

	BHARAT HEAVY ELECTRICAL LIMITED			Enquiry No. :	
UNIT'S ADDRESS:				Due Date :	
CONTACT PERSON'S NAME/DESIGN./PHONE NO./E-MAIL (FROM PURCHASE DEPTT.)			Supplier Qtn. No.:		
			Date :		
<u>SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR 300 TON EMBOSSING MACHINE</u>					
NOTE:-					
	1. Vendor must submit complete information against clause no. 24. 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 Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.				
	3. The offer and all documents enclosed with offer should be in English language only.				
	4. The information provided by vendor in specification cum compliance certificate will supersede any other information provided by vendor .				
NAME & ADDRESS OF THE SUPPLIER :	NAME & ADDRESS OF THE INDIAN AGENT :				
TELEPHONE NOS.:	TELEPHONE NOS.:				
FAX NOS.:	FAX NOS.:				
E-MAIL ADDRESS :	E-MAIL ADDRESS :				
SCOPE: SUPPLY AND COMMISSIONING OF 300 TON EMBOSSING MACHINE COMPLYING WITH SPECIFICATIONS AS FOLLOW:					

SNO	DESCRIPTION FOR BHEL REQUIREMENT		SPECIFIED CONFIRMED	OFFERED	DEVIATIONS
1	PURPOSE: 300 Ton Power Press is required for embossing radiator panel elements. The material thickness varies from 1.00 mm to 2 mm. Raw materials are CRNGO , CR sheets.		Vendor to confirm		
	2 SPECIFICATION:				
2.1	The press should be of latest design comprising all the features, which guarantee reliable services, most convenient and safe operating conditions and best quality production with least maintenance.		Vendor to confirm		
2.2	Frame: Welded steel box type four piece tie rod construction for maximum rigidity. The press should be of all steel construction fabricated from high quality rolled steel plates of fusion welding quality with heavy cross ribbed and stiffened, fully thermal stress relieved prior to machining. The box type crown to give maximum support for the eccentric shaft and bearings under heavy-duty load conditions. The uprights to be designed to reduce deflection and vibration to a minimum, thus providing the benefits of less die wear, greater part accuracy and longer press life. In machining, the squareness of uprights to the bed to be accurately maintained for maximum slide to bed parallelism. The crown and bed with uprights between them are tied together by tightening tie rods with pre-stressing to 200% of the nominal press capacity forming a very rugged press frame.		vendor to confirm		
2.3	RAM SLIDE: The ram slide should be Air Counter balanced and to be adjusted by double worm gears working simultaneously. A clear visible digital mechanical Die height indicator with least count of 0.1 mm to be fitted on the slide.		vendor to confirm		

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2.4	TRANSMISSION DRIVE: The drive should be transmitted from flywheel to slide through eccentric shaft & gears. The main motor should be foot mounted AC motor. The motor drive arrangement should be complete with adjustable motor mounting bracket etc .		vendor to confirm		
2.5	BEARINGS: Precision fitted, thick walled bronze bearings (BC-2 Japanese Grade or equivalent) to be used for eccentric shaft bearings and connecting Rod bearings. These should be heavily lubricated for smooth running. Anti-friction bearings should be used for flywheel mounting and flywheel shaft.		vendor to confirm		
2.6	FLYWHEEL: The flywheel should rotate on anti-friction bearings and should have enough energy content to perform the desired type of work within the capacity of the press.		vendor to confirm		
2.7	CLUTCH & BRAKE: The press to be equipped with pneumatically operated combined / separate clutch and brake unit of Ortlinghaus Germany make or reputed make (which should be asbestos free and should have friction blocks). The mounting of clutch and brake unit should be so designed as it gives easy accessibility for inspection, adjustment and maintenance. The system should be complete with all accessories viz. check valves, pressure regulator , safety valves etc. as required for proper operation of clutch and brake unit. <u>Ross make Dual Solenoid safety valve with large port size for longer friction liner life</u> to be provided for clutch and brake.		vendor to specify		

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2.8	SLIDE: The slide to be fabricated from rolled steel plates conforming to IS:2062 or equivalent standards into a rigid box section with adequate stiffeners and direct load bearing plates to ensure strength and rigidity. The fabricated slide should be fully thermal stress relieved prior to machining. Long guide ways should be machined square with the slide face and fitted with bronze liners (BC-2 Japanese Grade or equivalent) machined accurately for precise alignment and proper guiding		vendor to confirm		
2.9	GIBBS: Precise slide guiding should be maintained by 8-point flat gibbing (with renewable bronze liners) arrangement. All Gibbs should be accurately squared with the press bed and set properly. The long Gibbs to be provided to keep the slide fully guided within the Gibbs throughout the stroke from minimum to maximum shut height to assure excellent slide to bed parallelism at all times		vendor to confirm		
2.10	DIE HEIGHT ADJUSTMENT: Die height adjustment screws should be driven through worm wheel / bevel gear drive. A brake motor should power the drive for a creep free shut height adjustment mechanism.		vendor to specify & confirm		
2.11	SLIDE COUNTERBALANCING CYLINDERS: Pneumatic counter balancing cylinders to balance the weight of the complete slide assembly and upper tooling, taking up all bearing clearances to reduce shock and vibration during press operation and reduce the power required to lift the slide with suitable upper tooling weights. Complete piping, gate valve, check valve, surge tanks, pressure regulator and air pressure switches should be provided with counterbalancing cylinders. The length of the guideways should be minimum 80% of the Bolster length.		vendor to confirm		

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2.12	Crank shaft: Alloy steel forged precision machined, runs on Bronze bushes BC-2 or equivalent.	vendor to confirm		
2.13	TOOL LOADING / UNLOADING STAND : Foldable / Detachable type stand with pre-roller arms to be provided for easily tool loading on / unloading from the machine .	vendor to specify & confirm		
2.14	CAM LIMIT SWITCH : The press should be supplied with Cam Limit Switch for accurate operation of the press.	vendor to confirm		
2.14.1	The cam angles should be adjustable.	vendor to confirm		
2.14.2	Make: Reputed make like Balluf Germany	vendor to confirm		
2.15	HYDRAULIC SYSTEM : Details should be Submitted by the Vendor			
2.15.1	The System should be centralised.	vendor to confirm		
2.15.2	Make: Rexroth / Vickers Sperry / Yuken (Details to be submitted)	vendor to confirm		
2.15.3	Filtration System: The oil system to be continuously cleaned by high efficiency replaceable element filters with warning lamp indication for replacement.	vendor to confirm		
2.15.4	Oil pressure indicated by gauges mounted on the hydraulic unit.			
2.15.5	Failure indication: Unit should be with complete plug in test pressure connections at various points throughout the hydraulic circuit to facilitate fault finding. Tell tale indicator lamps visible on the outside of the unit to indicate when solenoids are activated	vendor to confirm		

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2.15.6	Automatic shut off provision. Details should be submitted.	vendor to confirm		
2.15.7	Refrigerated type cooling and electric heating if required for proper functioning of press.	vendor to confirm		
2.15.8	Hydraulic pump capacity (flow / pressure)	vendor to specify		
2.15.9	Each pump should have an independent motor. Tandem pumps should not be used.	vendor to confirm		
2.15.10	First filling of all required Oils & Grease etc. to be supplied by vendor. Indigenous (Indian) source or Indian equivalent and specifications of oils/ greases are also to be provided by the vendor.	vendor to confirm		
2.16	PNEUMATIC CONTROLS: The air supply to surge tanks of counter balance cylinders should be through a manifold. Pneumatic control consists of controls for Clutch & Brake, Counter Balance Cylinders & Flywheel Brake with appropriate filters and lubricators as well as pressure switches. All the controls should be neatly arranged in a pneumatic panel.	vendor to confirm		
2.17	LUBRICATION :			
2.17.1	Centralised automatic timer controlled lubrication system for the slide guides, connecting rod and crankshaft bearing preferably Cenlub / SKF-Vogel. Details of lubricating system and the type of lubricating oil / grease to be used are to be furnished along with the offer. BHEL lubrication colour code is to be displayed at suitable location in the press. Number of oiling / greasing points etc. are also to be indicated in respective location as per the above code. Details of colour code will be furnished by BHEL at the time of finalization of order.	vendor to confirm		

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2.17.2	Main gear should run in enclosed oil bath	vendor to confirm		
2.17.3	Manual grease pump for flywheel anti friction bearing	vendor to confirm		
2.17.4	Manual hand oil pump for balancer cylinder.	vendor to confirm		
2.01.12	SCRAP BIN / TROLLY : For collecting drop down slugs and easily taking out from the machine a rectangular bin of suitable size with wheel arrangement to move below the machine bed . Control should also be provided to stop the machine if the scrap height is increased to a specific height to prevent the tool damage.	vendor to confirm		
3	TECHNICAL REQUIREMENTS			
3.1	Capacity: 300 Metric Tons or more at 6mm up from BDC (Pressure exerted at bottom of stroke).	Vendor to confirm		
3.2	Type: Double Crank Single Action Power Press	vendor to confirm		
3.3	Number of slide suspension point: 2	vendor to confirm		
3.4	Bolster Area (LR x FB): 1500 x 1500 mm or more.	vendor to confirm		
3.5	Slide Area (LR x FB): 1500 x 1500 mm or more	vendor to confirm		
3.6	Stroke of Slide in the range of: 50 mm - 60 mm	vendor to confirm		
3.7	Stroke (fixed) any value in between 25 - 40 per minute.	vendor to confirm		
3.8	Motorized Adjustment of Slide: 150 mm or more	vendor to confirm		
3.9	Jam release: Through Hydraulic overload pump in seconds.			

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3.10	Shut height, Stroke down / Adj. up (Slide face to bolster): 400 mm or more	vendor to confirm		
3.11	Thickness of Bolster Plate in between the range of 180 - 200 mm	vendor to confirm		
3.12	Bolster type & quantity: Fixed, 1 No., suitable for fixing the adopter plate. Size of T Slots and its pitch opening as per our tool drawing.	vendor to confirm		
3.13	Bolster opening: Circular cut (removable) of diameter 250 mm at the centre of bolster plate for removal of circular scrap for our TA main pole. Opening with steps to be provided	vendor to confirm		
3.14	Floor to top face of Bolster in the range of 900 mm - 1200 mm	vendor to confirm		
3.15	Main Motor Power (AC): 18.5 KW / 25 HP (or more), 1500 / 1440 rpm pertaining to IS standard of reputed make like Siemens / Alstom / ABB / Kirloskar / Crompton Greaves / Bharat Bijlee with suitable Star-Delta Starter, Overload & SSP protections.	vendor to confirm		
3.16	Press (Geometrical & Job) accuracy for perpendicularity, Parallelism and flatness: As per Dr. Schlesinger's Test Charts relevant for such Presses / OEM / Indian / JIS Grade-I Standard.	vendor to confirm		
3.17	Deflection of the Bed/Slide: Within 0.17 mm per meter of span when 2/3rd area of Bolster is loaded	vendor to confirm		
3.18	Overall Dimension of the Press: Height over floor level, Left to right, front to back etc.	vendor to specify		
3.19	Video images on CD / Hard copy explaining the technical features / Literature with photographs, drawings explaining the technical features should be enclosed with the offer	Vendor to Confirm		

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4	OPERATION AND CONTROL SYSTEM:			
4.1	Machine Logic control through PLC with MMI & Fault indication on 10.4 Inch coloured TFT Display. In case of any fault in press, machine will stop and the MMI will display the cause & location of the fault with suggestive remedies.	Vendor to Confirm		
4.2	Make of PLC: Mitsubishi / Siemens / Fanuc / Allen Bradley / ABB	Vendor to Confirm		
4.3	Press control through 6 position selector switch	Vendor to Confirm		
4.3.1	Two-hand controls	Vendor to Confirm		
4.3.2	Off-inch-Forward-single stroke	Vendor to Confirm		
4.3.2	Continuous stroke & TDC stop	Vendor to Confirm		
4.3.4	Off-inch-Reverse-single stroke	Vendor to Confirm		
4.4	Pedestal type operator control station fitted on Portable T-stand the opposite side of the machine with selected duplicate controls.	Vendor to Confirm		
4.5	Press control panel should be separate from the press.	Vendor to Confirm		
4.6	Foot switch to be provided.	Vendor to Confirm		
4.7	Controls should include provision for operating each unit through push buttons. Schematic and other technical details for these are to be forwarded with the quotation. All necessary electrical interlocks to be incorporated as required for safe press operation.	Vendor to Confirm		
4.8	Cam Control: Electronic programmable cam module of reputed make like Balluf / Euchner / Mitsubishi / Siemens / Fanuc / Allen Bradley	Vendor to Confirm		

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4.9	Crank Angle Indicator: Digital independent or on MMI of reputed make like Mitsubishi / Siemens / Fanuc / Allen Bradley / Balluf	Vendor to Confirm		
4.10	Digital Stroke Counter: Press to be equipped with a six digit stroke counter with continuous, trip, resetting facility with basic arithmetic functions.	Vendor to Confirm		
4.11	Die height Indicator: A mechanical / digital type die height indicator with a least count of 0.1 mm and built in limit switch to cut off supply to slide adjustment motor for min & max. adjustment limit to be provided. KW rating of slide adjustment motor to be mentioned.	Vendor to Confirm		
4.12	Motion Detector: For sensing of drive to rotary cam box. Mitsubishi / Siemens / Fanuc / Allen Bradley / Balluf	Vendor to Confirm		
4.13	The control voltage for push buttons is 24V DC. All limit switches have 'tell tale' indicator lights of reputed make like Balluf / Tech-Euchner / Telemechanique etc. & Festo / Vickers etc. for pneumatics.	Vendor to Confirm		
4.14	Make of all contactors: Reputed make like Siemens / Schneider / ABB / Telemechanique.	Vendor to Confirm		
	5 PERFORMANCE			
5.1	The Machine should be able to give the guaranteed performance as specified in Clause No. 3 & 4	vendor to confirm		
5.2	Accuracy test chart of the press offered as per the machine manufacturer in-line with para 3.1.5 above, should be furnished with the offer. Schematic diagram should also be provided along with the offer.	vendor to confirm		
5.3	The test & Calibration of Machine should be confirmed to relevant standard. Vendor to specify and provide the standard copy for verification.	vendor to confirm		

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6	ULTRA ISOLATION TRANSFORMER			
6.1	Ultra Isolation Transformer (NEEL or reputed Indian make) suitable for complete machine , its drives, controls, PLC etc. for unbalanced load & supply conditions considering specified power supply & ambient conditions.	Vendor to confirm		
6.2	Make, Model, Rating & Input/output Voltage etc.	Vendor to specify		
6.3	Monitoring device with cut-off facility for under/over output voltage, Devices for load current measurement, MCCB at input for overload/short circuit protection of reputed make like Siemens / Schneider / ABB / Telemechanique. (Details to be specified)	Vendor to specify		
7	AIR COMPRESSOR:			
7.1	Independent Air Compressor with refrigerated type Dryer & Filter of suitable capacity for the total compressed air requirements of the machine & accessories and to suit required air quality should be supplied. The system should be so designed to have additional provision and required accessories so that BHEL compressed air supply (4 kg/cm2) could be used as and when required. The compressor unit should be suitable for continuous duty.	vendor to confirm		
7.2	Make: Elgi / Atlas Copco / Ingersoll Rand	vendor to confirm		
7.3	Make of Refrigerated Air dryer: Elgi / Atlas Copco / Ingersoll Rand or any reputed make	vendor to confirm		
7.4	Capacity (Flow, Pressure & KW)	vendor to specify		
8	TOOLS FOR OPERATION & MAINTENANCE: Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc.for operation and maintenance of the machine should be supplied. List of such tools should be submitted with offer	Vendor to Confirm		

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9	MACHINE LIGHTS: All light fittings, consumables, adapters/receptacles should have compatibility with Indian / International equivalents.	Vendor to Confirm		
10	MAINTENANCE			
10.1	All the parts of the press should have easy accessibility for maintenance work, lubrication inspection and repair work without any need for excessive dismantling	vendor to confirm		
10.2	A platform with ladder to be provided with easy maintenance.			
10.3	Any special tools required for maintenance and repair of the press should be indicated and quoted separately with item wise price details.	vendor to confirm		
10.4	Set of spare parts list with specifications including all spares required for servicing and maintenance for a time of approx. 2 years to be quoted.	vendor to confirm		
10.5	Necessary guard and protection covers should be provided to protect the press against dirt and dust.	vendor to confirm		
11	ELECTRICAL :			
11.1	415V + 10% / -10%, 50HZ +/-3 HZ, 3 Phase AC (3 wire system with out neutral) Power Supply Voltage will be provided by BHEL at a single point near the machine as per layout recommended by Vendor. All types of cables (including input power cable of at least 5 meter length), connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine/control cabinets with SFU/MCCB, shall be provided by the vendor.	Vendor to Confirm		

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11.2	The necessary transformer for stepping down to lower voltages for controls etc. fuses; terminals, bars, contactor, indicators pilot lamps and other auxiliaries are to be included. Suitable isolation transformer for main supply to be included with the specification.	vendor to confirm		
11.3	All controls and elements electrical and electronic circuits are to be grouped together and located in the control panel. The control cabinet housing all the electrical controls and other components should be provided with a key lock to obviate the risk on unauthorized tampering.	vendor to confirm		
11.4	Control panel wiring to be made by standard copper conductor PVC pipe with ferrule.	vendor to confirm		
11.5	All motors should be of reputed make like Siemens / Alstom / ABB / Kirlskar / Crompton Greaves / Bharat Bijlee etc. Vendor to provide specifications of motors used.	vendor to confirm		
11.6	The motors should have protection for overload, under voltage protection and single phase prevention.	vendor to confirm		
11.7	All electrical components in the cabinets should be mounted on DIN Rail	vendor to confirm		
11.8	All cables moving with traversing axes should be installed in caterpillar / Drag chain. Additionally, all the cable trays required for laying of cables should be included in the offer.	vendor to confirm		
11.9	Tropicalisation: All electrical / electronic equipment shall be tropicalized	Vendor to Confirm		
11.10	All electrical control gear should be housed in a lockable steel enclosure to I.P.55 protection standard which is mounted on the machine. 3 phase door interlocked circuit breaker is provided for the connection of incoming power.	Vendor to Confirm		

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11.11	All electrical & electronic control cabinets & panels should be dust and vermin proof	Vendor to Confirm		
11.12	All electrical and electronic panels including operator's panel should be provided with fluorescent lamps for sufficient illumination and power receptacles of 220Volts, 5/15 Amp AC. All adapters/receptacles should have compatibility with Indian equivalents.	Vendor to Confirm		
11.13	Motors shall conform to IEC or Indian Standards.	Vendor to Confirm		
11.14	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to Confirm		
12	SAFETY ARRANGEMENTS: Following safety features in addition to other standard safety features should be provided on the machine:			
12.1	Machine should have adequate and reliable safety interlocks / devices to avoid damage to the machine, work piece and the operator due to the malfunctioning or mistakes. Machine functions should be continuously monitored and alarm / warning indications through lights/ alarm number with messages (on display and panels) should be available.	vendor to confirm		
12.2	Electronic safety guard for safety of operator to be provided. Proper interlocking system must for safety purpose.	vendor to confirm		
12.3	The electrical control circuits should be so arranged that in the event of power failure or interruption, the press cannot inadvertently restart or make any uncontrolled movements after resumption of power.	Vendor to Confirm		
12.4	A detailed list of all alarms / indications provided on machine should be submitted by the supplier.	vendor to confirm		

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12.5	All the pipes, cables etc. on the machine should be well supported and protected. These should not create any hindrance to machine operator's movement for effective use of machine.	vendor to confirm		
12.6	Suitable safety device should be provided for longitudinal, vertical and transverse movements to prevent engagement of any of them if the respective slide has been locked.	vendor to confirm		
12.7	All moving parts should be covered by hinged guards	vendor to confirm		
12.8	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations.	vendor to confirm		
12.9	Overload safety: Hydraulic overload safety to be provided in slide. In case of overloading by 10% the press shall stop immediately.			
12.10	Emergency Switches should be positioned on both sides of the machine in addition to one on the control desk and the integrity of the emergency system is continually monitored in compliance with recognised safety standards.	vendor to confirm		
12.11	Oil & water pipe lines should not run with electrical cable in the same tray / trench.	vendor to confirm		
12.12	All the motor starters should be provided, with single-phase prevention device of reputable make in addition to normal voltage and over load protection.	vendor to confirm		
	13 ENVIRONMENTAL PERFORMANCE OF THE MACHINE: The Machine shall conform to following factors related to environment :			
13.1	Maximum noise level shall be 85 dB(A) at normal load condition, one meter away from the machine with correction factor for back ground noise, if necessary. This will be measured as per international standards like DIN 45635-16. Supplier to demonstrate compliance to noise level, if so required.	vendor to confirm		

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13.2	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	vendor to confirm		
13.3	Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.			
	14 SPARES:			
14.1	Itemised breakup of mechanical, hydraulic, electrical and electronic spares used on the machine as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous running basis should be offered by vendor. The list to include following, in addition to other recommended spares: (Unit Price of each item of spare should be offered)	Vendor to Confirm		
14.2	Mechanical, Hydraulic / Pneumatic & Lubrication Spares: All types of Pumps, Valves, Pressure Switches, Flow Switches, Filters, Seals, O-rings, Lining Disc for Clutch and Brake with Liners-1 Set, Counter balance Seal Kit, Hydraulic Hoses etc.	Vendor to Confirm		
14.3	Electrical / Electronic / Spares: All types of Relays, Contactors, Proximity Switches, Push Buttons, Indicating Lamps, Special Fuses, Circuit Breakers, Main Power Switch, Encoders, Operator's panel with Display Unit, PLC I/O module etc.	Vendor to Confirm		
14.4	All types of spares for total machine and accessories should be available for atleast 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 and provide drawings of parts / details of spares & suppliers to enable BHEL to procure these in advance, if required	Vendor to Confirm		
14.5	Recommended set of spares for all attachments are to be offered with details.	Vendor to Confirm		

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14.6	Vendor to confirm that complete list of spares for machine and accessories, 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		
15	DOCUMENTATION : Five sets of following documents (Hard copies) in English language should be supplied along with the machine. Two copies of each of these are to be forwarded within four weeks of placing of Purchase Order.	Vendor to Confirm		
15.1	Construction features, schematic diagrams, dimensional details and capacities of the items, details of accuracy / alignment etc of the equipment.	vendor to specify		
15.2	Operators manual consist of technical specifications, transportation and installation, Safety instruction, Operating instructions and Maintenance instructions.	vendor to specify		
15.3	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic/ Coolant / Hydraulic circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also	vendor to specify		
15.4	Details and type of lubrication and make of hydraulic valve etc.	vendor to specify		
15.5	PLC / Drive manual / catalogue. PLC program print-outs with comments in English. PLC program on CD.	vendor to specify		
15.6	List of wear and spare parts.	vendor to specify		
15.7	Fault Indicator & remedial action guide manual.	vendor to confirm		
15.8	List of electrical units and cam development.	vendor to specify		
15.9	Detailed specification of all rubber items and hydraulic/lube fittings	vendor to specify		

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15.10	Operating Manuals, Maintenance Manuals & Catalogues for supplied Voltage Stabilizer, Isolation Transformer, Air-Compressor and all bought out items and supplied Accessories.	vendor to specify		
15.11	Complete Master List of parts used in the machine shall be submitted by the vendor.	Vendor to Confirm		
15.12	One additional set of all the above documentation on CD ROM, wherever possible.	vendor to specify		
16	TRAINING			
16.1	BHEL Persons should be trained at supplier's Works for mutually agreed period in the area of (a) Technology, Use of all Features, Systems & supplied accessories etc. (b) Electronic maintenance for machine & other supplied equipments (c) Electrical & Mechanical & Hydraulic maintenance of the machine & other supplied equipments (d) Operation of the machine & other supplied equipments.	Vendor to Confirm		
16.2	Air-fare, boarding & lodging for the trainees shall be borne by BHEL.	Vendor to Confirm		
16.3	Competent, English speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel.	Vendor to Confirm		
16.4	Vendor to quote for training on man / week basis	Vendor to Confirm		
17	FOUNDATION :			
17.1	The machine will be mounted on Anti-Vibration mounts supplied by the vendor along with the machine. Vendor has to take the complete responsibility of machine stability on the mount supplied by them.	Vendor to Confirm		

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17.2	Vendor shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI) / P.O. Complete details viz. static / dynamic load details etc. and Final Layout drawings shall be submitted by the supplier within one month after getting BHEL's approval. The layout should consist of all requirements pertaining to complete machine including space requirement for Voltage Stabilizer, Isolation Transformer, Air compressor, any other accessories. Vendor should arrange equipments required for the testing of foundation, if required by the vendor. The vendor shall also indicate detailed specifications of grouting compound and Grouting procedure etc. for foundation bolts of the machine. Grouting for foundation will be done by BHEL in the supervision of Vendor.	vendor to confirm		
17.3	Complete anchoring system including foundation bolts, anchoring materials, fixates, levelling shoes etc should be supplied with the machine.	vendor to confirm		
18	ERECTION & COMMISSIONING			
18.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine, it's control & all types of other supplied equipment. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier in their. Other requirements like crane shall also be provided by BHEL. However, the maximum crane capacity available with BHEL is 10 Ton.. If higher capacity crane is required it has to be arranged by vendor. Details of these requirements should be informed by vendor in advance.	Vendor to Confirm		
18.2	Erection & Commissioning of Voltage stabilizer, Isolation Transformer & Air Compressor shall also be responsibility of the vendor.	vendor to confirm		

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18.3	Successful proving of BHEL components by the supplier shall be considered as part of commissioning. All tests, as mentioned at clause 20.2 (Machine Acceptance) shall form part of the commissioning activity.	Vendor to Confirm		
18.4	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to Confirm		
18.5	Portion, if any, of the machine, accessories 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 vendor should supply sufficient quantity of touch-up paint of various colours of paint used.	Vendor to Confirm		
18.6	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to Specify		
18.7	Charges, duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer.	Vendor to Specify		
19	AMBIENT CONDITIONS & THERMAL STABILITY :			
19.1	Total machine including CNC 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%, +10% 50 Hz +3%, - 3% No. of phases = 3 Ambient Conditions: Temperature = 5 to 50 degree Celsius Relative Humidity = 95% max. (Vendor to confirm the suitability of the machine, including attachments and accessories, should be suitable for commissioning at the end on)	Vendor to Confirm		

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED CONFIRMED	OFFERED	DEVIATIONS
19.2	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		
20	MACHINE ACCEPTANCE: (Tests/Activities should be Performed by Vendor)			
2.1.	Tests/Activities to be carried out at supplier's works on the machine before dispatch :	Vendor to Confirm		
20.1.1	Demonstration of all features of the machine, control system & accessories	Vendor to Confirm		
20.1.2	Tests according to the standard agreed in clause 5. 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		
20.1.3	All the above accuracies should be demonstrated to BHEL engineers during pre-acceptance at Suppliers works and during Erection & Commissioning at BHEL Works.	vendor to confirm		
20.2	Tests/Activities to be carried out at BHEL works while commissioning the machine :			
20.2.1	Dimensional accuracy as per BHEL drawing submitted and agreed with vendor.	Vendor to Confirm		
20.2.2	Positioning accuracies as per standard.	vendor to confirm		

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED CONFIRMED	OFFERED	DEVIATIONS
20.2.3	Full load test to demonstrate the maximum power & bending capacity of the machine.	Vendor to Confirm		
20.2.4	Demonstration of all features of the machine, control system & accessories to the satisfaction of BHEL for efficient and effective use of the machine	Vendor to Confirm		
20.2.5	The machine should be tested for continuous running of 48 hrs. If any break down occurs during this test, the test should be repeated for 48 hrs from that time.	vendor to confirm		
20.2.6	Two days supervision of independent operation of machine by BHEL after job prove out	Vendor to Confirm		
20.2.7	Training of BHEL machine operators in operation of complete machine & accessories etc by the supplier's experts / engineers during their stay at BHEL works	Vendor to Confirm		
20.2.8	Demonstration by actual use of all supplied attachments and accessories to their full capacity.	Vendor to Confirm		
21	PACKING: Sea worthy & rigid packing for all items of complete machine, control 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		
22	GUARANTEE: 24 months from the date of acceptance of the machine. Service is to be provided in less than a week time during the guarantee period.	Vendor to Confirm		

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED CONFIRMED	OFFERED	DEVIATIONS
23	GENERAL :			
23.1	Machine Model	Vendor to Specify		
23.2	Total connected load (KVA):	Vendor to Specify		
23.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to Specify		
23.4	Painting of Machine / Electrical Panels : RAL 6011 Apple Green (Polyurethane Paint)	Vendor to confirm		
23.5	Total weight of the machine	Vendor to Specify		
23.6	Weight of heaviest part of machine	Vendor to Specify		
23.7	Weight of the heaviest assembly / sub-assembly of the Machine	Vendor to Specify		
23.8	Dimensions of largest part/ sub-assembly/ assembly of the machine	Vendor to Specify		
23.9	Vendor to submit, along with offer, reference list of customers where similar machines have been supplied mentioning broad specifications of the supplied machine.	Vendor to Specify		
23.10	Detailed catalogues , sketch/ photographs of the m/c and accessories/ attachments should be submitted with the offer.	Vendor to Specify		
23.11	Hydraulic, Pneumatic & oil piping should be preferably metallic except places where flexible piping are essential. All the pipes required for the same shall be included in the standard scope of the machine.	Vendor to Specify		

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24	REFERENCE LIST / QUALIFYING CONDITIONS :			
24.1	Only those vendors, who have supplied and commissioned at least one press of 300 Ton or more for similar applications in the past ten years (on the date of opening of tender) and such machine is presently working satisfactorily for more than one year after commissioning (on the date of opening of tender) should quote. The following information should be submitted by the vendor about the companies where similar machines have been supplied. This is required from all the vendors for qualification of their offer.	Vendor to Confirm		
24.2	Name of the customer / company where similar machine is installed.	Vendor to Specify		
24.3	Complete postal address of the customer.	Vendor to Specify		
24.4	Month & Year of commissioning.	Vendor to Specify		
24.5	Application for which the machine is supplied .	Vendor to Specify		
24.6	Name and designation of the contact person of the customer.	Vendor to Specify		
24.7	Phone, FAX no. and email address of the contact person of the customer.	Vendor to Specify		
24.8	Performance certificate from the customers regarding satisfactory performance of machine supplied to them in original.	Vendor to Specify		
24.9	BHEL reserves the right to verify information provided by vendor. In case the information provided by vendor is found to be false/incorrect, the offer shall be rejected.	Vendor to Specify		