

	<b><u>BHARAT HEAVY ELECTRICAL LIMITED</u></b>			<b>Enquiry No. :</b>	
	<b><u>UNIT'S ADDRESS:</u></b>			<b>Due Date :</b>	
	<b><u>CONTACT PERSON'S NAME/DESIGN./PHONE NO./E-MAIL</u></b> <b><u>(FROM PURCHASE DEPTT.)</u></b>			<b>Supplier Qtn.</b> <b>No.:</b>	
				<b>Date :</b>	
<b><u>SPECIFICATION CUM COMPLIANCE CERTIFICATE OF SUBMERGED ARC</u></b> <b><u>WELDING MACHINE</u></b>					
	<b>NOTE:-</b>				
	1. Vendor must submit complete information against clause no. 16.0. 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.				
<b>NAME &amp; ADDRESS OF THE SUPPLIER :</b>					
<b>TELEPHONE NOS.:</b>					
<b>FAX NOS.:</b>					
<b>E-MAIL ADDRESS :</b>					

**SCOPE: SUPPLY, ERECTION & COMMISSIONING OF SUBMERGED ARC WELDING MACHINE COMPLYING WITH SPECIFICATIONS AS BELOW**

<b>S. No</b>	<b>Description of BHEL Requirement</b>	<b>Specified / to be Confirmed by:</b>	<b>Offered</b>	<b>Deviations</b>	<b>Remarks</b>
<b>1.0</b>	<b>PURPOSE &amp; WORKPIECE MATERIAL</b>				
1.1	<b>Purpose: (Operations/Jobs involved) :Inverter /Fully thristorized based Submereg Arc Welding machine to do Narrow Gap welding welding on mild steel, alloy steel and stainless steel.</b>	<b>Vendor to confirm</b>			
<b>2.0</b>	<b>SPECIFICATIONS:</b>				
<b>2.1</b>	<b>Welding Power Source</b>				
2.1.1	Type: Inverter based (on IGBT/MOSFET technology with switching frequency of 20 KHZ or more) or fully thyristorized machine .	Vendor to confirm			
2.1.2	IGBT/MOSFET to be on primary side for inverter based power source.	Vendor to confirm			
2.1.3	Characterstic: Constant Voltage	Vendor to confirm			
2.1.4	Model:	Vendor to specify.			
2.1.5	Welding Current Range: 250-1500 A	Vendor to confirm			
2.1.6	Welding Current (At 100 % duty cycle): 1500 A	Vendor to confirm			
2.1.7	Welding Voltage range:	Vendor to specify.			
2.1.8	Class of insulation:	Vendor to specify.			
2.1.9	Type of Cooling: Forced Air.	Vendor to confirm			
<b>2.2</b>	<b>Wire Feeder</b>				
2.2.1	Type: Four roll drive.	Vendor to confirm			
2.2.2	Wire Feed rate range: 500 -4000 mm/min	Vendor to confirm			

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2.2.3	Wire sizes to be used: 2.5, 3.15, 4.0, 5.0 mm	Vendor to confirm			
2.2.4	Spool holder dia: 300mm	Vendor to confirm			
2.2.5	Weight of Wire spool: 25 Kg	Vendor to confirm			
2.2.6	Wire feed motor type:	Vendor to specify.			
<b>2.3</b>	<b>Column and Boom Mounted Welding Head Assembly:</b>				
2.3.1	<b>Motorized Column and Boom mounted welding head fitted with :</b>				
	a) Welding head assembly duly fitted with wire feed drive roll, Vertical adjustment assembly	Vendor to Confirm			
	b) Flux hopper assembly	Vendor to Confirm			
	c) Controller assembly	Vendor to Confirm			
	d) Wire reel assembly with wire straightening arrangement	Vendor to Confirm			
	e) Welding cable assembly.	Vendor to Confirm			
2.3.2	Welding head to be tilting type and fitted with arrangements and Nozzles to do Narrow Gap welding up to 300 mm thickness.	Vendor to Confirm			
2.3.3	Smaller adjustment of Horizontal slide, vertical slide. Tilting arrangement and Horizontal swing in the welding head for insitu adjustment of welding position. Vendor to give details of adjustments provided along with dimensions.	Vendor to specify.			
2.3.4	Horizontal Stroke: 6000 mm (Min.)	Vendor to Confirm			
2.3.5	Column swivel: 355 degree Manual swivel arrangement with manual swivel locking	Vendor to Confirm			
2.3.6	Vertical Stroke: 6000 mm (approx.)	Vendor to Confirm			

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	Motorized and precise movement of column and boom. Details of motor, controller etc to be provided in detail by vendor.	Vendor to Confirm			
	Vertical lift speed: 750 mm /min (approx)	Vendor to Confirm			
	Minimum height of boom from rail: 1300 mm (approx)	Vendor to Confirm			
	Maximum height of boom from rail: 7300 mm (approx)	Vendor to Confirm			
2.3.7	Flux Hopper capacity: 5 kg (min)	Vendor to Confirm			
2.3.9	Boom Travel Speed Range: 100 - 1500 mm/min	Vendor to Confirm			
2.3.10	Welding Current (At 100 % duty cycle): 1500 A DC	Vendor to Confirm			
2.3.11	Wire feed drive rolls: 2.4, 3.15, 4.0, 5.0, 5.6 mm	Vendor to Confirm			
2.3.12	Nozzle: 2.5, 3.15, 4.0, 5.0 mm	Vendor to Confirm			
	<b>2.40 Features:</b>				
2.4.1	Machine must have facility for automatic start without need of steel wool. After automatic arc initiation & small delay, the machine should start so that weld bead appearance is uniform.	Vendor to Confirm			
2.4.2	At the end of welding the wire must retreat automatically without getting fused with the weld pool.	Vendor to Confirm			
	<b>2.5 Cables</b>				
2.5.1	Power source to earth Cable: 10000 mm	Vendor to confirm			
	<b>2.6 OPERATION AND CONTROL SYSTEM:</b>				
2.6.1	<b>Welding Process Controller on Welding Head Panel:</b>	<b>Vendor to confirm</b>			

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2.6.1.1	Electronic stepless Control of Welding Voltage.	Vendor to confirm			
2.6.1.2	Display of Welding Voltage and Current.	Vendor to confirm			
2.6.1.3	Wire Inching facility	Vendor to confirm			
2.6.1.4	On/Off switch.	Vendor to confirm			
2.6.1.5	Welding head position and nozzle tilting adjustment.	Vendor to confirm			
2.6.1.6	All the welding head controls to be on welding head and within suitable reach of operator.	Vendor to confirm			
2.6.1.7	Seam Tracking Unit with Servo Controlled Cross Slide assy., ProbeAssy.Controller Unit having 100 Kgs. Load capacity	Vendor to confirm			
2.6.1.8	Mechanised Flux Recovery & Feeding System	Vendor to confirm			
<b>2.6.2</b>	<b>Column and Boom Control</b>	Vendor to confirm			
2.6.2.1	Precise and accurate Control for Column and Boom Vertical and Horizontal travel	Vendor to confirm			
2.6.2.2	Precise and accurate Control for Column and Boom horizontal swing	Vendor to confirm			
2.6.2.3	Positioning and travel accuraciest of travel to be specified by vendor.	Vendor to confirm			
2.6.2.4	All the controls to be on remote contrl pendant with suitable cable length to reach at the farthest reach of colum and boom.	Vendor to confirm			

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2.6.3	WARN lamp in the front panel of the power source to indicate the abnormalities.	Vendor to confirm			
2.6.4	The welding voltage and current to remain in set stable condition against the supply voltage fluctuation of $\pm 15\%$ and even in case of any change in ambient temperature up to 50°C.	Vendor to confirm			
2.6.5	SAW Head single wire	Vendor to confirm			
<b>3.0 ELECTRICAL/ ELECTRONIC SYSTEM :</b>					
3.1	415V $\pm 15\%$ , 50HZ $\pm 3\%$ , 3 Phase AC (3 wire system without neutral) Power Supply Source will be provided by BHEL at a single point near the machine, as per layout recommended by Vendor. 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 vendor.	Vendor to confirm			
3.2	All electrical & electronic control cabinets & panels should be dust and vermin proof	Vendor to confirm			
3.3	Supplier will specifically mention the protections taken such as seals etc. used to prevent entry of dust etc. in to the machine.	Vendor to confirm			
3.4	All electrical components in the cabinets should be mounted on DIN Rail	Vendor to confirm			
3.5	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to confirm			

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<b>4.0</b>	<b>SAFETY ARRANGEMENTS:</b>				
	Following safety features in addition to other standard safety features should be provided on the machine:				
	1) .Machine should have adequate and reliable safety interlocks / devices to avoid damage to the machine, workpiece 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.	<b>Vendor to confirm</b>			
	2). All the cables etc. on the machine should be well supported and protected.	<b>Vendor to confirm</b>			
<b>5.0</b>	<b>ENVIRONMENTAL PERFORMANCE OF THE MACHINE :</b>				
	The Machine shall conform to following factors related to environment :	Vendor to confirm			
	(a) If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm			
	(b) Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Vendor to confirm			
<b>6.0</b>	<b>Optional Accessories (If any) :</b>	<b>Vendor to specify</b>			
<b>7.0</b>	<b>SPARES:</b>				

S. No	Description of BHEL Requirement	Specified / to be Confirmed by:	Offered	Deviations	Remarks
7.1	Itemised breakup of mechanical, 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 running basis should be offered by vendor. The list to include following, in addition to other recommended spares: <b>(Unit Price of each item of spare should be offered)</b>	Vendor to specify			
7.2	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			
7.3	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			
<b>8.0</b>	<b>DOCUMENTATION :</b> Five sets of following documents (Hard copies) in English language should be supplied along with the machine	<b>Vendor to confirm</b>			
8.1	Operating and maintenance manuals of Machine and all supplied accessories.	Vendor to confirm			
8.2	Detailed Maintenance manual of machine which shall contain System Description, Block diagram, Schematic drawings, Circuit diagrams & Trouble shooting charts, All Assembly/ Sub Assembly Drawings shall be supplied with the part list.	Vendor to confirm			



S. No	Description of BHEL Requirement	Specified / to be Confirmed by:	Offered	Deviations	Remarks
8.3	Complete Master List of parts used in the machine shall be submitted by the vendor.	Vendor to confirm			
8.4	One additional set of all the above documentation on CD ROM, wherever possible.	Vendor to confirm			
<b>9.0</b>	<b>AMBIENT CONDITIONS &amp; THERMAL STABILITY :</b>				
9.1	Total machine and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. Ambient Conditions: Temperature = 5 to 50 degree celsius with variation of 25 degree celcius (max) 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)	<b>Vendor to confirm</b>			
<b>10.0</b>	<b>FOUNDATION:</b> Vendor to supply foundation layout of the machine showing complete layout of the machine with load point. Foundation of the machine will be designed and prepared by BHEL.	<b>vendor to confirm</b>			
<b>11.0</b>	<b>COMMISSIONING:</b> Commissioning of the machine to be carried out by the vendor at BHEL. The following tests to be carried out at BHEL works while commissioning the machine :				

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11.1	Demonstration of all features of the machine & all accessories to the satisfaction of BHEL for their efficient and effective use.	Vendor to confirm			
11.2	Demonstration by actual use of all supplied attachments and accessories to their full capacity.	Vendor to confirm			
11.3	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			
11.4	Instrument must be calibrated and proved against setting knob as well as against actual current measured by tong tester while welding a job.	Vendor to confirm			
<b>12.0</b>	<b>PACKING:</b> Sea worthy & rigid packing for all items of complete machine.	Vendor to confirm			
<b>13.0</b>	<b>GUARANTEE :</b> 12 months from the date of acceptance of the machine.	Vendor to confirm			
<b>14.0</b>	<b>Colour of machine:</b> RAL6011	Vendor to confirm			
<b>15.0</b>	<b>GENERAL : The vendor should submit the following information:</b>				
15.1	Machine Model	Vendor to specify			
15.2	Total connected load (KVA):	Vendor to specify			
15.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to specify			
15.4	Total weight of the machine	Vendor to specify			

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15.5	Detailed catalogues , sketch/ photographs of the m/c and accessories/ attachments should be submitted with the offer.	Vendor to confirm			

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<b>16.0</b>	<b>QUALIFYING CONDITIONS :</b>				
16.1	Only those vendors, who have supplied at least two NGW SAW welding machines of 1500 A at 100 % duty cycle in the past ten years and such machine is presently working satisfactorily for more than one year in India (more than six months if supplied to BHEL) after commissioning, would be eligible for participating in the tender. The following information is to be submitted by the vendor about the companies where similar machines have been supplied.	<b>Vendor to Confirm</b>			
	1. Name of the customer / company where similar machine is installed.	Vendor to specify			
	2. Complete postal address of the customer.	Vendor to specify			
	3. Year of commissioning.	Vendor to specify			
	4. Application for which the machine is supplied with details of accuracies achieved on the job.	Vendor to specify			
	5. Name and designation of the contact person of the customer.	Vendor to specify			
	6. Phone, FAX no. and email address of the contact person of the customer.	Vendor to specify			
	7. Performance certificate from the customers regarding satisfactory performance of machine supplied to them	Vendor to specify			