLEXE/2018-19/06

Opening Date: 27.07.2018

Closing Date: 16.08.2018

NOTICE: INVITING TENDER FOR VARIABLE FREQUENCY DRIVES (VFD) FOR AHU's FAN MOTOR AT NCFLEXE

Sealed quotations are invited from OEM (original equipment manufacturer) or their authorized dealer/agencies by National Center for Flexible Electronics (NCFlexE), IIT Kanpur for the “**Variable Frequency Drives (VFD) HVAC drive for AHU's including supply, installation, commissioning, testing & validation**”.

Note: All vendors are requested to send “**Technical bid (Including unpriced item wise BOQ) and Price bid (Including item wise pricing BOQ)**” submitted together in separately sealed envelopes. The BIDS shall be based on the technical specifications as given in this document. The technical parameters has to be filled and submitted as in Annexure-1.

Scope of the work: Supply, Installation, Commissioning, Testing & Validation of variable frequency drives (VFD) HVAC Drive for AHU's with RTD sensor, 2 core shielded control cable & accessories, at NCFlexE, IIT Kanpur.

Technical specification for variable frequency drives for fans / pumps in HVAC applications

- 1) The VFD shall be of the type suitable for operation on a 3 phase, 380 - 480 VAC, 50 HZ input power supply at the following conditions:

Input supply voltage variations:	±10 %
Input supply frequency variations:	49-51 Hz
Ambient temperature:	0 - 50°C without deration
Maximum relative humidity:	95% non-condensing
Vibration:	min 1 g RMS in 3 directions
Minimum efficiency at full load:	>97%
VFD Ingress protection class:	IP20
RFI filter (EN 55011)	Class A2
Local control panel	Graphic
- 2) VFDs shall conform to the recognized international standards like IEC and manufactured according to ISO 9001, BS 5750 part 1 & 2 and shall be UL listed. It shall carry the CE mark on EMC compliance.
- 3) The VFD shall be dedicated for HVAC applications.
- 4) The VFD shall have an algorithm to operate any PM motor. Same drive can be used for PMAC motor in future.
- 5) The VFD shall be capable of providing overload torque of 110% torque for 1 minute.
- 6) The VFD shall maintain full output voltage during main's variations of +10% to prevent loss of torque and speed variations occurring during motor operation.

7) The VFD shall comply with Electro Magnetic Compatibility (EMC) product standard IEC 61800-3:2004, Category C2. The supplier of drives shall include additional filters needed, if any, to meet this compliance.

8) The VFD should have a fireman's override feature, where in the drive can override its standard settings to provide for a life safety application – such as building pressurization or smoke purge operation.

9) For higher reliability and up time the VFD PCB's shall be coated for 3C3 per (IEC 60721-3-3) standards.

10) The VFD shall have KWH counter built in.

11) The VFDs shall have internal harmonic filters on the both DC bus to reduce current harmonics (THiD) to 40-45%. AC line chokes on the input side are not allowed for harmonic current control as it will cause voltage drop to the VFD and motor.

12) Complete AMA (Automatic Motor Adaptation) at stand-still shaft shall be possible within selected VFD.

13) It should have USB port as inbuilt to read VFD parameters directly connecting laptop /PC through printer cable.

14) The VFD must have different protection modes as given below –

- a) Electronic thermal motor protection mode against overload.
- b) Frequency converter should trip, if heat sink temperature reaches 95°C ±5°C.
- c) Protection against short circuits on motor terminals.
- d) Protection against earth fault on motor terminals.
- e) Protection against mains phase loss

15) Brake IGBT is not required in VFD.

16) The VFD shall be provided with the following integrated, built in protocols as standard.

- a) Modbus RTU
- b) Johnson Controls N2
- c) BACnet MSTP

17) It must provide flexibility for the BMS.

BOQ of the material:

- 1. VFD rating with RTD sensor, 2 core shielded control cable & accessories : 11 kW : 2 nos.
- 2. VFD rating with RTD sensor, 2 core shielded control cable & accessories : 18 kW : 2 nos.
- 3. VFD rating with RTD sensor, 2 core shielded control cable & accessories : 22 kW : 1 nos.

Annexure-1

S. No	Parameters	Details Required
1	Input Supply/ General Data	
	Make of VFD	
	Display (local control panel)	
	Main supply voltage	
	Supply frequency	
	Displacement power factor	
2	Output Data	
	Ramp times	
	Output voltage	

	Output frequency	
3	Digital Inputs	
	No. of programmable digital inputs	
	Logic	
	Voltage level	
	Maximum voltage on input	
	Scan interval	
	Input resistance	
4	Analog Inputs	
	No. of Analogue inputs	
	Modes	
	Voltage level	
	Current level	
	Accuracy of analog inputs	
	No. of PID controller	
5	Pulse Inputs	
	No. of Programmable pulse inputs	
	Voltage level	
	Pulse input accuracy (0.1 – 1 kHz)	
6	Digital Outputs	
	No. of Programmable digital/pulse outputs	
	Voltage level at digital/frequency output	
	Max. output current (sink or source)	
	Maximum output frequency at frequency output	
7	Analog Outputs	
	No. of Programmable analogue outputs	
	Current range at analogue output	
	Max. load to common at analogue output	
	Accuracy on analogue output	
8	Relay Outputs	
	No. of Programmable relay outputs	
	Max. terminal load (AC)	
9	Control Card	
	RS485 interface speed	
	USB plug type	
	Max. load (10 V)	
	Max. load (24 V)	
10	Surroundings/External	
	Enclosure IP	
	Max. relative humidity	
	Ambient temperature w/o derating	

Terms and conditions

1. Evaluation will be done on the basis of technical specifications given in tender document.
2. Financial bid will be open for those only who qualify all the technical specification as per our tender notice.
3. Quotation must be valid for 90 days
4. Please send the name and contact details of the person to whom company had supplied/ or give services for similar systems & requirement. Committee may ask for the feedback.
5. Payments terms: 70% against delivery at IIT Kanpur, 20% against installation and 10% against successful running of equipment for 3 months and approval.
6. The supplier must have supplied systems to institutions of national and/or international repute.
7. Warranty/Guarantee should be clearly mentioned. The Warranty must start from the date of installation at IITK.

8. Installation, demonstration, and training-sessions at IIT Kanpur will have to be provided by the manufacturer or the vendor for the quoted system free of cost.
9. Quotation should carry proper certifications like proprietary certificate/ authorization certificate from manufacturer, etc.
10. Price must include all taxes and charges.
11. Institute is exempted for partial custom duty (CD applicable to IIT Kanpur is 5.15%).
12. The delivery period should be specifically stated. Earlier delivery may be preferred.
13. At any time prior to the deadline for submission of bid, the Institute may, for any reason, at its own initiative, modify the bid document by amendments. Such amendments shall be uploaded on the website through corrigendum and shall form an integral part of bid document. The relevant clauses of the bid document shall be treated as amended accordingly. It shall be the sole responsibility of the prospective bidders to check the website from time to time for any amendment in the tender document. In case of failure to get the amendments, if any, the Institute shall not be responsible for it.
14. The Penalty @1% per week or part thereof subject to max 10% of the delivery price will be deducted from the balance payment, if supply is not completed within aforesaid delivery period.
15. The indenter reserves the right to withhold placement of final order. The right to reject all or any of the quotations and to split up the requirements or relax any or all of the above conditions without assigning any reason is reserved.
16. Concessional rate of GST (@ 5%) will be applicable with reference to Notification No. 45/2017 Central Tax (Rate) dated 14/11/2017. We will provide relevant certificate for this purpose. On import items for research purpose presently the GST applicable is 0% (Zero). DSIR certificate along with CDEC has to be submitted for availing concession. Vendor should use these GST rates in their quotation.

Kindly send the quotation in sealed envelope latest by 3:00PM Dated 16.08.2018 to the following address;

**To,
Prof. Siddhartha Panda
Room No. 305,
Samtel Center for Display Technologies (SCDT)
Indian Institute of Technology Kanpur,
Kanpur-208016, Uttar Pradesh, India**