



BHARAT HEAVY ELECTRICAL LIMITED
HEAVY ELECTRICAL EQUIPMENT
PLANT RANIPUR, HARIDWAR - 249403,
UTTANCHAL INDIA

ENQUIRY
NO.

CONTACT	PERSON'S	NAME/
DESIGNATION/ PHONE/ E-MAIL		
(FROM PURCHASE DEPARTMENT)		

DUE DATE

SHRI GURMIT SINGH AGM(PPX-CAP)

**SUPPLIER'S
OTN NO.**

PHONE NO. :-

DATE _____

E-MAIL ID :-

TECHNICAL SPECIFICATION OF 125 TON CAPACITY ROTATOR SET
Specification no. NO. EMT- 6787 REV. 00

NOTE :-

1. Vendor (OEM) must submit complete information against clause no. 16 (Qualifying condition). The offer meeting this clause would only be processed (OEM : Original Equipment Manufacturer).

2. This technical specification is for one set of 125 Ton Rotators.

3. The following format must be completely filled and deviations mentioned in the appropriate columns. Inadequate /incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.


4. The offer and all documents enclosed with offer should be in English language only.

Name & address of supplier :-

Ninay
16/7/10
(N.S.RANA)
MGR(EMT)

(R.K.VERMA)
MGR(WEX-1)

(P.K.GUPTA)
DYMGR(WEX-I)


16.07.2021
(AJEET KUMAR)
DY.MGR(BL-I)

TECHNICAL SPECIFICATION FOR "125 TON CAPACITY ROTATOR SET" SPECIFICATION NO. EMT- 6787 REV-00

SL.N O.	DESCRIPTION OF BHEL REQUIREMENT	QUANTITY	OFFERED	DEVIATION
1.0	PURPOSE :-			
	125 Ton capacity motorized rotator set will be used for the rotation of the rotor of large size Turbo generator to facilitate rotor coil winding, laying and other assembly operation on the rotor.	Vendor to note		
2.0	SCOPE :-			
	The scope of supply includes design, manufacturing, supply, erection, commissioning and proving of the 125 Ton capacity motorized rotator set at BHEL Haridwar works.	One set of 125 Ton capacity motorized rotator, will consist of two nos. rotator block capacity 62.5 Tons each.		
3.0	DIMENSIONAL DETAILS OF THE ROTOR & JOB REQUIREMENT :			
3.1	Length of rotor : 15000 mm maximum; Weight : 125 Ton maximum; Seating diameter of rotor on the rotator : 200 mm minimum & 600 mm maximum	Vendor to note		
3.2	Rotor shaft drawing no. 01360101026 for 600 MW and drawing no. 01360101036 for 800 MW are enclosed with this specification. Offered rotator set must be capable to rotate these rotor shafts during winding stage. Rotor shaft journals will be placed on rollers of rotators. Vendor must take care that any part of the rotator must not foul with any other diameter of the rotor shafts, during rotation.	Vendor to confirm.		
3.3	The information on these documents is the property of BHARAT HEAVY ELECTRICAL LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of company.			
4.0	TECHNICAL SPECIFICATION OF 125 TON CAPACITY			

	MOTORIZED ROTATOR SET			
4.1	DESIGN CONSIDERATION : The rotator set should be designed for 150 Ton load with operating load 125 Ton i.e each rotator block shall have operating load carrying capacity of 62.5 Ton. However, each rotator block shall be designed for 75 Ton load capacity.	Vendor to confirm		
4.1.1	OPERATIONAL DETAILS :			
4.1.1.1	Rotator set shall be suitable for both clockwise and anticlockwise rotation of the job. Speed of rotation of ROLLER should be around 1 rpm . Rotator blocks will be kept directly on the floor of shop without any grouting.	Vendor to furnish the rpm of the roller, in the offer		
4.1.1.2	Provision for operating the rotator set from either end, shall be made. Safety provision i.e. inter locking shall be provided so that the rotator set is operated from one end, then rotator can not be operated from the other end at the same time. DOL starter shall be fixed on the front face of the rotator for the ease of operators.	Vendor to confirm		
4.1.1.3	The driving roller of the rotator block shall be motor operated through gears, worm wheel, worm shaft & bearing arrangement. Chain Pulley or belt driven arrangement shall not be accepted.	Vendor to confirm		
4.2	STRUCTURE OF ROTATOR BLOCK : Fabricated steel structure shall be provided in the manufacture of rotator block, duly stress relieved after fabrication. A certificate in this regard is to be submitted along with the supporting documents before despatch of the rotator.	Vendor to confirm		
4.2.1	Suitable lifting hooks are to be provided at suitable location of the rotator block for lifting the rotator block with the help of overhead crane.	Vendor to confirm		
4.3	ROLLERS and DRIVE :			
4.3.1	Each rotator block shall be designed with 1 no. driving roller and 1 no. idler roller. Thus, there will be total 2 nos. rollers and 1 no. drive motor in one rotator block. A set of 2 nos. such rotator block will be in the scope of supply for one complete set of rotator. Idler roller should have provision to rotate the roller by hand (using detachable handle), for checking free movement manually.	Vendor to submit the details in the offer as per SI. No. 5.1		
4.3.2	ROLLER DIMENSIONS :	Vendor to submit		

	Roller diameter - 375 mm approx.; Roller length - 220 mm approx.	the details in the offer as per Sl. No. 5.1		
4.3.3	Horizontal centre to centre distance in between the rollers : 500.00 mm approx.	Vendor to submit the details in the offer as per Sl. No. 5.1		
4.3.4	Centre height of rollers from the base of the rotator block : 580.00 mm approx.	The dimension as offered, is to be furnished in General Arrangement drawing (cl. 5.1)		
4.3.3	Material grade of rollers : Alloy Steel Forging - Grade 40 Ni6 Cr4 Mo3 (IS 4367 - 1991). Hardness of roller should be between 220 -240 BHN. Material Certificate of the rollers is to be submitted to BHEL before despatch of the rotator.	Vendor to confirm		
4.3.4	All the Heli-Worm units should be of Shanti / New Allenberry / Radicon/Elecon make. The gears, worm wheels, worm shaft and bearing arrangement should be lubricated properly with suitable lubricating grease / oil. In case of lubricating oil, effective double seal system should be provided to avoid the leakage / seepage of oil.	Details of the worm wheel and worm shaft, is to be furnished in General Arrangement of drawing (Sl. No. 5.1)		
4.3.5	Suitable capacity of motor Siemens / Bharat Bijlee / Kirloskar make is to be provided on the rotator. Technical Specification of motor is to be indicated in General Arrangement Drawing (Ref. Sl. No.5.1). The motor shaft will be coupled to heli-worm reducer with suitable speed reduction ratio to achieve offered RPM of the roller(Ref. Sl. no. 4.1.1).	Details of the motor, is to be furnished in the offer - refer Sl. No. 5.1		
4.4	BEARING : Only SKF / FAG/ NTN / INA make bearings shall be supplied.	Vendor to confirm & Relevant details to be furnished in the offer .		
5.0	GENERAL ARRANGEMENT DRAWING OF 125 TON CAPACITY MOTORIZED ROTATOR SET:			

5.1	General arrangement drawing of 125 Ton capacity Motorized Rotator set indicating all the details such as overall size and weight of each rotator block, dimensional details of fabricated steel body, roller dimensions, location of motor and gear - worm shaft arrangement, make and article number of the bearings, location of DOL starter, make and specification of motor, location of lifting hook (Sl. no. 4.2.1) etc. are to be furnished in the offer.	Vendor to submit the details in the offer		
5.2	General Arrangement Drawing with details as mentioned in Sl. No. 5.1, is to be submitted for BHEL approval within one month after placement of Purchase Order.	Vendor to confirm		
6.0	OPERATIONAL & MAINTENANCE MANUAL OF 125 TON CAPACITY MOTORIZED ROTATOR SET			
6.1	3 sets of Operational & Maintenance manual in English language, will be supplied for the 125 Ton capacity motorized rotator set.	Vendor to confirm		
6.2	NOTE : In addition to other information, O&M Manual should contain the following also :	Vendor to confirm		
6.2.1	Detail Operation Manual			
6.2.2	Detail Maintenance Manual, instruction for assembly and dis-assembly of the main items of 125 Ton capacity motorized rotator set.			
6.2.3	Electrical wiring circuit of the rotator set			
6.2.4	Constructional and general arrangement drawing of the rotator set			
6.2.5	Make, article no., torque, KW and other technical specification details of the motor			
6.2.6	Complete assembly drawing of the gearbox and worm wheel arrangement showing the bearing arrangement, oil seals/ rings/spacers etc., with their marking that matches with the attached part lists, having full description of the items. The above drawings are to be supported by the detailed kinematics diagram and sectional views of the worm wheel and worm shaft with details including the material, module, number of teeth of gear etc.			
6.2.7	Make and details of worm wheel, worm shaft			
6.2.8	Material specification and dimensional details of the rollers			
6.2.9	Make and specification details of the grease / lubricating oil			

	preferably IOC make			
6.2.10	Make and specifications of the parts like gears, worm wheels, worm shaft, bearings, seals etc. are to be provided in the parts list with cross reference to the assembly drawing of rotator set.			
6.2.11	Safety instruction for the operation of the 125 Ton capacity motorized rotator set			
7.0	POWER SUPPLY :			
7.1	BHEL will provide input power supply 3 phase, 3 wire, 415 + / - 15% volt, 50 + / - 3% Hz to Isolator Switch (BHEL scope) nearby 125 Ton capacity motorized rotator set. Cable connection (approx. 10.0 meters) from isolator switch (BHEL scope) to DOL starter of the rotator block of 125 Ton capacity motorized rotator set, will be in the scope of vendor. There will be no neutral wire and Earthing will be provided through shop structure column.	Vendor to note this point		
8.0	SPARES :-			
8.1	List for one set of spares required for 2 years trouble free operation of the 125 Ton capacity motorized rotator set	Vendor to furnish the list of spares in the offer		
8.2	The offer for the spares should be valid for 2 years after erection and commissioning of the 125 Ton capacity motorized rotator set.	Vendor to confirm		
8.3	Following optional spares are to be supplied with two set of rotators:- (Item wise price to be quoted)	Vendor to confirm		
8.3.1	Gear box as specified in clause no. 4.3.4 (Qty=01 number)			
8.3.2	Bearings as specified in clause no. 4.4 (Qty=01 set)			
8.3.3	Worm shaft and worm wheel as specified in clause no. 6.2.7 (Qty=01 set)			
9.0	PAINTING :			
9.1	125 Ton capacity motorized rotator set will be painted to RAL 7038 Grey paint or mutually agreed.	Vendor to confirm		
9.2	NOTE : Vendor will repair the paint with original paint in case the same is damaged in transit / erection, before commissioning the 125 Ton capacity motorized rotator set .	Vendor to confirm		
10.0	PRE-ACCEPTANCE OF 125 TON CAPACITY MOTORIZED ROTATOR SET AT VENDOR'S WORKS :			
10.1	125 Ton capacity motorized rotator set will be inspected by	Vendor to confirm		

	BHEL engineers on following points at vendor's works :-			
10.1.1	Overall dimensions of each rotator block, location of motor and coupling arrangement, make and specification of motor, details of worm wheel-worm shaft etc with reference to the approved General Arrangement Drawing (Sl. no. 5.2).	Vendor to confirm		
10.1.2	All operations of the rotator sets to be checked.			
10.1.3	Functions like interlocking, rpm of rollers as mentioned in clause 4.1.1.1 & 4.1.1.2 etc are to be checked. Rotation of rollers also to be checked wrt clause no. 3.2. Location of lifting hooks as per clause 4.2.1. to be checked.			
10.1.4	Certificates like stress relieving of fabricated steel structure (clause 4.2), material grade of rollers (clause 4.3.3) etc. to be checked.			
10.1.5	Availability of spare as per clause 8.3 to be checked. If applicable.			
11.0	ERECTION & COMMISSIONING OF THE 125 TON CAPACITY MOTORIZED ROTATOR SET:			
11.1	Vendor shall take full responsibility for carrying out the erection and commissioning the rotator set at BHEL Haridwar works.	Vendor to confirm		
12.0	JOB PROVING AND FINAL ACCEPTANCE OF THE 125 TON CAPACITY MOTORIZED ROTATOR SET AT BHEL HARIDWAR WORKS :	Vendor to confirm		
12.1	Final acceptance of 125 Ton capacity motorized rotator set shall be made at BHEL Haridwar works with any available rotor (which will be provided by BHEL) and final acceptance will be made after completion of the job proving of the rotator set.	Vendor to confirm		
12.2	First filling of all oils, grease etc. shall be in the vendor's scope of supply.	Vendor to confirm		
13.0	GUARANTEE :			
	Guarantee for the 125 ton capacity motorized rotator set for 24 months from the date of final acceptance of the rotator set. Any spares required during the guarantee period shall have to be arranged by the vendor free of cost (up to BHEL Haridwar stores) and duty levied have to be borne by the vendor	Vendor to confirm		
14.0	QUALITY PLAN :			
	Vendor shall submit Quality Plan within one month after issue	Vendor to confirm		

	of Purchase Order.			
15.0	PACKING :			
	Rigid packing shall be provided for each rotator block of 125 Ton capacity motorized rotator set to avoid any damage / loss in transit. All spares other loose items if any, should be suitably packed in separate wooden boxes.	Vendor to confirm		
16.0	Qualifying Conditions :			
16.1	Only those vendors (OEMs) should quote who have commissioned at least one 100 Ton capacity motorized rotator set in the past ten years (on the date of opening of Tender) and referred rotators set is presently working satisfactorily for more than one year after commissioning (on the date of opening of Tender). The following information should be submitted by the vendor about the companies where similar rotator set(s) have been supplied. This is required from all the vendors for qualification of their offer.	Vendor to accept & confirm		
	1. Name of the customer / company where referred rotator set is installed.	Vendor to inform		
	2. Complete postal address of the customer.	Vendor to inform		
	3. Month & Year of commissioning	Vendor to inform		
	4.Parameters of rotator set supplied (parameters specified in clause 16.1 above) and application for which the rotator set is supplied.	Vendor to inform		
	5. Name and designation of the contact person of the customer.	Vendor to inform		
	6. Phone, FAX no. and email address of the contact person of the customer.	Vendor to inform		
	7. Performance certificate from the customers regarding satisfactory performance of rotator set supplied to them (Original Certificate or Through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required.	Vendor to submit		
	8.BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	Vendor to accept & confirm		

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