

मौलाना आज़ाद राष्ट्रीय प्रौद्योगिकी संस्थान भोपाल
Maulana Azad National Institute of Technology Bhopal
(भारत सरकार, शिक्षा मंत्रालय के अधीन राष्ट्रीय महत्व का संस्थान)
(An Institution of National Importance under MoE, Govt. of India)



सीमित निविदा पृच्छताछ

LIMITED TENDER ENQUIRY

सामग्री/वस्तु का नाम
Name of Goods/Items

Battery cycler with desktop PC System and Software, Mass flow Controllers for Low Flow, LowFlowSensor for Air and Water, K type Thermocouples, temperature range -50°C to 300°C, Nano powder fluids, Thermal Compound Grease , Air and Liquid mass flow meter

Website www.manit.ac.in

Fax No: 0755-2670562

Email Address: info@manit.ac.in

Telephone No: 0755-4051000, 0755-4052000

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<i>मौलाना आज़ाद राष्ट्रीय प्रौद्योगिकी संस्थान, भोपाल</i>	
<i>Maulana Azad National Institute of Technology Bhopal</i>	
(भारत सरकार, शिक्षा मंत्रालय के अधीन राष्ट्रीय महत्व का संस्थान)	
(An Institution of National Importance under MoE, Govt. of India)	
No. MANIT/ESE/2025:17	दिनांक / Date: 25/11/2025
निविदा आमंत्रण सूचना	
NOTICE INVITING TENDERS	
सामग्री / वस्तु का नाम Name of Goods/Items	Battery cycler with desktop PC System and Software, Mass flow Controllers for Low Flow, Low Flow Sensor for Air and Water, K type Thermocouples, temperature range -50°C to 300°C, Nano powder fluids, Thermal Compound Grease , Air and Liquid mass flow meter
<p>उपरोक्त सामग्री / वस्तु के लिए निविदाएँ अमंत्रित की जाती हैं। इच्छुक निर्माता/अधिकृत भागीदार/ एंजेन्सियाँ, अधिक जानकारी के लिए संस्थान के वेबसाईट www.manit.ac.in और CPPP वेबसाईट www.eprocure.gov.in/epublish/app पर लाग-इन कर सकती हैं। निविदा दस्तावेज डाउनलोड कर विधिवत रूप से उप-कुलसचिव (भण्डार एवं क्रय) मौलाना आज़ाद राष्ट्रीय प्रौद्योगिकी संस्थान, भोपाल – 462003 जमा किया जा सकता है।</p>	
<p>सम्पूर्ण निविदा मय दस्तावेज प्रस्तुत करने की अंतिम तिथि 16 दिसंबर 2025 अपरान्ह 12.00 बजे तक है। संस्थान निदेशक, बिना कोई कारण बताए किसी या संपूर्ण निविदा को पूर्ण या आंशिक रूप से स्वीकार या अस्वीकार करने का अधिकार सुरक्षित है।</p>	
कुलसचिव	
<p>Tenders are invited for aforesaid Goods/ Items. Interested Manufacturers/ Authorized Partner/Agencies may log on Institute website www.manit.ac.in and CPPP website www.eprocure.gov.in/epublish/app for further details. Tender Document can be downloaded and the duly completed be submitted to the Deputy Registrar (Stores & Purchase) Maulana Azad National Institute of Technology- Bhopal- 462003.</p>	
<p>Last date of submission of complete tender document is 16 December 2025 up to 12.00 hours. The Director of the Institute reserves the right to accept or reject any or the entire tender in full or in part without assigning any reason whatsoever.</p>	
Registrar	

मौलाना आज़ाद राष्ट्रीय प्रौद्योगिकी संस्थान, भोपाल
Maulana Azad National Institute of Technology Bhopal

एक नजर में महत्वपूर्ण जानकारियाँ

IMPORTANT INFORMATION AT A GLANCE

निविदा क्रमांक एवं दिनांक Tender No & Date	No. MANIT/ ESE/2025:17 Date: 25/11/2025	
निविदा का कार्यक्षेत्र / SCOPE OF TENDER		
सामग्री / वस्तु का संक्षिप्त विवरण Brief Description of Goods/Items	संख्या Quantity	टिप्पणी Remarks
Battery cycler with desktop PC System and Software, Mass flow Controllers for Low Flow, Low Flow Sensor for Air and Water, K type Thermocouples, temperature range -50°C to 300°C, Nano powder fluids, Thermal Compound Grease , Air and Liquid mass flow meter	As per BoQ	संलग्नक- I पर विस्तृत विवरण Detailed Specification at Annexure-I
निविदा की अनुमानित लागत Estimated cost of Tender	Rs.1820000.00	
आपूर्ति एवं स्थापना का स्थान Location of Supplies & Installation	ऊर्जा विज्ञान एवं अभियांत्रिकी विभाग Department of Energy Science & Engineering at Institute	
निविदा दस्तावेज की उपलब्धता Availability of Tender Document	www.manit.ac.in www.eprocure.gov.in/epublish/app	
निविदा जमा करने के अंतिम दिनांक एवं समय Last Date & Time of Submission of Tender	16-12-2025 up to 12:00 hours	
निविदा खुलने की दिनांक एवं समय Date & Time of Opening of Bids	16-12-2025 at 15:00 hours	
निविदा वैधता की अवधि Tender Validity period	60 days from the date of opening of the Technical Bid	
वितरण / आपूर्ति की अवधि Delivery/ Supply period	06 weeks from the date of issue of Supply Order	
वारंटी अवधि Warranty Period	1 year (s) from the date of successful Installation & Commissioning of equipments/ items	
बोली सुरक्षा / बयाना राशि Bid Security/ EMD	As per slab mentioned in the document.	
निष्पादन सुरक्षा राशि Performance Security Amount	As per slab mentioned in the document	

बोलीदाता के लिये निर्देश/अनुदेश / INSTRUCTIONS TO BIDDERS

1	Scope of Supplies & Work:	
a	The Goods/ Items shall be supplied as per the Bill of Quantity and Specifications mentioned in ANNEXURE-I . However higher specification of equipment may be considered subject to their cost economics competitiveness.	
b	Bidder should supply illustrated leaflet giving technical details of Goods/ Item and attach the same with the tender to facilitate evaluation.	
c	No option(s) regarding price of Goods/ Items shall be entertained in the price bid. Bidder should quote the price of only one best & appropriate model of Good/Item available with them.	
d	Purchase Preference will be given to “Make in India products” as defined in Purchase Preference with Local Content (PP-LC) Policy. Accordingly, bidders with Local Content less than or equal to 20% will be treated as “Non Local Supplier”. The prescribed LC shall be applicable on the date of Bid opening. The bidder shall submit an undertaking along with the bid stating the bidder meets the mandatory minimum LC requirement and such undertaking shall become a part of the contract. Local content certificate from practicing Cost Accountant or practicing Chartered Accountant giving the percentage of local content shall be acceptable. The local content certificate shall be submitted along with each invoice raised.	
e	Purchase preference will be given to MSEs as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs). If the bidder wants to avail the Purchase preference, the bidder must be the manufacturer of the offered product in case of bid for supply of goods. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product or service. If L-1 is not an MSE and MSE Seller (s) has/have quoted price within L-1+ 15% (Selected by Buyer)of margin of purchase preference /price band defined in relevant policy, such Seller shall be given opportunity to match L-1 price and contract will be awarded for 25%(selected by Buyer) percentage of total QUANTITY.	
f	Bidder may be asked to supply sample of offered product/item before supply in bulk quantities.	
g	Where ISI certification marked goods are available in market, procurement should generally be limited to goods with those or equivalent marking only. The warranty/AMC required must be specified	
h	After the supply of Goods/ Items & Accessories as mentioned in the ANNEXURE-I , the bidder has to execute its installation at the designated location(s).No extra cost shall be paid for this reason.	
2	Delivery of Supplies & Installation:	
a	The purchaser interested for complete delivery of equipments along with Installation, Testing and Commissioning within the period as mentioned at IMPORTANT INFORMATION AT GLANCE sheet. However, the bidder has an option to submit the best delivery with installation time.	
b	The material shall be inspected on receipt at site and bidder shall be responsible for any damage during the transit of Goods/Items.	
c	The insurance cover including insuring the goods against the loss or damage incidental to manufacture or acquisition, transportation, storage and delivery/ installation shall be obtained by bidder in his own name and not in the name of	

		purchases.		
3	Warranty & After Sales Services:			
	a	The bidder shall offer on-site comprehensive warranty of equipments as mentioned at IMPORTANT INFORMATION AT GLANCE sheet at the designated location & shall cover each and every part of the equipments including parts having limited life etc. The purchaser is not liable to pay any extra charges on any account during warranty period.		
	b	The bidder shall ensure to render after sales services during the warranty period to the satisfaction of purchaser.		
4	Eligibility Criteria:			
	a	Bidder should be a Company/Partnership firm/ Proprietary firm/ Agency and operational from at least 03 years (Three) as on close date of tender. Copy of registration shall be attached.		
	b	Bidder should have minimum annual turnover (Double value of estimated cost of tender) in last year .CA certification in this regard is to be submitted.		
	c	The Earnest Money Deposition slip/ proof of payment.		
	d	Bidder should have GST Number & Income PAN both.		
	E	Please submit the MAF for at least Battery cycler with desktop PC System and Software		
	F	Datasheet of all the offered products must be enclosed		
5	Earnest Money Deposit:			
	The bidder is instructed to submit EMD in the form of DD/FDR/RTGS/NEFT/BG/Bank deposition slip along with bid to prove the transfer of payment to the purchaser's Account as per EMD slab mentioned below:			
	Tender Value	EMD Rate	Remarks	
	Less than 2.50 Lakhs	NIL		
	Between 2.50 lakhs to 25.00 Lakhs	2% of Tender Value rounded off in nearest in 100 rupees.		
	a	Purchaser's Bank Account details:		
		Account Name	Bank Name	Bank A/c No.
	Director MANIT Bhopal	State Bank of India	10020150107	SBIN0001608
b	The EMD will be returned to the unsuccessful bidders soon after placement of order and successful bidder shall get its EMD after supply of material.			
c	The bidder seeking EMD exemption, must submit the valid supporting document for the relevant category. Manufacturers for goods and service providers for services are eligible for exemption from EMD under MSE Category. Traders are excluded from the purview of this policy.			
6	Amendment of Tender Document:			
	a	At any time prior to the date submission of bids, the purchaser may, for any reason, whether at its own initiative or in response to a clarification sought by a prospective bidder, amend bid document by issuing corrigendum. The corrigendum will be notified/ published in e-tendering website www.eprocure.gov.in/epublish/app and Institute website only.		
7	Price Bid			
	a	The Prices should be quoted in Indian Rupees only.		
	b	Purchaser (being a research Institution) is registered with the Department of Scientific & Industrial Research (DSIR) for the purpose of availing custom duty exemption in terms of GoI Notification No. 51/96-Customs dated 23 July 1996. The bidder should quote their prices considering the exemption certificate. If any certification needed by bidder, may be given to avail this benefit.		

	c	Bidder shall take into account all costs including unloading at the location of purchaser, cartage etc. for giving delivery of material at site(s) before quoting the rates. In this regard no claim what so ever shall be entertained.
	d	The bidders are advised not to indicate any separate discount. Discount, if any, should be merged with the quoted unit prices.
	e	The price quoted in price bid shall be firm but subject to change in rate of applicable taxes if any.
	f	The Bidder should avoid the use of vague term such as “Extra as applicable”. Such offers shall be treated as non-responsive.
	g	No extra payment shall be paid on account of any discrepancy in nomenclature of items. The bidder shall seek clarifications if any before submitting the tender.
8	Bid Submission:	
		The bidder is instructed to give their offline offer through Single bid system for this tender. The tender must be placed in a properly sealed envelope super-scribed “ <i>Tender for the Supply and installation of Equipment.</i> ” with tender inquiry number and its due date addressed to The Director, Maulana Azad National Institute of Technology- Bhopal- 462003 and must reach the office of The Deputy Registrar- Stores & Purchase, Maulana Azad National Institute of Technology, Bhopal on or before as mentioned at IMPORTANT INFORMATION AT GLANCE sheet. The sealed Envelop should be consisting of followings:
	a	Copy of Certificate of Registration of firm, GST Number and Income Tax PAN.
	b	Proof of submission of EMD amount
	c	Certificate mentioning of Turnover for the last year and OEM authorization letter.
	d	BOQ Annexure-I and Price Bid Annexure-II duly filled and signed.
9	Evaluation of Bids:	
		The Institute may evaluate all the required Goods/Items in this tender together or independent depending upon nature of items & compatibility and compare the quotations determined to be substantially responsive i.e. which
	a	are properly signed;
	b	Confirm to the eligibility criteria of the vendor; and
	c	Confirm to the terms & conditions, and technical specifications.
	d	In case, required goods/items in this tender are independent and complete in nature. Institute may evaluate independently as far as price is concerned for placing order(s).
10	Validity of Tender:	
	a	The tender shall be valid as mentioned at IMPORTANT INFORMATION AT GLANCE sheet. Terms and financial details submitted in the bid shall be treated as firm during the validity period.
	b	In exceptional circumstances, prior to the expiry of the bid validity period, the purchaser may request bidders to extend the period of validity of their bids. The request and the responses shall be made in writing.
11	Notification of Award:	
	a	Prior to the expiry of the period of bid validity, the purchaser shall notify the successful bidder, in writing, that its bid has been accepted. The notification letter shall specify the sum that the purchaser will pay to the bidder in consideration of the <i>Supply of Goods/ Items</i> with the details of selected location.
	b	Purchase/ Contract order shall preferably be issued in favour of bidder. Bidder may request in advance for issuance of Purchase/ Contract order in favour of OEM of product. In this case billing and payment shall be made to OEM only.

12	Performance Security Deposit: The bidder is required to submit Performance Security in the form of DD/FDR/RTGS/NEFT/BG/Bank Deposit after installation of material along with the bill to the Institute as per slab mentioned below:			
	Order/ Contract Value	PSD Rate		PSD Period
	Less than 2.50 Lakhs	NIL		Warranty period plus two month extra
	Between 2.50 lakhs to 25.00 Lakhs	5% of Tender Value rounded off in nearest in 100 rupees.		
	a	Purchaser's Bank Account details:		
		Account Name	Bank Name	Bank A/c No.
		Director MANIT Bhopal	State Bank of India	10020150107
	b	In case of breach of contract, performance security shall be forfeited and the bidder shall be blacklisted for such period as decided by the competent authority in addition to cancellation of order.		
	c	Performance Security shall be returned to the bidder without any interest, whatsoever, after completion warranty period as specified in the tender.		
13	Penalty Clause:			
	a	The bidder shall indicate the period within which the ordered quantity will be supplied along with Installation & Commissioning of Goods/ Items. The bidder shall note that in case bidder fails to do so within the period of delivery indicated by the bidder in price bid of this tender, penalty @ 0.50 % on total value of the PO per week of delay would be levied subject to maximum 20 weeks. It means, the bidder shall have the liability of delayed supply to the maximum of 20 weeks after expiry of scheduled delivery date.		
14	Terms of Payment:			
	a	The Payment shall be made within 30 days by purchaser after supply and installation of Goods/ Items.		
15	Jurisdiction:			
	a	In the event of any dispute the legal matter shall be subjected to the jurisdiction of Bhopal court only.		
16	Details of Contact Persons for Query if any			
	Name	Dr. Ravindra Jilte	Rakesh Singh Parihar	
	Designation	Associate Professor	Technical Assistant	
	Tel No	91155 11973	9179840676	
	Email		Rakesh.singh@manit.ac.in	

मौलाना आज़ाद राष्ट्रीय प्रौद्योगिकी संस्थान, भोपाल
Maulana Azad National Institute of Technology Bhopal

सामग्री की मात्रा एवं विवरण
BILL OF QUANTITY AND SPECIFICATION

SN	Name of Product/ Items	Quantity	Remarks
1	Battery Cycler with desktop PC System and Software (Specification as per Annexure-1)	01 no.	
2	Mass Flow Controllers for Low Flow (Specification as per Annexure-1)	02 nos.	
3	Low Flow Sensor for Air and Water (Specification as per Annexure-1)	05 nos.	
4	K Type Thermocouples, Temperature Range -50 degree C to +300 degree C (Specification as per Annexure-1)	20 nos.	
5	Nano Powder Fluids (Specification as per Annexure-1)	01 no.	
6	Thermal Compound Grease (Specification as per Annexure-1)	01 no.	
7	Air and Liquid Mass Flow Meter (Specification as per Annexure-1)	02 nos.	

NB: Drawing/ Design is enclosed herewith.

We confirm with our acceptance to the technical specifications given above.

Date:

BIDDER'S NAME &
SIGNATURE WITH SEAL

				ANNEXURE- II		
FORMAT FOR SUBMISSION OF BID PRICE						
To,						
The Director						
MANIT- Bhopal- 462 003						
Sub: Tender Document dated .						
SN	Product Description with make & Model	Discounted unit price	Qty	Qty Price	GST	Total Price
1	2	3	4	5	6	7(5+6)
1						
2						
Total offered Price						
Total (In Words):						
Delivery Period required:						
The followings things are confirmed and undertake by us that:						
a	The price quoted above are inclusive of statutory Levies & Taxes, Duties, Transportation and other charges (Insurance, Loading/ unloading, Packing & Forwarding charges, Installation etc.) at site.					
b	Taxes are subject to change/ revision.					
c	We agree with the terms and conditions specified in "Instructions to Bidders" and if selected, the execution of supplies would be made as per bill of Quantity & Specification.					
Date:	Signature of Authorized Bidder with proper rubber stamp					
	Name:					
	Designation:					
	Mobile No:					

Technical Specifications

Item No.1: Battery cycler with desktop PC System and Software		
S.no	Specifications	Compliance (Yes/No)
1	<p>1. Equipment Description A high-precision battery test system designed for power batteries/battery packs, supporting performance testing, grading, and conditioning as required for lithium-ion battery manufacturing and research. The equipment features high accuracy, stability, advanced software, and modular design for ease of maintenance.</p> <p>2. Technical Specifications of Battery Cyclers Parameter / Specification</p> <ul style="list-style-type: none"> * Channels: One * Communication: Ethernet * Voltage Range (Charge): 0 to 60V DC * Voltage Range (Discharge): 60 to 3 VDC * Current Range (Charge): 1 to 100A DC * Current Range (Discharge): 1 to 100A DC * Voltage Accuracy: $\pm (0.05\%RD + 0.05\%FS)$ * Current Accuracy: $\pm (0.05\%RD + 0.05\%FS)$ * Voltage Resolution: 24 bit * Current Resolution: 24 bit * Power Output : 6 kW * Temperature range : -20 to 120 deg C * Input Power: AC 380V/220V $\pm 10\%$, 50Hz * Input Impedance: $\geq 10 \text{ M}\Omega$ * Current Response Time: $\leq 5 \text{ ms}$ * Continuous Operation: Designed for 24x7 operation * Equipment Noise: $< 65 \text{ dB}$ <p>3. Operating Modes Charging: Constant current, constant voltage, constant power Discharging: Constant current, constant power Charge Cut-off: Voltage, current, time, capacity, temperature Discharge Cut-off: Voltage, current, time, capacity, temperature</p> <p>4. Protection Features * Anti-reverse connection, over-voltage, over-current, over-temperature, etc.</p> <p>5. Data & Software Features * Data logging: local and detailed (current & historical data) * Safety protection conditions should be provided, including: voltage lower limit, voltage upper limit, current lower limit, current upper limit, delay time, etc. * Export: Single Excel reports : automatic derivative on test completion * Analysis of capacity, voltage, time * Step limit: Up to 100 steps per test flow, with nested loop operations * User-friendly interface with manual pause, software shutdown, power-failure recovery, communication loss extension, abnormal stop extension</p> <p>6. Technical Specifications of Desktop PC Desktop Computer: Workstation Intel -Xeon W3-2423 2.1G 15Mb 6C/ 32GBDDR5/ Z Turbo 1Tb M.2 SSD + 1Tb 7200Rpm Sata/Ent NVIDIA T1000 8GB/ Dvdrw/Win 11 Pro/ 6 Cores Mdp To Dp/ 775W/ 3 Yrs Warranty(8L189PA),Black, Processor: - Intel Xeon W3-2423 (up to 4.0 GHz with Intel Turbo Boost Technology, 15 MB L3 cache, 6 cores, 12 threads)</p>	

<p>Operating system & Graphics: - Windows 11 Pro, Graphics: Discrete, NVIDIA T1000 (8 GB GDDR6 dedicated) Memory & Storage: - 32 GB DDR5-4800 MT/s (1 x 32 GB) Memory Slots: 4 DIMM, Internal Storage: 1 TB HP Z Turbo Drive PCIe Gen4 TLC M.2 SSD, Hard drive (2nd): 1 TB 7200 rpm SATA HDD Graphics Coprocessor: NVIDIA T1000</p> <p>Ports: - Front 4 USB Type-A 5Gbps signalling rate; 1 headphone/microphone combo, Rear 1 RJ-45; 1 audio-in/out</p> <p>Audio C Keyboard: - Realtek ALC3205-CG, Wired Keyboard, Wired Mouse</p> <p>Monitor:- 27 plus</p> <p>7. General Requirements</p> <ul style="list-style-type: none"> * The system must be supplied with all necessary accessories, manuals, and cabling for full functionality per specification. * Compliance with local electrical and safety standards. * Local installation and commissioning support, with user training. * Minimum 1 year manufacturer's warranty 	
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Item No.2: Mass flow Controllers for Low Flow

<p>Equipment 1</p> <p>Application: It is specifically designed to measure and control low flow rates in the range of 1ml/min–100 ml/min (or high), making it suitable for precision applications such as coolant (water glycol mixture) control in battery thermal management systems (BTMS) and laboratory experiments. Flow Range: 1ml/min–100 ml/min (or high)</p> <p>Parameter Specification (Typical/Required)</p> <p>Measuring Principle: Electromagnetic (magnetic-inductive) or Coriolis/thermal</p> <p>Measuring Range: 0–5l/min (minimum 0.10l/min), or as per requirement</p> <p>Accuracy: ±2% of measured value + 0.5% of range (or better)</p> <p>Repeatability: ≤0.5% of measured value</p> <p>Viscosity Range: ≤50mm²/s at 40°C</p> <p>Response Time : ≤0.1s</p> <p>Process Connections: G 1/2, G 3/4, or equivalent via adapters</p> <p>Pressure Rating : ≥16bar</p> <p>Medium Temp Range: –10°C to +70°C</p> <p>Ambient Temp Range –10°C to +60°C</p> <p>Display: 4-digit alphanumeric LED (or equivalent for readout/diagnostics)</p> <p>Equipment 2 Application: It is specifically designed to measure and control low flow rates in the range of 100 ml/min (or low)–10000 ml/min (or high), making it suitable for precision applications such as coolant control in battery thermal management systems (BTMS) and laboratory experiments. Flow Range: 1–50 milliliters per minute (ml/min)</p> <p>Parameter Specification (Typical/Required)</p> <p>Measuring Principle: Electromagnetic (magnetic-inductive) or Coriolis/thermal</p> <p>Measuring Range: 0–5l/min (minimum 0.10l/min), or as per requirement</p> <p>Accuracy: ±2% of measured value + 0.5% of range (or better)</p> <p>Repeatability: ≤0.5% of measured value</p> <p>Flow Resolution : ≥0.01l/min</p> <p>Medium Conductivity: ≥20µS/cm (for EM sensors)</p> <p>Viscosity Range: ≤50mm²/s at 40°C</p> <p>Response Time : ≤0.1s</p> <p>Process Connections: G 1/2, G 3/4, or equivalent via adapters</p> <p>Pressure Rating : 10 bar</p> <p>Medium Temp Range: –10°C to +70°C</p>	
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Ambient Temp Range -10°C to $+60^{\circ}\text{C}$ Display: 4-digit alphanumeric LED (or equivalent for readout)	
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Item No.3: Low Flow Sensor for Air and Water

<p>Equipment 1 Inline Temperature and mass/volume flow sensors Application: It is specifically designed to measure temperature and flow rates in the range of 100 ml/min (or low)–1000 ml/min (or high), making it suitable for precision applications such as coolant control in battery thermal management systems (BTMS) and laboratory experiments. Flow Range: 100 ml/min (or low)–1000 ml/min (or high) Medium Temp Range: -10°C to $+70^{\circ}\text{C}$ Accuracy: $\pm 2\%$ of measured value + 0.5% of range (or better) Repeatability: $\leq 0.5\%$ of measured value Flow Resolution : $\geq 0.011/\text{min}$ Medium Conductivity: $\geq 20\mu\text{S}/\text{cm}$ (for EM sensors) Viscosity Range: $\leq 50\text{mm}^2/\text{s}$ at 40°C Response Time : $\leq 0.1\text{s}$ Process Connections: G 1/2, G 3/4, or equivalent via adapters Pressure Rating : 10 bar Ambient Temp Range -10°C to $+60^{\circ}\text{C}$ Display: 4-digit alphanumeric LED (or equivalent for readout/diagnostics)</p> <p>Equipment 2 Temperature and mass/volume flow sensors Application: It is specifically designed to measure temperature and flow rates in the range of 10 ml/min (or low)–100 ml/min (or high), making it suitable for precision applications such as coolant control in battery thermal management systems (BTMS) and laboratory experiments. Flow Range: 10 ml/min (or low)–100 ml/min (or high) Medium Temp Range: -10°C to $+70^{\circ}\text{C}$ Medium Conductivity: $\geq 20\mu\text{S}/\text{cm}$ (for EM sensors) Viscosity Range: $\leq 50\text{mm}^2/\text{s}$ at 40°C Response Time : $\leq 0.1\text{s}$ Process Connections: G 1/2, G 3/4, or equivalent via adapters Pressure Rating : 10 bar Display: 4-digit alphanumeric LED (or equivalent for readout/diagnostics)</p> <p>Equipment 3 Hot Wire Anemometer with low flow blower 1. Measurement Capabilities Air Velocity Range: 0 to 25 m/s (0 to 5000 ft/min) Air Flow Range: 0 to 999,900 m³/min (or ft³/min) Temperature Range: -20°C to 60°C Relative Humidity Range: 0 to 100% RH 2. Accuracy Velocity: $\pm 3\%$ of reading $\pm 1\%$ full scale (0–20 m/s), $\pm 5\%$ reading $\pm 1\%$ full scale (20–25 m/s) Temperature: $\pm 0.8^{\circ}\text{C}$ Humidity: $\pm 3.5\%$ RH (20–80% RH), $\pm 5\%$ (0– 100% RH) 3. Resolution Velocity: 0.01 m/s (1 ft/min) Air Flow: 0.001 m³/min (ft³/min) Temperature: $0.1^{\circ}\text{C}/^{\circ}\text{F}$ Humidity: 0.1% RH 4. Features & Accessories Telescopic probe (87 cm length) for ease of use in ducts</p>	
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	<p>Fast response time (warm-up time approx. 5 seconds) Sampling rate: 2 measurements per second Operates on 9V battery or USB power adapter (5V DC) Supplied with battery and carrying case Blower: It should be a variable rpm blower with rpm control. Require range of rpm is 50 RPM (or low) to 1000 RPM.</p> <p>Equipment 4 Hot Wire Anemometer with Wind Tunnel</p> <p>1. Measurement Capabilities Air Velocity Range: 0 to 25 m/s (0 to 5000 ft/min) Air Flow Range: 0 to 999,900 m³/min (or ft³/min) Temperature Range: -20°C to 60°C Relative Humidity Range: 0 to 100% RH</p> <p>2. Accuracy Velocity: ±3% of reading ±1% full scale (0–20 m/s), ±5% reading ±1% full scale (20–25 m/s) Temperature: ±0.8°C Humidity: ±3.5% RH (20–80% RH), ±5% (0–100% RH)</p> <p>3. Resolution Velocity: 0.01 m/s (1 ft/min) Air Flow: 0.001 m³/min (ft³/min) Temperature: 0.1°C/°F Humidity: 0.1% RH</p> <p>4. Features C Accessories Telescopic probe (87 cm length) for ease of use in ducts Fast response time (warm-up time approx. 5 seconds) Sampling rate: 2 measurements per second Operates on 9V battery or USB power adapter (5V DC) Supplied with battery and carrying case</p> <p>Wind Tunnel The dimensions of wind tunnel is shown in figure, its walls will be made of metal sheets and front of its test section should be of glass for visibility. Exhaust fan should be installed at diffuser end.</p> <p>Equipment 5 Inline Pressure transducer (Quantity:2): We require an inline pressure transducer for laboratory testing of our liquid-cooled Battery Thermal Management System (BTMS). The sensor will be installed directly within the coolant flow path to monitor the fluid pressure, ensuring system safety and leak detection during operation. The fluid medium is a water-glycol mixture, so the sensor must be compatible and resistant to corrosion and chemical effects from this coolant. The required pressure range for the sensor is 0 to 10 bar, with high accuracy (better than 1% full scale) and fast response time suitable for real-time monitoring. The transducer should support digital output (preferred) or standard analog for seamless integration with our data acquisition system. Please source a reliable, industrial-grade inline pressure sensor designed specifically for such liquid cooling applications. Calibration certificates and manufacturer compliance to quality standards will be preferred.</p>	
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Item No.4: K type Thermocouples, temperature range -50°C to 300°C

	<p>1. Sensor Type: Type K Thermocouple (Chromel–Alumel) 2. Polarity: Yellow (positive: Chromel, negative: Alumel) 3. Measurement Range: -50°C to +500°C 4. Junction Type: Exposed or Grounded Junction</p>	
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	<p>Ensures fast response time (typically <1 second)</p> <p>5. Probe Design: Flat/Washer/Ring Lug Type Probe for easy attachment to cylindrical or prismatic battery surfaces.</p> <p>6. Probe Dimensions: Ring Outer Diameter: 5 mm typical .</p> <p>7. Sensor Thickness: <2 mm (low profile for tight integration)</p> <p>8. Cable Specifications: Length: 2.5 meters Insulation: Teflon (PTFE) or Fiberglass insulation Outer Jacket: Twisted pair</p>	
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Item No. 5: Nano powder fluids

	<p>Sub-Item 1: Graphene Nano-powder, Quantity: 50 grams</p> <p>The product shall be a high-purity graphene nano powder consisting of fragile, exfoliated sheets with a high aspect ratio to ensure superior electrical conductivity and mechanical strength. The material must have a thickness in the range of 5 to 10 nanometers and lateral dimensions (diameter) between 5 and 10 microns. Carbon purity shall exceed 99%, providing enhanced conductivity and performance.</p> <p>The nanopowder should have a bulk density of approximately 0.24 g/cm³ and a specific surface area of around 150 m²/g to support advanced material interactions. Structurally, the graphene shall consist of multiple layers (typically 4 to 6) of hexagonally connected carbon atoms, where each carbon atom bonds with three adjacent atoms, leaving one free electron that facilitates excellent electrical conductivity.</p> <p>The material’s high aspect ratio— approximately 1000 times greater than standard carbon particles—contributes to its high strength while maintaining ease of handling. The product shall be black in color and intended for research, development, or high-performance industrial applications requiring premium quality graphene nano powder in powder form.</p> <p>Sub-Item 2: Aluminum Oxide (Al₂O₃) Nanoparticles, Quantity: 500 grams</p> <p>The material shall be supplied as a stable dispersion with a concentration of 20 wt.% in isopropanol. The particle size, measured by dynamic light scattering (DLS), shall be less than 50 nanometers to ensure uniformity and consistency in application. The dispersion’s pH level must be maintained between 8 and 10 to guarantee stability and performance.</p> <p>The density of the dispersion is approximately 0.79 g/cm³ at 25 °C. Mechanically, the material shall exhibit tensile strength ranging from 300 to 630 MPa, compressive strength between 2,000 and 4,000 MPa, and hardness values in the range of 15 to 19 GPa. The dispersion should provide moderate thermal conductivity, typically between 20 and 30 W/m·K.</p> <p>The operating temperature range without mechanical load is specified between 1,000 and 1,500 °C. The product shall be delivered in sealed PET bottles to preserve quality and prevent contamination during storage and handling.</p> <p>This specification is intended for use in research, development, or industrial processes that require high-quality nanomaterial dispersions with specified mechanical and thermal properties. Suppliers are requested to confirm compliance with these parameters and provide relevant test certificates where applicable.</p>	
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Sub-Item 3 : Copper Oxide (CuO) Nanoparticles Quantity : 500 grams

The product shall consist of copper oxide (CuO) nanoparticles with a particle size range of 1 to 100 nanometers. It is an ultrafine powder exhibiting a monoclinic crystalline structure and a brownish-black coloration. The material possesses a high surface-to- volume ratio, which enhances its catalytic activity, particularly aiding condensation reactions such as those involving iodobenzene.

The chemical composition of the nanoparticles shall contain approximately 79.87% copper and 20.10% oxygen by weight.

The product's physical properties include a density of 6.31 g/cm³, a molar mass of 79.55 g/mol, a melting point near 1201 °C, and a boiling point around 2000 °C.

Copper oxide nanoparticles are recognized for their semiconductor properties, including optical, electrical, and magnetic characteristics, making them suitable for various advanced applications. The material exhibits enhanced electrical conductivity, increased hardness, and improved mechanical strength when incorporated into metal alloys and composites. Furthermore, it demonstrates antimicrobial and biocidal activity, relevant for specialized industrial or research purposes.

The product should be supplied in powder form with consistent nanoscale particle size distribution and be suitable for laboratory, industrial, and research applications requiring high-quality copper oxide nanopowder.

Sub-Item 4: Multiwalled Carbon Nanotubes, Quantity: 50 grams

The purity of the carbon nanotubes must exceed 99.99%, ensuring high performance in electrical and thermal applications. The

nanotubes shall exhibit a specific surface area of approximately 400 m²/g and a bulk density in the range of 0.20 to 0.35 g/cm³. Thermal

conductivity is required to be greater than 3000 W/m·K, demonstrating excellent heat dissipation capabilities. Mechanical properties must include a tensile strength between 10 and 60 GPa, reflecting exceptional robustness.

These carbon nanotubes shall be chemically resistant and possess negligible heat generation during extended operation, making them suitable for use in applications where thermal management and electrical conductivity are critical.

The material's allotrope structure, derived from graphene layers, imparts outstanding electrical conductivity and mechanical strength.

The product shall be supplied as a consistent, high-quality powder suitable for research, industrial, and technological applications requiring premium multi-walled carbon nanotubes. Suppliers must provide documentation verifying compliance with the stated purity, dimensional, thermal, and mechanical characteristics.

Sub-Item 5: Copper Foam (Open Cell) Quantity: 2 pieces

Dimension: 300mm x 200mm Thickness: 1.5 mm

Cell Size (PPI): 110 PPI Purity > 99%

Porosity: 95%-98%

The product shall be copper foam consisting of a crystalline solid skeletal structure characterized by a robust, highly porous, and permeable architecture.

The foam shall exhibit a consistent and reproducible cell structure and connective matrix uniformly distributed throughout the material. It must be free from crushing, coating, plating, holes, impurities, or inclusions, maintaining purity comparable to the base copper alloy used in its production.

	<p>The material shall have an open-cell micro- porous structure with a high density of interconnected pores evenly spread across the copper substrate. The foam shall be manufactured from solid copper with a low relative density adjustable between approximately 3% and 12%, resulting in an extremely lightweight product suitable for weight-sensitive applications. Copper foam shall demonstrate excellent thermal conductivity relative to its size and weight. The design must facilitate enhanced heat transfer between the foam and fluids passing through its structure, significantly improving thermal transmission compared to solid metal alternatives due to its greatly increased surface area. This characteristic also makes the material well-suited for integration with phase change materials (PCM) to improve thermal coupling efficiency.</p> <p>Sub-Item 6: Aluminum Foam, Quantity: 2 pieces Dimension: 37.5mm x 37.5mm Thickness: 15 mm Cell Size (PPI): 10 PPI Purity > 99% Porosity: 95%-98%</p> <p>The product shall be aluminum foam manufactured either from aluminum alloy (minimum 98.5% purity, e.g., alloy 6101) or pure aluminum with a minimum purity of 99.5%. The foam shall exhibit a closed-cell structure with a porosity ranging between 60% and 90%, and pore sizes spanning approximately 2 to 11 millimeters.</p> <p>The density of the aluminum foam is required to be within the range of 0.11 to 0.41 g/cm³, providing a lightweight yet structurally robust material. Mechanical properties shall include a compressive strength of up to 44 MPa, ensuring durability under relevant operational loads.</p> <p>The material must withstand maximum service temperatures up to 450°C, with a melting point near 660°C consistent with aluminum. The foam’s architecture consists of interconnected aluminum strands forming numerous air-filled cells, which typically constitute 80% to 98% of the foam’s volume. This structure imparts a superior strength-to- weight ratio compared to solid aluminum, making it suitable for applications demanding lightweight structural support combined with mechanical resilience.</p> <p>Suppliers are requested to provide supporting documentation confirming chemical composition, density, porosity, pore size distribution, compressive strength, and thermal properties as part of their bid proposals.</p>	
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Item No. 6 : Thermal Compound Grease		
	<p>Quantity : 400 grams</p> <p>High temperature, high thermally conductive paste intended for use with temperature sensors such as thermocouples, RTDs, and thermistors on a variety of surfaces including metals, battery surface, plastics, and glass. The paste must be silicon grease, suitable for continuous use between -40°C and at least 200°C, possess very high thermal conductivity and offer excellent electrical insulation with a resistivity greater than 10¹⁴ Ω·cm.</p>	

	<p>It should be supplied as a thick, smooth paste that is easy to apply, wets most surfaces, does not require curing, and will not harden after prolonged exposure to elevated temperatures. The product should be thixotropic (non-drip), suitable for both temporary and permanent bonding or encapsulation of temperature sensors, and maintain its performance characteristics over long-term use. Bidders are requested to provide quotations with product's technical datasheet, compliance certification to the above requirements.</p>	
<p>Item No.7: Air and Liquid mass flow meter</p>		
	<p>Device Type: Electromagnetic flow meter for conductive liquids (Quantity: 2) Application Suitability: Well-suited for BTMS systems, cooling loops, and other thermal management setups involving water-glycol coolant due to its compact design, accuracy, and compatibility with conductive liquids. Measured Media: Suitable for conductive liquids such as water-glycol mixtures Minimum Flow Rate: 0.05 liters per minute (L/min) Maximum Flow Rate: 35 liters per minute (L/min) Pipe Connection Size: G 1/2 inch Power Supply Voltage: Operates on 18 V DC to 30 V DC Display: Integrated digital display available for flow and diagnostic parameters (typical in Picomag series) Protection Rating: IP65/IP67 enclosure protection (splash- and immersion-resistant) Installation Configuration: Designed for compact inline installation</p>	

