BHARAT HEAVY ELECTRICALSLIMITED		Enquiry No.:
JHANSI - 284129		Due Date :
CONTACT PERSON:	Specification No. Item No. Quantity	6191(R2) (MT-1/3/1429 & 1430 2 Nos.

SPECIFICATION CUM COMPLIANCE CERTIFICATE OF 10 TON VERTICAL WINDING MACHINE LIFTING PLATFORM TYPE

Note :

1. Vender must submit complete information against clause No. 20 (Qualifying condition). The offer meeting this clause would only be processed.
2. The " offered" Column and where applicable, the " Deviations" & " Remarks " Column of this format shall be filled in by the Vender and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specification / requirements shall be treated as non - compliance.
3. The offer and all documents enclosed with the offer should be in English language only.

NAME & ADDRESS OF THE SUPPLIER:	
TELEPHONE NOS. :	
FAX NOS. :	
E.MAIL ADDRESS :	

SCOPE : SUPPLY , ERECTION & COMMISSIONING OF 10 TONNE VERTICAL WINDING MACHINE LIFTINH FLATFORM TYPE COMPYING WITH SPECIFICATIONS AS BELOW:

S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFORMED BY	OFFERED	DEVIATIONS	REMARKS
1	PURPOSE & WORK PIESE MATERIAL				
1.1	10 Tonne vartical winding machine Lifting Platform Type is a special purpose machine used to make transformer coil made of paper insulated copper conductor in paralallel. No. of conductors vary as per disign. These conductors are wound circular on a mould mounted on face plate of machine.	VENDOR TO CONFIRM			
1.2	**work piece material:** Machine used paper covered continuously transposed copper conductor (CTC) incorporating a number of individual annealed copper strips insutated with a poly vinyl based enamel.copper conductors as per IS:3855 (partIII)-1978&-18-1990.	VENDOR TO CONFIRM			
2.0.	SPECIFICATION:				
2.1	**MACHINE CONFIGURATION :**-The 10 tonne vertical winding machine lifting platform type comprises of rotary table moving around vertical axes at requird rpm in clockwise or anti clockwise direction depending upon the design of coil being manufactured.The transformer coil are made of a bunch of insulated copper conductors passing through conductor tensioning device and then hold on a mould fixed on the face plate of rotating device. The operator, control cabinet and portable control panel/foot pedal switch, tensioning device are mounted on operators platform moveable in up and down direction. Copper conductors are mounted on bobbin stand placed on a saparate bobin stand platform. This platform is also moveable in up and down direction. While winding, a bending tool is required for copper conductors transposition. The operator platform shall be diaphragm type to close or open the opening as per diameter of mould or coil. The vertical position of operator platform and bobin stand platform shall be adjusted while making the coil as per height of coil being achived.The maximum downward movement of operator platform shall be **650 mm** below the faceplate of rotating table.	VENDOR TO CONFIRM			

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	The construction/ design of rotating table and it's driving mechanism shall be such that there shall be no obstacle while bringing operator's/ tensioning device plateform with minimum / maximam diaphragm opening. The up &down movement of operators platform shall be obtained by synchronous rotation of four lead screws and thus giving liner up and down movement to lead nuts fitted with platform/ wire rope and pulley with winch drive of suitable capacity. Supplier shall submit the detailes of up and down vertical movement mechanism. Similar arrangement shall be provided for Bobin stand platform having multiple number of reel mounted on bobin. Necessary telescopic collapsible ladder shall be provied on both the platforms.The ladder should have proper foot rest for safety of the operator while using it. Platform shall be provided with heavy duty safety railing all around both the plateform with necessary opening with gates. Both the platforms shall have anti skid chequred plates at floor. Design of moving platforms, rotating table , daiphram type aperture opening shall be robust and proven design. All drawing and design shall be got approved from BHEL.				
2.2	**TECHNICAL SPECIFICATION OF MACHINE:-**				
2.2.1	*Capacity of the M/C* : *10 tonnes.*	VENDOR TO CONFIRM			
2.2.2	Coil diameters : 500-2500 mm	VENDOR TO CONFIRM			
2.2.3	Coil height : 3000 mm	VENDOR TO CONFIRM			
2.2.4	Face plate dia of rotary table : 2250 mm	VENDOR TO CONFIRM			
2.2.5	**Face plate height : 1200 mm Below ground floor**	VENDOR TO CONFIRM			
2.2.6	**Movement of operator platform below faceplate : 650 mm**	VENDOR TO CONFIRM			
2.2.7	Vertical movement of operator platform above faceplate : 2500 mm Total vertical movement of operator platform shall be : 3500 mm	VENDOR TO CONFIRM			
2.2.7	Tension applicable on copper conductors : 2000 KPat 3000 mm	VENDOR TO CONFIRM			
2.2.9	RPM/ Torque reqd for winding (torque required to overcome friction is excluded.) 0-6.5 rpm at 1250KPm torque, 6.5 - 15 rpm at -850 KPm torque, 15-30 rpm at-725KPm torque.	VENDOR TO CONFIRM			
2.2.10	Aperture dia. : 600-2700 mm				
2.2.11	Acceleration of rotary table : 0.47 radian/sec.2	VENDOR TO CONFIRM			
2.2.12	Retardation of rotary table : 0.2 - 0.7 radian/sec.2	VENDOR TO CONFIRM			
2.3	**ROTARY TABLE**				
2.3.1	Face plate dia of rotary table : 2250 mm	VENDOR TO CONFIRM			
2.3.2	Load carrying capacity of rotary table. : 10 Tonnes.	VENDOR TO CONFIRM			
2.3.3	Face plate rotary table to be provided three rows of 25 mm tapped holes of 8 Nos.in each row at PCD of 1200, 1500, 2000 mm	VENDOR TO CONFIRM			
2.3.4	An A.C drive (Siemens/ABB/L&T make) shall be provided to control the speed of the main face plate. The speed control and acelaration / declienation of the drive shall be possible through foot switches provided for the operator. An additional potentometer may be provided in the operator panel to pre-select the speed range. A disc brake should also be provided to ensure no motion of face plate unless the drive is enable for motion. The drive shall be a closed loop one with a tach / encoder for speed feedback.	VENDOR TO CONFIRM			
2.3.5	Forward & reverse motion speed of rotary table using preset speed & control \through foot switch.	VENDOR TO CONFIRM			
2.3.6	Vartical speed of operator and bobin platform : 0.72 m/Min.(Approx)	VENDOR TO CONFIRM			
2.3.7	Drive for vertical movement of rotary table : Suitable AC motor with gear box. Or Suitable capacity reputed make winch hoist.	VENDOR TO CONFIRM			

2.3.8	Support for vertical movement of operator platform/ bobin stand platform shall of one lifting stage with 4 guidng pillars on which the platform is mounted & driven by a gear motor and 4 worm gear screw jacks/ four vertical structure provided with necessary pullies, their mounting on bearing , wire rope and suitable winch.	VENDOR TO CONFIRM				
2.3.9	The Diaphragm aperture on operator panel shall have 4 numbers radialy moving plates to cover all the areas except the opening required for mounting of coil/ mould. Suitable motor driven arrangement with rack & pinion or similar suitable design shall be provided to ensure smooth opening & closing of aperture.	VENDOR TO CONFIRM				
2.3.10	Type of gear box- worm gear box	VENDOR TO CONFIRM				
2.3.11	Make - Redicon/ shant gears/ elcon make only	VENDOR TO CONFIRM				
2.3.12	Lubrication system Cenralised lubrication	VENDOR TO CONFIRM				
2.4	**CONDUCTOR TENSIONING SYSTEM**					
	The insulated copper conductors are passed through a tensioning device which consist of 2 Face - ground steel brake plate pressed together by the brake clamp. Clamping force is accomplished by means of a pressure bellow pneumatically operated. A finger guide infront of the tensioning device gathers all conductors in to a bundle. The tensioning unit is mounted on operator platform.	VENDOR TO CONFIRM				
2.4.1	Size of brake plates 600X 500 mm	VENDOR TO CONFIRM				
2.4.2	Diaphragm / pneumatic cylinders 2 Nos.	VENDOR TO CONFIRM				
2.4.3	Air working pressure 4 bar	VENDOR TO CONFIRM				
2.4.4	Maximum load on brake plates	VENDOR TO CONFIRM				
2.4.5	Brake system shall be sliding manually over horizontal beam by rack and pinion arrangement	VENDOR TO CONFIRM				
2.4.6	Height of horizontal beam above platform lebel 800 mm	VENDOR TO CONFIRM				
2.4.7	Maximum N. of copper conductor used for winding : 16 Nos. having individual size of 1.5 to 4 mm thick and 6 to 17 mm wide.	VENDOR TO CONFIRM				
2.5	**ADAPTOR PLATE (to be mounted on rotary table for making transformer coil. Drawing will be supplied by BHEL)**					
2.5.1	Out side dia of fabricated structural steel adaptor plate without extension attachment 750 mm	VENDOR TO CONFIRM				
2.5.2	Out side dia of fabricated structural steel adaptor plate with four Nos channel structure extension welded on the outer periphery at 90 degree - 2800 mm with 'T' slot to accommodate 'T' bolt size A- 44mm, B-25mm , C-18mm, D-27 mm	VENDOR TO CONFIRM				
2.5.3	Height : 500 mm	VENDOR TO CONFIRM				
2.5.4	Center through hole at top and bottom 75 mm dia	VENDOR TO CONFIRM				
2.6	**BENDING TOOL(FOR TRANSPOSITION OF COPPER CONDUCTOR)**					
	Bending tool is required for bending copper conductors for making cross over bends. The bending operation shall be performed with minimal stress on the insulation material. It is a hydraulic operated tool.	VENDOR TO CONFIRM				
2.6.1	Hydraulic perssure required 300 bar	VENDOR TO CONFIRM				
2.6.2	Copper conductor size 6 mm to 18 mmwide and 1.5 to 4 mm thick	VENDOR TO CONFIRM				
2.6.3	Tool support swing type spring balancer	VENDOR TO CONFIRM				
2.6.4	Operation of bend tool - Hydraulic and manual	VENDOR TO CONFIRM				
2.6.5	Hydraulic pressure generated by Hydro - pneumatic magnifier - 1 Nos. of 300 bar capacity	VENDOR TO CONFIRM				
2.6.6	Maximum stroke range of tool 20 mm	VENDOR TO CONFIRM				

2.7	**APERTURE**				
2.7.1	Motor for aperture drive (Bhart bijee, Simens , ABB make) - suitable HP , 415 volt 3 phase 50 HZ , Suitable	VENDOR TO CONFIRM			
2.7.2	Gear box - ratio / suitable	VENDOR TO CONFIRM			
2.7.3	Type of gear box - Double worm reduction	VENDOR TO CONFIRM			
2.7.4	Aperture speed - 1000 mm / Min.	VENDOR TO CONFIRM			
2.7.5	Type of aperture - 4 segment construction	VENDOR TO CONFIRM			
2.7.6	Minimum/ maximum opening of aperture - 500mm / 3000 mm	VENDOR TO CONFIRM			
2.8	**BOBBIN & WIRE DRUM STAND**				
	One No bobbin & wire drum stand made of framed structral steel with .1 bobbin max. lengh 400 mm long suitable for accommodating 4 x 2 bobbin of 700 mm dia (each 250 kg weight) or with suitable brackets for mounting three bobbins of 500 mm dia x 1000 mm with (1ton each) complete with neccessry mounting shafts, rollers with bearing,rails etc.	VENDOR TO CONFIRM			
2.9	**CONSTRUCTION:**				
2.9.1	Vendor to furnish details of material, hardness & constructional detail material of rotary table structure -HT steel plate as is 2062 / cast iron grade 26. material of vertical lead screws - forged steel as per IS 2004 material of other components/structure-HT steel plates as per IS 2062.	VENDOR TO CONFIRM			
2.9.2	Video images on cd including hard copy explaining the features Literature with photographs, drawings explaining the technical features should be encolosed with the offer.	VENDOR TO CONFIRM			
2.10	**OPERATION AND CONTROL SYSTEM:**				
2.10.1	**OPERATORS PANEL:**				
2.10.1.1	All switches on the operators panel including that for table rotation should be within reach of operator of average hight (indian) for movement, efficent & safe operation. All display / indications should also be conveniently placed acordingly. Layout showing complete details of the items should be submitted. All the control operations to be provided through a opertor panel interface to the drive.	VENDOR TO CONFIRM			
2.10.1.2	An auxiliary pendant, switch can be taken to the table for job setting and similar other purposes, should be provided. Indication of RPM, Coil / Dissc no. etc.should be indicated on the operator panel.	VENDOR TO CONFIRM			
2.10.1.3	Foot pedal switch suitable for keeping it up or down side for left foot or right foot operation with two switches one in the front & one in the side. Front switch for operating of machine at preset RPM & side switch to over -ride speed & to reach max.speed A foot switch shall be dead man stop along with it switch for up & down movement of both platforms shall be provided on operator platform	VENDOR TO CONFIRM			
2.11	**MANUAL CONTROL:**				
2.11.1	Complete manual control of machine with required switches / Keys should be provided on operators panel for selection of required direction. Diagram/ Sketches for switch /keys shall be provided through operator panel interface on operators pendant.				
2.12	**HYDRAULIC SYSTEM:**				
2.12.1	The system should be centralised. Hydraulic tank shall be located near the bending tool.	VENDOR TO CONFIRM			
2.12.2	Make rexroth/ Vickers sperry or equivalated from a reputed manufacturer. (Details to be submitted)	VENDOR TO CONFIRM			
2.12.3	First filling of all required oils & grease etc.	VENDOR TO CONFIRM			

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2.13	**ELECTRICAL SYSTEM**				
2.13.1	415 +/- 10%, 50hz, 3 Phase A.C. Power supply source will be provided by BHEL at a single point near the machine, as a layout recommendation by vender. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine/ control cabinets, shall be the responsibility of vender.	VENDOR TO CONFIRM			
2.13.2	CONTROL PANEL:- A floor mounted sheet metal control panel to be provided complete with MCB/ Fuses for incomming power supply. All contactors, relays, starters, timer, single phasing preventor, MCB's and HRC fuses, Step down transformer for control voltage etc., indicating lamps for power supply shall be provided. Status monitoring and fault enunciation with alarm etc. with desire interlocks with electrical safety provisions, indications and operation of all electro pneumatic valves shall be provided.	VENDOR TO CONFIRM			
2.13.4	**TROPICALISATION:** All electrical/ electronic equipments shall be tropicalised.	VENDOR TO CONFIRM			
2.13.5	All electrical & electronic control cabinets & panel should be dust and vermin proof with suitable cooling arrangement. Panel should be of reputed make.	VENDOR TO CONFIRM			
2.13.6	All electrical components in the cabinets should be mounted on DIN Rail.	VENDOR TO CONFIRM			
2.13.7	All electrical and electronic panel including operator's panel should be provided with fluorescent/ CFL lamp for sufficient illuminication and power receptacles of 220volts. 5/15 Amp. A.C. All adapters / receptacles should have complatibility with Indian equivalents.	VENDOR TO CONFIRM			
2.13.8	Motors shall confirm to IEC of Indian standards.	VENDOR TO CONFIRM			
2.13.9	Vender should ensure the proper earthing for the machine and its peripherals.	VENDOR TO CONFIRM			
2.13.10	In- cycle hour counter with reset facility is to be included in the offer	VENDOR TO CONFIRM			
2.14	**SAFETY ARRANGEMENTS:**				
2.14.1	Following safety features in addition to other standard safety features should be provided on the machine:	VENDOR TO CONFIRM			
2.14.2	Machine should have adequate and reliable safety interlocks/ deviccs to avoid damage to the machine, work piece and the operator due to the malfunctionong or mistakes. Machine functions should be continuously monitored and alarm/warning indications through lights/ alarm number with messages (on panels) should be available .	VENDOR TO CONFIRM			
2.14.3	All the pipes. Cables etc . On the machine should be well supported and protected .	VENDOR TO CONFIRM			
2.14.4	All the rotating parts used on machine should be statically & dynamically balancod to avoid undue vibrations .	VENDOR TO CONFIRM			
2.14.5	ELCB to be provided in the the circuit to protect the equipment for Earth fault.				
2.14.6	Emergency Switches at suitable locations as per International Norms are to be proviede.	VENDOR TO CONFIRM			
2.15	**ENVIRONMENTAL PERFORMANCE TO THE MACHINE :**				
	The Machine shall conform to followong factors related to environment :	VENDOR TO CONFIRM			
2.15.1	Maximum noisc levcl shall be 85 dB (A) at normal load condition, this will be measured as per international standards like DIN 45635-16. Supplier to demonstrate compliancc to noise level . if so required.	VENDOR TO CONFIRM			
2.15.2	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor	VENDOR TO CONFIRM			
2.15.3	Paint of the machine should be oil / coolant resistant and should not peel off.	VENDOR TO CONFIRM			

3.0.	**PNEUMATIC SYSTEM**				
3.1	**COMPRSSED AIR POINTS :**				
3.1.1	Compressed Air Point with manual ON/OFF Valve and flexible of suitable for work piece cleaning. FRL, automatic dram trap valve condenste receiver for pneumatic system and suitable air compressor to give 8 bar pressure to operate machine . Compressor (reputed make) shall be supplied by the vendor.(Capacity to be specified).	VENDOR TO CONFIRM			
4.0.	**TOOLING :**				
4.1	Bending tool :- As per Para 2.6	VENDOR TO CONFIRM			
5.0.	**LEVELLING & ANCHORING SYSTEM**				
5.1	Complete anchoring system including foundation bolts , anchoring materials , fixators, leveling shoes etc, shall be supplied for the Machine .	VENDOR TO CONFIRM			
6.0.	**TOOLS FOR ERECTON, OPERATION & MAINTENANCE :**				
6.1	Special tools and equipment required for erection of the machine shall be brought by the vendor. Neccssary tools like Torque Wrench, Spanncrs,Keys, grease guns etc for operation and maintenancc of the machine should be supplied. List of such tools should be submitted with offer .	VENDOR TO CONFIRM			
7.0.	**ACCESSORIES :** Conductor tensioning system, adaptor plate, bending tool , & hydraulic system as described in Para 2.4,2.6 &2.12 to be provided.	VENDOR TO CONFIRM			
8.0.	**SPARES :**				
8.1	Item wise break - up of mechanical, hydraulic, electrical and electronic spares used on the machine in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous runing basis should be offered by vender. The list to include following, in addition to other recommended spares :(**Unit Price of each item of spare shouls be offered)**	VENDOR TO CONFIRM			
	a) **Mechanical & Hydraulic Spares** : All types of Valves, all types of pressure switches/ transducers, all types of filters, all types of seals.	VENDOR TO CONFIRM			
	b) **Electrical/Electronic Spares**: All types of Relays , contactors, MCB's, Proximity Switches, Push Buttons, Indicating Lamps , Semicondrctor Fuses, Special Fuses, Circuit Breakes, Main Power Switch, Disk Unit etc.	VENDOR TO CONFIRM			
8.2	All types of spares for total machine and accessories should be available for at least ten years after supply of the machine . If machine or control is likely to become obsolete in this period , the vendor should inform BHEL sufficiently in advance amd provide drawings of parts/ details of spares & suppliers to enable BHEL to procure these in advanece, if erquired	VENDOR TO CONFIRM			
8.3	Recommended set of spares for all attachments are to be offered with details .	VENDOR TO CONFIRM			
8.4	Vendor to confirm that complete list of spares for machine and accessries along with specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the machine	VENDOR TO CONFIRM			
9.0.	DOCUMENTATION : Five sets of following documents (hard copies) in english language should be supplied along with the machine.	VENDOR TO CONFIRM			
9.1	Operating manual of machine	VENDOR TO CONFIRM			
9.2	Programming manuals of machine	VENDOR TO CONFIRM			
9.3	Detailed maintenance manual of machine with all drawings of machine assemblies / sub assemblies / parts including electrical/ pneumatic / hydraulic circuit diagrames. All assemblies / sub- assemblies drawings shall be supplied with the part list also.	VENDOR TO CONFIRM			

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9.4	Catalogues , O&M manuals of all bought out items including drawings where ever applicable.	VENDOR TO CONFIRM			
9.5	Detailed specification of all rubber items and hydraulic / lube fittings.	VENDOR TO CONFIRM			
9.6	PLC programm print out with comments in english	VENDOR TO CONFIRM			
9.7	PLC programm and programming software on CD.	VENDOR TO CONFIRM			
9.8	Complete master list of parts used in the machine shall be submitted by the vender	VENDOR TO CONFIRM			
10.0	**TRANNING**				
10.1	BHEL persons should be trained at supplier works for mutually agreed period in the area of : a - Mechanical, Electrical and electronic maintenance for machine and other supplied equipments b- Operator for machine operation	VENDOR TO CONFIRM			
10.2	Air- fare , boarding and lodging for the trainees shall be born by BHEL.	VENDOR TO CONFIRM			
10.3	Vender to quote for tranning on man/ week basis.	VENDOR TO CONFIRM			
10.4	Vender should commit to orgnised and quote for tranning of electronic engineer at manufacturer works for advance features and specilised tranning if so required by BHEL.	VENDOR TO CONFIRM			
11.0	**FOUNDATION**				
11.1	Vendor shall submit the preliminay layout drawing for getting BHEL"s approval within one month from th date of Letter of Intent (LOI)/P.O. , whichever is carlier . Soil condition data will be furnished by BHEL along with the approval. Complete foundation Design including details, like Static/Dynamic load details etc . and final layout Drawings shall be submitted by the supplier within one month after geting BHEL"s approval . The Layout should consist of all requirements pertaining to complete machine and all accessories including space requirement. BHEL shall construc complete foundation for machine & supplier shall check & approve the same before etection. Vendor should arrange equipment required for the testing of foundation, if required. The vendor shall also indicate detailed specifications of grouting compound and grouting proccdure etc. for foundation bolts of the machine.	VENDOR TO CONFIRM			
12.0.	**ERECTION & COMMISSIONING**				
12.1	Supplier to take full responsibility for carrying out the erection, start up , testing of machine, it's control system & all types of other supplied equipment, machining of test pieces etc .Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier in their foundation/ layout drawings . Other requiremnts like crane, lifting tackles etc. shall also be provided by BHEL. Details of these requirements should be informed by vendor in advande.	VENDOR TO CONFIRM			
12.2	Successful proving of BHEL, components by the supplier shall be considered as part of commissioning .All tests, as mentioneda at **clause 16 (Machine Acceptance** shall form part of the commissionong activity .	VENDOR TO CONFIRM			
12.3	Test mandrel for checking run-out/taper & alignment should be supplide by the Supplier.	VENDOR TO CONFIRM			
12.4	Tools, Tackles, Test Mandrels, instruments and other necessary equipment including Laser erquipment required to carry out all above cativities should be brought by the supplier.	VENDOR TO CONFIRM			
12.5	**Commissionong spares** required for commissining of the machine within stipulated time, shall be brought by the supplier on rerturnable basis.	VENDOR TO CONFIRM			

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12.6	All Cover plates required for the machine and its peripherals including pits, if any, shall be supplied and installed by the vendor. **The plates should be sourced form India**	VENDOR TO CONFIRM				
12.7	Portion, if any , of the machine, acccssories and other supplied items where paint has rubbed off or peeled during transit or erection should be repainted and merged with the original surrounding paint by the vendor, For this purpose, the vendoe should supply sufficient quantity of touch up paint of various colours of paint used.	VENDOR TO CONFIRM				
12.8	Schedule of Erection smd Commissioning shall be submited with the offer.	VENDOR TO CONFIRM				
12.9	Charges, duration terms & conditions for E&C should be furnished in detail separatcly by vendor along with offer.	VENDOR TO CONFIRM				
13.0.	**ACCURACY TESTS:**					
13.1	**GEOMETRICAL ACCURACIES :**					
13.1.1	Geometrical Accuracies Tests shall be in accordance with standard chart or applicable standard. Detailed Test charts for the same, clearly showing the accuracies to be achieved on the machine, shall also be submitted with the offer.	VENDOR TO CONFIRM				
13.1.2	All the cbove accuraies to be demonstrated to BEHL engineers during pre-acceptancc tests at Suppliers works and during Erection & Commissioning at BHEL, works.	VENDOR TO CONFIRM				
14.0.	**AMBIENT CONDITIONS & THERMAL STABILTY**					
14.1	Total machine including PLC system and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. Power Supply: Voltage : 415 V +/-10%, Frequency : 50 Hz +/-1.5Hz . No . of phases = 4 wire system Ambient conditions : Temperature = 5 to 50 degree Celsius Relative Humidity = 95% max . (Vendor to confirm that machine is suitable for above and details of provisions on the machine for the same are to be furnished by Vendor)	VENDOR TO CONFIRM				
14.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year. Machine shall be kept in the normal shop floor condition. Max.Temperature variation is up to 25 deg Celsius in 24 hours.(Vendor to confirm that machine is suitable for above and details of provisions on the machine for the same are to be furnished by Vendor	VENDOR TO CONFIRM				
14.3	Thermal.Stability of the conplete machine keeping in view specifed Ambient Conditionds and accuracy requirements of BHEL components and trouble free operation of the machine should be ensured by vendor . (Vendor to confirm that machine is suitable for above and details of provisions on the machine for the same should be furnished by Vendor)	VENDOR TO CONFIRM				
14.4	The machine , including attachments and accessories, should be suitable for 24 Hrs. Continuous operation to its full capacity for 24 Hrs. a day and 7 days a week throughout. Vendor to ensure and confirm the same .	VENDOR TO CONFIRM				
15.0.	**PROVE OUT OF BHEL COMPONENTS:**					
15.1	Complete prove out of transformer coils shall be done by Vendor at BHEL works to the specified design accuracy. Materilal for the prove out components shall be provided by BEHL. Vendor shall be fully responsible for prove out of transformer coil as per drawing and other requirements specified by BHEL to the full satisfaction of BHEL. Clarifications, if any required by vendor, regarding accuracy requirements of the prove out transformer coil, whether specified or not, should be discussed and cleared by vendor during intial technical discussions.	VENDOR TO CONFIRM				
15.2	Vendor shall be respnsible for any deviation/rejecton in prove out transformer coil due to wrong opertion or malfuctioning of the machine during prove out operation and also for the delay in operation due to improper recommended tooling etc. The cost of such deviation / rejection, if any , shall be refunded by the vendor to BHEL	VENDOR TO CONFIRM				

16.0.	**MACHINE ACCEPTANCE: (Tests / Acctivities TO be performed by Vendor)**	VENDOR TO CONFIRM				
16.1	**Tests/Activities should be carrid out at supplier's works on the machine before dispatch :**	VENDOR TO CONFIRM				
16.1.1	Geometrical Accuracy Tests as per test chart .	VENDOR TO CONFIRM				
16.1.2	The machine should be tested for continuous runing of 8hrs. If any break down occurs during this test, the test should be repcated for 8 hrs from that time.	VENDOR TO CONFIRM				
16.1.3	Demonstration of all features of the machine , PLC system and all Acccssories.	VENDOR TO CONFIRM				
16.2	**Test to be carried out at BHEL works while commissioning the machine :**					
16.2.1	Geometrical Accuracy Tests as per test chart .	VENDOR TO CONFIRM				
16.2.2	Full load test to demonstrate the maximum power & winding / loading capacity of the machine .	VENDOR TO CONFIRM				
16.2.3	The machine should be tested for continuous running of 8 hrs. If any break down occurs during this test, the should be repeated for 8 hrs from that time .	VENDOR TO CONFIRM				
16.2.4	Demonstraion of all features of the mchine & all accessories to the satisfaction of BHEL for their efficient and effective use.	VENDOR TO CONFIRM				
16.2.5	Demonstration by actual use of all supplied attachments and accessorice to their full capacity .	VENDOR TO CONFIRM				
16.2.6	Job prove out. Minimum three job trial will be taken as per BHEL specifications.	VENDOR TO CONFIRM				
16.2.7	Two weeks supervision of independent operationof machine by BHEL after job prove out .	VENDOR TO CONFIRM				
16.2.8	Training of BHEL machine operators in operation of complete machine & accessorics etc.by the supllier's experts/ engineers during commissioning at BHEL works .	VENDOR TO CONFIRM				
17.0.	**PACKING :**					
17.1	Standard & rigid packing for all items of complete machine, PLC System, all Accessories and other supplied items to avoid any damage/ loss in transit. When machine is despatched in containers, all small loose items shall be suitably packed in boxes	VENDOR TO CONFIRM				
18.0.	**GUARANTEE :**					
18.1	24 months from the date of acceptance of the machine.	VENDOR TO CONFIRM				
19.0.	**GENERAL : The vendor should submit the following information :**					
19.1	Machine Model	VENDOR TO CONFIRM				
19.2	Total connected load (KVA) :	VENDOR TO CONFIRM				
19.3	Floor area requred (Length, Width, Height) for complete machine & accessoeies.	VENDOR TO CONFIRM				
19.4	Painting of machine / Electrical panels: RAL 6011 Apple green (Polyurethane paint)					
19.5	Total weight of the machine					
19.6	Weight of heaviest part of the machine					
19.7	Weight of the heaviest assembly / sub assembly of the machine					
19.8	Dimensions of largest part / sub assembly / assembly of the machine.					

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19.9	Vender to submit , along with offer, the reference list of customers where similar machines have been supplied mentioning the customer, machine model, major sp[ecification of the supplied machine, control system , year of supply etc.				
19.10	Detailed catalogues, sketch/ photograph of the machine and accessories/ attachments should eb submitted with the offer.				
19.11	Hydraulic, pneumatic and oil piping should be preferably matellic except places where flexible piping are eccential. All the pipes required for the same shall be included in the standard scope of the machine.				
20.0	**QUALIFYING CONDITIONS**				
20.1	Only those vender, who have supplied and commissioned atleast Three Numbers 10 Tonnes vertical transformer coil winding machine of same or highter sizes for similar application in the past ten years and such machine is presently working satisfactorily for more than one year (more than six month if supplied to BHEL) after commissioning should quote. The following information is to be submitted by the vender about the companies where similar machines have been supplied. This is required from all the venders for qualifications of their offers.				
	1. Name of the customer/ company where similar machine is installed				
	2. Complete postal address of the customer				
	3. Year of commissioning				
	4. Application for which the machine is supplied with details of accuracies achieved on the job				
	5. Name and designation of the contact person of the customer				
	6. Phone , Fax No. and e.mail address of the contact person of the customer				
	7. Performance certificate from the customer regarding satisfactry performance of the machine supplied to them				

Prepared by		Checked by		Approved by	
15/10/07	15/10/07	16/10/07			16/10/07
Inder Mathur	B.D.Richharia				
Manager (WE&S)	Manager (TRM)	Production In charge	Maintenance In charge	AGM (WES & FAB))	AGM (TRM/TRP)