



BHARAT HEAVY ELECTRICALS LIMITED
TRANSFORMER PLANT, JHANSI-284120, INDIA

SPEC NO. - MT-6238, Rev.-01
ITEM NO. - MT-1/1/1558
LOCATION - BAY-00
QTY - 01 NO.

TECHNICAL SPECIFICATION CUM COMPLIANCE SHEET OF CNC PLASMA CUTTING MACHINE

SCOPE: Design, Manufacturing, Supply, Erection & Commissioning of CNC Plasma Cutting Machine

Note:

1. Vendor must submit complete information against clause No. 40 (Qualifying criteria) and the offers meeting this clause would only be processed.
2. The "Bidder offer" column and the "deviations/remarks" column (if applicable) of this format shall be filled in by the vendor and submitted along with the offer. Technical details also need to be submitted along with the offer. Inadequate / incomplete, or unsustainable information against any of the clauses of the specification / requirements shall be treated as non-compliance.
3. The offer and all the documents enclosed with the offer shall be in English only.

SPECIFICATION CUM COMPLIANCE CERTIFICATE OF CNC PLASMA CUTTING MACHINE

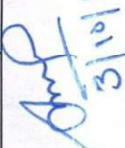
S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	BIDDER OFFER	DEVIATION / REMARK
1	Purpose: High current density CNC plasma cutting of aluminium alloy, stainless steel & mild steel in straight and profile cutting for various shapes.	Vendor to confirm		
2	SPECIFICATIONS: Basic Equipment:- Machine should be capable to mark and cut on Aluminium, SS & mild steel plates of specified thickness and size 3200 mm (width) x 10000 mm (length) without moving the plate. Machine shall be of gantry type construction, rigid enough to maintain plasma cutting of sheets at its maximum speed. Capacity of plasma cutting (Cut length) for both straight and profile cutting. 2.2.1 Cutting thickness capacity for aluminium: 3 mm to 60 mm, high quality dress & undulation free. 2.2.2 Cutting thickness capacity for SS: 3 mm to 60 mm, high quality dress & undulation free. 2.2.3 Cutting thickness capacity for MS: 3 mm to 60 mm, high quality dress & undulation free. 2.2.4 Production pierce: 50 mm 2.2.5 Max. pierce: 60 mm / to suit machine capacity for specified application. Plasma gasses (cutting gas) - Machine should be capable of performing cutting operation with Oxygen-O ₂ /Air / Nitrogen-N ₂ / H ₃₅ / H ₂ O as cutting gas for MS/SS/AL material / to suit machine capacity for specified application.	Vendor to confirm Vendor to confirm Vendor to confirm Vendor to confirm Vendor to confirm Vendor to confirm		
2.3	Shielding gas : Machine should be capable of performing cutting operation with Air / Oxygen-O ₂ / Nitrogen-N ₂ / H ₂ O (Water mist) / to suit machine capacity for specified application.	Vendor to confirm		
2.4	Kerf: 2-3mm upto 50 mm thick plate	Vendor to confirm		
3	Power Source Power source thyristor or IGBT Inverter or combined type with high quality plasma cutting & marking for full range of plate cutting from thinnest to highest thickness, performance for CNC control cutting to meet job requirements as per clause 2 of specification.	Vendor to confirm		
3.1	Power Source Make: ESAB/Kjellburg /Hypertherm/ Lincoln / Kempi	Vendor to specify		
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S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	BIDDER OFFER	DEVIATION / REMARK
3.3	Stepless control of current for plasma marking and cutting	Vendor to confirm		
3.4	Machine capacity (Current capacity) shall be up to 400Amp DC / to suit specified application.	Vendor to confirm		
3.5	Electrical efficiency: 0.85- 0.99	Vendor to confirm		
3.6	Power factor > 0.85 or better on 400 amps	Vendor to confirm		
3.7	Power consumption- 5 KW for CNC Machine / to suit machine capacity for specified application.	Vendor to specify		
3.8	Power consumption- 110 KW for plasma / to suit machine capacity for specified application.	Vendor to specify		
4	CUTTING TORCH:			
4.1	1 no. common cutting torch suitable for straight and profile cutting as per Clause -2.	Vendor to confirm		
4.2	Plasma cutting station & torch - 1 no. with 3 axis automatic plasma straight cutting and profile cutting of jobs.	Vendor to confirm		
4.3	Feature to mark jobs of all thicknesses to specified marking depth.	Vendor to confirm		
4.4	Operating Mode : Manual / Auto selectable	Vendor to confirm		
4.5	Torch suspension system for dry gas plasma cutting including arc height sensing control device to meet cutting parameters.	Vendor to confirm		
4.6	Arc height sensing & control system (for out of flatness plates) internal sensing & correction via programmable axis.	Vendor to confirm		
4.7	Torch anti-collision device is required and shall be of easily detachable breakaway unit which can be corrected easily after collision for both straight & profile cutting system.	Vendor to confirm		
4.8	One additional spare cutting torches with one set of spare soft seals for torch.	Vendor to confirm		
4.9	For one year consumable items each for cutting thickness upto 50 mm plate for Alluminium, MS & 25 mm SS, shall be quoted for the cutting torch as per cl. 4.2 to cover entire cutting & marking capability. Material to be cut in a year 50% aluminum , 10% SS & 40% MS and thier Thick range 3 mm to 20 mm is 50 % and 50% all other range of thickness considering 16 hrs cutting in a day.	Vendor to confirm and submit detail of consumable		
4.10	Pilot Arc ignition through a preferable "In-Built" solid state High Frequency ignition.	Vendor to confirm		
4.1	Life of all torch consumables like (nozzles, shield cap, electrodes, retaining cap, swirl ring etc.) for processing 50 mm thick Aluminium plates shall be min. 50 times piercing and 50 meter cut length.	Vendor to confirm		
5	TRACK /ENERGY FEEDING SYSTEM:			
5.1	Track length suitable to cut 10000 mm plates, including double sides synchronized longitudinal hardened rack & pinion drive/linear guides. Accurately machined Heavy duty rail tracks shall be used. Both the rails shall be perfectly aligned and parallel.	Vendor to confirm		
5.2	Heavy duty gantry construction with completely fabricated stucture to provide stable machine operation. Machine shall be suitable for high speed cutting of thin sheets and plates.	Vendor to confirm		
5.3	Highly durable robust rail , cross bar with rigid linear guiding system shall be used for both X and Y-axis, mounted firmly onto the thick fixing plates of the machine body.	Vendor to confirm		
5.4	Drag chain system for longitudinal energy feeding. It should be strong & flexible and properly supported along total length with sufficient no. of supports so that it can carry total weight of cables & hoses for long time at continuous duty without any breakage or damage of drag chain. Make Igus/Kabelshrupp.	Vendor to confirm		
5.5	Carriage with cable drag chain for transverse energy system for plasma cutting to cover full track width to meet job requirements as per clause 2.0 of specification. Heat resistant partition shall be provided to protect the transverse cabling and tubing from plasma heat.	Vendor to confirm		


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S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	BIDDER OFFER	DEVIATION / REMARK
5.6	X-axis rapid traverse rate shall be min. 12M/min.	Vendor to confirm		
5.7	X-axis feed rate (0-120%) of programmed speed.	Vendor to confirm		
5.8	Y-axis rapid traverse rate shall be min. 12M/min.	Vendor to confirm		
5.9	Y-axis feed rate (0-120%) of programmed speed.	Vendor to confirm		
5.10	Max. Positioning speed- 35000mm/min	Vendor to specify		
5.11	Traverse of X, Y and Z	Vendor to specify		
5.12	Gear box on drives shall be high precision zero backlash and suitable for thermal cutting machine. Wipers for X & Y axes guide ways to be provided	Vendor to confirm		
6	FED AND DRIVE SYSTEM:			
6.1	AC Servo Motors and Drives of suitable rating with necessary chokes and transformers including: i) Longitudinal double side drive. ii) Transverse drive & control	Vendor to confirm		
6.2	Make of all motors and drives : Siemens/ Fanuc/ Yaskawa / Bosch-Rexroth/ Panasonic/Baumuller. (Details of model, make, type etc. to be specified)	Vendor to specify		
6.3	The longitudinal travel of bridge on a precision track should be through servo drives on both sides of bridge having electronic synchronization control to avoid skewing of the machine.	Vendor to confirm		
7	CONTROL SYSTEM: latest model fully loaded CNC control system with all licensed and necessary softwares with programming facility for controlling all axes of Offered model Machine. The model , make and complete details with features to be mentioned along with the offer.	Vendor to confirm		
7.1	CNC Controller: Latest model, suitable for Plasma. And compatible with offered machine.	Vendor to confirm		
7.2	Controls on operator panel for torch station for straight / profile cutting.	Vendor to confirm		
7.3	Make: Latest model Burny-lincoln / Messer / Esab/Fanuc/Siemens/hypertherm.	Vendor to confirm		
7.4	All controls should have support for service & spares in India for a period of 10 years after supply of machine.	Vendor to confirm		
7.5	All software changes in cutting software should be supported free of cost for 10 years if there is any operating platform changes.	Vendor to confirm		
7.6	RS 232, Ethernet, suitable Nos USB ports for communication.	Vendor to confirm		
7.7	MANUAL CONTROL : Complete manual control of machine with required switches / keys should be provided on operator's panel for selection of required axis, axis direction, cutting feed, on/off, display of torch position etc. for manual operation without using CNC program or MDI mode. Diagram/ Sketches for switches/ keys provided on operators pendant to be specified	Vendor to confirm		
8	OPERATION AND CONTROL SYSTEM:			
8.1	OPERATOR'S PANEL:			
8.1.1	Fixed/Swivelling type operator's panel having latest model complete CNC and machine control system with large size TFT/LCD of required configuration shall be provided on the operators platform. All displays/indications should also be conveniently placed accordingly. Layout showing complete details of the panel should be provided.	Vendor to confirm		
8.1.2	Operator control panel should display all control features, other necessary features and shall have all push buttons, signal lamps, gauges, knobs etc. for easy & comfortable operation.	Vendor to confirm		
8.1.3	All details of operator panel to be provided.	Vendor to confirm		
9	Machine Accuracy			
9.1	X & Y positioning accuracy: ± 0.5 mm/10M length or better	Vendor to confirm		

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S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	BIDDER OFFER	DEVIATION / REMARK
9.3	Repeatability: +0.2 mm/10M length or better	Vendor to confirm		
9.4	Shape Accuracy / Diagonal Accuracy: ±1.5 mm in 10M x 4M cutting or better.	Vendor to confirm		
10	SOFTWARE PACKAGE:			
10.1	PC based Software package compatible to 64 bit for generation of nesting plans for plasma cutting.	Vendor to confirm		
10.2	The PC with software package will be located at remote place away from the machine	Vendor to confirm		
10.3	Adjustable technology database which takes care of all necessary parameters during nesting automatically based upon the material, plate thickness and cutting process	Vendor to confirm		
10.4	Definition and nesting of remnant plate geometries	Vendor to confirm		
10.5	Optimum plate usage	Vendor to confirm		
10.6	Compatibility to a wide range of cutting machines	Vendor to confirm		
10.7	Easy and intuitive operation as many of CAD drawing functions	Vendor to confirm		
10.8	Interfaces DXF, DWG, DWF, IGES	Vendor to confirm		
10.9	General Functions	Vendor to confirm		
10.10	Reading in and creation of part drawings	Vendor to confirm		
10.11	Manual nesting	Vendor to confirm		
10.12	Saving and loading of the nesting plans created	Vendor to confirm		
10.13	NC code generation	Vendor to confirm		
10.14	Printing of nested plans and parts	Vendor to confirm		
10.15	Technology database	Vendor to confirm		
10.16	Zoom, object snap and drawing functions	Vendor to confirm		
10.17	Preview of all parts in an optical parts list	Vendor to confirm		
10.18	Display and nesting of several nesting plans in one layer	Vendor to confirm		
10.19	Profiles to support a variety of individual configurations	Vendor to confirm		
10.20	Nesting Functions	Vendor to confirm		
10.21	Form and nest groups	Vendor to confirm		
10.22	Automatic check of gaps between parts	Vendor to confirm		
10.23	Nesting in rows	Vendor to confirm		
10.24	Part matrices	Vendor to confirm		
10.25	Move, Rotate, Copy, Mirror	Vendor to confirm		
10.26	Common cuts	Vendor to confirm		
10.27	Configurable process database	Vendor to confirm		
10.28	Gap between parts, lead length and position configurable according to process	Vendor to confirm		
10.29	Allocation of the process data for different machines	Vendor to confirm		
10.30	Pre-selection of the machine, thickness and type of material	Vendor to confirm		
10.31	Automatically placed lead-ins and run-outs	Vendor to confirm		
10.32	Lead length and type can be changed manually	Vendor to confirm		
10.33	Output format for the NC machine code configurable	Vendor to confirm		
10.34	Coordinate origin freely selectable	Vendor to confirm		
10.35	Autonest Program for automatic nesting	Vendor to confirm		

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S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	BIDDER OFFER	DEVIATION / REMARK
10.36	Selection of several strategies	Vendor to confirm		
10.37	Parts library with graphic representation.	Vendor to confirm		
10.38	Simple administration of the part	Vendor to confirm		
10.39	Saving of parts	Vendor to confirm		
10.40	Easy assembly of the parts for nesting using search criteria	Vendor to confirm		
10.41	Sorting parts lists by groups, for example by material and thickness	Vendor to confirm		
10.42	Creation of customer specific parts libraries	Vendor to confirm		
10.43	Plan Library	Vendor to confirm		
10.44	Administration of plans	Vendor to confirm		
10.45	Storage of plans	Vendor to confirm		
10.46	Plate Library	Vendor to confirm		
10.47	Administration of plates	Vendor to confirm		
10.48	Selection of plates for nesting	Vendor to confirm		
10.49	Saving of remnant plates created	Vendor to confirm		
10.50	Sorting of plates lists	Vendor to confirm		
10.51	Creation of customer specific plates libraries	Vendor to confirm		
10.52	Automatic generation of corner loops, lead-in windows, lead-in & lead-outs	Vendor to confirm		
10.53	Suitable post-processor for CNC controller supplied	Vendor to confirm		
10.54	Work order management, i.e. status of job cut wrt plate loaded, already produced, qty. left, may be automatically loading in the new nesting etc.	Vendor to confirm		
10.55	Desktop PC to be provided by Vendor	Vendor to confirm		
10.56	Make: HP/dell/ advantech/ latest versions	Vendor to confirm		
10.57	Latest operating version of Windows 64 Bit	Vendor to confirm		
10.58	Microsoft Internet Explorer latest version	Vendor to confirm		
10.59	Microsoft .NET Framework, latest Version	Vendor to confirm		
10.60	TFT 24", Hi resolution screen; min. Processor core i7 or better, 6 USB-Ports, 8 GB RAM, min.1GB HD with keyboard and mouse.	Vendor to confirm		
10.61	DNC NETWORKING: Make Cisco / Cimco Software for transfer of CNC part programmes from programming station computer to the machine via wireless communication. Suitable Hardware like Transmitter, Receiver, connecting cable, adapters should also be provided by the vendor.	Vendor to confirm		
10.62	Vendor to take full responsibility of commission the DNC Networking system between machine & PC supplied	Vendor to confirm		
11	FAULT DIAGNOSTIC SYSTEM : Supplier's own diagnostic system with required Software and Hardware installed on the CNC system, which shows detailed cause and remedy for the fault on the CNC system display with full diagnostics indicating the element / device causing the fault. Online error indication	Vendor to confirm		
12	Gas Control			
12.1	Automatic Gas control system to control flow & pressure of various gases suitable for the plasma.	Vendor to confirm		
12.2	Display of gas parameters, like pressure, ratio etc.	Vendor to confirm		

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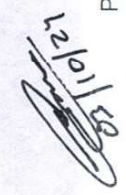
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13	Hoses and Cables: All hoses & cable assemblies required for Plasma cutting system should be of high quality, robust & resistant to heat, oil and suitable for tropical environment. Hoses shall be of OEM make or of manufacturers of repute like Parker/Gates. All fittings for the flow of all required gases from gas cylinders to gas console shall be supplied by vendor.	Vendor to confirm		
14	Suitable cooling arrangement for plasma torch shall be provided to ensure continuous cutting operation through out the shift.	Vendor to confirm		
15	Integrated compressor system with dryer for all needs of air plasma cutting. The manufacturer of compressor-drier shall be of Elgi/Ingersol Rand/Atlas Copco/Anest Iwata make.	Vendor to confirm		
16	Table: Dry cutting tables with easily replaceable plate support for gas plasma cutting with fume extraction system.	Vendor to confirm		
17	Removable trays for disposal of slag for entire cutting table of the machine.	Vendor to confirm		
18	Fume extraction system for plasma cutting to cover full cutting bed of size 3200mm x 10000mm. Cutting Table shall be modular fume extraction table with Mech / Pneumatic controls and with section modules. Efficiency of filter unit shall be as per latest Indian norms. Filter unit shall be vertically mounted. Sound level less than 80 dB (A) noise level. Single filter unit shall be with in-built fan, digital parameter display. It shall have self cleaning mechanism of cartridges filters and safe dust collection. GI ducting line up to filter minimum 20 meters shall be provided by vendor to extract fume.	Vendor to confirm		
19	Lubrication system if any shall be provided.	Vendor to confirm		
20	AIR CONDITIONERS:			
20.1	Independent air conditioners with dehumidifiers of suitable & sufficient capacity to be provided for each Electrical / Electronic Panels / Cabinets including Operator's Panel considering specified ambient conditions.	Vendor to confirm		
20.2	Air conditioner must be of refrigerant type. (Refer ambient conditions as per clause no. 3.5 of specification)	Vendor to confirm		
21	UPS FOR CNC SYSTEM:			
21.1	2 KVA or better suitable Online UPS unit for CNC System with 30 minute minimum backup time, automatic shutdown feature for Windows operating system.	Vendor to confirm		
22	MACHINE LIGHTS:			
22.1	Machine Lights for sufficient illumination at operator's panel should be provided for clear visibility.	Vendor to confirm		
22.2	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents	Vendor to confirm		
23	ULTRA ISOLATION TRANSFORMER			
23.1	Ultra Isolation Transformer (NEEL or reputed Indian make) suitable for complete machine including plasma source, for unbalanced load & supply conditions considering specified power supply & ambient conditions.	Vendor to confirm		
23.2	Make, Model, Rating & Input/output Voltage etc.	Vendor to specify and		
23.3	Monitoring device with cut-off facility for under/over output voltage, Devices for load current measurement, MCCB at input for overload/short circuit protection. (Details to be specified)	Vendor to confirm		
24	CONSTRUCTION:			
24.1	General arrangement drawing, technical literature with photographs, drawings explaining the technical features should be enclosed with the offer	Vendor to submit		
25	ELECTRICAL SYSTEM :			

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25.1	415V, 50HZ, 3 Phase AC (3 wire system with out neutral) Power Supply Source will be provided by BHEL at a single point near the machine, as per layout recommended by Vendor. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine/control cabinets, shall be the responsibility of vendor. Requirement of grounding/earthing with required material details is to be specified by vendor well in advance so that same could be incorporated during construction of foundation.	Vendor to confirm		
25.2	Tropicalisation: All electrical / electronic equipment shall be tropicalized	Vendor to confirm		
25.3	All electrical & electronic control cabinets & panels should be dust and vermin proof	Vendor to confirm		
25.4	All electrical components in the cabinets should be mounted on DIN Rail	Vendor to confirm		
25.5	All electrical / electronic panels to be provided with adequate door locks. All electrical and electronic panels including operator's panel should be provided with fluorescent lamps for sufficient illumination and power receptacles of 220Volts. 5/15 Amp AC. All adapters/receptacles should have compatibility with Indian equivalents.	Vendor to confirm		
25.6	Motors shall conform to IEC or Indian Standards	Vendor to confirm		
25.7	All cables moving with traversing axes should be installed in Caterpillar/ Drag chain. Additionally, all the cable trays required for laying of cables should be included in the offer.	Vendor to confirm		
25.8	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to confirm		
26	SAFETY ARRANGEMENTS Following safety features in addition to other standard safety features should be provided on the machine: Machine shall have adequate and reliable safety interlocks / devices to avoid damage to the machine, work piece and the operator due to the malfunctioning or mistakes. Machine functions should be continuously monitored and alarm / warning indications should be generated. 3 stage Limit safety available on X and Y axis Geometric Soft Limits, Electrical Limit & Mechanical Limits via suitable methods. Andon light with alarm which will give beep signal when the machine is moving in rapid.	Vendor to confirm		
26.1	All the pipes, cables etc. on the machine should be well supported and protected. These should not create any hindrance to machine operator's movement for effective use of machine and for maintenance personnel.	Vendor to confirm		
26.2	Emergency Switches at suitable locations as per International Norms should be provided.	Vendor to confirm		
26.3	ENVIRONMENTAL PERFORMANCE The machine should conform to following factors related to environment :	Vendor to confirm		
26.4	Supplier to specify the sound level during plasma cutting of various thicknesses.	Vendor to confirm		
27	No hazardous chemicals shall be required to be used in the machine.	Vendor to confirm		
27.1	If any safety / environmental protection enclosure is required, it shall be built-in by the vendor. Shall be quoted as optional.	Vendor to confirm		
27.2	Paint of the machine should be oil resistant & should not get peeled off.	Vendor to confirm		
27.3	LEVELLING & ANCHORING SYSTEM Complete set of anchoring materials including foundation bolts, nuts, washers, fixators, levelling shoes etc for alignment of tracks, levelling of tracks & transverse carriage, torch suspension system shall be arranged by the vendor to for machine erection.	Vendor to confirm		
27.4	TOOLS FOR ERECTION, OPERATION & MAINTENANCE	Vendor to confirm		
28		Vendor to confirm		
28.1		Vendor to confirm		
29		Vendor to confirm		

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S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	BIDDER OFFER	DEVIATION / REMARK
29.1	Tools and Equipments required for erection of the machine shall be brought by the vendor. Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc. for operation and maintenance of the machine shall be supplied by the vendor. List of such tools & machine equipments to be specified.	Vendor to confirm		
29.2	Set of Test instruments for alignment of track, carriage, checking levelling of cutting table to be brought by vendor. List of instruments to be specified.	Vendor to confirm		
30	SPARES: Optional -List of Itemised breakup of following mechanical, electrical, electronic and plasma source/torch spares used on the machine along with documentation. Unit Price of each item should be offered.	Vendor to confirm		
30.1	Mechanical Spares :	Vendor to specify		
30.1.1	All types of Valves, all types of pressure switches / transducers, all types of filters, all types of seals	Vendor to specify		
30.1.2	Gears & Pinions.	Vendor to specify		
30.1.3	Solenoid valves	Vendor to specify		
30.1.4	Bearings used.	Vendor to specify		
30.1.5	Gas regulators and hoses	Vendor to specify		
30.2	Electrical/Electronic/Plasma Spares	Vendor to specify		
30.2.1	Relays (each type)	Vendor to specify		
30.2.2	Contactors (each type)	Vendor to specify		
30.2.3	Proximity Switches (each type).	Vendor to specify		
30.2.4	Push Buttons (each type)	Vendor to specify		
30.2.5	Indicating Lamps (each type)	Vendor to specify		
30.2.6	Semiconductor Fuses (each type)	Vendor to specify		
30.2.7	Special Fuses (each type)	Vendor to specify		
30.2.8	Circuit Breakers (each type)	Vendor to specify		
30.2.9	Main Power Switch (each type)	Vendor to specify		
30.2.10	Encoders (each type) if used.	Vendor to specify		
30.2.11	Scanning Heads for Linear Scales (each type)if used	Vendor to specify		
30.2.12	Software 's back up on CD/hard disc (if used).	Vendor to specify		
30.2.13	Main CPU Board .	Vendor to specify		
30.2.14	Complete drive unit.	Vendor to specify		
30.2.15	Ext. PLC CPU, Power supply & I/O unit 1 no. (If used)	Vendor to specify		
30.2.16	Complete plasma arc height sensing system .	Vendor to specify		
30.2.17	Anti collision device.	Vendor to specify		
30.2.18	All PCB's of Plasma Power source unit .	Vendor to specify		
30.2.19	Power elements of plasma power source .	Vendor to specify		
30.2.20	Power lead of plasma torch.	Vendor to specify		
30.2.21	Operator's panel with Display Unit(If used)	Vendor to specify		
30.2.22	I/O Cards for PLC (each type)	Vendor to specify		
30.2.23	One each of the following items : CNC /PLC Power Supply, Control Panel, Any other auxiliary drive , if used, Complete Proportional Valve Controller, if used.	Vendor to specify		

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S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	BIDDER OFFER	DEVIATION / REMARK
30.2.24	Complete CNC system - I no.	Vendor to specify		
30.2.25	Axis Servo motor-I no. of each type.	Vendor to specify		
30.2.26	Spare hard disc of same capacity as used in the machine, loaded with system and OEM software.	Vendor to specify		
30.3	All types of spares for total machine and accessories should be available for at least ten years after supply of the machine. If machine or control is likely to become obsolete in this period, the vendor should specify BHEL sufficiently in advance and provide spares.	Vendor to confirm		
30.4	Complete list of spares for machine and accessories, with proper identification No./Code. Complete list of all Bought out items along with specification /Type, rating, model, make & address of supplier. Details technical leaflets, literature for all bought out item, accessories etc. of the supplier. All the details given on the drawing and manual should be in English. Addresses of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to confirm		
31	DOCUMENTATION :	vendor to confirm		
31.1	Four sets of following documents (Hard copies) in English language should be supplied along with the machine:-	vendor to confirm		
31.2	O & M manuals of Machine & CNC system	vendor to confirm		
31.3	Detailed Programming Manuals of Machine & CNC system	vendor to confirm		
31.4	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / as commissioned circuit diagrams. All mechanical Assembly/ Sub Assembly Drawings shall be supplied with the part list also in English.	vendor to confirm		
31.5	Offered CNC system detailed manual.	vendor to confirm		
31.6	Maintenance, interface & commissioning manuals for CNC system, feed drives.	vendor to confirm		
31.7	Electrical schematic wiring diagram junction Box details, connector pin details cable layout.	vendor to confirm		
31.8	O & M manual of plasma power source.	vendor to confirm		
31.9	Wiring diagram, Circuit diagram, Component layout of plasma Source.	vendor to confirm		
31.10	Interface description of Plasma Source with main machine.	vendor to confirm		
31.11	Alarm list & diagnostic manual of plasma unit.	vendor to confirm		
31.12	Operating Manuals, Maintenance Manuals & Catalogues for all items and supplied Accessories.	vendor to confirm		
31.13	Manual of all bought-out items, Spare parts list and complete addresses of bought-out items supplier.	vendor to confirm		
31.14	Catalogues, Operation & Maintenance Manuals of all bought out items including drawings, wherever applicable.	vendor to confirm		
31.15	Details of operator's Panels.	vendor to confirm		
31.16	PLC program print-outs (hard copy) with comments in English including PLC program for any other auxiliary system if used.	vendor to confirm		
31.17	PLC program, NC data & PLC data & backup in soft copy.	vendor to confirm		
31.18	Operating system & PLC back up in soft copy.	vendor to confirm		
31.19	Complete back-up, fully loaded, ready to use hard disk to be provided.	vendor to confirm		
31.20	Complete list of parts/items(Bill of materials) used in the machine in English language.	vendor to confirm		
31.21	One additional set of all the above documentation in soft copy, wherever possible.	vendor to confirm		
31.22	Online free access to complete PLC logic, CNC should be provided to BHEL for troubleshooting and maintenance purposes.	vendor to confirm		
32	FOUNDATION:			

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S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify vendor to confirm	BIDDER OFFER	DEVIATION / REMARK
32.1	Vendor shall submit the layout drawing with Complete Foundation Design including details of reinforcement for getting BHEL's approval within one month from the date of P.O. The layout should consist of all requirements pertaining to complete machine including space requirement for Voltage Stabilizer, Isolation Transformer (if any), Air compressor (if any), & any other accessories. BHEL shall construct complete foundation for the machine under supervision of supplier and at supplier's responsibility. Vendor should arrange equipments required for the testing of foundation, if required by the vendor. The vendor shall also indicate detailed specifications of grouting compound and Grouting procedure etc. for foundation bolts of the machine.			
32.2	All Foundation bolts, templates, anchoring and fastening items required for machine assemblies and accessories shall be in vendors scope.	vendor to confirm		
33	ERECTION & COMMISSIONING			
33.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine, it's control system & all types of other supplied equipments/accessories etc. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier in their foundation/layout drawings. Crane shall also be provided by BHEL. Details of these requirements should be specified by vendor in advance.	vendor to confirm		
33.2	Erection & Commissioning of track, Gantry, Drag chain, carriage, Power source, cable /hose assemblies, gas manifolds, UPS / Voltage stabilizer, Isolation Transformer with all mechanical /electrical connections shall be responsibility of vendor.	vendor to confirm		
33.3	Successful proving of BHEL components by the supplier shall be considered as part of commissioning for the machine. All tests, as mentioned at Sl. No. 36 (Machine Acceptance) and testing/demonstration of tele-diagnostic service etc. shall also be part of erection /commissioning.	vendor to confirm		
33.4	Tools, Tackles, instruments and other necessary equipment/ tools required to carry out all erection & commissioning activities should be arranged and brought by the supplier.	vendor to confirm		
33.5	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	vendor to confirm		
33.6	Duration for E&C after call of commissioning from BHEL - 2 Months Max.	Vendor to confirm		
33.7	Schedule of Erection and Commissioning shall be specified.	vendor to confirm		
33.8	Terms & conditions for Erection & Commissioning should be furnished in detail separately by vendor along with specify.	vendor to confirm		
33.9	Portion, if any, of the machine, accessories/attachments and other supplied items where paint got rubbed or peeled off during transit or erection should be repainted and matched with the original adjoining paint by the vendor.	vendor to confirm		
34	TRAINING			
34.1	BHEL Persons shall be trained at supplier's works during predispatch inspection in the area of (a) CNC Part Programming/ Technology, Use of all CNC Features, Programming for Measuring Systems & supplied accessories etc. (b) Electrical, Electronic & CNC maintenance for machine & other supplied equipments. (c) Mechanical & Hydraulic maintenance of the machine & other supplied equipments (d) Operation of the machine & other supplied equipments. (e) for advanced features and specialised training if so required by BHEL.	vendor to confirm		

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S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify vendor to confirm	BIDDER OFFER	DEVIATION / REMARK
34.2	Training of BHEL machine operators in operation of complete machine & accessories etc by the supplier's experts / engineers during their stay at BHEL works.	vendor to confirm		
34.3	In-depth Programming and maintenance Training on supplied CNC System should be given to Electronics maintenance at the Authorized training center of OEM of offered CNC Controller in india. Training cost (min 5 mandays) should be under scope of Vendor. Lodging boarding travel shall be arranged by BHEL.	vendor to confirm		
34.4	Two weeks supervision of independent operation of machine by BHEL after job prove out.	vendor to confirm		
34.5	Competent, English speaking experts shall be arranged by the vendor for satisfactory & effective training of BHEL personnel.	vendor to confirm		
35	AMBIENT CONDITIONS & THERMAL STABILITY			
35.1	Total machine including all supplied items should work trouble free and should give specified accuracies under existing power supply and ambient operating conditions, as mentioned below.	vendor to confirm		
35.2	Power Supply (AC): Voltage = 415V +10% / -10% of fluctuations , Frequency= 50Hz ±3%, No. of phases = 3 phase with neutral.	vendor to confirm		
35.3	Ambient Operating Conditions: Temperature = 5 to 50 degree Celsius with maximum temperature variation of 25 °c, Relative Humidity = 95% max.	vendor to confirm		
35.4	The machine should be suitable for continuous operation to its full capacity for 24 hours a day and 7 days a week throughout year. Vendor to ensure and confirm the same.	vendor to confirm		
36	MACHINE ACCEPTANCE (Tests/Activities to be performed & demonstrated by Vendor)	vendor to confirm		
36.1	Tests/Activities to be carried out at vendor's works on the machine before dispatch at the present of BHEL representatives:			
36.1.1	Demonstration of specified Geometrical accuracies as specified in clause 9 and as per test chart/standard and specified values.	vendor to confirm		
36.1.2	Demonstration of all features of the machine, control system & accessories	vendor to confirm		
36.1.3	60 mm thick Aluminum, MS and SS plate quality cut (Straight , circular and contour) as per CNC programmes to demonstrate cutting capacity of machine.	vendor to confirm		
36.2	Tests/Activities to be carried out at BHEL works while commissioning the machine :			
36.2.1	Demonstration of specified Geometrical accuracies in clause 9 and as per test charts/standards and specified values. Vendor to submit the test charts/standards.	vendor to confirm		
36.2.2	Demonstration of cutting of 60 mm thick plates at largest width to demonstrate the maximum cutting capacity of the machine as per cl. No. 2.2	vendor to confirm		
36.2.3	The machine shall be tested for continuous running of 24 hrs. If any break down occurs during this test, the test should be repeated for 24 hrs from that time.	vendor to confirm		
36.2.4	Demonstration of all features of the machine, control system & accessories to the satisfaction of BHEL for efficient and effective use of the machine.	vendor to confirm		
36.2.5	Demonstration by actual use of all supplied accessories to their full capacity for required applications.	vendor to confirm		

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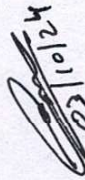
S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify vendor to confirm	BIDDER OFFER	DEVIATION / REMARK
36.2.6	PROVEOUT: Successful cutting of 6 sheets for components by vendor as per BHEL requirements & drawings through AUTO CAD/ AUTO NESTING /Programming to the specified cutting capability & quality of cut (as per job requirement vide clause no. 2.0 of specification) at BHEL works, using software Package / Tools etc. supplied by Vendor.	vendor to confirm		
37	PACKING: Sea worthy & rigid packing for all items of complete machine, CNC System, all Accessories and other supplied items to avoid any damage/loss in transit. When machine is dispatched in containers, all small loose items shall be suitably packed in boxes.	vendor to confirm		
38	GUARANTEE: Guarantee for complete machine and all supplied accessories/attachments/ equipments/items for 24 months from the date of acceptance of the machine. Including free replacement of defective items and services.	vendor to confirm		
39	GENERAL			
39.1	Machine Model No.	Vendor to specify		
39.2	Total connected load (KVA)	Vendor to specify		
39.3	Total Space required (Length, Width, Height) for complete machine, accessories/ attachments and other supplied items like Voltage Stabilizer, Isolation Transformer.	Vendor to specify		
39.4	Painting of Machine / Electrical Panels : Machine RAL 6011 Apple Green , panels off white. (Polyurethane Paint)	vendor to confirm		
39.5	Total weight of the machine	Vendor to specify		
39.6	Weight of heaviest part of machine	Vendor to specify		
39.7	Weight of the heaviest assembly of the Machine	Vendor to specify		
39.8	Dimensions of largest part of the machine	Vendor to specify		
39.9	Supply period: Max. 6 months from the PO date.	Vendor to confirm		
39.10	Vendor to specify reference list of customers where similar machines have been supplied mentioning broad specifications of the supplied machine i.e. Model, CNC System, capacity etc.	Vendor to specify		
39.11	Detailed catalogues, sketches/drawings/photographs pertaining to the specified machines and accessories /attachments /items should be specified	Vendor to specify		
39.12	All Cables and Hoses etc. should be well supported & protected in trays/brackets/drag chains etc. All designed & operating parameters for plasma power source, compressor, chiller unit etc. should be provided.	vendor to confirm.		
40	QUALIFYING CRITERIA			
40.1	Only OEM or OEM authorized dealer, who have supplied at least one number Gantry type CNC Plasma Cutting Machine of capacity 400 Amp. or more in the past 7 years from the date of tender opening should quote. If the bidder is OEM-authorized dealer, then bidder to submit valid authorization certificate from OEM & Letter from OEM for technical support for this tender. The following information is also to be submitted by all the bidders for qualification of their offer (BHEL may verify the supply and satisfactory performance / submitted credentials).	Vendor to Confirm		

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S. NO.	DESCRIPTION OF BHEL REQUIREMENT	Vendor to confirm/specify	BIDDER OFFER	DEVIATION / REMARK
40.2	Purchase order copy (Unpriced) along with proof of supply (Tax Invoice / GEM CRAC etc.) and proof of commissioning (commissioning certificate / commissioning MOM etc.) of minimum one number Gantry type CNC Plasma Cutting Machine of capacity 400 Amp. or more during last 7 years from the date of this enquiry. If the bidder is OEM-authorized dealer, purchase order in the name of principal is also accepted.	Vendor to Submit		
40.3	Satisfactory Performance report from the customer for at least one year from date of commissioning of the same Gantry type CNC Plasma Cutting Machine or self declaration regarding satisfactory working of supplied Gantry type CNC Plasma Cutting Machine of capacity 400 Amp. or more for last one year from date of enquiry.	Vendor to Submit		
40.4	Name of the customer/company	Vendor to Submit		
40.5	Complete postal address of the customer.	Vendor to Submit		
40.6	Date of supply	Vendor to Submit		
40.7	Date of commissioning.	Vendor to Submit		
40.8	Name and designation of the contact person of the customer.	Vendor to Submit		
40.9	Phone number & email address of the customer's contact person.	Vendor to Submit		
41	BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.	Vendor to Confirm		


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Satish Soni
Sr. Manager / WEX electronics


31/07/24

Suresh Kumar Yadav
Sr. Engineer / FBM


31/07/24

Ashis Kumar Mondal
Engineer / WEX