

**Odisha Skill Development Authority
Skill Development & Technical Education Department
Government of Odisha, Bhubaneswar**

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19th January 2023

CORRIGENDUM

(NCB Packages of Phase 7(III) Procurement under ADB Loan: 3539)

**Reference: Invitation for Bids No.: OSDA/WSC/Goods/M-7(III)/2022 dated
30.12.2022**

This Corrigendum is issued regarding the NCB Packages which was uploaded along with IFB issued on date 30.12.2022, as shown in the Table below. The prospective bidders are requested to read Corrigendum carefully before submission of the bid.

For necessary and regular updates, it is advised to keep visiting the project website: www.skillodisha.gov.in or www.worldskillcenter.org

SD/-

**Chief Executive Officer
Odisha Skill Development Authority**

CORRIGENDUM

Sl. No.	Package No & Name	RFP Section / Clause No./Page No	Reference	Bidder's query/item where modification is proposed	OSDA Response/modification
1.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Lift system, Lift shaft structure, Hoisting system and Chain block	No. of persons – 8 with Rated load of 680 kg	The technical specification is modified to: No. of persons – 10 with Rated load of 680 kg
2.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Lift system, Lift shaft structure, Hoisting system and Chain block	Rated speed - Variable speed from 10 m/min to 60 m/min.	The technical specification is modified to: Rated speed - Variable speed from 10 m/min to 36 m/min or more
3.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Lift system, Lift shaft structure, Hoisting system and Chain block	Car Floor Area - 4 m ² (=2 x 2 m)	The technical specification is modified to: Car Floor Area 2.69 m ² (=1.3 x 1.3m) or more
4.	PKG-0058: Training Equipment and units for Facility Technology – Vertical	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Lift system, Lift shaft structure, Hoisting system and Chain block	Car internal height - 2400 mm	The technical specification is modified to: Car internal height - 2200 mm or more

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	Transportation at WSC				
5.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Lift system, Lift shaft structure, Hoisting system and Chain block	Door size - 900 mm x 2100 mm	The technical specification is modified to: Door size - 900 mm x 2000 mm or more
6.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Lift system, Lift shaft structure, Hoisting system and Chain block	Lift shaft – Laminated Tempered Glass complying with SS 550 requirement or Equivalent Indian Standard	The technical specification is modified to: Lift shaft – Glass Cladded Structural Shaft will be provided.
7.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Lift system, Lift shaft structure, Hoisting system and Chain block	Other requirements / features to be provided: <ul style="list-style-type: none"> • Emergency battery operated power supply (EBOPS) (Maintenance free type battery) • Automatic rescue device (ARD) • Compensating rope • Hydraulic buffer • Counterweight safety screen • Standalone hall button fixtures • Overload detection system • Urine detection system • Door Nudging system • Card access system 	The technical specification is modified to: Other requirements / features to be provided: <ul style="list-style-type: none"> • Emergency battery operated power supply (EBOPS) (Maintenance free type battery) • Automatic rescue device (ARD) • Hydraulic buffer • Counterweight safety screen • Standalone hall button fixtures as wall mounted fixture. • Overload detection system • Door Nudging system

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				<ul style="list-style-type: none"> • In-car security CCTV (with color and sound) • Eco-efficient, long- lasting Led lighting • Energy regenerative drive to recovers potential energy when the car is descending with a heavy load (or ascending with a light load) • Environment friendly and light weight material to be used 	<ul style="list-style-type: none"> • Card access system • In-car security CCTV (with color and sound) • Eco-efficient, long- lasting Led lighting • Environment friendly and light weight material to be used
8.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Lift system, Lift shaft structure, Hoisting system and Chain block	<u>14. Buffers</u> Hydraulic buffer shall be provided. Oil level indicators shall be provided on the oil buffers	The technical specification is modified to: Buffers can be Hydraulic / Spring / Nylon
9.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Lift system, Lift shaft structure, Hoisting system and Chain block	<u>24. Information and Drawings</u> The Supplier shall submit 6 sets of the following information and drawings not later than 30 days after the award of tender, prior to manufacturing. <ul style="list-style-type: none"> • Installation drawing and installation manual. • Drawings on builder’s works, pre cast bolt and openings. • Scaffolding drawings. 	The technical specification is modified to: Information and Drawings to be provided before the final hand over of the machine
10.	PKG-0058: Training Equipment and units for Facility Technology – Vertical	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Lift system, Lift shaft structure, Hoisting system and Chain block	<u>25. As-Build Drawings</u> Upon completion of the installation, the Supplier shall provide six sets of as build drawings showing the details of the equipment exactly as installed and Operation & Maintenance Manual for record and maintenance purpose.	The technical specification is modified to: As-Build Drawings to be provided before the final hand over of the machine

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	Transportation at WSC			These drawings must be submitted for approval before acceptance of the installation.	
11.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.2: Escalator system	Capacity - To be advised by Tenderer	The technical specification is modified to: Capacity - 4500 Passengers/Hour or more
12.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.2: Escalator system	Rise - 4000 mm	The technical specification is modified to: Rise - 2500 mm or more
13.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Section 6 - Schedule of Supply of the Bid Document	Item No. A3: Escalator system	Angle of Inclination - 35°	The technical specification is modified to: Angle of Inclination - 30° or more
14.	PKG-0058: Training Equipment and units for Facility Technology – Vertical Transportation at WSC	Payment Terms & Conditions		(a) Advance Payment: 10% of the Contract Price within 28 days of signing of the Contract. Payment shall be made provided the Supplier presents a request for payment accompanied by an Advance Payment Security in the form of a	Original conditions as per the Tender document shall prevail.

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				<p>bank Section 8 – Special Conditions of Contract 8-3 Bid document for Training Simulators for Facility Technology – Vertical Transportation for WSC, Package 0059 guarantee for an amount equal to the amount of the payment, and that shall be valid until the Goods are delivered. The security shall be in the form as specified in Section 9 (Contract Forms).</p> <p>(b) On Delivery: The Purchaser shall pay the Supplier 70% of the Contract Price of the Goods, after delivery at site/ location and upon submission of documents specified in SCC Clause 12.1.</p> <p>(c) After substantial completion of related services: 20% of the Contract Price of Goods shall be paid immediately after satisfactory completion of Installation and Commissioning (except training)</p> <p>(d) On Acceptance: 10% of the Contract Price of Goods received shall be paid after successful training and upon submission of a claim supported by the acceptance certificate issued by the Purchaser.</p>	
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15.	PKG 0141 - Conventional Lathe Machines for Precision Engineering for WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine	Technical Specifications	The Technical specifications have been modified and attached at Appendix - 1				
16.	PKG 0141 - Conventional Lathe Machines for Precision Engineering for WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.2: Heavy Duty Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine	Technical Specifications	The Technical specifications have been modified and attached at Appendix - 2				
17.	PKG 0142: Conventional Milling & Grinder Machines for Precision Engineering for WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.1: Pedestal grinder c/w grinding wheel star dresser	<table border="1" style="width: 100%; text-align: center;"> <tr> <th style="padding: 5px;">SPECIFICATION AS PER TENDER</th> <th style="padding: 5px;">CHANGES REQUIRED AS PER BIDDER</th> </tr> <tr> <td style="padding: 5px;">• 230V, 50Hz, 700W, 2800 rpm</td> <td style="padding: 5px;">415 3 phase</td> </tr> </table>	SPECIFICATION AS PER TENDER	CHANGES REQUIRED AS PER BIDDER	• 230V, 50Hz, 700W, 2800 rpm	415 3 phase	Suggested amendments are accepted
SPECIFICATION AS PER TENDER	CHANGES REQUIRED AS PER BIDDER								
• 230V, 50Hz, 700W, 2800 rpm	415 3 phase								
18.	PKG 0142: Conventional Milling & Grinder Machines for Precision Engineering for WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.2: Vertical milling machine with digital readout (X, Y & Z axis) c/w standard tool kit and equipped with safety features and low voltage lamp, accessories & set of milling tools to suit the machine	Technical Specifications	The Technical specifications have been modified and attached at Appendix - 3				

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19.	PKG 0142: Conventional Milling & Grinder Machines for Precision Engineering for WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.3: Universal milling machine with digital readout (X, Y & Z axis) c/w standard tool kit and equipped with safety features and low voltage lamp, accessories & set of milling tools to suit the machine	Technical Specifications	The Technical specifications have been modified and attached at Appendix - 4
20.	PKG 0142: Conventional Milling & Grinder Machines for Precision Engineering for WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.4: Surface grinder with digital readout (Vertical down feed & Cross feed) and equipped with safety features, accessories and set of grinding wheels to suit the machine	Technical Specifications	The Technical specifications have been modified and attached at Appendix - 5
21.	PKG 0142: Conventional Milling & Grinder Machines for Precision Engineering for WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.4: Surface grinder with digital readout (Vertical down feed & Cross feed) and equipped with safety features, accessories and set of grinding wheels to suit the machine	Please confirm this is Hydraulic Machine or Manually operated machine	Hydraulic operated machine
22.	PKG 0142: Conventional Milling & Grinder Machines for	Section 6 - Schedule of Supply of the Bid Document	Sr. No.5: Universal cylindrical grinder with digital readout, equipped	Technical Specifications	The Technical specifications have been modified and attached at Appendix - 6

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	Precision Engineering for WSC		with safety features accessories and set of grinding wheels to suit the machine		
23.	PKG 0142: Conventional Milling & Grinder Machines for Precision Engineering for WSC	Section 6 - Schedule of Supply of the Bid Document	Sr. No.5: Universal cylindrical grinder with digital readout, equipped with safety features accessories and set of grinding wheels to suit the machine	Please confirm this is Hydraulic Machine or Manually operated machine	Hydraulic operated machine

APPENDIX – 1

Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine

S.No.	Description	Specification
Conventional Lathe Machine: Make & Model		
1.0	Following are the Lathe machine operations done either by holding the workpiece between centres or by a chuck:	
1.1	Machining of single jobs and batch production.	
1.2	Standard machining of Turning, Facing, Chamfering, Knurling, Thread cutting, Filing, Polishing, Grooving etc.	
1.3	Lathe machine operations which are performed by holding the work by a chuck or a faceplate or an angle plate are:	
1.4	Machining of single jobs and batch production.	
1.5	Drilling, Reaming, Boring, Counterboring, Taper boring, Tapping, Undercutting, Internal thread cutting, Parting-off etc.	
1.6	Special operation	
2.0	Material	
2.1	Tool steel, low-medium-high alloyed (Toughened, & Stainless steel , Casting steels, low, & medium carbon steels, Cast iron, Grey cast iron & Nodular cast iron ferritic / pearlitic type HRB 125-200 (Non hardened) etc.	
2.2	Non ferrous metals like Aluminium and aluminium alloys, Copper and copper alloys and Brass	
3.0	Machine Specification (Working range)	
3.1	Distance between the centres	1000mm or more
3.2	Centre Height	260mm or more
3.3	Swing over Bed	575mm or more
3.4	Swing over Cross Slide	350mm or more
3.5	Bed Width	415mm or more
3.6	Cross slide travel	300mm or more
	Weight of the machine	more than 2300 kg
3.7	Compound slide travel	150mm or more
4.0	WORK SPINDLE	
4.1	Type of spindle	Metric 60 or above
4.2	Size of Spindle	130 or above
4.3	Spindle Taper	MT5
4.4	Spindle Nose/Bore	A2-6/53mm or more
4.5	Taper Bore in Spindle As per IS 2582-1972 with latest Amendment	Metric 60 or above
4.6	Taper Bore in Spindle sleeve As per IS 1715-1986 with latest Amendment	MT5

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Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine

4.7	Bore in spindle	50 mm or above
4.8	Chuck	3 Jaw self centred chuck
5.0	TOOL SLIDE	
5.1	Graduation of longitudinal scale on apron box hand wheel	0.1 mm
5.2	Graduation of scale on cross slide spindle	0.05 mm or better
5.3	Graduation of scale on compound slide spindle	0.05 mm or better
5.4	Type of tool holder	Quick type tool post
5.5	Tool shank size as IS 1983:1958 with latest Amendment (mmXmm)	25x25 mm or above
6.0	TAIL STOCK WITH HAND WHEEL	
6.1	Stock of quill	180 mm or above
6.2	Diameter of Centre sleeve	75 mm or more
6.3	Tail stock Spindle Taper as per IS 1715:1986 with latest Amendment	MT 5
6.5	Scale graduation on hand wheel	3mm or more by 0.05 mm
6.6	Sleeve travel type (tail stock)	Manual
6.7	Tail stock barrel travel	175mm or more
7.0	FEEDS & THREADS	
7.1	Feed Range (Longitudinal)	0.04-2.0 mm /rev or more
7.2	Feed Range (Cross)	0.025-1.0 mm/rev or more
7.3	Lead Screw Pitch	6mm
7.4	Metric Threads	48 from 0.5-28mm
7.5	Modular Thread	40 from 0.25-14mm
7.6	Pitch Diametric threads	43 from 112.2 mm or more
8.0	DRIVE	
8.1	Drive	Gear Drive
8.2	No. of Spindle speed in forward direction	16 or more
8.3	No. of Spindle speed in reverse direction	7 or more
8.4	Spindle speed range in forward direction	40-2000 or more
8.5	Spindle speed range in reverse direction	60-1200 or more
9.0	Motor & Power supply	
9.1	Main motor power	11 Kw above
9.2	Electric Equipment i.e. Motor and control gear	Electric Equipment i.e. Motor and control gear suitable for operation on

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Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine

		415 V, 3 phase, 50 Hz 4 wire A.C. supply with suitable Ammeter
10.0	Coolant tank with pump	
10.1	Coolant pump output	As per IS 2161:1962 with latest Amendment 0.1 Kw
10.2	Coolant pump speed in Rev/min	2800 rev/min
10.3	Coolant pump discharge at maximum working height (L/min)	As per IS 2161:1962 with latest Amendment 30 L/min
10.4	Coolant tank capacity	18 Litre or More
11.0	Lubrication system	
11.1	Lubrication system	Lubrication system is required as per IS 11118
11.2	Type of lubrication	Dry sump Lubrication
13.0	ACCESSORIES	
13.1	Universal Face plate as per spindle dia.300 mm or above	1 No
13.2	4-jaw independent chuck, dia.250 mm (GMT/SECO or equivalent make)	1 No
13.3	3-jaw self-centring chuck, dia.250 mm(GMT/SECO or equivalent make)	1 No
13.4	Quick change tool post with spanner	4 Nos
13.5	Machine lamp	1 No
13.6	Revolving centre 3000 RPM, 0.005mm runout	2 Nos
13.7	Dog carrier (Dia.10 to Dia.50 in steps of 10 mm)	2 Nos
13.8	Splash guards	1 No
13.9	Moving steady rest and stationary steady rest	1 set
13.10	Chip tray	1 No
13.11	Taper turning attachment	1 No
13.12	Chuck Guard	1 No
13.13	Hand wheel operated Collect Chuck	1 No
13.14	Longitudinal stop	1 No
13.15	Service tools	1 set

APPENDIX – 1

Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine

13.16	One quick change tool post with 5 tool holders	1 set
13.17	One rotating centre with MT5 shank	1 set
13.18	One reduction sleeve socket metric 60/MT4	1 set
13.19	One 60 degree centre with MT5 shank	1 set
13.2	One 60 degree centre with MT4 shank	1 set
13.21	One set of hand tools eg spanners for normal operation.	1 set
13.22	Special tool kit consisting of turning tools, parting tool, external threading tool with a set of corresponding inserts for Lathe Machine	1 set
14.0	One Operator's manual and one spare parts manual	1 set
14.1	One driving plate for carriers.	1 set
14.3	Construction of machine and Standards	
14.4	Heavily ribbed alloy cast bed.	
14.5	Hardened and ground alloy steel guide ways.	
14.6	Main slide coated with least wearing, self-lubricating	
14.7	Cross slide with backlash eliminator and fitted with compound slide and tool post.	
14.8	Hardened and ground spindle.	
14.9	Heat treated and ground gears and shafts in headstock (Oil-dipped).	
14.10	Machine Bed and Tail stock Casting Grade Confirming to FG-260 with Hardness 180-230 BHN as per IS 11118-1997 with latest Amendment	
14.11	Tailstock Sleeve case Hardening steel 15Ni7Cr4Mo2 Hardened and ground to a hardness of 58- 62 HRC as IS 11118-1997 with latest Amendment	
14.12	Head stock drive gears confirming to alloy steel material specification 15 Ni 7 Cr 4 Mo2, Hardened 58-62 HRC and profile ground with 0.8 micron surface roughness Ra value	

APPENDIX – 1

Centre lathe with digital readout (X & Z axis), accessories & set of turning

tools to suit the machine

14.13	Main spindle conforming to C2R grade Forged steel and Hardened 58-62 HRC and profile ground with 0.8 micron surface roughness Ra value	
14.14	Main spindle bearing conforming Pre-loaded SKF/FAG/TIMKEN/GAMET/HB BEARING/NSK make or equivalent spindle bearing High precision class double row Taper roller or angular contact bearings at Front & Single row taper roller or angular contact bearing as back. (Type and make to be specified)	
14.15	Lead screw ground profile & pitch accuracy 0.01 mm over length of 60 mm	
14.16	Machine conforming Dynamically Balanced Spindle of more than 3m/sec	
14.17	Cooling system Requirement as per IS 11118	
14.18	Colour of the lathe machine as per IS 5:1978 with latest Amendment	
14.19	Mechanical guarding as per IS 9474:1980 with latest Amendment	
14.20	Noise Emitted by machine as per IS 10998:1984 with latest Amendment	
14.21	Lathe machine conforming to IS 6893-1988 part 1 with latest Amendment	
15.0	Lathe machine conforming to IS 210:1993 with latest Amendment (Scheme of testing and inspection for certification of Gray Iron Casting)	
15.1	The supplied machine should be complete in all respects in ready-to-operate condition	
15.2	Availability of test report from central Govt./NABL/ILAC/ Central Govt/ OEM Accredited lab to prove conformity to specification	
15.3	General Instructions:	
16.0	All the literature should be in English Language only.	
16.1	The Vendor must provide list of customers to whom they have supplied the model offered in this tender in last five years.	
16.2	Vendor should offer detailed technical catalogue of the machine and write up for highlighting special features, specific applications, attachments etc.	
17.0	Installation & Commissioning	

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Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine

17.1	The machine to be inspected as per accuracy chart before dispatch at supplier site. The suppliers to prove out the "Test Components" in all aspects. Acceptance and Qualification during Pre Dispatch Inspection (PDI), at the supplier end. Release of machine for dispatch after successful completion of acceptance test post PDI.	
17.2	The complete installation and commissioning must be carried out by the supplier for all the machines at the final destination/premises. A final accuracy test with an identified test component to be conducted by the purchaser/consignee. Final accuracy test report is to be signed jointly by Purchaser/consignee and supplier. Final acceptance would be given after conducting the accuracy test at the installation location.	
17.3	Service	
18.0	The manufacturer should have established after sales and service network in India.	
18.1	The authorised service partner in India (Name & address), must be certified by the manufacturer and shown in the quotation.	
18.2	Number of similar machine installed in India in a reputed organisation.	
18.3	Vendor will also confirm / commit in their offer for the following	
18.4	Two sets of manual for operation, maintenance and troubleshooting should be provided by the Vendor in English language, out of which one set of the manual for operation, and maintenance with details and requirements of space, power etc. for the installation and commissioning of the machine need be sent by email / speed mail, quite in advance for our study and readiness for installation and commissioning. Minimum one set of manual should be given in hard copy.	
18.5	Electric circuit diagram of the machine should be supplied with the machine in English language	
18.6	The Vendor should provide service for installation, commissioning and detailed training for operation, maintenance, trouble-shooting etc. free of cost at purchaser premises.	
18.7	Drawings of the important mechanical assemblies should be supplied for the maintenance purpose.	

APPENDIX – 1

Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine

19.0	2 sets of Machine manuals (Operation and maintenance), spare parts catalogue, machine test charts, calibration certificate in English language, shall be required with the supply.	
19.1	List of recommended spares to be offered, for two years of trouble free operation of machine with cost of each item mentioned separately.	
	** Important note: The bidder must provide exact and relevant input against the specified features having “numerical values” or “% values” or any “specific requirement” in the same format as specified in the tender document under bidder's specification column. Any response specifying Confirmed / Agreed / Complied etc. under bidder's specification column shall be summarily rejected.	
	The Vendor will have to demonstrate all the performance / specifications once again after installation at purchaser site. Necessary equipments required for measurement of geometrical accuracies has to be arranged by Vendor.	
	Warranty	
	Two-year on-site warranty for trouble free operation of the machine from the date of final commissioning and acceptance of machine and free services shall be provided for any trouble during this period. During the period of warranty, if any part is to be replaced, Vendor will have to replace it free of cost. Warranty should include all the items supplied against purchase order. Cost of one years' warranty should be included in the basic cost. During warranty period, vendor should respond to call/email in maximum 24hrs on all working days and vendor service engineer should attend the machine within maximum 10days from the date of the call/email.	

APPENDIX – 2

Heavy Duty Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine

S.No.	Description	Specification
Conventional Lathe machine: Make & Model		
1.0	Following are the Lathe machine operations done either by holding the workpiece between centres or by a chuck:	
1.1	Machining of single jobs and batch production.	
1.2	Standard machining of Turning, Facing, Chamfering, Knurling, Thread cutting, Filing, Polishing, Grooving etc.	
1.3	Lathe machine operations which are performed by holding the work by a chuck or a faceplate or an angle plate are:	
1.4	Machining of single jobs and batch production.	
1.5	Drilling, Reaming, Boring, Counterboring, Taper boring, Tapping, Undercutting, Internal thread cutting, Parting-off etc.	
1.6	Special operation	
1.7	Grinding operation	
2.0	Material	
2.1	Tool steel, low-medium-high alloyed (Toughened, & Stainless steel , Casting steels, low, & medium carbon steels, Cast iron, Grey cast iron & Nodular cast iron ferritic / pearlitic type HRB 125-200 (Non hardened) etc.	
2.2	Non ferrous metals like Aluminium and aluminium alloys, Copper and copper alloys and Brass	
3.0	Machine Specification (Working range)	
3.1	Distance between the centres	1500mm or more
3.2	Centre Height	320 mm or more
3.3	Swing over Bed	640 mm or more
3.4	Swing over Cross Slide	420 mm or more
3.5	Bed Width	415 mm or more
3.6	Cross slide travel	300 mm or more
3.7	Floor space	1100x3000 mm or less
3.8	Weight net	2700 kg or less
3.9	Compound slide travel	150mm or more
4.0	WORK SPINDLE	
4.1	Type of spindle	Metric 60
4.2	Size of Spindle	108mm to 133 mm
4.3	Spindle Taper	MT5/MT6
4.4	Spindle Nose/Bore	A2-8/80mm or more

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Heavy Duty Centre lathe with digital readout (X & Z axis), accessories & set of

turning tools to suit the machine

4.5	Taper Bore in Spindle As per IS 2582-1972 with latest Amendment	Metric 60
4.6	Taper Bore in Spindle sleeve As per IS 1715-1986 with latest Amendment	MT5 minimum
4.7	Bore in spindle	80 mm
4.8	Chuck	3 and 4 Jaw self centred chuck
5.0	TOOL SLIDE	
5.1	Graduation of longitudinal scale on apron box hand wheel	0.1 mm
5.2	Graduation of scale on cross slide spindle	0.02 mm or better
5.3	Graduation of scale on compound slide spindle	0.05 mm or better
5.4	Type of tool holder	Quick type tool post
5.5	Tool shank size as IS 1983:1958 with latest Amendment (mmXmm)	25 mm X 25 mm or More
6.0	TAIL STOCK WITH HAND WHEEL	
6.1	Stock of quill	200 mm or more
6.2	Diameter of Centre sleeve	90 mm or more
6.3	Tail stock Spindle Taper as per IS 1715:1986 with latest Amendment	90/MT5 minimum
6.5	Scale graduation on hand wheel	3mm or more by 0.05 mm
6.6	Sleeve travel type (tail stock)	Manual/200 mm minimum
6.7	Tail stock barrel travel	Min175mm
7.0	FEEDS & THREADS	
7.1	Feed Range (Longitudinal)	60 from 0.04-2.15 mm /rev or more
7.2	Feed Range (Cross)	0.02-1.12 mm/rev or more
7.3	Lead Screw Pitch	6mm
7.4	Metric Threads	48 from 0.5-28mm or more
7.5	Whitworth Thread	56-1 TPI
7.6	Modular Thread	0.25-12mm or more
7.7	Pitch Diametric threads	43 from 112.2
7.8	British thread range in TPI	56-1 TPI
8.0	DRIVE	

APPENDIX – 2

Heavy Duty Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine

8.1	Drive	Gear Drive
8.2	No. of Spindle speed in forward direction	16 or more
8.3	No. of Spindle speed in reverse direction	5 or more
8.4	Spindle speed range in forward direction	16 from 32-1632 minimum
8.5	Spindle speed range in reverse direction	7 from 48-1150 minimum
9.0	Motor & Power supply	
9.1	Main motor power	11 Kw or above
9.2	Electric Equipment i.e. Motor and control gear	Electric Equipment i.e. Motor and control gear suitable for operation on 415 V, 3 phase, 50 Hz 4 wire A.C. supply with suitable Ammeter
10.0	Coolant tank with pump	
10.1	Coolant pump output	As per IS 2161:1962 with latest Amendment 0.1 Kw
10.2	Coolant pump motor	0.1 kw minimum
10.3	Coolant pump speed in Rev/min	2800 rev/min or more
10.4	Coolant pump discharge at maximum working height (L/min)	As per IS 2161:1962 with latest Amendment 30 L/min
10.5	Coolant tank capacity	18 Litre or More
11.0	Lubrication system	
11.1	Lubrication system	Lubrication system is required as per IS 11118
11.2	Type of lubrication	Dry sump Lubrication
12.0	ACCESSORIES	
12.1	Face plate as per spindle dia.160 mm	1 No
12.2	4-jaw independent chuck, dia.160 mm (GMT/SECO or equivalent make)	1 No
12.3	3-jaw self-centring chuck, dia.160 mm(GMT/SECO or equivalent make)	1 No
12.4	Quick change tool post with spanner	4 Nos
12.5	Machine lamp	1 No

APPENDIX – 2

Heavy Duty Centre lathe with digital readout (X & Z axis), accessories & set of

turning tools to suit the machine

12.6	Revolving centre 3000 RPM, 0.005mm runout	2 Nos
12.7	Dog carrier (Dia.10 to Dia.50 in steps of 10 mm)	2 Nos
12.8	Splash guards	1 No
12.9	Moving steady rest and stationary steady rest	1 set
12.10	Chip tray	1 No
12.11	Taper turning attachment	1 No
12.12	Chuck Guard	1 No
12.13	Hand wheel operated Collect Chuck	1 No
12.14	Longitudinal stop	1 No
12.15	Service tools	1 set
12.16	Grinding attachment	1 set
12.17	Special tool kit consisting of turning tools, parting tool, external threading tool with a set of corresponding inserts for Lathe Machine	1 set
13.0	Construction of machine and Standards	
13.1	Heavily ribbed alloy cast bed.	
13.2	Hardened and ground alloy steel guide ways.	
13.3	Cross slide with backlash eliminator and fitted with compound slide and tool post.	
13.4	Hardened and ground spindle.	
13.5	Heat treated and ground gears and shafts in headstock (Oil-dipped).	
13.6	Machine Bed and Tail stock Casting Grade Confirming to FG-260 with Hardness 180-230 BHN as per IS 11118-1997 with latest Amendment	
13.7	Tailstock Sleeve case Hardening steel 15Ni7Cr4Mo2 Hardened and ground to a hardness of 58- 62 HRC as IS 11118-1997 with latest Amendment	
13.8	Head stock drive gears confirming to alloy steel material specification 15 Ni 7 Cr 4 Mo2, Hardened 58-62 HRC and profile ground with 0.8 micron surface roughness Ra value	
13.9	Main spindle confirming to C2R grade Forged steel and Hardened 58-62 HRC and profile ground with 0.8 micron surface roughness Ra value	
13.10	Main spindle bearing conforming Pre-loaded GAMET/HB BEARING/NSK make or equivalent spindle bearing High precision class double row Taper roller or angular contact bearings at Front & Single row taper roller or angular contact bearing as back. (Type and make to be specified)	
13.11	Lead screw ground profile & pitch accuracy 0.01 mm over length of 60 mm-	
13.12	Machine confirming Dynamically Balanced Spindle of more than 3m/sec	
13.13	Cooling system Requirement as per IS 11118	
13.14	Colour of the lathe machine as per IS 5:1978 with latest Amendment	

APPENDIX – 2

Heavy Duty Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine

13.15	Mechanical guarding as per IS 9474:1980 with latest Amendment
13.16	Noise Emitted by machine as per IS 10998:1984 with latest Amendment
13.17	Lathe machine conforming to IS 6893-1988 part 1 with latest Amendment
13.18	Lathe machine conforming to IS 210:1993 with latest Amendment (Scheme of testing and inspection for certification of Gray Iron Casting)
13.19	The supplied machine should be complete in all respects in ready-to-operate condition
13.20	Availability of test report from central Govt./NABL/ILAC Accredited lab to prove conformity to specification Central Govt/ OEM certificates
13.21	Heavily ribbed alloy cast bed.
14.0	General Instructions:
14.1	All the literature should be in English Language only.
14.2	The Vendor must provide list of customers to whom they have supplied the model offered in this tender in last five years.
14.3	Vendor should offer detailed technical catalogue of the machine and write up for highlighting special features, specific applications, attachments etc.
15.0	Installation & Commissioning
15.1	The machine to be inspected as per accuracy chart before dispatch at supplier site. The suppliers to prove out the "Test Components" in all aspects. Acceptance and Qualification during Pre Dispatch Inspection (PDI), at the supplier end. Release of machine for dispatch after successful completion of acceptance test post PDI.
15.2	The complete installation and commissioning must be carried out by the supplier for all the machines at the final destination/premises. A final accuracy test with an identified test component to be conducted by the purchaser/consignee. Final accuracy test report is to be signed jointly by Purchaser/consignee and supplier. Final acceptance would be given after conducting the accuracy test at the installation location.
16.0	Service
16.1	The manufacturer should have established after sales and service network in India.
16.2	The authorised service partner in India (Name & address), must be certified by the manufacturer and shown in the quotation.
16.3	Number of similar machine installed in India in a reputed organisation.
17.0	Vendor will also confirm / commit in their offer for the following
17.1	Two sets of manual for operation, maintenance and troubleshooting should be provided by the Vendor in English language, out of which one set of the manual for operation, and maintenance with details and requirements of space, power etc. for the installation and commissioning of the machine need be sent by email / speed mail, quite in advance for our study and readiness for installation and commissioning. Minimum one set of manual should be given in hard copy.

APPENDIX – 2

Heavy Duty Centre lathe with digital readout (X & Z axis), accessories & set of turning tools to suit the machine

17.2	Electric circuit diagram of the machine should be supplied with the machine in English language)
17.3	The Vendor should provide service for installation, commissioning and detailed training for operation, maintenance, trouble-shooting etc. free of cost at purchaser premises.)
17.4	2 sets of Machine manuals (Operation and maintenance), spare parts Catalogue, machine test charts, calibration certificate in English language, shall be required with the supply.
17.5	List of recommended spares to be offered, for two years of trouble free operation of machine with cost of each item mentioned separately.
17.6	The Vendor will have to demonstrate all the performance / specifications once again after installation at purchaser site. Necessary equipments required for measurement of geometrical accuracies has to be arranged by Vendor.
17.7	Two sets of manual for operation, maintenance and troubleshooting should be provided by the Vendor in English language, out of which one set of the manual for operation, and maintenance with details and requirements of space, power etc. for the installation and commissioning of the machine need be sent by email / speed mail, quite in advance for our study and readiness for installation and commissioning. Minimum one set of manual should be given in hard copy.
18.0	Warranty
18.1	Two-year on-site warranty for trouble free operation of the machine from the date of final commissioning and acceptance of machine and free services shall be provided for any trouble during this period. During the period of warranty, if any part is to be replaced, Vendor will have to replace it free of cost. Warranty should include all the items supplied against purchase order. Cost of two years' warranty should be included in the basic cost. During warranty period, vendor should respond to call/email in maximum 24hrs on all working days and vendor service engineer should attend the machine within maximum 10 days from the date of the call/email.

APPENDIX – 3

Vertical milling machine with digital readout (X, Y & Z axis) c/w standard tool kit and equipped with safety features and low voltage lamp, accessories & set of milling tools to suit the machine

S.No.	Description	Specification
1.0	Vertical milling machine Detailed specifications:	
1.1	Machining of single jobs and batch production.	
1.2	Milling machine operations which are performed by holding the work by a V-block, dividing head, or an angle plate are:	
1.3	Machining of single jobs and batch production.	
1.4	Face milling ,end milling, angular milling, gear cutting, form milling etc.	
2.0	Material	
2.1	Tool steel, low-medium-high alloyed (Toughened, & Stainless steel , Casting steels, low, & medium carbon steels, Cast iron, Grey cast iron & Nodular cast iron ferritic / pearlitic type HRB 125-200 (Non hardened) etc.	
2.2	Non ferrous metals like Aluminium and aluminium alloys, Copper and copper alloys and Brass	
3.0	Machine Specification (Working range)	
3.1	Table overall size	1050*200 mm or above
3.2	Table clamping area	850*200 mm or above
3.3	Travel (Manual)	
	X-Axis	750 mm or more
	Y-Axis	300 mm or more
	Z- Axis	380 mm or more
3.4	Travel with power feed units.	
	X-Axis	700 mm or less
	Y-Axis	300 mm or less
	Z- Axis	400 mm or less
3.5	Floor space	1550*1700*1900 mm or less
3.6	Weight nett	1000 kg or less
4.0	WORK SPINDLE	
4.1	Spindle Tapper	Not less than ISO 30
	Spindle Speed Range	with 60 Hz 60-1800 or more
	Ram	300 mm or more
	Quill	100 mm or more
4.2	Quill diameter	70 mm or more
4.3	Draw bolt	Not less than M12

APPENDIX – 3

Vertical milling machine with digital readout (X, Y & Z axis) c/w standard tool kit and equipped with safety features and low voltage lamp, accessories & set of milling tools to suit the machine

4.4	swivel of Milling Head	minimum 45 degree either side in X-Axis and Y-Axis.
4.5	Swivel of Ram	360 degree
5.0	Motor & Power supply	
5.1	Main motor power	3 Hp or above
5.2	Electric Equipment i.e. Motor and control gear	Electric Equipment i.e. Motor and control gear suitable for operation on 415 V, 3 phase, 50 Hz 4 wire A.C. supply with suitable Ammeter
6.0	Coolant tank with pump	
6.1	Coolant pump motor	0.1 kw minimum
6.2	Coolant pump speed in Rev/min	2800 rev/min minimum
7	Service tools	1 set
8.1	Grinding attachment	1 set
8.2	160mm Dia Face Mill And Indexable Inserts For Machining Steel, Cast Iron And Other Nonferrous Metals With Suitable Arbor for the Milling Machine	1 set
9.0	Construction of machine and Standards	
9.1	Heavily ribbed alloy cast bed.	
9.2	Ground cast Iron Dovetail/ Hardened and ground alloy steel guide ways.	
9.3	Manual Oil Lubrication System	
9.4	Hardened and ground spindle.	
9.6	Cooling system Requirement as per IS 11118	
9.7	Colour of the milining machine as per IS 5:1978 with latest Amendment	
9.9	Noise Emitted by machine as per IS 10998:1984 with latest Amendment	
9.10	The supplied machine should be complete in all respects in ready-to-operate condition	
9.11	Availability of test report from central Govt./NABL/ILAC Accredited lab to prove conformity to specification	
10.0	General Instructions:	
10.1	All the literature should be in English Language only.	
10.2	The Vendor must provide list of customers to whom they have supplied the model offered in this tender in last five years.	
10.3	Vendor should offer detailed technical catalogue of the machine and write up for highlighting special features, specific applications, attachments etc.	
11.0	Installation & Commissioning	

APPENDIX – 3

Vertical milling machine with digital readout (X, Y & Z axis) c/w standard tool kit and equipped with safety features and low voltage lamp, accessories & set of milling tools to suit the machine

11.1	The machine to be inspected as per accuracy chart before dispatch at supplier site. The suppliers to prove out the "Test Components" in all aspects. Acceptance and Qualification during Pre Dispatch Inspection (PDI), at the supplier end. Release of machine for dispatch after successful completion of acceptance test post PDI.
11.2	The complete installation and commissioning must be carried out by the supplier for all the machines at the final destination/premises. A final accuracy test with an identified test component to be conducted by the purchaser/consignee. Final accuracy test report is to be signed jointly by Purchaser/consignee and supplier. Final acceptance would be given after conducting the accuracy test at the installation location.
13.0	Service
13.1	The manufacturer should have established after sales and service network in India.
13.2	The authorised service partner in India (Name & address), must be certified by the manufacturer and shown in the quotation.
13.3	Number of similar machine installed in India in a reputed organisation.
14.0	Vendor will also confirm / commit in their offer for the following
14.1	Two sets of manual for operation, maintenance and troubleshooting should be provided by the Vendor in English language, out of which one set of the manual for operation, and maintenance with details and requirements of space, power etc. for the installation and commissioning of the machine need be sent by email / speed mail, quite in advance for our study and readiness for installation and commissioning. Minimum one set of manual should be given in hard copy.
14.2	Electric circuit diagram of the machine should be supplied with the machine in English language
14.3	The Vendor should provide service for installation, commissioning and detailed training for operation, maintenance, trouble-shooting etc. free of cost at purchaser premises.
14.4	Drawings of the important mechanical assemblies should be supplied for the maintenance purpose.
14.5	2 sets of Machine manuals (Operation and maintenance), spare parts catalogue, machine test charts, calibration certificate in English language, shall be required with the supply.
14.6	List of recommended spares to be offered, for two years of trouble free operation of machine with cost of each item mentioned separately.
14.7	The Vendor will have to demonstrate all the performance / specifications once again after installation at purchaser site. Necessary equipments required for measurement of geometrical accuracies has to be arranged by Vendor.
15.0	Warranty
15.1	Two-year on-site warranty for trouble free operation of the machine from the date of final commissioning and acceptance of machine and free services shall be provided for any trouble during this period. During the period of warranty, if any part is to be replaced, Vendor will have to replace it free of cost. Warranty should include all the items supplied against purchase order. During warranty period, vendor should respond to call/email in maximum 24hrs on all working days and vendor service

APPENDIX – 3

Vertical milling machine with digital readout (X, Y & Z axis) c/w standard tool kit and equipped with safety features and low voltage lamp, accessories & set of milling tools to suit the machine

	engineer should attend the machine within maximum 10days from the date of the call/email.
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APPENDIX – 4

Universal milling machine with digital readout (X, Y & Z axis) c/w standard tool kit and equipped with safety features and low voltage lamp, accessories & set of milling tools to suit the machine

1	<u>MAIN SPECIFICATIONS:</u>	
1.1	Max.safe weight on the table	250 kg or more.
1.2	Center distance between t- slot	65 mm mimimum
1.3	Table size	1350x250 mm minimum
1.4	Power operated Traverses :	
	Longitudinal	800 mm minimum
	Cross	265 mm minimum
	Vertical	400 mm minimum
1.5	Swivel of table (for Universal model only)	45 deg. either side
1.6	speed range	35.5-1800 rpm
1.7	Spindle speeds	18
1.8	Spindle nose	ISO-40 or higher
1.9	Feed range :	
	No of feed:Longitudinal & Cross	18:16-800 mm/min. or less
	No of feed:Vertical	18:4-200 mm/min. or less
1.10	Rapid traverse :	
	Longitudinal & Cross	3200 mm/min.
	Vertical	800 mm/min.
1.11	Motor :	
	Main motor	5.5 kw/1500 rpm minimum
	Feed motor	1.5 kw/1500 rpm minimum
	Coolant motor	0.11 kw/3000 rpm minimum
	160mm Dia Face Mill And Indexable Inserts For Machining Steel, Cast Iron And Other Nonferrous Metals With Suitable Arbor for the Milling Machine	1 set
2	Floor space	265*320*210 cm or less
3	Weight (Net/Gross)	2500 kg or less
4	Machine vice	as per IS: 4502/99 or IS4502/68
5	Universal Dividing Head	as per IS: 8165/76
6	Stub Arbors	27*21/25 mm minimum
7	Milling arbors	27*500 mm minimum
8	Coolant equipment	as per IS: 2161/62 or 2161/96

APPENDIX – 4

Universal milling machine with digital readout (X, Y & Z axis) c/w standard tool kit and equipped with safety features and low voltage lamp, accessories & set of milling tools to suit the machine

9	casting	as per IS: 210/78
10	casting Hardness	180-230 bhn
11	Spindle	Forged from suitable alloy steel
12	Spindle hardness	55 HRC or higher
13	Speed Gears, spindle shaft, feed screws etc.	Alloyed steel forgings
14	noise emitted by machine	upto 85 dBA
15	<u>STANDARD ACCESSORIES:</u>	
15.1	Electrical equipment suitable for 3 phase, 415 volts, 50 cycles AC supply.	
15.2	Climb milling attachment	
15.3	One draw bolt with nut	
15.4	One set of service tools	
15.5	One Operator's manual and one spare parts manual	
15.7	Standard colour: Apple green	
15.8	Two Arbor support bearing brackets	
15.9	One Overarm brace	
16.0	General Instructions:	
16.1	All the literature should be in English Language only.	
16.2	The Vendor must provide list of customers to whom they have supplied the model offered in this tender in last five years.	
16.3	Vendor should offer detailed technical catalogue of the machine and write up for highlighting special features, specific applications, attachments etc.	
17.0	Installation & Commissioning	
17.1	The machine to be inspected as per accuracy chart before dispatch at supplier site. The suppliers to prove out the "Test Components" in all aspects. Acceptance and Qualification during Pre Dispatch Inspection (PDI), at the supplier end. Release of machine for dispatch after successful completion of acceptance test post PDI.	
17.2	The complete installation and commissioning must be carried out by the supplier for all the machines at the final destination/premises. A final accuracy test with an identified test component to be conducted by the purchaser/consignee. Final accuracy test report is to be signed jointly by Purchaser/consignee and supplier. Final acceptance would be given after conducting the accuracy test at the installation location.	
18.0	Service	
18.1	The manufacturer should have established after sales and service network in India.	
18.2	The authorised service partner in India (Name & address), must be certified by the manufacturer and shown in the quotation.	

APPENDIX – 4

Universal milling machine with digital readout (X, Y & Z axis) c/w standard tool kit and equipped with safety features and low voltage lamp, accessories & set of milling tools to suit the machine

18.3	Number of similar machine installed in India in a reputed organisation.
19.0	Vendor will also confirm / commit in their offer for the following
19.1	Two sets of manual for operation, maintenance and troubleshooting should be provided by the Vendor in English language, out of which one set of the manual for operation, and maintenance with details and requirements of space, power etc. for the installation and commissioning of the machine need be sent by email / speed mail, quite in advance for our study and readiness for installation and commissioning. Minimum one set of manual should be given in hard copy.
19.2	Electric circuit diagram of the machine should be supplied with the machine in English language
19.3	The Vendor should provide service for installation, commissioning and detailed training for operation, maintenance, trouble-shooting etc. free of cost at purchaser premises.
19.4	Drawings of the important mechanical assemblies should be supplied for the maintenance purpose.
19.5	2 sets of Machine manuals (Operation and maintenance), spare parts catalogue, machine test charts, calibration certificate in English language, shall be required with the supply.
19.6	List of recommended spares to be offered, for two years of trouble free operation of machine with cost of each item mentioned separately.
19.7	The Vendor will have to demonstrate all the performance / specifications once again after installation at purchaser site. Necessary equipments required for measurement of geometrical accuracies has to be arranged by Vendor.
20.0	Warranty
21.1	Two-year on-site warranty for trouble free operation of the machine from the date of final commissioning and acceptance of machine and free services shall be provided for any trouble during this period. During the period of warranty, if any part is to be replaced, Vendor will have to replace it free of cost. Warranty should include all the items supplied against purchase order. During warranty period, vendor should respond to call/email in maximum 24hrs on all working days and vendor service engineer should attend the machine within maximum 10days from the date of the call/email.

APPENDIX – 5

Surface grinder with digital readout (Vertical down feed & Cross feed) and equipped with safety features, accessories and set of grinding wheels to suit the machine

SI No	Description & Specification	Specification
1	TABLE	
	Working Area	600 x 300 or more
	Longitudinal Table travel	620mm or more
	Cross feed table travel	440mm or more
	Distance from spindle centre to table	500mm or more
	Table Load	200Kg or more
2	WHEEL HEAD	
	Spindle Speed	1400 or better
	Grinding wheel dimension	
	Outer Diameter	300mm at least
	Inner Diameter	76.2mm min.
	Thickness of the Wheel	25mm or more
3	FEEDS	
	Vertical feed	0.01mm/gra. or better
	Longitudinal Speed	Min. 3 - Max. 30
	Cross feed on Hand Wheel	5mm or min.
4	MOTOR	
	Spindle Motor	2.2kw or more
	Coolant Motor	85 watt or more
5	ACCURACY	
	Parallelism on entire grinding surface	0.01mm or better
	Flatness	0.02mm or less
	Spindle run out	0.005mm or less
	Roughness value	0.3 micron or less
	Elevation least Count	0.001mm
6	COOLANT TANK WITH PUMP	
	Capacity	200ltrs or less
7	STANDARD FEATURES	
	Hydraulic operated automatic table travel	
	AC Servo Motor Z-Axis travel	
	Hardened and precision ground lead screws	

APPENDIX – 5

Surface grinder with digital readout (Vertical down feed & Cross feed) and equipped with safety features, accessories and set of grinding wheels to suit the machine

8	STANDARD ACCESSORIES TO BE SUPPLIED ALONG WITH EACH	
8.1	Precision Static Wheel balancing unit with mandrel	1 no.
8.2	Coolant system with magnetic separator	set
8.3	Lighting equipment with low volt transformer	set
8.4	Precision vice 100mm opening	1
8.5	Electro Magnetic Chuck	1
8.6	Wheel flange – 2 sets	2 sets
8.7	Diamond dresser	1
8.8	Centralised lubrication system	
8.9	Anti-vibration pad	1 set
8.10	First Fill of Coolant, Hydraulic Oil and Lubricant.	
8.11	Grinding Wheel (Size 200x20x31.75) with wheel flange	1 set
9	General Instructions:	
9.1	All the literature should be in English Language only.	
9.2	The Vendor must provide list of customers to whom they have supplied the model offered in this tender in last five years.	
9.3	Vendor should offer detailed technical catalogue of the machine and write up for highlighting special features, specific applications, attachments etc.	
10.0	Installation & Commissioning	
10.1	The machine shall be inspected as per accuracy chart before the dispatch at the vendor site. (As per Din 8632 TE or IS 2743-1972)	
10.2	The machine to be inspected as per accuracy chart before dispatch at supplier site. The suppliers to prove out the "Test Components" in all aspects. Acceptance and Qualification during Pre Dispatch Inspection (PDI), at the supplier end. Release of machine for dispatch after successful completion of acceptance test post PDI.	
10.3	The complete installation and commissioning must be carried out by the supplier for all the machines at the final destination/premises. A final accuracy test with an identified test component to be conducted by the purchaser/consignee. Final accuracy test report is to be signed jointly by Purchaser/consignee and supplier. Final acceptance would be given after conducting the accuracy test at the installation location.	
11.0	Service	
11.1	The manufacturer should have established after sales and service network in India.	
11.2	The authorised service partner in India (Name & address), must be certified by the manufacturer and shown in the quotation.	
11.3	Number of similar machine installed in India in a reputed organisation.	
12.0	Vendor will also confirm / commit in their offer for the following	

APPENDIX – 5

Surface grinder with digital readout (Vertical down feed & Cross feed) and equipped with safety features, accessories and set of grinding wheels to suit the machine

12.1	Provide Accuracy chart
12.2	Two sets of manual for operation, maintenance and troubleshooting should be provided by the Vendor in English language, out of which one set of the manual for operation, and maintenance with details and requirements of space, power etc. for the installation and commissioning of the machine need be sent by email / speed mail, quite in advance for our study and readiness for installation and commissioning. Minimum one set of manual should be given in hard copy.
12.3.	Electric circuit diagram of the machine should be supplied with the machine in English language
12.4	The Vendor should provide service for installation, commissioning and detailed training for operation, maintenance, trouble-shooting etc. free of cost at purchaser premises.
12.5	Drawings of the important mechanical assemblies should be supplied for the maintenance purpose.
12.6	2 sets of Machine manuals (Operation and maintenance), spare parts catalogue, machine test charts, calibration certificate in English language, shall be required with the supply.
12.7	List of recommended spares to be offered, for two years of trouble free operation of machine with cost of each item mentioned separately.
12.8	The Vendor will have to demonstrate all the performance / specifications once again after installation at purchaser site. Necessary equipments required for measurement of geometrical accuracies has to be arranged by Vendor.
13.0	Warranty
13.1	Two-year on-site warranty for trouble free operation of the machine from the date of final commissioning and acceptance of machine and free services shall be provided for any trouble during this period. During the period of warranty, if any part is to be replaced, Vendor will have to replace it free of cost. Warranty should include all the items supplied against purchase order. During warranty period, vendor should respond to call/email in maximum 24hrs on all working days and vendor service engineer should attend the machine within maximum 10days from the date of the call/email.

APPENDIX – 6

Universal cylindrical grinder with digital readout, equipped with safety features accessories and set of grinding wheels to suit the machine

Sl. No.	Descriptions	Specification
1.0	PROCESSING CAPACITY / WORKING AREA	
1.1	Swing over table	Minimum 250 mm
1.2	Centre Height	Minimum 130 mm
1.3	Distance between centers	Minimum 600 mm
1.4	Grinding Length	Minimum 500 mm
1.5	Maximum Grinding Diameter(OD)	Minimum 150 mm
1.6	Minimum Grinding Diameter(OD)	6 mm or less
1.7	Maximum Grinding Diameter(ID)	100mm or more
1.8	Minimum Grinding Diameter(ID)	Minimum 6 mm
1.9	Part Weight admissible between centres	Minimum 60 kg
1.1	Part Weight admissible in chuck	Minimum 50 kg
2.0	WHEEL HEAD	
2.1	Driving motor power	3HP/3.7 Kw or better
2.2	Circumferential speed	30 m/s or more
2.3	External Grinding wheel size	300 x 127 x 40 mm or better
2.4	Minimum usable size of wheel (OD)	240 x 127 x 40 mm or better
2.5	External Grinding wheel spindle speed	1900-2100 rpm or Better
2.6	Internal Grinding Wheel Spindle Diameter	Ø60 x 250 mm or Better
2.7	Internal grinding spindle speed range	15000 -20000 rpm or better
2.8	Internal grinding arbors and Quills	To suit Ø60 x 250 mm or Better
2.9	Face grinding arbors	To suit Ø60 x 250 mm or Better
2.10	Wheel head swivel L.C	With L.C 1 deg. or less
2.11	Wheel Head Swivel range	± 30° or better
2.12	Bore Grinding Capacity	15 - 100 mm in diameter
2.13	Rapid Approach	45 mm Minimum
2.14	In-feed with hand wheel	40 mm minimum
2.15	Max plunge feed on dia (Auto)	Plunge Travel- 0.4 mm(Radial) 0.8 mm (Dia)
2.16	Minimum increment on diameter	0.001 mm or better
2.17	In-feed rate on diameter (coarse/ Fine)	0.06-3 mm/min
2.18	Spark off time	0-60 sec
2.19	Front and Rear Movement Range	130 mm Minimum
2.20	Grinding wheel Infeed Range	120 mm Minimum

APPENDIX – 6

Universal cylindrical grinder with digital readout, equipped with safety features accessories and set of grinding wheels to suit the machine

2.21	Universal Wheel head/One external & one internal grinding spindle.	
2.22	The wheel head shall be equipped with maintenance free in built motor spindle with min three variable speed control.	
2.23	Wheel head shall swivel. Also an Internal Grinding Attachment to be provided. This means that workpieces can be completely machined in the same clamping.	
2.24	Grinding spindle bearings shall be roller/angular contact bearings of high accuracy, without wear and no play adjustments ensuring minimum maintenance.	
2.25	Machine should be capable to grind external, Face & Internal Grinding in single setup	
3.0	WORK HEAD	
3.1	Workhead shall be suitable for both grinding between fixed centres and for live spindle grinding. Accuracy of roundness for live spindle grinding shall be as per IS 2368. Fine adjustment feature to be provided for cylindricity corrections of below 1 micron during live spindle grinding.	
3.2	Spindle Speed	50- 600 rpm or better. 5 steps or more
3.3	Holding Taper Internal	Not less than MT 5
3.4	Reduction Sleeve	MT5/MT3
3.5	Roundness accuracy	as per IS 2368
3.6	Workhead Bearings must be protected against Dirt.	Overpressure filters or sealed bearing
3.7	Driving Power	0.37/0.75 kW minimum
3.8	Swivel Angle	120°(90° ccw,30° cw)
4.0	WORK TABLE	
4.1	Table Stroke	500 mm or more
4.2	Table Speed	0.03 -5 m/min or better
4.3	Maximum swivel of table	Upto 10° or more
4.4	Minimum automatic travel	2-10 mm
5.0	TAILSTOCK	
5.1	Hydraulic Operated Tailstock shall be designed for the use of Morse 3/4 taper centers. Centre pressure adjustment should be possible to achieve delicate precision grinding of small and thin parts also. The Tailstock fine adjustment should be possible for finest possible taper correction in the range below 1 micron when grinding between centers.	
5.2	Air cushion must be provided under the Tailstock for easy relocation during set up.	
5.3	Tailstock with fitting taper	not less than MT 3
5.4	Travel of Quill	25 mm or better
5.5	Quill Diameter	min. 40 mm
5.6	Fine Adjustment for taper corrections	+/- 40 microns
6.0	HYDRAULLIC UNIT	

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6.1	Hydraulic tank capacity	40 ltr minimum
6.2	Hydraulic motor power	0.75 kW minimum
6.3	Pump Capacity	8 lpm or better
7.0	COOLANT SYSTEM	
7.1	Magnetic separator filter system with coolant tank	Standard
7.2	Coolant tank capacity	120 ltr. Minimum
7.3	Motor power	0.4 kW or better
7.4	Pump Capacity	
8.0	ACCURACIES	
8.1	Roundness to the Ground workpiece when live spindle	as per IS 2368
8.2	Workpiece spindle axis equilibrium measured by face grinding of the workpiece in live spindle	0.01 mm or better
8.3	straightness accuracy of the ground workpiece on measuring length of 600 mm	as per IS 2368
8.4	Positional accuracy X Axis for complete stroke	0.003 mm or better
8.5	Repeatability X Axis	0.002 mm or better
8.6	External Grinding wheel spindle run out	0.005 mm or better
9.0	DRESSING	
9.1	Dressing device can be mounted on the workhead or on table	
9.2	Following Dressing arrangements are required with mounting arrangements. single point dressing	
10.0	WORK ENCLOSURE	
10.1	Machine lighting with LED lamp, 10 Watt	
10.2	Operator safety guard must be provided.	
11.0	MACHINE BASE & GUIDEWAYS	
11.1	The machine base shall be made from a mineral casting or grey cast iron optimized for high rigidity, vibration damping and guaranting longer wheel life and better surface finish.	
11.2	Temperature fluctuations shall be extensively compensated by the favourable thermal behaviour of the machine base, resulting in high dimensional accuracy at all time	
12.0	STANDARD ACCESSORIES	
12.1	Wheel Adapter for external grinding wheel	min 3sets
12.2	Set of open end wrenches - Size 40	1set
12.3.	Internal Grinding Unit	15000 rpm or better -1no 20000 rpm or better-1 no
12.4	Internal Grinding Arbors (5-12mm/12-32mm in different length)	1no. each
12.5	Collets for internal Grinding (Ø3, Ø4, Ø5, Ø6)	1no. each

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12.6	set of allen keys	1set
12.7	Balancing Mandrel	1no.
12.8	Box Wrench	1set
12.9	Static balancing equipment and balancing arbor	1no.
12.10	Assembly Arbour	1no.
12.11	Centres for workhead and Tailstock	1no. Each
12.12	Dressing Tool Holder for workhead on Tailstock	1no. each
12.13	PCD Dressing plate	1no.
12.14	Reduction Sleeve	1set
12.15	Full Carbide tipped centre points	1no.
12.16	Half Carbide tipped centre points	1no.
12.17	Ejector Rod	1no.
12.18	Set of Damping boses	1set
12.19	Set of Diamond holder with diamonds	1no. Each
12.20	Supporting plate for diamond holder on workhead or tailstock	1no. each
12.21	Grinding wheel flange	Min 2sets
12.22	Collet dia 2 to 25mm	with 0.5mm step
12.23	Magnetic chuck-min dia 170mm or better	1no.
12.24	Three & Four jaw chuck Ø160mm or better	1no. each
12.25	Grinding wheels for External & Internal	2no. Each
12.26	Manual Draw Bar	1no.
12.27	Wheel Changing aid	1no.
12.28	DRO with magnetic scale for both X & Z axes.	
12.29	First Fill of Coolant / Lubricant/Hydrauic Oil	
12.30	Set of reduction sleeves (MT5/MT1, MT5/MT2, MT5/MT3 & MT5/MT1) with set of Drill (5,10,15,20,25,30,40,50)	1 set
9	General Instructions:	
9.1	All the literature should be in English Language only.	
9.2	The Vendor must provide list of customers to whom they have supplied the model offered in this tender in last five years.	
9.3	Vendor should offer detailed technical catalogue of the machine and write up for highlighting special features, specific applications, attachments etc.	
10.0	Installation & Commissioning	
10.1	The machine shall be inspected as per accuracy chart before the dispatch at the vendor site. (As per Din 8632 TE or IS 2368)	

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10.2	The machine to be inspected as per accuracy chart before dispatch at supplier site. The suppliers to prove out the "Test Components" in all aspects. Acceptance and Qualification during Pre Dispatch Inspection (PDI), at the supplier end. Release of machine for dispatch after successful completion of acceptance test post PDI.
10.3	The complete installation and commissioning must be carried out by the supplier for all the machines at the final destination/premises. A final accuracy test with an identified test component to be conducted by the purchaser/consignee. Final accuracy test report is to be signed jointly by Purchaser/consignee and supplier. Final acceptance would be given after conducting the accuracy test at the installation location.
11.0	Service
11.1	The manufacturer should have established after sales and service network in India.
11.2	The authorised service partner in India (Name & address), must be certified by the manufacturer and shown in the quotation.
11.3	Number of similar machine installed in India in a reputed organisation.
12.0	Vendor will also confirm / commit in their offer for the following
12.1	Provide Accuracy chart
12.2	Two sets of manual for operation, maintenance and troubleshooting should be provided by the Vendor in English language, out of which one set of the manual for operation, and maintenance with details and requirements of space, power etc. for the installation and commissioning of the machine need be sent by email / speed mail, quite in advance for our study and readiness for installation and commissioning. Minimum one set of manual should be given in hard copy.
12.3.	Electric circuit diagram of the machine should be supplied with the machine in English language
12.4	The Vendor should provide service for installation, commissioning and detailed training for operation, maintenance, trouble-shooting etc. free of cost at purchaser premises.
12.5	Drawings of the important mechanical assemblies should be supplied for the maintenance purpose.
12.6	2 sets of Machine manuals (Operation and maintenance), spare parts catalogue, machine test charts, calibration certificate in English language, shall be required with the supply.
12.7	List of recommended spares to be offered, for two years of trouble free operation of machine with cost of each item mentioned separately.
12.8	The Vendor will have to demonstrate all the performance / specifications once again after installation at purchaser site. Necessary equipments required for measurement of geometrical accuracies has to be arranged by Vendor.
13.0	Warranty
13.1	Two-year on-site warranty for trouble free operation of the machine from the date of final commissioning and acceptance of machine and free services shall be provided for any trouble during this period. During the period of warranty, if any part is to be replaced, Vendor will have to replace it free of cost. Warranty should include all the items supplied against purchase order. During warranty period, vendor should respond to call/email in maximum 24hrs on all working days and vendor service engineer should attend the machine within maximum 10days from the date of the call/email.