



Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

An ISO 9001
Company

ENQUIRY NOTICE INVITING TENDER	Phone: +91 431 257 79 38 Fax : +91 431 252 00 31 Email : tvenkat@bheltry.co.in Web : www.bhel.com
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TWO PART BID Tender to be submitted in two Parts	Enquiry Number: 2851300042	Enquiry Date: 18.12.2013	Due date for submission of quotation: 28.01.2014
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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	Qty.	Delivery Required	Delivery Terms Required
10	IGBT Based Inverter Controlled Welding Power Sources for SMAW/TIG Welding (400A, 60% Duty Cycle) as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	76 Nos.	31.01.2015	F.O.R, BHEL Stores, Power Equipment Fabrication Plant, Bharat Heavy Electricals Ltd., Mundipar- 441804, Sakoli Taluk, Bhandara District, Maharashtra State.
20	IGBT Based Inverter Controlled Welding Power Sources for SMAW/TIG Welding (400A, 60% Duty Cycle) as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	21 Nos.	4 months from the date of Purchase Order.	FOR, BHEL Stores, High Pressure Boiler Plant, Bharat Heavy Electricals Ltd., Tiruchirappalli – 620014, Tamilnadu

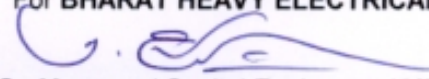
Important points to be taken care during submission of offer:-

1. Compliance Form No. BND/IMP/01 & BND/IND/01A to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
2. EMD for this Tender will be Rs. 2,00,000.00/-
3. 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.
4. The time period required for Commissioning & Performance Prove out of the item shall be 2 weeks for item Sl. No. 10 and 1 week for item Sl. No. 20 from the date of intimation from BHEL requesting supplier to depute Service Engineers about site readiness.
5. Offer shall be evaluated on a single package basis for item Sl. No. 10 & 20 (overall L1 basis) and hence offer should be submitted for both items (Sl. No. 10 & 20) without any fail, otherwise your offer will not be considered.

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 "2851300042".

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

T. VENKATESWARAN
Senior Manager
Capital Equipment / MM
BHEL, Tiruchirappalli - 620 014.

PART A**IGBT based Inverter controlled Welding Power Source for SMAW/TIG welding (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	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 Welding Power Sources for SMAW/TIG Welding ” for Radiographic Quality SMAW/TIG welding 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 200 Nos. of the model quoted against this tender of “IGBT based Inverter controlled Welding Power Source for SMAW/TIG welding” with a rating of 400A - 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 Welding Power Source for SMAW/TIG welding” supplied & commissioned till date.	
4.0	Year of Launch of the Offered Model in this tender.	
5.0	<p>The quoted model of Welding Power Source shall be complying with at least one of the Standards as given below:</p> <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 25 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.	
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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 Welding Power Source for SMAW/TIG Welding
(400 Amps, 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) and also Manual TIG welding process 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 IGBT based Inverter Controlled 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	
2.4	Operating Range for Welding Current 20 A to 400 A (with step less variation Continuously adjustable)	
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.	

BHEL SPECIFICATION		OFFER BY BIDDER
S. no.		
2.8	Digital Control	Welding power source shall have digital control/ display/ Setting features. Type of digital control shall be explained by vendor.
2.9	Input Power Supply	3 Phase AC 415 V \pm 10%, 50 Hz \pm 2%, through a 3 Wire System (4 th wire for Earthing) – No Neutral Conductor.
2.10	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.
2.11	Control Panel Switches	Power ON/OFF, Remote ON/OFF, Voltage & Ampere Control, Hot Start Control, Arc Dynamics Control, GTAW/SMAW mode selection etc.
2.12	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. If the input connections to the ammeter and voltmeter are taken from PCB, with digital readout then a) in-built provision for error correction shall be provided in the welding machine and b) Calibration kit for measuring welding current (0 to 600A) and Welding voltage (0 to 100V) shall be provided. The measuring instrument in the Calibration kit shall be calibrated at NABL Accredited labs. Calibration certificate has to be provided for the display meters. <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. Vendor shall define & Demonstrate Step by step Calibration procedure for the measuring instruments in the welding machine at BHEL Works.

S. no.	BHEL SPECIFICATION		OFFER BY BIDDER
2.13	Arc Strike	Selection for Instantaneous Arc Strike with Hot Start for SMAW Process.	
2.14	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.	
2.15	Insulation	Class "H" - shall be provided to suit Tropical Working Conditions	
2.16	Machine Protection	IP 23 - Degree of Protection	
2.17	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.	
2.18	Functional / Elemental Design Protection / operator safety	<ul style="list-style-type: none"> 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. 	
2.19	Electromagnetic Interference (EMI) Suppression	<ul style="list-style-type: none"> 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. 	

S. no.	BHEL SPECIFICATION	OFFER BY BIDDER
2.20	Portability Under-Carriage with hard rubber lined wheels for portability of the power source by manual pushing and bottle rack for holding one Argon Gas cylinder.	
2.21	Ambient Conditions Temperature up to +50°C; Humidity up to 90% but both upper limits do not occur simultaneously.	
2.22	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.	
2.23	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.	
2.24	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 Power source and the free end provided with a female Connector to connect to the male Connector of the Manual Welding Electrode Holder.	
2.25	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.	
2.26	TIG Arc Ignition By means of scratch start	
2.27	Torch connection Facility to connect gas cooled TIG torch through suitable adapters to prevent leakage of gas for GTAW.	
2.28	Power Rating BIDDER to indicate the Maximum Power Rating (kVA) of the Power source and the no-load Power consumption in Watts.	

S. no.	BHEL SPECIFICATION		OFFER BY BIDDER
2.29	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) and foot operated (for GTAW) with 10 m long control cable with quick-fix end connectors. Type of remote control (analog or digital) may be specified.	
3.3	Current Control	Step less regulation of Welding Current	
4.0 TIG WELDING TORCHES			
4.1	Application	Suitable for GTAW process and for the nature of welding works listed under S. no. 1.0 and compatible to the welding powersource offered.	
4.2	Make	Preferred makes are Weld Craft, Abicor Binzel or any other reputed make acceptable to BHEL.	
4.3	Torch configuration	The torch Head-gas lens & nozzles configuration shall be suitable for performing the following: a) Tube butt welds in close pitch tubular panels with a minimum clear gap of 12mm between the adjacent tubes(gas nozzle end diameter is to be 11mm for a length of 25mm). b) Root GTAW pass welding in a 90mm (wall thickness) pipe butt welds (gas nozzle end dia. is to be 11mm for a length of 45mm).	

S. no.	BHEL SPECIFICATION		OFFER BY BIDDER
4.4	Cable sheathing	Protective sheathing to be provided for the TIG Torch cables & Hoses, to withstand shopfloor rough use for the entire length of cables/hoses.	
4.5	Gas cooled Torch	a) Current rating: 140 to 180 A @ 100% Duty Cycle. b) Cable length: Around 8 m.	
5.0	SCOPE OF SUPPLY : [The scope of supply shall consist of the following, for each machine]		
5.1	Welding Power source with Transport Trolley with wheels and integrated Argon gas Cylinder Cart (one gas cylinder/bottle only).		
5.2	Control Unit Integrated with Powersource		
5.3	Power source suitable for TIG/GTAW with scratch start		
5.4	Hand Operated Remote Control Unit.		
5.5	Foot operated Remote Control Unit		
5.6	Set of Inter-Connecting Cables, Adapters, hoses etc.		
5.7	Welding Cable and Welding Holder		
5.8	Return Current Cable with Screw Type Earth Clamp.		
5.9	Gas cooled TIG welding torch		
5.10	Electrical & Mechanical Spares for Powersource & Control Unit		
5.11	Calibration kit if necessary		
5.12	OPTIONAL: Program loadershall be supplied if the power source is pre-programmed.		

S. no.	BHEL SPECIFICATION		OFFER BY BIDDER
6.0	SPARES :		
6.1	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	
6.2	TIG Torch consumables	Complete set of consumable spares for \varnothing 2.4mm Tungsten electrode, 'O' Rings, Gas lens, nozzle/diffusers, ceramic nozzles (both types), collet bodies, etc. for one year trouble free operation are to be offered with unit price.	
6.3	Remote Control Unit	Complete Set of Spares for Remote Control Unit to be offered.	
7.0 O & M MANUALS :			
7.1	No. of Copies	One copy for each machine	
7.2	Language	English	

S. no.	BHEL SPECIFICATION		OFFER BY BIDDER
7.3	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	
7.4	Manual Details :	<ul style="list-style-type: none"> 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. 	
8.0	GENERAL POINTS :		
8.1	Bought-Out Items	<ul style="list-style-type: none"> 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. 	
8.2	Weight	Bidder to specify the Weight of single power source	

S. no.	BHEL SPECIFICATION		OFFER BY BIDDER
8.3	Pre-dispatch Inspection	The welding machines shall be offered for inspection by BHEL Engineers at supplier's works for performance evaluation prior to despatch.	
8.4	Commissioning	Commissioning and performance prove out of the offered equipment at BHEL works, by the supplier's representative.	
8.5	Performance prove out at BHEL works	<p>a) Welding Trials are to be taken on butt joints of carbon & alloy steel tubes (of dimensions as mentioned in Clause 4.3 and root pass of pipes) and subjected to radiographic tests for acceptance.</p> <p>b) BHEL will provide necessary jobs and consumables for SMAW and TIG welding trials.</p>	
8.6	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, during commissioning of the Welding Machines.	
8.7	Guarantee	The machine shall be guaranteed for a minimum of 24 months from the date of commissioning at BHEL.	