

SPECIFICATION OF CYLINDRICAL GRINDING MACHINE

1.0 Purpose:-

This machine is required for the precision grinding of various governing component e.g. valve seat, valve cone and mandrels etc to meet stringent drg. accuracy requirement.

Broad specification of machine is as under.

2.0 Work Piece Material:-

Ferrous material like carbon steels, alloy steels, tool steels etc.

3.0 Machine Specification:-

3.1 Capacity for work piece mm

Swing : 800mm

Length : 3000mm

3.2 Max. grinding diameter with new wheel : 700mm approx

3.3 Steady rest capacity mm

Max. : 400mm

Min. : 100mm

3.4 Max. grinding length : 2600mm

3.5 Centre height : 410mm

3.6 Max. weight of work piece in Kg : Supplier to indicate

3.7 Grinding wheel Dia x Width : 750 x 70 mm approx

3.8 Wheel spindle speed RPM : Supplier to indicate

3.9 Motor power (KW) : - Do –

Bed and Table

3.10 Max. table traverse : 3500mm

3.11 Table speed M/Min. : Supplier to indicate

3.12 Table swivel either side : 4° (approx)

Work Head

3.13 Spindle bore taper : Supplier to indicate

3.14 Power (KW) : Supplier to indicate

Tail Stock

3.15 Taper : Supplier to indicate

3.16 Total quill travel : Supplier to indicate

4.0 General Feature of Machine:-

- 4.1 Supplier to indicate Std. accessories being offered along-with the machine.
- 4.2 Additional accessories recommended to be indicated separately along-with the breakup prices.
- 4.3 The basic machine shall have a robust and vibration free construction and high power rating to ensure accurate grinding of jobs.
- 4.4 Machine should have push buttons controlling the different functions of the machine. Devices should be protected against short-circuiting with proper safety measures.
- 4.5 Suitable lubrication system to be provided.
- 4.6 Standard operation and service tools shall be supplied along with the machine.
- 4.7 The machine shall be supplied with complete equipment ready for the connection to the power main.
- 4.8 Details of the civil work if any required be done for the installation of the machine should be specified by the supplier.
- 4.9 Maintenance manual 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 coolant circuit diagram with description of each element having their specification, make and part number.
 - c- Complete electrical circuit drg., including service manual of A.C. drive, if any.
- 4.10 Detailed schematic diagram of the proposed machine to be submitted along with the offer.
- 4.11 Compliance with all safety norms must be followed.

5.0 Attachment Accessories:-

- 5.1 Grinding wheels
- 5.2 Re-circulating type coolant system
- 5.3 Work piece illumination light
- 5.4 Splash guards
- 5.5 Foundation parts
- 5.6 Any other standard / optional attachment which will increase the productivity / performance of machine should be quoted with their individual prices.

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 Power Supply / Environment Condition:-

The machine should be suitable for operation in the following conditions:-

- Power supply for the machine : 415V \pm 10%-15%, 50Hz \pm 3%
- For controls : 230 V \pm 10-15%, 50 Hz \pm 3%
- Temperature : 5-45⁰C
- Relative humidity : 95% Max
- Compressed air : 4-6Kg/cm²
- Other conditions : Similar to tropical country
- Water supply industrial : 1.5 to 2.0 Kg/cm²
- Dust laden atmosphere during some part of the year.

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 Voltage Transformer & Stabilizer:-

The required voltage stabilizer and matching isolation transformer if recommended by supplier, should be part of offer.

10.0 General:-

- 10.1 Total power requirement of the machine to be specified by the supplier.
- 10.2 Overall space required for installation of the machine to be specified by the supplier
- 10.3 Pre-dispatch inspection may be carried out by BHEL representative at party's works. However it is at the description of BHEL and final acceptance will be done at BHEL, Haridwar after carrying out all the required accuracy test etc.
- 10.4 Training of machine operation, mechanical and electrical maintenance should be provided free of cost at suppliers work for one week.
- 10.5 The manufacturers shall take the full responsibility for supervising the erection, startup, testing of machine its controls and other supplied equipment, test piece machining etc at BHEL Haridwar.
- 10.6 Colour of the machine should be apple green as per ISO.
- 10.7 The supplier is to submit a clause wise deviation statement against each clause of this technical specification along with the offer.

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