Request For Quotation

Enquiry No. ME/JR/2015-16/Micromachining Setup

Enquiry Date: 12/07/15

Closing Date: 27/07/15

Subject: **Purchase of Micromachining Setup**

Quotation for the items mentioned above is requested in sealed envelop. The quotation should reach on or before July 27, 2015 to the address given below. The prospective suppliers are required to send quotation in two parts in sealed envelops, as **"TECHNICAL BID"** and "**FINANCIAL BID**". The Technical Bid should contain detailed technical specification of the product being offered and should not mention and prices. The financial bid should include the detailed price quotation clearly including the cost of the equipment, taxes, service and shipping and handling charges, The two separate and sealed envelopes should be clearly marked appropriately as "Technical Bid" and Financial Bid.

Terms and conditions:

1. Maximum educational discount, if any should be offered
2. Validity of Quotation should be at least for 60 days
3. Prices should include delivery up to IIT Kanpur
4. Prices should include the installation and training cost
5. Warranty should be for at least two years after installation with 1 year AMC at free of cost
6. Delivery period: within 80 days from the date of purchase order
7. Normal payment terms for the Institute will be applicable 90% on delivery of the item and the remaining 10% after satisfactory installation/inspection
8. Quotation should carry proper certification like Agency Certificate Proprietary Certificate, etc.
9. An undertaking that the vendor will supply all the spares and service for the equipment for at least 5 years from the date of commissioning

CNC MICROMACHINING CENTER

(MILLING AND TURNING)
Detialed Specifications / Instructions to Bidders

1. IIT Kanpur is looking for multi-purpose Micromachining Centre. The Centre should have the high tech features to aid research, education and production. Hence the machine should be rugged and have open architecture which will enable students and faculty to use it optimally.

2. Flexibility for convering the machine with EDM and ECM operation is also required. Thus controller must have open architecture and should support 5 axis, so that at future date, by simple addition of 2 motors and 2 drives, 2 more axis can be attached. Suitable space must be provided in panel for the same. Power supply should also be rated suitably for 5 motors of 18-20 kg-cm torque. Motor connectors should be provided on the panel wall.

3. **While the machine configuration is like a CNC milling machine, the machine must come with automatic turning option. The job will be held on the spindle and a turning tool will be mounted on a holder which will be used to operate the machine like a CNC lathe. Software, controller and machine should all be tuned to support this feature. This is a mandatory basic feature of the machine to be supplied.**

4. Controller and software must be open architecture, as IITK will develop suitable application software around the supplier's software.

5. System must be tested/calibrated as per standards and test certificates must be provided. IITK reserves the right to witness these tests. This testing will be for flatness, alignment, accuracy, spindle runout, etc.

6. Please fill the attached checklist to enable evaluation of the offer – Suppliers who do not send the confirmed checklist or who quote simply with "as per your specifications " will be rejected.

7. It is stressed once again that this machine requires high level of integration between mechanical machine and the control system.

8. Supplier must hence :

a. build a rugged vibration free machine. The machine has been specified with a granite bed to achieve vibration free operation.
b. Highly precise spindle with minimum runout
c. offer suitable 5 axis PC-based controller which has open architecture which can be expanded further to incorporate sensors for vibration, acoustic emission, etc.
d. Should have standard PLC functions like digital inputs / outputs, analog inputs/outputs built in with simple programming method in C/C++ or using ladder logic
e. offer software that runs ISO standard G/ M codes to enable IITK to operate the machine
f. offer software libraries and source codes to enable IITK to develop custom software for applications
g. Provide suitable programming language / tool to enable IITK to modify the PLC program in the controller
h. Vendor should also provide sample program and source codes for programming the system under Linux.
i. Supply High quality documentation for the machine, hardware, operation, motion programming, PLC
j. Offer training to IITK personnel to develop additional software modules to suitably program the controls

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Controller/ Electricals :

- Standalone closed loop control system – rotary encoder or linear scale feedback must be taken and axis should be controlled. There should be no hunting so tuning software with PID controls should be provided.
- Should be connected to PC with USB port or Ethernet port – PC is not in scope of vendor
- 5 axis closed loop control (over Ethernet or USB port)
- Operation Software should be provided that will run on standard PC / laptop (PC/Laptop is not in scope of the supplier. This will be provided by IITK – however for testing / calibration purpose, vendor to provide PC/Laptop at their works)
- Screen update/refresh should be better than 1 millisecond so realtime data can be viewed on screen
- In built PLC with 16 DI/ 16 DO,
- 1 analog output with 16 bit resolution minimum, -10 volts to +10 volts
- IO expandable to 64 DI and 48 DO and 4 AI/4 AO (16 bit resolution)
- G/M codes based operation
- Operation software with G/M codes
- Operation software should support Drawing inputs (from AutoCAD)
- Linux based program for operation of system with source codes in C/C++
- PLC programming software
- Software programming libraries to enable us to develop own programs in C/C++ under Windows and Linux environments and Labview

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Note :

- Supplier may please quote upgradation possibilities and their costs.
- Supplier must give list of installations of similar system.
- Supplier must give drawing of the system indicating overall size, weight and utility requirements
- Supplier must provide software manuals along with the quotation.
- Supplier may be requested to give presentation at IITK re. the machine, hardware design, upgradation possibilities and their costs. Also, after the presentation, supplier should give demonstration of the software and its programming aspects.
- Supplier must make a compliance sheet with the above points in Excel and indicate compliance pointwise and attach with the quotation.

Specifications :

CNC Micromachining Center (Milling and Turning)

Mechanical system :

XY axis
    Travel   :   90 mm x 90 mm
    Drive   :   Ground ball screws
    Support :   LM guideways
Z axis
    Travel   :   150 mm
    Drive   :   Ground ball screw
    Support :   LM guideways
    Covers :   Bellows
Straightness and
Flatness   :   5 microns
Accuracy   :   5 microns
Repeatabiltiy :   2 microns
Motors   :   Microstepping motors
Encoders   :   Encoders for all axis (linear preferred, rotary is also acceptable)

Load capacity : 5 kgs
Max. speeds:
      Feed : 200 mm/min
      Rapid : 500 mm /min
Spindle : 400 watts, 6000 rpm,
                        Min. 2 microns runout , ER11 collet
                        Vibration free high precision bearings to be used
Compact size : Max. 600 x 600 mm max. size
MS fabricated stand
Granite base
Holes on sides for fixing eye bolts and lifting
Al extrusion based top cover with acrylic door
Coolant tank and pump
Castor wheels with lock so machine can be moved
Tool holder to hold turning tool (job will be mounted on the vertical spindle)
Aesthetic looks

Controller/ Electricals :

- 5 axis control (over Ethernet or USB port)
- G/M codes based operation
- Turning option (where job is mounted on spindle) in the operation software to turn parts while holding job in the spindle
- Connect to operating PC via USB or Ethernet port
- Motor drives and power supply integrated below the machine in frame
- Protected power supply (from voltage fluctuations)

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