

**GOVERNMENT OF INDIA  
DEPARTMENT OF SPACE  
VIKRAM SARABHAI SPACE CENTRE (VSSC)  
THIRUVANANTHAPURAM**

## **Tender for 35kN Electrodynamic Vibration Shakers**

**Bids to be submitted online**

**Tender No.: VSSC/PURCHASE UNIT I (MAIN PURCHASE)/VS202400268301 dated  
13-06-2024**

## A. Tender Details

Tender No :	<b>VSSC/PURCHASE UNIT I (MAIN PURCHASE)/VS202400268301</b>
Tender Date :	<b>13-06-2024</b>
Tender Classification:	<b>GOODS</b>
Purchase Entity :	<b>PURCHASE UNIT I (MAIN PURCHASE)</b>
Centre :	<b>VIKRAM SARABHAI SPACE CENTRE (VSSC)</b>

### **Supply, Installation and Commissioning of 35kN Electrodynamic Vibration Shakers and accessories as per specification provided.**

1.This is a TWO-PART tender. i e Techno-Commercial Bid (Part-1) and Price Bid (Part-II) shall be submitted separately. All technical and commercial terms and conditions shall be furnished in the Techno-Commercial Bid while price shall be indicated only in the price bid. Uploading price details anywhere else other than price bid shall lead to unconditional rejection of the tender. Please make note of the same.

2. Tenders are advised NOT TO UPLOAD any documents revealing the price of the main equipment, accessories, spares or AMC along with Part-1 commercial bid. They are how ever requested to upload UNPRICED BIDS (i.e Price details masked) showing appropriate break up of components of main equipment, individual accessories and spares as desires.

3.Technical bids will be opened at the scheduled due date and time. No further intimation will be sent in this regard. The schedule for price bid opening shown is only indicative. Price bids will only be opened in the case of parties who have been techno-commercially accepted, the details of which will be communicated at a later stage.

1.In order to avail the benefits extended by the Govt. of India to the Micro and Small sector Vendors are requested to submit along with their offers-attested copy of valid EM Part II signed by the General Manager, DIC.

2.Make/Model should be specifically mentioned in your offer. Authorized Dealership Certificate should be sent along with your offer.

3.If any of the bidders submit any forged or false documents along with the tender such tenders will be summarily rejected and such bidders will be blacklisted for all future tenders.

4.All Tax Invoices issued by supplier/ service providers shall invariably bear their GST Registration No. (GSTIN) & the applicable GST rates. In the absence of which, the invoices shall not be processed for payment. [VSSC GST IN 32AAAGV0026J1ZL]

### A.1 Tender Schedule

Bid Submission Start Date : **18-06-2024 18:00**

Bid Clarification Due Date : **03-07-2024 17:00**

Bid Submission Due Date : **18-07-2024 14:00**

Bid Opening Date : **18-07-2024 14:30**

Price Bid Opening Date : **24-07-2024 14:00**

## B. Tender Attachments

NA

### Instructions To Vendors

#### 1. PPP Make in India(Non- Divisible Items-Class I & II Local Suppliers Only)

1. A committee (with an external expert from a practicing cost accountant or practicing chartered accountant, if required) constituted for independent verification shall verify the self-declarations & auditor's / accountant's certificates on random basis, as per the requirements.

2. a) The subject item falls under Non-divisible category. b) The offers sought only from Class-I & Class-II local suppliers

3. Definitions: A supplier or service provider, whose goods, services or works offered for procurement, has local content: i. Equal to or more than 50%: Class-I local supplier. ii. More than 20% but less than 50%: Class-II local supplier. iii. Less than or equal to 20%: Non-local supplier.

4. False declarations will be in breach of code of the integrity for which a bidder or its successor's will not be eligible/debarred for purchase preference from further tenders / pending tenders for two years along with other actions as may be applicable.

5. In case of a complaint received from any local supplier indicating a need for review / verification of Local content of successful vendor / awarded vendor, for accepting a complaint from such complainant (w.r.t the false declaration given by the successful vendor on the local content), a complaint fee of Rs.2Lakhs or 1% of the locally manufactured items being procured (subject to a maximum Rs. 5Lakhs), whichever was higher, to be paid by demand draft by the complainant. In case, the complaint is found to be incorrect, the complaint fee shall be forfeited. In case, the complaint is upheld and found to be substantially correct, deposited fee of the complainant would be refunded without any interest.

6. In cases the quoted price is in excess of Rs.1000 Lakhs (including duties, taxes and freight & Insurance) the 'Class-I & II local supplier shall provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in case of suppliers other than companies) giving the percentage of local content.

7. In line with Public Procurement (Preference to Make in India), Order 2017 & its amendments issued by Govt. of India from time to time with a view to support the Indian industries, ISRO has implemented "Purchase Preference Policy". The "Purchase Preference" is applicable for the "Class-I Local Supplier"

for the goods/ services/ works covered in this tender, subject to the following terms & conditions:-

8. 'L1' means the lowest technically accepted tender / bid / quotation (i.e. lowest landed cost including duties, taxes and freight & Insurance).

9. 'Local content' means the amount of value added in India (i.e. indigenous items/services added in the offered products/ services/ works) be the total value of the item offered (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties/IGST) as a proportion of the total value (excluding net domestic indirect taxes), in percent.

10. 'Margin of purchase preference' means the maximum extent to which the price quoted by the "Class-I local supplier" above the L1 (landed cost).

11. Purchase Preference Policy:- Goods/Works which are not divisible (ie., required quantity is 1 or as a package) and Services:

a) If L1 is from a 'Class-I local supplier', the contract will be awarded to L1 bidder.

b) If L1 is not from a 'Class-I local supplier', the lowest bidder among the 'Class-I local supplier' will be invited to match the L1 price subject to local supplier's quoted price falling within the margin of purchase preference (i.e. 20%) and the contract shall be awarded to such 'Class-I local supplier' subject to matching the L1 price (inclusive of duties, taxes and freight & insurance).

c) In case such lowest eligible 'Class-I local supplier' fails to match the L1 price, the 'Class-I local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on, and order/contract shall be awarded accordingly. In case where none of the 'Class-I local supplier' within the margin of purchase preference agree to match the L1 price, then the order/contract shall be awarded to the original L1 Bidder.

12. The 'Class-I & II local supplier' should provide a "Self Certification" along with technical offer indicating that the item offered meets the minimum local content [as per Sl. No.(3)] as called for in the tender and provide the percentage of local content along with details of the location(s) at which the local value addition is made. In case of two bid tenders, it is mandatory to indicate compliance to MLC(minimum Local Content) in technical bid zone.

13. The ink-signed certificate shall be provided on vendors letter head along with the offer (in case of online tender, copy of ink-signed certificate shall be uploaded along with your offer under concerned tab. Original in Hard copy shall be produced on request). In case of non-submission of certificate, the purchase preference shall not apply.

14. The margin of Purchase Preference shall be up to 20%.

15. The Public Procurement (Preference to Make in India), Order 2017 issued by Govt. of India indicates that if there are any general or specific restrictive clauses to restrict participation of Indian

companies in those countries procurement tenders, reciprocity clause need to be invoked as per the order. Hence, if ISRO or Govt. of India come across that Indian suppliers of an item are not allowed to participate and / or compete in procurement by your government, the bid submitted by you will be not be considered and excluded from eligibility for procurement. Please note this point.

16. Works means all works as per Rule 130 of GFR- 2017, and will also include 'turnkey works'. Works includes Engineering, Procurement and Construction (EPC) contracts and services include System Integrator (SI) contracts.

## **2. Format for Self Certification under Preference to MAKE IN INDIA Policy**

1. 1. In line with Government Public Procurement Order No. P-45021/2/2017-BE-II dt. 15.06.2017, as amended from time to time and as applicable on the date of submission of tender, we hereby certify that we M/s. \_\_\_\_\_(supplier name) are local supplier meeting the requirement of minimum percentage of Local content \_\_\_\_\_ ( class I/Class II) as defined in above orders for the materials against Tender No. \_\_\_\_\_

2. 2. Details of locations at which local value addition will be made is as follows: -----  
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3. 3. We also understand, false declarations will be in breach of the Code in Integrity under Rule 175(1) (i) (h) of the General Financial Rule for which a bidder or its successors can be debarred for up two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

4. 4. Seal and Signature of Authorized Signatory.

## **3. PROFORMA FOR INSTRUCTIONS TO TENDERERS AND TERMS & CONDITIONS OF TENDER (IG)**

1. (a) All available technical literature, catalogues and other data in support of the specifications and details of the items should be furnished along with the offer.

(b) Samples, if called for, should be submitted free of all charges by the tenderer and the Purchaser shall not be responsible for any loss or damage thereof due to any reason whatsoever. In the event of nonacceptance of tender, the tenderer will have to remove the samples at his own expense.

(c) Approximate net and gross weight of the items offered shall be indicated in your offer. If dimensional details are available the same should also be indicated in your offer.

(d) Specifications: Stores offered should strictly confirm to our specifications. Deviations, if any, should be clearly indicated by the tenderer in his quotation. The tenderer should also indicate the Make/Type number of the stores offered and provide catalogues, technical literature and samples, wherever necessary, along with the quotations. Test Certificates, wherever necessary, should be forwarded

along with supplies. Wherever options have been called for in our specifications, the tenderer should address all such options. Wherever specifically mentioned by us, the tenderer could suggest changes to specifications with appropriate response for the same.

2. (a) All available technical literature, catalogues and other data in support of the specifications and details of the items should be furnished along with the offer.

(b) Samples, if called for, should be submitted free of all charges by the tenderer and the Purchaser shall not be responsible for any loss or damage thereof due to any reason whatsoever. In the event of nonacceptance of tender, the tenderer will have to remove the samples at his own expense.

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### 3. ACCEPTANCE OF STORES:

(a) The stores shall be tendered by the Contractor for inspection at such places as may be specified by the purchaser at the Contractor's own risk, expense and cost.

(b) It is expressly agreed that the acceptance of the stores Contracted for, is subject to final approval by the purchaser, whose decision shall be final.

(c) If, in the opinion of the purchaser, all or any of the stores do not meet the performance or quality requirements specified in the Purchase Order, they may be either rejected or accepted at a price to be fixed by the purchaser and his decision as to rejection and the prices to be fixed shall be final and binding on the Contractor.

(d) If the whole or any part of the stores supplied are rejected in accordance with Clause No. (c) above, the purchaser shall be at liberty, with or without notice to the Contractor, to purchase in the open market at the expense of the Contractor stores meeting the necessary performance and quality Contracted for in place of those rejected, provided that either the purchase, or the agreement to purchase, from another supplier is made within six months from the date of rejection of the stores as aforesaid.

4. As a Government of India Department, this office is exempted from payment of Octroi and similar local levies. Tenderers shall ensure that necessary Exemption Certificates are obtained by them from the Purchase Officer concerned to avoid any payment of such levies.

5. a) Your offer should be valid for 90 days from the date of opening of the tender.

b) Prices are required to be quoted according to the units indicated in the annexed tender form. When

quotations are given in terms of units other than those specified in the tender form, relationship between the two sets of units must be furnished.

6. DESPATCH: The Contractor is responsible for obtaining a clear receipt from the Transport Authorities specifying the goods despatched. The consignment should be despatched with clear Railway Receipt/Lorry Receipt. If sent in any other mode, it shall be at the risk of the Contractor. Purchaser will take no responsibility for short deliveries or wrong supply of goods when the same are booked on 'said to contain' basis. Purchaser shall pay for only such stores as are actually received by them in accordance with the Contract.

7. d) The term "Purchase Order" shall mean the communication signed on behalf of the Purchaser by an Officer duly authorised intimating the acceptance on behalf of the Purchaser on the terms and conditions mentioned or referred to in the said communication accepting the tender or offer of the Contractor for supply of stores or plant, machinery or equipment or part thereof.

#### 8. GUARANTEE & REPLACEMENT:

(a) The Contractor shall guarantee that the stores supplied shall comply fully with the specifications laid down, for material, workmanship and performance.

(b) For a period of twelve months after the acceptance of the stores, if any defects are discovered therein or any defects therein found to have developed under proper use, arising from faulty stores design or workmanship, the Contractor shall remedy such defects at his own cost provided he is called upon to do so within a period of 14 months from the date of acceptance thereof by the purchaser who shall state in writing in what respect the stores or any part thereof are faulty.

(c) If, in the opinion of the purchaser, it becomes necessary to replace or renew any defective stores such replacement or renewal shall be made by the Contractor free of all costs to the purchaser, provided the notice informing the Contractor of the defect is given by the purchaser in this regard within the said period of 14 months from the date of acceptance thereof.

(d) Should the Contractor fail to rectify the defects, the purchaser shall have the right to reject or repair or replace at the cost of the Contractor the whole or any portion of the defective stores.

(e) The decision of the Purchaser notwithstanding any prior approval or acceptance or inspection thereof on behalf of the Purchaser, as to whether or not the Stores supplied by the Contractor are defective or any defect has developed within the said period of 12 months or any other period or as to whether the nature of defects requires renewal or replacement, shall be final, conclusive and binding on the Contractor.

(f) To fulfill guarantee conditions outlined in (a) to (e) above, the Contractor shall, at the option of the Purchaser, furnish a Bank Guarantee (as prescribed by the Purchaser)

9. PACKING FORWARDING & INSURANCE: The Contractor will be held responsible for the stores being sufficiently and properly packed for transport by rail, road, sea or air to withstand transit hazards and ensure safe arrival at the destination. The packing and marking of packages shall be done by and at the expense of the Contractor. The purchaser will not pay separately for transit insurance, all risks in

transit being exclusively of the Contractor and the Purchaser shall pay only for such stores as are actually received in good condition in accordance with the Contract.

10. Preference will be given to those tenders offering supplies from ready stocks and on the basis of FOR destination/delivery at site.

11. PRICES: Tender offering firm prices will be preferred. Where a price variation clause is insisted upon by a tenderer, quotation with a reasonable ceiling should be submitted. Such offers should invariably be supported by the base price taken into account at the time of tendering and also the formula for any such variation/s.

#### 12. REJECTED STORES:

Rejected stores will remain at destination at the Contractor's risk and responsibility. If instructions for their disposal are not received from the Contractor within a period of 14 days from the date of receipt of the advice of rejection, the purchaser or his representative has, at his discretion, the right to scrap or sell or consign the rejected stores to Contractor's address at the Contractor's entire risk and expense, freight being payable by the Contractor at actuals.

13. Sales Tax and/or other duties/levies legally leviable and intended to be claimed should be mentioned in the price bid template. If nothing is mentioned, then it will be presumed that the rate quoted is inclusive of all taxes/duties.

14. SECURITY DEPOSIT: Wherever, the Purchase Order value is Rs. 5.00 Lakhs or more, on acceptance of the tender, the Contractor shall, at the option of the Purchaser and within the period specified by him, deposit with him, in cash or in any other form as the Purchaser may determine, security deposit not exceeding ten percent of the value of the Contract as the Purchaser shall specify. If the Contractor is called upon by the Purchaser to deposit, 'Security' and the Contractor fails to provide the security within the period specified, such failure shall constitute a breach of the Contract, and the Purchaser shall be entitled to make other arrangements for the re-purchase of the stores Contracted at the risk of the Contractor in terms of Sub-Clause (ii) and (iii) of clause regarding Delivery. (b) hereof and/or to recover from the Contractor, damages arising from such cancellation.

#### 15. TERMS & CONDITIONS OF TENDER

16. TEST CERTIFICATE: Wherever required, test certificates should be sent along with the despatch documents.

17. The authority of the person signing the tender, if called for, should be produced.

18. The Purchaser reserves the right to place order on the successful tenderer for additional quantity up to 25% of the quantity offered by them at the rates quoted.

19. The purchaser shall be under no obligation to accept the lowest or any tender and reserves the right of acceptance of the whole or any part of the tender or portions of the quantity offered and the tenderers shall supply the same at the rates quoted.

20. The tenderer should supply along with his tender, the name of his bankers as well as the latest Income-Tax clearance certificate duly countersigned by the Income-Tax Officer of the Circle concerned under the seal of his office, if required by the Purchaser.

21. The term Contractor shall mean, the person, firm or company with whom or with which the order for the supply of Stores is placed and shall be deemed to include the Contractor's successors, representative, heirs, executors and administrators unless excluded by the Contract.

22. The term Purchaser shall mean the President of India or his successors or assigns.

23. The term "Stores" shall mean what the Contractor agrees to supply under the Contract as specified in the Purchase Order including erection of plants & machinery and subsequent testing, should such a condition is included in the Purchase Order.

#### **4. Conditions for BIDDER FROM A COUNTRY WHICH SHARES LAND BORDER WITH INDIA**

1. 1. As per the Rule 144(xi) of General Financial Rule, 2017, any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the competent authority ie., Department for Promotion of Industry and Internal Trade (DPIIT).

2. 2. Hence, Vendors or Agents of a Vendor (Indian or others) from a country sharing border with India shall submit copy of valid registration made with Department for Promotion of Industry and Internal Trade (DPIIT), Government of India along with the tender mandatorily, without which the offer will be treated as invalid.

3. 3. Model Certificate for Tenders : "I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered". Please submit this declaration duly signed and stamped by your Authorized signatory in your Company/OEM's Letter head.

4. 4. Validity of Registration: Registration should be valid at the time of submission of bids and should be valid at the time of placement of order.

5. 5. Any false declaration and non-compliance of the above would be a ground for immediate rejection of offer or termination of the contract and further legal action in accordance with the laws.

## C. Bid Templates

### C.1 Technical Bid - 35kN Electrodynamic Vibration Shakers

**1. ELECTRODYNAMIC SHAKER SYSTEM: Supply, Installation and commissioning of 35kN capacity electrodynamic vibration shaker system along with slip table, Power amplifier and auxiliaries as per the specifications provided.**

#### Item specifications for ELECTRODYNAMIC SHAKER SYSTEM

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Shaker type	Electro-dynamic, Air cooled	Yes / No / Explain		
2	Armature diameter	440 mm (minimum)	Yes / No / Explain		
3	Peak sine force	35,000 N	Yes / No / Explain		
4	Random force	35,000 Nrms	Yes / No / Explain		
5	Half sine bump force	70,000N	Yes / No / Explain		
6	Displacement (continuous)	≥50 mm sine (peak to peak)	Yes / No / Explain		
7	Acceleration Sine (Bare table)	≥100 g (peak) from 5 to 2000 Hz (limited to maximum displacement and maximum velocity in lower frequency) ≥1g from 2000 to 3000Hz	Yes / No / Explain		
8	Acceleration Random (Bare table)	≥100 grms	Yes / No / Explain		
9	Acceleration Shock (Bare table)	≥150 g(peak)	Yes / No / Explain		
10	Velocity bare table	≥1.8 m/sec(peak)	Yes / No / Explain		
11	Armature resonance frequency	≥2100 Hz	Yes / No / Explain		
12	Armature Body Material	Magnesium alloy	Yes / No / Explain		

13	Armature suspension cross-axial stiffness	≥5kN/mm	Yes / No / Explain		
14	Armature suspension rotational stiffness	≥65 kNm/rad	Yes / No / Explain		
15	Armature cross axial response	< 10%, in 5 to 2kHz frequency band, except at resonant frequency peaks. Vendor to provide typical Cross axis response curves of this class of armature in the offer at 100g and 10g.	Yes / No / Explain		
16	Shaker body isolation	Air spring suspension, resonance frequency <5 Hz	Yes / No / Explain		
17	Internal load support capability	≥500 Kg	Yes / No / Explain		
18	Total armature moving mass	≤35 Kg	Yes / No / Explain		
19	Stray magnetic field	< 1 mT at 150 mm above the armature with degaussing coil on	Yes / No / Explain		
20	Armature inserts type and inserts pattern	Raised hexagonal payload securing inserts M8x1.25 insert 1no. at centre. M8x1.25 inserts (4 nos) equally spaced on 4" PCD. M8x1.25 inserts (8 Nos each) equally spaced on 6", 8", 12", 16" PCDs.	Yes / No / Explain		
21	Armature Auto Centring	Armature auto centring at stated load by means of centre positioning sensor	Yes / No / Explain		
22	Armature over travel	Armature over travel should be sensed using non-contact type optical sensor. Armature over travel interlock should trip the power amplifier.	Yes / No / Explain		

23	Minimum possible bare table test levels	≤0.25g swept sine, sweeping rate 1 oct/min. from 5Hz to 2500 Hz. Control and drive plots are required from 5-2500Hz. (Should be supplied along with quotation)	Yes / No / Explain		
24	Nominal length of hose for cooling air (shaker to blower)	20meters. Slight incremental length may be required depending on the positioning of shaker and blower.	Yes / No / Explain		
25	Compressed air requirement	Information to be provided by the vendor in the technical offer regarding Flow rate, Pressure, Dryness in terms of condensation temperature in degree Celsius at supplied pressure. Compressed air pressure preferably <8 bar	Yes / No / Explain		
26	Acceleration waveform distortion (THD) at armature top	< 20% at full acceleration level from 5 to 2000Hz (Frequency v/s distortion graph to be provided)	Yes / No / Explain		
27	Shaker Assembly type	Combo base- shaker and slip table, mounted on a standalone single structure providing permanent alignment of shaker & slip table. The combo-base shall be isolated from ground by suitable means.	Yes / No / Explain		
28	Armature mounting	Trunnion mounted air suspension	Yes / No / Explain		

29	Geared rotation	Provision for easy rotation of the shaker to 90 degree using manual rotation with gear and chain drive so as to connect to the slip-table as and when required. Electrical cables, flexible hoses and hydraulic hoses are to be properly guided and secured during shaker rotation.	Yes / No / Explain		
30	Air cooling blower	Suitable air blower shall be provided with acoustic enclosure. The blower noise shall be below 85dB at a distance of 1 meter from the blower.	Yes / No / Explain		
31	Working temperature range	20 to 35 deg Celsius	Yes / No / Explain		
32	Emergency stop	There shall be at least 4 nos. of Emergency stop buttons (One near vibration controller ~20meters from the power amplifier, One on power amplifier control panel and two on either sides of shaker)	Yes / No / Explain		
33	Slip table size	Usable area of 600 mm x 600 mm ( $\pm 10$ mm)	Yes / No / Explain		
34	Slip table thickness	50 mm or higher	Yes / No / Explain		
35	Slip table material	Magnesium alloy AZ 31 B	Yes / No / Explain		
36	Slip table Type	Granite base with oil film + high pressure Hydrostatic Bearing.	Yes / No / Explain		
37	Minimum number of bearings for slip table	Two	Yes / No / Explain		
38	Maximum slip plate stroke	$\geq 90$ mm	Yes / No / Explain		
39	Flatness of slip table	0.10mm/m or better	Yes / No / Explain		
40	Driver bar for slip table	Tension bolt type	Yes / No / Explain		

41	Driver bar material	Magnesium alloy AZ 31 B	Yes / No / Explain		
42	Total Moving Mass during slip table operation	The total moving mass of the system including Armature, Driver Bar, slip plate & slip Plate bearings and any other moving parts shall be less than 100kg. The breakup of mass to be provided along with quote	Yes / No / Explain		
43	Combined resonance frequency during slip table operation	>1000 Hz	Yes / No / Explain		
44	Combined useful frequency range during slip table operation	5 -2000 Hz	Yes / No / Explain		
45	Slip table over travel switch	Slip table over travel interlock should trip the power amplifier	Yes / No / Explain		
46	Slip table Over turning moment	>20 kNm about Pitch, Yaw and Roll axes	Yes / No / Explain		
47	Slip table bearings	Hydrostatic bearing. Vendor to provide exact number of bearings and its configuration to meet the above-mentioned pitch, yaw, roll moment specifications.	Yes / No / Explain		
48	Acceleration waveform distortion (THD) at slip table edge	<20% at maximum rated acceleration level in the frequency range 5 to 100 Hz	Yes / No / Explain		

49	Hydraulic power pack	Suitable for the bearing of slip table, low noise, less than 70 dB approximately within 2m from the equipment. The power pack should operate with mains power supply. Hydraulic system interlocks to be provided with the amplifier. Provision to be made in the shaker for automatically bypassing this interlock during vertical axis operation.	Yes / No / Explain		
50	Type of insert and pattern on the top surface of slip table	Metric (M8), coarse threaded, flush with surface Inserts. M8x1.25 insert 1no. at center. M8x1.25 inserts (4 nos) equally spaced on 4" PCD. M8x1.25 inserts (8 Nos each) equally spaced on 6", 8", 12", 16" PCDs. M8x1.25 inserts 13 Nos on 24" PCD. M8x1.25 inserts 4 Nos on 28" PCD.	Yes / No / Explain		
51	Power amplifier Power Output	Suitable to meet the shaker specification	Yes / No / Explain		
52	Power amplifier Signal to Noise ratio	>65 dB w.r.t 100V rms output	Yes / No / Explain		
53	Power amplifier Type	PWM based, switching type, class D, Modular, air cooled	Yes / No / Explain		
54	Number of power modules	Number of power modules should be minimum 4 to operate the machine at the maximum capacity. The individual rating of the module shall be indicated.	Yes / No / Explain		
55	Total Harmonic distortion of Power amplifier	< 2% when measured with matched resistive load at rated output.	Yes / No / Explain		

56	Peak current handling capacity	≥3 times that of continuous Sine Current Rating for a period of 100 msec	Yes / No / Explain		
57	Amplifier Remote control panel	Remote control panel with all monitoring and control switches to be provided with a cable length of approximately 20 meters via PC interface. Remote panel shall allow to Bypass some interlocks also.	Yes / No / Explain		
58	Amplifier, soft start / soft shut down	Shall be available	Yes / No / Explain		
59	System noise	0.05 Vrms or Less, with Input shorted and full gain.	Yes / No / Explain		
60	Switching frequency of Power amplifier	Greater than or equal to 150 kHz	Yes / No / Explain		
61	Input impedance	Higher input Impedance, Greater than or equal to 10 KΩ	Yes / No / Explain		
62	Input compatibility	Differential input compatible with all standard controllers. Should accept maximum ±10 V peak input and adjustable system Gain upto 100	Yes / No / Explain		

63	Safety Interlocks	<p>The power amplifier and shaker system must be protected with following system interlocks</p> <ol style="list-style-type: none"> <li>1. HT Minimum</li> <li>2. HT Maximum</li> <li>3. Power Module Failure</li> <li>4. Power Module overcurrent</li> <li>5. Input over drive</li> <li>6. Phase failure</li> <li>7. Amplifier over temperature</li> <li>8. Cabinet door open</li> <li>9. Output Over voltage</li> <li>10. Armature over current (Adjustable limit)</li> <li>11. Vibrator field (ON / OFF)</li> <li>12. Vibrator Over travel</li> <li>13. Vibrator Cooling system failure (blower)</li> <li>14. Air pressure</li> <li>15. Field temp</li> <li>16. Slip table overtravel</li> <li>17. Slip table oil (Hydraulic Pressure)</li> <li>18. Configurable External Trip-1 &amp; 2 slip table interlocks are to be automatically bypassed during vertical operation of the shaker</li> </ol>	Yes / No / Explain		
64	Safety indicators	<p>The following system level indications must be provided on remote panel and also on power amplifier display panel.</p> <p>Transformer Temp, Rectifier temp, Emergency stop and also for each of the interlocks mentioned above.</p> <p>The Power amplifier and remote panel shall display which interlock had tripped the power amplifier.</p>	Yes / No / Explain		

65	Power amplifier display panel	There shall be separate display pages available in the Power amplifier for the list of interlocks available, and whether it is enabled/disabled.	Yes / No / Explain		
66	Metering	The Power amplifier must meter the following parameters and display on Amplifier metering page and on remote panel 1. Amplifier Output Voltage & Current 2. Field Voltage & Current 3. Amplifier Gain	Yes / No / Explain		
67	Power Amplifier operation	The user shall be able to operate, change settings or enable/disable interlocks in the power amplifier without intervention of the supplier. Passwords, licenses, if any for the above should be shared with the user during the supply and should not require any update later.	Yes / No / Explain		
68	Variable field control	Amplifier should accommodate the field power supply transformer and related circuits. User should be able to vary the field power supply voltage.	Yes / No / Explain		
69	Mains power	3 phase 415 V $\pm$ 10 %, 50 Hz. Transformer tapping shall be provided to operate the system at 380V, 400V, 415V, 440V.	Yes / No / Explain		
70	Power module cooling	The power modules should have independent cooling	Yes / No / Explain		
71	Power Loss Protection	The amplifier should have synchronized loss protection facility to have a smooth shut down in the event of power failure.	Yes / No / Explain		

72	System Interface	The amplifier should have Microprocessor based user interfaces which improves reliability and fault diagnosis of the system.	Yes / No / Explain		
73	Power Rating of Individual Module in kVA	Information to be Provided by the Vendor in the technical offer	Yes / No / Explain		
74	Line filter	Line filter (RFI filter) to be incorporated to meet the emission levels specified by the European Union (EU) directive. Total system wherever applicable should comply with EU directive 2004/108/CE or equivalent standard.	Yes / No / Explain		
75	Warranty	Comprehensive onsite warranty for a period of one year (minimum) for all the items. The warranty period shall start from the date of acceptance of the shaker system in all respect at VSSC, Trivandrum	Yes / No / Explain		
76	Scope of supply	Combo-base type electro dynamic vibration shaker with slip table, Power amplifier, Field power supply, Shaker cooling system, Hydraulic power pack and other auxiliaries, Essential accessories / toolkit & spares, Adequate power cables, control cables, air hoses and any other materials required for operation of the complete system.	Yes / No / Explain		

77	Pre-delivery inspection	Vendor shall conduct acceptance testing for each of the shaker system as and when realised at factory before shipment in presence of VSSC engineers. Minimum test requirement is given in Annexure-I. The supplier may conduct additional tests as per their standard acceptance procedure. Any special equipment required for the installation & acceptance test shall be arranged by the party, if required.	Yes / No / Explain		
78	Testing and Acceptance at VSSC	Vendor shall conduct acceptance testing of each of the shaker system after installation at VSSC. The supplier may conduct additional tests as per their standard acceptance procedure. Any special equipment required for the installation & acceptance test shall be arranged by the party, if required.	Yes / No / Explain		
79	Compliance statement	Table of compliance statement giving exact numerical values should be provided along with the quote. Merely stating "comply" does not constitute sufficient technical data. Offer without this information will be rejected without any further reference.	Yes / No / Explain		

80	Documents required for Technical Evaluation	Detailed technical specifications of the items should be provided. Specified technical data should be supported by product catalogues, manuals, test procedures, and test results/plots etc. In order to validate any of the specification, supplier must allow VSSC team to inspect and conduct tests on similar shaker supplied within India and demonstrate the capability as per the above specifications.	Yes / No / Explain		
81	Schematic drawing	Schematic diagram of quoted machine assembly with insert configuration shall be provided along with the quote.	Yes / No / Explain		
82	User manuals	Operation, service and maintenance manuals, Assembly drawings, in soft and hard copy format shall be supplied	Yes / No / Explain		
83	Extended Warranty (Optional)	Extended 3-year comprehensive onsite warranty (after completion of standard warranty) with break up for 1st year, 2nd year and 3rd year should be quoted separately in the price bid.	Yes / No / Explain		
84	Annual Maintenance Contract (Optional)	Non comprehensive AMC for 3 years (after completion of standard warranty) with breakup for 1st year, 2nd year and 3rd year should be quoted separately in the price bid. AMC shall include two mandatory visits per year as a part of preventive maintenance and unlimited breakdown calls.	Yes / No / Explain		

85	Service support	<p>Supplier shall be bound to supply OEM spares/components for servicing the shaker system and its auxiliaries for a minimum period of 10 years.</p> <p>Supplier shall extend required support during warranty and extended warranty period/AMC.</p> <p>Supplier should have service centre with trained service engineer in India. Service centre address, contact person details etc. shall be provided along with the quote. Breakdown maintenance to be attended within 2 days of intimation during warranty and AMC period.</p>	Yes / No / Explain		
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**Document : Annexure-I, Pre delivery Inspection**

**2. SPARES FOR SHAKER: Supply of essential accessories, toolkit and spares (list provided) for the electrodynamic vibration shaker system as in Item sl. no. 1**

**Item specifications for SPARES FOR SHAKER**

Sl No	Specification	Value	Compliance	Offered Specification	Remark
1	Essential Accessories / Toolkit	<p>One set of Standard tool kit for the repair and maintenance of the shaker systems (Including Armature servicing kit) shall be provided.</p> <p>Vendor shall provide the list of tools along with quantity recommended in the technical offer.</p>	Yes / No / Explain		

2	Essential Spares	The vendor shall supply essential spares for the shakers system quoted as per the list attached in Annexure-II. Price breakup for spares shall be provided along with price bid.	Yes / No / Explain		
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**Document : Annexure-II, Spares**

**Common Specifications (Applicable for all items)**

SI No	Specification	Value	Compliance	Offered Specification	Remark
1	Eligibility for Participation in tender	Supplier should have commissioned at least two numbers of shakers of similar capacity (in terms of force, displacement, g level) in two industries/institutions in India, with minimum one in Aerospace application which has completed at least 1 year of trouble-free operation.	Yes / No / Explain		
2	List of Installations	The supplier should submit a list of these installations giving the date of supply and contact details along with the quote, so that VSSC engineers may visit these installations and evaluate the system as part of tender evaluation. Offer without this information will be rejected without any further reference.	Yes / No / Explain		
3	Minimum Local Content	The quoted item shall meet the minimum local content criteria for Class-I local supplier.	Yes / No / Explain		

**Supporting Documents required from Vendor**

**1. Any other documents**

**2. Detailed price bid with price breakup of shaker system and spares (Price Bid Related)**

**3. List of installations**

**4. List of Tools and spares**

**5. Schematic drawing**

**6. Product catalogues, manuals, test procedures, and test results/plots etc**

**7. Compliance statemet**

5 additional documents can be uploaded by the vendor

## C.2 Commercial Terms / Bid

Sl. No.	Description	Compliance	Vendor Terms
1	Delivery schedule: The 1st system to be supplied within the stipulated delivery period in the Purchase Order. 2nd and 3rd shakers to be supplied after the intimation from VSSC on the successful installation & acceptance of 1st shaker at VSSC.	Yes / No / Explain	
2	Training shall be given to VSSC Engineers at site for operation and maintenance of the system installed	Yes / No / Explain	
3	The party should bring all the necessary tools, equipments/machineries required for installation and commissioning of the vibration shaker system at site. Warehouse to warehouse insurance shall be in vendor's scope.	Yes / No / Explain	
4	The vibration shaker system has to be Installed, tested and commissioned at VSSC.	Yes / No / Explain	
5	Taxes and other costs,	Yes / No / Explain	
6	Security Deposit (Applicable if Offer Value is Rs. 5 Lakhs or above. MSME/NSIC Units are NOT EXEMPTED from the payment of SD. Bank Guarantee @ 3% of Order Value valid till 60 days from the date of supply to be submitted. Mandatory compliance required. Only Government Bodies/PSUs/PSEs can submit Indentity Bond in lieu of BG. In the event of non-performance of contractual obligations, SD will be forfeited).	Yes / No / Explain	
7	Delivery Terms.	Yes / No / Explain	
8	Delivery schedule: The 1st system to be supplied within the stipulated delivery period in the Purchase Order. 2nd and 3rd shakers to be supplied after the intimation from VSSC on the successful installation & acceptance of 1st shaker at VSSC.	Yes / No / Explain	

9	Liquidated Damages (Applicable beyond the delivery period mentioned in this tender @ 0.5% per week or part thereof on the undelivered portion subject to a maximum of 10% of the contract value. Mandatory compliance required).	Yes / No / Explain	
10	Warranty	Yes / No / Explain	
11	Performance Bank Guarantee (PBG) Bank Guarantee @ 3% of Order Value valid till the completion of warranty period plus 2 months claim period to be submitted. Mandatory compliance required. Only Government Bodies/PSUs/PSEs can submit Indemnity Bond in lieu of BG. In the event of non-performance of warranty obligations, PBG will be forfeited).	Yes / No / Explain	
12	Payment Term: (Our Default payment term: For indigenous orders: 100% within 30 days after receipt acceptance, INSTALLATION AND COMMISSIONING of item at our site ON PRO-RATA BASIS. NOTE: CONSEQUENT TO COVID 19 PANDEMIC AND AS PER EXTANT GUIDELINES FROM DEPARTMENT OF SPACE, NO ADVANCE PAYMENT IS PAYABLE TO THIS TENDER).	Yes / No / Explain	
13	Definitions: A supplier or service provider, whose goods, services or works offered for procurement, has local content: a) Equal to or more than 50% : Class-I local supplier. b) More than 20% but less than 50% : Class-II local supplier. c) Less than or equal to 20% : Non-local supplier. Mention your category.	Yes / No / Explain	
14	Local content means the amount of value added in India (i.e. indigenous items/services added in the offered products/services/works) be the total value of the item offered (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties/IGST) as a proportion of the total value (excluding net domestic indirect taxes), in percent. Indicate extent of Minimum Local Content in offered product/service and location of such value additions.	Yes / No / Explain	

15	The Class-I & II local supplier should provide a Self Certification along with your offer in PDF format indicating that the item offered meets the minimum local content as called for in the tender as mentioned above and provide the % of local content along with details of the location(s) at which the local value addition is made. In case of two part tenders, it is mandatory to indicate compliance to MLC(minimum local content) in technical bid itself. Confirm attachment of Self declaration along with the offer.	Yes / No / Explain	
16	PO Placement Address (with Name and Contact Details of sales person concerned).	Yes / No / Explain	
17	Any Other Terms	Yes / No / Explain	
18	Offer Validity	Yes / No / Explain	
19	PERFORMANCE BANK GUARANTEE cum SECURITY DEPOSIT: -BG for 3 % of the total order value towards SD cum PBG on receipt of Purchase Order shall be submitted in Rs. 200/- Non-judicial stamp paper issued by Nationalized/ Scheduled Indian Bank valid 2 months beyond the completion of warranty period shall be provided by you.	Yes / No / Explain	

20	<p>1.This is a TWO-PART tender. i.e Techno-Commercial Bid (Part-1) and Price Bid (Part-II) shall be submitted separately. All technical and commercial terms and conditions shall be furnished in the Techno-Commercial Bid while price shall be indicated only in the price bid. Uploading price details anywhere else other than price bid shall lead to unconditional rejection of the tender. Please make note of the same.</p> <p>2. Tenders are advised NOT TO UPLOAD any documents revealing the price of the main equipment, accessories, spares or AMC along with Part-1 commercial bid. They are how ever requested to upload UNPRICED BIDS (i.e Price details masked) showing appropriate break up of components of main equipment, individual accessories and spares as desires.</p> <p>3.Technical bids will be opened at the scheduled due date and time. No further intimation will be sent in this regard. The schedule for price bid opening shown is only indicative. Price bids will only be opened in the case of parties who have been techno-commercially accepted, the details of which will be communicated at a later stage.</p>	Yes / No / Explain	
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### C.3 Price Bid

Sl. No.	Item	Quantity	Unit Price	Currency	Total Price	Remark
1	ELECTRODYNAMIC SHAKER SYSTEM: Supply, Installation and commissioning of 35kN capacity electrodynamic vibration shaker system along with slip table, Power amplifier and auxiliaries as per the specifications provided.	3.00 Nos.		-		

2	SPARES FOR SHAKER: Supply of essential accessories, toolkit and spares (list provided) for the electrodynamic vibration shaker system as in Item sl. no. 1	1.00 Sets		-		
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**Common charges (Applicable for all items)**

<b>Freight charge</b>	
<b>P&amp;F Charges</b>	