

## **Design & Fabrication of a 'Rotating Platform'**

### **1. Specifications of the Rotating Platform:**

1. Maximum load carried by rotating platform: 1000 kg
2. Diameter of the rotating platform: 1100 mm
3. Platform rotational speed range: 1 rpm to 250 rpm (Clockwise and counter-clockwise).
4. Rotational speed accuracy: 0.01% or less upon heavy load, power and temperature fluctuations
5. Durable slip rings for 230 V, 15 A power transmission with 3 leads
6. Provide suitable threaded holes and appropriate clamping arrangements on the platform to secure tanks of various shapes and dimensions
7. A flatness of 0.2mm for the upper face of the platform
8. Alignment of the axis of rotation with the vertical: maximum deviation of 0.5 mm/m for the rotation axis (normal to the upper face of the platform) from the vertical
9. Mounting feet on the ground with levelling screws for adjusting the horizontal with a tolerance of 0.2mm/m is required

### **2. Actuator and Control Systems.**

1. 5000 W AC servo motor and its associated servo drive-mechanism is required for the operation of the rotating platform.
2. Motion of the rotating platform is to be programmable when required, via PLC based interface
3. Servo motor must be capable of responding to an event of sudden, heavy angular acceleration and avoid damage to the entire set-up
4. Controller should follow EN Standards – Euro Norms
5. Provide an emergency stop switch

Note: Gear Motor, Controllers, HMI and PLC should be of same make (for easy integration).

### **3. Rotation Profiles Programmable via LABVIEW (or) PLC based Interface:**

1. Rotation at fixed rotational speed with a drift in rotational speed not more than 0.01% during continuous operation over 7 days
2. Smooth, constant angular acceleration from initial angular/rotational speed,  $\Omega_1$  to final angular speed,  $\Omega_2$  over specified time, t
3. Random fluctuation in the angular speed about a given mean angular speed for a specified r.m.s. of angular speed fluctuation

4. Sloshing motion of the platform of the form,  $\Omega = \Omega_0 \sin(\omega t)$ , where  $\Omega_0$  is the amplitude of angular speed and  $\omega$  is the frequency
5. Change angular speed as a function of time,  $\Omega = \Omega(t)$ , based on input .dat / .txt files

#### **4. Additional Requirements:**

1. Vendors should provide continuous technical support and maintenance of equipment.
2. Vendors have to provide warranty for a minimum of one year. Approximate cost of annual system support/ maintenance contract once the warranty period is over has to be quoted for a period covering 5 years from the date of purchase. Payment for the AMC will be made only at the end of warranty period on yearly basis.
3. Vendors must have sufficient experience in supplying equipment in reputed organizations for research purpose. They must provide references of end users whom we can contact for their experience with the supplied machine. Experience of the end users will also be used as a criterion for the selection of bids that meet technical requirements.
4. Vendors must provide detailed documentation for the equipment.
5. Vendors may be called to visit and give presentation/demonstration on the equipment after opening the technical bid. They need to provide the approximate date for this presentation in the bid. The time period for this presentation would be 14 days from the date of opening of the bid.
6. Vendors must provide training to our technical staff for using the equipment.
7. All the expenses for installation, training and post sales technical support will be borne by the vendor.