

TECHNICAL SPECIFICATION OF PLANO MILLER

1.0 Purpose & Work Piece Material:-

The machine is required for machining of joint plane of bearing GBC's etc of Steam Turbine of 200MW, 250MW & 500MW. The machine shall be suitable for machining of components of Ferrous and non ferrous metals like Carbon steel, Low & High Alloy steel, Cast Iron & similar other materials.

2.0 Specification:-

- Work Table (MM) : 1500 X 4000
- Max distance travelled by Table : 4500 MM
- Max. spindle column movement
 - Horizontal : 1200 MM
 - Vertical : 2000 MM
- Max. Spindle sleeve Movement for all the four spindles MM : 315 MM
- Table traverse MM / Min
 - Fast : supplier to quote
 - slow : - do -
- Longitudinal taper turning by horizontal head right & left both : $\pm 30^0$
- Vertical taper tuning by Horizontal head spindle right & left both : $\pm 45^0$
- Spindle Taper : ISO : 60

3.0 Essential Features/ Requirements –

- 3.1 The basic machine shall have a robust and vibration free construction and high power rating to ensure accurate machining of the jobs.
- 3.2 All drive should be AC thyristorised / transistorized type, of siemens/ABB or indramat make. Motors should be protected against over-heating. In electrical panel all accessories should be of siemens or other reputed make.
- 3.3 Machine should have push-button controlling the different function of the machine. Device should be protected against short-circuiting with proper safety measure.
- 3.4 Suitable lubrication system to be provided.
- 3.5 Standard operation and services tools shall be supplied along with the machine.
- 3.6 The machine shall be supplied with complete electrical equipment ready for the connection to the power mains.

- 3.7 Details of the civil work required to be done for the installation of the machine should be specified by the supplier. Foundation drawings to be submitted one month after placement of PO by BHEL.
- 3.8 5 sets of operation & Maintenance (O & M) manuals to be supplied along with machine must contain following things.
- a) Assembly drawing of each sub- assemblies with indication of each components with their specification, part number and make.
 - b) Hydraulic & lubrication circuit diagrams with description of each elements having their specification , make and part number
 - c) Complete electrical circuit drg. including service manual of A.C. drive, if any
- 3.9 Detailed schematic diagram of the proposed submitted along with the offer. Overall size (L X B X H) & the weight of the machine to be specified.
- 3.10 Compliance with all safety norms must be followed
- 3.11 Maintenance of machine along with necessary spears to be covered by vendor under warranty period.
- 3.12 AMC (Annual Maintenance Contract) after warranty period of 2 year (renewable) also to be quoted separately.
- 3.13 Vendor to furnish noise level (db) of the machine during operation.

4.0 COLOUR:-

Colour of the machine shall be Apple Green

5.0 COMMISSION AND ACCEPTANCE:-

- 5.1 Machine will be inspected at supplier works before dispatch by BHEL's representative at supplier's work prior dispatch.
- 5.2 Final acceptance shall be made at BHEL, Haridwar following successful erection, assembly, test run and commissioning Achieving specified accuracy and surface finish on a test job shall be part of successful commissioning.
- 5.3 Test / Geometrical accuracy charts as per relevant / Indian / International standard for testing the machine shall be supplied along with the technical offer.
- 5.4 The vendor shall impart training to BHEL Personnel in operation and maintenance of the machine at vendors manufacturing plant for one week.

6.0 SPARES:-

Mechanical :

- 6.1- One no. of each type of following things used in hydraulic, lubrication and coolant system of machine.
- a- Pumps
 - b- Pressure relief, pressure reducing, flow control and direction control valves.
 - c- Pressure switches, flow switches and level switches.
 - d- Ten nos. regenerative type filter elements and twenty nos. disposable type filter elements.

- 2- One set of rubber hose pipes with and connections i.e. each type of pipe having same numbers used in hydraulic, lubrication and coolant system of machine.
- 3- One set of seal-kits of different hydraulic cylinders used in machine.
- 4- All other rubber seals used in machine except asked at Sl.No. 3.
- 5- One set of spindle bearings / bushes used in machine.
- 6- One complete set of belts including timing belts used in machine.

Electrical & Electronic Spares

1. Contactors	- 2 nos each type
2. Limit switches	- 2 nos each type
3. Automets	- 2 nos each type
4. Proximity switches	- 2 nos each type
5. Pressure switches	- 2 nos each type
6. Flow switches	- 2 nos each type
7. Float switches	- 2 nos each type
8. Signal lamps	- 50 nos
9. Push button	- 10 nos
10. Selector switches	- 1 no. each type
11. Axis reference potentiometer	- 5 nos
12. PLC CPU, PLC Power supply	- 1 no. each type
13. I/O board	- 1 no. each type
14. Spare for drive controller	
a) I/R unit	- 1 no.
b) Power module	- 1 no. each type
c) Controller card	- 1 no. each type
d) Spindle module	- 1 no.
15. Complete DRO unit	- 1 no.
16. Heidenhein scanning head	- 1 no. each type along with scale
17. Table encoder	- 1 no.
18. Main switch	- 1 no.
19. Lubrication unit	- 1 no.

General Condition:-

- PLC should be of following makes only i.e. Siemens / Fanuc / Mussung
- Drive controller of axis drive controller should be of Siemens /Fanuc / ABB make
- Feed motor spindle motor should be of following make – Siemens / Fanuc

7.0 GUARANTEE:-

The vendor shall offer performance guarantee of the machine for 24months from the date of final acceptance.

8.0 Manuals / Documents :-

- 8.1 5 Sets of documents for operation, maintenance and service manuals for machine and other equipment to be provided in English language only out of which 1st set to be sent along with offer.
- 8.2 Service manual should contain following in addition to description:

- a- Assembly drawing of each sub-assemblies of machine with marked list of each components with its specification & make.
 - b- Hydraulic, lubrication & coolant diagram with marked list of each component with its specification & make.
 - c- Detail catalogue of bought-out items with its specification & make.
- 8.3 3 sets of following documents will also be submitted
- a. Electrical schematic.
 - b. Wiring diagram.
 - c. Junction box & connection details.
 - d. PLC user program (Hardcopy) with comments in English.
 - e. Interface & commissioning manual of drive controller.
 - f. PLC programming manual.
 - g. Spare parts list along with ordering no.
 - h. O & M manual of machine.
- 8.4 Foundation drawing is to be submitted by supplier within 4 weeks of placement of LOI.
- 8.5 Each document for operation, maintenance & service manual should be given on CD.

9.0 TECHNICAL SUPPLY CONDITION:

The machine shall be able to operate in following technical condition

POWER:-

Machine should be suitable to operate on 3- phase A.C. supply of 415 volts \pm 15%, 50 Hz \pm 3%,

ENVIRONMENT:-

Tropical environment consist of dust laden atmosphere during some part of the year.

Temperature : Min.3⁰ C / Max. 45⁰ C

Relative humidity : 95%

10.0 GENERAL INFORMATION:-

The vendor should give agreement / comment against each and every feature/ item as mentioned in the specification. Any deviation in the offer shall be clearly highlighted against that particular item/ feature.

(TTX)

(WEX Mech.)

(WEX Elect.)

(TUM)