

**Public Tender No. BLL-PT/119/2006-07.**

**TECHNICAL SPECIFICATION AND SCOPE OF SUPPLY & SERVICE OF CNC VERTICAL MACHINING CENTRE.**

- A. **MACHINE:** Computerised numerically controlled 3-axis CNC vertical machining centre complete with Automatic tool changer, with standard accessories suitable for operation on 415 ±10%, 3 phase, 50 cycle AC supply. The basic machine should be preferably hydraulics free for maintenance free use over long period of time
- B. **PURPOSE:** It should be capable of performing a variety of machining operations such as milling, drilling & tapping, boring, contouring with linear, circular, helical interpolation etc.
- C. **QUANTITY REQUIRED:** One.
- D. **TECHNICAL SPECIFICATION OF MACHINE AND ACCESSORIES**

Bed, column and all major castings should be of high grade ( FG 260 ) close grained Cast Iron, duly stress relieved. The bed should be designed in such a way that used/waste lubrication oils is collected at a single place and shall be guided to an oil collector at the rear. The guide ways should be Linear Motion bearing rectangular guide ways on all three X, Y & Z axes.

The Vertical Machining Centre should be equipped with large diameter pre-loaded double nut ball screw assemblies for traverses on all the 3 axes.

**The major specifications should be as follows:**

**1. BASIC MACHINE**

Longitudinal - Table	- X Axis	600 mm (minimum)
Cross - Table	- Y Axis	450 mm (minimum)
Vertical - Spindle head	- Z Axis	460 mm (minimum)
Distance from Spindle nose to Table top		150 - 610 mm ( minimum)
Distance from Spindle Centre to Column face		680 mm (minimum)
Table working surface		800 X 450 mm (minimum)
Distance from floor to Table top		935 mm ( minimum)
Maximum allowable weight on Table		400 kg ( minimum)

**2 SPINDLE**

The spindle should be gearless, cartridge type with large dia bearings, grease packed for life. The spindle head construction should be Ram type to minimise thermal displacement. The distance between the spindle centre and guide ways in the column shall be kept minimum (140mm).

**The major specifications should be as follows:**

Spindle bore Taper	7/24 or BT 40
Spindle speed range - Standard	60 – 6000 rpm ( minimum)
Spindle motor power rating AC cont./30 min.	7.5/11 Kw (minimum)
Spindle max. torque ( 30 min )	116 Nm (minimum)
Spindle front bearing dia	110 mm ( minimum)

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### 3. FEED SYSTEM

The feed system should employ large diameter pretensioned ball screw and double nut assembly for heavy duty cutting and to provide minimal thermal distortions.

The major specifications should be as follows:

Cutting feed rate	1 – 10000 mm/min (minimum)
Rapid traverse rate - X & Y Axes	24000 mm/min.(minimum)
Rapid traverse rate - Z Axis	15000 mm/min.(minimum)
Ball Screw size - dia X pitch X, Y axis	40 X 12 mm (minimum)
Z axis	40 X 10 mm(minimum)
Feed motor torque X & Y axis	8 Nm (minimum)
Z axis	22 Nm (minimum)
Feed back elements	Absolute Rotary optical Incr. Encoder preferred
Guideways : X, Y Axes	Linear motion bearings
Z axes	Hardened & ground guide ways

### 4 AUTOMATIC TOOL CHANGER

The Vertical Machining Centre should be equipped with disc type tool magazine. The ATC mechanism should have adequate safety guards. It should be possible to change tools at the ATC standing at the floor level.

The ATC should use shortest distance, random indexing system.

The major specifications should be as follows:

Tool storage capacity	20 nos (minimum)
Tool shank configuration	BT 40
Tool selection	Memory - random
Maximum tool diameter	80 mm ( minimum)
Max. tool diameter without adjacent tools	125 mm(minimum)
Maximum tool length	250 mm (minimum)
Maximum tool weight	8 kg ( minimum)
Tool change time - Tool to Tool	2.5 sec (maximum)
- Chip to Chip	6.5 sec (maximum)
Tool holding arrangement in spindle	Collet type

### 5 LUBRICATION

The machine should be equipped with automatic lubrication of slides and spindle unit. In case of low lubrication, it should give an alarm message on the screen and the machine should stop automatically after completion of the cycle.

Spindle Bearings	Grease packed
Guideways and Ball Screws	Automatic pressure lubrication with fault detection

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6. **COOLANT**

The machine should have a coolant system of adequate capacity.

The major specifications should be as follows:

- |     |  |                           |
|-----|--|---------------------------|
| 7.1 | Coolant tank capacity                    | 400 litres (minimum)      |
| 7.2 | High pressure coolant system with filter | 60 lpm @ 4 bar ( minimum) |

7. **ACCURACY AS PER JIS STANDARD**

- |                                    |                      |
|------------------------------------|----------------------|
| Positioning accuracy - X Y& Z axes | 0.020 mm (minimum)   |
| Repeatability X,Y & Z axes         | ± 0.003 mm (minimum) |

Supplier must enclose copy of test chart along with the technical bid.

8. **ELECTRICAL EQUIPMENT**

The electrical equipment shall be suitable for operations on a power supply of 415 ± 10% Volts, 50 ± 1 Hz.

- |      |                              |             |                   |
|------|------------------------------|-------------|-------------------|
| 10.1 | Electrical power supply      | - Voltage   | AC 415 ± 10 %     |
|      |                              | - Frequency | 50 ± 1 Hz         |
| 10.2 | Electrical power requirement |             | 25 kva ( minimum) |

9. **SAFETY DEVICES**

The machine and its control units shall be equipped with safety devices for protection of the operator and the equipment. The following safety features should be available.

- Failure of centralised lubrication to inhibit next auto cycle.
- Axis inhibit with ATC function
- No TOOL UNCLAMP during spindle running/power failure/power restoration
- Over travel protection for all the three axes
- The spindle taper to cleaned by air blow before tool change takes place every time in auto mode.
- Continuous monitoring of air pressure for spindle cleaning.
- In all the three axes, moving parts are to be fitted with telescopic covers/winding cover/guards suitably.

10. **CONTROL CABINET**

Control cabinet shall be constructed to avoid entrance of dust, moisture and other environmental contaminants that may cause damage to the systems. Control cabinet must be provided with built-in AC Unit.

11. **CNC SYSTEM**

FANUC 0i – MC CNC System

**E. SCOPE OF SUPPLY**

Single drive for all 3 axes including precision,  
 preloaded ball screw and nut assemblies  
 High speed ATC-20 tools  
 Pitch error and backlash compensation  
 Automatic centralized lubrication system  
 Slideway covers  
 Pendant type operator panel  
 Coolant system  
 Table mounted splash guard  
 "T" nuts for table  
 Machine light  
 Hand held coolant gun  
 Spindle load meter  
 Manual pulse generator  
 Built-in AC for control cubicle (indigenous)  
 One set of maintenance tools  
 Pull studs 20 nos  
 Levelling pads  
 One set of machine manuals  
 CNC system Fanuc Oi MC  
 Process completion Light  
 Rigid Tapping attachment

**F. OPTIONAL ACCESSORIES**

- a) High pressure coolant system : 60 lpm @ 4 bar (minimum)
- b) Auto Pallet Changer as per the following specs
- |                            |                              |
|----------------------------|------------------------------|
| Pallet Size:               | 600 x 400 mm (minimum)       |
| Max load on pallet :       | 200 kgs (minimum)            |
| No. of T slots :           | 4 ( 18 width x 100 pitch)    |
| No. of pallets :           | 2                            |
| Pallet clamp :             | Hydraulic/pneumatic type     |
| Pallet clamping pressure : | 15 kg/sq. cm(minimum)        |
| Pallet clamping force :    | 1500 kg ( minimum)           |
| Edge locator /pallet :     | 2 ( one in each X & Y axis)  |
| Pallet configuration:      | side – shuttle (preferred)   |
| Pallet change:             | Pneumatic/ electromechanical |
- c) Air Dryer
- d) 200 mm column extension
- e) Sub table
- f) Point master
- g) Interface for forth axis including cables and connector.

**G. TRIAL TESTING**

Our engineers at our works will carry out trial testing of the machine in presence of your service engineer after successful commissioning of the machine.

**H PERFORMANCE GUARANTEE**

Machine should be guaranteed for satisfactory performance for a period of 12 months from date of commissioning or 18 month from the date of supply, whichever is earlier. Security Deposit ( 10 % OF THE BASIC VALUE OF THE MACHINE ) in the form of Bank Guarantee will be required to be furnished along with the Performance Guarantee.

**I. PAYMENT TERMS**

Our preferable payment terms is 90 days credit.

**J. SHIPMENT**

Within ONE month after placement of technically and commercially OK order.

**K. LIQUIDATED DAMAGE CLAUSE**

Liquidated Damage Clause @ 0.5 % per week maximum to 10 % of the Order Value will be applicable.

**L. SERVICE**

Successful tenderer would be required to provide the following service as a part of the contract free of cost.

1. Erection and Commissioning of the machine at our works.
2. Training in the areas of machine operation, programming, and maintenance to be provided to our operators and engineers.

Complete list of service centres along with available facilities/manpower for providing after sales service should be submitted separately with the quotation.

**M. ESSENTIAL CRITERIA**

1. Proven track record of the particular model of the machine offered in Indian Environment is an essential criteria. The factors for proving the same would be : atleast five years of satisfactory performance in India or about 15 such installations @ 3 Nos per year .List of clienteles where the quoted machines are working satisfactorily must be furnished in the techno commercial bid.

**N. BID / OFFER**

Offer to be submitted in two parts,1.**Techno commercial Bid** 2. **Price Bid**.

**Techno commercial Bid** must cover points under serial A to P of this document. **Price Bid** will contain only the price of the machine ,software, Toolings, spares etc and will be as per serial no Q of this document.

Our company reserves the right to accept / reject whole or part of any quotation / tender without assigning any reason, whatsoever. The decision of the Company shall be final and binding on the tenderer(s).

**O. ARBITRATION CLAUSE**

Any dispute of any nature whatsoever or regarding any right , liability Act , Commission or account of any of the parties hereto arising out of or in relation to this enquiry / order shall be referred to the sole Arbitration of the Managing Director of Biecco Lawrie Limited or any other Officer of Biecco Lawrie Limited , as nominated by the said MD.

The award of the Arbitrator so appointed shall be final and conclusive and binding on all parties to the agreement / standard terms & conditions relating to this enquiry / order subject to the provision of the Arbitration & Conciliation Act 1996 or statutory modification of Re enactment thereof.

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**P. JURISDICTION**

The Courts in the District of 24 Parganas (South) in West Bengal alone shall have Jurisdiction to entertain any suit , application or other proceeding in respect of any claim or dispute arising under this enquiry / agreement / standard terms & conditions relating to this order.

**Q PRICE BASIS**

Price Should be on Door Delivery basis / CIF ( With insurance coverage up to our Store at P 54 Hide Road Extn., Kolkata )

**R. Mode of Submission::**

Tender documents downloaded from Company's Website [www.biecco.gov.in](http://www.biecco.gov.in) for submission of offer , must be accompanied by non-refundable tender document fee of Rs. 100.00 for each machine by Cash or by Pay Order/DD in favour of Biecco Lawrie Limited payable at Kolkata . Offers without tender document fee will be liable for rejection.

The mode of submission of tender should be in two parts: Part (I) in one sealed envelope superscribed with " Techno- Commercial bid", tender no., due date , name of the machine & Part (II) in another sealed envelope super scribed with "Price Bid" ,tender no., name of the machine. Both the above sealed envelopes should be put in another sealed envelope superscribed with tender no., due date and name of the machine. Separate envelopes must be submitted for each machines . Please note that the tender document is not transferable.

Tender must be deposited in the Tender Box in Purchase Department. at P-54, Hide Road Extn., Kolkata-700088 on or before 21.6.2006 by 3.00 p.m . Tenders will be opened on 22.6.2006 (only Part-I) at 3.00 pm at P-54, Hide Road Extn.Kol-700088.

The Company (BLL) is not responsible for Postal delay or non-receipt of tender documents lost in transit.