



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY	Phone: +91 431 257 79 38
NOTICE INVITING TENDER	Fax : +91 431 252 07 19
	Email : tvenkat@bheltry.co.in
	Web : www.bhel.com

TWO PART BID	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
Tender to be submitted in two Parts	2621300019	05.08.2013	09.09.2013

You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order.

Please note that under any circumstances both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of tender opening.

Item	Description	Quantity
10	Inverter Controlled Manual Arc Welding Power Sources – SMAW 400A as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	89 Nos.

Important points to be taken care during submission of offer

1. Checklist No. TRY/ IMP/ 02 and TRY/ IND/ 02A to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
2. All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media.
3. Delivery required: Four months from the date of Purchase Order.
4. EMD for this tender will be ` 2,00,000.00

BHEL's General guidelines / instructions (refer MM/CE/GENL/001-EMD) including bank guarantee formats and list of consortium banks, commercial terms check-list can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference "2621300019".

Tenders should reach us before 14:00 hours on the due date Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present	Yours faithfully, For BHARAT HEAVY ELECTRICALS LIMITED Sr.Manager / Capital Equipment / MM
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PART A**Inverter controlled Manual Arc Welding Power Sources – SMAW
(400 A – 60% duty cycle)****SECTION – I: Qualifying Criteria**

The BIDDER has to compulsorily meet the Qualifying criteria indicated in SECTION –I to get qualified. Otherwise the technical offer will not be considered.

S. no.	REQUIREMENTS	VENDOR's RESPONSE
1.0	<p>Experience of the BIDDER /VENDOR in terms of years in the field of design, manufacture and supply of 'Inverter Controlled Manual Arc Welding Power Source' for Radiographic Quality SMAW applications.</p> <p>Only those bidders who have a minimum of TEN Years of Continuous Experience in Design, Manufacture & Supply of Inverter Controlled SMAW Machines are eligible to quote for this tender.</p>	
2.0	The BIDDER should have supplied at least 50 nos. of Inverter Controlled SMAW Machines with a minimum rating of 400 A - 60 % Duty Cycle to Customers in India. Indicate the number of such welding machines sold in India.	
3.0	Year of Launch of the Model Quoted Against this Enquiry.	
4.0	Number of 'Inverter Controlled Manual Welding Machines' supplied & commissioned till date.	
5.0	A reference list of about 10 Customers shall be furnished (preferably Heavy Engg. Companies) to whom such quoted model has been supplied in the last five years.	
6.0	<p>Performance certificate from any two customers in India shall be submitted for satisfactory performance of the offered model supplied in the last 5 years for a minimum period of one year from the date of commissioning (as on date of opening tender).</p> <p>Full contact details of the end user from whom the performance certificate is obtained is to be provided.</p>	

SECTION – II

The BIDDER / VENDOR is requested to provide the following information:

S. no.	REQUIREMENTS	VENDOR's RESPONSE
7.0	Details of Design Set-Up and Technology Back-Up (R & D Centre) available with the Principal Equipment Maker.	
8.0	Details on International Standards followed in Design and Testing of Welding Machines (Copy of English Version of Standards / Design Codes followed shall be furnished with the Technical Offer).	
9.0	Details of Quality System followed (Furnish the salient aspects of the Quality Assurance System followed)	
10.0	Comprehensive Details, on Performance Testing of Welding Machines carried out at the Factory, to be furnished with the Technical Offer.	
11.0	Details on Service-After-Sales Set-Up in India (Address of Agents / Service Centres), to be furnished compulsorily.	
12.0	The BIDDER shall give details about supply of similar welding machines to other BHEL units if any with make, Model and Year of Supply etc.	
13.0	Any Additional Data to supplement the manufacturing capability of the BIDDER.	

SECTION – III

The BIDDER to note:

S. no.	PARTICULARS	VENDOR'sRESPONSE
14.0	The BIDDER shall submit the offer in Two Parts – 1. Technical [with PART A & PART B] and 2. Commercial and Price Bid.	
15.0	The VENDOR'sRESPONSE against each clause in PART A & B of the offer should be filled by the BIDDER compulsorily with essential details. Single word responses like Confirmed /Complies /Ok /Yes /No or without required details may lead to disqualification of the offer.	
16.0	The BIDDER shall assure a continuous support for Spares and Service for Ten Years, from the date of commissioning of the equipment at BHEL Works.	
17.0	The Technical Offer shall be supported by Product Catalogue and Data Sheets in original and complete technical details / literature on the quoted models of Welding Powersources.	
18.0	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation.	
19.0	Earlier performance & field experience (service support) with BHEL (if any) will be a reckoning factor for the technical qualification of the offer.	
20.0	Delivery: The delivery period (including the time for Pre-Dispatch Inspection clearance by BHEL) for the welding machines shall not be more than 4 months from the date of Ordering.	

PART B

**Technical Specification for the supply of Inverter controlled Manual Arc Welding Power Sources
SMAW (400 A, 60% duty cycle)**

S. no.	BHEL SPECIFICATION		OFFER BY BIDDER
1.0	APPLICATION :		
1.1	The proposed Welding Machine is intended for Manual Arc Welding Process (SMAW) for producing Radiographic Quality Welds like Butt Joints, Fillet Welds, and Double Groove Welds coming in High Pressure Vessels using 2.5 mm to 5.0 mm dia. basic coated stick electrodes.		
2.0	POWERSOURCE FEATURES		
2.1	Type	Power source shall be Inverter Controlled with IGBT and capable of delivering a Constant Direct Current(in DCEP and DCEN modes of welding operations).	
2.2	Switching Frequency	BIDDER has to indicate the Switching Frequency of the Inverter Circuit and the make of IGBT used.	
2.3	Current Rating	400 A @ 60 % Duty Cycle Around 320 A at 100% Duty Cycle. OR	
2.4	Operating Range for Welding Current	20 A to 400 A (with step less variation)	
2.5	Open Circuit Voltage	Preferred OCV is 70 to 75 V. BIDDER to mention the Open Circuit Voltage for the offered Power source	
2.6	Current Setting	The variation in the set value of the welding current to the actual value shall not exceed 1 %.	
2.7	Current Control	Current control / regulation shall be provided in the Front Panel of Power source and also in the Remote Control Unit by knob control.	

PART B - Technical Specification Inverter controlled manual arc welding power sources (400 A)

S. no.	PARTICULARS	BHEL SPECIFICATION	OFFER BY BIDDER
2.8	Power Input	3 Phase AC 415 V \pm 10%, 50 Hz \pm 2%, through a 3 Wire System (4 th wire for Earthing) – No Neutral Conductor.	
2.9	Input Power Cable	5 metre long electric input power cable with protective sheathing (for 3phase with potential earth) to be provided with the power source.	
2.10	Control Panel Switches	Power ON/OFF, Remote ON/OFF, Voltage & Ampere Control, Hot Start Control, Arc Dynamics Control etc.	
2.11	Voltmeter & Ammeter	Factory Installed Ammeter & Voltmeter on the front panel with easy removal and replacement (i.e., without lifting the top cover of the Welding Power source) for periodic instrument calibration. Calibration procedure: Details of Input Source like voltage or current, Full scale deflection shall be furnished along with the offer which is necessary for calibration.	
2.12	Arc Strike	Selection for Instantaneous Arc Strike with Hot Start for SMAW Process.	
2.13	Arc Dynamics Control - Electronic Inductance Variable Control	Arc dynamics Control shall be built in the machine for minimising the spatter and optimising weld-bead wetting action during welding of special materials like Stainless Steel, T91/P91, Inconel, in addition to Carbon and Low Alloy Steels.	
2.14	Insulation	Class "H" – shall be provided to suit Tropical Working Conditions	
2.15	Machine Protection	IP 23 – Degree of Protection	
2.16	Machine Cooling	The Power source shall feature a forced air cooling system that ensures adequate cooling of the components while preventing dust and metal particles from being drawn in.	

PART B - Technical Specification Inverter controlled manual arc welding power sources (400 A)

S. no.	PARTICULARS	BHEL SPECIFICATION	OFFER BY BIDDER
2.17	Functional / Elemental Design Protection / operator safety	a) Inbuilt protection for the IGBT/Power source against Thermal / Overload / Short-Circuit / Single or Two Phase Power Input Conditions. b) All PCBs shall be sprayed with mould coating to prevent damage from dust and grinding particles. c) Machine Design to ensure proper earthing for the machine and its peripherals. d) Protection against electric shock from input supply for ensuring operator safety.	
2.18	Electromagnetic Interference (EMI) Suppression	a) Power source shall be equipped with a suitable Filter Network connected to the input Power Line, to prevent propagation of EMI either into or out of the Power source. b) All metal enclosures and internal shields shall prevent radiated EMI. c) BIDDER has to elaborate the design features to meet the above requirements.	
2.19	Portability	Under-Carriage with hard rubber lined wheels for portability of the power source by manual pushing.	
2.20	Ambient Conditions	Temperature up to +50°C; Humidity up to 90% but both upper limits do not occur simultaneously.	
2.21	Load Compensation	Output variation in terms offluctuation in line voltage, cable heating or drift caused due to usage of 20 m long welding cable, shall be compensated suitably.	
2.22	Electrode Holder & Return Current Connection	The power source should have preferably Heavy Duty rugged lug type terminals to connect Welding Cable (for SMAW Electrode Holder) and Return Current Cable.	

PART B - Technical Specification Inverter controlled manual arc welding power sources (400 A)

S. no.	PARTICULARS	BHEL SPECIFICATION	OFFER BY BIDDER
2.23	Welding Current Cable	SMAW (current) Cable with a minimum cross sectional area of 50mm ² , 20 m in length, with one end connected to the Powersource and the free end provided with a female Connector to connect to the male Connector of the Manual Welding Electrode Holder.	
2.24	Return Current Cable	Welding Current return cable, 20 m in length, with one end connected to the Power source and the other end provided with a Screw Type Earth Clamp.	
2.25	Power Rating	BIDDER to indicate the Maximum Power Rating (kVA) of the Power source and the no-load Power consumption in Watts.	
2.26	Power Source Model	To Specify the Model of Power source Offered (Metallic name plate of the machine shall also include details like name of manufacturer, Serial no, Year of Mfg. input power in kVA, input voltage, No. of phase, operating frequency, weight of the unit etc.)	
3.0	REMOTE CONTROL UNIT FEATURES		
3.1	Application	Remote control unit shall be provided for setting welding current from a distant work place, in addition to that provided in the front panel of the welding power source.	
3.2	Type	Hand Operated (for SMAW) with 10 m long control cable with quick-fix end connectors	
3.3	Current Control	Step less regulation of Welding Current.	
4.0	SCOPE OF SUPPLY : (The scope of supply shall consist of the following, for each machine)		
4.1	Welding Power source with Transport Trolley with wheels.		
4.2	Control Unit Integrated with Powersource		
4.3	Hand Operated Remote Control Unit.		
4.4	Set of Inter-Connecting Cables, Adaptersetc.		

PART B - Technical Specification Inverter controlled manual arc welding power sources (400 A)

S. no.	PARTICULARS	BHEL SPECIFICATION	OFFER BY BIDDER
4.5	Welding Cable and Welding Holder		
4.6	Return Current Cable with Screw Type Earth Clamp.		
4.7	Electrical & Mechanical Spares for Powersource & Control Unit		
4.8	OPTIONAL: If the input connections to the ammeter and volt meter are taken from PCB, then Calibration kit shall be supplied. Calibration certificate shall be issued,		
4.9	OPTIONAL: Program loader shall be supplied if the power source is pre-programmed.		
5.0	SPARES :		
5.1	Power Source	All type of Spare Parts required for 2 years of trouble free operation on three shift basis including the following items are to be compulsorily quoted (with Unit Rate). a) IGBT Kit b) All Types of Fuses c) Control – Transformers d) Printed Circuit Boards / PCBs – All Types e) Rectifiers, Thermistors, Capacitors f) Switches and Knobs g) Cooling Fan Motor h) Ammeter & Voltmeter i) Potentiometer j) Relays & Timers k) Receptacles l) Control Cable with End Connectors m) Filters n) Welding & Return Cable Connectors	
5.2	Remote Control Unit	Complete Set of Remote Control Unit and its Spares like Knob, Potentiometer, etc. to be offered	

PART B - Technical Specification Inverter controlled manual arc welding power sources (400 A)

S. no.	PARTICULARS	BHEL SPECIFICATION	OFFER BY BIDDER
6.0	O & M MANUALS :		
6.1	No. of Copies	One for Each Machine	
6.2	Language	English	
6.3	Soft Copy	One soft copy in CD-ROM is to be given for each machine, containing the details mentioned under Clause Sl. No. 6.0/6.4	
6.4	Manual Details :	a) Manual shall contain all instructions for machine installation and welding trial testing, in sequence. b) Manual to give general circuit diagrams, showing the interconnection of various elements and also details on PCBs [Printed Circuit Board] like tapping voltages, main electronic elements' specifications and ratings, etc. c) Manual to give other details like trouble shooting chart, weld parameters selection for various base metals, etc. d) Master List of Parts & Spares used in the machine with Make, Model, Rating, Part number etc.	
7.0	GENERAL POINTS :		
7.1	Inspection	The welding machines shall be offered for inspection by BHEL Engineers at supplier's works for performance evaluation prior to despatch.	
7.2	Delivery Period	4 months from the date of ordering by BHEL	
7.3	Commissioning	Commissioning and performance prove out of the offered equipment at BHEL works, by the supplier's representative.	
7.4	Performance prove out at BHEL works	a) Welding Trials are to be taken on butt joints of carbon & alloy steel tubes (size: 38.1 mm and 4mm wall thickness) and subjected to radiographic tests for acceptance. b) BHEL will provide necessary jobs and electrodes for SMAW.	

PART B - Technical Specification Inverter controlled manual arc welding power sources (400 A)

S. no.	PARTICULARS	BHEL SPECIFICATION	OFFER BY BIDDER
7.5	Training	The Supplier's Service Engineer shall give training in the Operation and Maintenance (mainly on electric/electronic troubleshooting) of the Machine to BHEL Staff, after the successful commissioning of the Welding Machines.	
7.6	Guarantee	The machine shall be guaranteed for a minimum of 24 months from the date of commissioning at BHEL.	
7.7	Bought-Out Items	a) The Bought-Out Items - like Motors, IGBTs, ICs, Relays, Contactors, Switches, Electronic Elements, etc., used in the Power source & Control Unit shall be of Reputed Makes only. b) BIDDER has to furnish the make of Bought-Out Items, along with the offer.	