

**TECHNICAL SPECIFICATIONS**  
**JOB ROTATOR WITH PU CLADDED ROLLERS (CAPACITY 50 TON)**

	Requirement	Vendor Confirmation / Remarks
1	<b>PURPOSE :</b> Roller supports are required for rotating the Turbine rotor during Blade assembly, Seal strip assembly, inserion groove machining, repair and other miscellaneous work.	
2	<b>TECHNICAL SPECIFICATIONS / REQUIREMENTS :</b>	
	Rotator Capacity of 1 set (consisting of 2 end supports) : 50 Tons. Rotator set should be capable to rotate 50 tons rotor, supported over two end support. Vendor to confirm.	
2.1		
2.2	Centre Height of each end support : 700 MM. Vendor to confirm.	
2.3	Supporting Diameter range : Min. 300 MM – Max. 800 MM (Infinitely Variable). Vendor to confirm.	
2.4	Width of 1 Roller (including cladding): Min. 180 – Max. 220 MM. Vendor to specify.	
2.5	Dia. of 1 Roller(including cladding) : Min. 400 – Max. 440. Vendor to specify.	
2.6	Centre Distance between rollers (i.e. D, refer Annexure-1) : Shall be fixed (Not variable or adjustable). Vendor to confirm.	
2.7	Rotation Speed (constant) : 1.5 RPM. Vendor to confirm.	
2.8	Rotor Turner direction of Rotation : Clockwise as well as Anti-clockwise. Vendor to confirm.	
2.9	A.C. Motor Power of the Drive unit & Make : Vendor to specify. (Drive unit to be sufficient to rotate the 50 tons rotor. Total two nos. motors required for complete set of rotator consisting of two end supports i.e. one motor at each end support). All AC motors on the machine should be of Siemens/ABB/Crompton Greaves/Kirloskar/L&T. Vendor to specify.	
2.10	Type of drive : Gear Drive (Chain drive or Belt drive not acceptable). Vendor to confirm.	
2.11	Material of the Rollers : Steel with Polyurethane cladding(To be hard & resistant enough to bear load of 50 tons turbine rotor for continuous operation). Vendor to confirm.	
2.11 a	Cladding thickness and hardness to be specified by the vendor.	
2.11 b	Address and contact details of the Works where cladding is to be done, is to be specified by the vendor.	
2.12	Hand operated Switch Box : For clockwise and anti-clockwise rotation(To be fixed on one end support with start & stop options). Vendor to confirm.	
2.13	Foot-operated switches : For clockwise and anti-clockwise rotation. Total two nos. foot-operated switches connected with flexible wires required for rotator. Simultaneous rotation of the rollers of both the ends to be ensured. Sufficient electrical wiring to be provided to cover at least 10 m length of the rotor. Vendor to confirm.	
2.14	All the electrical equipments should be of Siemens / ABB / Control & Switch gear / L&T / Telemecanique. Vendor to confirm.	
2.15	Electrical control panel should be ergonomically located from operation and maintenance point of view. Electrical panel should have sufficient space for future maintenance and component replacement. Vendor to confirm.	
2.16	Metallic industrial iron clad plug and socket (rating 3phase, 415v, 30amp) to be fitted on the external side of control panel. Vendor to confirm.	
2.17	Motors control should have protection against single phasing phenomena and overloading. MCB/MPCB and fuses to be provided for the protection of motor, control panel components and other field components. Vendor to confirm.	
2.18	Motor mounting on the gearbox should be such it can be easily replaced. Vendor to confirm.	
2.19	The contactors controlling the forward and reverse motion of the motor should be mechanically interlocked. Vendor to confirm.	

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2.20	The vendor should supply 4 core cable of sufficient rating (length 30mtrs for connection to the Mains). Vendor to confirm.	
2.21	Width of one end support (including Worm gear drive & motor arrangement) along the longitudinal axis of the rotor : 500 MM Maximum. Vendor to specify.	
2.22	The two end supports of the Rotator should not have any obstruction e.g. Gear Box, Worm wheel etc. along the longitudinal axis of the Rotator to accommodate Rotors of different designs / dimensions between the end supports. Vendor to confirm.	
2.23	Motor arrangement is preferred to be located in the transverse direction only to avoid any fouling with the turbine rotors of different diameters. However, if the motor is located along the longitudinal axis then that has to be only on the outer side of the roller supports. Also it is to be ensured that there is atleast 300 mm clear vertical space from the top of the motor to the centre of the roller to avoid any fouling with the turbine rotor flanges which project on the outer side of the rollers. ( Ref: Annexure-I & II). Vendor to confirm.	
2.24	Width of each end support along the longitudinal and transverse axis of rotor ( including Worm gear drive & motor arrangement) should be kept as minimum possible to avoid undue coverage of working area. Care should also be taken to facilitate easy movement of shop personnel around the rotator ( Ref: Annexure- I & II). Vendor to confirm.	
2.25	The Rotator set shall have drive units on both the end supports of the set. The Motors of both the end supports shall be interconnected for simultaneous start/stop on both ends. Only one motor is required for one end support of the rotator. Total two nos. motors required for the complete set of rotator consisting of two end supports. The motor at one end support shall provide drive to one roller of that end support only. The other roller is free on axle. ( Ref: Annexure-I & II). Vendor to confirm.	
2.26	Inside surfaces of the flanges of the end supports to be fixed with softer material like Hylam etc. approx. 200x100x16 mm thick (2 nos. on each end support i.e. total 4 numbers for 1 rotator set) to avoid any damage to the turbine rotor surface. Vendor to confirm.	
2.27	Suitable lifting arrangement to be provided on the end supports for transportation. It should be possible to lift each support individually. Vendor to confirm.	
2.28	Detailed dimensional drawing (including arrangement of the drive unit) of rotator is to be submitted by the party at the time of submission of offer. Vendor to provide.	
2.29	First fill of Gear Oil / synthetic oil etc. (as required for proper functioning of rotator) will be done by supplier. The supplied Rotator set should be complete in all respect in ready to operate condition. Vendor to confirm. Vendor to specify Oil grade.	
3	<b>POWER SUPPLY :</b>	
3.1	AC 3-Phase, 415V + 10%/-15%, 50 Hz +/-3%. Vendor to confirm.	
3.2	The control supply voltage should be 110V AC for electrical panel and 24 V for foot operated switches. Vendor to confirm.	
4	<b>COLOUR :</b>	
	Colour of the Rotator shall be Apple Green Colour (ISC. No.- 281 as per IS-5:2007). Vendor to confirm.	
5	<b>GUARANTEE :</b>	
	Vendor shall provide full guarantee for all supplied equipment for a minimum period of 2 years for trouble free operation from the date of successful commissioning. Vendor to confirm.	
6	<b>PRE-DESPATCH INSPECTION :</b>	

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Kumar

	Pre-despatch inspection may be done by BHEL at vendor's work to ensure specifications compliance and functioning of the rotators. Vendor is required to send the actual photographs of the rotator manufactured as per our specifications (alongwith the actual dimensions of the rotator, certified by supplier's QC) in advance clearly showing all the views, before giving notice for pre-despatch inspection. The supplier to give prior notice sufficiently in advance (15 days before PDI date) for carrying out the pre-despatch inspection. Vendor to confirm.	
7	<b>MACHINE ACCEPTANCE :</b>	
	Final acceptance shall be made by BHEL at it's plant following successful commissioning which shall include prove-out of the complete equipment for load testing. Rotor for load testing will be provided by BHEL. It shall be the responsibility of the supplier to arrange and provide all required items, tool tackles, as required for successful commissioning / testing / proving of rotators. BHEL will provide power mains only. Any shortcoming in the functioning of the Rotator due to any reason shall be rectified by the supplier, free of cost. Vendor to confirm.	
8	<b>MACHINE PACKING :</b>	
	The Rotator shall be packed rigidly to avoid any transit damage. Vendor to confirm.	
9	<b>SPARES :</b>	
	(As applicable) (Per Rotator Set) : 1. Foot operated switch – 05 nos. each type. 2. Contactor/relay – 02 nos. each type. 3. O/L relay – 02 nos. each type. 4. MCB/MPCB – 02 nos. each type. 5. Single phase preventer – 02 nos. each type. 6. Push buttons – 05 nos. each type. 7. Bearing set - 1 no each type. 8. All type of gears - 1 no. each type Vendor to specify item-wise price of each spare.	
10	<b>MANUAL :</b>	
	3 Nos of operation and maintenance (O&M) manual (Per Rotator Set) & soft copy of manual to be supplied with the Rotators supply. Vendor to confirm.	

Attachments: ANNEXURES: 1 & 2 attached

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**QUALIFYING CONDITIONS FOR JOB ROTATOR WITH PU CLADDED ROLLERS (CAPACITY 50 TON)**

(Rev.-01, dtd. 15.01.16)

Indent no. - 20155433

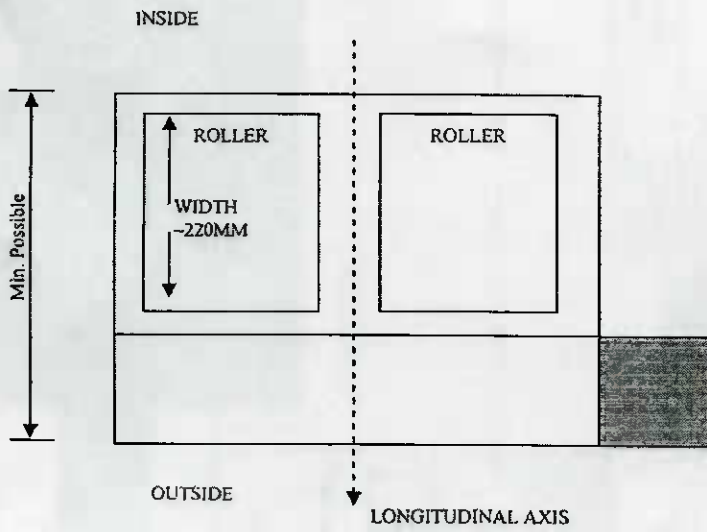
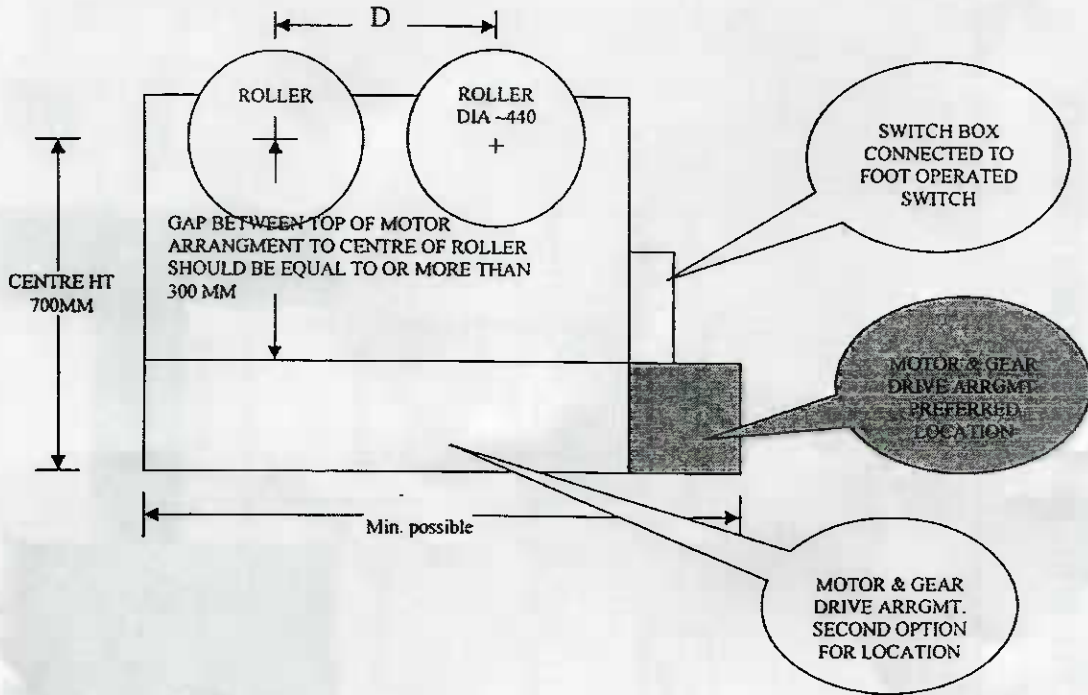
Requirment		Vendor Remarks / Confirmation
a.	The supplier should be a Original Equipment manufacturer / Authorised supplier of Job Rotators. Authorised supplier should provide copy of authorisation letter from their Original Equipment manufacturer.	Vendor to confirm & provide related documents.
b.	Only those vendors / suppliers, who have supplied and commissioned at least two Job rotators of Capacity- 50 tons or more, in the past five years (on the date of opening of tender) and such equipment is presently working satisfactorily, should quote.	Vendor to confirm.
c.	Vendor to specify following information about two nos. Job rotators supplied & commissioned, as referred in pt. no.-b.	
c.1	Capacity & model no. of job rotators supplied & commissioned	Vendor to inform
c.2	Date of commissioning	Vendor to inform
c.3	Name & complete address of company where referred job rotators are supplied	Vendor to inform
c.4	Name, Designation, contact number (phone) & email address of Contact person in company where referred job rotators are supplied	Vendor to inform
d.	BHEL reserves the right to verify the information provided by vendor. For this, vendor may be asked to provide copy of different documents (e.g. Copy of P.O., Commissioning report etc.). Vendor may also be required to arrange visit to their customers works, to verify their supplied item. In case, the information provided by vendor is found to be false /incorrect, the offer shall be rejected & suitable action shall be taken against vendor.	Vendor to confirm

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ANNEXURE-I



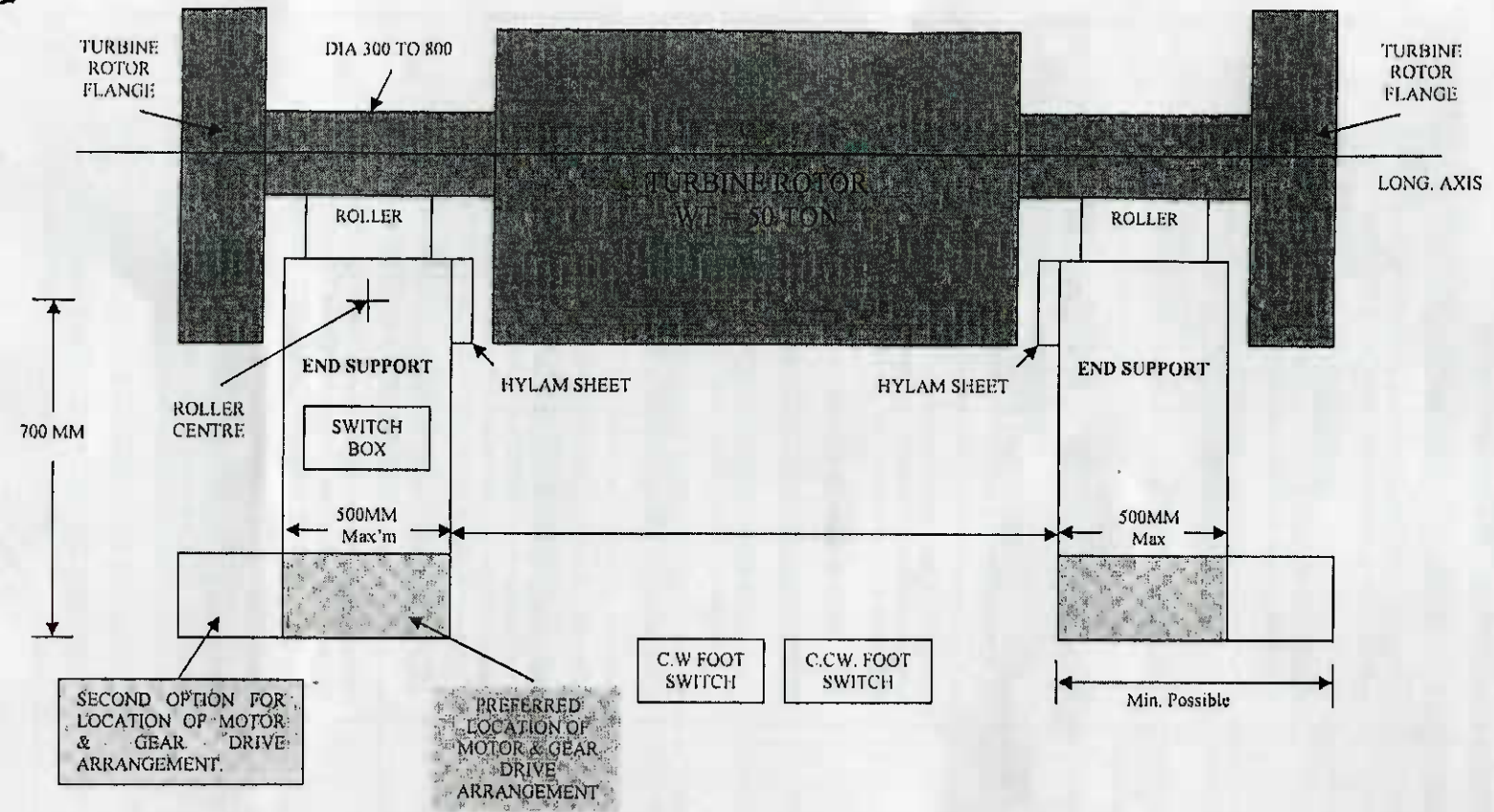
**PROPOSED SCHEMATIC DIAGRAM OF EACH END SUPPORT OF 50 T ROTATOR**  
**(ONE SET CONSISTS OF 2 SUCH END SUPPORTS)**  
**(FOR REFERENCE ONLY)**

(NOT TO SCALE)

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Kul



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**PROPOSED SCHEMATIC DIAGRAM OF 1 SET OF 50 T ROTATOR CONSISTING OF 2 END SUPPORTS**  
**SHOWN WITH TURBINE ROTOR OF 50 TON**  
**(FOR REFERENCE ONLY)**  
**(NOT TO SCALE)**