

	Machine Shop Equipment SCOPE OF WORK	Turbo Gen Services
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Machine Shop Equipment**

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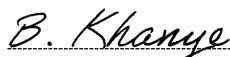


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1. PURPOSE

The purpose of this document is to define the specifications of equipment to be supplied and delivered to Bearing Services section under Works TGS of Eskom Rotek Industries

2. CONTEXT FOR MACHINES AND EQUIPMENT MAINTENANCE AND REPAIRS

Eskom Rotek Industries Bearing Services requires service for supply and delivery of machine shop equipment as detailed on the below scope of work.

3. SCOPE OF WORK

TYPE OF EQUIPMENT

3.1 Vertical Boring Mill T1000 Si

The machine must be capable of machining turbo white metal bearings pre- dominantly on for turbo generators. The machine must be capable of machining to specified tolerances on all 5 axis and have CNC capability.

SPECIFICATIONS OF EQUIPMENT

- Supplied Machinery to comply to ISO 9001, 14001 and 45001
- Turning diameter 12 500 mm
- Table diameter 10 000/12 000 mm
- Load on table 400-800 Ton
- Table speeds 0.16~16 rpm
- Table motor 150 Kw
- Work piece height 6300-8000 mm
- Vertical head travel 4000 mm
- Horizontal head travel 6000 mm
- Weight 300 Ton
- Controls Fanuc/siemens
- CNC capability
- Rigid & robust structure of high-grade cast iron to influence stability and rigidity.
- Allow for easy operation with hydraulic actuated / driven gears shifting from different speeds and feed rates,
- Must Include an optical positioner for table positioning with high accuracy
- Have a automatic lubrication system equipped for affluent lubrication and easy maintenance
- To have a capability to include Electro-hydro interlocks integrated with moving parts to allow for safer operation
- Contain a programmable logic controller (PLC) unit integrated with electric system for reliable control

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- Include a swivel operation panel with centralized buttons and switches which has cordless capability
- Machine capability to include a robust modular design with wide options for diverse needs: not limited to tool holders, boring bars, milling heads, etc.
- Must have a rigid nitrified spindle with ISO 50 taper capability and hydro-mechanical tool clamp & unclamp system
- Machinery must include a AC servo spindle motor for variable spindle speeds and a AC servo motor for variable feed rates to support cutting of different work pieces
- Equipment must be user friendly and easily operatable.

3.2 CNC Lathe

CNC turning machine is a machine that spins material around a central spindle and a fixed cutting tool. The machine is controlled by coded instructions fed to a computer.

SPECIFICATIONS OF EQUIPMENT

- Supplied Machinery to comply to ISO 9001, 14001 and 45001
- Swing over bed 1600mm
- Swing over saddle 1250mm
- Spindle bore 130mm
- Between centres 1500,3000,5000 mm
- Turning lengths 1230,2730,4730 mm
- Width of bed 755mm
- No of head gears 4
- Spindle speeds 35-3000 rpm
- Tailstock taper 6 MT
- Motor 22 KW
- Controls Fanuc / Siemens

3.3 CNC Milling Machine (Large)

Large CNC turning machine that typically rotates the cutting tool and the workpiece is fixed. The machine is controlled by coded instructions fed to a computer.

SPECIFICATIONS OF EQUIPMENT

- Supplied Machinery to comply to ISO 9001, 14001 and 45001
- Table size (W x L) 800 x 2000 mm
- Travels (X / Y / Z) 1800x850x710 mm
- Spindle speed 6000 rpm
- Spindle taper BT50
- Spindle motor (Cont./30min) 15/18.5 Kw
- Rapid feed (X / Y / Z) 24-32 m/min
- Tool change 24
- Tool change time 2.9 sec

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- Weight 18 Ton
- Controls Fanuc/Siemens

3.4 CNC Milling Machine (Small)

Small CNC turning machine that typically rotates the cutting tool and the workpiece is fixed. The machine is controlled by coded instructions fed to a computer.

SPECIFICATIONS OF EQUIPMENT

- Supplied Machinery to comply to ISO 9001, 14001 and 45001
- Table size (W x L) 600 x 1100 mm
- Travels (X / Y / Z) 100 x 600 x 550 mm
- Spindle speed 6000-10000 rpm
- Spindle taper Bt40
- Spindle motor (Cont./30min) 7.5/11 kw
- Rapid feed (X / Y / Z) 36-48 m/min
- Tool change 20 (arm or disc)
- Load table 800kg
- Dimensions (L x W x H) 2800x2200x2600 mm
- weight 5.4 ton
- Controls Fanuc/Siemens

3.5 Spark Eroder / Electrical Discharge Machine (EDM)

The Spark Eroder is a machine that follow a manufacturing process which creates a specific shape using electrical discharge (Sparks). This is used to remove or separate materials from a piece with current discharges between two electrodes.

SPECIFICATIONS OF EQUIPMENT

- Supplied Machinery to comply to ISO 9001, 14001 and 45001
- Worktable size 1000mm x 550mm
- X-Y stroke 600mm x 500mm
- Z axis stroke 250mm
- Spindle head axis 300mm
- Electrode head to worktable 320-950um
- Working tank inner size 1600mm x 920mm x 550mm
- Max electrode weight 250kg
- Workable loading 2500kg
- Processing current 30/50/75/100A
- Positioning accuracy 0.005mm
- Repositioning accuracy 0.003mm
- Max working speed 550/750/1050mm 3min
- Max roughness 0.2um
- Max electrode consumption <0.2%

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- Power supply 380V/3phase

3.6 Heavy Duty Bandsaw Machine (with Saw Weld)

Power operated Saw using a roll of Bandsaw blade, cut and joined at a particular size. This machine must also be able to join the ends of a bandsaw blades with precision ensuring seamless weld that maintains the integrity and performance of the blade. Our application will be on Millboards / Gaskets.

SPECIFICATIONS OF EQUIPMENT

- Max cutting height 336mm
- Max cutting width 585mm
- Table size 660x700mm
- Blade speed 15-328 rpm
- Length of saw blade 4430-4520mm
- Blade width 6-19mm
- Table tilt R-30° / L -15°
- Main motor/grinder 1.5Kw / 0.09Kw
- Electric welder 2.4Kva

3.7 Jigsaw Machine

This is a power saw with short sharp blade and a bench, which is used for cutting curved and / or intricate cuts. Our application will be on Millboards / Gaskets.

SPECIFICATIONS OF EQUIPMENT

- Supplied Machinery to comply to ISO 9001, 14001 and 45001
- Charger voltage 100-240V~/50-60 Hz
- Battery Amps 4.0Ah
- Rated voltage 18V
- No load speed 0-23,000/min
- Stroke length 25mm
- Mitre capacity 45°
- Cutting capacity (metal) 8mm (aluminium) 10mm
- Charging time ± 120min

DOCUMENTATION

- Maintenance and operational manuals, BOM's and maintenance schedules to be included.
- Wiring Scheme/diagram of connection
- EC declaration of conformity
- Test Certificate
- User friendliness of machine must be explained by the supplier on the quotation.
- Supplier to provide life cycle / design life curve with asset management instruction.

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- Supply annual failure rate of the machine (for calculating annual failure cost).
- The specification and supply of the first fill of operating fluids
- Spare parts list.
- Specify and supply special tools.
- Specify Painting and Protective Coatings.
- Specify Export Packaging.
- Specify Stainless steel nameplate.
- Outline drawings including the mass and Centre of Gravity of the machine itself.
- Specify Motor schedules.
- Supply lubrication and coolant schedules.
- Supply design information as required by Rotek, such as absorbed power, installed power and safety factors.
- Provide a metal shipping container to transport the machine.
- Machine design to accommodate future upgrades easily.

MACHINE TOLERANCES

Supplier to quote highlighting deviations from required tolerances.

TECHNICAL SUPPORT AND TRAINING

- Technical Assistance on site in South Africa
- Including: Installation, commissioning, operator training
- 2-year warranty on hardware and software
- 5-year service and maintenance plan inclusive of spares

PROOF OF COMPLIANCE WITH THE LAW

The contractor shall ensure that:

1. All employees are registered with the Workmen's Compensation Commissioner in a manner which is acceptable to the Department of Labour and which satisfies the requirement of the compensation for occupational injuries and diseases act.
2. All employees are registered for unemployment.
3. All unskilled/casual staff must be paid in accordance with the Labour Act. The contractor will be responsible for their training.
4. All personnel shall wear the necessary protective clothing in accordance with Occupational Health and Safety Act No.85 / 1993 and the Construction Regulations of 2003.

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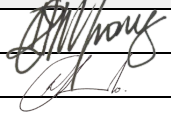
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HEALTH AND SAFETY

The Contractor shall at all times comply with the requirements of the Occupational Health & Safety Act (1993), Construction Regulations (2003) and the Employer's Pre-construction Health and Safety Specification. In pursuit of the aforementioned, the Contractor shall allow for:

- Carrying out and documenting risk assessments of all work to be carried out under the contract.
- Preparation of safe work procedures for all work to be carried out under the contract.
- Preparation of an H&S plan, discussing it with the Employer, and then amending it as agreed.
- Preparation for and conducting "toolbox talks" with relevant employees.
- Induction and training as and where required.
- Preparation of a Project H&S File.
- Regular updating of all of the foregoing.
- Provision of PPE and protective clothing for employees
- Complying with all H&S requirements for the duration of the contract
- Storage of cleaning material / equipment

DOCUMENT SUPPORTED BY:

NAME	POSITION	SIGNATURE	DATE
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Sibusiso Khumalo	Works Bearing Services Senior Supervisor		20.11.2024

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