An ISO 9001 Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)
Tiruchirappalli – 620014, TAMIL NADU, INDIA
CAPITAL EQUIPMENT/ MATERIALS MANAGEMENT

ENQUIRY **NOTICE INVITING TENDER**	Phone: +91 431 257 70 49 Fax : +91 431 252 07 19 Email : csguna@bheltry.co.in Web : www.bhel.com

TWO PART BID Tender to be submitted in two parts.	**Enquiry Number:** **2620900158**	**Enquiry Date:** **29.08.2009**	**Due date for submission of quotation:** **13.10.2009**

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	**350 A Multi Purpose welding Power Source** as per the technical specification, general guidelines instructions & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	**87 Nos.**

Important points to be taken care during submission of offer

1. **Delivery required 6 months from the date of purchase order.**
2. **Grace period of 2 months beyond the above delivery period will be considered.**
3. **Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.**

BHEL's General guidelines / instructions (refer MM/CE/GT/001) 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 "2620900158".

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 / MM / Capital Equipment

PART A

QUALIFYING CRITERIA FOR THE SUPPLY OF *INVERTER CONTROLLED MANUAL ARC WELDING POWERSOURCES – 350 Amps.* *[60% Duty Cycle]*

SECTION – I

The BIDDER is expected to give complete details against each clause in the table given below and wherever necessary an additional sheet may be attached (giving clear reference number) to cover the required details.

S. No.	PARTICULARS	VENDOR's RESPONSE
1.0	Number of Years of Experience of the BIDDER (Original Equipment Supplier) in the field of design, manufacture and supply of 'INVERTER CONTROLLED MANUAL ARC WELDING MACHINES' [with the option for Scratch TIG Welding also] for Radiographic Quality SMAW & TIG Welding Applications for Pressure Parts Fabrication	
2.0	YEAR of LAUNCH of the MODEL quoted against this ENQUIRY	
3.0	Number of 'Inverter Controlled Manual Arc cum Scratch TIG Welding Machines' supplied, till date in the QUOTED MODEL	
4.0	Number of 'Inverter Controlled SMAW with Scratch TIG Welding Machines – 350 Amps. Rating with 60 % Duty Cycle' supplied and commissioned till date for the following category of CUSTOMERS a) High Pressure Boiler Industries b) Nuclear & Space Applications c) Heat Exchangers / Pressure Vessels	
5.0	Details on International Standards followed in Design and Testing of Welding Machines	
6.0	Comprehensive Details, on Performance Testing of Welding Machines carried out at the Factory, to be furnished with the Technical Offer.	
7.0	Details on SERVICE-AFTER-SALES Set-Up in India including the Addresses of Agents / Service Centres in India, to be furnished compulsorily.	
8.0	BIDDER to indicate the Country of Origin for the supply of welding machines. Machines manufactured in Countries like TAIWAN/CHINA/KOREA are not preferred.	

SECTION – II

The BIDDER has to compulsorily meet the following requirements to get qualified for submitting an offer for the Inverter Controlled SMAW / TIG Welding Machine .

S. No.	REQUIREMENTS	VENDOR's COMMENTS
9.0	The BIDDER shall have a minimum of TEN Years of Continuous Experience in the Design, Manufacture & Supply of Inverter Controlled SMAW cum Scratch TIG Welding Machines.	
10.0	The BIDDER should have supplied a minimum of 50 number of Inverter Controlled SMAW cum Scratch TIG Welding Machines with rating 350 Amps. (@ 60 % Duty Cycle) and above to Customers in India. Indicate the number of such welding machines sold in India.	
11.0	Reference List of Customers and Performance Certificate from minimum THREE CUSTOMERS [Heavy Engineering Companies] with full contact details of CONTACT PERSON, who are the End Users of the MODEL (given under Clause No.10.0) of Inverter Controlled SMAW cum Scratch TIG Welding Machines.	

SECTION – III

The BIDDER has to comply with the following, for accepting the Technical Offer for scrutiny by the Purchaser :

S.No.	REQUIREMENTS	VENDOR's COMPLIANCE
12.0	The BIDDER shall submit the offer in TWO PARTS - Technical **[**with **PART A** & **PART B]** & Commercial and Price Bid.	
13.0	The Offer shall contain a comparative statement of Technical Specifications given by BHEL and the Offer Details submitted by the Bidder, against each clause. A just 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement may lead to disqualification of the Technical Offer.	

S.No.	REQUIREMENTS	VENDOR's COMPLIANCE
14.0	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.	
15.0	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	
16.0	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 for the scope of supply.	
17.0	Earlier performance & field experience (service support) with BHEL (if any) will be a reckoning factor for the technical qualification of the OFFER.	
18.0	The expected delivery period (including the time for Pre-Dispatch Inspection clearance by BHEL) for the welding machines is not more than six months from the date of issue of BHEL Purchase Order. In case the quoted delivery period extends beyond six months, an additional grace period of two months is permitted, but with a loading for arriving at the PRICE COMPETITIVENESS of the Offer (if the OFFER is technically acceptable on all accounts). Details are given in the commercial terms of the this tender	

PART B

TECHNICAL SPECIFICATIONS FOR INVERTER CONTROLLED MULTI-PURPOSE WELDING POWERSOURCES [350 AMPS.]

1.0.0. APPLICATION :			
Sl.No.	**FEATURES / BHEL SPECIFICATION**	**OFFER BY BIDDER**	**DEVIATIONS**
1.1.0	The proposed Welding Machine is intended for use with Manual Arc Welding (SMAW) Process and also Manual TIG Welding Process for Radiographic Quality Welds like Butt Joints (coming in tubes and pipes), Fillet Welds, and Single Groove Welds coming in High Pressure Vessels using ϕ 2.5 mm to ϕ 5.0 mm basic coated stick electrodes .		
2.0.0. MACHINE CONFIGURATION : [The scope of supply shall consist of the following, for each Machine]			
Sl.No.	**FEATURES / BHEL SPECIFICATION**	**OFFER BY BIDDER**	**DEVIATIONS**
2.1.0	Welding Powersource with Transport Trolley with integrated Argon Gas Cylinder Cart		
2.2.0	Manual Arc Welding Control Unit Integrated with Powersource (for Hot Start & Arc Dynamics Control)		
2.3.0	Powersource also suitable for TIG / GTAW Welding with Scratch Start		
2.4.0	Hand Operated Remote Control Unit for Current Variation		
2.5.0	Foot Operated Remote Control Unit for Current Variation (with accelerator type operation)		
2.6.0	Set of Inter-Connecting Cables, Adaptors , etc. (if required)		
2.7.0	Welding Cable and Welding Holder (multiples of 5 mtrs. in length)		
2.8.0	Return Current Cable with Screw/Crocodile Grip Type Earth Clamp.		
2.9.0	Gas Cooled TIG Welding Torch		
2.10.0	Electrical & Mechanical Spares for Powersource & Control Unit		
2.11.0	Operation & Maintenance Manuals – Three Copies per Machine		
2.12.0	Commissioning of Equipment and Performance Prove-out of the offered equipment at BHEL Works, by Supplier's Representative, free of cost.		

3.0.0. EQUIPMENT SPECIFICATION : POWERSOURCE FEATURES				
S.No.	**FEATURES**	**BHEL SPECIFICATION**	**OFFER BY BIDDER**	**DEVIATIONS**
3.1.0	Type	Powersource shall be Inverter Controlled with IGBT and capable of delivering a smooth Constant Direct Current (suitable for DCEP and DCEN modes of welding operations) even with a fluctuation of ±10 % in the Input Voltage		
3.2.0	Switching Frequency	BIDDER has to indicate the Switching Frequency of the Inverter Circuit and the make of IGBT used		
3.3.0	Current Rating	350 Amps. @ 60 % Duty Cycle **OR** Minimum 280 Amps. at 100% Duty Cycle.		
3.4.0	Operating Range for Welding Current	20 Amps. to 350 Amps. (with stepless variation)		
3.5.0	Open Circuit Voltage	BIDDER to mention the Open Circuit Voltage for the offered Powersource [Preferred OCV is above 65 V]		
3.6.0	Current Setting	The variation in the set value of the welding current to the actual value, shall not exceed 1 %.		
3.7.0	Current Control	Preferred through a local variator [with the help of a 3 inch diameter KNOB] provided in the Front Panel of Powersource and the Remote Control Unit.		
3.8.0	Power Input	415 ± 10% V AC, 3 Phase, 50 ± 2% Hz, through a 3 Wire System [4th wire for EARTHING] – No Neutral Conductor		
3.9.0	Input Power Cable	A 10 metre long electric input power cable with protective sheathing to be provided with the powersource.		
3.10.0	Control Panel Switches	Power ON/OFF, Remote ON/OFF, Voltage & Ampere Control, Hot Start Control, Arc Dynamics Control, GTAW/SMAW Mode Selection, etc.		
3.11.0	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 Powersource) for periodic instrument calibration		

CC. EQUIPMENT SPECIFICATION : POWERSOURCE FEATURES [….contd……..]				
Sl.No.	**FEATURES**	**BHEL SPECIFICATION**	**OFFER BY BIDDER**	**DEVIATIONS**
3.12.0	Arc Dynamics Control - Electronic Inductance Variable Control	To minimise spatter and optimise weld-bead wetting action, during welding of materials special materials like Stainless Steel, T 91/P 91, Inconel, in addition to Carbon and Low Alloy Steels.		
3.13.0	Insulation	Class "H" – to suit Tropical Working Conditions		
3.14.0	Machine Protection	IP 23 – Degree of Protection		
3.15.0	Machine Cooling	The Powersource shall feature forced air cooling system that ensures adequate cooling of the components while preventing dust and metal particles from being drawn in.		
3.16.0	Functional / Elemental Design Protection	a) Inbuilt protection for the IGBT/Powersource 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	***[BIDDER has to specifically furnish technical details on how these protective measures are addressed in the Machine Design]***	
3.17.0	EMI Suppression	a) Powersource shall be suitably equipped, to prevent propagation of EMI either into or out of the Powersource. b) All metal enclosures and internal shields shall prevent radiated EMI. c) BIDDER has to elaborate the DESIGN FEATURES to meet the above requirements.		
3.18.0	Portability	Under-Carriage with hard rubber lined wheels for portability of the powersource by manual pushing and bottle rack for holding one Argon Gas Cylinder		
3.19.0	Ambient Conditions	Temperature upto + 50 ° C ; Humidity upto 90 % but both upper limits do not occur simultaneously.		

CC. EQUIPMENT SPECIFICATION : POWERSOURCE FEATURES [….contd……..]				
Sl.No.	**FEATURES**	**BHEL SPECIFICATION**	**OFFER BY BIDDER**	**DEVIATIONS**
3.20.0	Load Compensation	Output variation due to line voltage fluctuation, cable heating or drift due to the use of long cable, [20 metres long welding cable] to be eliminated.		
3.21.0	Arc Strike	Selection for Instantaneous Arc Strike with HOT START for SMAW Process.		
3.22.0	Electrode Holder & Return Current Connection	Heavy Duty rugged LUG type terminals to connect 50 mm^2 Welding Cable for SMAW Electrode Holder and Return Current Cable for SMAW Process		
3.23.0	Welding Current Cable	SMAW Welding (current) Cable, 20 mtrs. in length, with one end connected to the Powersource and the free end provided with a FEMALE Connector to connect a MALE Connector with 50 mm^2 Cable of the Manual Welding Electrode Holder.		
3.24.0	Return Current Cable	Welding Current RETURN Cable , 10 mtrs. in length, with one end connected to the Powersource and the other end provided with a Screw Type Earth Clamp		
3.25.0	TIG Arc Ignition	By means of scratch start		
3.26.0	Torch Connection	Facility to connect Gas Cooled TIG Torch through suitable adopters to prevent leakage of Gas for GTAW		
3.27.0	Power Rating	BIDDER to indicate the Maximum Power Rating [in kVA] of the Powersource and the NO-LOAD Power Consumption in Watts.		
3.28.0	Power Source Model	To Specify the Model of Powersource Offered		

4.0.0. EQUIPMENT SPECIFICATION : REMOTE CONTROL UNIT FEATURES				
Sl.No.	**FEATURES**	**BHEL SPECIFICATION**	**OFFER BY BIDDER**	**DEVIATIONS**
4.1.0	Application	For welding current variation from a distant work place, in addition to that provided in the front panel of the welding powersource.		
4.2.0	Type	Hand Operated (for SMAW) and Foot Operated (for GTAW) with 10 mtrs. long control cable with quick-fix type end connectors		
4.3.0	Current Control	Stepless Variation of Welding Current		
5.0.0. EQUIPMENT SPECIFICATION : TIG WELDING TORCHES' FEATURES				
S.No.	**FEATURES**	**BHEL SPECIFICATION**	**OFFER BY BIDDER**	**DEVIATIONS**
5.1.0	Application	Suitable for GTAW Process and for the nature of welding works listed under Clause Sl. No. 1.0.0 and compatible to the welding powersource offered.		
5.2.0	Make	Preferred makes are WELD-CRAFT of USA, KEMPPI of FINLAND or OTC/DAIHEN CORPN. of JAPAN		
5.3.0	Torch Configuration	The Torch Head – Gas Lens & Nozzle configuration shall be suitable for performing the following : a. Tube Butt Welds in close pitch tubular panels with a minimum clear gap of 12 mm between the adjacent tubes [Gas Nozzle End Diameter is to be 11 mm for a length of 25 mm] b. Root GTAW pass welding in a 140 mm (wall thickness) Pipe Butt Welds [Gas Nozzle End diameter is to be 11 mm for a length of 45/65 mm]		
5.4.0	Cable Sheathing	Protective Sheathing to be provided for the TIG Torch Cables & Hoses, to withstand shopfloor rough use for the entire length of the cables/hoses.		

5.0.0. EQUIPMENT SPECIFICATION : TIG WELDING TORCHES' FEATURES [....contd.....]				
S.No.	**FEATURES**	**BHEL SPECIFICATION**	**OFFER BY BIDDER**	**DEVIATIONS**
5.5.0	Gas Cooled Torch	a. Current Rating :- 140 to 180 Amps. @ 100 % Duty Cycle b. Cable Length :- Not less than 7.5 Metres		

6.0.0. O & M MANUALS :				
S.No.	**PARTICULARS**	**BHEL SPECIFICATION**	**OFFER BY BIDDER**	**DEVIATIONS**
6.1.0	No. of Copies	3 (Three) for Each Machine		
6.2.0	Language	English		
6.3.0	Soft Copy	One SOFT COPY in DC-ROM is to be given for each machine, containing the details mentioned under **Clause Sl. No. 6.4.0**		
6.4.0	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.		

7.0.0. SPARES :

S.No.	ITEMS	BHEL SPECIFICATION	OFFER BY BIDDER	DEVIATIONS
7.1.0	Power Source	All type of Spare Parts including the following items : 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 n. Filters o. Welding & Return Cable Connectors are to be COMPULSORILY QUOTED (with Unit Rate) for one powersource required for 2 years of operation on THREE shift basis for 365 Days in an year.		
7.2.0	TIG TORCH Consumables	Complete Set of Consumable Spares for ϕ 2.4 mm Tungsten Electrode, “O” Rings, Gas Lens, Nozzle / Diffusers, Ceramic Nozzles (both types), Collet Bodies, etc. are to be OFFERED with unit price.		
7.3.0	Remote Control Unit	Complete Set of Remote Control Unit and its Spares like Knob, Potentiometer, etc. to be **OFFERED**		

8.0.0. GENERAL POINTS :

S.No.	PARTICULARS	BHEL SPECIFICATION	OFFER BY BIDDER	DEVIATIONS
8.1.0	Inspection	a. The welding machines shall be offered for inspection by BHEL Engineers at supplier's works for performance evaluation prior to despatch. b. Welding Trials are to be taken on butt joints of carbon & alloy steel tubes [size: ϕ51.0 mm & 4 mm wall thickness] and subjected to Radiographic Tests, for acceptance. c. Supplier to arrange for Tubes & Electrodes of ϕ 2.5/3.15 mm of Class E-7018-1/E-9018-B3 for SMAW and ϕ 2.4 mm x 1000 mm Filler Wires of Class ER 90 S-G (2.25 % Cr-1% Mo) and ER 80 S-G (½ Mo) for TIG Welding		
8.2.0	Commissioning	The equipment shall be commissioned, free of cost by the supplier's representative at BHEL Works.		
8.3.0	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, after the successful commissioning of the Welding Machines		
8.4.0	Guarantee	The machine shall be guaranteed for a minimum of 12 (twelve) months from the date of commissioning & performance prove-out at BHEL/Trichy Works.		
8.5.0	Bought-Out Items	a) The Bought-Out Items - like Motors, IGBTs, ICs, Relays, Contactors, Switches, Electronic Elements, etc., used in the Powersource & Control Unit shall be of Internationally Reputed Manufacturers only. b) BIDDER has to furnish the MAKE of Bought-Out Items proposed to be used in the Welding Machine, with the OFFER .		