



An ISO 9001
Company

Bharat Heavy Electricals Limited
(High Pressure Boiler Plant)
Tiruchirappalli – 620014, TAMIL NADU, INDIA
CAPITAL PURCHASE / MATERIALS MANAGEMENT / MANUFACTURING

ENQUIRY	Phone: +91 431 257 75 75 Fax : +91 431 252 07 19 Email : rrmanohar@bheltry.co.in Web : www.bhel.com
----------------	---

	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
	2620700013	04.06.2007	16.08.2007

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

Item	Description	Quantity	Delivery Schedule
10	CNC Gantry Welding System as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com)	1 No.	15.01.2008

Note:

- (1) Confirmation of acceptance for BHEL commercial terms & conditions and Price Bid formats have been posted in BHEL Corporate web site www.bhel.com under Enquiry reference “2620700013”. Your offer should be based on all the above documents.
- (2) Also, you are requested to fill in the Supplier Registration formats available in www.bhel.com (under Advancement – Supplier Registration) and send it along with your offer.

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. Dy. Genl. Manager / Capital Purchase / MM / Manufacturing
--	--

PART A

QUALIFYING CRITERIA FOR THE SUPPLY OF CNC GANTRY ROBOT WELDING SYSTEM.

SECTION – I

The BIDDER / VENDOR has to compulsorily meet the following requirements to get Qualified for submitting an offer for **CNC Gantry Robot welding system**

S. No.	REQUIREMENTS	Vendor's RESPONSE
1	The BIDDER shall have a minimum of THREE Years of Continuous Experience in the field of Design, manufacture and supply of CNC gantry integrated with multi robot welding system.	
2	Only those vendors, who have supplied, and commissioned at least one integrated CNC Gantry with multi-robot welding system for similar applications in the past five years (on the date of opening of Tender) and such machine is presently working satisfactorily for more than one year after commissioning (on the date of opening of Tender), should quote. However, if such machine (s) has/ had been supplied to BHEL, then such machine should be presently working satisfactorily for more than six months after its commissioning and acceptance (on the date of opening of Tender).	
2.1	The vendor should submit the following information where similar machines have been supplied, for qualification of their offer.	
2.2	Name and postal address of the customer / company where similar machine is installed.	
2.3	Name and designation of the contact person of the customer.	
2.4	Phone, FAX no. and email address of the contact person of the customer.	
2.5	Month and Year of commissioning	
2.6	Application for which the machine is supplied.	
2.7	One Performance certificate from the customers regarding satisfactory performance of machine supplied to them. The certificate should be current and on the letterhead of the Customer. It should contain information regarding model / Size of machine, year of commissioning and performance of M/c.	
3.0	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	

SECTION – I I

The BIDDER is expected to give complete details against each clause in the table given below, with additional sheets those may be attached (giving clear reference number) to furnish and cover the requisite details / documents.

S. No	PARTICULARS	VENDOR's RESPONSE
4	Profile of the Company bringing-out the years of Experience of the BIDDER in the field of design, manufacture, integration and supply of CNC Gantry Robot welding system	
5	Number of CNC Gantry Robot welding systems supplied, installed and commissioned till date for multi robot welding applications (with details on machine type / model, configuration, customer and quantity)	
6	YEAR of supply of latest, CNC Gantry Robot welding systems for welding applications and the Technical Specifications of the Machine supplied [Details to be furnished]	
7	Details on the Firm's Registration and the FINANCIAL STRENGTH of the COMPANY (Balance Sheet for the last 3 years) shall be submitted with the TECHNICAL OFFER	
8	Details on International Standards / Design Process Codes followed in Design and Manufacture of the Equipment.	
9	Details on SERVICE-AFTER-SALES Set-Up in India including the Addresses of Agents / Service Centers in India. Competency & Experience of the Local Service Agency are to be provided	
10	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment	

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 RESPONSE
11	The BIDDER / VENDOR shall submit the offer in TWO PARTS-Technical [with PART A & PART B] & Commercial and Price Bid.	
12	The Technical Offer shall be supported by Product Catalogues and description.	
13	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 mere 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement [without any supporting technical write-ups, photos and datasheets] may lead to disqualification of the Technical Offer.	
14	The BIDDER / VENDOR shall assure a continuous support for the supply of SPARES and SERVICE for TEN Years, from the date of commissioning of equipment at BHEL Works.	
15	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 of the inclusion of all the accessories, tooling, attachments, auxiliary parts, spares, consumables, etc. with the main and basic equipment, to meet the technical specification requirements.	
16	Soft copy if any, giving the salient features of the proposed machine with all sub-systems and auxiliaries, and /or showing live-demo of an existing and working machine of similar configuration and capacity may be provided.	
17	BIDDER has to indicate the Country of Origin for the supply of equipment.	
18	The reference List of Customers shall be accompanied with (Phone Number and E-Mail ID) of the CONTACT PERSON for cross reference by BHEL	
19	In case of preliminary qualification of the offer, on technical grounds, the BIDDER may be called for a detailed technical discussion on the original technical offer at BHEL Works, with a sufficient notice period.	

PART – B
SPECIFICATION FOR CNC GANTRY ROBOT WELDING SYSTEM

Sl. No	Particulars and BHEL specification	Bidder's offer (With Complete Technical Details)
1.0	Purpose	
	The CNC multi robot gantry welding system is for welding boiler components with high productivity and quality. The system shall be capable of handling and tilting a fixture frame with job mounted in pre-determined positions. The system shall have two welding robots mounted on moving gantry. The robots system shall have capability to carry out linear welding, rotary welding and welding in any predetermined path.	
2.0	Scope of supply	
2.1	<u>Scope of supply:</u> The CNC gantry robot welding system consists of <ol style="list-style-type: none"> 1. Head stock tail stock positioner 2. CNC controlled trolley. 3. T-Slotted bars grouted on shop floor for mounting the positioner and CNC controlled gantry and trolley. 4. Two cross slides mounted on the bottom frame for fixing the robots. 5. Two six axis welding robot mounted on the cross slides. 6. Inverter based MIG welding power sources along with torches, wire feeders and cables, 7. Main integrated controller for control of gantry movement, robot arms and welding power sources. 8. Sub systems for robot welding 9. Safety devices 	
3.0	Positioner and gantry base	
3.1	Two nos of rigid T-slotted cast iron bars leveled and grouted on the shop floor to form the bed to hold the headstock and tailstock positioner. The bars shall be equally spaced within the width of the gantry.	
3.2	Two nos of rigid T-slotted cast iron bars having sufficient length (to achieve an effective welding length of 12,000 mm) leveled and grouted on the shop floor for mounting the gantry base and guides	
4.0	Head Stock –Tail stock Positioner	
4.1	The center height of the head stock-tail stock positioner shall be 1300 mm from T-slotted bar level. The headstock and tailstock base shall have provisions for mounting on T-slotted bars grouted on the shop floor. The positioner shall have provision to lock the same in any tilted position.	

4.2	<p>The headstock shall be power driven with a manual chuck having a radial stroke of 200 mm (with minimum holding diameter 200mm).</p> <p>The headstock shall be tiltable over 360 degrees and shall be indexed in steps of 45 deg with the job and fixture frame (combined weight of fixture frame with maximum weight of 5000 Kgs)..</p>	
4.3	The Idle tailstock shall have a manual chuck to hold the other end of the shaft of the fixture frame.	
5.0	CNC Gantry with cross slides	
5.1	<p>CNC controlled rigid gantry type trolley moving on fixed LM guides driven by double side synchronized drives.</p> <p>The overall length of travel of the gantry shall be designed to achieve welding length of 12,000 mm.</p> <p>The inner dimension (width) of the gantry shall be 2500 mm.</p> <p>The gantry shall have a linear travel speed of 100 mm to 2000 mm per minute for welding.</p> <p>The gantry shall have a rapid (idle) movement of 5000 mm per minute.</p> <p>The gantry shall have repetition and positional accuracy of 0.1 mm with zero backlashes.</p>	
5.2	<p>The LM guide bases of the gantry shall be mounted on the T-slotted rigid cast iron bars using suitable support brackets.</p> <p>The LM guides shall be suitably protected against dust.</p>	
5.3	<p>Two cross slides moving independently on the bottom frame of the gantry in the transverse direction through manually operated rack and pinion arrangement.</p> <p>They shall have provision to be locked in a given position.</p>	
6.0	Welding Robots	
6.1	<p>Two six axis robots [50 kg payload] mounted up side down on the bottom face of the cross slides suitable for all position welding.</p> <p>The robot (torch tip) shall have a maximum reach of 500 mm height (from the T-slot bed) to a minimum reach of 2500 mm height (from the T slot bed) in the vertical direction.</p> <p>The robots shall have minimum air cut time.</p> <p>The robots shall have repetition and positional accuracy of 0.1 mm.</p> <p>The robots shall have capability for welding with different standard weave patterns.</p> <p>Suitable anti collision provision shall be provided for the robots.</p>	

7.0	Welding power sources & accessories	
7.1	Inverter based programmable MIG welding power sources with maximum 350 A continuous duty cycle for welding under standard MIG, pulsed MIG, synergic MIG and Pulse-on-Pulse MIG welding modes.	
7.2	Water-cooled heavy-duty MIG welding torches mounted on each robot with wire feeders to handle wires of dia 0.8, 1.0, 1.2, 1.6 & 2.4 mm and standard wire spools.	
8.0	Sub systems	
8.1	The robot system shall have sub systems for effective operation that includes the following <ol style="list-style-type: none"> 1. Nozzle cleaning arrangement, 2. Wire cutting arrangement, 3. Gas mixer, 4. Gas and water manifold arrangement, 5. Position calibrator, 6. Cable tray handling etc 	
9.0	Main Controller	
9.1	Integrated programmable controller to control the gantry movement, robot arm motion and welding parameter control. The controller shall have necessary cooling /air conditioning arrangement.	
9.2	The main controller shall have a monitor to enable off line setting and dry run display and recording of all parameters that are downloadable to computes.	
9.3	Remote pendant type control for programming and setting and resetting of all-important parameters.	
10.0	Safety measures	
10.1	The system shall have standard in-built safety features such as Infrared sensors for work boundary definition, Anti collision system for robots & gantry Interlocks for welding power sources etc.	
11.0	Inspection	
11.1	Inspection of the total system and typical job trials at suppliers works before dispatch.	
12.0	Installation and commissioning	
12.1	Installation, commissioning and integration of the system at WRI shop and conduct of first off prove out trials	
13.0	Documentation	
13.1	Three sets of following documents (3 Hard copies) in English language should be supplied along with the machine.	
13.2	Machine Operation manuals: <ul style="list-style-type: none"> • Operating manuals of Machine & CNC system with machine specifications, detailed operating instructions for machine operation, setting of machine parameters, precautions, and machine safety details. 	

	<ul style="list-style-type: none"> • Programming Manuals of Machine & CNC system 	
13.3	Maintenance and trouble shooting manuals: <ul style="list-style-type: none"> • Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts, Hydraulic , Electrical circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also • Maintenance, Interface & commissioning manuals for CNC system & drives • Manufacturing drawings for all supplied holders, adapters, sleeves, fixtures etc if any. • Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable. • Detailed specification of all wear items and hydraulic / lube fittings • PLC program printouts with comments in English. • PLC program on CD, NC data & PLC data on CD • Complete back up of hard disk on CD and clear written Instructions to take back up and reloading of a new hard disk. • The vendor shall submit complete Master List of parts used in the machine. • One additional set of all the above documentation on CD • On line fault diagnostic system 	
14.0	Maintenance spares	
14.1	Spares for two years trouble free operation of the total system.	
15.0	Civil foundation	
15.1	Civil and foundation details for T-slot bed for gantry and base for mounting head stock and tailstock positioner to be supplied by the supplier.	
16.0	Power supply	
16.1	Input Power supply- 440V/ 50Hz	
16.2	All electronic controls that need stabilized supply shall be provided with suitable voltage stabilizer	
17.0	General Points	
17.1	Make and Model of the machine to be mentioned. Detailed catalogs of the machine to be sent with the offer.	
17.2	Complete description of all systems & sub-systems shall form part of the technical bid	
17.3	A schematic diagram showing the layout of the machine & associated systems with salient dimensions shall be submitted along with the offer.	
17.4	The operating sequence of the machine with broad outline of various operations involved should be	

	furnished with the offer.	
17.5	Standards for Design, Manufacture and testing of the machine shall be in accordance with internationally accepted standards.	
17.6	Total weight of the Machine & Sub-Systems. Weight of the heaviest part of the machine	
17.7	Total connected load KVA	
17.8	Painting of machine and Electrical panel: RAL6011 Apple green (Polyurethane paint)	
17.9	Floor area required (Length x width x height) for complete machine and accessories	