



Electronics Corporation of India Limited

A Government of India Enterprise

CONTROL & AUTOMATION DIVISION-PURCHASE

ECIL Post, Hyderabad - 500 062.

ENQUIRY No. EC/PUR/CAD/ 1907/120590

DATE : 2015.01.22

DUE DATE : 2015.02.16

e-mail:
EXTRA COPY

Contact: D P RAO, SM

Dear Sir(s),

Kindly submit you quotation in a Sealed Envelope Superscribing Enquiry No. and Due Date for the supply of the Following items as per terms and conditions overleaf to PURCHASE MANAGER - CONTROL & AUTOMATION DIVISION ECIL, HYDERABAD-62. QUOTATIONS AGAINST EACH TENDER SHALL BE SENT IN SEPARATE ENVELOPE QUOTATIONS RECEIVED AFTER THE DUE DATE AND TENDERS SENT IN OPEN/UNSUPERSCRIBED ENVELOPE WILL BE REJECTED. PLEASE SEND REGRET LETTER, IF YOU ARE NOT ABLE TO QUOTE TO CONTINUE TO KEEP YOUR NAME IN OUR MAILING LIST.

IMPORTANT INSTRUCTIONS

Parties must give the following information otherwise offer may be rejected.

1. Unit Rate and Terms of price
2. Quantity discount if any
3. Rate of Excise Duty, Sales Tax if any
4. Firm Delivery schedule
5. Mode of despatch
6. Estimated Packing and Forwarding Charges
7. Validity of quotation
8. Terms of Payment
9. Sales Tax Registration Number/VAT and Service Tax Regn. No.
10. SSI/NSI Regn. No.

Sl.No.	Material Description and Specification	Estimated Requirement	
		Unit Code	Quantity
1	SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF ELECTRO DYNAMIC SHAKER (VIBRATION TEST SYSTEM) AS PER ANNEXURE (12 PAGES) AND APPENDIX A (2PAGES) ENCLOSED. <u>Special Notes.</u> 1. Data sheet/Catalogues shall be enclosed to your offer. 2. A Certificate of Compliance shall be submitted along with the consignment. 3. Our Terms of Payment : 90% payment will be made within 60 days of receipt of material at ECIL, subject to acceptance. Balance 10% payment will be made within 30 days of acceptance. 4. If you are unable to quote, send regret letter positively by mail. Our Mail ID prasadaraom@ecil.co.in enable us to keep you in mailing list. 5. Please quote Terms of Price as Free Delivery to our Stores. 6. You should be profit making company in the last preceding 3 financial years (ending by 31st March) 7. You should be an ISO certified Company. 8. This is two part Tender Bid 1. Technical Bid & 2. Price Bid.	Nos.	1

- NOTE:** 1. CERTIFICATE OF COMPLIANCE/BATCH CERTIFICATE/CCOE/CMRI/ATX/ WARRANTY TEST CERTIFICATE SHALL BE FURNISHED. PLEASE CONFIRM.
2. DATA SHEETS (CATALOGUES) SHALL BE SUPPLIED WITH THE QUOTATION.
3. IF THE MATERIAL IS COVERED UNDER DGS & D RATE CONTRACT. PLEASE QUOTE THE RATES ACCORDINGLY.
4. IF THE MATERIAL IS COVERED UNDER EXCISE, FURNISH EXCISE TARIFF NUMBER AND CLASSIFICATION.

Yours faithfully,
For Electronics Corporation of India Limited

(Signature)
MMSC / CSG
ई सी आई एल, हैदराबाद/ECIL, HYD-62

ANNEXURE TO VIBRATION TEST SYSTEM INDENT No. 120590 dated 26-12-2014**SCOPE OF WORK:**

Supply, installation, testing and commissioning of Electro Dynamic Shaker (Vibration Test System) with compatible subsystems such as Shaker, Power Amplifiers, Shaker Control System, Slip Table, Head Expander, Shaker Cooling / field power systems, etc., as per the following specifications, at ECIL, Hyderabad. The Supplier must critically examine the detailed specification provided, comply with those and supply in accordance. The proposal shall be accompanied by a detailed compliance statement in the same order with substantial proof of evidence like product catalogues, technical drawing, references etc.,

I	SHAKER	
Sl. No.	Parameter	Specification
1.	Type	Electro Dynamic Shaker
2.	Sine Force (peak)	90±1 kN or Better
3.	Random Force (rms)	90±1 kN or Better
4.	Shock Force	≥ 180±2 kN (half Sine)
5.	Maximum Acceleration Sine (Bare Table)	≥ 100 g peak
6.	Maximum Acceleration Random (Bare Table)	≥ 50 g rms
7.	Half Sine, Sawtooth and Trapezoidal Shock (Bare Table)	≥ 100 g peak with 18 ms. Acceleration and Pulse width shall be programmable.
8.	Maximum Sine Acceleration with 600 Kg load (Specimen + fixture). Slip table, Bull Nose, Armature and Head Expander extra as applicable	8 g peak for horizontal, 6 g peak for vertical
9.	Maximum Random Acceleration with 600 Kg load (Specimen + fixture). Slip table, Bull Nose, Armature and Head Expander extra as applicable	8 g rms for horizontal, 6 g rms for vertical
10.	Dimensions of Fixture	1.2 m (L) x 1.2 m (W) x 2 m (H)
11.	Maximum Displacement (Bare Table)	≥ 60 mm peak to peak for Sine, ≥ 75 mm peak to peak for Shock
12.	Maximum Velocity (Bare Table)	≥ 2 m/s
13.	Useful Frequency Range	5 Hz to 2500 Hz or better
14.	Armature Diameter	≥ 440 mm
15.	Armature Axial Resonance Frequency (Bare Table)	> 2100 Hz
16.	Internal static load support	≥ 1000 Kg
17.	Shaker Mounting	Lin-E-Air isolated trunnion mounted with geared rotation handle for 90° tilting of the table to assemble with slip table.
18.	Stray Magnetic field	< 10 gauss at 150 mm above the armature
19.	Armature Auto Centering	Armature auto centering at the rated static load, by means of pneumatic load support mechanism with manual over ride.
20.	Effective Armature Mass in kg	Preferably ≤ 85 Kg

Sl. No.	Parameter	Specification
21.	Noise level	The noise level at a distance of 1 meter from Shaker shall not exceed 100 dBA.
22.	Armature Hole Pattern	These interface holes shall be provided with UNC-M10 stainless steel inserts a) One number of M10 insert at center b) Four numbers of M10 inserts at 50 mm PCD c) Eight numbers of M10 inserts at 100 mm PCD d) Eight numbers of M10 inserts at 200 mm PCD e) Eight numbers of M10 inserts at 300 mm PCD
23.	Armature Cross axis response	5 Hz – 500 Hz < 5% & 500 Hz – 1000 Hz < 15% Measured on 15 inch or higher PCD of the armature.
24.	Armature Guidance	Rolling truss design assembly with dual heavy duty hydrostatic bearings integrated with load support.
25.	Armature over travel interlock	Armature over travel shall be sensed using contact type optical sensor/scale. Armature over travel interlock shall trip the power amplifier.
26.	Armature position display	Armature position shall be sensed using noncontact type optical sensor/scale. Digital or LED bar graph display of the armature position shall be provided.
27.	Shaker body position display	Shaker body position shall be sensed using Non-contact type optical sensor/scale. Digital or LED bar graph display of the Shaker body armature position shall be provided. This shall be interlocked with power amplifier with +15 mm limit from mean position.
28.	Shaker Cooling System	Air / Water Cooled
29.	Minimum Length of Air Hose	12 meters
30.	Compressed air requirement	Information to be provided by the Supplier in the technical offer. Supply rate, Pressure, Dryness in terms of condensation temperature in °C at supplied pressure. Suitable Air Compressor shall be provided. Make: Kirloskar or ELGI or Atlas Capco
31.	Shaker body isolation	Air spring suspension, resonance shall be at less than 5 Hz.
32.	Shaker to Slip Table Assembly Movement	Electrically controlled rotating mechanism with gear reduction technique and by manual rotation.

II	POWER AMPLIFIER	
	Matching Power Amplifier in all aspects with above mentioned specifications of the shaker and shall ensure the operation of the shaker to full capacity as per specifications	
Sl. No.	Parameter	Specification
1.	Capacity	Suitable to the rate Capacity of the Shaker
2.	Type	Modular Type, Class 'D' Digital Power Amplifier switching type, Pulse Width Modulation, Variable Field Control, Air Cooled, should be matched with shaker to achieve the rated Sine, Random and Shock testing capabilities. The Power Amplifier should be compatible with all standard controllers and should be capable of continuous operation at full rated load under non air conditioned environment having a temperature of 35°C max.
3.	Frequency Response	DC to 5000 Hz
4.	Switching frequency	100 kHz or Higher preferred
5.	DC Stability	< 0.05% of full voltage with 10% line voltage change
6.	Input Drive	1.5 V rms into 10 K Ohms for full 120 V output
7.	Overall efficiency	> 92% (nominal)
8.	Amplifier shaker distance	≤10 meters Approx.
9.	Peak current handling capacity	Approximately three times or more, that of continuous Sine Current Rating for a period of 100 m seconds
10.	Amplifier Remote control	Remote Control unit for full system control at a distance of 20-30 meters
11.	Digital Metering	LCD display panel with system status of: Output Voltage, Output Current, 3 Phase Input Supply, Module DC Supply Voltage, Field Current, Shaker Temperature
12.	Amplifier, Soft start/Shut down	Shall be provided
13.	Total Harmonic Distortion at rated output	≤1 % or Less with matched resistive load over DC to 4000 Hz
14.	Power Line Filters	RF Line filter to be incorporated, meeting emission levels, specified by EU directive 2004/108/CE or equivalent std. The entire system shall comply with EU Directive 2004/108/CE or equivalent standard
15.	Signal to Noise Ratio	> 65 dB
16.	Input impedance	Higher input Impedance, 10 KΩ Preferred.
17.	Signal Input	1 V rms for 100 V rms output. Differential input compatible with all standard controller. Shall accept maximum 10 V peak input.
18.	Output Voltage	Shall be Compatible with Shaker
19.	Safety Interlocks, Indicators: The power amplifier and shaker system must be protected with these interlocks. Complete with appropriately located Indicators. To be indicated on remote panel and also on power amplifier	3 Phase & Over Under Voltage, Output Over Voltage, Output Over Current, Armature Over Travel, Shaker Over Temperature, Module DC Supply Over & Under Voltage, Module Failure / Fault, Field Supply Failure / Fault, Relay Overload, Door Open e.t.c.,

Sl. No.	Parameter	Specification
20.	Power Rating of Individual Module in kVA	Shall be specified by the supplier. 10-15KVA Modules preferred for easy upgrade and serviceability
21.	Amplifier maximum output Voltage for typical power module used.	Information to be provided by the Supplier in the technical offer
22.	Amplifier maximum output Current for typical power module used	Information to be provided by the Supplier in the technical offer
23.	Entire System Power Consumption while operating at Rated Force	Information to be provided by the Supplier in the technical offer
24.	Operating Voltage	415 VAC \pm 10%, 50Hz, 3 Phase

III COMBINED SLIP TABLE		
Sl. No.	Parameter	Specification
1.	Type	Combo, Shaker and slip table, mounted on a standalone single structure, providing permanent alignment of shaker with slip table and air isolations.
2.	Slip table Useful mounting area	1500 mm x 1500 mm
3.	Thickness of Slip Plate	50 mm Nominal
4.	Combined Resonance Frequency	\geq 150 Hz
5.	Cross axis responses	< 10% up to 800 Hz, all over the plate
6.	Slip table material	Magnesium Alloy
7.	Driver bar material	Type: Tension bolt type. All welded construction, Magnesium alloy.
8.	Stroke	Compatible with Shaker Stroke
9.	Maximum Stroke	\geq 100 mm
10.	Maximum Static Load Support	\geq 1000 kgs
11.	Bearing	8 Hydrostatic Bearings for better cross axis response
12.	Hydraulic Power Supply	Self-Contain hydraulic power supply with hoses capable of generating 3000 PSI high pressure with the following function and feature: a) Start/Stop Switch b) Oil Temperature Indicator c) 3 Phase Power Indication light d) Oil Level Indicator
13.	Nominal Length of Hydraulic hoses	10-15 meters
14.	Slip Table Inserts	M10 SS Inserts with 100 mm Grid Pattern
15.	Safety Interlocks	Flow Pressure, Over Travel, Motor Overload and Oil Over Temperature shall be provided.

IV	HEAD EXPANDER	
	Suitable Guided Head Expander compatible with the shaker that can accommodate large, heavy test specimens with high center of gravity. It shall be designed with light metal Magnesium Alloy, with required number of bearings to provide guidance for tall or offset loads.	
Sl. No.	Parameter	Specification
1.	Material	Magnesium Alloy
2.	Head Expander Useful mounting area	1500 mm x 1500 mm
3.	Insert & Mounting Pattern	M10 SS inserts with 100 mm grid pattern
4.	Frequency Range	up to 2,500 Hz
5.	Resonance Frequency	≥ 150 Hz
6.	Weight	Preferably less than 300 Kg
7.	Guidance	Shall be designed to withstand 1.0 Ton payload

V	VIBRATION CONTROLLER	
	<p>The vibration controller shall be entirely compatible with the proposed shaker and work with high efficiency and without any latency. It shall be based on the latest high speed DSP technology and Ethernet capability. The controller shall be PC based with below configuration.</p> <p>The Host PC for control software shall be of HP make, 4th Gen Intel Core i5 OR higher processor based equipped with motherboard supporting RAID 1 (mirroring) facility (no hot swap) and two nos. of 1 Terabyte HDDs (to be configured in RAID 1 mode), 2 x 4 GB DDR3 1600 RAM, industrial grade SMPS, one no. of USB 3.0 interface portable USB Powered external HDD of 1 Terabyte capacity (Seagate or WD make) and one USB 2.0 based external DVD+/- RW drive shall also be supplied for taking backups. Monitor shall be of 23 inch Full HD LED IPS type with capacitive multi touch screen with greater than 160 deg Vertical and Horizontal viewing angles. The Host PC shall be based on Windows 7 Professional version or higher OS with license and also MS-Office latest professional version with license (standalone). The host PC shall support USB 3.0 and HDMI ports.</p>	
Sl. No.	Parameter	Specification
1.	Hardware	Digital Vibration Controller
2.	Number of Channels	Required 8, Upgradable to 24 channels and shall be demonstrated.
3.	Number of Output Channels for drive	2 Nos.
4.	System Expandability	System shall be able to synchronized with an Online Reduction System
5.	Accelerometer Input	Voltage and ICP mode
6.	Control Type	Digital, single or multi channel average
7.	Frequency Range	DC- 40 kHz
8.	Resolution	Minimum 16000 lines or better
9.	Sample Rate	Minimum 200 kHz per channel
10.	Dynamic Range	150 dB or better
11.	Controller/Computer Interface	Gigabit LAN with maximum throughput rate of 14M Samples/Sec
12.	Throughput measurement	Parallel throughput measurement shall be possible with over sampling

Sl. No.	Parameter	Specification
13.	ADC	Minimum 24-bit sigma-delta ADC
14.	Control Mode	Single Channel, Average, Peak Limit, Average with Peak Limit
15.	Controller Display	16 windows with maximum 8 traces per window shall be possible for data viewing
16.	Import & Export Feature	Data export and import must be possible from and to UFF, SDF, Dynaworks and Matlab
17.	Overload detection and indication	Analog and Digital overload detection Overloads shall be indicated on the front panel LED and transmitted to the host
18.	ICP Cable check	ICP cable check with indication by LED in the front panel.
19.	Phase Match	better than 0.2° @ 10kHz with 10V input range
20.	Crosstalk	Between any two channels: better than -123 dB at 1 kHz typical, independent of input range settings.
21.	Calibration	<p>It shall be possible to carry out onsite instrumentation front end calibration without the need of support / intervention from the supplier.</p> <p>The hardware and software accessories required for the same shall be provided.</p> <p>Offset removal and gain linearity adjustment for all the input/output channels shall be provided.</p> <p>In case of any channel fails in calibration, the calibration process shall continue skipping that particular channel. It shall be possible to isolate / disable the failed channel in further calibration steps.</p>
22.	Environmental Specifications	System shall have been qualified with MIL-STD-810F, JSS 55555 for Vibration, Shock and IP32 according to EN60529.
23.	Operational Specifications	Temperature Operating : -10°C to +55°C, Storage Temperature : -20°C to +70°C, Relative humidity : Up to 95% non-condensing at 23°C and 50% at 45°C
24.	Operating Voltage	230 V AC ± 10%, 50 Hz and wide range of DC Supply from 10.8 V to 42 V.
25.	TEDS Support	Shall support IEEE 1451.4 smart sensors to readout Transducer Electronic Data Sheet (TEDS).

Sl. No.	Parameter	Specifications
6.	Shock Control	<ul style="list-style-type: none"> i. Classical Shock (half Sine, triangular, initial and terminal peak (saw-tooth), trapezoid) ii. User definable peak amplitude and duration (0.06ms to 30 sec) iii. Up to 64,000 point frame size iv. Calculation of MIL STD 810 F, JSS 55555 and GAM EG 13 standards for verification / control v. Shock Response Spectrum (SRS) vi. Limit on SRS during shock test vii. Complete voltage drive signal display before each pulse
7.	Time waveform replication	<ul style="list-style-type: none"> i. Time Replication (generation of pre-recorded time histories) ii. Multiple control strategies: open loop replay, iterative closed loop, adaptive closed loop iii. Reply of time series profile shall be possible up to 0.5 G Samples
8.	Mission Synthesis	<ul style="list-style-type: none"> i. Creating test specifications based on measured real life environment or from standard specifications ii. Comparison of deterministic and stochastic inputs through MRS and FDS at imposed risk shall be possible iii. In line with GAM EG-13, MIL-STD 810F, JSS 55555 and NATA AECTP 200 iv. Fatigue Damage Spectrum, Maximum Response Spectrum

VII ACCELEROMETERS		
Sl. No.	Parameter	Specification
1.	ICP type Accelerometer with suitable 6 mtr long cable and isolation studs	<p>8 Nos. uniaxial type, sensitivity 10 mV/g, range 500g pk 2 Nos. uniaxial type, sensitivity 100 mV/g, range 50g pk 2 Nos. triaxial type, sensitivity 100 mV/g, range 50g pk 2 Nos. triaxial type, sensitivity 500 mV/g, range 10g pk</p> <p><u>Freq Range of Accelerometer with 10 mV/g sensitivity:</u></p> <ul style="list-style-type: none"> i. Freq Range ($\pm 5\%$) ---- 1 to 7,000 Hz ii. Freq Range ($\pm 10\%$) ---- 0.7 to 11,000 Hz iii. Freq Range (± 3 dB) ---- 0.35 to 20,000 Hz iv. Sinusoidal vibration limit : 500 g pk v. Shock Limit : 5000 g pk <p><u>Freq Range of Accelerometer with 100 mV/g sensitivity:</u></p> <ul style="list-style-type: none"> i. Freq Range ($\pm 5\%$) ---- 1 to 4,000 Hz ii. Freq Range ($\pm 10\%$) ---- 0.7 to 7,000 Hz iii. Freq Range (± 3 dB) ---- 0.35 to 12,000 Hz iv. Sinusoidal vibration limit : 500 g pk v. Shock Limit : 5000 g pk <p><u>Freq Range of Accelerometer with 500 mV/g sensitivity:</u></p> <ul style="list-style-type: none"> i. Freq Range ($\pm 5\%$) ---- 0.5 to 3,000 Hz ii. Freq Range ($\pm 10\%$) ---- 0.4 to 4,000 Hz

		iii. Freq Range (± 3 dB) ---- 0.2 to 6,000 Hz iv. Sinusoidal vibration limit : 500 g pk v. Shock Limit : 5000 g pk Make: B&K / PCB / Kristen / Daytran
2.	Accelerometers Calibration	Accelerometers shall be supplied along with Calibration Certificates issued by NABL accreditation Lab.

VIII ACCESSORIES		
Sl. No.	Parameter	Specification
1.	Spare Parts Package	Shall quote for spare parts package comprising fuses, valves, air bags, bearings etc.,
2.	Hardware Tools	2 Nos. of motorized torque wrench with adjustable head and settable torque suitable for the range of torque required for vibration test system operation. Make: Bosch
3.	Alignment and maintenance tool kit	Tool kit comprising of necessary tools is to be supplied for alignment and maintenance of the shaker system. Detailed list of tools of the tool kit shall be given.
4.	Ear Muffs	6 Nos. of noise isolating ear muffs, make 3M to be supplied.
5.	UPS	Suitable or 1 KVA UPS of reputed make with maintenance free batteries for 2 hours of backup shall be supplied. Note: This shall be compatible with Vibration controller and shall automatically switch on to UPS in case of power failure.
6.	Printer	HP Color LaserJet Pro MFP M476dw (CF387A) Printer or better model.

GENERAL REQUIREMENTS:

- Supplier shall supply, install, commission the vibration test system at ECIL, Hyderabad and shall conduct Acceptance Tests as per Factory Acceptance Test (FAT) document.
- Supplier to provide Foundation / Installation details / drawings two months in advance for site preparation.
- Two sets of Hard Copies of Operation, Installation and Maintenance Manuals, Software Configuration, Circuit Diagrams, Wiring Diagrams & Troubleshooting in English and one soft copy also shall be provided.
- Spare Part List with ordering information shall be provided.
- Essential Spares for trouble – free operation of the system for three years to be supplied along with the chamber.
- Three years comprehensive onsite warranty shall be provided for all the items from the date of acceptance. None of the sub components of the equipment shall be excluded from warranty. If the warranty service entails taking the equipment to other place, the costs associated with such movements shall be borne by the supplier. The turnaround time for warranty service shall be less than two days for minor repairs & general service, less than ten days for major part replacements. Beyond permitted down time, warranty will be extended by twice the cumulative excess down time. Supplier shall replenish spares at the end of warranty period by repair or replacement.
- Preferably Shaker, Power Amplifier, Controller shall be of same make and Certificate of origin shall be given.

8. Compressor, Chiller, UPS, PC and Printer shall be from a reputed Indian source and are to be quoted in Indian Rupees. A separate purchase order will be placed for the items supplied from local sources.
9. The supplier shall provide assurance on product support for a minimum period of FIFTEEN years.
10. The successful bidder shall submit FAT document for ECIL's approval. The FAT document shall include all the tests given in Appendix-A, to demonstrate the capability of the vibration test system for the complied specifications and safety interlocks.
11. The FAT invitation letter shall accompany test results and graphs for all tests carried out by OEM as per the approved FAT document.
12. The pre-dispatch inspection shall be conducted by ECIL Engineers at OEM premises before dispatch as per the FAT document. Clearance in FAT does not relieve supplier's responsibility to demonstrate proper operation at ECIL.
13. The Vibration Test System and the auxiliary systems shall be installed, commissioned and demonstrated at ECIL, Hyderabad by supplier.
14. Supplier shall have supplied at least one system with the same or better specifications during the past three years to Indian customers. Copies of the purchase orders with price information shall be enclosed.
15. The list of your customers in India using similar capacity systems and their addresses with telephone numbers, the contact persons and their e-mail details shall be provided.
16. Foreign Based OEM having well established Service Centers in India only can bid. The local agency shall submit authorization letter issued by OEM.
17. Supplier shall provide one week Operation and Maintenance training for our Engineers, free of cost at ECIL, Hyderabad.
18. Calibration Certificate issued by NABL Accredited Laboratory or Equivalent with test results shall be provided along with delivery of the Vibration Test System.
19. Preventive maintenance shall be carried out once a month during warranty period. Failure to do so will result in extension of warranty period by twice the amount of delay in preventive maintenance.
20. Supplier shall specify the country of manufacture for each of the equipment/sub systems, as well as country of integration of Vibration Test System.
21. **Utility requirements:** Supplier shall provide details of the utilities, like power requirements, place requirements etc required for the operation of shaker system.
22. Technical catalogues giving detailed specifications, photographs, drawings, material's certificate for Head Expander & Slip table and dimensions up to subsystem level shall be made available along with quotation for technical evaluation of the Bid. Deviations if any in the specifications shall be clearly mentioned and shall be supported along with technical literature.
23. The firm will be responsible to provide standard test loads (Non-Resonating) to carry out acceptance tests as per FAT document at factory and at ECIL, Hyderabad.
24. **Technical evaluation:** Technical committee / evaluation based on documents provided in offer / presentation discussions with supplier / track record / optionally (as determined by TEC) shall be carried out. Arrange for physical inspection of installations in India of same make equipment of similar capacity may be taken up by TEC for evaluation. Prospective suppliers may be asked to demonstrate on no-cost-no-commitment basis.
25. The supplier shall quote for any other items including consumables, if any required for operation of the Vibration Test System.

TERMS AND CONDITIONS:

1. The bid shall be in TWO parts. i.e.,
 - A) Technical Bid - shall contain
 - i) Technical details
 - ii) Un-priced Bid with complete Bill of Material
 - iii) Compliance statement on the tender technical specification/General Requirements/Terms and Conditions point wise
 - iv) Earnest Money Deposit Cheque / Bank Guarantee
 - v) Details of similar orders executed in the last 3 years
 - vi) Profit & Loss account and balance sheet statements of the last 3 years.
 - B) Price Bid - shall contain Price with complete BOM
2. The supplier shall submit offer in one common sealed cover containing two parts in separate sealed covers. First cover shall contain Technical Bid and second cover shall contain Price Bid. Quotes not received in sealed covers and FAX/Mail quotes are not acceptable. Also, tenders received after due date will not be considered.
3. Supplier shall provide point by point Technical Compliance Matrix specifying compliance supported by Technical Literature. Supplier to furnish these documents along with the Technical bid, failing which the technical bid would be invalid.
4. **I&C Charges:** Charges for Installation and Commissioning shall be quoted separately.
5. **Duties, taxes & levies, freight and insurance** shall be specified separately.
6. The **offer shall be validity for 120 days** from the date of tender opening.
7. The supplier shall submit quotation in separate cover for three years Annual Maintenance Contract from the date of expiry of warranty period for all the items supplied, in Indian Rupees.
8. The original technical bid along with compliance statement supported by product data sheets and test reports of similar equipment executed, shall be submitted. The detailed point to point compliance statement to be enclosed along with the quote. Offer is liable to be rejected if compliance statement is vague (replies like "Yes", "Meets"), unsubstantiated or incomplete. The technical compliance statement and supporting documents shall match with each other. The technical bid / compliance statement shall be signed by Original Equipment Manufacturer.
9. **Earnest Money Deposit:** EMD for an amount of Rs10,00,000/- (Rupees Ten Lakhs only) in the form of **crossed Demand Draft or Bank Guarantee drawn on any Scheduled Bank in India** in favour of 'Electronics Corporation of India Limited, Hyderabad' payable at Hyderabad shall be submitted along with the technical bid. The tenders not accompanied by EMD will be summarily rejected. The EMD amount will be returned to the unsuccessful bidders after completion of selection process.
10. **Security Deposit:** The Security Deposit in the form of bank guarantee valid up to agreed delivery date plus 3 months need to be submitted within one week of receipt of purchase order for 10% of order value. This is an essential condition and exemption will not be given. Security Deposit shall be forfeited in case of non-compliance to purchase order terms and conditions.
11. **Delivery Schedule:** Material is to be supplied within 10 months from the date of release of purchase order.
12. **Payment Terms:** 80% payment within 90 days from the date of shipment against submission of invoice along with related documents and Bank Guarantee for equal amount valid till the equipment is commissioned and satisfactory performance demonstrated for a period of 3 months. Balance 20% within 60 days after successful completion of Installation & Commissioning and training along with I&C Charges, against PBG for 10% of the Order Value.

13. **PBG for 10%** of order value shall be submitted from any Bank, Branch of Indian Origin only, covering the warranty period of 36 months with a grace period of six months from the date of acceptance.
14. **Warranty:** On-Site warranty shall be provided for a period of 36 months from the date of acceptance at ECIL, Hyderabad.
15. **Confidentiality and Non-Disclosure Agreement** shall be provided on Rs.100/- Non-Judicial Stamp Paper as per the format provided by ECIL and signed by supplier.
16. **Liquidated Damages / Penalty Clause:** In the event of any delay in supply beyond the stipulated delivery schedule, ECIL, at their option, LD will be recovered @ ½% per week on the value of undelivered goods, subject to a maximum 10% of the total order value. Inspection offer / call letter will be treated as the basis for imposition of LD. Any delay in deputing our engineer for FAT will be to ECIL account. LD will be levied from the date of non conformity of requirements observed if any during FAT.
17. **Risk Purchase Clause:** In the event of any failure of the seller to comply with the purchase order terms, the buyer has a right to cancel the order and proceed with an alternate source. In the event of proceeding with such an alternate source, the default Supplier shall be liable to bear the extra cost which may incurred by the buyer.
18. **Order Cancellation Clause:** Purchase Order is liable to be cancelled if there is any non-compliance, false statements, dissatisfactory progress and quality related issues with respect to technical specifications and other requirements as called up in tender enquiry / purchase order.
19. Bidders should provide details of litigations if any with Govt. Organisations and Public Sector Undertakings during the past eight years.
20. **Arbitration Clause:** All disputes or differences whatsoever arising between two parties out of relating to the construction meaning and operation of effect of this contract or the breach of them shall be settled by arbitration in accordance with the rules of arbitration of the Indian Council of Arbitration at Hyderabad/Secunderabad jurisdiction.

FACTORY ACCEPTANCE TEST (FAT) DOCUMENT
for
ELECTRO DYNAMIC SHAKER (VIBRATION TEST SYSTEM) 90±1 kN

The following tests are required to be conducted at the time of factory acceptance at OEM's premises and at the time of installation & commissioning in ECIL, Hyderabad.

Note: The below list of tests is indicative only. The purchaser has the right to include additional tests to demonstrate the machine operation as per specifications. FAT document will be finalized after discussions with successful bidder.

Sl. No.	Nomenclature
1.	Bare Table Calibration Test with a standard Optical Triangle method Frequency : 5-10 Hz Constant Displacement : 10 mm and 20 mm
2.	Bare Table Resonance Search Sine Frequency : 5 – 2500 Hz Acceleration : 1 g
3.	Bare Table Maximum Specification Sine Test in all three axes Frequency : 5 – 2500 Hz Displacement : ≥ 60 mm (Peak to Peak) Velocity : 2 m/s Acceleration : 100 g Duration : 30 minutes/axis
4.	Bare Table Maximum Specification Random Test in all three axes Frequency : 5 – 2500 Hz grms : 50 grms
5.	Bare Table Maximum Specification Shock Test in all three axes Frequency : 5 – 2500 Hz Displacement : ≥ 75 mm (Peak to Peak) Velocity : 2 m/s Acceleration : 100 g Duration : 30 minutes/axis
6.	Slip Table Signature in Sine Control Test in all three axes Frequency : 5 – 2500 Hz Acceleration : 1 g
7.	Slip Table Signature in Random Control Test in all three axes Frequency : 5 – 2500 Hz Acceleration : 1 grms Duration : 30 minutes/axis

Sl. No.	Nomenclature
8.	Sine Test with Full Load in all three axes Frequency : 5 – 33 Hz, Displacement : ± 0.125 mm, both forward and backward sweeps (Specimen + Fixture) Weight 600 Kg with additional weight of Armature + (Slip Table + Bull Nose) / Head Expander as applicable Duration : 30 minutes/axis
9.	Sine Test with Full Load in all three axes Frequency : 5 – 2500 Hz Acceleration : 8 g peak for horizontal, 6 g peak for vertical (Specimen + Fixture) Weight 600 Kg with additional weight of Armature + (Slip Table + Bull Nose) / Head Expander as applicable Duration : 30 minutes/axis
10.	Endurance Test Sine at 80% of full capacity in all the three axes: with (Specimen + Fixture) Weight 600 Kg, and additional weight of Armature + (Slip Table + Bull Nose) / Head Expander as applicable for 60 minutes (max. one interrupts)
11.	Random Test with Full Load in all three axes Frequency : 5 – 2500 Hz (Specimen + Fixture) Weight 600 Kg with additional weight of Armature + (Slip Table + Bull Nose) / Head Expander as applicable Acceleration : 8 g rms for horizontal, 6 g rms for vertical Duration : 30 minutes/axis
12.	Endurance Test Random at 70% of full capacity in all the three axes: with (Specimen + Fixture) Weight 600 Kg, with additional weight of Armature + (Slip Table + Bull Nose) / Head Expander as applicable for 60 minutes (max. one interrupts)
13.	Shock Test in Half Sine, Sawtooth and Trapidoizal in all three axes Load : 300 Kg Acceleration : 20 g for horizontal, 17 g for vertical Pulse width : 18 ms No. of Shocks : Positive 5, Negative 5
14.	All interlocks and protections: to be demonstrated at the time of FAT as well as at the time of installation at ECIL, Hyderabad
15.	Gauss test: Stray magnetic field should be less than 10 gauss at 150 mm height above Armature Head.