

## **ANNEXURE-1 to Indent No: 2024003636**

### **GENERAL CONDITIONS AND SPECIFICATIONS**

#### **1. General Conditions**

Sl. No:	Details	Compliance / acceptance
1.1	The Brand must be in existence in market for minimum 5 years as on 30/06/2024 and should have very good bench mark.	
1.2	The UPS and Isolation transformer should have IEC or equivalent BIS Certifications for use in heavy industry applications with high reliability and safety.	
1.3	The manufacturer or its authorized service center must be capable of attending any reported fault within 8 Hrs.	
1.4	A service center with qualified technicians must be available to fix the fault and clear it within 24Hrs of reporting through Phone, email or any digital media. Proof for the same must be submitted in the Bid.	
1.5	The bid is in two parts. First part is 'Techno-commercial' and second part is the Price bid. The Part-1 of the Bid will be opened first and evaluated the compliance of technical specifications and acceptance of commercial conditions by a Technical Evaluation Committee (TEC) constituted by VSSC. The technically qualified and accepted bids alone will be selected for opening Part-2 Price bid.	
1.6	If Price is uploaded in the Part-1 of Bid, the offer will be summarily rejected.	

#### **2. Specific conditions:**

Sl. No:	Description	Compliance / acceptance
2.1	The UPS and its Isolation transformer shall be considered as one Unit. Warranty of 5 years are essentially for the same. Comprehensive AMC for 5 years should be provide after warranty by the OEM or the reseller.	
2.2	The reseller must provide OEM authorization certificate clearly showing support for 5 years warranty and 5 years CAMC	
2.3	The Unit cost to be uploaded in e-procurement portal shall be cost of Supply and installation of 'Modular UPS' with 'Isolation transformer'. Cost for 'Comprehensive AMC' (CAMC) charges for 5 years after warranty shall be uploaded separately in the Price Bid. Additional payments on account of transportation, loading/unloading charges, insurance etc. will NOT be done from VSSC.	
2.4	The uploaded cost must include the total cost as above with applicable duties, taxes etc. The rate and cost of GST must be separately given. GST will be considered at common rate for all vendors.	
2.5	The CAMC charges must include item cost for any essential components like capacitors or any other part required to be periodically replaced.	
2.6	The L1 will be decided based on total of Unit and CAMC charges.	
2.7	CAMC charges will be paid on pro-rata basis after warranty period. Payment will be on quarterly basis against submission of 'Service Call Report' duly certified from concerned system engineer.	
2.8	Separate order will be issued for CAMC on completion of warranty period.	

### 3. Technical Specifications

#### 3.A Specifications for Modular UPS 80/120kVA.

	Description	Specifications	Compliance
<b>3A.1. GENERIC</b>			
3A1.1	UPS type	Online Modular type with 'Decentralized Parallel Architecture' (DPA) power modules, Voltage and frequency Independent (VFI)	
3A1.2	Output power capacity including redundancy	80 KVA	
3A1.3	Expandability (Rack facility)	Up to 120KVA. The rack must be capable of inserting minimum 6 (six) number of modules to ensure required redundancy.	
3A1.4	Individual DPA module capacity	(3+1) Nos. of 20kVA modules. To provide 120kVA with 6 modules required.	
3A1.5	Minimum backup time	30 Minutes	
3A1.6	Minimum VAH	65600 VAH (VAH shall be calculated as Battery voltage x Battery Ah x No. of batteries = Total VAH)	
3A1.7	VAH tolerance	-1% of the defined capacity	
3A1.8	Essential features	Modular type UPS equipped with microprocessor / Digital signal processor and power modules. Power expansion facility. LCD/ Digital display. Capacity expandable up to maximum capacity RS232 port and SNMP port with each power module and with suitable rack (compatible maximum expandable) Complete lockable door having visibility for maximum expandable capacity Protected cable entry cavity	
3A1.9	DPA Module replacement method	Hot swappable power module	
3A1.10	Battery redundancy maintenance and monitoring feature	Periodic "battery self-test" feature shall be available in the UPS to monitor battery health from remote location.	
3A1.11	Inverter Technology	PWM with IGBT, double conversion	
3A1.12	Output wave form	Pure sine wave	
3A1.13	Noise level	</= 65 dB	
3A1.14	Type of cool	Air cooled (Minimum 2 Fans for each power module)	
3A1.15	Parallel (Power Modules) load sharing	Total load should be shared with all modules for redundant operation in case of failure of modules.	
3A1.16	Installation and commissioning	Required on site at VSSC Thumba, Trivandrum, Kerala	
3A1.17	Additional accessories with UPS: Remote status / Alarm display panels	The UPS displays such as warning and alarms are to be displayed at 3 locations at a maximum distance of 100m away from the UPS Room.	
<b>3A2. INPUT</b>			
3A2.1	Input	AC Three Phase	
3A2.2	In put Voltage Range	320 V AC to 470 V AC 3 Phase	
3A2.3	Input frequency range	50 +/-10% Hz	
3A2.4	Input power factor at full output load leading to unity with active power factor correction (APFC)	>/=0.99 for 25% to 100% load	
3A2.5	Distortion (current)	< / = 5%	

	Description	Specifications	Compliance
3A2.6	UPS shall have DG set compatibility	Required	
<b>3A3. OUTPUT</b>			
3A3.1	Output	AC Three Phase	
3A3.2	Output voltage	380/400/415, 3 phase, 4 wire	
3A3.3	Voltage regulation (Steady state) at No load to full load, 0.6 lag to Unity PF, During entire back up time, Complete input voltage range	+/-1%	
3A3.4	Output power factor	>/=0.99	
3A3.5	Frequency	50 Hz +/-0.5 % Hz	
<b>3A4. CONSTRUCTION</b>			
3A4.1	Minimum thickness of Rack Enclosure for Modular UPS	1.2mm and duly powder coated above that.	
3A4.2	UPS shall be free from workmanship defects, sharp edges, nicks, scratches, burst, etc. All fasteners shall be fixed properly. The equipment shall be complete with all parts and all parts shall be functional		
3A4.3	Size of UPS Rack	Height of UPS rack shall not exceed 2000mm	
3A4.4	UPS enclosure's degree of protection as per IS:13947 (Part 1)/1993 latest :	IP20	
3A4.5	Standard quality Output terminals shall be provided for output connection		
3A4.6	UPS shall have static and manual bypass facility		
3A4.7	UPS shall be supplied with required rated power cable (Copper) of length 5 meter		
3A4.8	Total Harmonic Distortion (THD) for 100% linear load	< 2%	
3A4.9	Total Harmonic Distortion (THD) for 100% non-linear load	< 5%	
3A4.10	Operating temperature	0 deg C to +40 deg C	
3A4.11	Humidity	Up to 95% non-condensing	
3A4.12	Crest factor on full non-linear load	Not less than 3:1	
3A4.13	Overall efficiency on rated full load of 0.8 PF (min.) AC output	>/=94%	
3A4.14	Inverter efficiency on rated full load of 0.8 PF (min.) AC output	>/=95%	
3A4.15	UPS shall withstand Over load capacity - 125% (Output with mains AC-AC)	for 5 Minutes (Minimum)	
3A4.16	UPS shall withstand Over load capacity - 150% (Output with mains AC-AC)	for 60 seconds (Minimum)	
3A4.17	UPS shall withstand Over load capacity - 125% (Output in battery run DC-AC)	for 2 Minutes (Minimum)	
3A4.18	UPS shall withstand Over load capacity - 150% (Output in battery run DC-AC)	for 30 seconds (Minimum)	
3A4.19	Load power factor	0.8 lagging to unity	
3A4.20	Transient response time (for 100% load change, output must remain within +/-1% and recovery)	<20 milliseconds	
<b>3A5. PROTECTION</b>			
3A5.1	Short circuit protection	Required	
3A5.2	Over load protection	Required	
3A5.3	Over temperature protection	Required	
3A5.4	In put low/high voltage control	Required	
3A5.5	DC low/high voltage trip	Required	
3A5.6	Back feed protection for both, mains and bypass input	Required	

	Description	Specifications	Compliance
<b>3A6. BATTERY</b>			
3A6.1	Battery standard / certification shall conform to	JISC:8702 (Pt.I,II&III) latest or equivalent BIS	
3A6.2	Battery type	SMF VRLA	
3A6.3	Battery recharge time (after complete discharge to 90% charge) and charge rating: Battery recharge time to 90% charge after 100% DoD	8 to 10 hours	
3A6.4	Battery charger capacity	One in each power module should be capable to charge battery at C10 rate	
3A6.5	Battery cutoff voltage during back up	Not less than 10.5 V	
3A6.6	Batteries rack	Suitable metal rack capable of carrying full battery to be supplied	
3A6.7	Battery connection cables required	Shall supply DC Cable from UPS to battery and batteries to UPS , Battery interlink cables, battery breaker	
<b>3A7. METERS, INDICATORS AND DISPLAY</b>			
3A7.1	All the meters and display LCD/Digital type shall support for maximum expandable capacity		
3A7.2	Input: Voltage line to line and line to neutral, currents, frequency, power factor display		
3A7.3	Bypass: Phase voltage, line to line voltage, frequency display		
3A7.4	UPS Output: Phase voltage, phase currents, line-line voltage, power factors, frequency display		
3A7.5	Local load: Load of each phase (% age of total load), Active power (KW), Apparent power (KVA), and Reactive power (KVAR) of each phase, load crest factor display		
3A7.6	Battery: Battery bus voltage, battery charge and discharge current, forecasted battery backup time, battery capacity (Ah)		
3A7.7	Parallel load (for parallel operation system): Apparent power (KVA) of each phase, Active power (KW) of each phase, reactive power (KVAR) of each phase		
3A7.8	UPS shall have an indication for Mains on, Load on battery, Inverter, Battery level, Load level, Inverter over load		
3A7.9	UPS shall have audible alarm for over temperature, mains failure, battery low, inverter overload		
3A7.10	Communication interface: SNMP/MODBUS/HTTP/JAVA/UPSMON/SMTP etc., and 2 serial port USB/ RS232, RS485, 1 logic level port, 4 Dry contacts ports		
3A7.11	Log History storage facility with display (minimum 200 events)		
<b>3A8. WARRANTY AND AMC SERVICES</b>			
3A8.1	Warranty for Modular UPS (on site comprehensive warranty)	5 years	
3A8.2	Warranty for battery (replacement warranty)	2 years	
3A8.3	After sales and complaint service	within 24 hours	
3A8.4	Service support on 24 x 7 basis	Required at Trivandrum, Kerala	
3A8.5	Comprehensive AMC (CAMC) support after 5 year warranty. Note: Supply of battery will not be under Comprehensive AMC.	Quote to be submitted for 5 years CAMC separately along with bid.	
3A8.6	Preventive maintenance	Quarterly	
3A8.7	Availability of spares in close proximity (Spares should be easily available close to the site)	Required	
<b>3A9. CERTIFICATIONS</b>			
3A9.1	ISO: 9001 Certification		
3A9.2	ISO: 14001 Certification		

	Description	Specifications	Compliance
3A9.3	Environmental compliance certificate RoHS		
3A9.4	CE Certification and marking		
3A9.5	UPS shall meet and comply with the General and safety requirements as per IEC:62040-1		
3A9.6	UPS shall meet and comply with the Electromagnetic compatibility (EMC) requirements as per IEC:62040-2		
3A9.7	Damp Heat Test : in accordance with IS:9000 (part 5/sec.2)1981 at Temperature of 40 degree C, two cycles of (12+12) hours each 2007)		
3A9.8	Dry Heat Test: in accordance with IS:9000 (part 3/sec.5)1977 (reaffirmed 2007) at 55 degree C for 16 hrs.		
3A9.9	Cold Test: in accordance with IS:9000 (Part 2/Sec.4)1977 (Reaffirmed 2007) at -10 degree C for 4 hrs.		
3A9.10	Availability of the Type Test Report from Central Govt. /NABL/ILAC Accredited lab covering all technical requirements.		
3A9.11	All the test reports and certificates shall furnish by the supplier to the buyer/consignee on demand		

### **3.B Specifications for K-13 grade Isolation transformer 120kVA.**

	Description	Specifications	Compliance
3B1.0	Technical parameters		
3B1.1	Rating	120 KVA / 440V, 50 Hz, Three Phase, K-13 Rated	
3B1.2	Winding material	Electrolytic grade copper	
3B1.3	De-rating factor due to harmonic load (K- factor)	K-13	
3B1.4	Electrostatic shielding	Minimum two copper shielding between primary and secondary. It must be provided on the full length of the windings and connected to the body.	
3B1.5	Connection	Primary – Delta connected Secondary – Star connected with neutral brought out	
3B1.6	Vector Group	DYN 11	
3B1.7	Rated Primary voltage	440 VAC , 50 Hz $\pm$ 3%, 3 Phase	
3B1.8	Rated Secondary voltage	440 VAC at No load line to line	
3B1.9	Voltage regulation	4% max	
3B1.10	Percentage impedance	4% with tolerance as per IS-11171: 1985 / IS-2026:1977	
3B1.11	Insulation class	F	
3B1.12	Max. temperature rise	90 Deg.C above ambient temperature	
3B1.13	Cooling	Natural air-cooled (AN)	
3B1.14	Dielectric voltage	2.5 kV rms 50 Hz for one minute i) Between primary and secondary Winding. ii) Between shorted windings and frame.	
3B1.15	Ability to withstand Short Circuit	As per IS 2026 (part 1) : 1977	
3B1.16	External Hardware case	Zinc Plated passivated / Stainless steel	
3B1.17	Enclosure ingress protection standard	IP23	
<b>3B2. Test Certificates Required for transformer:</b>			

	Description	Specifications	Compliance
	The following parameters are to be tested and Certified from Transformer Testing Laboratories having NABL accreditation and BIS recognition. <i>No separate charges shall be payable for conducting any of these tests.</i>		
	Test description	Parameter values	
3B2.1	Winding material test	Electrolytic grade copper	
3B2.2	De-rating factor due to harmonic load (K-factor)	K-13 harmonics test (Harmonic tolerant for 100% non-linear loads.)	
3B2.3	Voltage regulation test	4% max at 120kVA load	
3B2.4	Percentage impedance	4% with tolerance as per IS-11171: 1985 / IS-2026:1977	
3B2.5	Insulation test	Class F. Primary with 1KV & secondary with 500V Insulation tester	
3B2.6	Max. temperature rise	90 Deg.C above ambient temperature	
<b>3B2.7</b>	<b>Test Procedure/reference documents</b>		
	Ability to withstand Short Circuit	As per IS 2026 (part 1) : 1977	
	Measurement of winding resistance	16.2 of IS: 2026 (part) -1977	
	Measurement of voltage ratio and check of voltage vector relationship	16.3 of IS: 2026 (part-1) -1977	
	Measurement of impedance voltage, short-circuit impedance and load loss	16.4 of IS: 2026 (part-1) – 1977	
	Measurement of no load loss and current	16.5 of IS: 2026 (part -1) -1977	
	Separate –source voltage with stand test	14 of IS 11171	
	Induced overvoltage withstand test	15 of IS 11171	
	Temperature rise test	17 of IS 11171	

#### **4. Bid Acceptance Criteria**

Sl. No.	Description	Acceptance / Compliance
4.1	The technical and evaluation committee (TEC) will consider all the parameters and conditions given in the para 1 to para-3 in this annexure to decide the acceptance of Bid part-1.	
4.2	Party has to submit the relevant documents, test certificates, internet links etc. to prove the compliance of parameters given in the specifications. The documents submitted must be reliable, public and available in public domain.	
4.3	TEC will be visiting the factory if necessary to evaluate the production methods and testing procedure for UPS and isolation transformer. Party has to demonstrate the production method and show the production and testing facility.	
4.4	The offers from the Parties <b>not accepting the above condition (Para 4.3) will be rejected.</b>	
4.5	The final acceptance of technical bid will be on the basis of compliance of product parameters with catalog /data sheets published in printed media or Internet and Certificates from BIS, ISO or authorized National or International test agencies.	

## **5. Terms & Conditions during WARRANTY and COMPREHENSIVE AMC periods**

<b>Sl. No.</b>	<b>Description</b>	<b>Acceptance / Compliance</b>
5.1	The warranty of UPS system will be 5 years from the date of commissioning.	
5.2	Comprehensive AMC (CAMC) will be for 5 Years after successful completion of warranty. Separate Order will be issued for Comprehensive AMC after warranty.	
5.3	The service & maintenance during warranty and CAMC will be applicable to all parts of the UPS System including hardware, software, accessories, add-on parts /modules, cables, extended panels etc. connected to the system, except Battery.	
5.4	The warranty of Battery supplied along with the System shall be for 2 Years. The battery required for replacement after warranty period of battery will be supplied by VSSC. The installation/replacement and testing of <u>system with battery shall be</u> part of warranty or CAMC.	
5.5	During the warranty period and CAMC period, the service personnel should attend any number of breakdown calls and preventive maintenance once in three months.	
5.6	The service persons must be made available in all working days and holidays as and when required for attending breakdown calls at VSSC, TERLS Area. Maintenance shall be provided during working hours [9.00 AM to 5.00 PM]. Breakdown calls shall be attended within 8 hours of intimation from the focal point or from his office.	
5.7	Repairs shall include replacement of defective parts or units with original spare parts and upgrading or restoring the software or firmware as applicable. Service Personnel have to take up and complete maintenance jobs as per the information sent through phone or e-mail.	
5.8	The input and output capacitors shall be clearly checked and any degraded capacitors should be changed immediately. All the input & output capacitors which was in service for <b>4 years</b> must be replaced during preventive maintenance.	
5.9	No separate payment will be made against the visit of Service Personnel or their stay during warranty as well as CAMC	
5.10	<b>Down-Time Compensation during warranty period:</b> In case the break-down calls are not completed within one Week and if substitute UPS is not provided, down time compensation at the rate of 0.5% of the Purchase value per week will be recovered from the PBG. The recovery for the same case will be 10% of the quarterly Bill <b>during Comprehensive AMC</b>	

## **6. Acceptance tests for UPS after installation**

<b>Sl. No.</b>	<b>Description</b>	<b>Acceptance / Compliance</b>
6.1	UPS functional checks: Unit will be tested for full functional test including input and output voltage regulation checks, output load regulation checks, battery backup test under load etc.	
6.2	Mains Power failure checks: UPS will be tested for working with battery and changeover to mains. The power interruption during changeover will be monitored. Voltage and load regulation with battery power also will be checked.	
6.3	Overload checks: UPS will be tested for specified overload on individual modules.	
6.4	System instrumentation checks: All measurements in the UPS and their internal storages, UPS activity/function logs will be verified.	
6.5	Communication checks: The communication through SNMP to remote monitoring PC's, alarms /warnings on the UPS and 'remote alarm & displays' will be checked.	
6.6	Battery health checks: All individual battery will be tested.	
6.7	The UPS will be accepted and cleared only after PASSING all above mentioned checks in addition to standard checks by the Vendor.	

**Annexure-2 to Indent No: 2024003636**

**List of items / Materials to be included in the set showing the make in India content.**

The following table has to be filled and uploaded in the Part-1 of Bid. The overall Make-In-India content must be more than 20% to meet the MII Class-II conditions.

<b>Sl. No:</b>	<b>Item Description</b>	<b>Make / Brand</b>	<b>Quantity</b>	<b>MII %</b>	<b>Remarks</b>
1	UPS rack and associated items		1 Set		
2	UPS inverter Modules		4 nos		
3	Battery rack with battery breaker				
4	SMF battery				
5	Remote monitoring panels		3 nos		
6	Isolation transformer 120KVA K13 grade		1 No		
7	Cables for battery connection to UPS				
8	Cables for connecting mains power to UPS				



**ANNEXURE-3**

(Format for MAC)

**CERTIFICATE OF UNDERTAKING FROM ORIGINAL EQUIPMENT MANUFACTURER/S**

(This certificate should be submitted along with the technical bid, signed & sealed by respective Original Equipment Manufacturer/s. The individual signing the OEM undertaking shall have the power of attorney to sign the undertaking and has to be signed with direct contact details)

We, M/s ....., the manufacturer of .....  
(Item Name, Make, Model No.), here by authorize M/s ..... (Bidder Name)  
to participate in the tender ..... (Tender No.) for  
"Supply installation and commissioning of '80kVA Modular UPS with k-13 rated 120kVA Isolation Transformer"  
in VSSC. We guarantee that the equipment's supplied are manufactured by us and are brand new and these  
items have not been used anywhere else before. Also, we hereby authorize M/s .....  
..... (name of Bidder) to provide support and service for the supplied equipment's during warranty  
period of **FIVE YEARS** and operation & maintenance contract period of **FIVE YEARS** after warranty as per  
the terms and conditions specified in the tender document,.....  
(Tender No.). In case M/s ..... (name of Bidder) is not able to perform their  
duties including service support for our supplied equipment's during installation, warranty, operation and  
maintenance period, we are ready to extend our support to VSSC for our supplied equipment, either directly  
or through our mutually agreed authorised service partner, under the same terms and conditions of this tender  
document, without any additional expenditure to VSSC. We further guarantee the availability of spares for the  
above said period for the equipment supplied.

Name

Designation

Signature of the Manufacturer (OEM)

Seal of the manufacturer (OEM)

**ANNEXURE -4**  
**Format for backend support from OEM**

To  
The Purchase & Stores Officer,  
MVIT Purchase,  
VSSC, Valiamala.  
Thiruvananthapuram

Sir/Madame,

Sub: Agreement with product vendors on Back to Back support

Ref: VSSC Tender No:

This is to certify that we M/s....., the manufacturer of ..... (Item Name, Make, Model No.) have agreed to provide back to back support to M/s ..... (Bidder Name & Address) for implementation, operations and maintenance phases of the items supplied for the tender ..... (Tender No.) for "Supply & installation of 80kVA Modular UPS"/ " K13 rated Isolation Transformer" for VSSC. The spares and upgrades will be made available to VSSC for a minimum period of 10 years from the date of commissioning of the system in conformance to the tender terms and conditions.

Yours faithfully

(Signature)

(Rubber Seal)