Ref: APD/CB/MF/20/ASR/374

Sub: Minor Fabrication - invitation of quotations for the job of “Design, Fabrication, Inspection & Supply of Job handling Unit (4 axis Manipulator) up to 100Kg load capacity with remote operation for EHPPL, Kalyan” as per attached Annexure I.

Due Date: - 24th March 2020.

Dear Sirs,
1. Quotations are invited for the minor fabrication job, as per the enclosed specifications and drawings.
2. Bidder shall quote for fabrication of these components with material.
3. Bidder shall take out an insurance policy in favor of BARC for any free issue material supplied.
4. Taxes shall be quoted separately. Form H shall be provided where necessary.
5. The quotations must reach, Head, Applied Physics Division on or before the due date referred above and must be sent in a sealed envelope super scribed with the above reference number and due date.
6. The address on the envelope should read:
   The Head,
   Applied Physics Division, PURNIMA LABS,
   Bhabha Atomic Research Centre
   Trombay, Mumbai - 400 085.
   Attn: - Shri. Amit Rav

7. The fabrication work shall be subject to inspection by our representative. The finished components shall not be dispatched prior to approval by our representative at the bidder's works. Necessary inspection facilities should be provided to our engineers during fabrication at bidder's premises.
8. The bidder shall deliver the finished components after approval by our representative, within four months from the date of the firm purchase order issued to the bidder. The finished components shall be delivered by the bidder at Village Chinchavli, Post khoni, Malang road, EHPPL, BARC Kalyan (E) -421 204.
9. Head, Applied Physics Division, BARC, reserves the right to accept/reject any or all quotations without assigning any reason.
10. Payment will be made only after satisfactory completion of work on production of bill, delivery challan and advance stamped receipt. It may be noted that IT @ 2% shall be deducted from your bills.
11. Job will be guaranteed against material and manufacturing defects for 1 year from the date of supply.

(Amit Rav)
For and on behalf of
Head, Applied Physics Division
Annexure 1

Ref: APD/CB/MF/20/ASR/374

Title: Design, Fabrication, Inspection & Supply of Job handling Unit (4 axis Manipulator) up to 100Kg load capacity with remote operation for EHPPL, Kalyan.

Scope of work:

1. Design, fabrication and supply of 4 axis Job Handling Unit with load bearing capacity up to 100 kg with remote operation.
2. 4 axes include X-axis, Y-axis, Z-axis and Rotation with respective travel ranges which are not less than around 1200 mm, 650 mm, 650 mm and 360° respectively at a linear speed variation of 0 – 40 mm/sec and rotational speed of 0-20° /sec.
3. Design, fabrication and supply of electrical system of desired supply, controls and feedback for smooth operation of Job Handling Unit.
4. Design, fabrication and supply of mechanical system of desired load capacity.
5. Integration, testing, inspection and commissioning of electrical and mechanical system to achieve desired target of 4 axis Job Handling Unit of 100 kg load capacity with remote operation from a distance of 20 mtr.

I. Electrical Modification:

1. Design, fabrication & Supply of Complete Electrical Panel for four (04) axis, i.e. X, Y, Z Axis & Rotary Table, Job Handling Unit with load capacity of 100 kg.
2. Programmable Logic Controller (PLC) with required programming and configuration having sufficient Digital Inputs / Digital Outputs for controlling and operating all four axis.
3. Servo motor and Servo Drive for rotary axis or equivalent along with electrical panel and switch gear Accessories with feedback system for accurate positioning (0.5°) of the rotation axis.
4. Induction motor with VFD or equivalent for X, Y and Z axis motion.
5. PC based control development for remote operation for all four axis.
6. All motors and their capacity should be selected for smooth operation of 100 kg load.
7. Single phase supply should be used for all electrical components.
8. Limit switches / End proximity switches should be provided for X, Y and Z axis.
9. Cables and wires should be neatly routed through conduit.

II. Mechanical Modification:

1. For X-axis Ball Screw and LM Guide ways or equivalent for total travel of ~1200 mm. The Ball screw should be driven by an AC Induction Motor or equivalent, through an appropriate Reduction Gear Box. Positive Stoppers with limit switches should be provided at both ends of the travel.
2. For Y-axis Ball Screw and LM Guide ways or equivalent for total travel of ~650 mm. The Ball screw should be driven by an AC Induction Motor or equivalent, through an appropriate Reduction Gear Box. Positive Stoppers with limit switches should be provided at both ends of the travel.
3. For Z-axis Ball Screw and LM Guide ways or equivalent for total travel of ~650 mm. The Ball screw should be driven by an AC Induction Motor or equivalent, through an appropriate Reduction Gear Box. Positive Stoppers with limit switches should be provided at both ends of the travel.
4. A turn Table, having diameter 600 mm & Load bearing Capacity 100Kg should be provided for mounting of the Test Piece. This Turn Table should be attached to Z-axis through bracket or other arrangements. This Turn Table should be driven by a Servo Motor, through Timing Belt and Timing Pulleys or equivalent. Precision controls and feedback should be derived to have rotation position accuracy of 0.5°.

III. Other Requirement:

1. The travel speed for the X, Y and Z axis should be variable 0 – 40mm/sec and turn table rotates clockwise or anticlockwise with variable speed will be 0-20 deg/sec.
2. All motors should be operating on single phase power supply and should be flame proof.
3. Mechanical stands may be provided if required during installation process of the Job Handling Unit.
4. Movable trolley / material handling cart of capacity 100 kg should be provided, to facilitate loading of Job on the turn table attached to Z-axis.
5. Materials and standard parts which are necessary for the fulfilment of the specification shall be of good quality and in accordance with good practice in the manufacture of the components, specified herein. Workmanship shall be in accordance with the best engineering practice in order to ensure satisfactory operation for the service life of least ten years and ease of maintenance.

IV. Tentative Schematic of 4 axis Job Handling Unit for 100kg Capacity