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SCOPE OF WORK  
PURCHASE OF MULTI AXIS CNC WIRE TYPE ELECTRICAL DISCHARGE MACHINING  
CENTER

**1. Description of Requirement:** We have a requirement to purchase a 6 Axis, CNC, wire type, Electrical Discharge Machining Center (EDM). The center should operate on 440 volts 3 phase, have 6 axis of motion controlled by an onboard computer system capable of reading G-code programming, have an automatic wire threading system, The system should provide adequate safety features to insure operator safety when operating.

**2. System Requirements Overview:** The system shall include, but is not limited to the following:

Composite material base, 65Rc chrome plated hardened table, minimum X axis travel of 47 inches, minimum Y axis travel of 27.5 inches, minimum Z axis travel of 15.7 inches. Automatic wire threading system, integrated CNC control with a 6<sup>th</sup> axis control capability, Hirschman H100.NC 4<sup>th</sup> axis indexing unit with plug and play capability, Hirschman H80R.MAC 4<sup>th</sup> axis spinner (separate unit) with Hirschman H1680.AC4 independent control box.

**3. Specification requirements for the CNC control:**

**3.1.0** Core CNC control must meet or exceed the following identified capabilities:

- 3.1.1 ISO G code compatible.
- 3.1.2 dedicated keypad for system operation on the control box
- 3.1.3 Ability to restart from any point on the path.
- 3.1.4 Remote operation control jog handle with ability for MDI manual data input.
- 3.1.5 Integrated interface to control up to 4 axis of motion simultaneous and positional
- 3.1.6 Programmable energy management of high voltage power supply to reduce power consumption, scheduled auto on based on a user defined calendar.
- 3.1.7 Turn while burn capability integration on the machine tool control
- 3.1.8 Minimum of 512MB of RAM
- 3.1.9 Minimum of 40GB of onboard storage capacity
- 3.1.10 onboard self diagnostics with Electronic Thermal compensation.
- 3.1.11 RS-232 DNC interface
- 3.1.12 USB port minimum of one
- 3.1.13 Integrated interface to control simultaneous turn and burn operations and burn and turn operations on the onboard control.
- 3.1.14 Taper cutting up to 48 degrees at max height.
- 3.1.15 Automatic hole detection for threading wire
- 3.1.16 Auto restart in the event of power outage when power restored within 3 minutes.
- 3.1.17 Collision detection on all axes is required.
- 3.1.18 power failure detection for controlled system stop in the event of power outage

#### **4.0 . Specification requirements for the Hardware**

- 4.1 The CNC EDM Center should meet or exceed the following requirements.
  - 4.1.0 Working range in the X axis of a minimum of 47 inches.
  - 4.1.1 Working range in the Y axis of a minimum of 27.5 inches.
  - 4.1.2 Working range in the Z axis of a minimum of 15.75 inches.
  - 4.1.3 Glass scales on X,Y,U,V,Z axis minimum resolution of .00002
  - 4.1.4 Positional accuracy requirements of +/- .00007 per axis minimum.
  - 4.1.5 Repeatability accuracy requirements of +/- .00007 per axis minimum.
  - 4.1.6 Programmable flushing controllable from both the program and pendant.
  - 4.1.7 automatic wire capabilities of minimum of .003 diameter and maximum of .013
  - 4.1.8 Filtration system capacity of minimum of 4 filters with 5 micron screen capability.
  - 4.1.9 The system should include a full 4<sup>th</sup> axis rotary integrated control capability.
  - 4.1.10 11 The system should include a Hirschman H100.NC rotary axis indexing unit with plug and play capability for full rotary axis interpolation via the machine control.
  - 4.1.11 The system should include a Hirschman H80R.MAC 4<sup>th</sup> axis spinner (separate unit) with Hirschman H1680.AC4 independent control box.
  - 4.1.12 The system should include a manually operated System 3R clamping system on all rotational axis.
  - 4.1.13 The EDM machining center should be setup for 480 volt operation 3 phase.
  - 4.1.14 Transformers to meet the requirements of item 4.1.13 should be included if needed.
  - 4.1.15 Resin de-ionizing system
  - 4.1.16 Bridge style construction machine base made from mineral cast composite materials for stability and thermal stability.
  - 4.1.17 Stainless steel closed frame work table chrome plated hardened stainless construction.
  - 4.1.18 Independent chiller capable of minimum of 22K BTU per hour.
  - 4.1.19 Work light for work envelope area.
  - 4.1.20 Large wire spool capacity up to 55 pounds maximum.
  - 4.1.21 Ethernet Port RJ45 Standard.

**5.0 . Safety requirements for the system:**

5.1.1 Safety switches to insure operation only when doors are closed.

5.1.2 Power failure detection for controlled system stop in the event of power outage.

5.1.3 Crash/collision protection capabilities for all axis.

**6.0 Additional requirements**

6.1.1 Two (2) year full system warranty.

6.1.2 Trade in of (1) Charmille Robofill 300 and (1) Elox EDM centers is required

6.1.3 Service/Application support onsite of minimum of 100 hours.

6.1.4 Operator Training for a minimum of 2 technicians at a vendor training facility.

6.1.5 Stand alone chiller with minimum of 22K BTU/hr cooling capacity

**7.0 Shipping Requirements:**

7.1.1 Delivery to our facility on truck and rigging to the setup location to be included.

7.1.2 Removal of trade in machines and rigging out of NASA facility to be included.