

**DEPARTMENT OF ELECTRICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY (BHU) VARANASI
ENQUIRY**

Ref: IIT (BHU)/EE/2021-22/15

Due Date: 22-10-2021

Date: 08-10-2021

Dear Sir / Madam,

Please submit your lowest quotation for supplying the under mentioned items. Quotation in duplicate must reach "The Head, Deptt. of Electrical Engg., IIT(BHU), Varanas-221005" before the date marked above and should contain the following information:

1. Full specification and make of the item offered and its rate F.O.R. Varanasi/CIF New Delhi.
2. Sales tax at concessional rate as applicable to educational institution.
3. Your sales tax registration number and TAN number.
4. Conditions of supply and terms of payment.
5. If you are a manufacture of the item or if you have proprietary right over it, please mention it in the quotation and provide a certificate.
6. Please mention your agency commission in Indian Rs., if applicable (in case of imported items).
7. Please give undertaking as per annexure-I-B and annexure I-C

Quotation must be sent in a **sealed envelope** with the following items written over the envelope.

1. "QUOTATION of PMBLDC Motor Drive: For Kind attention of Dr. N. K. Swami Naidu".
2. The reference number mentioned above and the due date mentioned above.

S.No.	Item Description	Qty. No.
1	<p>3 HP PMBLDC motor Coupled with DC generator with Drive and in built Controller</p> <p>The complete setup should consists of all the following 4 elements to demonstrate the working of PMBLDC motor drive up to its rated speed and rated load conditions.</p> <p>a) 3 HP BLDC Motor with DC Generator Load b) 3 phase, 10 KVA IGBT Power Module with input diode bridge rectifier c) Loading Rheostat & Field Exciter d) FPGA based PWM Controller</p> <p>The complete setup should have the access to take out the sensor outputs and also to give the PWM pulses from the external DSP controller.</p> <p>The detailed specifications of each sub module are mentioned below</p>	1

a) 3 HP BLDC MOTOR WITH GENERATOR LOAD SETUP:

Both motor and generator should be coupled and mounted in common base plate.

PMBLDC Motor Specifications

Voltage : 48/60/72 V
Rated Current : 60 Amp
Rated Speed : 3000 RPM
Rated Power : 3 HP
Sensor : Hall Effect Position Sensors at 120 degrees apart

DC Machine Specifications

Power : 3 HP
Voltage : 220V DC
Armature Current : 12 A
Speed : 3000 RPM
Field voltage : 220V DC
Double side shaft extension.

b) 3 KVA IGBT POWER MODULE WITH INPUT DIODE BRIDGE RECTIFIER

Input	:	300 V DC max
Output	:	60 V, 75 A AC
Capacity	:	10 kVA
IGBT Power Module Rating	:	600 V, 100 A
3Ø diode rectifier	:	1200V @ 150A
Analogue DC Voltmeter	:	0-600V DC
Number of PWM Input	:	6
Maximum PWM Frequency	:	15 KHZ
PWM Level	:	0-3.3/5V (TTL)

- Six Number of PWM Isolator with power supply for IC
- IGBT Gate Driver with Model SKYPER 32R
- Common +15V Power supply should be provided for all the driver circuit.
- Driver circuit with Short Pulse Suppression (SPS), Under Voltage Protection (UVP), Drive interlock (dead time) top / bottom (DT), Dynamic Short Circuit Protection (DSCP) by VCE monitoring
- Temperature protection should be available.
- LED should be provided for trip status indication
- Reset switch should be provided for TRIP RESET
- The inverter should also provide required current and voltage sensor to successfully run the drive.
- Test points need to be provided for PWM signal and Current wave form measurements
- Sensors output and PWM isolator input terminals should be available from the outside
- MCB should be there at input side for Input supply ON/OFF
- LED indication should be available for PWM input and power supply input and fault signal.
- Banana connectors should be provided for 3 PHASE AC input
- Banana connectors should be provided for 3 phase output

c) Loading Rheostat & Field Exciter

- 1 No. of 3 KW Loading Rheostat should be provided.
- 1 No. of Field Exciter should be provided

d) FPGA based PWM GENERATOR (Controller)

- Processor speed 20 MHZ
- 20 output lines / inputs lines are in 3.3/5V level
- Isolated serial communication interface through USB connector
- 4MB PROM for code execution memory.
- External JTAG header for programming
- 20x4 (or 16x2) LCD interface header.
- 8 user LEDs/4 position user DIP switch
- 2 up & down input push switch
- Increment & decrement key should be provided to vary the duty cycle in open loop & vary the set speed for closed loop.

N Krishna Swami Naidu,
Assistant Professor,
Electrical Engineering Department,
IIT(BHU), Varanasi-221005,
India

INDIAN INSTITUTE OF TECHNOLOGY (BHU) VARANASI

TO BE RETURNED

Following proforma should be filled in and duly signed by the firm and sent along with the quotation.

(Please refer to the detailed instructions/notes before filling this proforma).

1. Validity of the offer :
2. Approximate Delivery Period :
3. (a) Whether rates have been quoted F.O.R. site and covers packing forwarding and insurance charges. : YES / NO
- (b) If not, please mention the same : YES / NO
4. (a) Whether the prices are inclusive of Sales Tax and other taxes. YES / NO
- (b) If not, kindly specify the amount / rate :
5. If the Sales Tax is charged extra, declaration for charging Sales Tax correctly attached. : YES / NO
6. (a) Whether supply will be made directly or through any Local / Regional / Authorized Dealer / Stockist : Directly/Stockist/Authorized Dealer.
- (b) If through a Stockist / Dealer: -
- (i) Name and full address of the Party :
-
- (ii) Whether the order to be placed with the : Principal / Stockist / Dealer
- (iii) Who will raise the bill : Principal / Stockist / Dealer
- (iv) Cheques will be drawn in favour of : Principal / Stockist / Dealer
- (v) Whether any Delivery, Packing and Forwarding : YES / NO
- Charges will be payable to local : Stockist/Dealer
- (Please specify the amount/percentage etc, if any)
7. Our terms of payment (Please indicate your preference by a (✓) mark).
Please note that no other payment terms are likely to be accepted
- (a) For Local Firms or if the bills are raised by the Local Dealers.**
- (i) 100% Payment on bill basis :
- OR**
- (ii) 100% payment against Proforma Invoice after receipt of materials in good condition, installation and satisfactory report.
- (Only under exceptional cases)**
- (b) If the bills are raised by outstation Firms**
- (i) 100% Payment on bill basis :

OR

- (ii) 100% payment against Proforma Invoice :
after receipt of materials in good condition,
installation and satisfactory report :
- OR
- (iii) D.G.S. & D. Terms of Payment for D.G.S. :
& D Rate Contract items :
- OR
- iv) 75% against Proforma Invoice (at site) or :
documents through Bank and 25% after
receipt of materials in good condition,
installation and satisfactory report. :
- OR
- (v) 90% payment against Proforma Invoice (at :
site) or documents through bank and 10%
after receipt of materials in good condition,
installation and satisfactory report (Only under
special Circumstances). :
8. Whether any Excise Duty is payable on the : YES/NO
items. :
If yes, indicate the amount / percentage. :%
9. Whether any installation charges are payable : YES/NO
extra. :
If yes, amount to be specified. :
10. Whether any discount for educational :
institution :
offered on the printed price list of the : YES/NO
manufacturer. :
Please mention the amount / percentage. :
11. Whether the product is on DGS &D/D.I. Rate :
contract. :
If yes, please enclose a photocopy of the : YES/NO
same. :
12. Whether the product bears I.S.I. Mark. YES/NO
If yes, please mention the I.S.I. License no. :
13. (a) Whether the firm is Sales Tax payer. : YES/NO
If yes, please mention the Sales Tax Numbers. :
- (b) Whether the Local Dealer(s) is / are Sales : YES/NO
Tax payer(s) :
If yes, please mention the Sales Tax numbers :
of each :
14. Whether printed / authenticated price list of :
the Firm's :
Products and Catalogue etc. enclosed. : YES/NO

Signature of the Authorised Official with Seal

TO BE RETURNED WITH QUOTATION

UNDERTAKING

WE HEREBY UNDERTAKE THE FOLLOWING:

1. We will not sell the product (s) to other institutions, bodies and also in the market on the rates Less than those quoted by us to the Institute.
2. The goods on which Sales Tax has been charged are not exempted for payment of Sales Tax under C.S.T. Act or U.P.S.T. Act or the rules made there under and the amount mentioned on account of Sales Tax on goods is not more than what is payable under the provisions of the relevant Act or Rules made there under.
3. The rate of Excise Duty mentioned in the quotation is in accordance with the provisions of the rules and the same is payable to the Excise Authorities in respect of the stores.
4. The goods / Stores / articles offered shall be of the best quality and workmanship and their supply will be strictly in accordance with the technical specifications and particulars as detailed in the quotation.
5. The information furnished by us in the quotation is true and correct to the best of our knowledge and belief.
6. We have read and understood the rules, regulations, terms and conditions and agree to abide by them.

Authorised

Signatory (Seal)