Electrical Engineering Department,
Indian Institute of Technology Delhi

Date:7/11/22013

NIQ for purchase of "Three Level VSC"

Sealed quotations are invited for purchase of four in number "Three Level VSC" with the following specifications:

DC bus rating	750 V
DC link capacitance	Around nominal (1600±100)μF
AC output voltage	415 V
AC output current	35 A
Output frequency	50 Hz
Switching frequency	20 kHz
Output power	25kVA
Type of cooling	Forced air cooling(1 phase Fan)
Snubbers for switch	Required with proper design for proper function of system
Thermal protection	Required (set according to safe operation of devices)
Gate driver specifications.	Supply +15 V 0 V(nominal) Input signal voltage levels for on/off typically +15/0 V respectively **Internally isolated grounds** 14 A peak current driving capacity Maximum average current of 200mA per leg(4 IGBT) Operating temperature -30 to 80 °C collector emitter voltage sense across the IGBT 1600V dV/dt typically 45 KV/μs Output-turn on gate voltage 15 V w.r.t. emitter. Output-turn off gate voltage -7 V w.r.t. emitter. I/P-O/P turn on/turn off propagation time delay typ. 1 to 2 micro seconds R_{in} min.80 k Ω. Internal dc-link dead short circuit protection. Device short circuit current protection.(V_{ce} protection)

IGBT module specification	All the switches in one leg (4-IGBTs with inverse diodes and 2 freewheeling diodes) should be in a single module. V_{ces} at T_j 25°C 600 volts The collector current rating IGBT (I_c) at T_j 175°C (T_s 25°C 80 A T_s 70°C 65 A with I_{CRM} 150 A) V_{GE} ±20 V On resistance of switch maximum 10 m Ω at T_j 25°C and 15 m Ω at T_j 150°C(V_{GE}=15V) V_{CEO} maximum 1.1V at T_j 25°C and 1V at T_j 150°C Inverse diode current rating T_j 175°C (T_s 25°C 90 A T_s 70°C 70 A with I_{FRM} 150 A) V_{FO} for inverse diode maximum 1.1V at T_j 25°C and 1V at T_j 150°C Freewheeling diode current rating T_j 175°C (T_s 25°C 90 A T_s 70°C 70 A with I_{FRM} 150 A) V_{FO} for freewheeling diode maximum 1.1V at T_j 25°C and 1V at T_j 150°C
Packaging	Enclosed in transparent acrylic sheets with all salient power terminals (Three terminals of DC bus and three-terminals of three-phases)available for connection with standard banana switches. Terminals for connecting 1-ph input to cooling fan. Terminals for connecting +15V bias supply for gate drivers. Terminals for connecting all gate inputs with isolated +15V and ground.
DC bus structure	Sandwiched platted DC link structure.

Where T_j is junction temperature and T_s is heat sink temperature

TERMS & CONDITIONS

1. Please submit the TECHNICAL and FINANCIAL bids in separate sealed envelopes. Mark the two envelopes clearly as "Technical Bid" and "Financial Bid". Both the sealed envelopes should be sent in a single sealed envelope, with clearly marked as "NIQ for 3 level VSC". The quote should reach the following address on or before **2/12/2013** upto **5:00 PM.**

   Name : Prof. Bhim Singh
   Address : Professor, Room No. II-118,
   Deptt. of Electrical Engineering,
   Indian Institute of Technology, Delhi
   Hauz Khas, New Delhi-110016 (India)

2. Please quote prices at FOB/ CIF New Delhi, inclusive of installation charges.
3. Quote should be in Indian Rupees and to valid for at least three months.

4. Attach all the technical literature and a list of similar installations done in India.
5. Mention the warranty period. Also mention if there are additional prices for on-site warranty.
6. Mention if you can provide any technical support like training of IIT Delhi personnel at IIT Delhi or in your factory and providing a technical person for operation of the machine for the initial period of 2 years. Kindly mention about this in technical bid.
7. If the quote is being submitted by the representative of the Principals/manufactures themselves, a valid Agency ship/Dealership Certificate authorizing the agent to quote to IIT Delhi on behalf of the Principals should be enclosed.
8. The Institute reserves the rights to accept/reject any/all quotations without assigning any reasons thereof.
9. Complete set of manuals for the operation and servicing of equipment should be given. All circuit diagrams, other mechanical and electrical schematics must be provided to Main unit, sub systems and accessories.
10. **Delivery as early as possible in weeks on receipt of PO.**
11. Clearly specify the installation requirements – such as space, power, frequency, environment (Temperature and humidity) etc.
12. If the items quoted are proprietary in nature, please enclose proprietary certificate from the principals stating "Certified that ---------- is a proprietary item of M/s ---------- and no other manufacture make these items".
13. If the bidder is Indian agent, the agency certificate should be enclosed.
14. Please produce compliance certificate for the specification.
15. Please ensure that the Indian agent has been enlisted with the Department of Expenditure, evidence may please be attached.
16. All bank charges payable in India are to buyer's account and bank charges in seller's country to seller's account.

(Principal Investigator)

(Chairman, Purchase Committee)

Purchase Committee Members:

Prof. Bhim Singh

Prof. G. Bhuvaneswari

Prof. S. Mishra

Dr. B. K. Panigrahi