

REQUEST FOR QUOTATION



BHARAT HEAVY ELECTRICALS LIMITED
Electronics Division
PB No. 2606, Mysore Road Bangalore - 560026
INDIA

RFQ NUMBER:
KMVM900362

RFQ DATE :
03.OCT.2009

Due Date
11.NOV.2009
Time: 13:00 HRS

VENUE :
NEW ENGG. BLDG

MMI:PU:RF:003

(for all correspondence)

Purchase Executive : RITESH C
Phone : 080-26998886
Fax : 00918026989217
E-mail: ritesh@bheledn.co.in

Please submit your lowest quotation subject to our terms and conditions attached for the material mentioned below. The quotation must be enclosed in a sealed envelope / Fax superscribed with RFQ no.and due date, should reach us on or before the due date by **13.00** hours IST and will be opened on the same day at **13.30** hours at the venue mentioned above. **PLEASE DROP THE OFFER IN THE BOX PROVIDED AT RECEPTION.**

SPECIAL TERMS AND CONDITIONS:

1. TENDER/OFFER MUST BE SUBMITTED IN TWO PARTS: (1).TECHNO- COMMERCIAL BID (2).PRICE BID.
2. QUOTATIONS MAY BE SUBMITTED BY ORIGINAL EQUIPMENT MANUFACTURER'S (OEM'S) OR THEIR AUTHORISED DEALERS.
3. VENDOR HAS TO CONFORM TO THE CLAUSES IN THE PURCHASE SPECIFICATIONS (EDN/CEFAB/VMC/01 Rev 0). DEVIATIONS, IF ANY, TO BE BROUGHT OUT CLEARLY IN THE TECHNICAL BID.
4. VENDOR IS ADVISED TO GO THROUGH THE GENERAL TERMS AND CONDITIONS, DOCUMENT CPD-20000 ENCLOSED WITH THIS RFQ.
5. VENDOR HAS TO CONFORM TO ALL THE CLAUSES LISTED IN THE COMMERCIAL TERMS (ANNEXURE A/B). DEVIATIONS, IF ANY, TO BE HIGHLIGHTED AND BROUGHT OUT CLEARLY IN THE TECHNICAL BID.
6. DELIVERY REQUIRED: 24 WEEKS FROM THE DATE OF PO.
7. TERMS OF PAYMENT: 80% BY SIGHT DRAFT / WITH 30 DAYS CREDIT AFTER RECEIPT OF MATERIAL, 10% AFTER INSTALLATION & COMMISSIONING AND 10% AGAINST SUBMISSION OF PERFORMANCE BANK GUARANTEE(PBG) OR AFTER WARRANTY PERIOD.
8. QUOTATION SHOULD BE VALID FOR 90 DAYS FROM DUE DATE.
9. BHEL RESERVES THE RIGHT TO RESORT TO REVERSE AUCTION BEFORE THE PRICE BID OPENING.

Sl No.	Description	Qty	Unit	Delivery qty	Delivery Date
1	Vertical Machining Center as per EDN/CEFAB/VMC/01 Rev 00	1	NO	1	30.JUN.2010

Total Number of Items - 1

Please note that the tender will be opened in the presence of the bidders or his authorised representatives (maximum two per organisation) who choose to be present with authorisation letters. Refer annexure for the terms and conditions.
Preference will be given to vendors who accepts our standard payment terms i.e.100% payment - 30 days after receipt of material at our works subject to acceptance.
Please specify Terms of delivery, Excise duty, sales tax, Ex-BHEL, Ex-works surcharge, Insurance,P&F, Freight and other taxes very clearly .

- i). This is only RFQ not an order.
- ii). In all correspondence quote RFQ No. & due date.
- iii). In Quotation BHEL material code / RFQ Sl. No. should be mentioned clearly.
- iv). Quotation Envelope / Fax not superscribed with RFQ No.and due date is liable for rejection.
- v). Quotation should remain valid for a minimum period of 90 days from due date.
- vi). In case of non-receipt of Quotation or regret letter for 3 consecutive RFQs you are liable to be removed from our vendors list.
- vii). All Prices should be written in words and numbers.
- viii). Excise Chapter Heading should be mentioned for all items where VAT is applicable .

For and On behalf of BHEL.



BHARAT HEAVY ELECTRICAL LIMITED,
ELECTRONICS DIVISION,
MYSORE ROAD, BANGALORE 560026

Purchase Specification No.
EDN/CEFAB/VMC/01 Rev 0

SPECIFICATION CUM COMPLIANCE CERTIFICATION

FOR

VERTICAL MACHINING CENTER

NOTE:-

1. Vendor must submit complete information against clause no. 25.0 The offer meeting this clause would only be processed.
2. The "Offered" Column and where applicable, the "Deviations" & "Remarks" Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.
3. The offer and all documents enclosed with offer should be in English language only.

SCOPE: SUPPLY, ERECTION & COMMISSIONING OF CNC VERTICAL MACHINING CENTER AS SPECIFIED BELOW					
SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
1.0	PURPOSE & WORKPIECE MATERIAL				
1.1	Purpose: (Operation/Jobs involved) Milling, Drilling and Tapping of Aluminum Heat Sinks, Copper Bus bars & Steel	Vendor to confirm			
1.2	Work Piece Material : Copper, Aluminum, Steel	Vendor to confirm			
2.0	MACHINE SPECIFICATION				
2.1	MACHINE CONFIGURATION : Vertical Machining Centre with ATC , Rotary Table and rigid tapping	Vendor to confirm			
2.2	TABLE :				
2.2.1	Size of Clamping Surface / Table (L X B) 800 mm x 450 mm (Minimum values)	Vendor to confirm			
2.2.2	Max. Weight of Work-piece 50 Kg (Excluding Weight of Fixtures)	Vendor to confirm			
2.2.3	Weight of Rotary Table (Clause 11.9)	Vendor to specify			
2.2.4	Table Clamping Mechanism (Hydraulic clamps)	Vendor to confirm			
2.2.5	Clamping Force	Vendor to specify			
2.2.6	Details of T-Slots: No / Size / Pitch	Vendor to specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
2.2.7	Tapped Holes: Size / Pitch	Vendor to specify			
2.2.8	Max Load on Table	Vendor to specify			
2.2.9	Central Slot tolerance	Vendor to specify			
2.2.10	Lateral Slot size and tolerance	Vendor to specify			
2.2.11	Table top and central slot should be accurately machined and it shall be used as reference surfaces.	Vendor to confirm			
2.2.12	4 Hydraulic clamping points on the table to hold jobs & 2 Hydraulic clamping points on the rotary table. (List of jobs available in annexure 1)	Vendor to confirm			
2.2.13	False plate on Table (Z axis values are after considering the increased table height)	Vendor to confirm			
2.3	SPINDLE:				
2.3.1	Integral Spindle / Rigidly coupled spindle (Belt / Gear Drives are not acceptable)	Vendor to confirm			
2.3.2	Spindle Diameter	Vendor to specify			
2.3.3	Spindle Motor Power (AC Continuous Duty S1)	7.5 KW (Minimum)			
2.3.4	Spindle Motor Make, Model etc.(Should comply with IEC / IS specifications)	Fanuc / Siemens AC Servo motor			
2.3.5	Spindle Bearing Diameters (Radial & Axial)	Vendor to specify			
2.3.6	Spindle bearing details	Vendor to specify			
2.3.7	Taper in Spindle	BT 40			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
2.3.8	Spindle speed (Continuously Variable)	Min - Max. Speed			
2.3.9	Maximum Spindle Speed	• 10000 RPM			
2.3.10	Detail of speed ranges (Selectable through program)	Vendor to specify			
2.3.11	Range of spindle speed at constant power.	Vendor to specify			
2.3.12	Max Spindle Torque	Vendor to specify			
2.3.13	RPM at which max. permissible torque is available	Vendor to specify			
2.3.14	Torque/Power/Speed diagram of spindle motor is to be submitted with the offer.	Vendor to specify			
2.3.15	Spindle Orientation	Programmable			
2.3.16	Vendor to provide details of spindle cooling along with technical offer	Required			
2.3.17	Distance from Spindle Face to Pallet / Table Top for VMC	Vendor to specify			
	(a)Min:	Vendor to specify			
	(b)Max:	Vendor to specify			
2.3.18	Distance from Spindle Center Line to Pallet / Table Center for VMC	Vendor to specify			
	(a)Min:	Vendor to specify			
	(b)Max:	Vendor to specify			
2.4	TRAVERSES:				
2.4.1	Longitudinal Travel (X-Axis)	600 mm (Minimum)			
2.4.2	Spindle Head Vertical Travel (Z Axis)	450 mm (Minimum)			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
2.4.3	Cross Travel (Y-Axis)	500 mm (Minimum)			
2.5	FEEDS AND DRIVE SYSTEM:				
2.5.1	Rapid Traverse X-Axis	• 24 m / min			
2.5.2	Rapid Traverse Y-Axis	• 24 m / min			
2.5.3	Rapid Traverse Z-Axis	• 24 m / min			
2.5.4	Maximum Feed - all axes	• 10 m / min			
2.5.5	Feed Rate in X Axis (continuously variable)	Min to Max.			
2.5.6	Feed Rate in Y-Axis (continuously variable)	Min to Max.			
2.5.7	Feed Rate in Z-Axis (continuously variable)	Min to Max.			
2.5.8	Feed drives/motors [AC servo motors] Either Siemens or Fanuc digital type (detail of model, make, type etc. to be submitted)	Vendor to confirm			
2.5.9	Feed back system for X, Y & Z axes. Heidenhain encoders details to be submitted.	Vendor to confirm			
2.5.10	Details of System to ensure zero backlash for the axes	Vendor to specify			
2.5.11	Mechanism for locking / clamping the axes	Vendor to specify			
2.5.12	Clamping force of each axes to be furnished	Vendor to specify			
2.5.13	Detail of axes feed mechanism (Details should include diameter of Ball Screws of each axis)	Vendor to specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
2.5.14	All linear traversing axes shall be provided with Steel Telescopic covers of rust resistant material with wipers. Joints of telescopic covers should be so sealed to avoid mixing of coolant and other lubricating oil.	Vendor to confirm			
2.5.15	Vendor to provide details of counter balance for Z axis	Required			
2.5.16	Range for rigid tapping (M3 - M24)	Vendor to confirm			
2.6	CONSTRUCTION:				
2.6.1	High quality cast iron structure fully stress relieved. Vendor to furnish material, hardness of guide ways & constructional details , including explanatory drawings, of various components/ assemblies like Gear Box, Guide ways/ slides, Telescopic covers, Accessories, Table, feed transmission system, hydraulic and lubrication system, feed back system etc. of the machine.	Vendor to provide details			
2.6.2	Video images on CD including hard copy explaining the technical features / Literature with photographs, drawings explaining the technical features should be enclosed with the offer	Vendor to provide details			
2.7	AUTOMATIC TOOL CHANGER:	To be provided			
2.7.1	ATC details to be submitted by vendor along with technical offer	Vendor to confirm			
2.7.2	Tool selection method	Random & Shortest Path			
2.7.3	Tool Taper	BT 40			
2.7.4	Number of Tools in the Magazine	20 (minimum)			
2.7.5	Maximum Diameter of Tool:				
	(a) With all Pockets Full:	• 75 mm			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
	(b) With adjacent Pockets Empty:	• 110 mm			
2.7.6	Max Length of Tool	Vendor to specify			
2.7.7	Max Weight of Tool	Vendor to specify			
2.7.8	Limitation regarding length & weight of tool / tool holder clamped in different tool holders for trouble free operation	Vendor to specify			
2.7.9	Tool Change Time (Tool-to-Tool) - (• 2 Sec)	Vendor to confirm			
2.7.10	Tool Change Time (Chip-to-Chip) - (• 6 Sec)	Vendor to confirm			
2.7.11	The machine shall have manual Tool loading / unloading through push button provided on machine / Auxiliary Hand pendant.	Vendor to confirm			
2.7.12	The spindle taper and tool pocket at changer station will have the provision of cleaning by compressed air blow during ATC cycle. The spindle taper will also have the provision of compressed air blow through push button provided on machine for manual tool change.	Vendor to confirm			
2.7.13	Auxiliary Control, with suitable interlocks, for manual insertion / withdrawal of tool from the tool magazine shall be provided.	Vendor to confirm			
2.7.14	Suitable arrangement, Software custom screen based and manual key based pendant, should be provided to extract a tool trapped anywhere in the ATC cycle. Details of both the system to be provided along with the offer.	Vendor to confirm			
2.7.15	The Machine operation should be possible with or without referencing ATC.	Vendor to confirm			
2.7.16	One set of tool holder retention stud equal to Tool magazine capacity shall be provided as standard item with the machine.	Vendor to confirm			
2.7.17	Working of Tool Changer Arm should be explained in details. Full ATC catalogue should be submitted with the offer.	Vendor to confirm			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
2.8	OPERATION AND CONTROL SYSTEM:				
2.8.1	OPERATOR'S PANEL:				
2.8.1.1	Fixed / Swiveling type operator's panel having complete CNC and machine control system with Colour LCD / TFT Panel shall be provided on the operators platform. All switches with suitable interlock with table traverse should be within reach of operator of average height (Indian) for easy & safe operation. All displays/indications should also be conveniently placed accordingly. Layout showing complete details should be submitted. Panel must also have push buttons for operating each of the Hydraulic Clamping points provided on the Work Table and Rotary Table.	Vendor to confirm			
2.8.2	CNC SYSTEM & FEATURES :				
2.8.2.1	Make : Siemens / Fanuc / Bosch	Vendor to confirm			
2.8.2.2	Type : Siemens 810 D or Equivalent	Vendor to confirm			
2.8.2.3	Model : (Latest version, as available at the time of ordering should be supplied)	Vendor to confirm			
2.8.2.4	Full 4th Axis for Rotary Table (Clause 11.9)	Vendor to confirm			
2.8.2.5	Details of Standard features including Helical Interpolation and Thread Milling (List to be Submitted)	Vendor to specify			
2.8.2.6	Details of optional features, recommended by vendor. (Including features required for Prove-Out Components)	Vendor to specify			
2.8.2.7	Details of other optional features which are to be selected by indenter	Vendor to specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
2.8.2.8	The system should have full alphanumeric keyboard, LCD / TFT colour display(10.4" or more), additional draw-out type Qwerty Key Board and mouse in suitable enclosure, RS232C serial interfaces, parallel interface for printer, COM port for telediagnosics, network ready with Ethernet port, USB port unit for data input/output, hard disk of sufficient capacity (Largest size available at the time of order shall be supplied), graphic simulation and preinstalled system software & other required software's etc. (Details should be submitted by Vendor)	Vendor to confirm			
2.8.2.9	Provision for automatic safe shut down of CNC Control in case of Power Failure	Vendor to confirm			
2.8.3	MANUAL CONTROL:				
2.8.3.1	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, table/ spindle speed, cutting feed on/off, display of axis position values etc. for manual operation without using CNC program, CNC option Manual Turn or MDI mode. Diagrams/ sketches for switches/ keys provided on operator's pendent should be submitted.	Vendor to confirm			
2.8.4	UPS FOR CNC SYSTEM:				
2.8.4.1	UPS of 30 minutes for CNC system with inbuilt cooling and charge status display (Battery charging /discharging time should be specified by vendor)	Vendor to Confirm			
2.9	MACHINE LIGHTS:				
2.9.1	Machine Lights for sufficient illumination of complete working area should be provided for clear visibility.	Required			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
2.9.2	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents	Required			
2.9.3	Flashing / rotary type End of Cutting and Program Stop Light.	Required			
2.10	AIRCONDITIONERS:				
2.10.1	Air Conditioners with Dehumidifiers of suitable / sufficient capacity should be provided for all Electrical / Electronic Panels / Cabinets including Operator's Panel considering specified ambient conditions. Detailed specifications of the same to be submitted.	Vendor to Specify			
2.11	HYDRAULIC SYSTEM : Details should be submitted by the vendor.				
2.11.1	System should be centralised. Hydraulic Tank shall preferably be located at floor level (Tank capacity must be at least 4 times the pump flow)	Vendor to confirm			
2.11.2	Make Rexroth / Vickers Sperry or equivalent from a reputed manufacturer. (Details to be submitted)	Vendor to confirm			
2.11.3	Filtration System	Required			
2.11.4	Failure indication	Required			
2.11.5	Automatic shut off provision (Details to be submitted)	Required			
2.11.6	Refrigerated type cooling and electric heating (Electric heating only if required) system of sufficient capacity to maintain complete Hydraulic System, including lubrication oil, hydrostatic oil and gearbox oil, etc. at a temperature not exceeding 40 deg C irrespective of the ambient conditions. Complete details should be submitted	Vendor to confirm			
2.11.7	Hydraulic pump capacity (flow / pressure)	Vendor to specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
2.11.8	Each pump should have an independent motor. Tandem pumps should not be used	Required			
2.11.9	<u>First filling of all required oil & grease etc.</u> should be supplied by vendor. Indigenous (Indian) source, or Indian Equivalent, and specifications of oils/ greases also should be provided by the vendor.	Vendor to confirm			
2.11.10	Job clamping is hydraulic with 4 clamping points provided on the table and 2 clamping points on the Rotary Table . Clamp / decamp feature to be incorporated in the controller for each of the clamping points.	Vendor to confirm			
2.11.11	Hydraulic pressure for Job clamping	Vendor to specify			
2.12	COOLANT SYSTEM :				
2.12.1	Recirculation type Flood Coolant System with all accessories suitable for all types of milling , drilling & tapping operations using milling cutters, drills and taps selectable through program and push buttons as well (available on operator's panel). Vendor to specify coolant emulsion (with oil content) to be used. Provision should also be there to use air coolant (only pressurised air) instead of flood coolant through same outlet using program.	Vendor to confirm			
2.12.2	All attachments, tool holders, adapters etc. shall have the provision so that coolant is available directly at the tool-cutting tip.	Vendor to confirm			
2.12.3	Coolant collection and recirculation system should be leak proof & perfect to avoid any spillage on shop floor, trenches for cables & foundation pit of the machine etc. In case, any leakage is found, it shall be corrected by vendor	Vendor to confirm			
2.12.4	Coolant Filtration System: Recirculating type coolant system with Cartridge Type Filtration System (Paper Band type, 40 microns) and magnetic separator.	Vendor to confirm			
2.12.5	Coolant Flow Diagram showing filters, pumps, valves, tanks etc.to be submitted with the offer.	Required.			

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2.12.6	Coolant flow should be sufficient for the coolant to reach the tool tip at full pressure.	Required.			
2.12.7	Coolant Tank Capacity	Vendor to specify			
2.12.8	For finer control of Pressure and Coolant Flow Rate, after its activation through program or switches, Rotary/ potentiometer switches shall be provided on the Operator's Panel.	Required.			
2.12.9	Coolant must reach the cutting tip while machining at all cutting / drilling conditions for different types of tools.	Vendor to confirm			
2.12.10	Coolant pump and motor details	Required.			
2.12.11	The coolant tank should be fitted with skimmer for regular cleaning of coolant from contamination with tramp oil.	Required.			
2.13	ELECTRICAL:				
2.13.1	415V + 10% / -10%, 50HZ +/-3 HZ, 3 Phase AC (3 wire system with out neutral) Power Supply Voltage 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 informed by vendor well in advance so that same could be incorporated during construction of foundation.	Vendor to confirm			
2.13.2	Tropicalisation: All electrical / electronic equipment shall be tropicalized	Vendor to confirm			
2.13.3	All electrical & electronic control cabinets & panels should be dust and rodent proof	Vendor to confirm			
2.13.4	All electrical components should be mounted on DIN Rail	Vendor to confirm			

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2.13.5	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			
2.13.6	Motors shall conform to IEC or Indian Standards	Vendor to confirm			
2.13.7	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			
2.13.8	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to confirm			
2.13.9	In-cycle hour counter with reset facility.	Vendor to confirm			
2.13.10	Electromagnetic Compatibility as per 89/336/CEE (or equivalent)	Vendor to confirm			
2.13.11	Machine should comply with CE Low Voltage Directive 72/23/CEE (or equivalent)	Vendor to confirm			
2.14	SAFETY ARRANGEMENTS:				
	Following safety features in addition to other standard safety features should be provided on the machine:	Vendor to confirm			
	1. Machine should have adequate and reliable safety interlocks / devices to avoid damage to the machine, workpiece and the operator due to the malfunctioning or mistakes. Machine functions should be continuously monitored and alarm / warning indications through lights/ alarm number with messages (on CNC display and panels) should be available.				
	2. A detailed list of all alarms / indications provided on machine should be submitted by the supplier.				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
	3. 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.	Vendor to confirm			
	4. All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations.				
	5. Emergency Switches at suitable locations as per International Norms are to be provided.				
	6. Oil & water pipe lines should not run with electrical cable in the same tray / trench.				
	7. Machine must conform to NFPA 79 / IEC (or equivalent) Electrical standards				
	8. The machine must also comply with CE Machine Directive 98/37/CE (or equivalent) safety requirements				
2.15	ENVIRONMENTAL PERFORMANCE OF THE MACHINE :	Vendor to confirm			
	The Machine shall conform to following factors related to environment:				
	(a) Maximum noise level shall be 85 dB(A) at normal load condition, 1 M away from the machine with correction factor for back ground noise, if necessary. This will be measured as per international standards like DIN 45635-16. Supplier to demonstrate compliance to noise level, if so required.	Vendor to confirm			
	(b) There shall not be any emissions from the machine except fumes of cutting fluid during machining.				
	(c) There should not be any effluent from the machine. In case there are any effluents from the machine, requisite effluent treatment plant or pollution control device should be built into the machine by the supplier.				
	(d) No hazardous chemicals shall be required to be used in the machine.				

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	(e) If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.				
	(f) Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.				
3.0	CHIP CONVEYOR:				
3.1	A chip conveyor to carry both short and curly chips efficiently and effectively to the chip bin on the floor, should be provided at the side of the machine. Two chip bins of appropriate size , with wheels and handle for movement, should also be supplied.	Vendor to confirm			
3.2	Type of chip conveyor	Vendor to specify			
3.3	Width of conveyor	Vendor to specify			
3.4	Elevation of chip conveyor for chip bin	Vendor to specify			
3.5	Material of chip conveyor (to be rust resistant)	Vendor to specify			
3.6	Provision for smooth flow of chips to the conveyor.	Vendor to specify			
3.7	Operation of chip conveyor (forward & reverse) through push buttons on operator's panel and at Chip Conveyor	Required			
3.8	Layout showing location of chip conveyor should be submitted.	Required			
4.0	SERVO STABILIZER:				
4.1	Indian make Oil / Air Cooled Servo Controlled Voltage Stabilizer suitable for complete machine, its drives, controls, PLC etc. with no undesirable Harmonics in the stabiliser output.	Required			
4.2	Make of a reputed manufacturer	Vendor to specify			
4.3	Model & Rating	Vendor to specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
4.4	Spares Package for the Voltage Stabiliser for 2 years working should also be offered.	Required			
4.5	Catalogue of the Voltage Stabiliser shall be submitted with the offer.	Required			
5.0	ULTRA ISOLATION TRANSFORMER				
5.1	Indian make Ultra Isolation Transformer suitable for complete machine, its drives, controls, PLC etc.	Required			
5.2	Make of a reputed manufacturer	Vendor to specify			
5.3	Model & Rating	Vendor to specify			
5.4	Spares Package for the Ultra Isolation Transformer for 2 years working should also be offered.	Vendor to specify			
5.5	Catalogue of the Ultra Isolation Transformer shall be submitted with the offer.	Required			
6.0	PNEUMATIC SYSTEM:				
6.1	AIR COMPRESSOR:				
6.1.1	Compressed air will be made available at one point near the machine by BHEL. Vendor to indicate the position of air point, air pressure and flow rate. Vendor must supply Filter, Regulator & Lubricator (FRL) unit and Air Dryer.	Vendor to confirm			
6.1.2	Make & Model of FRL unit and Dryer	Vendor to specify			
6.1.3	Air Pressure required	Vendor to specify			
6.1.4	Flow rate	Vendor to specify			
6.2	COMPRESSED AIR POINTS:				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
6.2.1	Compressed Air Point with manual ON/ OFF Valve and flexible pipe of suitable length for work piece cleaning.	Required			
7.0	TOOLINGS:				
7.1	All types of cutting tools, tool holders, adapters, sleeves, pull studs, Centering Devices etc. required for the machine. (List of tools required is given in Annexure 2)	As per Annexure 1 & 2			
7.2	All cutting tools, adaptors,sleeves & tool holders recommended for machining of prove out components.	Required			
7.3	Tapping	M 3 to M 24			
7.4	All toolings should be from a reputed manufacturer like Kennametal, Sandvik, Iscar.				
8.0	DIAGNOSTIC SYSTEM				
8.1	TELE-DIAGNOSTIC SERVICE :				
8.1.1	Tele-diagnostic service should be provided through telephone lines / Internet along with required Hardware / Software package for the supplied CNC system for remote diagnosis and correction of the problems in both CNC System and PLC of the machine. This should be provided free of charge for the guarantee period. Terms and conditions for the service after guarantee period should be informed by vendor.	Required			
8.2	DIAGNOSTIC SYSTEM:				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
8.2.1	Supplier's own diagnostic system with required hardware and software should be supplied and installed on the CNC system. This should include standard auto-diagnostic system with supporting hardware and software which shows detailed cause and remedy for the fault on the display and supplier's smart diagnostic system for full video diagnostic help for faults related to mechanical and electrical maintenance	Required			
8.3	Help guide should be provided to use both diagnostic systems	Required			
9.0	LEVELING & ANCHORING SYSTEM				
9.1	Complete anchoring system including foundation bolts, anchoring materials, fixtures, leveling shoes etc should be supplied	Vendor to confirm			
10.0	TOOLS FOR ERECTION, OPERATION & MAINTENANCE :				
10.1	Special tools and equipment required for erection and necessary tools like Torque Wrench, Spanners, Keys, grease guns etc.for operation and maintenance of the machine should be supplied. List of such tools should be included with offer	Vendor to confirm			
10.2	Test mandrel for checking run-out/taper & alignment should be supplied	Vendor to confirm			
11.0	ACCESSORIES :				
11.1	Full Enclosure for Machine	Required			
11.2	Auxiliary Plate, equal to Table size, to avoid collision zone (In case of machining of small components)	Required			
11.3	Mounting fixtures for components listed in Annexure 1	Required			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
11.4	CAM Software Package with (3D /2D drafting module, Capability to accept AutoCAD Inventor 3D solid models, AutoCAD 2D drawings and capable of utilising full 4th axis functionality (Rotary Table), Cutter path simulation, Process time optimisation, Dead zone detection, Post processing and Transfer of CNC part programmes to the machine. Offline programming. The offer to include necessary hardware (PC, LCD Monitor etc.)	Required			
11.5	Tools as per Annexure 2	Required			
11.6	Tool presetter with digital readout as per the following specification	Required			
	a) Sleeve taper - BT 40				
	b) Digital Readout for Diameter and Height				
	c) Test Bar				
	d) Tool Diameter upto 150 mm				
	e) Tool Length up to 300 mm				
	f) Pneumatic Tool Clamping				
	g) Capable of use in Shop Floor				
	h) Colour LCD / TFT display with touchscreen buttons, Graphical User Interface				
	i) Automatic Cutting edge detection				
	j) Display Accuracy - 0.001 mm				
	k) Help and Fault diagnostics.				
	l) If the presetter is from a third party then the qualifying conditions listed in Clause 25 is applicable to the Presetter supplier				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
11.7	Tool life monitoring system with facility to set maximum cutting parameters for each tool	Vendor to Specify			
11.8	PORTABLE DRIVE.				
11.8.1	Portable Flash drive unit or its' equivalent, for bi-directional program & data and machine parameter transfer between the unit & supplied CNC system and as well as with standard PC.	Vendor to confirm			
11.9	CNC Rotary Table with Base Plate (Machine to be interfaced with rotary table)	Vendor to confirm			
	a) Make of a reputed manufacturer	Vendor to specify			
	b) Model	Vendor to specify			
	a) Turn Table diameter	• 250 mm			
	b) Table center height	• 160 mm			
	c) Drive Motor (Fanuc / Siemens AC Servo)	Vendor to confirm			
	d) Vertical Load Capacity	• 100 Kg			
	e) Feed back through Heidenhain rotary encoders.	Vendor to confirm			
	f) Indexing accuracy (Arc Sec)	± 15"			
	g) Interfacing with CNC controller to enable full 4th axis functionality including contouring.	Vendor to confirm			
	f) If the Rotary Table is from a third party then the qualifying conditions listed in Clause 25 is applicable to the Rotary Table supplier	Vendor to confirm			
11.10	NETWORKING:				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
11.10.1	Machine control should have necessary hardware and software for interfacing with gigabit Ethernet Local Area Network with 100 MB/sec through UTP cables for NC program and other related data transfer. This network to be connected to wide area network/Internet. The networking should have following capabilities.	Vendor to offer			
	a) The machine shall appear as a node in the Entire Network. (Network Neighborhood)				
	b) The program transfer shall be by simple copy and paste method provided sharing access is allowed between any PC and the machine across the network.				
	c) The program transfer between CNC system and network should also be possible in CNC Mode.				
12.0	SPARES:				
12.1	Itemised breakup of mechanical, hydraulic, electrical and electronic spares used on the machine, rotary table and tool presetter in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous running basis should be offered by vendor. The list to include following, in addition to other recommended spares: (Unit Price of each item of spare should be offered)	Vendor to Specify			
	a) Mechanical & Hydraulic Spares: All types of Pumps, Valves, Pressure Switches, Transducers, Flow Switches, Filters, Seals, O-rings, Hydraulic Hoses etc.	Vendor to Confirm			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
	b) Electrical /Electronic / CNC Spares: All types of Relays, Contactors, Proximity Switches, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch, Encoders, Scanning Heads for Linear Scales, MMC module, NCU module, Operator's panel with Display Unit, Floppy Disk Unit, I/O Cards for PLC, Servo Motors for Feed Drives, Power Module & Control Cards for Main Drive as well as Feed Drives etc.	Vendor to Confirm			
12.2	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 inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure them in advance, if required	Vendor to Confirm			
12.3	Recommended set of spares for all attachments are to be offered with details.	Vendor to Specify			
12.4	Vendor to confirm that complete list of spares for machine and accessories, along with specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to Confirm			
12.5	Supplier to provide AMC details and value for post warrantee period.	Required			
13.0	DOCUMENTATION : Five sets of following documents (Hard copies) in English language should be supplied along with the machine				
13.1	Operating manuals of Machine & CNC system, Rotary table and Tool presetter.				
13.2	Programming Manuals of Machine & CNC system (Including Rotary Table), and Tool Presetter				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
13.3	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic/ Coolant / Hydraulic circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also	Vendor to Offer			
13.4	Maintenance, Interface & commissioning manuals for CNC system, spindle & feed drives.				
13.5	Manufacturing drawings for all supplied tool holders, coolant connections, adapters, sleeves, fixtures etc.				
13.6	Catalogues, O&M Manuals, Test certificates, warranty of all bought out items including drawings, wherever applicable.				
13.7	Detailed specification of all rubber items and hydraulic/lube fittings				
13.8	Operating Manuals, Maintenance Manuals & Catalogues for supplied Tool presetter, Voltage Stabilizer, Isolation Transformer, and all supplied Accessories.				
13.9	PLC program print-outs with comments in English.				
13.10	PLC program on CD, NC data & PLC data on floppy.				
13.11	Complete back-up of hard disk on GHOST CD and clear written Instructions (3 copies) to take back-up and reloading of a new hard disk.				
13.12	Complete Master List of parts used in the machine and accessories (Rotary Table, Tool presetter) shall be submitted by the vendor.				
13.13	One additional set of all the above documentation on CD ROM, wherever possible.				
14.0	SERVICE CENTER / OFFICE IN BANGALORE				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
14.1	Vendor should have an established office in Bangalore City, with trained personnel, for providing prompt service backup. Necessary Documents for establishing the same to be submitted along with the offer.	Vendor to Confirm			
14.2	Offers of those suppliers not having an established service center in Bangalore will be rejected.	Vendor to Note			
15.0	TRAINING				
15.1	BHEL Persons should be trained at supplier's Works for mutually agreed period 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.	Vendor			
15.2	Competent, English speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel.	Vendor to Confirm			
16.0	FOUNDATION : (Indentor to Suitably modify this clause based on size of the machine)				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
16.1	Vendor shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI) / P.O. whichever is earlier. Soil condition data will be furnished by BHEL along with the approval. Complete Foundation Design including details viz. static / dynamic load details etc. and Final Layout drawings shall be submitted by the supplier within three months after getting BHEL's approval. The layout should consist of all requirements pertaining to complete machine including space requirement for Voltage Stabilizer, Isolation Transformer, Chip Bin & 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.	Vendor to Note			
17.0	ERECTION & COMMISSIONING				
17.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine, it's control & all types of other supplied equipment , machining of test pieces 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.	Vendor			
17.2	Erection & Commissioning of Voltage stabilizer, Isolation Transformer shall also be responsibility of the vendor.	Vendor			
17.3	Successful proving of BHEL components by the supplier shall be considered as part of commissioning. All tests, as mentioned at clause 20 & 21 (Acceptance of BHEL prove out components) shall form part of the commissioning activity.	Vendor			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
17.4	Test mandrel for checking run-out/taper & alignment should be supplied	Vendor			
17.5	Tools, Tackles, Test Mandrels, instruments and other necessary equipment including Laser equipment required to carry out all above activities should be brought by the supplier. .	Vendor			
17.6	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	Vendor			
17.7	All Cover Plates required for the machine and its peripherals including pits, if any, shall be supplied and installed by the vendor.	Vendor			
17.8	Portion, if any, of the machine, accessories and other supplied items where paint has rubbed off or peeled during transit or erection should be repainted and merged with the original surrounding paint by the vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colours of paint used.	Required			
17.9	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor			
17.10	Charges, duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer.	Vendor			
18.0	ACCURACY TESTS:				
18.1	GEOMETRICAL ACCURACIES :				
18.1.1	Submit test chart for all accuracies as per DIN 8609/ ISO 10791 standard or equivalent applicable standard.	Vendor			
18.1.2	All the above accuracies should be demonstrated to BHEL engineers during pre-acceptance at supplier's works and during erection & commissioning at BHEL works.	vendor			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
18.2	MACHINE POSITIONING ACCURACIES & REPEATABILITY: Should be measured as per VDI/DGQ 3441 (Latest Revision) using LASER INTERFEROMETER.				
18.2.1	Positioning accuracy in X / Y axis per 1000 mm	• ± 0.01 mm			
18.2.2	Positioning accuracy in Z axis per 1000 mm	• ± 0.01 mm			
18.2.3	Repeatability in X / Y axis	• ± 0.005 mm			
18.2.4	Repeatability in Z axis	• ± 0.005 mm			
18.2.5	Positioning accuracy over entire traverse in X / Y axis	vendor			
18.2.6	Positioning accuracy over entire traverse in Z axis	vendor			
19.0	AMBIENT CONDITIONS & THERMAL STABILITY :				
19.1	Total machine including CNC system and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. Power Supply: Voltage: 415 V \pm 10% Voltage Frequency: 50 Hz \pm 3% No. of phases = 3 Ambient Conditions: Temperature = 5 to 45 degree Celsius. Relative Humidity = 95% max. (Vendor to confirm that machine is suitable for above and details of provisions on the machine for the same are to be furnished by Vendor)	Vendor to Confirm			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
19.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year. Machine shall be kept in the normal shop floor condition. Max. temperature variation is up to 25 deg Celsius in 24 hours. (Vendor to confirm that machine is suitable for above and details of provisions on the machine for the same are to be furnished by Vendor)	Vendor to Confirm			
19.3	Thermal Stability of the complete machine keeping in view specified Ambient Conditions and accuracy requirements of BHEL components and trouble free operation of the machine should be ensured by vendor. (Confirm that machine is suitable for above and details of provisions on the machine for the same should be furnished)	Vendor to Confirm			
20.0	PROVEOUT OF BHEL COMPONENTS :				
20.1	Drawings of prove out components are enclosed. Vendor to submit preliminary process, time study & tool list recommended by them along with the offer. Change in process/tools if required may be mutually discussed and agreed. Complete machining of prove out components shall be done by Vendor at BHEL works to the specified design accuracy and surface finish, using cutting tools and CNC programs (to be provided by the vendor) to prove the machine after complete erection, tests & test piece machining etc. Material for the prove out components shall be provided by BHEL. Vendor should submit the CNC programs, setting schemes, process sheets, tooling layouts, time studies etc. in advance for the prove out components. Vendor shall be fully responsible for machining of prove out components as per drawing and other requirements specified by BHEL to the full satisfaction of BHEL. Clarifications, if any required by vendor, regarding accuracy requirements of the prove out components, whether specified or not, should be discussed and cleared by vendor during initial technical discussions.	Vendor to offer			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
20.2	During prove out, all tools shall be set by using supplied Tool Offset Measuring System.	Vendor to Confirm			
20.3	Vendor shall be responsible for any deviation/rejection in prove out component due to wrong machining or malfunctioning of the machine during prove out machining and also for the delay in machining due to improper recommended tooling etc. The cost of such deviation / rejection, if any, shall be refunded by the vendor to BHEL.	Vendor to Confirm			
21.0	MACHINE ACCEPTANCE: (Tests/Activities should be Performed by Vendor)	Should be accepted & confirmed by Vendor			
21.1	Tests/Activities to be carried out at supplier's works on the machine before dispatch in the presence of BHEL representatives. Test / Compliance certificate to be furnished.				
21.1.1	Geometrical accuracies as per test chart. (Clause 18.1)	Vendor to Confirm			
21.1.2	Positioning accuracies and repeatability as per VDI-DGQ/3441 (Clause 18.2)	Vendor to Confirm			
21.1.3	The machine should be tested for continuous running of 48 hrs. If any break down occurs during this test, the test should be repeated for 48 hrs from that time.	Vendor to Confirm			
21.1.4	Demonstration of all features of the machine, control system & accessories	Vendor to Confirm			
21.1.5	Machining of test piece as per NAS/AFNOR/ISO. Vendor to supply test piece and tooling for it's machining	Vendor to Confirm			
21.1.6	Machining of prove out component at vendor's works . The required tooling shall be supplied by Vendor.	Vendor to Confirm			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
21.2	Tests/Activities should be carried out at BHEL works while commissioning the machine :				
21.2.1	Geometrical accuracies as per test chart. (Clause 18.1)	Vendor to Confirm			
21.2.2	Positioning accuracies and repeatability as per VDI-DGQ/3441 (Clause 18.2)	Vendor to Confirm			
21.2.3	Full load test to demonstrate the maximum power & cutting capacity of the machine.	Vendor to Confirm			
21.2.4	The machine should be tested for continuous running of 48 hrs. If any break down occurs during this test, the test should be repeated for 48 hrs from that time.	Vendor to Confirm			
21.2.5	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			
21.2.6	Machining of prove out components in associated fixtures supplied.	Vendor to Confirm			
21.2.7	Two weeks supervision of independent operation of machine by BHEL after job prove out	Vendor to Confirm			
21.2.8	Machining test piece as per NAS/AFNOR/ISO. Vendor to arrange Test pieces and tooling for it's machining.	Vendor to Confirm			
21.2.9	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			
21.2.10	Demonstration by actual use of all supplied attachments and accessories to their full capacity.	Vendor to Confirm			
22.0	PACKING:				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
22.1	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 despatched in containers, all small loose items shall be suitably packed in boxes	Vendor to Confirm			
23.0	GUARANTEE :				
23.1	24 months from the date of acceptance of the machine.	Vendor to Confirm			
24.0	GENERAL :				
24.1	Machine Model	Vendor to Specify			
24.2	Total connected load (KVA):	Vendor to Specify			
24.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to Specify			
24.4	Painting of Machine / Electrical Panels : Polyurethane Paint	Required			
24.5	Total weight of the machine	Vendor to Specify			
24.6	Weight of heaviest part of machine	Vendor to Specify			
24.7	Weight of the heaviest assembly / sub-assembly of the Machine	Vendor to Specify			
24.8	Dimensions of largest part/ sub-assembly/ assembly of the machine	Vendor to Specify			
24.9	Vendor to submit, along with offer, reference list of customers where similar machines have been supplied mentioning broad specifications of the supplied machine i.e. Model, Pallet size, Spindle power, Load Capacity, Max job Envelope, CNC System etc	Required			
24.10	Detailed catalogues , sketch/ photographs of the m/c and accessories/ attachments should be submitted with the offer.	Required			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
24.11	Hydraulic, Pneumatic & oil pipings should be preferably metallic except places where flexible pipings are essential. All the pipes required for the same shall be included in the standard scope of the machine.	Vendor to Confirm			
25.0	REFERENCE LIST / QUALIFYING CONDITIONS :	Vendor to Note			
	01. Only those vendors, who have supplied and commissioned at least three Vertical Machining Centers of same or higher sizes (Power, Load Capacity, Axes Traverse & Max Job Envelop) for similar applications in the past Five years in India and such machine is presently working satisfactorily for more than three years after commissioning should quote.	Vendor to Confirm			
	02. 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 in BHEL should quote.				
	03. The vendor shall be an Original Equipment Manufacturer (OEM). Only the OEM or their authorized dealers in India along with an authorization letter can submit offers. An authorized Representative/Dealer in India, cannot quote for the same equipment from more than one OEM.				
	04. Offer shall be for a new equipment and not for any refurbished / used equipment. All the parts used in the equipment shall also be new and not used / refurbished ones. A declaration to the above effect has to be furnished.				
	05. Foreign OEM shall have Authorized Indian dealer(s) / representative(s) for After- sales service and support. The authorization letter for the dealer/ representative shall be provided with confirmation that after sales service support shall be provided by them.				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
25.1	06. The vendor or their authorized service representatives shall have trained engineers in India for commissioning & service for the offered equipment and shall be in a position to provide prompt after sales service and spares support for our installations.				
	07. The vendor shall be in a position to undertake AMC or provide service support for the equipment supplied, after the expiry of the warranty/ guarantee period either directly or through a service representative.				
	08. If required by BHEL, the vendor shall arrange for a demonstration of the equipment or similar equipment operating in India. Pre-qualification will be carried out based on the details furnished by the vendor / feedback from their customers / inspection of the company / product if required by BHEL and at its sole discretion.				
	09. Vendors should have ISO 9000 & ISO 14000 Certification.				
	The Pre-qualification criteria are mandatory requirements and the technical bids will be evaluated only when the Pre-Qualification criteria are met.				
	Vendor should already have an established office in Bangalore City with trained personnel for providing prompt service backup. Necessary Documents for establishing the same to be submitted with the offer. This is required from all the vendors for qualification of their offer.				
	The following information should be submitted by the vendor about the companies where similar machines have been supplied.				
	1. Name of the customer / company where similar machine is installed.				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	Deviations	Remarks
	2. Complete postal address of the customer.				
	3. Year of commissioning.				
	4. Application for which the machine is supplied				
	5. Name and designation of the contact person of the customer.				
	6. Phone, FAX no. and email address of the contact person of the customer.				
	7. Performance certificate from the customers regarding satisfactory performance of machine supplied to them				

	Components to be machined in the Machining Center		ANNEXURE I	
	Prove Out Drawings item 1,2 & 3 with suggested operations, Vendor to suggest proper operations / tooling suitable to the machine. Toolings to be chosen for maximum productivity or machines w.r.t Speed, Feed, Rigidity.			
	Item No 4 to 10 are the indicative list of Components to be machined. Vendor to Suggest & Provide suitable extra toolings required			
	Vendor to provide cutting paramaters for all tools / operations.			
	Vendor to Design and Supply Suitable fixtures for prove out components.			
SI No.	DRG.NO.	DESCRIPTION	OPERATIONS	TOOLS
1)	16880210009IT01	HEAT SINK M/C PART II - HE06	1) SIZE MILLING TO 225 MM.	25MM END MILL
			2) FACING & STEP MILLING 215.5 & 6*62 MM	80MM SIDE &FACE CUTTER.
			3) DRILLING - 13 MM DIA, 11MM DIA & M3 TAP	13MM, 11MM & 2.5MM DRILLBIT.
			4) PCKT MILLING- 45*196 MM.	16 MM SLAT DRILL
			5) FIN MILLING-33*147MM.	18MM ENDMILL
			6) DRILLING 17.5 MM DIA, 3.1 MM DIA HOLES.	17.5 MM,& 3.1 MM DRILLBIT.
			6) DRILLING 5 HOLES OF 3.1MM DIA .	3.1 MM DRILLBIT
			7) FACING- 130MM DIA.	80MM SIDE &FACE CUTTER.
2)	26992350038	HEAT SINK NH 01	1) DIA 53 MM MILLING	DIA 16 MM ENDMILL.
			2) DIA 22.5 MM DRILL 28MM DEEP.	DIA 6MM ,12 MM & 22.5 MM DRILL
			3) DIA 25.5 MM DRILL 2.5 MM DEEP.	DIA 25.5 MM DRILLBIT,
			4) M 24 *1.5 TAPPING	M24*1.5 TAP
			5) DIA 50 MM SPOT FACING	16 MM SLOT DRILL.
3)	2660MD02088 01	HEATSINK M/C	1) SIZING-136.4MM.	12MM ENDMILL.
			2) 13 HOLES OF M4 *10 DEEP.	3.3MM DRILL & M4 TAP.
			3) 3 HOLES OF 25MM DIA *11.5 MM DEEP	8 MM & 25 MM DRILLBIT
			4) 4HOLES OF M4 *13 DEEP	3.3MM DRILL & M4 TAP.
			5) 4HOLES OF M4 *13 DEEP	3.3MM DRILL & M4 TAP.
			6) FACING-136.4MM WIDTH.	150MM SIDE & FACE CUTTER.

4) 16880210010IT01 HEAT SINK M/C PART I - HE06

1) SIZE MILLING TO 225 MM.	25MM END MILL
2) FACING & STEP MILLING 215.5 & 6*62 MM	80MM SIDE &FACE CUTTER.
3) DRILLING - 13 MM DIA, 11MM DIA & M3 TAP	13MM, 11MM & 2.5MM DRILLBIT.
4) FIN REMOVING & FACING TO 40MM DIA.	16 MM SLAT DRILL
5) FIN MILLING-33*147MM.	18MM ENDMILL
6) DRILLING 17.5 MM DIA, 3.1 MM DIA HOLES.	17.5 MM,& 3.1 MM DRILLBIT.
7) DRILLING 5 HOLES OF 3.1MM DIA .	3.1 MM DRILLBIT
8) FACING- 130MM DIA.	80MM SIDE &FACE CUTTER.

5) 16880210001IT01 HEAT SINK M/C - TYPE HE05

1) SIZE MILLING TO 225 MM.	25MM END MILL
2) FACING & STEP MILLING 214 & 6*60 MM	80MM SIDE &FACE CUTTER.
3) DRILLING - 11MM DIA & M3 TAP	11MM & 2.5MM DRILLBIT.
4) FIN MILLING-33*147MM.	18MM ENDMILL
5) DRILLING 17.5 MM DIA,5HOLES OF3.1 MM DIA HOLES.	17.5 MM,& 3.1 MM DRILLBIT.
6) FACING- 80MM*1.8MM	80MM SIDE &FACE CUTTER.

6) 16880210002IT01 HEAT SINK M/C - HE05-S

1) SIZE MILLING TO 225 MM.	25MM END MILL
2) FACING & STEP MILLING 214 & 6*60 MM	80MM SIDE &FACE CUTTER.
3) DRILLING -13MM DIA& 11MM DIA & M3 TAP	13MM, 11MM & 2.5MM DRILLBIT.
4) FIN MILLING-33*147MM.&FIN-45MM*80MM	18MM ENDMILL
5) M4*12 DEEP.	3.3mm drill & m4 tap
6) DRILLING 17.5 MM DIA,5HOLES OF3.1 MM DIA HOLES.	17.5 MM,& 3.1 MM DRILLBIT.
7) FACING- 80MM*1.8MM	80MM SIDE &FACE CUTTER.

7) 36880410029 IT01 HEAT SINK-M/C

1) SIZING TO 203MM.	25MM END MILL.
2) DRILL 2HOLES DIA 25 MM& ONE HOLE DIA 3.1 MM*5 DEEP.	8MM,25MM &3.1MM DRILLBIT.
3) 80 MM WIDTH FACING.	80MM SIDE &FACE CUTTER.
4) FINS MILLING- 7MM*5MM	12MM END MILL
5) FINS FACINGTO 38.4MM	100MM SIDE & FACE CUTTER.
6) 4 HOLES M4*13MM DEEP.	3.3MM DRILL & M4 TAP.

8) 26992350017 HEAT SINK FL 01

1) DIA 28 MM MILLING-	DIA 16 MM END MILL.
2) DIA 6.8 MM DRILL 19 MMDEEP.	6.8 MM DRILLBIT
3) DIA 9MM DRILL 5.5 DEEP.	9 MM DRILLBIT.
4) TAPPING M8.	M8 TAP
5) SPOT FACING WITH 25MM SLOT DRILL	16 MM SLOT DRILL.

9) 26992350016 HEAT SINK LL 01

1) DIA 47 MM MILLING	DIA 16 MM END MILL.
2) DIA 14.5 MM DRILL 28 MM DEEP.	DIA 14.5 MM DRILLBIT.
3) DIA 17.5 MM 2.5MM DEEP.	DIA 17.5 MM DRILBIT
4) M16*1.5 TAPPING.	M 16* 1.5 TAP.
5) DIA 38 MM SPOT FACING.	16 MM SLOT DRILL.

10) 26992350051 HEAT SINK NH02

1) DIA 53 MM MILLING	DIA 16 MM ENDMILL.
2) DIA 22.5 MM DRILL 28MM DEEP.	DIA 6MM ,12 MM & 22.5 MM DRILL
3) DIA 25.5 MM DRILL 2.5 MM DEEP.	DIA 25.5 MM DRILLBIT,
4) M 24 *1.5 TAPPING	M24*1.5 TAP
5) DIA 50 MM SPOT FACING	16 MM SLOT DRILL.

VMC TOOLS LIST				Annex - II
Sl No	Type	Size (Ø) in mm	Qty	Remarks
1	Side & Face Cutter	40	2	With BT 40 Adaptor
2		50	2	
3		63	2	
4		80	1	
5		125	1	
6		150	1	
7	Drills	3	10	Collets for Straight shank drills suitable to Spindle Taper & Morse Taper adapters for Taper shank drills suited to spindle taper
8		3.1	10	
9		3.2	10	
10		4.2	10	
11		4.5	10	
12		5.2	10	
13		5.5	10	
14		6.5	5	
15		7.8	5	
16		9	5	
17		11	5	
18		13	5	
19		14.5	5	
20		15	3	
21		17	3	
22		17.5	3	
23		18	3	
24		20	2	
25		22.5	2	
26		25	1	
27		25.5	1	
28	Centre Bit	2.5	10	Collets for straight shank drills suitable to spindle taper
29		3	10	
30		5	10	
31	Pre Drills for Tapping	M3	10	Collets for Straight shank drills suitable to Spindle Taper & Morse Taper adapters for Taper shank drills suited to spindle taper
32		M4	10	
33		M5	10	
34		M6	10	
35		M8	3	
36		M10	3	
37		M12	3	
38		M16	2	
39		M24	2	

VMC TOOLS LIST				Annex - II
Sl No	Type	Size (Ø) in mm	Qty	Remarks
40	Taps for Rigid Tapping	M3	10	Collets and Morse Taper Adapters suitable to Spindle Taper
41		M4	10	
42		M5	10	
43		M6	10	
44		M8	3	
45		M10	3	
46		M12	3	
47		M16	2	
48		M24	2	
49	End Mill	9	10	Collets for End Mills suitable to Spindle Taper
50		10	10	
51		12	10	
52		14	10	
53		16	5	
54		20	5	
55		25.5	2	
56		32	2	
57	Slot Drill	7.8	10	Collets for Slot Drills suitable to Spindle Taper
58		10	10	
59		12	10	
60		16	5	
61		20	5	



Bharat Heavy Electricals Ltd.,

(A Government of India undertaking)

Electronics Division

PB No.2606, Mysore Road, Bangalore-560026, India

CPD-20000

Page 1 of 19

Enquiry - General Terms & Conditions for Supply of CAPITAL ITEMS
(Imported & Indigenous) (Two parts bid),
Doc Ref: CPD-20000

I. Enquiry / Request For Quotation (RFQ):

- (a) Any Purchase Order resulting from this enquiry shall be governed by **these general terms and conditions listed below and special terms and conditions, if any, along with this enquiry** of Bharat Heavy Electricals Limited, Electronics Division, Bangalore-560026 (**hereinafter referred to as BHEL EDN**).
- (b) Any of the terms and conditions not acceptable to vendor, shall be explicitly mentioned in the quotation. Otherwise, it will be treated as that all terms and conditions of this enquiry are acceptable.
- (c) If counter terms and conditions are offered by vendor, BHEL EDN shall not be governed by such terms and conditions, unless it is agreed and incorporated in the Purchase Order of BHEL EDN.
- (d) Any deviation to the terms and conditions not mentioned in the quotation by vendor in response to this enquiry will not be considered, if put forth subsequently or after issue of order, unless clarification is sought for by BHEL EDN and agreed upon in the Purchase Order of BHEL EDN.
- (e) BHEL EDN reserves the right to adopt Reverse Auction for the enquiry sent, at its discretion.
- (f) BHEL EDN shall be at liberty to cancel the tender at any time, before ordering, without assigning any reason.

II. General Terms and conditions:

1. **TWO PARTS BID:** Quotation shall be submitted in two parts bid i.e.

(a) **Techno-commercial i.e., Un-priced Bid (in one sealed envelope):**

Techno-commercial bid shall be submitted with complete description of the equipment, specification compliances to the enquired specification and all the commercial terms & conditions indicated in the **COMMERCIAL TERMS (ANNEXURE - A / ANNEXURE - B)**. Any other enclosure, which the vendor wishes to submit like product catalogue, technical literature etc., may also be submitted in a sealed envelope super scribed clearly as **“TECHNO-COMMERCIAL BID” with RFQ No. and DUE DATE**. An un-priced copy of price bid (without price) shall also be enclosed with the techno-commercial bid for evaluation of commercial terms. The vendor shall not give the price in the technical bid.

Confirmation to BHEL specifications shall be indicated by the vendor in the respective columns provided in the purchase specification wherever applicable. Deviations to the specification /

item description, if any shall be brought out clearly indicating “DEVIATION TO BHEL SPECIFICATION” without fail as a part of technical offer.

Compliance to Pre-qualification criteria (if applicable) shall also be enclosed with the Techno-commercial bid.

Manufacturer’s name, their trade mark and brand, part number, alternate material to the one asked in enquiry, if any, should be mentioned in quotation and illustrative leaflets giving technical particulars etc. are to be attached to facilitate consideration and technical evaluation of the quotation.

BHEL EDN material code number (as in enquiry) shall be indicated for each item quoted.

(b) Price Bid (in one sealed envelope):

Price bid should contain basic unit prices, discount if any, applicable taxes & duties, packing & forwarding charges (if applicable), Freight & insurances (if applicable) FOB charge (if applicable) etc., in a sealed envelope super scribed clearly as “**PRICE BID**” with **RFQ No. and DUE DATE**. Installation, commissioning, start-up and training charges (if any) shall also be indicated in the price bid.

It is preferred to indicate the rates in both figures and words. In such case, if there is difference / discrepancy between the rates in figures and words, the **least of the two** rates will be considered.

(c) Tender Offer (above two envelopes inside another sealed envelope):

Both these sealed envelopes [(a) Techno-commercial i.e., un-priced Bid and (b) Price Bids] shall be kept in a single sealed envelope and super scribed clearly with **RFQ No. and DUE DATE**.

2. The above sealed envelope (Tender) shall reach our office on or before the due date by **13:00 hrs.** Quotations are to be dropped in the tender box marked for the OPENING ON respective days i.e., MONDAY / WEDNESDAY / FRIDAY kept at BHEL-EDN’s Reception area of our works with caption “CE, M&C, SC&PV, TSC, DEFENCE, TELECOM, CPD”. **Quotations also can be dispatched by Couriers / Registered post / FAX / e-mail to the Purchase Executive indicated in the RFQ at the risk of vendor / bidder.**

Quotation through courier / register post / fax / email when addressed to the specific fax number and email address given in the enquiry, to be sent well in advance to enable BHEL EDN purchase personnel to drop in the tender box before the scheduled opening date and time. **Vendor is fully responsible for lack of secrecy on information of such quotations.** Vendor shall confirm with the concerned purchase executive after sending the offer regarding such delivery mode to ensure participation. BHEL EDN is not responsible for any delay in receipt of quotation sent by vendor through post/fax/email.

Late Tenders i.e., Tenders received after due date will be rejected.

3. The rate quoted against each item shall be in units stated in the enquiry. Where quotation is in terms of unit other than that in enquiry, relationship between the two units must be furnished in the quotation.
4. As far as possible, the quotations shall be free from corrections / overwriting. Corrections / overwriting, if any should be signed by authorized person with the company seal. Any typographical errors, totaling mistakes, currency mistakes, multiplication mistakes, summary mistakes observed in your priced bids, BHEL may consider whichever is beneficial to BHEL for evaluation. Vendor shall doubly ensure that the quote is correct and complete. The corrections / overwriting if any shall be signed with the seal.
5. Quotations are to be duly signed. Unsigned bids / offers are liable for rejection.
6. Tenders will be opened at **13:30 hrs.** & the venue is New Engg., Bldg., 2nd floor, MM conference hall. All the tenderers or their authorized representatives (with authorization letter from their principals) may witness opening of techno-commercial bid on the due date.
7. After evaluation of techno-commercial bids, price bids of only those which are technically & commercially accepted, will be opened on a subsequent date, which will be intimated to the concerned in advance for witnessing of price bid opening.
8. The quantity in each item to be purchased may vary from quantity enquired according to the actual requirement at the time of placing the purchase order. Quantity discount, if any, should be mentioned in the quotation.
9. BIDDERS (for indigenous purchase) shall indicate clearly Excise duty, Education Cess, Sales Tax/VAT, Octroi, Exit/Entry tax, Service Tax as applicable for the quoted items. In the absence of clarity of these, any claim at a later date will not be entertained. Any changes in Taxes and duties after award of the contract will not be considered except such are those, which are imposed by Govt., notification within the contractual delivery after placement of PO. Seeking price amendments for change in Excise duty due to crossing of turnover limits will not be considered under any circumstances.

10. DUN & BRADSTREET REPORT (for Foreign purchase):

In case of foreign vendors, the vendors should obtain a report from Dun & Bradstreet or equivalent and submit a copy of the report with their Duns number mentioned along with the technical offer. Offer without this report is liable for rejection.

11. Payment of Agency Commission to Indian Agent (for Foreign purchase):

The vendor shall give a certification to the following effect:

The seller confirms and declares to the Buyer that the seller is the original manufacturer of the stores referred to in this contract and has not engaged any individual or firm, whether Indian or Foreign whatsoever, to intercede, facilitate or in any way to recommend to the Government of India or any of its functionaries, whether officially or unofficially, to the award of the contract to the seller; nor has any amount been paid, promised or intended to be paid to any such individual or firm in respect of any such intercession, facilitation or recommendation. The seller agrees that if it is any way incorrect or if at a later stage it is discovered by the Buyer that the seller has engaged any such individual/ firm, and paid or intended to pay any amount, gift,

reward, fees, commission or consideration to such person, party, firm or institution, whether before or after the signing of this contract, the seller will be liable to refund that amount to the Buyer. The seller will also be debarred from entering into any supply contract with the Government of India for a minimum period of five years. The Buyer will also have a right to consider cancellation of the contract either wholly or in part, without any entitlement or compensation to the seller who shall in such event be liable to refund all payments made by the buyer in terms of the contract along with interest at the rate of 2% per annum above the LIBOR rate. The Buyer will also have the right to recover any such amount from any contracts concluded earlier with the Govt. of India

BHEL would like to procure the above item directly from you and not to involve services of Indian Agent for the procurement. The quotation submitted by your Indian Agent is not acceptable and liable to be rejected. However, in case you would like to involve your Indian Agent for supply of the items/service therefore you may furnish the following information along with the Techno Commercial bid.

- (a) Registration status of Indian Agent with DGS&D and BHEL.
- (b) Commission payable to Indian Agent and percentage.
- (c) Currency in which payable to Indian Agent.
- (d) If the agency commission is payable by the foreign principal/OEM, such commission shall be received by Indian Agent through inward FFE remittance through banking channels and disbursed in rupees only.
- (e) Tax at source deduction is applicable to the Agency Commission paid to the Indian Agent as per the prevailing rules.
- (f) If the respective Indian Agents are not registered with DGS&D or BHEL, are required to register their names with BHEL by providing the following information's for registration.
 - (i) Name of the foreign firm / original equipment manufacturer represented by the Indian representative / Indian Agent.
 - (ii) Agency agreement.
 - (iii) PAN No, Name, Address of Bankers in India and Abroad.
 - (iv) Nature of services to be rendered by Indian Agent / Indian representative and percentage of commission payable to Indian Agent / Indian representative by Principal / original equipment manufacturer.
- (g) All particulars relating to Agency Commission will be reported to the enforcement Directorate of Income Tax Department.
- (h) Undertaking to be submitted by Indian Representative / Agent that the agency commission would be accepted in Indian Rupees only and through inward FFG remittance through banking channel for the services rendered towards the execution of the orders.

12. TOTAL COST TO BHEL: Purchase order will be placed on the lowest quotation (L1) only among the technically & commercially accepted quotations. Lowest quotation (L1) is determined on the basis of the total cost to BHEL.

(a) FOR FOREIGN PURCHASE:

Total cost to BHEL = Total basic value (including installation, commissioning, training, spares etc.) in foreign currency + FOB charges (if any) + Packing & Forwarding charges (if any) + Cost Insurance Freight (CIF) + Basic Custom Duty (BCD) + Counter Veiling Duty (CVD) + Educational Cess + Special Additional Duty (SAD) + Entry TAX + Service TAX (if applicable) + Loading factors for deviations to commercial terms & conditions.

Note: Exchange rate ruling on the date of Tender opening (Techno-commercial / un-priced Bid) will be considered for converting foreign currency to Indian currency. Exchange rates of banking TT selling will be considered.

No import license will be given by BHEL EDN unless otherwise specifically stated.

(b) FOR INDIGENOUS PURCHASE:

Total cost to BHEL = Total basic value (including installation, commissioning, training, spares etc.) + Packing & forwarding charges + Excise duty + Education cess + sales Tax/VAT + Octroi + Exit/Entry tax + Freight & Insurance + Service Tax (if applicable) + Loading factors for deviations to commercial terms & conditions.

13. FIRM PRICE: Rates quoted should be firm from the date of P.O., to the completion of supply and no enhancement in the rates and changes in the techno-commercial terms will be allowed once the quotation is accepted and order is placed.

If Installation & Commissioning is in vendor's scope, then the price shall remain FIRM till commissioning & handing over of the complete system.

14. TERMS OF PAYMENT:

(a) FOR FOREIGN PURCHASE:

Payment will be made against “**SIGHT DRAFT**” on presentation of documents to our bankers. Payment through LC is also made subject to loading factors as per **Clause 27 (Ai)**. For LC payment bank charges within India will be borne by BHEL and outside India will be to vendor's account.

The payment terms are as follows:

- (i) 100% against complete dispatch documents i.e. AWB / BOL, Invoice, Packing list, Warranty certificate (if applicable), Nil shortage certificate, Certificate of country of origin etc., (where both commissioning & PBG are NOT applicable).
- (ii) 90% against complete dispatch documents i.e. AWB / BOL, Invoice, Packing list, Warranty certificate, Nil shortage certificate, Certificate of country of origin etc., & balance 10 % on submission of Performance Bank Guarantee (PBG) (where PBG only is applicable).
- (iii) 80% against complete dispatch documents i.e. AWB / BOL, Invoice, Packing list, Warranty certificate, Nil shortage certificate, Certificate of country of origin etc., 10% after completion of commissioning & balance 10 % on submission of Performance Bank Guarantee (PBG) (where both commissioning & PBG are applicable).

- (iv) If PBG could not be submitted, vendors can also accept for the final 10% payment, payable after the warranty period + 6 months of claim period against supplementary invoice subject to the completion of commissioning (if applicable). In such cases loading for PBG is not applicable.

(b) FOR INDIGENOUS PURCHASE:

- (i) 100% payment with 30 days credit (where both commissioning & PBG are NOT applicable).
- (ii) 90% basic payment + 100% taxes & duties with 30 days credit & balance 10% basic against submission of PBG (where PBG only is applicable).
- (iii) 80% basic payment + 100% taxes & duties with 30 days credit 10% basic after completion of commissioning & balance 10% basic against submission of PBG (where both commissioning & PBG are applicable).
- (iv) If PBG could not be submitted, vendors can also accept for the final 10% payment, payable after the warranty period + 6 months of claim period against supplementary invoice subject to the completion of commissioning (if applicable). In such cases loading for PBG is not applicable.

15. ADVANCE PAYMENT: Quotations with “Advance payment” without fully securing with equal value of BG is liable for rejection. “Inland Letter of Credit” is not encouraged.

16. PENALTY: Failure to supply within the delivery time as per purchase order will make the vendor liable to an unconditional **penalty of 0.5 % (half percent) per week at the basic price of the goods for the undelivered quantity, subject to a maximum of 10%.**

If pre-shipment inspection is involved, date of issue of pre-shipment call by the vendor along with test certificates / test reports / certificate of conformance / calibration reports as proof of completion will be treated as date of dispatch for the purpose of penalty calculation.

In the absence of reports stated above, actual date of inspection will be considered as date of dispatch for penalty calculation.

Date of receipt / Date of dispatch / Date of LR / Date of Airway bill / Date of pre-shipment inspection call with relevant documents as stated above, whichever is applicable shall be considered as delivery date for the purpose of penalty calculation. BHEL is not liable for delayed OA for opening LC or corrections/amendment to LC asked after opening of LC.

17. PBG: Performance Bank Guarantee (PBG) to be submitted on Rs.100/- non-judicial stamp paper as per the BHEL prescribed format given in **ANNEXURE - E / ANNEXURE - F** for 10% of the basic equipment value obtained from any BHEL member (consortium) banks indicated in **ANNEXURE-G.**

PBG shall be valid for 12 months from the date of commissioning or 18 months from the date of dispatch whichever is earlier. The PBG shall also have 6 months claim period from the date of dispatch / commissioning.

The Bank Guarantee shall be submitted directly to the concerned Purchase Executive by the issuing Bank with their forwarding letter. BHEL will verify independently with the bank to establish the authenticity.

18. WARRANTY: Goods dispatched shall have warranty period of 18 months from the date of dispatch or 12 months from the date of commissioning whichever is earlier or as mentioned in the RFQ.

19. TERMS OF DELIVERY:

(a) FOR IMPORTED PURCHASE:

Price offered shall be for goods packed and delivered **F.O.B.** (named international Airport / sea port) including packing, forwarding, Handling, Ancillary charges like processing of Sight Draft, Letter of credit (L/C) if applicable, negotiation of bank documents, Export declaration, Certificate of origin etc.

Packing shall be Road / Rail / Air / Sea worthy, best suitable for transshipment and to take care of transit damages. If containerized, no. of containers & size of container shall be mentioned. Packing weight (gross & nett) Packing dimensions shall be given prior to shipment to ascertain whether the consignment can be carried on standard cargo in contract or as ODC.

Wooden packing material for all the foreign consignments should be treated as per ISPM-15 & **Fumigation / Phytosanitary certificate** to be submitted to the freight forwarders / BHEL along with the invoice, AWB, packing list etc.

Vendors shall indicate the name of International Airport/ Seaport. The consignment shall be handed over to BHEL approved freight forwarded as mentioned in PO.

Note: Name of International Airport has to be selected from any one of the airports indicated in the table provided in **ANNEXURE – C**.

(b) FOR INDIGENOUS PURCHASE:

Equipment shall be delivered on EX-EDN/BHEL, Bangalore basis, inclusive of freight, packing, insurance & forwarding charges.

Packing shall be Road / Rail / Air / Sea worthy, best suitable for transshipment and to take care of transit damages.

It is preferred to dispatch the consignments through EDN/BHEL approved transporters indicated in **ANNEXURE - D** on Door Delivery basis.

Smaller consignments can be dispatched through Courier services / RPP with the prior approval of the purchasing Executive.

In case of ex-works dispatches, transit insurance shall be arranged by BHEL. Vendor shall intimate the dispatch details to BHEL immediately after effecting shipment, to arrange transit insurance accordingly.

20. DELIVERY REQUIREMENT: In the quotation, earliest firm delivery (number of days or weeks) by which material will be dispatched from the date of Purchase order must be indicated. It is recommended to avoid Quotations with delivery term such as 'ex-stock', 'subject to prior sale', or 'delivery at the earliest'. Date of BHEL PO is the reference for all purposes.

21. VALIDITY: Quotation should remain valid for a period of **90 days** from the date of technical bid opening. Offer with Non-conformance is liable for rejection.

22. POST-ORDER REQUISITES:

- (a) Vendor shall give an Order Acknowledgement indicating the delivery date within one week of receipt of PO.
- (b) Pre-shipment inspection at vendor's works, if required, will be carried out by BHEL. Required assistance will have to be provided by the vendor at the time of pre-shipment inspection.
- (c) Test certificates, Calibration certificates and warranty certificates as stipulated at the time of ordering shall be furnished.
- (d) Items shall be dispatched by Air/Road/Rail/Sea worthy packing. Any damage and later rejection, due to poor / improper packing shall be to vendor's account.
- (e) Any damage/rejection should be made good or replaced immediately without any extra cost to BHEL such as freight, duties, taxes etc. The liability is restricted to the value of the order.
- (f) Wherever commissioning is involved, it shall be carried out by the vendor's qualified engineers. Scope of work includes installation, commissioning and start-up trials till satisfactory performance level is reached as certified by BHEL.
- (g) BHEL will not be responsible for any loss, damage or injuries to vendor's personnel sustained during installation / commissioning / start-up trials. Vendor shall ensure compliance with all statutory requisites as laid down by local bodies, state & Central Government. Vendor shall indemnify BHEL for all damages/ losses to various personnel during their presence in BHEL's premises for whatever purpose.
- (h) Suitable markings & damage control indicating devices shall be provided where applicable.

23. Equipment shall comply with the standard requirements of ISO 14001 & OHSAS 18001.

24. GENERAL TERMS AND CONDTITIONS GOVERNING REVERSE AUCTION (RA):

- (a) Against this enquiry for the subject item/system with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING ON INTERNET. • For the proposed RA, technically and commercially acceptable bidders only shall be eligible to participate.
- (b) In case of RA, BHEL will engage the services of a service provider for conduct of the RA who will provide all necessary training and assistance to the bidders before commencement of on line bidding on internet.

- (c) Business rules governing the RA will be communicated to the bidders through service provider for compliance.
- (d) Vendors have to fax the Compliance form in the prescribed format (provided by Service provider) before start of RA. Without the compliance, the vendor will not be eligible to participate in the event.
- (e) BHEL will provide a sample calculation sheet (in EXCEL format) which would help the bidders to arrive at "Net Cash outflow to BHEL" considering various price / cost elements like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) etc. for each of the bidders to enable them to arrive at "Net Cash outflow to BHEL (Total Cost to BHEL)" which is the amount the bidder would be bidding during the RA.
- (f) RA will be conducted on scheduled date & time and at the end of event, the lowest bidder value will be known on the network.
- (g) The lowest bidder has to Fax the duly signed "Price Break-up" in prescribed format as provided on case-to-case basis to BHEL through Service provider within 24 hours of Auction without fail.
- (h) Any variation between the on-line bid value and the signed document will be considered as sabotaging the tender process and will invite disqualification of vendor to conduct further business with BHEL, as per the prevailing procedure.

25. REGRET LETTER: In case any vendor is unable to quote, vendor shall send a regret letter without fail. In case of non-receipt of quotations or regret letters for three consecutive enquiries, such vendor is liable to be removed from our vendor list.

26. Any dispute arising out of this, shall be referred to the sole arbitration of Head of Dept. Materials Management of group concerned, BHEL EDN or any other officer nominated by him and his award shall be final and binding on the parties. The venue of the arbitration in all cases shall be Bangalore.

27. Any legal suit in respect of this enquiry lies in the court of Jurisdiction of Bangalore (India) only.

28. LOADING FACTORS:

Loading factors as detailed below will be added to the quoted price (basic) to evaluate the lowest quote for non compliance of BHEL standard commercial terms.

A(i). For non compliance of standard Terms of payment (For Foreign Purchase Orders)

Sl. No.	BHEL standard term	If you quote	Loading factor in % for non-compliance
1	100% against "SIGHT DRAFT" on presentation of dispatch documents to our Bankers (where both commissioning & PBG are not applicable).	Payment through Letter of Credit (LC) with bank charges to respective accounts	10 % x Percentage quoted through LC

2	90% against "SIGHT DRAFT" + 10% against PBG (where PBG only is applicable)	Payment through Letter of Credit (LC) with bank charges to respective accounts	10 % x Percentage quoted through LC
3	80% against "SIGHT DRAFT" + 10% after commissioning +10% against PBG (where both commissioning & PBG are applicable)	Payment through Letter of Credit (LC) with bank charges to respective accounts	10 % x Percentage quoted through LC

A(ii). For non compliance of standard Terms of payment (For Indigenous Purchase Orders)

Sl. No.	BHEL standard term	If you quote	Loading factor in % for non-compliance
1	100% payment with 30 days credit (where both commissioning & PBG are not applicable).	Payment through bank	10 % x percentage quoted through bank / proforma invoice
		Payment against proforma invoice	
2	90% basic payment + 100% taxes & duties with 30 days credit + 10% against PBG (where PBG only is applicable)	Payment through bank	10 % x percentage quoted through bank / proforma invoice
		Payment against proforma invoice	
		100% with 30 days credit & against submission of PBG	Nil
3	80% basic payment + 100% taxes & duties with 30 days credit + 10% after commissioning +10% against PBG (where both commissioning & PBG are applicable)	Payment through bank	10 % x percentage quoted through bank / proforma invoice
		Payment against proforma invoice	
		100% with 30 days credit after commissioning & submission of PBG	Nil

B. For non compliance of Penalty clause for delayed delivery:

Sl. No.	BHEL standard term	If you quote	Loading factor for non-compliance
1	Penalty of 0.5% per week subject to max. of 10% on the basic value of the items not supplied /delayed	Not agreed.	10 %
		5% max., agreed.	5%
		Other than the above.	10% - (minus) agreed max. %

C. For non compliance of Performance Bank Guarantee (PBG):

Sl. No.	BHEL standard term	If you quote	Loading factor for non-compliance
1	PBG for 10% of the basic material cost shall be furnished in the BHEL prescribed format.	Not agreed.	10 %
		5% agreed.	5 %
		Other than the above.	10% - (minus) agreed max. %

D. For non conformance to delivery requirement indicated in the RFQ:

Sl. No.	BHEL standard term	If you quote	Loading factor for non-compliance
1	Delivery requirement as indicated in the RFQ in number of weeks from the date of issue of PO	Not agreed for the stipulated delivery in the RFQ	0.5 % per week up to max., of 10% for the difference in delivery period

E. For non compliance of Warranty:

Sl. No.	BHEL standard term	If you quote	Loading factor for non-compliance
1	18 months from the date of dispatch or 12 months from the date of commissioning whichever is earlier or as indicated in the RFQ	Not agreed.	6%
		Less than 12 months or as indicated in the RFQ	0.5 % per month for the difference in period

F (i) For Non- agreement on delivery at BHEL-EDN (For Foreign Purchase Orders):

Sl. No.	BHEL standard term	If you quote	Loading factor for non-compliance
1	FOB / CIF to nearest international Airport/Seaport	Not agreed for the standard term of delivery	10 %

F(ii) For Non- agreement on delivery at BHEL-EDN (For Indigenous Purchase Orders):

Sl. No.	BHEL standard term	If you quote	Loading factor for non-compliance
1	Ex-EDN/BHEL, Bangalore (Free delivery to EDN/BHEL Bangalore including freight, packing & forwarding charges)	Not agreed for the standard term of delivery	10 %

ANNEXURE - A

COMMERCIAL TERMS (to be enclosed with TECHNO-COMMERCIAL BID)
(for Foreign Purchase Orders)

Sl. No.	Particulars	Bidder's confirmation
1	Price basis: Firm i.e., from the date of PO to completion of supply [Price Variation Clause (PVC) not acceptable]	Acceptable / Not acceptable
2	Terms of Payment: Against "SIGHT DRAFT" on presentation of documents to our bankers. (a) 100% is payable on negotiation of complete set of original documents (where commissioning & PBG are not applicable) (b) 90 % is payable on negotiation of complete set of original documents & balance 10% against submission of PBG (where PBG only is applicable). (c) 80 % is payable on negotiation of complete set of original documents, 10% after commissioning & balance 10% against submission of PBG (where both Commissioning & PBG are applicable). (d) Deviation if any please specify Note: Refer clause 14 (a) above	(a) Acceptable / Not acceptable (b) Acceptable / Not acceptable (c) Acceptable / Not acceptable
3	BHEL's penalty clause: (a) Delay in delivery as per PO delivery date will result in penalty of 0.5 % per week subject to maximum of 10% on the value of the items not vendor/delayed. (b) Deviation if any Please specify	(a) Acceptable / Not acceptable (b)
4	Performance Bank guarantee: PBG for 10% of the basic material cost shall be furnished in the BHEL prescribed format as detailed in clause 17.	Yes / No
5	Terms of delivery: (a) F.O.B international Airport/Seaport as per clause 19 (a) (Indicate name of International Airport/Seaport) (b) Deviation if any Please specify	(a) Acceptable / Not acceptable (b)
6	Warranty: (a) 18 months from the date of dispatch or 12 months from the date of commissioning (b) Deviation if any Please specify	(a) Acceptable / Not acceptable (b)
7	Delivery period: Indicate number of weeks from the date of issue of Purchase order	_____Weeks
8	Validity: (a) Quotation should remain valid for a period of 90 days from the due date (b) Deviation if any Please specify	(a) Acceptable / Not acceptable (b)
9	Bank charges (If applicable): (a) Bank charges within India is to BHEL account and outside India is to Vendor's account (b) Deviation if any Please specify	(a) Acceptable / Not acceptable (b)
10	Weight and Dimension of consignment with packing	Furnished / To be furnished

Signature of tenderer / with seal

ANNEXURE - B
COMMERCIAL TERMS (to be enclosed with TECHNO-COMMERCIAL BID)
(For Indigenous Purchase Orders)

Sl. No.	Particulars	Bidder's confirmation
1	Price basis: Firm i.e., from the date of PO to completion of supply [Price Variation Clause (PVC) not acceptable]	Acceptable / Not acceptable
2	Excise duty: If applicable indicate %.	Applicable / Not applicable ED: _____%
3	Sale tax: If applicable indicate %	Applicable / Not applicable (a) VAT _____% (b) CST _____% against form C
4	Payment terms: (a) 100% payment with 30 days credit (where commissioning & PBG are not applicable) (b) 90 % basic payment + 100% taxes, duties & freight charges with 30 days credit & balance 10% against submission of PBG (where PBG only is applicable) (c) 80 % basic payment + 100% taxes, duties & freight charges with 30 days credit, 10% after commissioning & balance 10% against submission of PBG (where both commissioning & PBG are applicable) (d) Deviation if any please specify Note: As per clause 14 (b)	(a) Acceptable / Not acceptable (b) Acceptable / Not acceptable (c) Acceptable / Not acceptable (d)
5	BHEL's penalty clause: (a) Delay in delivery as per PO delivery date will result in penalty of 0.5 % per week subject to maximum of 10% on the basic value of the items not vendor/delayed. (b) Deviation if any Please specify	(a) Acceptable / Not acceptable (b)
6	Performance Bank guarantee (PBG): PBG for 10% of the basic material cost shall be furnished in the BHEL prescribed format as per clause 17.	Yes / No
7	Terms of delivery: (a) Ex EDN / BHEL, Bangalore (Free delivery to EDN/BHEL Bangalore including freight, packing & forwarding charges) (b) Deviation if any Please specify	(a) Acceptable / Not acceptable (b)
8	Warranty: (a) 18 months from the date of dispatch or 12 months from the date of commissioning (b) Deviation if any Please specify	(a) Acceptable / Not acceptable (b)
9	Delivery period: Indicate number of weeks from the date of issue of Purchase order	_____Weeks
10	Validity: (a) Quotation should remain valid for a period of 90 days from the due date (b) Deviation if any Please specify	(a) Acceptable / Not acceptable (b)
11	Bank charges (If applicable): (a) All Bank charges to vendor's account (b) Deviation if any Please specify	(a) Acceptable / Not acceptable (b)
12	Weight and Dimension of consignment with packing	Furnished / To be furnished

Signature of tenderer / with stamp

ANNEXURE - C

LIST OF INTERNATIONAL AIRPORTS

Sl. No	Country	Air Ports
1	Austria	Vienna, Linz, Graz
2	Australia	Sydney, Melbourne, Perth
3	Belgium	Antwerp, Brussels
4	Canada	Toronto, Montreal
5	China	Shangai
6	Cyprus	Lamaca
7	Czech Republic	Prague (Via Frankfurt)
8	Denmark	Copenhagen
9	Egypt	Cairo
10	Finland	Helsinki
11	France	Paris (Rossy), Lyon
12	Germany	Darmstadt, Manihem, Nurnberg, Hamburg, Stuttgart, Munich, Koln, Dusseldorf & Hannover, Frankfurt, Berlin
13	Hongkong	Hongkong
14	Italy	Rome, Milan, Turin, Bologna, Florence
15	Ireland	Dublin
16	Isrel	Telaviv
17	Japan	Tokyo, Osaka
18	Malaysia	Kaulalampur, Penang
19	Neatherlands	Amsterdam, Rotterdam
20	Newzealand	Auckland
21	Norway	Oslo
22	Oman	Muscat
23	Philiphines	Manila
24	Romania	Bucharest
25	Russia	Moscow
26	Saudi Arabia	Riyad
27	Singapore	Singapore
28	Slovakia	Bartslowa
29	South Africa	Johannesburg, Durban
30	South korea	Kimpo
31	Spain	Barcelona
32	Sweden	Stockholm, Gothenburg, Milano
33	Switzerland	Basle, Zurich, Geneva
34	Taiwan	Taipei
35	U.A.E.	Dubai
36	U.K.	Landon (Heathrow), Newcastle, Oxford, Cheltham, Bristol, Wellingborough, Birmingham, East Midland, Manchester, Leeds, Glasgow.
37	U.S.A.	Newyork, Chicago, Sanfrancisco, Los Angeles, Atlanta
38	Ukraine	Kiev

ANNEXURE-D

BHEL EDN APPROVED TRANSPORTERS FOR INLAND ROAD TRANSPORTATION

1. M/s Awagaman Road Carriers Ltd., Bangalore. (AWG)
2. M/s BLR India pvt., Ltd., Bangalore. (BLR)
3. M/s Delhi Assam Roadways corporation Ltd., Bangalore. (DRL)
4. M/s Indo Arya Central transport Ltd., Bangalore. (IACT)
5. M/s Prakash parcel Services, Bangalore. (PPS)
6. M/s Road Carrier of India, Bangalore. (RCI)
7. M/s Union Roadways Ltd., Bangalore. (URL)

ANNEXURE-E**PERFORMANCE BANK GUARANTEE
(FOR FOREIGN PURCHASE ORDERS)****BANK NAME AND ADDRESS**

Bharat Heavy Electricals Limited (BHEL),
Electronics Division,
PB No. 2606,
Mysore Road,
BANGALORE- 560 026
INDIA

Dear Sir,

Ref: CONTRACT PERFORMANCE GUARANTEE.

WHEREAS you have entered into a contract reference No PO NO. _____ with M/s _____ having its registered office at _____ for the supply of _____ as detailed in your purchase order No. _____ which is hereinafter referred to as "the said contract" and WHEREAS M/s _____ has undertaken to produce a Bank Guarantee for 10% (Ten Percent) of _____ the contract price amounting _____ to _____ (_____) to secure its obligations to Electronics Division, BHEL having its registered office at New Delhi for the performance of the contract including the warranty of the equipment supplied, We _____ Bank _____ hereby expressly, irrevocably and unreservedly undertake and guarantee as principal obligors on behalf of M/s _____ that in the event Bharat Heavy Electricals Ltd. (B.H.E.L.) declares to us in writing that M/s _____ has not fulfilled any obligation according to the contractual obligation of the said contract, to pay you on demand and without demur to Bharat Heavy Electricals Ltd., Electronics Division , Mysore Road, P.B.No. 2606, Bangalore-560 026, India an amount of _____ (in words _____) subject to as may be determined below:

- 1) Notwithstanding any right M/s. _____ may have directly against you or _____ any disputes raised by M/s _____, Your written demand shall be conclusive evidence to us that repayment is due under the terms of the said contract and shall be binding on us.
- 2) We shall not be discharged or released from this undertaking and Guarantee by any arrangements, variations made between you and M/s. _____ with or without our consent and Knowledge or by any alterations in the obligations of M/s. _____ by any forbearance whether as to payment, time, performance or otherwise.
- 3) This guarantee shall remain valid until the end of twenty-four weeks after the close of the warranty period or until the same is reported by BHEL to us whichever is earlier.
- 4) We agree and undertake not to revoke this guarantee during its validity unless discharged in writing by you subject to the provision of clause (7) below.

- 5) This guarantee shall be a continuing guarantee subject to the foregoing and shall not be discharged by any change in the constitution of the Bank or M/s. _____.
- 6) This guarantee shall be governed by and constructed in accordance with the Laws of India.
- 7) At any time _____ Bank may render this guarantee null and void by paying to Bharat Heavy Electricals Ltd. the full amount being _____ (in _____ words _____)

For and on behalf of Bank
by its Authorised Signatory

Note:

- (1) To be executed in INR 100 Non-Judicial stamp paper by any authorized Indian Bank.
- (2) To be submitted directly by banker to concerned executive in purchase dept., Please give BHEL address to banker.
- (3) Do not enclose with Bank document.
- (4) Any Modification & omissions to this are not permitted

ANNEXURE - F**PERFORMANCE BANK GUARANTEE
(FOR INDIGENOUS PURCHASE ORDERS)**

THIS DEED OF GUARANTEE made and executed on the _____ day of _____ (year), by the _____ (Bank), registered under the Companies Act 1956/Nationalised Bank constituted under the Banking Companies (acquisition and transfer of undertakings) Act constituted under the State Bank of India Act / Subsidiary Banks Act, having its registered / head office at _____ represented herein by its Branch Manager / authorised representative Sri. _____ & Sri. _____ (Hereinafter called 'guarantor ' which term shall mean and include its successors and assigns)

IN FAVOUR OF BHARAT HEAVY ELECTRICALS LIMITED

_____ (Buyer's Name), a company registered under the companies Act, 1956 having its registered office at BHEL House at Siri Fort , New Delhi-100 049 and its Electronics Division at Mysore road, Bangalore-26 (hereinafter referred to as the 'Company' Which term shall include its successors and assigns):

Whereas the company has placed an order on _____ (State the name of the company / firm and its address) (hereinafter referred to as the 'Supplier' which term shall mean and include its liquidators, successors and assign) for the supply of system under order / Contract No _____ Dt _____.

AND WHEREAS the supplier has agreed to supply the materials and carryout the works as detailed and in accordance with the terms set out in the said order/contract.

AND WHEREAS the company is not required to pay to the supplier a sum of Rupees _____ being the 10% of the value of the goods supplied / Works performed / Services rendered under the said order / contract between the supplier and the company, till the company is satisfied with the mechanical Warranties and the performance standards stipulated in the said order / contract between the company and the supplier has been duly fulfilled, except against a Bank Guarantee for the said sum of Rs _____ in favour of the company by reputed Bank, in which case the company has agreed to make payment to the supplier of the said sum of Rupees _____ being (...%) of the value of the goods supplied / Works performed / Services rendered under the agreement between the supplier and the company and the Guarantor has at the request of the supplier, agreed to furnish this Guarantee subject to the terms and conditions stated below:

NOW THIS DEED WITNESSES THAT IN pursuance of the above said agreement, the guarantor hereby agrees and covenants With company is as follows :-

- 1) That during the period this contract of Guarantee remains effectual, the guarantor shall be liable in respect of the amount due and owing to the company in respect of the payments to the extent of Rs _____ (in words) _____ against any loss or damage caused to or suffered by the company by reasons of any breach of the terms of the said order / contract / Agreement by the supplier.
- 2) The Guarantor hereby undertakes to pay the amounts due and payable under this guarantee without any demur, merely on demand from the company intimating that the amount claimed is due by way of loss or damage caused to or suffered or would be caused or suffered by the supplier of any terms contained in the said order / contract. Any such demand made on the guarantor shall be conclusive as regards the amount due and payable by the Guarantor irrespective of the fact whether the Contractor / supplier admits or denies.

- 3) The Guarantor further agrees that the agreement herein contained shall remain in force and effect till all the supplies to be made / Works to be performed / Services to be rendered under the said order / contract / agreement are completed to the entire satisfaction of the company or till company certifies that the terms and conditions of the said order / contract / agreement have been fully and properly carried out by the said supplier and accordingly discharges the Guarantee. Unless a demand or claim under this guarantee is made on the guarantor in writing on or before the expiry of claim period indicated in clause 6 below , the guarantor shall be discharged from all the liability under this guarantee thereafter.
- 4) The guarantor further agrees with the company that the company shall have the fullest liberty without the consent of the guarantor and without effecting in any manner the obligations of the guarantor hereunder to vary any of the terms of the said order / contract / agreement or extend the time of performance by the said supplier from time to time or refrain from exercising the power exercisable by the company against the said supplier or to forebear or omit to enforce any of the terms and conditions relating to the said order / contract / agreement, and the guarantor shall not be relieved of its liability in whole or in part , by reason of any act, commission or forbearance on the part of the company or by reason of any such variation, or extension being granted to the said supplier or by reason of any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving the guarantor.
- 5) The guarantor undertakes not to revoke this guarantee during its currency except with the previous consent of the company in writing.
- 6) Notwithstanding anything herein above contained, the liability of the guarantor under these presents is restricted to Rs_____. The guarantee shall be in force till its expiry on _____ unless a demand is made on the guarantor within SIX months from the date of expiry, all the liability of the guarantor under this guarantee shall stand fully discharged. The decision of the claimant in regard to breach of contract is final and binding on the Bank.

IN WITNESS whereof, the guarantor, acting through it authorised representative has executed this deed of Guarantee on the day, month and year first above written.

(Seal of the Bank to be affixed)

WITNESS

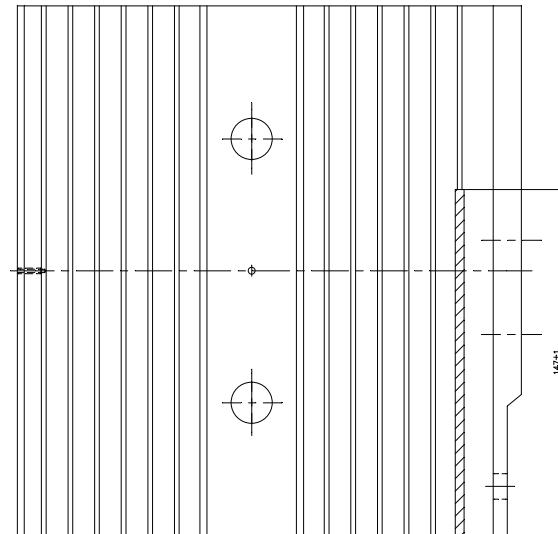
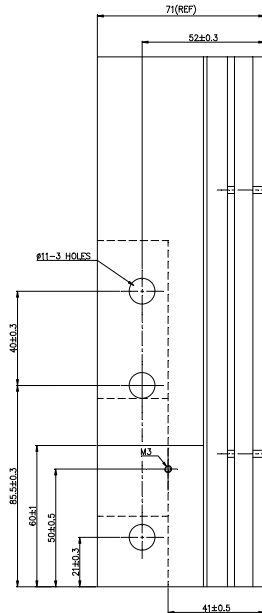
1.

2.

ANNEXURE - G**BHEL MEMBER BANKS (CONSORTIUM BANKS)**

PBG SHALL BE ISSUED FROM THE FOLLOWING BANKS OR THEIR BRANCH OFFICES ONLY


Sl. No.	Bank name
1	State Bank of India
2	Canara Bank
3	Punjab National Bank
4	Bank of Baroda
5	State Bank of Hyderabad
6	Corporation Bank
7	Syndicate Bank
8	State Bank of Travancore
9	ABN Amro Bank N.V.
10	Deutsche Bank AG
11	HDFC Bank Ltd.
12	CITI Bank N.A.
13	Standard Chartered Bank
14	ICICI Bank Ltd.
15	IDBI Bank Ltd.
16	HSBC Ltd.
17	Kotak Mahindra Bank Ltd.
18	Indian Bank
19	Oriental bank of Commerce
20	UCO Bank
21	Central Bank of India
22	The Federal Bank Ltd.



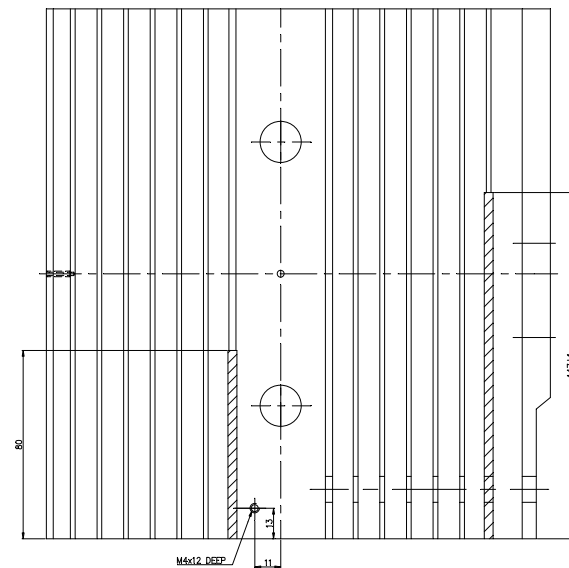
VIEW-X

NOTE :-

1. FLATNESS ON 80x80 W.R.T CENTER DIA 3.1 HOLE.
2. ALL THE MACHINED EDGES SHALL BE DEBURRED.
3. MILLED SURFACES SHALL BE PROTECTED BY COVERING WITH HARD CARD BOARD PAPER TO AVOID SCRATCHES, DENTS, ETC.
4. MACHINED SURFACES SHALL BE FREE FROM OIL/GREASE. STAINS SHALL BE VAPOUR DEGREASED.

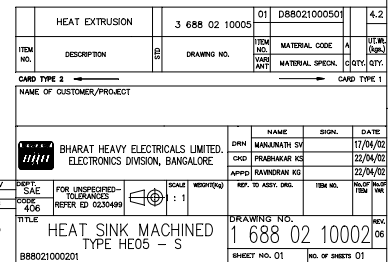
01	HEAT EXTRUSION		3 688 02 10005	01	D88021000501		4.2
ITEM NO.	DESCRIPTION	ID	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	(TRG) REF.
				DATE AMT	MATERIAL SPEC.	COPY	STY.
CARD TYPE 2 ←				→ CARD TYPE 1			
NAME OF CUSTOMER/PROJECT							
 BHARAT HEAVY ELECTRICALS LIMITED. ELECTRONICS DIVISION, BANGALORE.							
DRN	NAME	SIGN.	DATE				
SAHSNI UK			6.4.96				
CO PRODUCTION NO			6.4.96				
APPROV	NAME		DATE				
DO NOT ASSESS, SIGN		ITEM NO.	REV				
DRAWING NO.				NOV. 09			
1 688 02 10001							
SHEET NO. 01				NO. OF SHEETS 01			
10		11				12	

INVENTORY NO.	SIGN & DATE	REF. DRG.NO.
---------------	-------------	--------------



NOTE :-

1. FLATNESS ON 80x80 SQUARE W.R.T CENTER ± 3.1 HOLE.
2. ALL THE MACHINED EDGES SHALL BE DEBURRED.
3. MILLED SURFACES SHALL BE PROTECTED BY COVERING WITH HARD CARD BOARD PAPER TO AVOID SCRATCHES, DENTS, ETC.
4. MACHINED SURFACES SHALL BE FREE FROM OIL/GREASE. STAINS SHALL BE VAPOUR DEGREASED.



REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED			
						REV. 06	20/06/00	ALTERED MANJUNATH SV CHECKED RAVINDRAN KG APPROVED RAVINDRAN KG	REV. 05	05/07/00	ALTERED MANJUNATH SV CHECKED NAGARAJ K APPROVED RAVINDRAN KG	REV. 04	29/06/00	ALTERED MARUTHI CHECKED NAGARAJ K APPROVED RAVINDRAN KG	REV. DATE	20/06/00	ALTERED MARUTHI CHECKED NAGARAJ K APPROVED RAVINDRAN KG	REV. 02	02/07/00	ALTERED MANJUNATH SV CHECKED PRABHAKAR KS APPROVED RAVINDRAN KG	REV. 01	06/06/00	ALTERED MANJUNATH SV CHECKED NAGARAJ K APPROVED RAVINDRAN KG
								#13 HOLE POSITION REVISED DIMM 97.5 WAS 96.5 NOTE:5 DELETED.						AT 0-3 #13 WAS 341 AT 0-3 DIMM 43.2 ADDED AT 0-3 DIMM 48 ADDED. AT F-10 DIMM FLATNESS ERROR WAS FOUND. AT D-2 (6MM) ALTERED.			#11 HOLE WAS ALSO 0.5 DEEP DIMM 80 WAS 80 AT D-8			DIMM 193X ADDED DIMM 97.5 ADDED			AT F-10 NOTE 5 ADDED

2 660 MD 02088
DRAWING NO. FIRST ANGLE PROJECTION

2

3

4

5

A

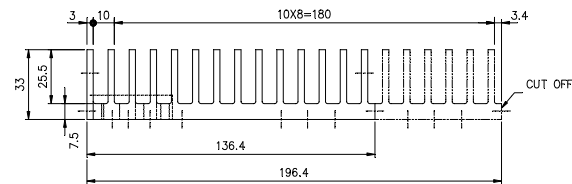
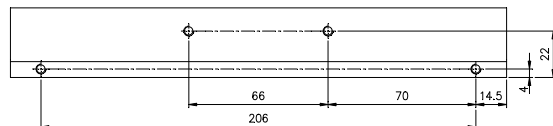
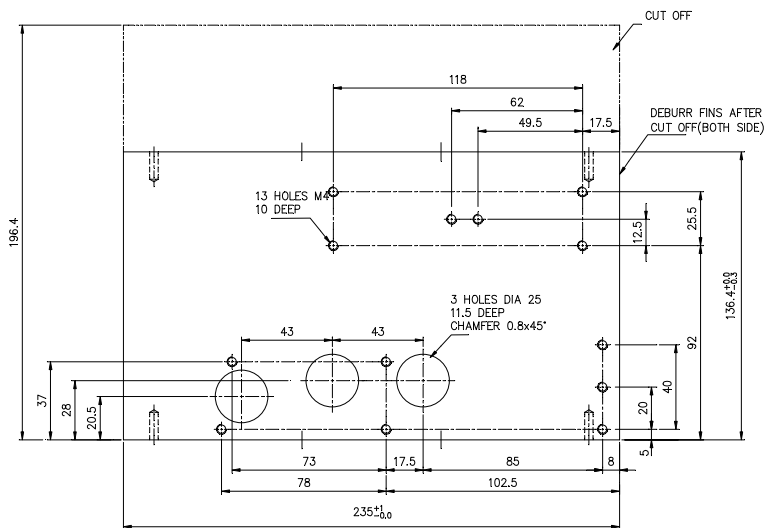
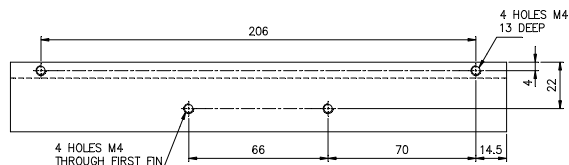
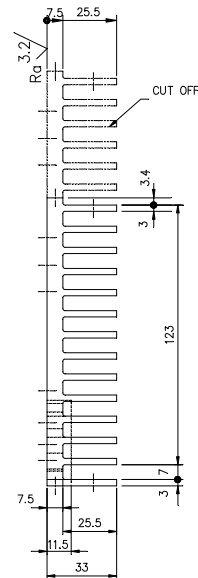
B

C

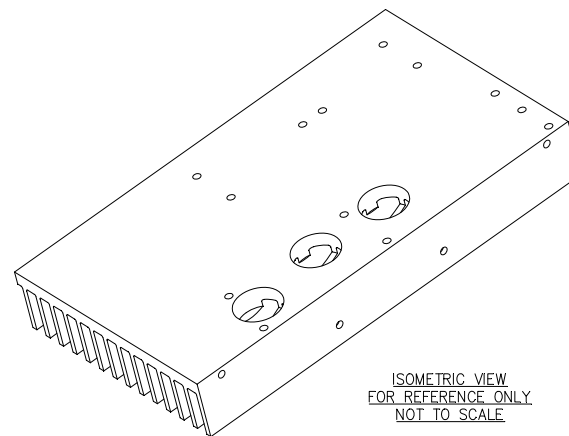
D

3

F



HEAT SINK EXTRUSION



ISOMETRIC VIEW
FOR REFERENCE ONLY
NOT TO SCALE

NOTE :- 1.NO BURRS ALLOWEED ON SURFACE AROUND HOLES.
2.PART TO BE CAREFULLY HANDLED TO PREVENT DAMAGE.

FINISH: – NATURAL

01	HEAT SINK EXTRUSION 235Lg.		AFCOSET TYPE No. 196 L.W.		CUG980011022				2.20
ITEM NO.	DESCRIPTION	STD	DRAWING NO.	ITEM NO.	MATERIAL CODE	A		QUANTITY	UT.Wt. (kgs.)
				VARI	MATERIAL SPECN.	C			QTY.

CARD TYPE 2 ←

CARD TYPE 1

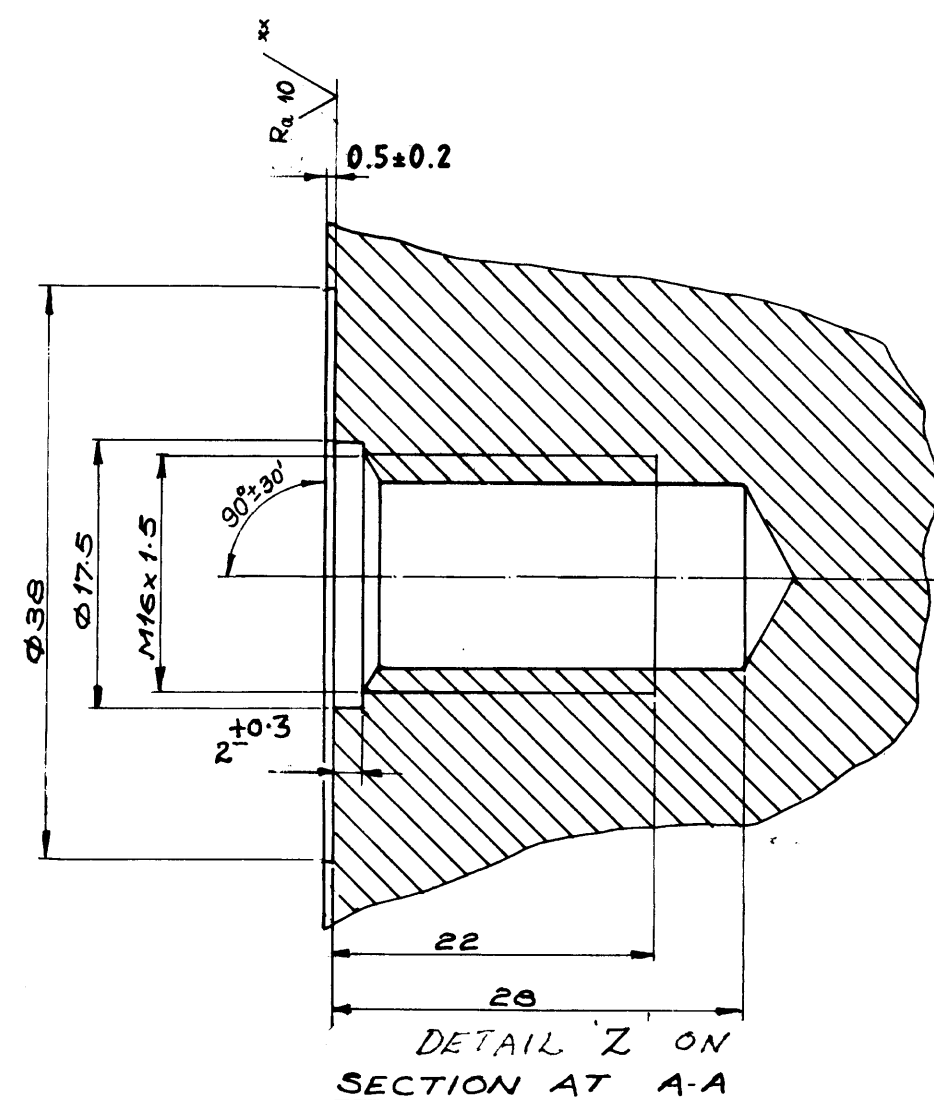
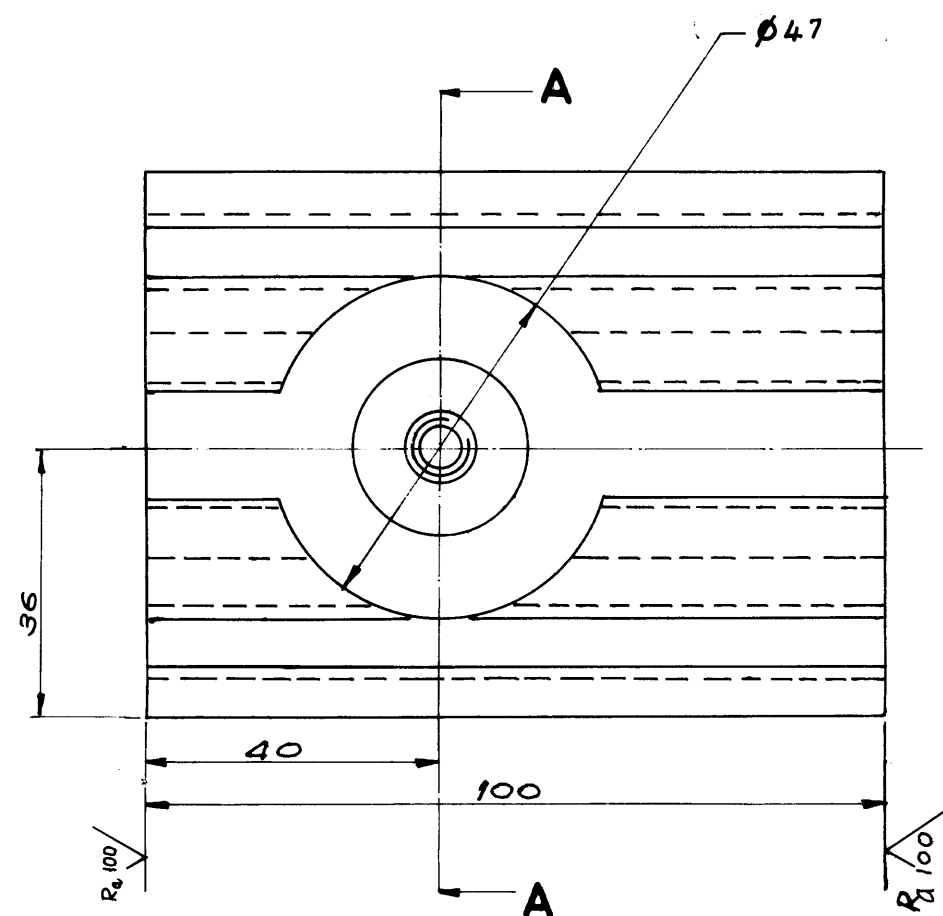
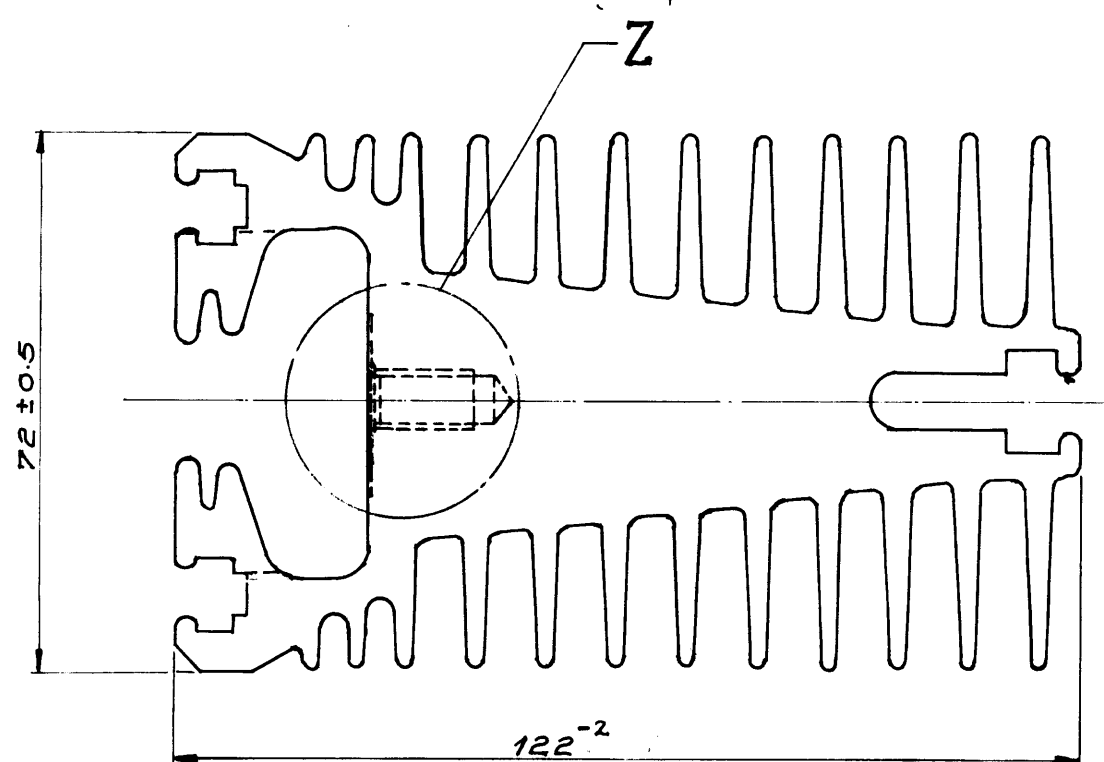
	BHARAT HEAVY ELECTRICALS LIMITED			DRN	NAME	SIGN.	DATE	No OF VAR
	ELECTRONICS DIVISION, BANGALORE			GKD	K.NAGARAJU		19.07.89	
				APPD	M.BALGOPAL		20.7.89	
					G.V.P		25.07.89	
DEPT.	SAE	FOR UNSPECIFIED-TOLERANCES	SCALE	WEIGHT(Kg)	REF. TO ASSY. DRG.		ITEM NO.	No OF ITEM
CODE	406	REFER ED 0230499	1:1.5		1 660 MD 02070		01	
TITLE				DRAWING NO.				REV.
CN9087631049				2 660 MD 02088				07
				SHEET NO. 01		NO. OF SHEETS 01		

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

91005-222669-2

DRAWING NO.



SCALE 2:1

XX - BORED TOLERANCE WITHIN THE SURFACE DEPTH
M/C SURFACE SHALL BE PROTECTED BY COVERING WITH A CLEAN CARDBOARD

QTY.	No. OFF	UNIT OF QTY.	DESCRIPTION	ITEM NO.	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	UNIT Wt. (Kg)	BMI/GRSP	ZONE
VARI-ANT	VARI-ANT	RM UNIT QTY.		NO.		VARI-ANT	MATERIAL SPECN.	C	QUANTITY		
			HEAT SINK PROFILE	01	2-661-23-00002	01					

CARD TYPE 2

CARD TYPE 1

ADDITIONAL INFORMATION 2GE-464-072-0001-034		TYPE OF PRODUCT THYRISTOR STACK-6QB-11; LL-01	
STATUS OF DRAWING DEVELOPMENT.		OR NAME OF CUSTOMER/PROJECT	
DISTRIBUTION OF PRINTS		Bharat Heavy Electricals Limited. CONTROL EQUIPMENT DIVISION, BANGALORE.	
OFFICE COPY 1			
PROD. PLANNING 1			
TECH. SECTION 1			
MATL. PLANNING 1			
DEVELOPMENT 2			
DEPT. C.E.D	CODE	SCALE 1:1 & 2:1	WEIGHT (Kg)
TITLE HEAT SINK TYPE : LLO1		REF. TO ASSY.DRG. 1-699-23-50001	
DIMENSIONS TO BE CONTROLLED WITHIN LIMITS AS SHOWN MACHINING TOLERANCE ± 0.25 M.M. UNLESS OTHERWISE SHOWN NON-MACHINING TOLERANCE ±		DRAWING NO. 2-699-23-50016	
SHEET NO.		NO. OF SHEETS.	

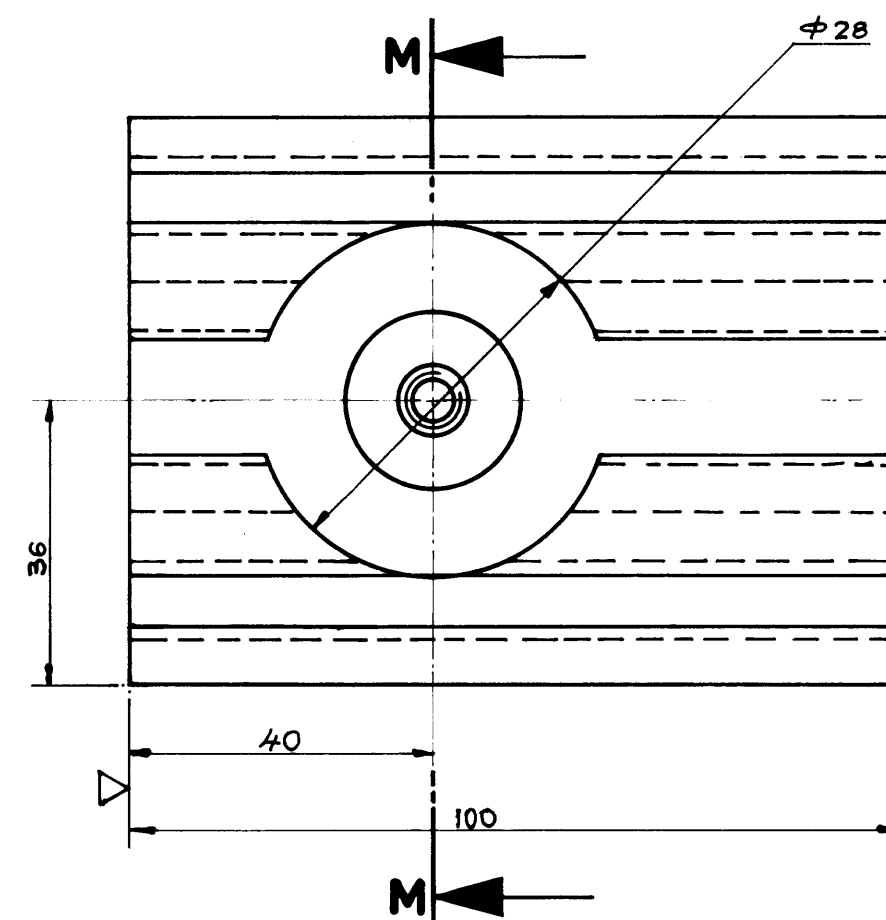
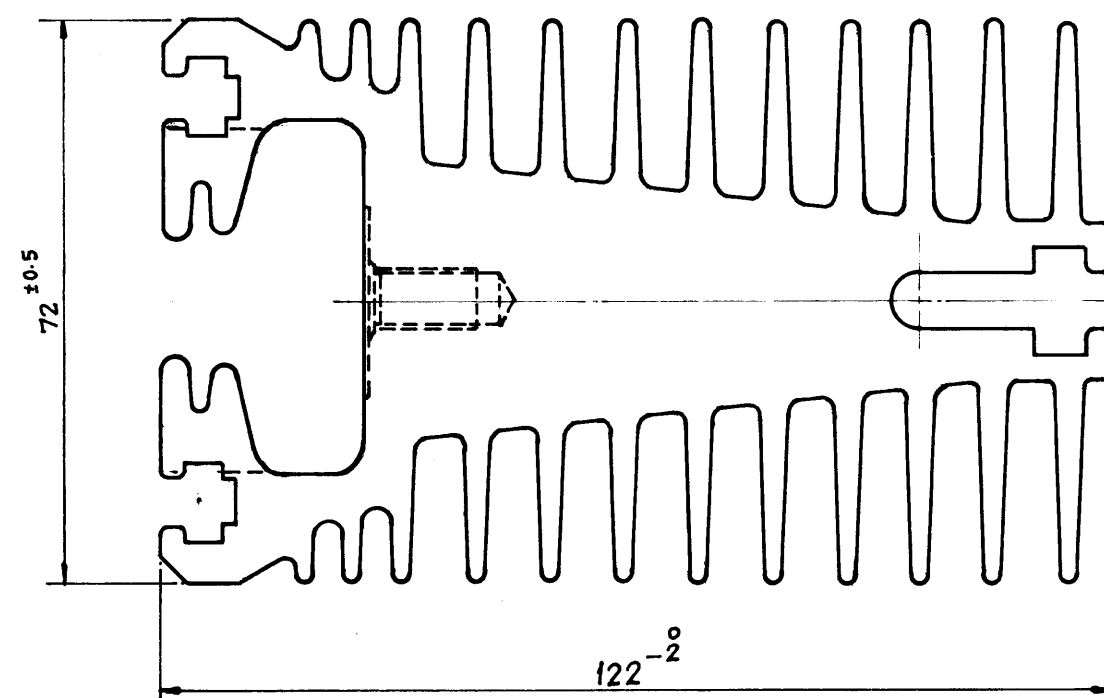
SIZE A2

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

2-699-23-50017

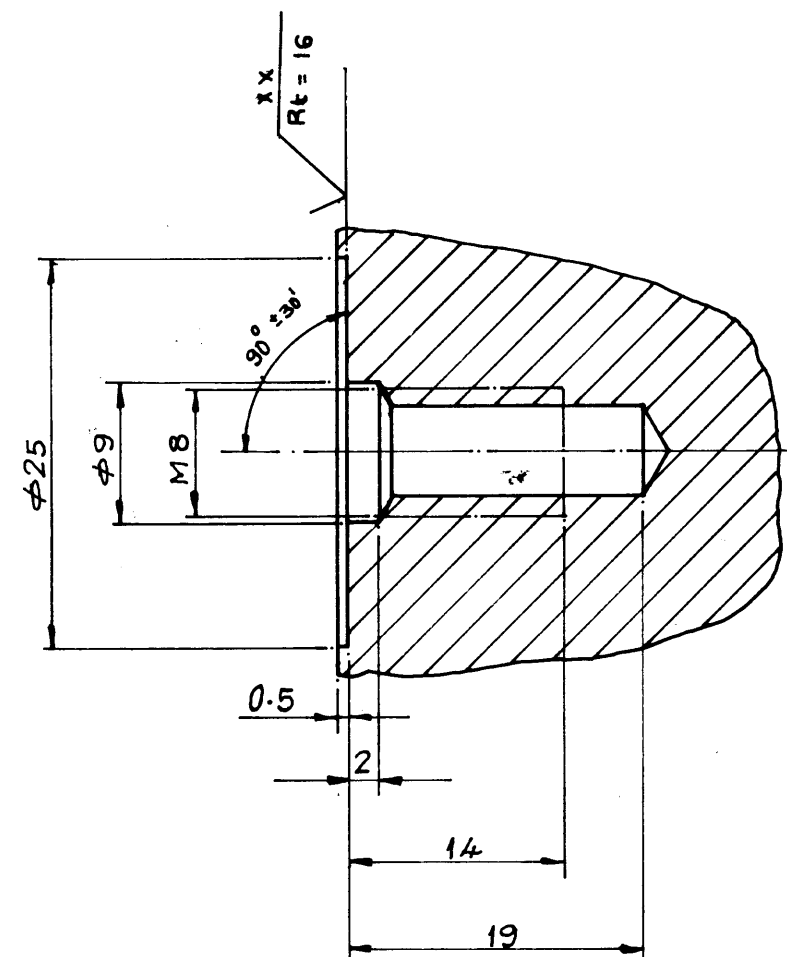
DRAWING NO.



NOTE: ASSEMBLY INSTRUCTIONS;

XX- USE EMERY ON THE HEAT SINK AND DEVICE CONTACT SURFACE. WIPE THE SURFACE WITH TRI CHLORO ETHYLENE. SPRAY CROMOLIN-B. HEAT SINK AND DEVICE SHOULD BE ASSEMBLED IMMEDIATELY AFTER SPRAYING CROMOLIN-B.

OPEN TOLERANCE AS PER AA0230208 OR IS: 2102 UNLESS OTHERWISE SHOWN.



SECTION ON 'MM'
SCALE 2:1

			HEAT SINK PROFILE	01	2-661-23- 00002	01								
QTY.	No. OFF	UNIT OF QTY.	DESCRIPTION	ITEM NO.	STD.	DRAWING NO.	ITEM NO.	MATERIAL CODE	A.	COMP / GROUP	UNIT Wt. (Kg)	BM/GRSP	D1	ZONE
VARI- ANT	VARI- ANT	RM UNIT QTY.					VARI- ANT	MATERIAL SPECN.	C.		QUANTITY			
CARD TYPE 2			CARD TYPE I											

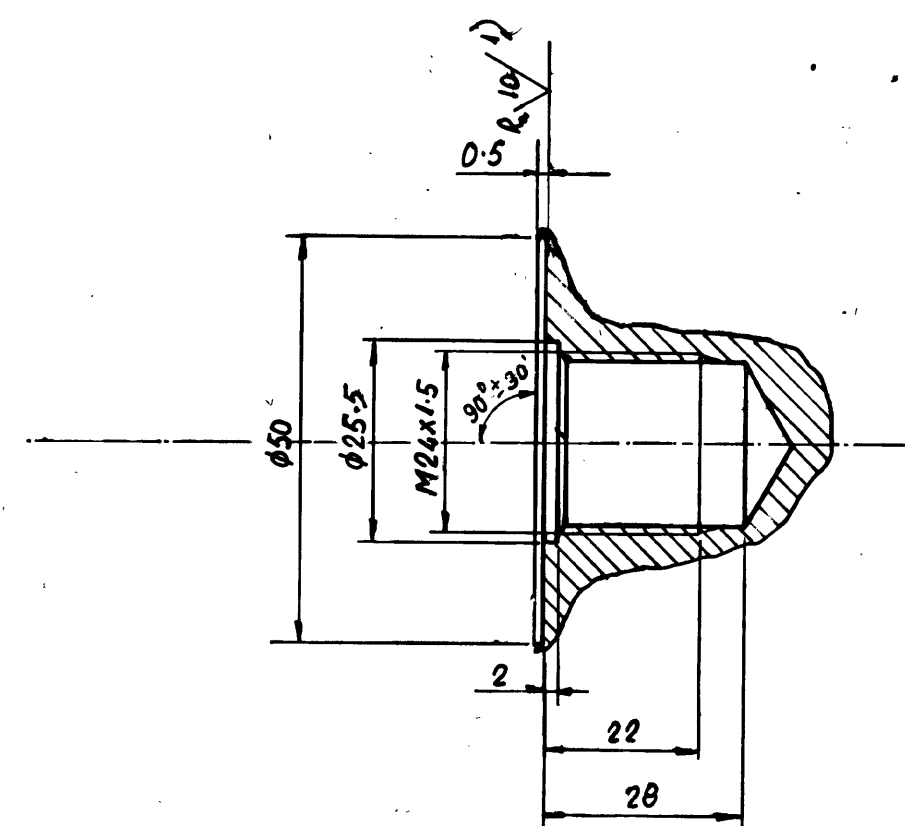
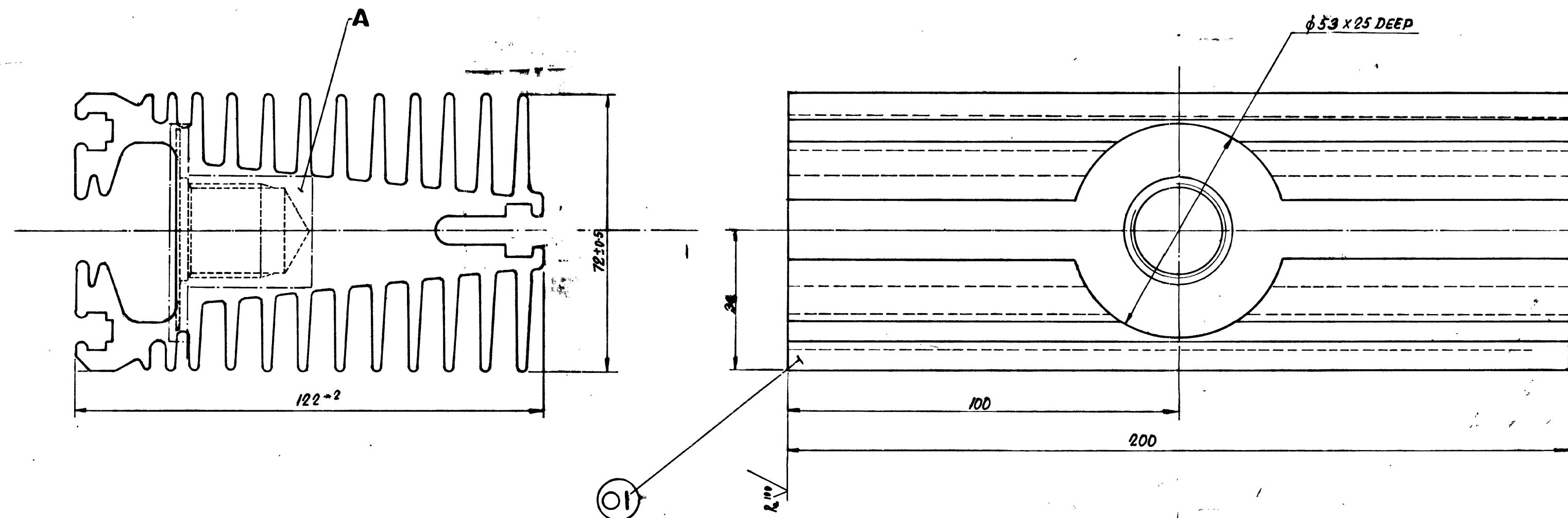
CARD TYPE 2		CARD TYPE 1	
ADDITIONAL INFORMATION 2 GE 464 072.0001.00-03		TYPE OF PRODUCT THYRISTOR STACK 6QG 11	
STATUS OF DRAWING		OR SITOR SATZ	
DISTRIBUTION OF PRINTS		NAME OF CUSTOMER/PROJECT	
OFFICE COPY 1		BHARAT HEAVY ELECTRICALS LIMITED.	
PROD. PLANNING SUB ASSY 1		CONTROL EQUIPMENT DIVISION, BANGALORE.	
TECH. SECTION 1		DEPT. SAE	
PCB SUB ASSY + PCB TEST 1		CODE 406	
SUB ASSY ENG 1		SCALE 1:1 & 2:1	
REV. DATE		WEIGHT (Kg)	
02 31.12.94		REF. TO ASSY.DRG.	
ALTERED K.R.S. P. 100		ITEM NO.	
CHECKED K.G.R.		18/12/78	
ZONE E4		NOTE ADDED & ALTERED. GENERALLY REVISED.	
TITLE		HEAT SINK TYPE: FL-01	
CN9068500015		DRAWING NO. 2-699-23-50017	
DIMENSIONS TO BE CONTROLLED WITHIN LIMITS AS SHOWN		SHEET NO. 1	
MACHINING TOLERANCE ± 0.25 M.M. UNLESS OTHERWISE SHOWN		NO. OF SHEETS. 1	
NON-MACHINING TOLERANCE ±		SIZE A2	

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

9E00S - E2-669 - 2

ON ONLY

DETAIL 'A'
SCALE:1:1NOTE: 1) SURFACE FINISH ON BORED SURFACE
IS CRITICALTHE BORED SURFACE IS COATED WITH
CRAMOLIN B AFTER MACHINING

QTY	NO. OFF	UNIT OF QTY.	DESCRIPTION	ITEM NO.	STD	DRAWING NO	ITEM NO	MATERIAL CODE	A	COMP / GROUP	UNIT WT (Kg)	BM/CRSP	D1	ZONE
1			HEAT SINK PROFILE 200MM LG.	01		2-661-23-00002	01	CN9037523017			± 2.368 Kg			
VARI-ANT	VARI-ANT	RM UNIT QTY					VARI-ANT	MATERIAL SPECN	C		QUANTITY			

ADDITIONAL INFORMATION		TYPE OF PRODUCT BLOCKING DIODE	
STATUS OF DRAWING		OR	
DISTRIBUTION OF PRINTS		NAME OF CUSTOMER/PROJECT	
O.C. & Q.C.		BHARAT HEAVY ELECTRICALS LIMITED,	
PRODUCTION PLANNING		CONTROL EQUIPMENT DIVISION, BANGALORE.	
MATERIAL PLAN & TECH. SEC.			
PCB ASSY & PCB TEST			
DEVELOPMENT			
REV. DATE ALTERED		DEPT. CODE	
01 16/12/86		CED (00)	
CHECKED		SCALE 1:1	
ZONE		WEIGHT (Kg)	
		REF. TO ASSY. DRG.	
		2-699-23-50039	
		ITEM NO.	
		01	
		TITLE	
		HEAT SINK MACHINED	
		TYPE: NHOI	
		DIMENSIONS TO BE CONTROLLED WITHIN LIMITS	
		AS SHOWN	
		MACHINING TOLERANCE ± 0.25 MM UNLESS	
		OTHERWISE SHOWN	
		NON-MACHINING TOLERANCE ±	
		CARD CODE	
		DRAWING NO	
		2 - 699 - 23 - 50038	
		SHEET NO	
		NO OF SHEETS	

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It must not be used directly or indirectly in any way detrimental to the interest of the Company

SIGN. AND DATE REF. DRG. NO

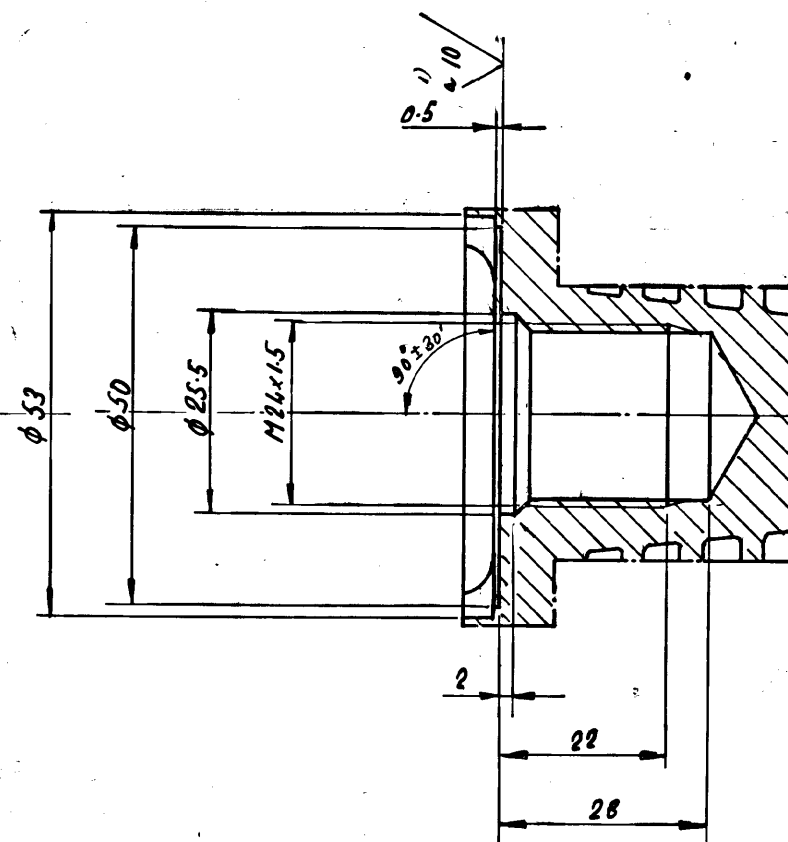
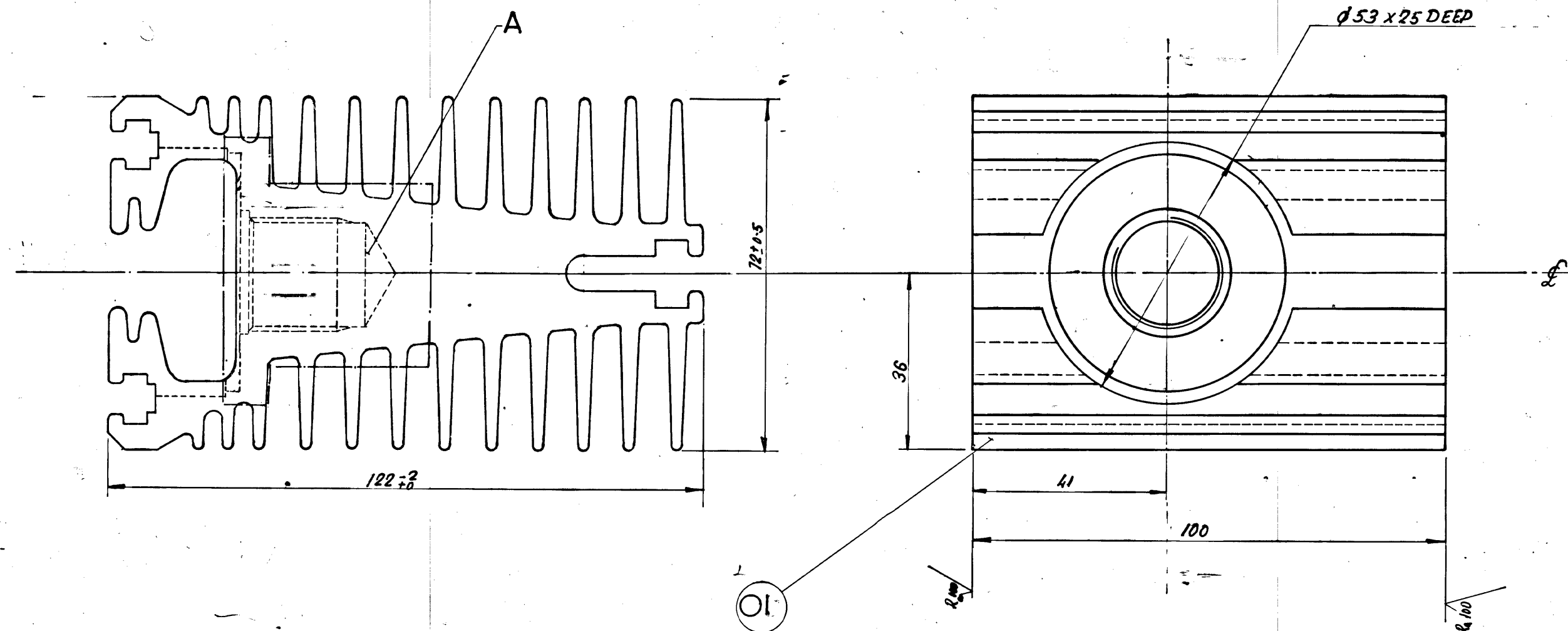
INVENTORY NO.

SIZE: A0

FIRST ANGLE PROJECTION


ALL DIMENSIONS ARE IN MM

DRAWING NO. 2-699-23-50051

DETAIL - A
SCALE-1:1

NOTE: 1) SURFACE FINISH ON THE BORED SURFACE IS CRITICAL.
THE BORED SURFACE IS COATED WITH CRAMOLIN B' AFTER MACHINING.

QTY	NO. OFF	UNIT OF QTY	DESCRIPTION	ITEM NO.	STD	DRAWING NO.	ITEM NO.	MATERIAL CODE	A	COMP / GROUP	UNIT Wt (Kg)	BM/GRSP	DT	ZONE
VARI-ANT	VARI-ANT	RM UNIT QTY						MATERIAL SPECN	C		QUANTITY			
			HEAT SINK PROFILE 100MMLG	01		2-661-23-00002	01	CN3097523017			1.183			

ADDITIONAL INFORMATION		TYPE OF PRODUCT						
STATUS OF DRAWING		OR						
DISTRIBUTION OF PRINTS		NAME OF CUSTOMER/PROJECT						
OFFICE COPY	1							
PROD. PLANNING	1							
TECH. SEC & TOOL CRIB	1+1							
MATERIAL PLANNING	1							
DEVELOPMENT SECTION 2		BHARAT HEAVY ELECTRICALS LIMITED.						
		CONTROL EQUIPMENT DIVISION, BANGALORE.						
REV.	DATE	ALTERED	DEPT.	CODE	SCALE	WEIGHT (Kg)	REF. TO ASSY. DRG.	ITEM NO.
01	25/2/82	CHECKED			1:1		1-699-23-50021	01
ZONE		DETAIL - A - REDRAWN	TITLE		HEAT SINK MACHINED		DATE	
			TYPE: NH02				15/6/81	
			DIMENSIONS TO BE CONTROLLED WITHIN LIMITS AS SHOWN		CARD CODE		DRAWING NO.	
			MACHINING TOLERANCE ± 0.25 MM UNLESS OTHERWISE SHOWN				2-699-23-50051	
			NON-MACHINING TOLERANCE ±				SHEET NO.	
							NO OF SHEETS	

SIZE A2

