



Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

An ISO 9001
Company

ENQUIRY	Phone: +91 431 257 79 38 Fax : +91 431 252 00 31 Email : tvenkat@bheltry.co.in Web : www.bhel.com
NOTICE INVITING TENDER	

TWO PART BID	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
Tender to be submitted in two Parts	2851300041	17.12.2013	31.01.2014

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	IGBT based Inverter Controlled Synergic Welding Power Source for MIG/MAG welding with Digital Control 500 A as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	8.00 Nos.

Important points to be taken care during submission of offer

1. Material shall be delivered to
Indigenous Vendors:
FOR, BHEL, Stores
Power Equipment Fabrication Plant
Bharat Heavy Electricals Limited
Mundipar – 441 804, Taluka: Sakoli, District: Bhandara, Maharashtra State
2. Delivery required 10 months from the date of purchase order.
3. Erection and Commissioning period required 1 Week from the date of intimation by BHEL.
4. EMD for this Tender will be (INR) : 1,00,000.00
5. Compliance Form No: BND/IMP/02, BND/IND/02A to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
6. 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.

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 "2851300041".

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**IGBT based Inverter controlled Synergic Welding Power Source for MIG/MAG welding with Digital Control (500 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	Only BIDDER /VENDOR (OEM) who have a minimum of last TEN Years (as on date of opening of tender) of Continuous Experience in Design, Manufacture & Supply of “IGBT based Inverter controlled Synergic Welding Power Sources for MIG/MAG welding” for Radiographic Quality applications, are eligible to quote for this tender. Vendor shall indicate the actual no. of years of experience in the field.	
2.0	Only those vendors (OEMs) should quote, who have commissioned in the last (5) years, at least 20 Nos. of the model quoted against this tender of “IGBT based Inverter controlled Synergic Welding Power Source for MIG/MAG welding with Digital Control” with a rating of 500A - 60% Duty Cycle EITHER (i) in at least one country other than the country of origin to establish vendor's (OEM's) global business activity OR (ii) in India. The name and contact addresses of the customers to whom the machines have been supplied has to be furnished with details. Indicate the number of such welding machines sold in India.	
3.0	Number of “IGBT based Inverter controlled Synergic Welding Power Source for MIG/MAG welding” supplied & commissioned till date.	
4.0	Year of Launch of the Offered Model in this tender.	
5.0	The quoted model of Welding Power Source shall be complying with at least one of the Standards as given below: <ol style="list-style-type: none"> 1. IEC 60974-1:2012 Edition 4.0 2. BS EN 60974-1/2012 3. ANSI/IEC 60974-1: 2008 4. JIS C 9300-1:2006/AMENDMENT 1:2008 5. NEMA EW 9-2012 <p>A document certifying or declaration for complying with the above standards shall be submitted with the technical offer which will be subject to verification by BHEL.</p>	

S. No.	REQUIREMENTS	VENDOR'S RESPONSE
6.0	<p>Vendor to submit TWO Performance certificates satisfying all the following conditions (as on original date of opening tender) (suggestive format is given as annexure):</p> <p>a) Performance Certificates from any TWO customers for satisfactory performance of minimum 5 Nos of the quoted model against this tender, from each of the customers, for a minimum period of one year from the date of commissioning (as on original date of opening of tender), supplied in the last five years, EITHER (i) in the country other than the country of origin OR (ii) in India, especially from Heavy Engineering / Fabrication Public/Private sector companies like Utility Boiler Manufacturers, Ship Building, Heavy duty Site fabrication, Large Heat Exchanger & Pressure Vessels manufacturers etc.</p> <p>b) Performance certificates to be submitted as Original Certificate or through E-mail directly from the customer. The original performance certificate may be returned after verification by BHEL, if required.</p> <p>c) Full contact details of the customers from whom the performance certificates are obtained are to be provided.</p> <p>d) For obtaining the Performance certificate, a suggestive format is provided.</p>	
7.0	<p>Indian bidders shall submit Audited financial results for the past three financial years (2010-11, 2011-12, 2012-13) and Foreign bidders shall submit D&B report covering past three financial years. The financial results shall be verified and evaluated to examine the financial health of the company. BHEL reserves the right to accept or reject the OEMs based on the assessment of their financial capability.</p>	
8.0	<p>Servicing facility to be available in India. Details on Service-After-Sales Set-Up in India (Address of Agents / Service Centres), to be furnished compulsorily.</p>	
9.0	<p>BHEL reserves the right to accept or reject the OEMs based on the assessment of their technical capability. BHEL reserves the right to verify the information provided by the Vendor for the referred machine at their referred customer's works. It shall be the responsibility of the vendor to facilitate the visit of BHEL's team at their referred customer works. The Travel, Board & Lodging expenses for BHEL Personnel shall be borne by BHEL. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.</p>	

SECTION – II

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

S. No.	REQUIREMENTS	VENDOR's RESPONSE
10.0	Details of Design Set-Up and Technology Back-Up (R & D Centre) available with the OEM.	
11.0	Details on 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).	
12.0	Details of Quality System followed (Furnish the salient aspects of the Quality Assurance System followed)	
13.0	Comprehensive Details, on Performance Testing of Welding Machines carried out at the Factory, to be furnished with the Technical Offer.	
14.0	The BIDDER shall give details about supply of similar welding machines to BHEL units if any with Make, Model and Year of Supply & Commissioning etc.	
15.0	A complete reference list of Customers shall be furnished (preferably of Heavy Engg. Companies) to whom such offered model has been supplied in the last ten years with PO details, Qty., Year of commissioning with contact details of the customers.	
16.0	Any Additional Data to supplement the manufacturing capability of the BIDDER.	

SECTION – III

The BIDDER to note:

S. No.	PARTICULARS	VENDOR's RESPONSE
17.0	The BIDDER shall submit the offer in Two Parts – 1. Technical [with PART A & PART B] & 2. Commercial and Price Bid.	
18.0	The VENDOR's RESPONSE against each clause in PART A & B of the offer should be filled by the BIDDER compulsorily with complete details.	
19.0	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.	
20.0	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.	
21.0	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.	

The performance certificate should be produced **on Customer’s Letter Head.**

Suggestive Format of Performance Certificate

(On Customer’s letter head)

PERFORMANCE CERTIFICATE

1. Supplier of the machine :
2. Make & Model of the m/c :
3. Month & Year of Commissioning :
4. Quantity :
5. Machine Details
 - a) Type :
 - b) Capacity in Amp. :
 - c) Duty Cycle :
6. Application of the welding power sources:
7. Performance of the Machine : Satisfactory / Good / Average / Not Satisfactory
(Strike off whichever is not applicable)
8. After sales service : Satisfactory / Good / Average / Not Satisfactory
(Strike off whichever is not applicable)
9. Any Other remarks :

Date:

Signature & Seal of the Authority
Issuing the Performance Certificate

TECHNICAL SPECIFICATION - PART B**IGBT based Inverter Controlled Synergic Welding Power Source for MIG/MAG welding with Digital Control (500 A, 60% duty cycle)**

S.No.	BHEL SPECIFICATION		OFFER BY BIDDER
1.0	APPLICATION		
1.1	The offered equipment shall be portable type and suitable for semi-automatic FCAW/MIG/MAG welding process using flux-cored wires of carbon steel, alloy steel grades Gr 11/22/91.		
1.2	The equipment shall be suitable for welding in all positions with pure Argon or Carbon Di-oxide/Argon and Carbon Di-oxide gas mixture as shielding gas and also for welding with self-shielded flux-cored wires of sizes 1.0 and 1.2 mm.		
2.0	POWERSOURCE FEATURES		
2.1	Type	Power source shall be IGBT based Inverter controlled Synergic Welding Power Source for MIG/MAG welding with Digital Control, Constant Potential type, even with a fluctuation of $\pm 10\%$ in the Input Voltage	
2.2	Switching Frequency	BIDDER has to indicate the Switching Frequency of the Inverter Circuit	
2.3	Current Rating	500 A @ 60 % Duty Cycle	
2.4	Operating Range	a) Voltage: 20 V to 50 V (continuous control) b) Current: 50 A to 500 A (continuous control)	
2.5	Open Circuit Voltage	Preferred OCV is 70 to 75 V. BIDDER to mention the Open Circuit Voltage for the offered Powersource	
2.6	Current Setting	The variation in the set value of the welding current to the actual value shall not exceed 1 %.	

S. No.	BHEL SPECIFICATION		OFFER BY BIDDER
2.7	Digital Control	Welding power source shall have digital control/ display/ setting features. Type of Digital Control shall be explained by vendor.	
2.8	Input Power Supply	3 Phase AC 415 V \pm 10%, 50 Hz \pm 2%, through a 3 Wire System (4th 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	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.	
2.11	Voltmeter & Ammeter	Factory Installed Digital 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. <u>Calibration procedure:</u> Details of Input Source like voltage or current, Full scale reading shall be furnished along with the offer which is necessary for calibration. If the input connections to the ammeter and volt meter are taken from PCB, then Calibration kit shall be supplied. Calibration certificate has to be provided for the display meters.	
2.12	Gas-Heater for CO ₂ - Shielding Gas	Provision of one Single Phase AC tapping point in the Power source, for the gas heater input power supply [110 V or 230 V – AC Supply. Power receptacle shall be suitable to Indian standard]	

S No.	BHEL SPECIFICATION		OFFER BY BIDDER
2.13	Auxiliary Power for Wire-Feeder Unit	Low voltage (like 48 V/110V) auxiliary power tapping point in the Power source	
2.14	Arc Strike (F.A.S.)	Instantaneous Arc Striking facility (Fresh Arc Strike)	
2.15	Weld Stop Condition	No globule formation at the wire tip , at the time of weld stopping	
2.16	Gas Flow Setting	Gas Flow Check Push Button for Gas Solenoid Valve actuation in weld switch in "OFF" position.	
2.17	Compulsory Features	The Power source shall have Features like a) Gas / Wire Inching Facility b) Spatter Control Facility c) Gas Pre-flow / Post-flow Facility d) Crater Control & Fill	
2.18	Insulation	Class "H" preferred – Tropical Working Conditions	
2.19	Machine Protection	IP 23 – Degree of Protection	
2.20	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.	
2.21	Functional / Elemental Design Protection/ operator safety	a) Inbuilt protection for the IGBT/ Power source against Thermal / Overload / High voltage / low voltage / Short-Circuit conditions/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 as well as HF source for ensuring operator safety.	

S. No.	BHEL SPECIFICATION		OFFER BY BIDDER
2.22	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 /HF noise 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.	
2.23	Portability	Under-Carriage with hard rubber lined wheels for portability of the power source by manual pushing and bottle rack for holding one Argon/CO2 Gas cylinder.	
2.24	Ambient Conditions	Temperature up to + 50 °C; Humidity up to 90 % but both upper limits do not occur simultaneously.	
2.25	Load Compensation	Output variation in terms of fluctuation in line voltage, cable heating or drift caused due to usage of 20 m long welding cable, shall be compensated suitably.	
2.26	Power Rating	BIDDER to indicate the Maximum Power Rating [kVA] of the Power source and the NO-LOAD Power Consumption in Watts.	
2.27	Power Source Model	Vendor 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	WIRE-FEEDER UNIT FEATURES		
3.1	Type	4-Roll Drive [All Powered Drive Wheels]	
3.2	Burn-Back Control	Compulsorily to be provided	
3.3	Wire Sizes	1.0 and 1.2 mm (Self-Shielded / Flux-Cored Wires)	

S. No.	BHEL SPECIFICATION		OFFER BY BIDDER
3.4	Wire Feed Speed	1.0 to 18.0 m/ min.	
3.5	Wire Feeder Motor	BIDDER has to indicate the Type of Motor used for wire feeding	
3.6	Wire Spool mounting facility	Facility to hold wire spools of weight 15 to 20 kg and dimensions as per ISO 544: S 300	
3.7	Brake Torque on Wire Feeder Hub	Shall be of adjustable type.	
3.8	2 / 4 Track Facility	Torch latching facility to be provided compulsorily	
3.9	Feed Rolls & Guides	Suitable for 1.0mm & 1.2 mm Cored wires	
3.10	Connector for Torch	Euro / Unitized Connector with polymedium cable	
3.11	Inter-connecting cables/hoses assembly	10 metres long power & control cables and gas hose assembly with plug-in and quick-fix end connectors to connect the power source and the wire-feeder.	
3.12	Wire-feeding capacity	Shall be suitable for feeding welding wire through Welding Torches with 3.0 m long & 4.5 m long cables [without the use of additional push or pull motor in the wire-feed line]	
3.13	Wire Feeder Model	To specify the Wire-Feeder Model & Weight	
4.0	WELDING TORCH FEATURES AND GAS GUARD		
4.1	Make	OTC DAIHEN/ KEMPP/ DAIDEN/WELDCRAFT/ABICOR BINZEL	
4.2	Type	Goose-Neck, Gas cooled	
4.3	Shielding Gas	CO ₂ , Argon or Mixture of CO ₂ & Argon	
4.4	Cable & Connector	Polymedium Cable, Euro / Unitized Connector Adapter to suit to torch	
4.5	Wire Sizes	1.0 & 1.2 mm (Self-Shielded / Flux-Cored Wires)	
4.6	Wire Material	Carbon & Alloy Steel, Stainless Steel, Aluminium	
4.7	2 / 4 Track Facility	Compulsorily to be provided in the Torch	

S. No.	BHEL SPECIFICATION		OFFER BY BIDDER
4.8	Type A – Rating	300/350 Amps. @ 60 % Duty Cycle Torch with 3.0 metre long cable.	
4.9	Type B – Rating	300/350 Amps. @ 60% Duty Cycle Torch with 4.5 metre long cable.	
4.10	Torch Models & Weight	To specify the Models and the Torch Weight for Type A, B in the OFFER	
4.11	Gas Guard	A device to stop welding if there is any drop in the gas pressure to avoid weld defects	
5.0	REMOTE CONTROL UNIT FEATURES		
5.1	Type	Hand Operated with 10 m long control cable with Display and end connectors. Type of remote control (analog or digital) may be specified.	
5.2	Control	Step less Variation of Welding Current & Voltage	
5.3	Connection	Remote Control Unit to be connected to the Wire-Feeder	
6.0	GAS REGULATOR, FLOW METER & HEATER		
6.1	Function	To regulate CO ₂ Gas Pressure, Flow Rate and for Heating the CO ₂ Gas, to avoid ice formation.	
6.2	Power	To draw from Single Phase AC Power Supply from Power source (110 V or 230 V - AC) through a 2 m Cable	
6.3	Pressure Gauges	Preferred to have 2 Nos. – To indicate independently cylinder pressure and gas delivery pressure	
6.4	Accessories	Double glass covered flow-meter, power cable with end-connectors, electrical heating unit, Gas Guard etc.	
7.0	MACHINE CONFIGURATION : [The scope of supply shall consist of the following, for each machine]		
7.1	Welding Power source with Transport Trolley and Wheels& integrated Argon gas cylinder cart.		

S. No.	BHEL SPECIFICATION	OFFER BY BIDDER
7.2	Wire Feeder Unit	
7.3	Welding Torch (2 Types)	
7.4	Remote Control Unit	
7.5	Gas Regulators for (Ar + CO ₂) Gas Mixture or CO ₂ Gas	
7.6	CO ₂ Gas Pressure Regulator, Gas Guard, Flow–Meter and Heater Unit	
7.7	Set of inter-connecting cables/hoses with quick-fix end couplings	
7.8	Consumables & Spares for Welding Torches	
7.9	Electrical & Mechanical Spares for Power source and Wire-Feeder	
7.10	Operation & Maintenance Manuals – Three Copies per Machine	
7.11	Calibration Kit if necessary	
7.12	OPTIONAL: Program loader shall be supplied if the power source is pre-programmed.	

S.No.	BHEL SPECIFICATION		OFFER BY BIDDER
8.0	SPARES		
8.1	Power Source	<p>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).</p> <ul style="list-style-type: none"> 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 	
8.2	Wire-Feeder Unit	Spares such as feed-rolls (suitable for 1.0 & 1.2 mm dia. suitable for Cored Wires), wire-feed motor, wire guides, control PCB cards, connectors, etc. shall be offered. To be LISTED ITEMWISE	
8.3	Remote Control Unit	Complete Set of Spares for Remote Control Unit to be offered.	
8.4	Welding Torch	Consumables & Spares such as Liners & Contact Tip (suitable for 1.0 & 1.2 mm dia. Welding Wires), Contact Tip Body, Gas Nozzles, Insulator, Orifice, 'O' Ring, Adaptor 'O' Ring, etc. shall be offered for all the two types of Torches. To be LISTED ITEMWISE.	

S. No.	BHEL SPECIFICATION		OFFER BY BIDDER
9.0	O & M MANUALS		
9.1	No. of Copies	2 (Two) for Each Machine	
9.2	Language	English	
9.3	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, etc.	
10.0	GENERAL POINTS		
10.1	Bought-Out Items	a) IGBTs used in the welding power sources shall be of HITACHI, JAPAN/ DYNEX, U.K/ FUJI, JAPAN/ IXYS, USA/ POWEREX, USA/ MITSUBISHI, JAPAN/ TOSHIBA, JAPAN / INFINEON, GERMANY/ SEMIKRON, GERMANY make only. The manufacturer's original test certificate for the IGBTs used in the power sources shall be provided with the equipment. These shall be verified during pre-dispatch inspection. b) The Bought-Out Items - like Motors, ICs, Relays, Contactors, Switches, Electronic Elements, etc., used in the Power source & Control Unit shall be of Reputed Makes acceptable to BHEL. c) BIDDER has to furnish the make of Bought-Out Items, along with the offer.	
10.2	Weight	Bidder to specify the Weight of single power source	

S. No.	BHEL SPECIFICATION		OFFER BY BIDDER
10.3	Pre-dispatch Inspection	The welding machines shall be offered for inspection by BHEL Engineers at supplier's works for performance evaluation prior to despatch.	
10.4	Commissioning	Commissioning and performance prove out of the offered equipment at BHEL works, by the supplier's representative.	
10.5	Performance prove out at BHEL works	a) Welding Trials are to be taken on carbon & alloy steel pipes/plates and subjected to radiographic tests for acceptance. b) BHEL will provide necessary jobs and filler wires for MIG/MAG.	
10.6	Training	The Supplier's SERVICE ENGINEER shall give training in the Operation and Maintenance (mainly on electric/electronic troubleshooting) of the Machine for BHEL Staff, during commissioning of the Welding Machines	
10.7	Guarantee	The equipment shall be guaranteed for a minimum of 24 months from the date of commissioning at BHEL.	