

**Annexure-III**

**RECONDITIONING, UPGRADATION AND CNC RETROFITTING OF TOS  
MILLING MACHINE, MODEL FD 40 V, PLAN NO. 2-424, BLOCK-III**

**A. MACHINE DESCRIPTION:**

Three axes milling machine  
Make: TOS, Czech Republic  
Model: FD 40 V

A.1 Weight of the machine: Approx. 7 T

A.2 Movements: 3-axes (table longitudinal, table across and spindle vertical)

Table longitudinal: 1250 mm

Table cross: 430 mm

Spindle vertical: 475 mm

|                        |                         |             |
|------------------------|-------------------------|-------------|
| A.3 Machine velocities | Feeds                   | Rapid       |
|                        | Long. 10-2000 mm/min    | 3200 mm/min |
|                        | Cross 10.2000 mm/min    | 3200 mm/min |
|                        | Vertical 2.5-500 mm/min | 800 mm/min  |

A.4 Spindle Dia: 90 mm

A.5 Spindle Motor power: 25 kW, 1460 RPM; AC asynchronous motor

A.6 Axes Drives: All the three axes are driven by a single motor (3 kW, 1420 RPM) through clutch control

A.7 Existing gear change system: Spindle gearsteps are changed through cams operated by an electrical motor

A.8 Lubrication system: Machine has got one lubrication pump for spindle and the speed gear box and another for the feed axes and feed gearbox

## **B. BROAD SCOPE OF WORK:**

1. Reconditioning and upgradation of the complete machine to suit for CNC operation and restoration of accuracies as per original test chart of the m/c.
2. Fitment of new ball screws and nut assemblies for all the axes.
3. Spindle bearings shall be replaced, *if required*, to eliminate run out of spindle.
4. Separate drive for each axis
5. New pumps for the lubrication system of the machine

### **6. Other Works:**

#### **All activities related to**

- 6.1 Dismantling of existing clutch based drive system of the machine
- 6.2 Installation and commissioning of a suitable CNC system to control three machine axes without interpolation
- 6.3 Mounting and fitment of axes AC servomotors after preparing appropriate mechanical modifications in the existing design
- 6.4 Installation and commissioning of servodrives for axes
- 6.5 Installation and commissioning of PLC system
- 6.6 Interfacing the spindle and axes with the CNC.
- 6.7 Installation of new operator Panel with side handles having the new MCP, monitor, CNC keyboard, handwheel, required Push buttons, selector switches,
- 6.8 New electrical cabinet having contactors, MPCBs, MCB's, plug sockets, relay modules, DC SMPS power supplies, etc.
- 6.9 Job Prove-out
- 7.0 All the material including CNC system, servodrives, servomotors, new ball screws etc for completing the above mentioned activities shall be in the scope of supply of vendor.

Note: **Party may suggest any other work for further improvement and productivity enhancement of the machine**